

**Newfoundland and Labrador
Health and Community Services
Human Resource Planning Steering Committee**

Final Report

July 2003



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- Government;
- Health Boards;
- Professional Associations;
- Unions;
- Educational Institutions;
- Numerous Individuals.

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Executive Summary

Each section of the report is summarized below, followed by a list of recommendations. Recommendations are grouped into the five overarching goals of this report including: integrated planning, system leadership, appropriate supply, quality workplaces, and sufficient data.

— Introduction —

The Newfoundland and Labrador Health and Community Services Human Resource Planning Steering Committee was established by the Minister of Health and Community Services in the fall of 1999. The purpose of the committee was to coordinate and direct a visionary and integrated health human resource plan for the province. This report summarizes the committee's essential findings and provides 30 key recommendations for sustaining the Newfoundland and Labrador health and community services system workforce of 19,000 people.

Much of the committee's work has centered on building a solid base of data and research upon which projections and key human resource policy decisions could be made. The working assumption for the committee was a "status quo" system in which health services would continue to be provided in the same manner in the future. It is appropriate that *Healthier Together – A Strategic Health Plan for Newfoundland and Labrador* was introduced in September 2002, just as the committee was entering the conclusion of its mandate. *Healthier Together* clearly acknowledges the need for changes in the system and the committee's work has laid the foundation for understanding the implications of this change on health human resources.

Physician data are noticeably absent from this document. Physician participation was suspended in 2001 and has not resumed. It is critical that this group be reintegrated into future provincial planning processes. Additionally, efforts to date have generally focused on licensed professionals, which translates to about half of the system's total workforce. The remaining half includes ancillary and support staff. These groups will also be integrated into future planning.

— Environment —

In this province, publicly-funded health human resources constitute almost 10 per cent of the entire provincial workforce, and cost about \$1.0 billion annually, or about 32 cents of every dollar that government spends. Budgetary restraint means increasing pressure on the health and community services system to find new sources of funding and curb rising costs. Sustainability of the health and community services system is the key driving force behind the search for efficiencies and new models of delivery, both of which have direct impacts on human resources.

The provincial population is shrinking but the demand for health services is expected to grow. Compared to the rest of Canada, the province has among the highest rates of circulatory disease, cancer, and diabetes, and ranks high on the risk factors of smoking, obesity, alcohol consumption, and inactivity, which are strongly linked to many chronic diseases.

Newfoundland and Labrador faces the greatest challenges of any Canadian province with respect to the accessibility and sustainability of health services and the staffing of those services, due to the rural nature of our population and the great distances between communities. Rural issues permeate most health human resource issues including recruitment and retention, core staffing requirements, quality of work-life, areas of sole practice, and others. Positions in rural areas may remain vacant for months at a time, and new graduates are sometimes placed in remote locations with little experience and inadequate peer support. Convincing new graduates or experienced professionals to relocate to a rural area can be very challenging. Balancing supply and demand figures at the provincial level is not enough; more effort is required to match the supply of new professionals to the local needs and challenges in every region of the province.

The lack of data and/or data standards blurs our understanding of the system and makes it difficult to answer basic questions. For example, to understand how a changing demographic might affect the need for occupational therapists we need to be able to describe their clients' attributes including age, gender, diagnosis, etc. On a provincial basis, very little of this data are available, especially where privately-funded services are concerned. There is also no definitive link between health outcomes and the numbers or types of health human resources delivering the service. Although critical work to standardize the collection and reporting of data in health has made great strides, there is much left to do.

All health human resource planning efforts must move forward in the context of *Healthier Together*. Efforts to sustain and improve health services in this province are inexorably linked to the people delivering the services.

— **Who's Who** —

The health workforce has the greatest variety of highly-educated and legislated professionals of any sector. About two-thirds of the workforce is represented by more than two dozen provincial and national professional associations. Compared to national averages, Newfoundland and Labrador seems to have its fair share of health professionals, except for the allied health groups: occupational therapy, physiotherapy, psychology, and speech-language pathology where there are significantly fewer professionals per capita. Data for other groups such as audiologists was not available but the same conclusion is suspected. Significant gaps in occupational therapy, physiotherapy, and speech-language pathology services were identified by the committee. Other groups such as registered nurses and licensed practical nurses have significantly higher professionals per capita than national averages. These comparisons can be misleading due to a host of issues unique to Newfoundland and Labrador (mostly related to rural issues) and the prevalence of other types of workers, including unregulated workers, in other provinces.

There is a need to expand the human resource planning focus to all groups and think about the *team* required to deliver services rather than *individual professional types*. The pursuit of integrated health services delivery requires an integrated approach for planning health human resources. Recommendations to expand the human resource planning efforts to all staff, including support personnel, and to better incorporate physician planning, are included in this report.

— **Workforce Supply** —

Health education programs for some groups are only available outside the province. These include: occupational therapists, physiotherapists, radiation therapists, clinical psychologists, speech-language pathologists, audiologists, nuclear medicine technologists, dietitians/nutritionists, and several speciality physician types, amongst others. Seat purchase arrangements exist for occupational therapists, physiotherapists and radiation therapists (cancer treatment) and bursary arrangements are also available for several groups. The greatest recruitment success for most professionals has been from in-province training programs. Recruiting out-of-province professionals or bringing back ex-provincial graduates has had minimal success for most groups without significant incentives.

An adequate supply of faculty in educational institutions, and preceptors in health boards, has been flagged as important considerations for sustaining and/or increasing the number of enrollments. Also, changing requirements for entry to practice is a health human resource planning issue. Historically, government and employers have had little input on changes to entry to practice requirements, but are impacted in a significant way. Decisions on entry to practice requirements can have serious impacts on sustaining services in rural and remote areas, adding to existing difficulties in recruiting and retaining health professionals. Rural employers often require a broad skill set and have unique requirements for credentials. Recommendations on addressing faculty, preceptors, and entry to practice issues are contained in this report.

— **Transition to the Workplace** —

A committee study surveyed three groups to examine issues around transition from educational programs to the workplace: new graduates who took positions in the provincial health and community services system, employers, and directors of selected educational programs. The study reported that: social workers and occupational therapists felt less prepared, compared to other groups, for the workforce and that their orientation to the workplace was insufficient; employers felt social workers and registered nurses were less prepared for the workforce than other groups; both employers and social workers were concerned with the appointment of new graduates to complex areas such as child welfare; and employers felt nurses had insufficient clinical experience in acute care settings. Common themes emerged related to the need for increased clinical experience, improved ability of graduates to work in teams, and improved technology/computer skills. Sample sizes were small in some cases and caution is noted in interpreting the results. Positive themes also emerged. For the majority of professional groups, over half of employers felt that graduates were prepared for the current workplace, and with the exception of social work and occupational therapy, new graduates in all categories surveyed felt they were adequately prepared to meet employer expectations.

— **Recruitment and Retention** —

Four key themes for recruitment and retention of health professionals were identified. These are quality of work-life, workload, professional development, and financial incentives. This report has recommendations to develop and adopt best practices for quality of work-life, improve workload measurement, dedicate resources for professional development, improve existing bursary programs, and develop better recruitment materials. Effective recruitment and retention efforts are critical for all groups but more so for many allied health groups comprised of young, mobile, highly-educated professionals, that are small in number and largely educated outside of the province. Reducing turnover greatly reduces the supply requirements for all groups.

— **Working in Health** —

More than half of all health board employees work on the Avalon Peninsula. A quarter of all paid hours in the province for the professional groups studied were attributed to long-term care. Almost another quarter of all paid hours were attributed to inpatient, surgical, and intensive care units combined. A total of 57 per cent of licensed practical nurses and 12 per cent of registered nurses' hours were in the long-term care sector. The percentage of paid hours employees are physically present at the workplace varies greatly between professionals groups and boards, but licensed practical nurses were the lowest in the province at 74 per cent. Licensed practical nurses also have the lowest percentage of any of the groups studied in permanent positions, at 68 per cent.

Many groups have significant turnover including managers, radiation therapists, audiologists, occupational therapists, psychologists, pharmacists, and respiratory therapists. Additionally, vacant positions for some of these groups may remain unfilled for months.

The highest rates of overtime for registered nurses were experienced in emergency or combined emergency/outpatient departments and obstetrical departments. When considered as a percentage of all earned hours, medical radiation technologists had the highest rates of overtime due to callback.

Many groups have a large portion of their workforce employed outside of the publicly-funded health sector including: social workers (24 per cent), occupational therapists (30 per cent), physiotherapists (39 per cent), speech-language pathologists (56 per cent) and pharmacists (86 per cent). These groups are subject to market forces outside of publicly-funded health services, complicating planning exercises.

Work to continue collecting fundamental indicator data will continue and be expanded to cover all employees of health boards.

— **The Health of Health Workers** —

Considerable capacity of the workforce is lost annually when employees are absent from the workplace for reasons such as sickness, injury or other leave. National data suggests health occupations lose twice the time of the workforce average due to illness or disability, and absenteeism in Newfoundland and Labrador health occupations is notably higher than the national average for health occupations.

In fiscal year 2000/01, 477 full-time equivalents were taken in sick leave and 272 full-time equivalents in lost time due to workplace injuries. This is only for the groups studied by the committee, and the provincial figures could be double. At a minimum, 1150 full-time equivalents were paid out but not worked, due to illness or injury. Many employees are replaced when absent from the workplace and health boards report increasing difficulty in providing this relief. Reduced casual staffing levels and growing difficulties in reaching employees on their off-time have created difficulties in sustaining services to the public at times. Increasing trends in Employment Insurance sick benefits is also noted.

Licensed practical nurses accounted for 54 per cent of the lost time due to injuries within the professional groups studied, but represented only 30 per cent of the paid hours. In long-term care within specific health boards, the percentage of all hours lost due to workplace injuries approached 17 per cent of all paid hours, or the equivalent of nearly one in six employees. This figure was higher when the data were further broken down by facility.

This report proposes a recommendation that a joint task force be developed to advise on effective workplace wellness programs, injury prevention programs, attendance management programs, and design of benefits.

— **Leadership** —

Approximately one thousand health and community services system managers work collectively in Newfoundland and Labrador health boards and the provincial government's Department of Health and Community Services. These managers are accountable for much of the \$1.6 billion it costs to run the system. The number of managers was drastically reduced in the mid to late 1990s. The number of management personnel is currently comparable to national figures, where management in acute care settings is concerned.

Health board managers are among the oldest employees in the system, and retirements are increasing each year. Many have clinical backgrounds and as these staff retire, they will likely be replaced with employees of similar professional backgrounds. Retirements in management positions cannot therefore be examined in isolation of other professional groups. With a significant turnover of managers annually (an estimated 16 per cent), and an increasing number of retirements expected in the next ten years, succession planning will become critical. Many health boards do not have formal succession plans and report that succession planning is very difficult with existing health employees seeing no incentive, financial and otherwise, to move into management positions.

Unique challenges facing managers include: a highly unionized and legislated environment, increasing pressure to reduce workplace sick leave and injury (attendance management), and the management of services often separated by large distances. Financial management is also a significant responsibility of managers, especially in an environment of tight fiscal restraint. Handling client issues increases the workload of clinical managers significantly. Working with physicians who are often independent from the manager's organization in terms of remuneration and chain-of-command, also poses unique challenges. Finally, management is often the target of public discussion, debate, and criticism.

Inadequate compensation has been identified as a primary factor impeding the recruitment and retention of management personnel. Throughout 2000 and 2001, selected unionized health professional groups were successful in having their compensation levels adjusted through occupational reviews, but management personnel received no similar adjustment. The net effect of these increases is that no significant difference exists between the salary levels of frontline clinical management positions and bargaining unit positions. The availability of other benefits to bargaining unit employees, such as overtime, differentials, and premiums, further decreases or often reverses the salary gap. Consequently, there is little or no financial incentive to leave unionized positions for management positions. Additionally, more attractive salaries are available to many managers outside the health and community services system, especially those with transferable skills such as the management of human resources, information technology, etc.

Five recommendations are given in this report, to ensure an adequate supply of competent leaders, and to ensure they are fairly compensated and recognized for their efforts.

— Forecast —

Forecasting involves estimating the inputs and outputs of the current workforce now and into the future, and estimating changes in the overall need for health human resources. Movement into and out of the workforce is mostly quantifiable but changes in the population's underlying need for human resources is difficult to quantify. For example, *Healthier Together* focuses on location of services, and other efforts to address scope of practice and skill mix issues. This will change requirements for health human resources. An underlying difficulty in health human resource forecasting exercises is that the manner in which the system reacts to changing circumstances (for example, circumstances such as fiscal restraint, an aging population, gaps in services, the pursuit of efficiencies, policy, advancing technology, etc.) has a big impact on human resource requirements, yet the answers to these questions lie well outside the mandate of human resource planners.

Forecasting estimates in this report considered all available pieces of information, which ranged from abundant to virtually non-existent. All occupations benefit directly from better retention approaches, resulting in lower turnover. Some locations will experience shortages or oversupply, despite overall supply figures that seem to balance, due to geographic locations of positions or the inability to offer graduates full-time employment. Reduced absenteeism could make a significant difference for some groups. Close annual monitoring is required for all groups, including those not yet analysed. Following, is a summary of forecasting results:

Five-Year Forecasting Summary (2003 to 2007)

Group and Estimated Shortage (-) or Surplus (+) ¹	Notes and Recommendations
Registered Nurses -149 to -201	The overall number of graduates and other sources of registered nurses will not meet the needs of the workforce in the next five years. Further increases of eight seats in 2005, eight seats in 2006, and 16 seats in 2007 are recommended in the long-term. Reduced absenteeism could reduce total requirements for this group. The implementation of elements of <i>Healthier Together</i> could reduce requirements for registered nurses. Rural areas require special attention to avoid shortages. Close annual monitoring is required.
Psychologists -5 to +5	Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover. This group relies on effective recruitment and retention techniques such as bursaries. Recommendations to improve recruitment and retention are critical to avoid shortages, especially in rural areas. Reintroduction of Memorial University's Clinical Psychology program is recommended.
Social Workers -144 to -68	A gap is projected in the supply of social workers in the next five years (entire social work workforce considered) based on high turnover rates, however a stable or decreasing turnover could narrow or eliminate the gap. Rural areas, notably Labrador, require special attention to avoid critical shortages. Close annual monitoring is required. Reduced absenteeism could reduce total requirements for this group.
Audiologists -7 to -10	Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover.
Occupational Therapists -5 to -15	Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover.
Pharmacists Unknown	Current gaps in supply are projected to continue, not because of insufficient seats but because of recruitment difficulties combined with high turnover in health boards. Efforts to have pharmacists work to their full scope of practice (i.e. clinical pharmacy) are important to support. Labour market adjustment to salaries may be required.
Physiotherapists -40 to +25	Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover.
Speech-Language Pathologists -6 to -16	Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover.
Managers Unknown	The workforce will not be sustained in the future if current circumstances prevail. Issues around succession planning, professional development, compensation, and workload will result in a dwindling supply of willing managers and less than ideal health and community services system leadership in the future. Proposed recommendations addressing succession planning, leadership development, rewards/recognition, and inequities in compensation are vital for sustaining this group of professionals.
Radiation Therapists (cancer treatment) 0, No Gap	No gaps in supply projected for the next five years provided existing seat purchase and bursary arrangements continue with successful return-in-service results.
Dietitians/Nutritionists -10 to 0	Potential gaps in supply projected for the next five years with current arrangements. Rural areas require special attention to avoid shortages. Close annual monitoring is required.
Licensed practical nurses 0, No Gap	Close monitoring of licensed practical nurse requirements is required as a Long-term Care and Supportive Services strategy is developed, as outlined in <i>Healthier Together</i> . Reduced absenteeism could reduce total requirements for this group.
Medical Laboratory Technologists +31 to +42	No gaps in supply are projected for the next five years. Retirements begin to climb after 2010 but not significantly. Rural areas require special attention to avoid shortages.
Medical Radiation Technologists (x-ray) +5 to +10	No gaps in supply projected for the next five years. System growth and increased turnover could lead to shortages. Rural areas require special attention to avoid shortages.
Respiratory Therapists +25	Surplus in supply projected over the next five years. Annual monitoring is required.

Notes

1. This represents the estimated range of total shortage or surplus for each group for the next five years.

— **Planning Support Systems** —

The availability of data has been one of the most challenging aspects of the Human Resource Planning Steering Committees' work. It has delayed the completion of reports and challenged the committee's ability to meet its mandate. It remains a very limiting factor to the planning process. Recommendations to improve data availability and quality include continued involvement in the development of provincial data standards, and having professional associations submit annual minimum data sets.

Human resource information systems and standards are needed for both management and planning. Although it is difficult to build a business case around the need for an electronic human resource information system, the need clearly exists. Health human resources represent an annual expenditure of \$1.0 billion in this province, and modern tools are required to properly manage the resource. It is recommended in this report that government support the implementation of human resource information systems in health boards using a provincial framework.

There is a need to monitor trends, revise forecasts and advise government and health boards on emerging human resource issues and solutions. Most provinces have dedicated human resource planning staff to support such activities and this is seen as a growing priority with an aging workforce and increasing competition for recruitment and retention of professionals in the health and community services system. As the committee's work is concluded and a new health human resource planning process is initiated, it is important to maintain close relationships with key stakeholders developed over the last three years, but just as important to maintain a system-wide perspective. To this end this report recommends that a Human Resources Advisory Committee be established to support the work of the Human Resource Planning Unit, and formal stakeholder links be established.

Tremendous knowledge and experience has been developed in government and health boards related to planning for and managing health human resources. Bringing together key stakeholders to address human resource issues on a provincial level is recommended, through regular workshops to identify best practices and share information.

— **Summary of Recommendations** —

Following, is a summary of the recommendations of the Human Resource Planning Steering Committee. They are not sorted by priority or importance, but grouped in five broad categories according to their purpose, which is to ensure:

1. Integrated Planning;
2. System Leadership;
3. Appropriate Supply;
4. Quality Workplaces;
5. Sufficient Data.

— **INTEGRATED PLANNING** —

- a. **Human resource planning be incorporated into provincial and regional strategic health planning goals and objectives as they unfold and develop in the next five years. (Recommendation 1, page 3)**
- b. **Government and health boards produce regularly updated integrated human resource plans covering all applicable professionals, including the role of support staff and scope of practice issues. These plans are to be constructed within the framework of government and health board strategic health plans. (Recommendation 2, page 5)**
- c. **Government and health boards resume physician human resource planning activities within the framework of government and health board strategic health plans as per Recommendation 2. (Recommendation 3, page 5)**
- d. **Provincial and federal governments partner with stakeholders when increased entry to practice educational requirements are being considered, including an analysis of the need for such increases and their impact on the sustainability of the workforce. (Recommendation 6, page 15)**
- e. **Government update health human resource forecasts on an annual basis and closely monitor all professional groups for shortages. Stakeholders continue to develop and explore systematic approaches to supply and demand forecast modeling. (Recommendation 22, page 64)**
- f. **Government establish a Newfoundland and Labrador Health and Community Services Human Resource Advisory Committee. (Recommendation 27, page 66)**
- g. **Upon evaluation of previous experiences, government establish formal mechanisms that ensure stakeholder groups continue to have adequate input into human resource planning. (Recommendation 28, page 66)**
- h. **Government continue its mandate of centralized human resource planning in partnership with the Newfoundland and Labrador Health Boards Association. (Recommendation 29, page 66)**
- i. **Government and health boards work with stakeholders to facilitate regular workshops on key topics such as wellness, workplace injuries, scope of practice, continuing education, recruitment and retention, and others, with the goal of identifying best practices and sharing information. (Recommendation 30 page 66)**

— **SYSTEM LEADERSHIP** —

- a. **Health boards develop succession plans for their respective health and community services system managers. (Recommendation 15, page 36)**
- b. **Governments and health boards define minimal competencies for health and community services system managers and develop learning plans on how these competencies will be achieved, including the potential for developing provincewide educational programs and workshops to meet this goal. (Recommendation 16, page 36)**

- c. **Employers implement a system of recognition and rewards for their respective health and community services system management employees including statements acknowledging manager's achievements, letters of thanks, certificates of appreciation, and awards of excellence. (Recommendation 18, page 37)**
- d. **Government develop and implement a plan to (1) address current inequities in health and community services system management salaries, and (2) to avoid similar future problems. (Recommendation 19, page 37)**

— **APPROPRIATE SUPPLY** —

- a. **Educational institutions offering health-related programs monitor key issues affecting the availability of faculty, including retirements and external recruitment activities. (Recommendation 4, page 13)**
- b. **Health boards work with educational institutions to increase support of preceptorship programs. Educational institutions improve communications with, and support of, preceptors throughout the province through regular professional development workshops in health boards and the continuation of recognition and reward mechanisms. Educational institutions work with health boards and staff to develop best-practice models for preceptorship programs. (Recommendation 5, page 13)**
- c. **Health boards and educational institutions work together to develop comprehensive orientation programs to ensure graduates are optimally prepared for the workplace, notably but not limited to social workers and registered nurses. (Recommendation 7, page 17)**
- d. **Government and health boards continue to support (1) the implementation of the Master in Health System Management Program at Memorial University and (2) the Scholarship for Graduate Program in Health Administration offered through the Newfoundland and Labrador Health Boards Association. (Recommendation 17, page 36)**
- e. **Government support a bursary program that (1) increases the value and scope of present bursaries, (2) is more flexible in awarding bursaries to a wider range of professional groups, (3) is flexible in awarding bursaries based on identified regional need, and (4) has decisions related to the availability of bursaries made at least six months prior to graduation so health boards can effectively recruit. (Recommendation 11, page 22)**
- f. **Government develop high-quality marketing materials to assist health boards with recruitment. (Recommendation 12, page 23)**
- g. **Government sustain the 32 seats added to the Bachelor of Nursing Collaborative program in 2002. Further increases of eight seats in 2005, eight seats in 2006, and 16 seats in 2007 be implemented with attention to the required infrastructure, faculty, and clinical placements. Reevaluate this recommendation annually. Support efforts to establish the Licensed Practical Nurse Bridging Program, the Labrador Inuit Access Program, and distance education initiatives. (Recommendation 20, page 43)**
- h. **Government work with Memorial University to reintroduce a clinical psychology program in the province. (Recommendation 21, page 57)**

— **QUALITY WORKPLACES** —

- a. **Health boards, professional associations, unions and other stakeholders develop a plan to identify and adopt best practices for quality professional practice environments, building on existing initiatives. (Recommendation 8, page 18)**
- b. **Government and health boards work toward a five-year plan to ensure that a minimum of one per cent of payroll is dedicated to training, continuing education, and other professional development. Health boards ensure that organizational learning and development plans are in place. (Recommendation 10, page 21)**
- c. **Government, health boards and unions establish a task force to determine best practices and advise on (1) effective workplace wellness programs (2) injury prevention programs (3) attendance management programs and (4) design of benefits program.**
 - **Resources be allocated to seek immediate and long-term solutions in high-risk areas of workplace injuries such as licensed practical nursing in long-term care;**
 - **Incorporate allied health professionals, notably physiotherapy and occupational therapy, in key injury prevention and occupational health and safety roles;**
 - **Build on existing best practices in health boards.****(Recommendation 14, page 34)**

— **SUFFICIENT DATA** —

- a. **Governments and health boards establish minimum workload data reporting requirements and support efforts to improve the collection and reporting of workload/performance measurement data. (Recommendation 9, page 19)**
- b. **Government continue to prepare an annual Provincial Human Resource Indicator Report covering all employees and all earned hour types. (Recommendation 13, page 29)**
- c. **Health boards implement a standard exit survey to capture information on reasons why employees leave health boards. (Recommendation 23, page 64)**
- d. **Government continue to work closely with health boards and the Newfoundland and Labrador Centre for Health Information to develop and implement standards for abstracting of financial and statistical data, including human resource data. (Recommendation 24, page 65)**
- e. **Government work with professional associations to identify and implement a suggested minimum data set to be submitted by professional associations annually. (Recommendation 25, page 65)**
- f. **Government support the implementation of human resource information systems in health boards using a provincial framework. (Recommendation 26, page 66)**

— **Conclusion** —

The Human Resource Planning Steering Committee has made great strides in gathering basic data and monitoring key workforce trends but there is much left to do. The list of unknowns is very long, and every effort must be made to identify what core information is needed and how it is to be obtained.

All organizations including government, health boards, professional associations, unions, and educational institutions, have a role to play in implementing the recommendations contained in this report. Each of these organizations should examine the list of recommendations, identify the required actions, and form implementation plans to realize the goal of sustaining and strengthening Newfoundland and Labrador's health and community services workforce.

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1 Introduction

The Newfoundland and Labrador Health and Community Services Human Resource Planning Steering Committee was established by the Minister of Health and Community Services in the fall of 1999 to coordinate and direct a visionary and integrated health human resource plan for the province. Through extensive consultations, the committee has completed more than two dozen initiatives during its tenure. This report represents the summary findings and recommendations of the committee as per the requirements of its Terms of Reference. Further background and other documents can be found at <http://www.nlhba.nf.ca/hr>.

The purpose of this document is to summarize essential findings and to present a plan for sustaining an appropriate workforce. The committee's status report of July 2002 provided numerous recommendations on sustaining an appropriate workforce. This document reiterates and builds upon existing recommendations, however only essential supporting material will be repeated. The emphasis is on new findings and future directions.

Physician data are noticeably absent from this document. Physician participation was suspended in 2001 and has not resumed. It is critical that this group be reintegrated into future provincial planning processes. Two existing committees considering human resource issues include the Provincial Physician Recruitment and Retention Committee and the Physician Services Liaison Committee. There are positive signs of future partnerships in this area.

2 Environment

The total Newfoundland and Labrador workforce is approximately 200,000 people. Approximately nine per cent or 19,000 people work in the publicly-funded health sector. Costs associated with this workforce account for about 70 per cent of the total public health sector expenditure of \$1.6 billion, or about \$1.0 billion annually. Funding for health and community services programs represents 45 per cent of all government program spending; therefore nearly 32 per cent of all government expenditure is for health human resources. Per capita public sector spending on health in Newfoundland and Labrador has exceeded the Canadian average for the past five years, and for fiscal year 2002/03 should exceed that average by almost 11 per cent (Government of Newfoundland and Labrador, March 27 2003). Budgetary restraints mean increasing pressures on the health and community services system to find new sources of funding and curb rising costs. Sustainability of the health and community services system is the key driving force behind the search for efficiencies and new models of delivery, both of which have direct human resource impacts.

The overall population of the province is projected to continue to decline to about 502,000 in 2013 from 516,000 today (Government of Newfoundland and Labrador, March 16 2003). This decline is uneven in that urban areas have an increasing proportion of the overall population while most rural areas have seen population decreases. Despite overall population decline, the number of people over the age of 65 (the primary users of the health and community services system), will grow by 31 per cent in the next ten years. The out migration of younger people means a decrease in the availability of traditional supports for seniors and others requiring long-term care. Compared to the rest of Canada, the population of Newfoundland and Labrador has among the highest rates of circulatory disease, cancer, and diabetes, and ranks high on the risk factors of smoking, obesity, alcohol consumption, and inactivity, which are strongly linked to many chronic diseases (Newfoundland and Labrador Centre for Health Information September 2002).

Statistics Canada reports that Newfoundland and Labrador's population consisted of 42 per cent rural (living in communities under 1000 persons) in 2001. The Maritime Provinces all have higher percentages of rural populations (49 per cent in New Brunswick to 55 per cent in Prince Edward Island) however Newfoundland and Labrador's population density (people per square kilometer) is seven times lower than New Brunswick and 17 times lower than Prince Edward Island (Statistics Canada, April 21 2003). Considering community size and dispersion, Newfoundland and Labrador faces the greatest challenge of any Canadian province with respect to the accessibility and sustainability of health services and the staffing of those services. *Healthier Together*, the province's strategic health plan, states "...quality and access issues in this province exist in the areas of primary health care, location of services, organizational boundaries, long-term care and supportive services, and mental health services." Strategic directions identified in the plan will have important implications for health human resources as they are rolled-out over the next five years. The Royal Commission on the Future of Health Care in Canada identified treating health human resource planning as a separate policy exercise as one of the key barriers to reform.

Another planning consideration is the presence of variation. For example, variation in demographics, population needs, system efficiencies, system utilization, skill mix, team mix, and absenteeism, is common and ever-changing. This variation also exists between provinces, complicating benchmarking exercises. Given unique environments, variation is often quite appropriate but seriously challenges the planning process. Additionally, the lack of data and/or data standards blurs our understanding of the system and makes it difficult to answer basic questions. For example, to understand how a changing demographic might affect the need for occupational therapists we need to be able to describe their clients' attributes including age, gender, diagnosis, etc. On a provincial basis, very little of this data are available, especially where privately-funded services are concerned. There is also no definitive link between health outcomes and the numbers or types of health human resources delivering the service, however this is an emerging area of research. Although critical work to standardize the collection and reporting of data in health has made great strides, there is much left to do.

RECOMMENDATION 1.

Human resource planning be incorporated into provincial and regional strategic health planning goals and objectives as they unfold and develop in the next five years.

3 Who's Who

Table 1 summarizes public-sector health human resources in Newfoundland and Labrador. All are employed by provincial health boards except fee-for-service (FFS) physicians.

Table 1 Public Sector Health Human Resources in Newfoundland and Labrador

Primary Occupations		Ancillary Occupations, Clinical ²		Ancillary Occupations, System ²	
Description	No.	Description	No.	Description	No.
Audiologist ¹	16	Audiology Technician	3	Administration ⁴	2236
Behaviour Management Specialist ²	44	Cardiology Technician	4	Biomedical Engineering	19
Cardiology Technologist ²	28	Combined laboratory/x-ray Technician	30	Dietary	1015
Child Management Specialist ²	24	Medical Laboratory Technician	31	Facilities	415
Combined laboratory/x-ray Technologist ²	12	Medical Radiation Technician	6	Housekeeping	1298
Dietitian ¹	67	MLT Support Staff	117	Information Systems	78
Electroneurophysiology Technol. ²	12	MRT Support Staff	8	Laundry	252
Licensed Practical Nurse ^{1,7}	2790	Nuclear Medicine Technician	5	Materials Management	135
Managers, clinical and non-clinical ²	872	OT Support Worker	33	Medical Service Aide	229
Medical Laboratory Technologist ²	370	Personal Care Attendant	327	Records ⁶	90
Medical Radiation Technologist ²	238	Pharmacy Technician	91		
Nuclear Medicine Technologist ²	15	Physiotherapy Support Work.	70		
Nurse Practitioner ²	51	Prosthetist-Orthotist Technic.	5		
Occupational Therapist ¹	106	Psychologist Assistant	7		
Paramedic (private not included) ²	114	Recreation Therapy Worker	99		
Pharmacist ¹	73	Social Service Worker	62		
Physicians – General Practitioners ³	448	Other Occupations	70		
Physician – Specialists ³	504				
Physiotherapist ¹	110				
Psychologist (Clinical) ¹	59				
Prosthetist-Orthotist ¹	12				
Radiation Therapist (cancer treat.) ⁸	17				
Recreation/Development Special. ¹	24				
Registered Nurse ¹	5070				
Respiratory Therapist ¹	68				
Social Worker ¹	662				
Speech-Language Pathologist ¹	40				
Other Occupations ^{2,5}	37				
Total	11,883	Total	968	Total	5767
Grand Total			18,618		

Sources and Notes:

1. Source: Human Resources Indicator Report 2000/01 (October 2002).
2. Source: Newfoundland and Labrador Health and Community Services Retirement Analysis (April 2003).
3. Source: Medical Services Branch of the Department of Health and Community Services. Data as of March 31, 2002. Note that of 448 general practitioners, 141 were salary and 307 FFS. Of 504 specialists, 212 were salary and 292 FFS. In 2001, 42 per cent of physicians in Newfoundland and Labrador were international medical graduates. This was second only to Saskatchewan at 51 per cent, and nearly twice the Canadian average of 23 per cent.
4. "Administration" includes all clerks (admitting, ward, payroll, and others), secretaries, and other administrative staff excluding managers.
5. "Other Occupations" includes cardio-pulmonary technologists, cardiovascular perfusion technologists, dentists, dosimetrists, electrocardiograph technologists, genetic counselors, medical physicists, orthopaedic technologists, orthopists, and pastoral care clinicians.
6. "Records" includes medical records technicians, medical records analysts, and medical records librarians.

7. “Licensed practical nurse” group includes 23 operating room technicians and 136 psychiatric licensed practical nurses.
8. Source: Newfoundland Cancer Treatment and Research Foundation, May 2003.

Table 1 shows about 60 of the unique professions that work together to deliver health services in Newfoundland and Labrador. The committee focused mainly on licensed professionals, which translates to about half of the system’s total workforce. There is a need to expand the human resource planning focus to all groups and think about the *team* required to deliver services rather than the *individual*. For example, achieving the right skill mix allows all involved to work to their maximum scope of practice. Increasing levels of key support positions may yield tremendous improvements in service delivery. The pursuit of integrated health services delivery requires an integrated approach for planning health human resources.

RECOMMENDATION 2.

Government and health boards produce regularly updated integrated human resource plans covering all applicable professionals, including the role of support staff and scope of practice issues. These plans are to be constructed within the framework of government and health board strategic health plans.

RECOMMENDATION 3.

Government and health boards resume physician human resource planning activities within the framework of government and health board strategic health plans as per Recommendation 2.

To compare the Newfoundland and Labrador health workforce to the overall Canadian health workforce, population per professional ratios are provided in Table 2. It is important to note that these ratios include all professionals registered with a professional association, not only those in the publicly-funded health sector. For example, most pharmacists in Newfoundland and Labrador work for private organizations (86 per cent), and more than half of the provincial speech-language pathologists work in the education sector (56 per cent). Other practice settings and other professional groups are shown in Table 8.

Table 2 Provincial and National Population per Professional Ratios.

Group ¹	Level	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Dietitian	NL	5,973	5,533	5,499	5,654	5,700	5,519	5,393	4,723	4,586	4,372
	Canada	4,454	4,463	5,086	4,763	4,713	4,661	4,621	4,519	4,513	4,499
Licensed Practical Nurse	NL	206	206	210	200	199	196	197	193	189	185
	Canada	336	341	349	354	364	379	392	412	419	423
Medical Lab. Technologist ²	NL	2,122	2,097	2,163	1,910	1,856	1,715	1,730	1,735	1,645	1,686
	Canada	1,445	1,430	1,468	1,469	1,538	1,583	1,680	1,734	1,755	1,742
Medical Radiation Technologist ³	NL	2,926	2,324	2,195	2,155	2,082	2,128	2,076	2,073	2,065	2,053
	Canada	2,053	1,986	2,018	2,027	2,037	2,088	2,129	2,125	2,137	2,122
Occupational Therapy	NL	11,361	10,759	7,218	7,050	6,068	5,412	5,094	4,893	3,979	3,926
	Canada	4,814	4,514	4,206	4,358	4,056	3,942	3,836	3,630	3,439	3,255
Pharmacy	NL	1,400	1,308	1,269	1,283	1,166	1,154	1,125	1,106	1,013	1,046
	Canada	1,423	1,403	1,381	1,365	1,329	1,310	1,321	1,310	1,276	1,259
Physicians	NL	637	653	596	590	600	603	591	587	585	580
	Canada	535	532	524	531	537	543	545	540	538	534
Physiotherapy	NL	4,789	4,150	4,066	3,482	3,319	3,149	3,572	3,017	2,894	2,702
	Canada	2,385	2,351	2,233	2,169	2,139	2,138	2,091	2,051	2,017	1,967
Psychology ⁴	NL	25,192	22,345	21,157	20,181	19,329	18,582	17,957	2,936	2,909	2,758
	Canada	2,928	2,817	2,843	2,794	2,752	2,717	2,658	2,546	2,397	2,334
Registered Nurse	NL	117	115	112	110	108	106	106	102	103	100
	Canada	124	122	122	125	127	130	131	133	134	133

Source: Health Personnel in Canada, Canadian Institute for Health Information (CIHI) 1991 to 2000, 2001.

Notes

1. Speech-language pathology, audiology and respiratory therapy not reported by CIHI. Social work omitted due to data accuracy issues.
2. Only five of 13 provinces and territories require licensure for medical laboratory technologists. Not mandatory in Newfoundland and Labrador. Figures represent voluntary active membership in many instances.
3. Only six of 13 provinces and territories require licensure for medical radiation technologists. In Newfoundland and Labrador all medical radiation technologists must register with the national association (CAMRT) but it is not mandatory to register with the provincial association (NAMRT). Figures represent voluntary active membership in many instances.
4. A major change is evident in the provincial population per professional ratio for psychologists in 1998. This is a data quality issue, and does not mean there was a big change in the number of psychologists in the province in that year.

There are six groups shown in Table 2 that were significantly different from the national average in 2000. Three groups had significantly better ratios including licensed practical nurses, registered nurses, and pharmacists, and three groups had significantly worse ratios including psychologists, occupational therapists, and physiotherapists. There are several limitations associated with interpreting population per professional ratios:

The population figures only reflect gross numbers and not the age/gender distribution. The population out-migrating from Newfoundland and Labrador tends to be young, resulting in an older provincial population. An older population uses more health services than a younger one. Therefore as the census decreases, the ratios decrease, leaving one with an impression of a situation improving more quickly than it actually is. Additionally, overall population numbers do not reflect health status, population density, or patterns of utilization. Finally, census data only represents best estimates of population, and there are many factors impacting its accuracy.

The number of professionals does not reflect scope of practice issues, the existence or nonexistence of support personnel, utilization, casualization, distribution of personnel, or to which sector they belong i.e. public versus private. Core staffing requirements in rural and remote locations are also a factor in determining the appropriate number of health professionals. Population per professional ratios should only be used at the provincial level, and with great caution. Other methods should be used to augment findings.

4 Workforce Supply

4.1 New Graduates

The current supply of health professionals from provincial educational institutions and those where seat purchase arrangements are in place outside the province is shown in Table 3 and Table 5:

Table 3 Health Professional Graduates.

Profession	Education Program (See notes)	Type of Program	Number of Applicants (2001)	Capacity (2003)	Number of Graduates					
					1999	2000	2001	2002	2003 ⁸	2004 ⁸
Respiratory Therapy	CNA	Diploma	> 400 (for all three programs for common year one in 2000)	10	10	10	9	10	8	13
Medical Laboratory Technology	CNA	Diploma		29	23	20	13	19	19	29
Medical Radiation Technology	CNA	Diploma		12	11	13	13	12	14	12
Ultrasound	CNA	Diploma	4 (2000)	4	3	5	4	4	4	4
Practical Nursing	CNS, CNA	Diploma	964	Variable	104	104	105	154	109	109
Registered Nursing⁴	MU, CNS, WRSN	Bachelor	494	220	40	163	162	180	180	191 ⁴
	MU	Master	23	20	3	9	9	16	8	Not avail.
Nurse Practitioner	CNS	Post-RN Certificate	38	16 ¹	12	12	0 ²	9	12	22
Social Work⁶	MU	Bachelor	101 (1 st Degree) 19 (2 nd Degree)	35 (1 st Degree) 10 (2 nd Degree)	60	43	40	49	45	45
		Master	31	15	31	19	11	11	15	15
Pharmacy	MU	Bachelor	About 118 (2000)	36 – 40	37	38	41	41	32 ⁵	38 ⁵
		Master		6	2	1	0	0	3	2
Physiotherapy	Dalhousie (seat purchase)	Bachelor	225	48 (10 NL seats)	10	10	10	10	10	10
Occupational Therapy	Dalhousie (seat purchase)	Bachelor	81 (2000)	48 (8 NL seats)	8	8	8	8	8	8
Radiation Therapy (cancer treatment)	Michener Institute ³ (seat purchase)	Bachelor	89	75 (3 NL seats)	0	0	0	3	3	3 ⁷

Source: Educational institutions offering programs, accurate to March 2003.

Notes

1. Nurse practitioner program capacity increased to 20 seats in September 2002.

2. No nurse practitioner graduates in 2001 due to the fact that in 2000 the program was extended from 12 months to 16 months. For this reason, applicants who were accepted into the program in 2000 did not start until January 2001 and will therefore not graduate until April 2002.
3. Radiation therapy program (cancer treatment) located in Toronto, Ontario.
4. First graduates of the nursing “fast track” option included. Registered nurse estimates for 2005 and beyond is 216. Further increases may be realized through the proposed Labrador Inuit Access Program and the Licensed Practical Nurse Bridging Program. Government has funded a Rural Student Nursing Incentive Program at \$75,000 annually to assist bachelor of nursing students access rural community placements in their 4th year.
5. Pharmacy numbers are slightly below capacity due to faculty and clinical preceptorship issues.
6. MU also offers a PhD program in social work, generally graduating two every other year.
7. Three more radiation therapists (cancer treatment) expected for 2005 and two more in 2006.
8. All figures for 2003 and 2004 are estimates.

Acronyms:

- Centre for Nursing Studies (CNS)
- College of the North Atlantic (CNA)
- Memorial University of Newfoundland (MU)
- Western Regional School of Nursing (WRSN)

Expressing the number of graduates as a percentage of the provincial workforce for selected groups provides an interesting comparison:

Table 4 Health Professional Graduates as a Percentage of Workforce.

Profession	Workforce (Public and Private)	Graduates	Graduates as a Percent of Workforce
Registered Nursing	5600	215	3.8%
Practical Nursing	2900	110	3.8%
Medical Radiation Technology	255	12	4.7%
Social Work	950	45	4.7%
Physiotherapy	200	10	5.0%
Occupational Therapy	136	8	5.9%
Medical Laboratory Technology	430	29	6.7%
Pharmacy	585	40	6.8%
Respiratory Therapy	80	10	12.5%
Total	11,136	479	4.3%

The number of graduates required to satisfy workforce requirements depends on both public and private sector issues including the retention of graduates, turnover, external supply, retirements, changes in demand, and other factors, but figures provided above provide an additional piece of information for planning purposes. For example, in the year 2000 there were about 232,000 registered nurses and roughly 4000 seats in Canada, or 1.7 per cent of the workforce. Prior to 2000, the number of seats had reached a high of about 10,000 or 4.3 per cent of the workforce. There is a consensus that reductions in the number of seats were too great, and recent increases in the number of seats across the country will return the level to four or five per cent. This sizable increase in number of seats may not be sufficient to meet the unprecedented number of upcoming retirements, but with such a large and complex system there is always the danger of overcorrection, leading to cyclical patterns of shortage and surplus of professionals.

In Newfoundland and Labrador, the average number of registered nurse graduates in the early 1990s was about 275 or 5 per cent of the workforce. It decreased by 34 per cent to give us our present figure of 180 or 3.2 per cent of the workforce, and will soon increase to 215 for 2005 (with the addition of 32 seats in 2002 and reduced attrition from the program) or 3.8 per cent of the workforce.

The province is dependent on out-of-province training for several health professional groups beyond those noted in Table 3, including clinical psychologists, speech-language pathologists, audiologists, nuclear medicine technologists, and dietitians/nutritionists. No seat purchase arrangements exist for these groups however there is an internship program for dietitians/nutritionists.

Since the discontinuation of the Master in Clinical Psychology program in the early 1990s, the health and community services system has had increased difficulty in recruiting and retaining these professionals. Increased reliance on international recruits has been noted. A recommendation is contained in Section 10.11.

Historical and projected Newfoundland and Labrador medical school graduates are shown in Table 5:

Table 5 Memorial University of Newfoundland Medical Graduates.

Type of Program	Sub-Specialties	Length of Program	Capacity (2000)	Number of Graduates (Projected for 2003 and 2004)					
				1999	2000	2001	2002	2003	2004
M.D, Undergrad (about 750 Applicants)		4 years	60 (45 NL seats)	59	60	59	60	61	61
Family Medicine		26 months	20	24	19	18	15	15	20
Anesthesia		5 years	2	2	1	1	1	3	4
Medicine	Internal	4 years	5	1	0	0	0	4	10
	Nephrology	5 years	0	0	1	0	1	0	0
Neurology		5 years	1	2	1	0	0	1	0
Obstetrics & Gynecology		5 years	2	0	2	0	4	2	3
Pathology	General	5 years	1	0	1	0	0	0	0
	Anatomical	5 years	1	0	1	0	0	0	0
Pediatrics		4 years	3	1	3	1	2	3	5
Psychiatry		5 years	3	4	3	4	2	2	2
Radiology		5 years	3	3	1	1	2	0	0
General Surgery		6 years	3	3	2	2	3	3	3
Orthopedic Surgery		5 years	2	1	1	0	1	3	2
Subtotal, Post-graduate				41	36	27	31	36	49
Grand Total				100	96	86	91	97	110

Source: Memorial University of Newfoundland, Faculty of Medicine, accurate to March 2003.

Overall, numbers in post-graduate programs are projected to experience significant increases to 2004.

There is a concern across all educational programs that with the declining youth population in this province, it will become increasingly difficult for health professional training programs to compete for the declining student base.

The greatest recruitment success for most professionals has been from in-province training programs. Recruiting out-of-province professionals or repatriation of ex-provincial graduates has had minimal success for most groups without significant recruitment incentives. In the current workforce, 93 per cent of registered nurses, 99 per cent of licensed practical nurses, and 85 per cent of social workers were educated in this province. While statistics are not available for medical laboratory technologists, medical radiation technologists, or pharmacists in the province, it is estimated that over 90 per cent of these groups were also educated in this province. Retention of new graduates varies based on factors such as availability of full-time jobs, competitive salaries, spousal employment in the designated location, work-life variables such as on call requirements, and other variables.

The Newfoundland and Labrador Association of Medical Radiation Technologists has recently agreed to give combined laboratory/x-ray professionals the opportunity to obtain membership with that organization. Employers, especially in rural locations, advocate for the necessity of this role if services are to be sustained in many areas of the province with declining populations. The program to cross train medical laboratory technologists in radiology was re-introduced at the College of the North Atlantic in September 2002.

The provincial government has recently announced a number of initiatives that will benefit students in Newfoundland and Labrador, including those pursuing a career in health. These initiatives include tuition rate reduction measures, a new student loan tax credit program and the creation of the Student Investment and Opportunity Corporation (SIOC), established to take a strategic approach to address youth employment needs (Government of Newfoundland and Labrador Department of Youth Services and Post-Secondary Education, April 2003). The impact of these initiatives on recruitment and retention in the health and community services sector is unknown at this time.

An Atlantic health education initiative is currently under development by departments of Health and Community Services and Post-secondary Education. The proposal is to assess the emerging issues in Atlantic health education programs, consider capacity to increase enrollment, and examine issues such as the ability to share programs, program funding, faculty recruitment, infrastructure, and clinical capacity including viability of preceptorship programs. Newfoundland and Labrador is supporting this initiative to increase regional cooperation.

4.2 Faculty

An aging faculty in some disciplines, coupled with recruitment challenges and potential increases in demand stemming from increased entry to practice requirements, increases in enrollments, and other factors, may create barriers in the province's ability to meet the need for new graduates. The Human Resource Planning Steering Committee generally focused on schools of nursing faculty only.

The committee report "Issues in Nursing Education: Faculty Supply" (February 2003) notes that nursing faculty are typically master or doctorate-prepared nurses employed by schools of nursing. As of 2002, there were approximately 107 registered nurses in this province who identify "teaching students" as their primary area of responsibility, 53 per cent of which are 45 years of age and older. The Practical Nursing Program in this province has not, to date, expressed concern over increased faculty retirements, however shortages of master-prepared faculty in brokered sites throughout the province has been an issue. Combined with the increased number of seats in the Bachelor of Nursing Collaborative program, and other initiatives that may further increase the number of seats, there is a growing concern around the availability of faculty. Other teaching demands on faculty include re-entry, post-basic, advanced practice and master courses/programs, and research.

Some useful suggestions stemming from the report may be applicable for other educational institutions. The report's recommendations for improving utilization/sustaining schools of nursing faculty include:

1. Targeted funding with return-in-service commitment to encourage master-prepared nurses to complete PhD programs;
2. Increased marketing by Schools of Nursing, highlighting advanced education opportunities including master and PhD programs using techniques such as career development workshops;
3. Continued efforts by Memorial University to work with the Atlantic Provinces to develop a PhD program in nursing;
4. Maximized cross appointments of master/PhD prepared nurses from other sectors (i.e. government, associations, management, and private practice);
5. The development of shared programs between universities and/or colleges in other provinces to reduce per course faculty requirements, including the use of graduate students to assist with grading and other work;
6. The use of non-nursing faculty (i.e. professionals educated in other social sciences) for selected program components;
7. Consideration of part-time employment opportunities for retired faculty.
8. The use of Bachelor-prepared nurses to teach the clinical and laboratory components of the nursing education program;
9. Employer's support for staff nurses availing of opportunities as clinical instructors, acknowledging the benefits of these nurses as part of their organization.

Challenges recruiting new faculty in the School of Pharmacy has been cited as one factor in recent reductions in enrollments. Several of the above suggestions may be useful for other educational programs.

RECOMMENDATION 4.

Educational institutions offering health-related programs monitor key issues affecting the availability of faculty, including retirements and external recruitment activities.

4.3 Preceptorship

Preceptors are employees who teach, support, and evaluate students in clinical settings. They are role models that help students make the transition from the classroom to the workplace. Limited capacity exists in most health professional training programs in relation to clinical capacity for student placements, preceptors, and availability of faculty to teach increased class sizes, educational infrastructure, and funding. Both the School of Pharmacy and School of Nursing face increasing difficulty in securing preceptors. The School of Pharmacy reported that student intake for 2002 was reduced with a lack of clinical preceptors as the major determining factor. This is still the case today for the School of Pharmacy, although enrollments are only slightly below the program's capacity, as shown in Table 3.

Sustainability of preceptorship programs is vital to sustaining most current clinical programs. Educational institutions must monitor this regularly.

RECOMMENDATION 5.

Health boards work with educational institutions to increase support of preceptorship programs. Educational institutions improve communications with, and support of, preceptors throughout the province through regular professional development workshops in health boards and the continuation of recognition and reward mechanisms. Educational institutions work with health boards and staff to develop best-practice models for preceptorship programs.

4.4 Entry to Practice Requirements

Changing educational requirements for entry to practice is actively occurring for several professions. Table 6 outlines some of these changes either under discussion or already announced.

Table 6 Movement Regarding Entry to Practice.

Professional Group	Current Education for Entry to Practice (ETP)	Anticipated Changes in NL
Registered Nurses	Degree or diploma under certain conditions, however only Bachelor of Nursing education offered in the province.	None in this province. Seven of 10 provinces are Bachelor of Nursing education only or moving in that direction.
Licensed Practical Nurses	Diploma (one-year Program).	None.
Occupational Therapists	Bachelor Degree.	Master degree as future ETP by 2010 announced by Canadian Association of Occupational Therapists (CAOT) Dec. 2001. Only master programs will receive CAOT accreditation by 2008.
Physiotherapists	Bachelor Degree.	Discussions are very active related to master degree as ETP.
Speech-Language Pathologists	Master Degree. (No Legislation).	None.
Social Workers	Bachelor Degree.	None.
Audiologists	Master Degree. (No Legislation).	Discussions reported related PhD as entry to practice.
Medical Radiation Technologists	Diploma – Three-year Program at the College of the North Atlantic (CNA). (Mandatory registration with CAMRT to operate radiation equipment).	Bachelor degree by 2005 announced by Canadian Association of Medical Radiation Technologists (CAMRT) in mid 1990s. This will also affect nuclear medicine technologists, sonographers, radiation therapists, and MRI technologists. Newfoundland and Labrador has until 2010 to comply with this requirement.
Health Records Technologists	Diploma. (No legislation, no mandatory membership with provincial or national association).	Early 2002 the Canadian Health Records Association (CHRA) rescinded their earlier decision that bachelor degree will be required to hold a designation with their organization. A degree is strongly recommended however for an administrative designation with the organization (voluntary membership).
Medical Laboratory Technologists	Diploma: Three-year program at CNA (No legislation, voluntary membership in association).	The Canadian Society of Medical Laboratory Technologists (CSMLS) supports transition to bachelor degree. Implications for education program to be determined.
Dietitians/nutritionists	Bachelor Degree.	Potential move to master.
Psychologists	Master.	Reverted from PhD in 2000 back to master.
Respiratory Therapists	Diploma: Three-year CNA (No Legislation).	None known however some jurisdictions offer bachelor degree education program.
Dental Hygienists	Degree.	Unknown at this time.
Home Support Workers	16-week certificate. (No legislation).	None.
Dentists	Bachelor Degree.	Unknown at this time.
Chiropractors	Diploma or Degree.	Unknown at this time.
Paramedics	Eight-month Primary Care Paramedic offered through the Health Care Corporation of St. John's.	This is a change from previous Paramedic Level 1-3 program. Unknown at this time.
Physicians	MD and Residency; some post residency sub-specialty.	Increasing tendency toward sub-specialization.
Pharmacists	Bachelor Degree.	None.

Source: Educational Requirements for Entry to Practice of Professionals in the Health Sector Discussion Brief (July 2002)

Formal announcements to increase entry to practice requirements have been issued by the national associations for occupational therapy (Canadian Association of Occupational Therapists - CAOT Accreditation of only master level occupation therapy programs by 2008) and medical radiation technologists (Canadian Association of Medical Radiation Technologists - CAMRT approval of only bachelor degree programs for medical radiation technologists only by 2005, although Newfoundland and Labrador has been granted an extension until 2010). The move to degree-level education for the medical radiation technologists group will also increase the program of study for sonographers which will move from a three-year diploma plus one year to specialize, to a four-year degree plus one year to specialize.

The national standard for nurse practitioner education, suggested by the Canadian Nursing Association, is the master level. In Newfoundland and Labrador, the Nurse Practitioner Program in primary health care services is an 18-month post-diploma certificate. Some changes in the Newfoundland and Labrador program are expected in this regard, over the next few years. Memorial University of Newfoundland is introducing a master-level Nurse Practitioner program (specialty) in the fall of 2003.

Historically, government and employers have had little input on changes to entry to practice requirements, but are impacted in a significant way. Decisions on entry to practice requirements can have serious impacts on sustaining services in rural and remote areas, adding to existing difficulties in recruiting and retaining health professionals. Rural employers often require generalists and have unique requirements for credentials. An independent assessor model should be explored that assures some independent analysis of proposed changes by working with professional associations, employers, educational institutions, the public, and governments, towards an objective outcome.

RECOMMENDATION 6.

Provincial and federal governments partner with stakeholders when increased entry to practice educational requirements are being considered, including an analysis of the need for such increases and their impact on the sustainability of the workforce.

5 Transition to the Work Place

In 2001 the committee conducted a study focusing on four major issues related to new graduate preparedness for the workplace including perceptions of preparedness, adequacy of orientation, satisfaction with the program, and perspectives on future workplace needs. The study surveyed new graduates who took positions in the public health and community services system, employers, and directors of selected educational programs. Key findings are listed below:

- There was a high correlation between perceptions of educational preparedness on behalf of the employer and that of the new graduates;
- For the majority of professional groups, over half of employers felt that graduates were prepared for the current workplace;
- With the exception of social work and occupational therapy, new graduates in all categories surveyed felt they were adequately prepared to meet employer expectations. Caution is noted in interpreting results for occupational therapists as response rates were low;
- With the exception of occupational therapy graduates, all others felt more prepared to meet employer expectations than employers felt they were;
- Employers of social workers and registered nurses felt these graduates were less prepared for the workplace than other groups;
- Comments revealed that social work concerns were primarily related to the appointment of new graduates to complex areas such as child welfare, where vacancies more often exist at the entry level in health and community services and integrated health boards. Both new graduates and employers saw this as problematic;
- Comments related to registered nurse new graduates primarily related to insufficient clinical experience in acute care settings;
- For most professional groups, over half of employer and student respondents reported that the orientation was adequate. Occupational therapy and social work were exceptions to this finding;
- Overall, new graduates were dissatisfied with the overall cost of their program;
- While perspectives on future changes needed in education programs varied, common themes emerged related to increased clinical experience, improved ability of graduates to work in teams, and improved technology/computer skills.

The Association of Registered Nurses of Newfoundland and Labrador has recently completed a project to develop best-practice guidelines for orientation of new and transferring registered nurses. This document is available on the Association's web site.

On-site mentorship requirements for provisionally licensed professionals had an impact on the employment of graduating physiotherapy students in 2002. New graduates in 2002 who accepted placements in sole practice locations were required to work in large centres in designated health boards with a licensed physiotherapist until they achieved a full licensure. Several of the current vacancies are in such sole practice locations. Health boards should avoid placing inexperienced graduates in specialized areas of practice and areas of sole practice wherever possible. If it is unavoidable, intensive orientation and close monitoring is required.

RECOMMENDATION 7.

Health boards and educational institutions work together to develop comprehensive orientation programs to ensure graduates are optimally prepared for the workplace, notably but not limited to social workers and registered nurses.

6 Recruitment and Retention

The Human Resource Planning Steering Committee conducted a provincial consultation on effective tools of recruitment and retention of health professionals, summarizing the results in the report: “Recruitment and Retention in the Health System: A Discussion Paper” (June 2002). Four themes were examined: quality of work-life, workload, professional development, and financial incentives. The major priorities identified through the consultation included:

- Competitive salaries in Atlantic Canada;
- Commitment of resources to learning and development to support quality of care and service;
- Bursary programs and retention bonuses targeted at difficult to recruit professionals and locations.

Recommendations listed in the following sections reflect the results of the consultation.

6.1 Work-life

There have been a growing number of initiatives in recent years on the topic of work-life. Quality of work-life is a key component in recruiting and retaining health professionals, and also providing quality health services. For example, the Canadian Council on Health Services Accreditation (CCHSA) has included work-life as one of four dimensions of quality in its Achieving Improved Measurement (AIM) Accreditation Standards. Organizations that are currently undergoing or will undergo accreditation will be evaluated in the quality of the working environment provided to employees. The Canadian Health Services Research Foundation (CHSRF) has funded research around the benefits of healthy workplaces for nurses and magnet hospital research in the United States also concentrates on the quality of work-life for nurses, and the benefits of a positive work environment on staff and patient outcomes. The Canadian Nursing Advisory Committee was formed to examine the work-life of nurses and produced 51 recommendations. Additionally, Health Canada’s Office of Nursing Policy has committed funds to develop healthy workplace guidelines.

RECOMMENDATION 8.

Health boards, professional associations, unions, and other stakeholders develop a plan to identify and adopt best practices for quality professional practice environments, building on existing initiatives.

Employee wellness is an important factor in a quality work-life. Recommendations pertaining to employee wellness are contained in Section 8. Another important consideration is professionals working in small centres where access to peers is infrequent. Many allied health professionals work in sole practice or with only one other professional in their discipline.

6.2 Workload

The workload of health professionals has been raised as a significant issue in the health and community services system, and is of concern to the majority of health professional groups. Environments with consistently high workloads affect the retention of professional groups, as high workloads often impact job satisfaction and burnout. A reasonable and manageable workload has been identified as a key element in decreasing turnover, increasing retention and increasing productivity. While increased workloads may increase short-term productivity, they increase long-term costs and problems through development of stress-related illness, impaired judgment, and other problems. The relationship between recruitment, retention and workload has been cited repeatedly throughout literature on health professions. In 2001, the provincial government developed templates for nursing workload and skill mix to bring uniformity to staffing in the province. Recently, workload issues surrounding social workers have been reported in a provincial study.

The challenge in this area has historically been the ability to measure workload comparably, reflecting patient acuity and environmental considerations. Variables such as patient acuity and functional independence, work environment, support systems, technology and skill/experience level of the practitioner all contribute to a complex group of workload determinants. Systems, such as Management Information System (MIS), have been in place for many years, yet consistency and compliance in reporting remains a challenge. Education of health and community services system managers, senior administrators, staff, professional associations, unions, and other decision makers concerning the collection of workload statistics, interpretation of the statistics, and how they can be used for planning purposes, is essential in ensuring consistency and compliance in reporting of workload.

The committee recognizes the need for more consistent workload data covering a broader range of professionals that is simple (or automated) enough to gain acceptance by those required to complete, yet comprehensive enough for effective decision making.

RECOMMENDATION 9.

Governments and health boards establish minimum workload data reporting requirements and support efforts to improve the collection and reporting of workload/performance measurement data.

6.3 Professional Development

Organizational learning is evident as a priority need in the health and community services system today. Rapid advances in technology, research, products, procedures, and pharmaceuticals require professionals to remain current to ensure quality client/patient care, to ensure organizations are managed efficiently and effectively, and to ensure the public have access to required services. Mandatory certification and re-certification are required for several professional groups in addition to minimal continuing education credits required by some professions to maintain a practising license. High turnover and difficulty in recruiting for some positions may be associated with a lack of development and learning opportunities or resources.

Organizational learning may be achieved by numerous routes including in-house resources such as in-services, computer-based learning, mentoring and workplace learning, and journals. External methods include job rotation, conferences, and local or distance education programs. Many health boards conduct organizational learning needs assessments on a regular basis, including mandatory training. Learning needs may also arise from an individual's performance evaluation or the introduction of new job requirements.

Research by the Conference Board of Canada demonstrated that average investment across industries in training and development is 1.8 per cent of payroll. A recent review carried out for the British Columbia Public Service Employee Relations Commission in July 2002 found similar results. The Conference Board found health and education sectors performed quite low in this assessment with only 0.6 per cent of payroll dedicated to this purpose. The definition used by the Conference Board focuses primarily on wages for in-house educators, hardware/software investments for training, and funds for tuition. The committee reviewed budget allocations in the health boards for organizational learning, but difficulties exist in evaluating these allocations against Conference Board definitions, as budgets in most health boards, similar to those in government departments, are not set up to capture such detail.

Most industry experts advocate that a minimum of two per cent of salary expense be dedicated to training and development, however this target is rarely achieved in the public sector. The Quebec government has legislated employers, including those in the public sector, with over 500 employees, to dedicate at least one per cent of payroll to training and development. Quebec is the only province in Canada with such legislation. The Canadian Council of Health Services Accreditation has established standards against which health boards are evaluated on a regular basis. While no specific percentage of salary is recommended, organizations are expected to have learning plans in place to meet the needs of the organization.

There was a strong consensus in Health Forums, held in 2001 by the Department of Health and Community Services, that support for learning was required for safe and competent practice and that development and learning opportunities are of immeasurable value in the recruitment and retention of health professionals. Professionals represented at these forums in all areas of the province spoke to lack of learning opportunities, minimal access to learning tools such as the internet, journals and other resources, and frozen and reduced education budgets in health boards to cope with global deficits. Adding to this challenge is the cost of sending staff to educational events. Many professionals such as registered nurses and licensed practical nurses must be replaced on the unit, unlike the education system where classes can be cancelled for professional development events. With replacement staff scarce in some locations and at certain times during the year, the situation becomes complicated further.

To achieve the goals and objectives of *Healthier Together* it is envisioned that significant investment in organizational learning will be required, including such priorities as primary health care, long-term care, mental health services, and location of services. Greater use of technologies such as telehealth, electronic client records and other new advances will require a workforce to acquire focused education programming in these new approaches. It is important to note that the current workforce was largely educated under a more traditional model of service delivery. Finally, there is a growing national focus on medical errors and patient safety, and the need for better staff education.

RECOMMENDATION 10.

Government and health boards work toward a five-year plan to ensure that a minimum of one per cent of payroll is dedicated to training, continuing education, and other professional development. Health boards ensure that organizational learning and development plans are in place.

6.4 Other Issues

As described in Section 4.1, seat purchase programs for occupational therapy and physiotherapy currently graduate eight and ten new graduates per year respectively, with a three-year return-in-service agreement. Students have expressed disagreement with the current process of being required to fulfil the return-in-service agreement while not receiving any financial assistance from the seat purchase program.

An audit of the seat purchase program for occupational therapy and physiotherapy bursary programs indicates that since 1999, 49 per cent of all students in purchased occupational therapy seats completed (or are currently completing) the mandatory return-in-service, or were released from their contract. For physiotherapy seat arrangements, 58 per cent of all students completed (or are currently completing) the mandatory return-in-service, or were released from their contract. A total of five new graduates have been released from contracts, for both programs, for graduating classes 1999 to 2002.

A major issue affecting the percentage of graduates completing the mandatory return-in-service is the match of available positions to new graduates. For example, consider a situation where only a single position remains available and five new graduates with return-in-service requirements have not yet been placed. As each new graduate rejects the position, they default on their contract and must repay the cost of the seat purchase. The new graduate may accept a temporary position elsewhere in the province, which may in turn lead to a permanent full-time position, however temporary positions of less than nine months do not satisfy the return-in-service requirements.

Bursaries have also contributed to the success of recruiting physiotherapy and occupational therapy graduates, radiation therapy (cancer treatment), speech-language pathology and audiology graduates, and Bachelor of Nursing graduates in 2000 and 2001. In 2000, 148 bachelor of nursing graduates accepted bursaries, with 27 later renegeing on the contract. In 2001, 153 nursing graduates (a small number of these bursaries went to out-of-province nurse graduates who came here to work) accepted bursaries, with one renegeing and 16 under review when this information was received. It is important to note that full-time jobs were also available to most of those graduates. Bursaries for medical students and postgraduate trainees (residents) are also in place and vary in success.

New graduates have indicated that three main factors influence their decision to stay in the province: permanent full-time employment, comparable Atlantic Canadian salaries, and availability of bursaries/incentives. Large student debts upon graduation, for most professionals, mean most are strongly motivated to accept positions with incentive packages from other jurisdictions or other countries, to pay off these loans quickly.

The Allied Health Seat Purchase and Bursary Committee reviewed the seat purchase and bursary program in 2002. Their recommendation was continuation of the seat purchase program with elimination of the mandatory return-in-service requirement once an effective recruitment and retention program is in place. The committee further supported increasing the value of the bursaries for occupational therapy, physiotherapy, speech-language pathology and audiology. Consideration for rural and remote locations included adjustments to either the value of bursaries (higher value in rural/remote areas) or the length of return-in-service (less time required) to make these employment settings more attractive to new graduates. Subject to increased funding, the Allied Health Seat Purchase and Bursary Committee recommends an expanded bursary program to include other allied and selected diagnostic professionals where evidence exists that significant difficulty in recruitment is experienced. These recommendations have been submitted to the Department of Health and Community Services for consideration.

RECOMMENDATION 11.

Government support a bursary program that (1) increases the value and scope of present bursaries, (2) is more flexible in awarding bursaries to a wider range of professional groups, (3) is flexible in awarding bursaries based on identified regional need, and (4) has decisions related to the availability of bursaries made at least six months prior to graduation so health boards can effectively recruit.

The long-standing Labrador Benefits Agreement provides funds to public sector employees and their dependants, to address unique cost of living challenges faced by those residing in Labrador. Health board employees are included in this agreement and receive a general allowance and a travel allowance based on specific conditions. This agreement is an important recruitment and retention tool for health board employees. Registered nurses and social workers in remote Labrador locations have additional incentives such as an annual retention bonus.

Issues around the retention of older workers have not been explored by the committee. There are advantages associated with retaining older workers in some job categories, including opportunities for mentorship and preceptorship, however retaining older workers may increase the risk of injury and illness and simply delay the inevitable exit from the system. Several stakeholders have raised this subject as an appropriate area of research for future human resource planning activities. Similarly, issues around the casualization of the workforce have been raised several times, as a deciding factor in workforce morale and in the retention of new graduates (i.e. new graduates do not want casual positions). The committee collected data in this respect but did not address the subject directly.

The availability of marketing materials for the recruitment of health professionals has been raised several times. It is felt that these materials would be useful to those tasked with recruiting health professionals to the province.

RECOMMENDATION 12.

Government develop high-quality marketing materials to assist health boards with recruitment.

7 Working in Health

Much of the data provided in this section was taken from the Health Human Resources Indicator Report, Newfoundland and Labrador 2000/01 (October 2002). Where earned hours (total of worked and benefit hours) are discussed, the data only covers 15 professional type groupings, or about half the total number of employees in health boards. Other indicators were collected at the union or health board level, including the overall number of employees. This is provided in Table 7:

Table 7 Employee Count by Health Board, July 2001

Health Board	Health Board Name	Employee Count ¹	Employee Count as a Percent of Total
HCCSJ	Health Care Corporation of St. John's	6757	37%
WHCC	Western Health Care Corporation	2522	14%
SJNHB	St. John's Nursing Home Board	1654	9%
CWHC	Central West Health Corporation	1415	8%
CEHCIB	Central East Health Care institution Board	1057	6%
PHCC	Peninsulas Health Care Corporation	1025	6%
AHCIB	Avalon Health Care institutions Board	970	5%
HLC	Health Labrador Corporation	657	4%
HCS-SJ	Health and Community Services – St. John's Region	640	3%
GRHS	Grenfell Regional Health Services Board	550	3%
HCS-W	Health and Community Services – Western Region	397	2%
HCS-C	Health and Community Services – Central Region	298	2%
HCS-E	Health and Community Services – Eastern Region	285	2%
NCTRF	Newfoundland Cancer Treatment and Research Foundation	156	1%
PSCH	Pentecostal Senior Citizens Home	113	1%
Total	15	18,496	100%

Source: Health Human Resource Indicator Report, Newfoundland and Labrador 2000/01 (October 2002)

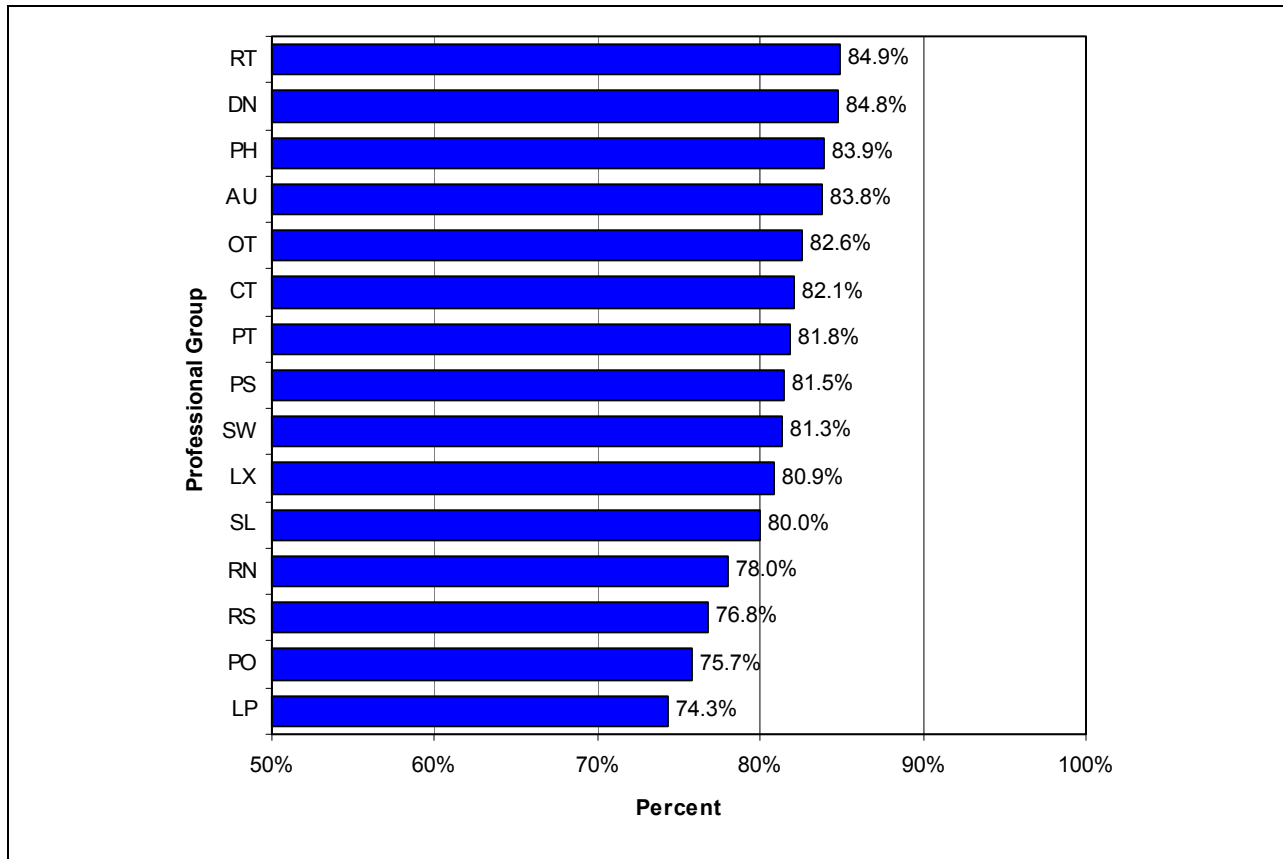
Notes

1. Includes part-time and casual positions - use caution in interpreting figures.

A quarter of all earned hours for the professional groups studied in the report were attributed to long-term care. Almost another quarter was attributed to inpatient, surgical, and intensive care units (ten, eight and six per cent respectively). A total of 57 per cent of licensed practical nurses and 12 per cent of registered nurses' hours were in long-term care.

The per cent of time employees are physically present at the workplace is a good indicator to place initial focus on opportunities for improvement. These percentages are shown in Figure 1:

Figure 1 Worked to Earned Ratios.



Source: Health Human Resource Indicator Report, Newfoundland and Labrador 2000/01 (October 2002)

Notes

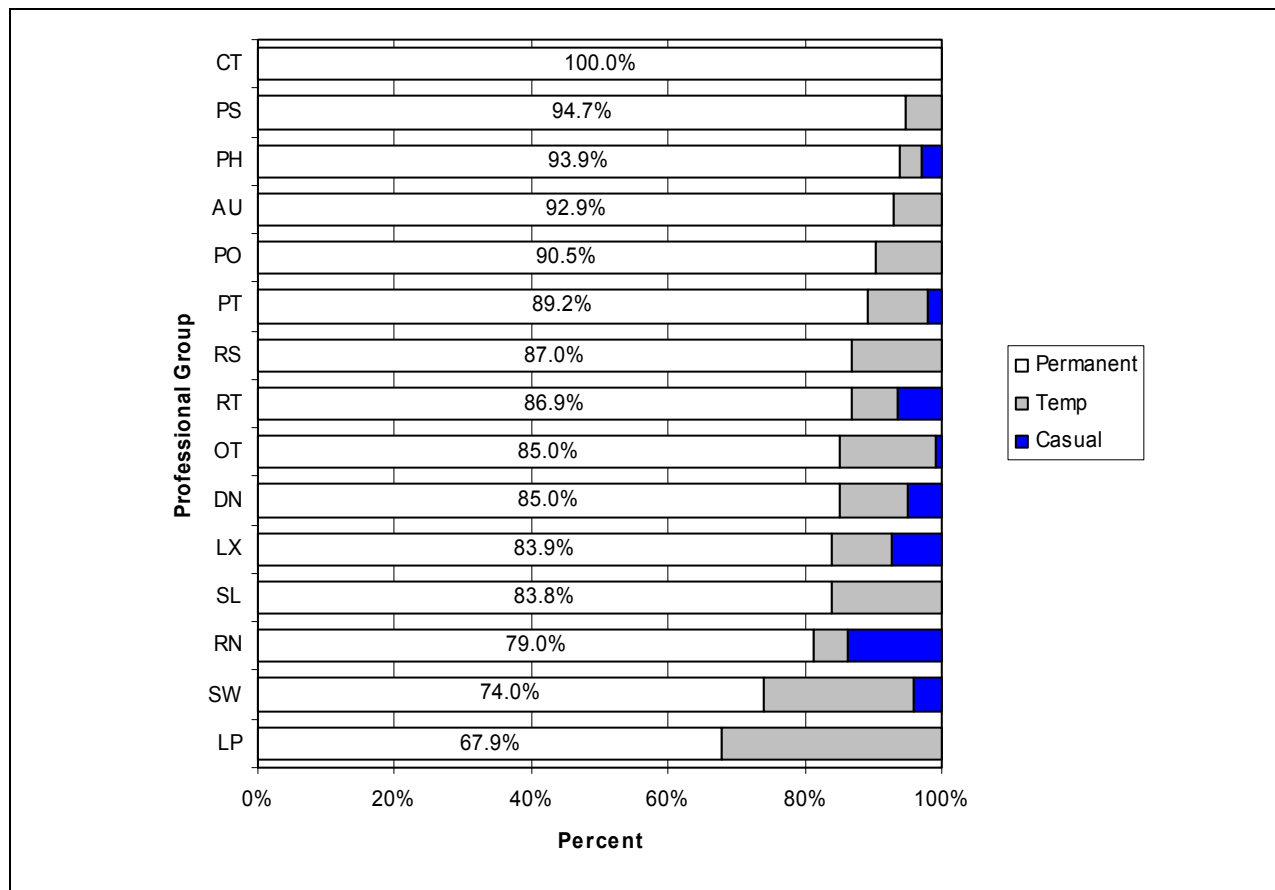
Acronym Professional Group

- AU Audiologists
- DN Dietitians/nutritionists
- LP Licensed Practical Nurses
- LX Medical Laboratory Technologists, Medical Radiation Technologists, Medical Radiation Technicians
- OT Occupational Therapists
- PH Pharmacists
- PO Prosthetists/Orthotists
- PS Psychologists
- PT Physiotherapists
- RN Registered Nurses
- RS Recreation Specialists
- RT Respiratory Therapists
- SL Speech-Language Pathologists
- SW Social Workers
- CT Radiation Therapists, Medical Physicists, Medical Dosimetrists

Figure 1 shows that respiratory therapists are physically present at the workplace for a very large portion of all their earned hours (85 per cent) while at the opposite end of the scale, licensed practical nurses are physically present at their workplace for 74 per cent of all their earned hours. As with all indicators, there is considerable variation between health boards. The range for licensed practical nurses by health board (68 per cent to 81 per cent) is lower than for registered nurses (74 per cent to 93 per cent). This is consistent with higher rates of absenteeism for licensed practical nurses, discussed in Section 8. For example, if an employee takes four weeks holidays, two weeks statutory days, and two weeks of other leave, they are at work 85 per cent of his or her paid hours. To approach 68 per cent, another 8.5 weeks of leave is required. It is important to note that these statistics also reflect long-term leave due to sickness and injury.

Another important factor that affects the number of people required to meet worked hours' requirements is the amount of part-time work being performed. There is often confusion when discussing the terms permanent, temporary, casual, part-time and full-time. The key distinction is if the employee has guaranteed hours they are permanent or temporary, otherwise they are casual, except for those in the NAPE bargaining unit, where staff without guaranteed hours are labeled temporary. The terms full-time and part-time are best used to describe the number of hours per pay period, and not the employment contract. Figure 2 shows the percentage of the workforce in permanent, temporary or casual positions.

Figure 2 Permanent, Temporary, and Casual Employee Summary.



Source: Health Human Resource Indicator Report, Newfoundland and Labrador 2000/01 (October 2002)

Notes

1. Definition - Percentages of each employee type in each group. No data were available for AHCIB and CEHCIB. Note that some health boards identified casual licensed practical nurses although there is technically no such category. All licensed practical nurses identified as casual are added to the temporary category. See Appendix L.

A certain percentage of casual and temporary staff is required to provide the necessary flexibility in dealing with leave replacement and changes in workload, however having a large casual/temporary group may have a negative impact on continuity of care, recruitment, retention, and employee morale. The Human Resource Planning Steering Committee report “Licensed Practical Nurse Supply Report” (December 2001) indicates that as of November 2001, 61 per cent of licensed practical nurses reported permanent (full and part-time) employment. This percentage has remained fairly constant over the past ten years. For registered nurses, the committee report “Registered Nurse Supply Report” (October 2001) indicates that in fiscal year 2000/01 the workforce was 72 per cent full-time, 16 per cent part-time, and 12 per cent casual. The percentage full-time has increased from a low of 59 per cent in 1996. In 2000, Newfoundland and Labrador had the highest percentage of registered nurses with full-time positions in Canada. The data in these two documents are self-reported to their respective professional associations and includes management, while the data in Figure 2 originated from the HR departments of the health boards and includes only unionized staff.

Other key findings for the groups within the scope of the Health Human Resource Indicator Report for the fiscal year 2000/01 include:

- Position vacancy periods were about 13 weeks for psychologists, 10 weeks for audiologists, nine weeks for registered nurses, and five weeks for social workers. Other groups studied had fewer than five-week vacancy periods;
- Employee turnover was the highest for allied health groups. Groups to highlight were those having over 15 per cent turnover including radiation therapists, audiologists, occupational therapists, psychologists, and respiratory therapists. Given challenges facing the recruitment and retention of pharmacists in the province, their turnover rate which stood at 14 per cent is also of concern;
- Employee counts for groups common to the first and second initiatives to collect health board data all increased from December 1999 to July 2001. Total earned hours for most professional groups also showed an increase;
- Licensed practical nurse to registered nurse ratios showed significant variation in long-term care between health boards;
- Overtime for registered nurses dropped by nearly one-half in fiscal year 2000/01 from calendar year 1999 data, and for licensed practical nurses by nearly one-third. Data quality issues may account for this large drop and will be addressed in future data collection. Also, increases in staff may have reduced the need for overtime;
- Registered nurses accounted for more than half of the total 156 full-time equivalents of overtime (including callback) generated by the groups studied, with the highest rates being in emergency or combined emergency/outpatient departments and obstetrical departments. When considered as a percentage of all earned hours, medical radiation technologists had the highest rates of overtime due to callback.

Table 8 profiles the primary area of work for several health professionals in the province. The largest majority of all groups examined are working in acute client services. It is also noted that allied health professionals often work in other public sectors as well as the private sector.

Table 8 Professionals Reported by Practice Setting – Estimated Percentages.

Group	Practice Setting ¹			
	Acute Care (Per cent)	Long-term Care (Per cent)	Community (Per cent)	Other ² (Per cent)
Management ³	71	10	19	0
Medical Radiation Technologists	98			2
Licensed Practical Nurses	40	57	1	2
Registered Nurses	75	12	9	4
Medical Laboratory Technologists	93			7
Audiologists	62	15	15	8
Respiratory Therapists	90			10
Dietetics	59	16	10	15
Social Workers ³	19	2	55	24
Occupational Therapists	55	4	11	30
Physiotherapists	45	16		39
Speech-Language Pathologists	22	10	12	56
Psychologists	31			69
Pharmacists	14			86

Source: Newfoundland and Labrador Allied Health Supply Report (May 2002) and other sources.

Notes

1. Practice setting as reported by professional associations. Does not necessarily reflect distribution by health board type. Breakdown not always available.
2. “Other” includes the private sector and public sectors outside of the health sector.
3. Distributed between publicly funded health categories based on distribution by health board type assuming: SJNHB = Long-term care, health and community services boards = Community, institutional boards = Acute, and integrated boards’ staff allocated half and half between Acute and Community.

RECOMMENDATION 13.

Government continue to prepare an annual Provincial Human Resource Indicator Report covering all employees and all earned hour types.

8 The Health of Health Workers

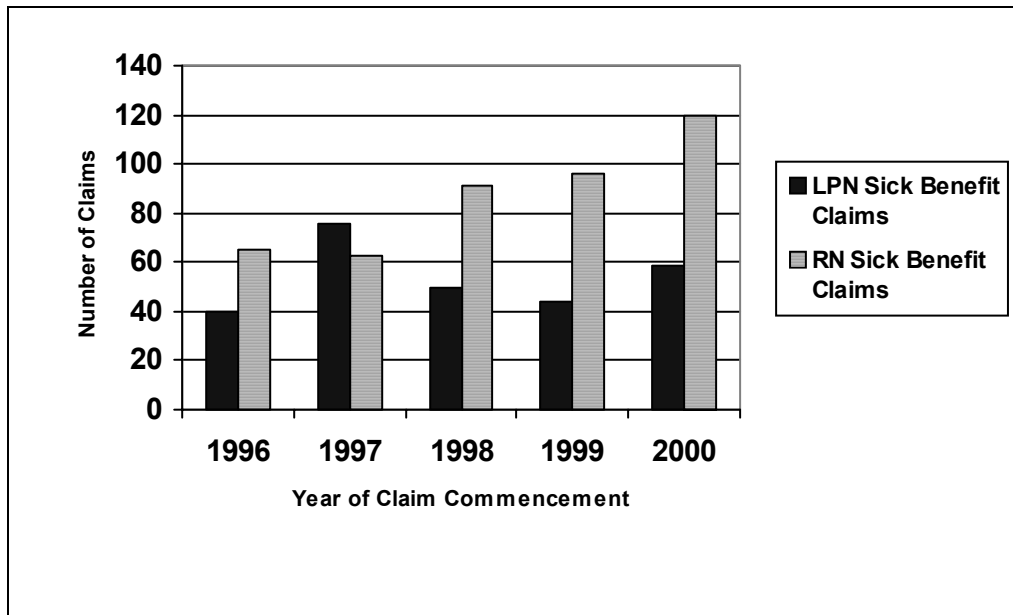
Considerable capacity of the workforce is lost when employees are absent from the workplace for reasons such as sickness, injury or other leave. There are a number of statistics that assist in the examination of issues including sick leave, Workplace Health and Safety Compensation Commission claims, long-term disability claims, and Employment Insurance sick leave.

National data from the Canadian Institute for Health Information reveals:

- Since 1987, the average number of work days lost in Canadian health occupations due to illness or disability is twice the total workforce average;
- The health workforce is 1.5 times more likely to miss work due to illness and disability than the total workforce;
- Reducing Canadian health workers' absenteeism to total Canadian workforce absenteeism equates to 13,700 full-time equivalents less in 2000, including 5,500 registered nurses;
- In 2000, the Newfoundland and Labrador full-time workforce in health occupations was absent due to illness or disability 8.6 per cent of each week. The figure for the national sector is 7.2 per cent.

Employment Insurance sick benefit claims on the provincial front (Figure 3 and Figure 4) and absenteeism due to sick leave and workplace accidents (Table 9) describe a number of concerning trends.

Figure 3 Registered Nurse and Licensed Practical Nurse Employment Insurance Sick Benefit Claims.



Source: Registered Nurse and Licensed Practical Nurse Employment Insurance Summary 1996 - 2000, January to April (November 2001)

Figure 3 reveals an upward trend in the number of registered nurse sick leave claims and a variable number of licensed practical nurse sick leave claims. In 1999, the number of sick weeks claimed by registered nurses was 1512 while for licensed practical nurses it was generally about 565 weeks annually except for a spike in 1997.

Table 9 demonstrates that the employee sick leave rate and the Workplace Health and Safety Compensation Commission lost hour rate are higher in the registered nurse and licensed practical nurse groups than any other health professional groups examined. It is recognized that these indicators may be notably high in some support areas which were not part of the human resource study. Further to this, comparisons to benefit entitlements of public sector employees in other jurisdictions indicate this province has a more generous package.

The Newfoundland and Labrador Health Boards Association Sick Leave Analysis of 2001 data showed \$10.52 million was paid to those using sick leave. An additional \$5.11 million was paid to those providing sick leave relief, or 48 per cent replacement (remembering that relief can be paid at a rate higher than the straight rate of pay). Health boards code relief hours separately, and analysis shows that provincially, licensed practical nurses are replaced at 62 per cent of the time, medical laboratory and medical radiation technologists at 47 per cent, and registered nurses at 44 per cent. Coding issues are known to cause these figures to be understated, as not all relief is coded as relief hours, particularly where overtime is incurred. It is estimated that registered nurses, licensed practical nurses and medical laboratory and radiation technologists are replaced at a higher rate than stated above. Health boards report increasing difficulty in providing this relief. Reduced casual staffing and growing difficulties in reaching employees on their off-time has created difficulties in sustaining services to the public at times.

Table 9 Absenteeism due to Sick Leave and Workplace Accidents.

Professional Group	Avg. Hours Sick Leave/ FTE (Calendar Year 1999 and Fiscal Year 2000/01)	Avg. WHSCC Lost Hours/employee (Calendar Year 1999 and Fiscal Year 2000/01)	WHSCC Lost-Time Incidents/100 employees (Calendar Year 1999 and Fiscal Year 2000/01)	Total Equivalent FTE Lost Time due to Sick Leave and WHSCC (Fiscal Year 2000/01 Estimates)	
				Sick Leave	WHSCC
Registered Nurses	109 111	29.0 50.8	7.2 6.3	232.8	117.5
Licensed Practical Nurses	150 140	106.5 88.0	8.9 9.8	177.8	147.2
Social Workers	73 98	3.2 4.9	1.0 1.4	24.1	1.7
Pharmacists	40 41	0.3 0.0	2.1 0.0	1.5	0
Physiotherapists	58 64	0.1 1.2	1.7 0.9	3.4	0
Occupational Therapists	48 52	1.5 0.1	3.2 0.9	2.5	0
Psychologists	53 59	0.9 4.4	0.0 4.0	1.6	1.6
Respiratory Therapists	N/A N/A	N/A 46.0	N/A 2.9	1.6	0
Audiologists	60 51	0 0	0 0	0.4	0
Speech-Language Pathologists	59 77	0 0	0 0	1	0
Medical Laboratory Technologists	86 92 (MLT and MRT)	4.8 9.8 (MLT and MRT)	1.6 3.3 (MLT and MRT)	30.1	4.4
Medical Radiation Technologists	46 92 (MLT and MRT)	19.2 9.8 (MLT and MRT)	2.9 3.3 (MLT and MRT)		
Total				476.8	272.4

Source: Calendar Year 1999 data: Provincial Health and Community Services Interim Human Resources Planning Report 2000 (July 2001). Fiscal Year 2000/01: Health Human Resource Indicator Report, Newfoundland and Labrador 2000/01 (October 2002)

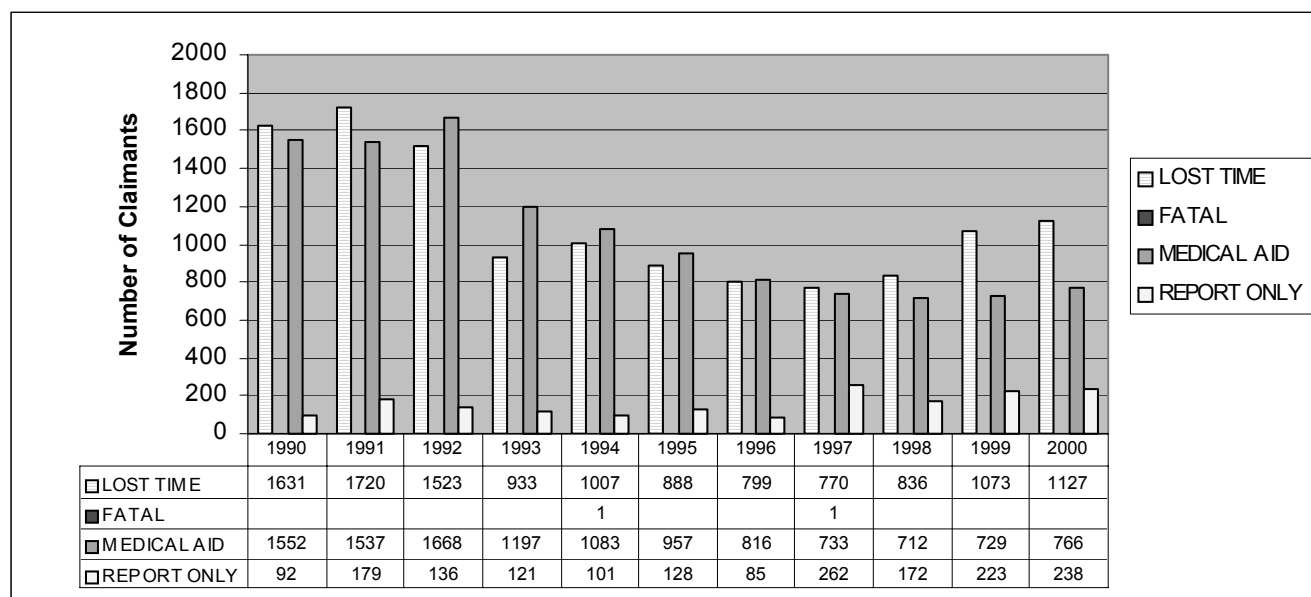
The range of sick leave is about 17 normal working days (7.5 hour) per employee for the highest users of sick leave to a little over four days for the lowest. Within health boards, there is also great variation: 10 to 21 days for licensed practical nurses and two to 20 days for registered nurses (annually). The data collected has not distinguished between long-term and short-term leave, but health boards have identified this as an important issue.

The Newfoundland and Labrador Health Boards Association Sick Leave Analysis for calendar year 2001 indicated that there were 453,066 sick leave hours for unionized registered nurses in health boards. This translates into 232 full-time equivalents, supporting the above statistics on registered nurses (Only registered nurses could be compared, as the analysis grouped staff by bargaining unit and the Newfoundland and Labrador Nurses Union is the only unit aligned solely with one professional group within the scope of the report). The analysis also indicates that the entire system (including many employees not within the scope of this report) generated about 1.7 million hours of sick leave, or about 872 full-time equivalents.

Note that 1512 and 565 employment insurance sick benefit weeks paid to registered nurses and licensed practical nurses respectively in 1999 equated to 29 registered nurse full-time equivalents and almost 11 licensed practical nurses full-time equivalents. Employment Insurance sick leave data for other groups was not studied.

Figure 4 profiles summary statistics for Workplace Health and Safety Compensation Commission claims and costs over a ten-year period from 1990-1999.

Figure 4 Number of Health Sector Workplace Injury Claims by Type and Year.



Source: Review of Workplace Health and Safety Compensation Commission Claims by Public Health Care Employees in Newfoundland and Labrador 1990 – 1999, (April 2002)

The number of workplace injuries has decreased slightly for registered nurses to 6.2 per 100 registered nurses and increased slightly for licensed practical nurses to 9.8 per 100 licensed practical nurses. All other groups had less than four incidents per 100 professionals.

Licensed practical nurses had concerning statistics for lost time due to workplace injuries. They accounted for 147 of 272 full-time equivalents of lost time of the professional groups studied or 54 per cent, but they only represented 30 per cent of all the earned hours of the professional groups studied. In certain areas within specific health boards, the percentage of all hours lost due to workplace injuries approached 17 per cent of all earned hours, or the equivalent of nearly one in six employees. This figure was higher when the data were further broken down by facility.

Table 9 indicates that 272 full-time equivalents were lost due to workplace injuries in fiscal year 2000/01 for the professional groups studied. As the scope of the Human Resource Indicator Report was only half of the system's total full-time equivalents, the system-wide figures will be substantially higher. In salary alone, the annual cost to the system is in the tens of millions of dollars. Provincial efforts must be made to reduce this figure.

RECOMMENDATION 14.

Government, health boards, and unions establish a task force to determine best practices and advise on (1) effective workplace wellness programs (2) injury prevention programs (3) attendance management programs and (4) design of benefits program.

- **Resources be allocated to seek immediate and long-term solutions in high-risk areas of workplace injuries such as licensed practical nursing in long-term care;**
- **Incorporate allied health professionals, notably physiotherapy and occupational therapy, in key injury prevention and occupational health and safety roles;**
- **Build on existing best practices in health boards.**

9 Leadership in Health

Approximately 950 health and community services system managers (those remunerated on the HAY management scale and excluding certain support position) work in Newfoundland and Labrador health boards and the provincial government's Department of Health and Community Services. These managers are accountable for much of the \$1.6 billion it costs to run the system and will be responsible for implementing changes stemming from the 2003 First Ministers' Accord on Health Care Renewal, the province's plan in *Healthier Together*, and other initiatives. The report of the Royal Commission "Building on Values – The Future of Health Care in Canada" states: "...health care managers are frequently overlooked in the health care system, yet their work is vitally important to the overall organization, planning, and funding of health care systems across the country."

The Human Resource Planning Steering Committee acknowledged the important role of health and community services system leaders and undertook three initiatives to better understand management issues. Part I focused on compensation issues (developed in response to a request by the Provincial Labour Relations Committee), Part II presented a demographic, education and workload profile (achieved through collection of data from human resource departments and a comprehensive management survey), and Part III provided a leadership strategy for the future, building upon key information highlighted in the first two studies and relevant research literature. This Section provides an overview of findings and proposes recommendations on sustaining and improving leadership in the health and community services system.

Throughout the mid to late 1990s, Newfoundland and Labrador's health and community services system underwent significant reform. Reforms resulted in a more regionalized system and fewer management positions. For instance, institutional boards had about 1040 managers before restructuring and about 660 after, a cut of almost 37 per cent. Those remaining incurred additional responsibilities and a wider scope of responsibility.

Today there are approximately 875 managers in health boards. Most of these managers are female (67 per cent) and most are working in acute care (71 per cent). Compared to other health professional groups, managers are among the oldest. Health board managers have an average age of about 46 years, and 43 per cent of the workforce is expected to retire in the next ten years (compared to, for example, 22 per cent of the registered nursing workforce). About half have clinical backgrounds and half have other backgrounds including business, information technology, engineering, finance, etc. Of those with clinical backgrounds, it is important to note that an estimated 34 per cent of managers have a registered nursing background, and nine per cent have a social work background. Other managers have backgrounds in medical radiation technology, medical laboratory technology, pharmacy, etc. Retirements in these areas will likely be replaced with employees of similar professional backgrounds. Retirements in management positions cannot therefore be examined in isolation of other professional groups. With a significant turnover of managers annually (16 per cent in fiscal year 2001/02) and an increasing number of retirements expected in the next ten years, succession planning will become critical. Many health boards do not have formal succession plans and report that succession planning is very difficult with existing health employees seeing no incentive, financial and otherwise, to move into management positions.

RECOMMENDATION 15.

Health boards develop succession plans for their respective health and community services system managers.

The educational backgrounds of the health and community services system managers are diverse. About 39 per cent hold a certificate or diploma, 34 per cent hold a bachelor degree, and 19 per cent hold a master degree. Three per cent were physicians, three per cent had a high school diploma, and two per cent did not report. New managers entering the system tend to have a bachelor degree or higher, whereas those leaving tend to have a certificate or diploma. Most managers have significant working experience in both management and non-management positions. A new Memorial University master program *Master in Health System Management* has a tentative start date of January 2004. The projected number of student in the first year is 12 to 14, with a full capacity of 20. The program is of two-year duration and distance education options are being explored.

It is vitally important that leaders have the required competencies to effectively manage the health and community services system today and in the coming years. The following two recommendations are focused on leadership development:

RECOMMENDATION 16.

Governments and health boards define minimal competencies for health and community services system managers and develop learning plans on how these competencies will be achieved, including the potential for developing provincewide educational programs and workshops to meet this goal.

RECOMMENDATION 17.

Government and health boards continue to support (1) the implementation of the Master in Health System Management Program at Memorial University and (2) the Scholarship for Graduate Program in Health Administration offered through the Newfoundland and Labrador Health Boards Association.

Managing their workload was the number one self-reported challenge of managers. Self-reported overtime statistics indicated that 27 per cent of managers worked less than five hours of overtime per week, 38 per cent worked between five and 10 hours, 13 per cent worked between 11 and 15 hours, and another 16 per cent worked in excess of 15 hours weekly. Overtime is not normally paid for those in management positions. Span of control statistics indicated that there are approximately 23 employees per supervising manager; managers with clinical responsibilities are more likely to supervise more than fifty employees; and of those supervising more than 50 employees, 64 per cent had a registered nursing background. The final report of the Canadian Nursing Advisory Committee in 2002 concluded that younger nurses view nursing management positions as being "... so demanding that younger nurses have little interest in taking on those roles; they see the working lives of their managers and want no part of it."

Other unique challenges facing managers include a highly unionized environment, attendance management (under increasing pressure to reduce workplace sick leave and injury), and the management of services often separated by large distances. Financial management is also a significant responsibility of managers, especially in an environment of tight fiscal restraint. Client issues are a considerable workload issue for clinical managers. Working with physicians who are often independent from the manager's organization in terms of remuneration and chain-of-command, also poses unique challenges. Finally, health and community services system management is often the target of discussion, debate, and criticism. The following recommendation is proposed to support managers, and raise awareness on their important role in health boards and government:

RECOMMENDATION 18.

Employers implement a system of recognition and rewards for their respective health and community services system management employees including statements acknowledging manager's achievements, letters of thanks, certificates of appreciation, and awards of excellence.

Inadequate compensation has been identified as a primary factor impeding the recruitment and retention of management personnel. Throughout 2000 and 2001, selected unionized health professional groups were successful in having their compensation levels adjusted through occupational reviews, but management personnel received no similar adjustment. The net effect of these increases is that no significant difference exists between the salary levels of frontline clinical management positions and bargaining unit positions. The availability of other benefits to bargaining unit employees, such as overtime, differentials, and premiums, further decreases or often reverses the salary gap. Consequently, there is little or no financial incentive to leave unionized positions for management positions. Additionally, more attractive salaries are available to many managers outside the health and community services system, especially those with transferable skills such as the management of human resources, information technology, etc.

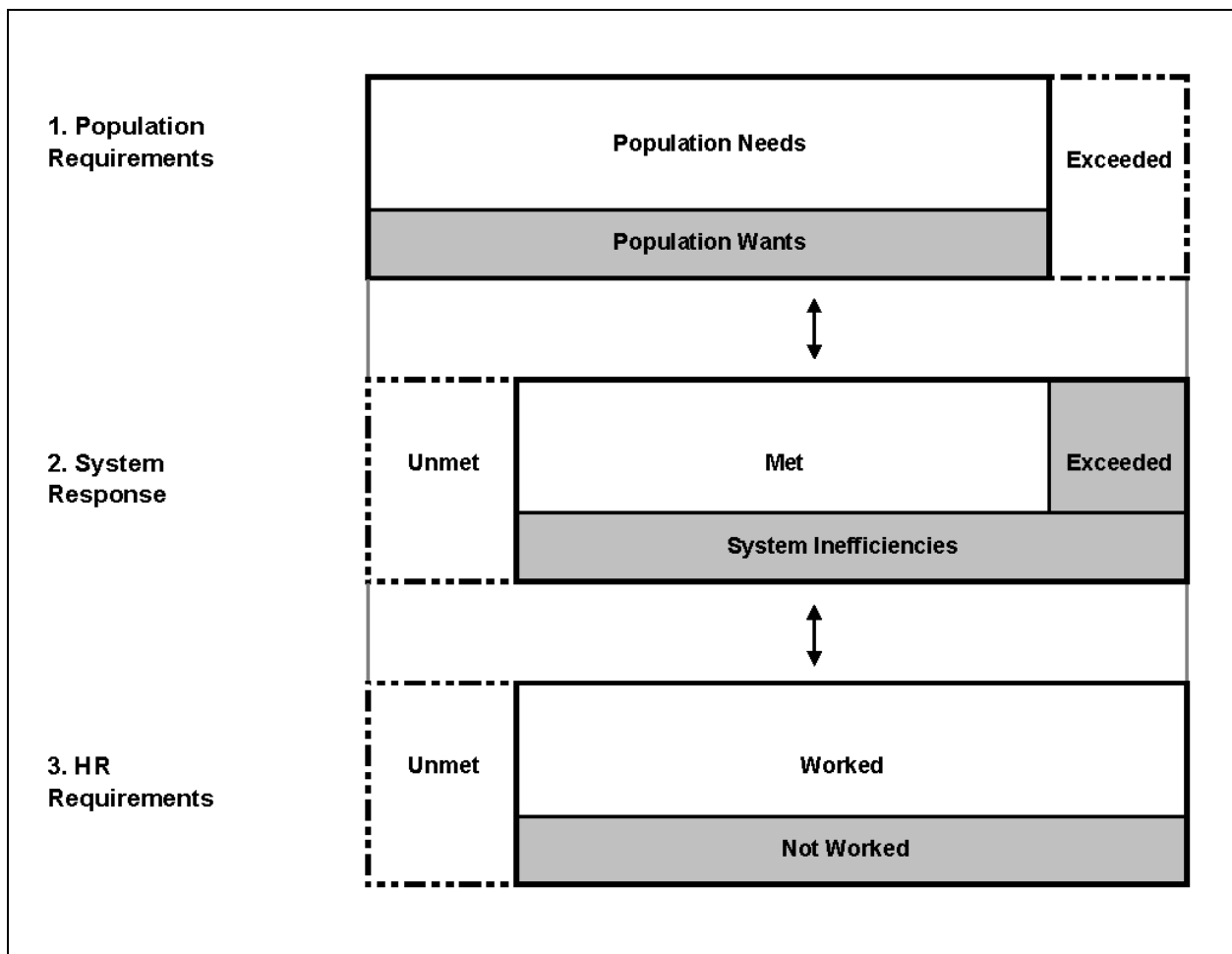
RECOMMENDATION 19.

Government develop and implement a plan to (1) address current inequities in health and community services system management salaries, and (2) to avoid similar future problems.

10 Forecast

This section provides forecasts for selected occupations and recommendations for sustaining the present workforce. A discussion on forecasting providing more detailed definitions, limitations and illustrations, is provided in Appendix A. Clarification on forecasting terminology in the context of this report is required. Forecasting involves **supply** forecasting and **demand** forecasting. In the context of this report, supply is the movement of people into and out of the workforce (for example, graduates in, retiree's out). Demand is the system's requirements for health workers. To forecast demand, one must consider population requirements (needs and wants), the health and community services system's response (meet, exceed, or not meet these needs and wants, and the system's efficiency in its response), and finally how the system staffing requirements are met (part-time vs. full-time and rates of absenteeism). These are summarized visually in Figure 5:

Figure 5 Health and Community Services System Human Resource Requirements.



Source: Wells, 2003, Newfoundland and Labrador HR Planning Unit.

It is important to note that in this definition of demand, the system providing health services is in itself an important driver of demand, and perhaps the most important to consider for most occupations. For example, *Healthier Together* initiatives on location of services, and other efforts to address scope of practice and skill mix issues will change requirements for health human resources. An underlying difficulty in health human resource forecasting exercises is that the manner in which the system reacts to changing circumstances (i.e. circumstance such as fiscal restraint, an aging population, gaps in services, the pursuit of efficiencies, policy, advancing technology, etc.) has a big impact on human resource requirements yet the answers to these questions lie well outside the mandate of HR planners. For example, growth in the size of certain professional groups may not be affordable, yet several factors may be encouraging such growth, based on the current model of service delivery in the province.

Note that all situations described in the following sections benefit directly from better retention approaches, resulting in lower turnover. Some locations will experience shortages or oversupply, despite overall supply figures that seem to balance, due to geographic locations of positions or the inability to offer graduates full-time employment. A point-in-time number of vacancies for each group is provided but is not included in the forecasted shortage or surplus. It is important however, to consider vacancies, as they represent the starting point upon which projected gaps or surpluses are overlaid. There are a “normal” or expected number of vacancies for all groups, however in some cases the number of vacancies seems excessive and may represent a system already in shortage.

What follows is a broad picture for each professional group, highlighting the major planning considerations and five-year forecasting estimates. Each group’s supply and demand trends are examined and overall provincial requirements are estimated using recent trends experienced in health boards. As health human resource planning progresses, these forecasts will improve with annual monitoring mechanisms, and increasing insights on workforce dynamics. The large size of the registered nursing workforce and the availability of data enabled a more in-depth analysis for this workforce only. Similar detailed data were not available for other groups.

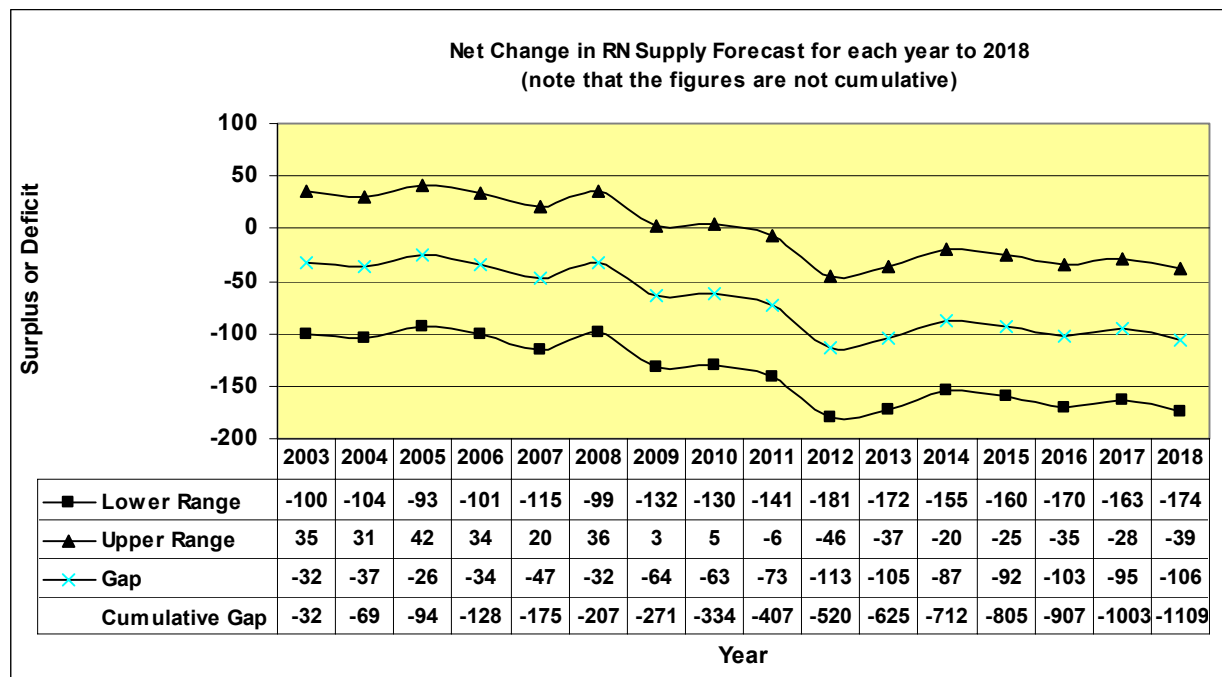
10.1 Registered Nurses

There are approximately 5600 registered nurses in Newfoundland and Labrador. Over 95 per cent, or 5400 employees, are employed by health boards, including about 5100 unionized nurses and 300 management staff with nursing backgrounds. About three quarters of unionized health board nurses work in acute care, with the remaining quarter split almost evenly between community care and long-term care. On a population per professional basis, Newfoundland and Labrador's ratio is lower than the national ratio by one quarter (more nurses in Newfoundland and Labrador).

Supply

Newfoundland and Labrador schools of nursing will graduate approximately 180 nurses in 2003 and 190 nurses in 2004. This is about 70 per cent of the historical figures of 250 to 300 between 1991 and 1998. The one-year retention rate of these graduates has ranged from 55 to 75 per cent since 1998 and is highly dependent on the circumstances facing the graduates upon completion of their program (for example, the number of available positions and type/location). Approximately 20 to 40 registered nurses from outside the province are issued new licenses in Newfoundland and Labrador each year. Retirement analysis shown in Table 12 reveals that an estimated 416 registered nurses will retire by 2007, including nurses in management positions and those working outside of health boards. The linear retirement trend shows eight to nine more nurses will retire in each successive year. Considering these factors, a supply forecast has been constructed. This forecast includes the increase in seats (32 fast-track seats) discussed in Section 4.1. The forecast is shown in Figure 6:

Figure 6 Registered Nurse Supply Forecast to 2018 Assuming a Workforce of Constant Size.



Source: HR Planning Unit Calculations (March 2003)

The shortfall shown in Figure 6 is not cumulative; it is the estimated shortfall for *each* year. The cumulative total over the next five years is a shortfall of 175 registered nurses and for the entire 16 year period it is a shortfall of 1109 registered nurses. This does not account for ongoing vacancies that tend to number between 150 and 250 positions, discussed below.

Figure 6 assumes a five per cent increase in retention rates of new graduates to 2018 and a steady proportion of the workforce (2.1 per cent) leaving the system for reasons other than retirement, in keeping with historical trends. The supply forecast is based on sustaining a provincial workforce of 5600 registered nurses. The total number of registered nurses in Newfoundland and Labrador has remained relatively stable over the past decade. It is recognized that these projections are uncertain. The supply forecast shown in Figure 6 does not consider changing population requirements, system changes, or worked/unworked nursing hours. These items are considered next in the discussion on demand.

Demand

Each of the three components in Figure 5 is addressed next: **population requirements, the system's response to population requirements**, and finally the **system's nursing requirements**.

To consider **population requirements** for nursing services in isolation, we must initially assume that the system will continue to provide services in the same manner (i.e. maintain status quo). Population requirements for nursing services into the future are difficult to quantify but certain proxy measures can help explain trends. Examining the Newfoundland and Labrador population demographic and utilization of physician medical services and institutional based resources, it is clear that an aging population, using more services per person than they did a decade ago, will result in a slow but steady increase in the overall need for medical services *despite overall population decline*. Actual increases in per capita requirements for medical services are not known, and exactly how they relate to the provision of nursing services remains unknown. At the most basic level, it is intuitive that an aging population will increase the demand for health services. It is also likely that the need to sustain the system means new ways of delivering services must be sought.

In considering the **system's response**, three things need consideration including focus on how the system will address 1) unmet population requirement, 2) exceeded population requirements, and 3) system inefficiencies in the coming years. Goals stated in *Healthier Together* to improve the health status of the population and improve the quality, accessibility and sustainability of health and community services will affect all three to some degree. For example, addressing the unmet need for mental health services could require extra nursing resources to implement while a new approach for determining location of health services and transitioning from current models of long-term care could reduce the system's requirements for registered nurses. Efforts to reduce system inefficiencies could also reduce requirements by making nurses more productive. The net result of these considerations is not known at this time.

Finally, the **system's nursing requirements** must be met by worked nursing hours. Paid hours are not all worked hours. For example, in fiscal year 2000/01 350 full-time equivalent registered nurses (equivalent to 8.5 per cent of the entire group) were unproductive due to illness and injury. Reclaiming 10 to 15 per cent of this over ten years could possibly reduce registered nurse shortfalls by three to five nurses annually. Employment Insurance sick leave benefits for this group amounted to about 30 full-time equivalents in the year 2000 and are rising. The second consideration in this demand category is the unused potential of the part-time workforce. However, in the year 2000, Newfoundland and Labrador had the highest percentage of nurses working full-time in Canada and further conversions of staff from part-time to full-time to narrow the supply gap would attain minimal overall returns.

Forecast

Summarizing the supply forecast only, the net projected supply gap in the next five years, from 2003 to 2007 inclusive, is 175 registered nurses. Retention of new graduates in this scenario is critical; if less than 65 to 67 per cent are retained, the need could rise. Similarly, if registered nurses retire earlier than age 58 on average, the need could rise. The vacancy rate for registered nursing positions seems fairly constant over recent years, although there are annual variances between 150 and 250 vacancies (including permanent, casual, and temporary positions) in health boards. These vacancies also represent movement within and between health boards. Population requirements for nursing services may increase slightly in the same time frame. System reforms are an important consideration for narrowing the projected gap. If a five per cent reduction in the need for registered nurses (250 nurses) is achieved over five years, the gap could possibly be closed, however this would require aggressive reforms in the short-term. The key questions are how much system reform can be expected and when? Also, numerous factors cannot be accounted for in the above simplified analysis including:

1. One exit from the system is not simply backfilled by one graduate entering the system. There are issues of location, timing, experience, expectations, etc;
2. If a particular system circumstance or reform reduces the need for graduates in a particular year, they will not remain available for employment at a later date;
3. Projections are always uncertain, with a potentially significant degree of error;
4. Better recruitment and retention techniques and reduced absenteeism help to narrow projected gaps in supply.

It is difficult to predict how the system will respond to the trends described above, but considering all factors, it is likely that shortages will be experienced in the coming years. Therefore it is concluded that in addition to aggressive system reforms, more nursing enrollments will be required to eliminate projected gaps in supply. Results from increases in enrollments will not be realized for two to four years after implementation, at which time the problem will have become more acute. It is recommended that eight more seats be considered for 2005, eight more in 2006, and 16 more in 2007. This would bring the total number of seats to about 252 (4.5 per cent of the workforce), still 23 less than the historical average of 275 in the early 1990s, when it was acknowledged that too many nurses were being educated, but at the same time requirements were probably lower than today, and likely lower than projections for the next 10 years.

REGISTERED NURSES	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		5400	5600
Vacancies ¹ (number as of March 2003)		218	Unknown
Projected Retirements (number turning 58, 2003 to 2007, including managers)		402	417
Total Requirements ² (total supply required 2003 to 2007)		962	996
Total Graduate Supply ³ (number from NL 2003 to 2007)			671
Total Other Supply (number other than graduates 2003 to 2007)			150
Potential Surplus ⁴ (+) or Gap (-) (cumulative 2003 to 2007)			-149 to -201
Forecast: The overall number of graduates and other sources of registered nurses will not meet the needs of the workforce in the next five years. Further increases of eight seats in 2005, eight seats in 2006, and 16 seats in 2007 are recommended in the long-term. Reduced absenteeism could reduce total requirements for this group. The implementation of elements of <i>Healthier Together</i> could reduce requirements for registered nurses. Rural areas require special attention to avoid shortages. Close annual monitoring is required.			

Notes

1. Vacancies include 92 permanent positions, 75 casual positions, and 51 temporary positions. This is provided for information purposes only and is not factored into the forecast. It does not include management positions.
2. Based on provincial retirements and a constant percentage of the workforce of about 2.1 per cent leaving for reasons other than retirement.
3. Total graduates from 2003 to 2007 expected to be 1019. Factoring in a retention rate of 65 per cent in 2003 increasing to 67 per cent in 2007 yields 671 effective supply.
4. Range estimated based on a projected gap of -175 plus or minus 15 per cent.

RECOMMENDATION 20.

Government sustain the 32 seats added to the Bachelor of Nursing Collaborative program in 2002. Further increases of eight seats in 2005, eight seats in 2006, and 16 seats in 2007 be implemented with attention to the required infrastructure, faculty, and clinical placements. Reevaluate this recommendation annually. Support efforts to establish the Licensed Practical Nurse Bridging Program, the Labrador Inuit Access Program, and distance education initiatives.

10.2 Licensed Practical Nurses

Virtually all of the 2900 provincial licensed practical nurses in the province work for health boards. Since the Practical Nurse program spans only 12 months and can be offered in multiple locations, the response to a need is swift and localized. The process of brokering the Practical Nurse program, given a demonstrated requirement for graduates, ensures that the supply of licensed practical nurses matches the requirements. The number of graduates has varied in the past decade, but has remained near 100 per annum recently. Work patterns of licensed practical nurses show high rates of sickness and injury, totaling 325 full-time equivalents in fiscal year 2000/01 (13 per cent of the total workforce full-time equivalents). Additionally, they have the highest numbers of casual and part-time staff of the groups studied, at 32 per cent of their entire workforce. Maximizing licensed practical nurse scope of practice is an important goal for this group.

Most licensed practical nurses (55 to 60 per cent) work in long-term care. Turnover is about six per cent, and more than half of the positions are filled internally. The current average age is 44 years and retirements show a steep increase in numbers from 47 in 2003 to 102 projected in 2007, decreasing to 68 in 2011, based on retirement at age 58. Retirements are not the only exit from the system, although the trend in retirements in the next four or five years will increase the need for graduates. The need for new graduates and/or other supply to maintain the current workforce is estimated to be 80 to 100 in 2003, steadily increasing by about 15 annually to 140 to 160 in 2007, then dropping by about nine annually to 105 to 125 in 2011.

The focus in *Healthier Together* on a Long-term Care and Supportive Services strategy shows there are increasing needs for services but also opportunities for better utilization of services. Given the important role of licensed practical nurses in long-term care, these considerations are important for HR planning purposes and must be monitored. No shortage is projected for these professionals in the next five to ten years.

LICENSED PRACTICAL NURSES	ESTIMATES >>	BOARD LEVEL ¹	PROVINCIAL LEVEL
Workforce (number of employees)			2900
Vacancies (number as of March 31, 2001)			14
Projected Retirements (number turning 58, 2003 to 2007)			405
Total Requirements² (total supply required 2003 to 2007)			550 to 650
Total Graduate Supply³ (number from NL 2003 to 2007)			550 to 650
Total Other Supply (number other than graduates 2003 to 2007)			Very low
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)			0
Forecast: The overall number of graduates will meet the needs of the workforce in the next five years. Close monitoring of licensed practical nurse requirements is required as a Long-term Care and Supportive Services strategy is developed, as outlined in <i>Healthier Together</i>. Close annual monitoring is required. Reduced absenteeism could reduce total requirements for this group.			

Notes

1. Assume provincial numbers are representative of board numbers.
2. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
3. Matched to requirements based on an effective brokering process that satisfies a demonstrated need.

10.3 Audiologists

In 2002 there were 18 audiologists in the province, 16 of which worked in five health boards (including managers). For audiologists in health boards, absenteeism is low and retirements are not expected for 15 years. This group has an average age of less than 35 years. Turnover was 22 per cent (three or four employees) in 1999 and 46 per cent (eight employees) in 2000 and most hires were filled externally. This translates into an annual requirement of about three to six audiologists, probably closer to the lower end of the scale. Audiologists are not educated in Newfoundland and Labrador. About 50 to 60 graduate annually from Canadian programs. A total of eight \$5000 bursaries have been offered since 1999 (four years), with seven accepted. Health and Community Services – Western Region and Grenfell Regional Health Services Board reported six-month vacancy periods in past years. In November 2002 there were three vacant positions in the province.

No data have been compiled on potential gaps in service. National population per provider benchmarks were not available. Recruitment to rural areas of the province is the biggest supply issue for this group, and recommendations in Section 6 concerning a multi-dimensional recruitment and retention program should assist in addressing these issues. No other supply recommendations are made for this group.

AUDIOLOGISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		16	18
Vacancies (number as of November 2002)		3	Unknown
Projected Retirements (number turning 58, 2003 to 2007)		0	0
Total Requirements¹ (total supply required 2003 to 2007)		15 to 18	18 to 22
Total Graduate Supply (number from 2003 to 2007)		Not applicable	
Total Other Supply² (number other than graduates 2003 to 2007)		8	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		-7 to -10	
Forecast: Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover. This group relies on effective recruitment and retention techniques such as bursaries. Recommendations provided in Section 6 to improve recruitment and retention are critical, especially in rural areas, to avoid shortages. Close annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Based on bursary acceptance in last four years and continued recruitment success rate.

10.4 Dietitians/Nutritionists

In this province, clinical dietitians are mainly based in institutional boards and do primarily one-on-one patient care whereas nutritionists develop programs within the community that focus on wellness and prevention. Both dietitians and nutritionists must be registered with the Newfoundland Dietetics Association, but in other provinces only the “dietitian” title is protected through legislation. Both types of professionals are referred to as dietitians in this section.

There were 123 registered dietitians in the province in the year 2000. Newfoundland and Labrador was slightly better than the Canadian population per professional average. About half (65 to 70) work in health boards. Positions are mostly full-time, absenteeism is low and retirement projections show only a few expected to retire starting in 2009. This group has an average age of 38 years. Students complete three years at Memorial University, an additional year at Acadia University in Nova Scotia, and a final one-year internship. The Health Care Corporation of St. John’s provides the only internship program in Newfoundland and Labrador, accepting four annually. Memorial University is exploring the potential of implementing a full dietetics program. The current proposal is to offer a master degree through the Faculty of Medicine, including all field work. In this case, the one-year internship program will no longer be required or offered at the Health Care Corporation of St. John’s. Anecdotal evidence suggests up to half of the enrollees in dietetics programs in Canada never complete the program due to difficulties in securing internship postings. Dietitian turnover in fiscal year 2000 in health boards was 10 per cent and 58 per cent of the positions were filled internally. This equates to about three external hires annually. Vacancies and vacancy periods are both low for this group.

Newfoundland and Labrador has high rates of obesity, heart attacks and strokes. Health and nutritional problems are more common among vulnerable groups such as the aging population and those living in poverty. Goals in *Healthier Together* to improve the health status of the population through a wellness strategy may increase requirements for dietitians, as these professionals play an important part in population wellness. A report titled Eating Healthier in Newfoundland and Labrador – Our Provincial Food and Nutrition Policy (July 2002) was released in draft format and the impact of this strategy, once approved, on provincial requirements for dietitians, is unknown at this time.

DIETITIANS/NUTRITIONISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees)		67	123
Vacancies (number as of November 2002)		0	Unknown
Projected Retirements (number turning 58, 2003 to 2007)		0	0
Total Requirements¹ (total supply required 2003 to 2007)		15	30
Total Graduate Supply² (number from 2003 to 2007)			20
Total Other Supply (number other than graduates 2003 to 2007)			Unknown
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)			-10 to 0
Forecast: Potential gaps in supply projected for the next five years with current arrangements. Rural areas require special attention to avoid shortages. Close annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Student complete three years at Memorial University an additional year at Acadia University in Nova Scotia, and a final year internship. This represents four interns in each of five years.

10.5 Managers

Approximately 950 health and community services system managers (those remunerated on the HAY management scale and excluding certain support positions) work in Newfoundland and Labrador health boards and the provincial government's Department of Health and Community Services. There are approximately 872 managers in health boards. Most of these managers are female (67 per cent) and most are working in acute care (71 per cent). Positions are largely full-time, absenteeism is low, and the amount of unpaid overtime worked is significant. Eleven vacancies were recorded in November 2002. There was significant turnover in the fiscal year 2001/02, at 150 positions or 16 per cent. The majority of positions (69 per cent) were filled internally.

Compared to other health professional groups, managers are among the oldest, at an average age of 46 years. In the next five years it is projected that 158 managers will retire in health boards and as many as 172, if the Department of Health and Community Services managers are included, assuming early retirement at age 55 years. The difficulty in considering management retirements is that about half of the management pool is comprised of employees with other professional backgrounds. Therefore, when one of these managers retires they are likely replaced by another employee with a similar background. For example, if a registered nurse in a management position exits the system and is replaced by a unionized registered nurse, a vacancy is now experienced in the unionized registered nurse workforce, and the registered nurse taking the position now becomes a management trainee that may require education in management skills.

Many issues face health and community services system managers and impact on their recruitment and retention including succession planning, professional development, compensation, and workload. A complete discussion is contained in Section 9 - Leadership in Health.

The reference in *Healthier Together* to altering existing board structures could have some effect on the required number of managers and their span of responsibility, but the nature of these changes is unknown at this time.

MANAGERS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees)		872	950
Vacancies (number as of November 2002)		11	Unknown
Projected Retirements ¹ (number achieving early retirement, 2003 to 2007)		158	Unknown
Total Requirements ² (total supply required 2003 to 2007)		Unknown	Unknown
Total Graduate Supply ³ (number from 2003 to 2007)		Unknown (read note 3)	
Total Other Supply (number other than graduates 2003 to 2007)		Unknown	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		See forecast below	
Forecast: If sustaining the management workforce is defined as having an adequate supply of competent leaders, the workforce will not be sustained in the future if current circumstances prevail. Issues around succession planning, professional development, compensation, and workload will result in a dwindling supply of willing managers and less than ideal health and community services system leadership in the future. Proposed recommendations addressing succession planning, leadership development, rewards/recognition, and inequities in compensation are vital for sustaining this group of professionals.			

Notes

1. About half of the total number of projected retirements for managers in the system will be replaced by employees with professional backgrounds such as registered nurses, social workers, medical laboratory technologists, etc.
2. Total requirements for new supply depends on the manner in which vacancies are filled i.e. lateral movement of managers, staff trained in-house, or external hires. Given a turnover of 16 per cent in 2001/02, a five year requirement could be stated as 760 positions, but this reflects movement in the system and not requirements for new in-house supply or new externally supplied managers.
3. There will be 24 to 28 projected graduates from the new Master in Health System Management Program at Memorial University however these graduates may be originating from the system and may not represent "new" supply. Additionally, there are many other educational programs in health and business administration in Canada, representing an unknown supply potential.

10.6 Medical Laboratory Technologists

There are about 430 medical laboratory technologists in Newfoundland and Labrador. An estimated 91 per cent, or 390, work in health boards, including managers, and most of the others are employed by the College of the North Atlantic or Canadian Blood Services. On a population per professional basis, Newfoundland and Labrador is very close to the national ratio. Newfoundland and Labrador has a program at the College of the North Atlantic, with an output of 13 in 2001, 19 in 2002, projected output of 19 in 2003 and a projected increase to full capacity of 29 in 2004. Attrition from the program's first year (there is a common first year for medical laboratory technology, medical radiation technology and respiratory technology) is partially responsible for under subscription of available seats. Sick leave has been significant for this group, totaling 14 to 18 full-time equivalents or 4.7 per cent of total workforce full-time equivalents. The percentage of medical laboratory technologists in health boards with permanent positions was about 84 per cent in July 2001. Turnover was quite low in 2000 at about two per cent and although not available in 2001, it is estimated to be near seven per cent. Retirements in health boards, including managers, are expected to number about 43 in the next five years, including management and unionized employees, based on early retirement eligibility at age 55. Approximately 30 to 40 per cent of vacancies are filled externally. This group has an average age of just less than 43 years.

Following the discontinuation of the Nova Scotia medical technology program, Newfoundland and Labrador and New Brunswick are the only two Atlantic provinces with training programs, and increased interest in recruiting Newfoundland and Labrador technologists and graduates can be expected as retirements increase. The system's demand for this profession may change with an aging population requiring more diagnostic testing, the introduction of new technologies (that may or may not increase demand), and changes in the way services are organized. It is unknown at this time if the sum of these influences will increase or decrease demand however overall increases, perhaps with a slow onset, are likely.

Given current capacity and a continued high output of graduates, the slow growth in retirements, a modest growth in demand, and other external factors, this current workforce is projected to be sustainable for the next five years. Employers will have best success recruiting and retaining graduates with permanent (as opposed to casual or part-time) positions, and as the need for graduates grows, one might expect program subscription rates to remain filled. No recommendations are considered necessary at this time, although rural recruitment may become an issue, and retention of new graduates is an important consideration.

Cytologists have not been educated in Newfoundland and Labrador since 1997. There are currently about 22 cytologists in the province (included in the provincial and board figure above). Given an increased focus on illness prevention in *Healthier Together*, specifically a more comprehensive cervical screening program for the province, careful attention must be paid to the supply of this group of professionals. There is currently no excess capacity in the system. Special recruitment incentives or seat purchase arrangements may be required to avoid shortages in the future.

Another specialty group to consider is combined laboratory/x-ray technologists numbering about 12 in health boards, not included in above health board figures or forecast shown below. There are currently five students enrolled in the 16-month X-Ray Skills for Medical Laboratory Technologists program offered by the College of the North Atlantic. The program will be repeated in the fall of 2003. Combined laboratory/x-ray technologists are required in rural areas of the province where sustaining both types of professionals is not feasible.

MEDICAL LABORATORY TECHNOLOGISTS ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)	390	430
Vacancies (number as of November 2002)	2	Unknown
Projected Retirements ¹ (number achieving early retirement, 2003 to 2007)	43	48
Total Requirements ² (total supply required 2003 to 2007)	50 to 60	56 to 67
Total Graduate Supply ³ (number from 2003 to 2007)		98
Total Other Supply ³ (number other than graduates 2003 to 2007)		Unknown
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		+31 to +42
Forecast: Given an assumed average output of 23 graduates annually and 85 per cent retention of these graduates, no gaps in supply are projected for the next five years. Retirements begin to climb after 2010 but not significantly. Rural areas require special attention to avoid shortages. Close annual monitoring is required.		

Notes

1. Most employees in this group will be eligible for early retirement and it was felt that these estimates better reflect exits from the system than the assumption of retirement at age 58. Also includes managers.
2. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
3. Based on an 85 per cent retention rate of new graduates. There are also an unknown number of others entering the workforce besides graduates from Newfoundland and Labrador.

10.7 Medical Radiation Technologists

There are about 255 medical radiation technologists in Newfoundland and Labrador. About 250 or 98 per cent work in health boards, including managers. The population per professional ratio is slightly better than the national ratio. Supply of graduates from the Newfoundland and Labrador program is typically 12 to 14 graduates annually. Medical radiation technologists had lower rates of sick leave and higher rates of injury than medical laboratory technologists in calendar year 1999. Data were combined in fiscal 2000/01, and it is not known if the trend continued, but it will be monitored annually in the future. Medical radiation technologists hold mostly permanent full-time positions.

The system's demand for this profession may change with an aging population requiring more diagnostic testing, the introductions of new technologies (equipment purchases of four CTs in recent years has increased requirements, and a pending MRI acquisition will also require more staff), and changes in the way services are organized. Additionally, specialized training is required for operation of CT and MRI equipment. It is unknown at this time if the sum of these influences will increase or decrease demand, however overall increases, perhaps with a slow onset, are likely.

Turnover is estimated to be eight per cent, and the percentage of positions filled externally is similar to medical laboratory technologists at 30 to 40 per cent. Current new supply requirements for health boards are estimated to be about seven annually. The average age of this group is just over 42 years and retirements are projected to total 33, based on eligibility for early retirement at age 55, in the next five years, including management and unionized employees.

Given current capacity and the numbers of graduates, the slow growth in retirements, a modest growth in demand (similar to the one described for medical laboratory technologists), and other external factors, this current workforce is projected to be sustainable for the next five years if new graduates are retained. Employers will have best success recruiting and retaining graduates with permanent (as opposed to casual or part-time) positions.

A specialized group associated with medical radiation technology includes nuclear medicine technologists (15 in number) not included in provincial board numbers above or the forecasted figures below. Nuclear medicine technologists (trained out-of-province) have recently experienced shortages within the Health Care Corporation of St. John's of five positions. No recommendations on this group are proposed at this time although close monitoring is required.

Another specialty group to consider is combined laboratory/x-ray technologists, numbering about 12 in health boards, not included in health board numbers above or the forecasted figures below. A course offered by the College of the North Atlantic titled Laboratory Skills for Medical Radiation Technologists has been developed and advertised, but the program was not offered in 2002 due to a lack of applications. The program is six months in duration with a four-month classroom component. Combined laboratory/x-ray technologists are required in rural areas of the province where sustaining both types of professionals is not feasible.

MEDICAL RADIATION TECHNOLOGISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		250	255
Vacancies (number as of November 2002)		11	Unknown
Projected Retirements ¹ (number achieving early retirement, 2003 to 2007)		33	34
Total Requirements ² (total supply required 2003 to 2007)		45 to 50	46 to 51
Total Graduate Supply ³ (number from 2003 to 2007)			56
Total Other Supply ³ (number other than graduates 2003 to 2007)			Unknown
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)			+5 to +10
Forecast: No gaps in supply projected for the next five years if the number of graduates is sustained, and 85 per cent of graduates are retained to work in the system. System growth and increased turnover could lead to shortages. Rural areas require special attention to avoid shortages. Close annual monitoring is required.			

Notes

1. Most employees in this group will be eligible for early retirement and it was felt that these estimates better reflect exits from the system than the assumption of retirement at age 58. Also includes managers.
2. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
3. Based on an 85 per cent retention rate of new graduates. There are also an unknown number of others entering the workforce besides graduates from Newfoundland and Labrador.

10.8 Occupational Therapists

There are about 136 occupational therapists in Newfoundland and Labrador, and about 106 are employed by health boards. Population per provider ratios are higher (worse) in Newfoundland and Labrador than the Canadian average. In health boards, positions are mostly full-time, absenteeism is low, and retirement projections show four in the next five years. This group has an average age of 35 years. Eight seats are purchased annually in the occupational therapy program at Dalhousie University. Additionally, bursaries are offered each year to Dalhousie graduates, with most being accepted. In 2002, all 10 bursaries were accepted. Three bursaries have been offered (and accepted) in the past to graduates from programs other than Dalhousie. At present, seat purchase and bursary arrangements both have return-in-service commitments. Turnover for occupational therapy has ranged from 20 to 25 per cent in recent years, with more than half of the positions being filled internally (this statistic is dominated by the Health Care Corporation of St. John's). Approximately nine to 11 occupational therapists are required annually to meet this high turnover and external hire rate. In November 2002 there were three to four vacancies in health boards.

Healthier Together has identified occupational therapists as key members of the primary health care team, however long-term changes in the workforce requirements are not known at this time. Current seat purchase arrangements seem to be sufficient for sustaining the present workforce (if graduates do not default on their return-in-service commitments) with its high rate of turnover; however potential growth in this group may increase the need for new recruits. Given fiscal restraint, if growth occurs it will probably be slow enough to be accommodated within the present arrangements, if turnover can be slowed to more acceptable levels. Also, other recommendations in this document should improve recruitment and retention techniques.

OCCUPATIONAL THERAPISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		106	136
Vacancies (number as of November 2002)		4	Unknown
Projected Retirements (number turning 58, 2003 to 2007)		4	5
Total Requirements¹ (total supply required 2003 to 2007)		45 to 55	Not applicable
Total Graduate Supply² (Dalhousie numbers from 2003 to 2007)		40	
Total Other Supply² (number other than graduates 2003 to 2007)		Unknown	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		-5 to -15	
Forecast: Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover. This group relies on effective recruitment and retention techniques such as bursaries. Recommendations provided in Section 6 to improve recruitment and retention are critical, especially in rural areas, to avoid shortages. Close annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Not all seat purchase arrangements are successful with respect to return-in-service, but there is also an unknown other supply of not included in the estimates.

10.9 Pharmacists

Newfoundland and Labrador has about 585 pharmacists in total, of which 81 work in health boards, some in management positions. The ability of health boards to recruit and retain pharmacists is greatly affected by external market forces including salary and sign-on bonuses offered in the private sector. Of the groups studied, the disparity between compensation levels in the private sector and the public service are the highest in this group. Additionally, retention is reported to suffer in health boards due to scope of practice issues. New graduates are more likely to seek clinical pharmacy roles versus dispensing roles, and few are available in the province. This issue may also hamper recruitment efforts. Delegation of duties to pharmacy technicians is limited by legislation governing pharmacists; however actions are being taken to change this situation.

Overall, Newfoundland and Labrador has a better population per professional ratio than the national average. Newfoundland and Labrador graduates about 40 pharmacists annually. This number has been recently restricted by the availability of faculty and clinical placements. The majority of the seats (25 to 30) are reserved for Newfoundland and Labrador students; however Newfoundland and Labrador students may also compete for the remaining seats. About 10 or less may therefore be out-of-province students who may or may not be enticed to remain in the province. There were 41 graduates in 2002, 32 are projected for 2003, and 38 are projected for 2004. Pharmacists hold mostly full-time positions, absenteeism is low, and retirement projections (including pharmacists in management positions) show two or three retiring from health board positions, based on eligibility for early retirement at age 55, in the next five years. This group has an average age of less than 40 years. Six bursaries to new graduates of \$3000 were offered in 2001 and one was accepted. In 2002, five were offered and two accepted. These bursaries originated with Newfoundland and Labrador Health Boards Association residual funds from other bursary programs i.e. they were not part of the formal programs. Health board turnover of pharmacists stands at 11 to 14 per cent, with about two-thirds of the positions filled externally. Annual health board requirements are estimated to be between five and seven. Five vacancies were reported in health boards in November 2002.

Given that pharmacists in the private sector are outside the scope of this project and this group dominates in terms of overall numbers, it is difficult to forecast supply and demand figures for health boards alone. For example, population per professional ratios suggest sufficient overall numbers but cannot be used to benchmark health board requirements. Recommendations in this document on better recruitment and retention techniques are important for this group. The committee supports proposed efforts to have pharmacists work to their full scope of practice (i.e. clinical pharmacy) which would likely have a major effect on recruitment and retention for this group.

PHARMACISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		81	585
Vacancies (number as of November 2002)		5	Unknown
Projected Retirements ¹ (number achieving early retirement, 2003 to 2007)		3	Unknown
Total Requirements ² (total supply required 2003 to 2007)		25 to 35	Unknown
Total Graduate Supply ³ (number from 2003 to 2007)		133	
Total Other Supply ³ (number other than graduates 2003 to 2007)		Unknown	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		Unknown	Unknown
Forecast: Current gaps in supply are projected to continue, not because of insufficient seats but because of recruitment difficulties combined with high turnover in health boards. Recommendations provided in Section 6 to improve recruitment and retention are critical, especially in rural areas, to avoid shortages. Efforts to have pharmacists work to their full scope of practice (i.e. clinical pharmacy) are important to support. Labour market adjustment to salaries may be required. Close annual monitoring is required.			

Notes

1. Most employees in this group will be eligible for early retirement and it was felt that these estimates better reflect exits from the system than the assumption of retirement at age 58. Also includes managers.
2. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
3. Based on a 70 per cent retention rate of new graduates recognizing that there will be a much lower retention rate for non-Newfoundland and Labrador students. There are also an unknown number of others entering the workforce besides graduates from Newfoundland and Labrador.

10.10 Physiotherapists

There are about 200 physiotherapists in the province, and in July 2001, 110 worked in health boards, including management positions. The gap between the provincial population per professional ratio and national population per professional ratio is much greater with physiotherapy than occupational therapy (i.e. physiotherapy is further behind than occupational therapy). In health boards, positions are mostly full-time, absenteeism is low, and retirement projections show similar patterns to occupational therapists (very few in the next five years). This group has an average age of 36 years. Ten seats are purchased annually in the physiotherapy program at Dalhousie University. Additionally, bursaries are offered each year, and in the past two years about half have been accepted. Bursaries for graduates of educational institutions other than Dalhousie are also usually offered, with poor rates of acceptance. All seats and bursaries have return-in-service commitments. Turnover for physiotherapy has ranged from 11 to 37 per cent in recent years, with more than half of the positions being filled internally (this statistic is dominated by the Health Care Corporation of St. John's). Variability in turnover means it is difficult to pinpoint annual requirements for physiotherapists. Annual requirements are estimated to range from five to 18 depending on turnover and other factors. In November 2002 there were seven vacant positions in health boards.

Healthier Together has identified physiotherapists as key members of the primary health care team however long-term effects on workforce requirements are not known at this time. Current seat purchase arrangements seem to be sufficient for sustaining the present workforce, if the new graduates can be effectively placed, however potential growth in positions for this group may increase the need for new recruits, and several recent return-in-service agreements have been broken. Given fiscal restraint, if growth occurs it will probably be slow enough to be accommodated within the present arrangements. Also, other recommendations in this document should improve recruitment and retention techniques.

PHYSIOTHERAPISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		110	200
Vacancies (number as of November 2002)		7	Unknown
Projected Retirements (number turning 58, 2003 to 2007)		2	4
Total Requirements ¹ (total supply required 2003 to 2007)		25 to 90	Not Applicable
Total Graduate Supply ² (Dalhousie number from 2003 to 2007)		50	
Total Other Supply ² (number other than graduates 2003 to 2007)		Unknown	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		-40 to +25	
Forecast: Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover. This group relies on effective recruitment and retention techniques such as bursaries. Recommendations provided in Section 6 to improve recruitment and retention are critical, especially in rural areas, to avoid shortages. Close annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Not all seat purchase arrangements are successful with respect to return-in-service, but there is also an unknown other supply of not included in the estimates.

10.11 Psychologists (Clinical)

About 190 registered psychologists work in this province, but only 59 are clinical psychologists employed by health boards (health boards specifically require an educational background in clinical psychology). Population per professional ratios show that this province has fewer psychologists per capita than the national average. Memorial University’s Master in Clinical Psychology program was discontinued in the early 1990s. In health boards, positions are largely full-time, absenteeism is low, and retirement projections show two to four retirements over the next five years. The average age is 41 years. Four bursaries to new graduates of \$5000 were offered in 2001 and all were accepted. In 2002, seven were offered and four accepted. These bursaries originated with Newfoundland and Labrador Health Boards Association residual funds from other bursary programs i.e. they were not part of the formal programs. Turnover in health boards in 1999 and 2000 was significant, at 16 per cent and 20 per cent respectively. About half of the positions were filled internally (this statistic is dominated by the Health Care Corporation of St. John’s). In November 2002 there were six vacant positions. Annual health board requirements are estimated to range from three to five depending on turnover and other factors.

Healthier Together identifies mental health services as a focus in its goal to improve the quality, accessibility and sustainability of health and community services. It states “...It is well recognized that the existing level of services is underdeveloped despite the creation and growth of community mental health since the mid-1990s”. The need for psychologists may increase as the plan unfolds.

CLINICAL PSYCHOLOGISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		59	Not applicable
Vacancies (number as of November 2002)		6	Not applicable
Projected Retirements (number turning 58, 2003 to 2007)		2 to 4	Not applicable
Total Requirements¹ (total supply required 2003 to 2007)		15 to 25	Not Applicable
Total Graduate Supply (number from 2003 to 2007)		Unknown	
Total Other Supply² (number other than graduates 2003 to 2007)		20	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		-5 to +5	
Forecast: Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover. This group relies on effective recruitment and retention techniques such as bursaries. Recommendations provided in Section 6 to improve recruitment and retention are critical to avoid shortages, especially in rural areas. Reintroduction of Memorial University’s Clinical Psychology program is recommended. Close annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Based on bursary acceptance in 2001 and 2002 and continued availability of bursaries and recruitment of four annually over five years, however funds are limited and there are no long-term plans to continue to offer bursaries. This is not a government-funded program.

To sustain the clinical psychology workforce, it is important that Newfoundland and Labrador become self-sufficient by reintroducing the program at Memorial University.

RECOMMENDATION 21.

Government work with Memorial University to reintroduce a clinical psychology program.

10.12 Radiation Therapists (Cancer Treatment)

Radiation therapists are employed by the Newfoundland Cancer Treatment and Research Foundation. There are currently 17 radiation therapists employed in Newfoundland and Labrador, including a manager. Critical shortages and extreme vacancy periods led to a seat purchase arrangement with the Michener Institute in Ontario in 1999 for three seats annually. The first group of three graduates were hired in 2002 and three more will be hired in July 2003. Three more in the year 2004, and again in 2005, are expected and two in 2006. Graduates must complete a five year return-in-service agreement. Regional managers of radiation therapy have recently begun meeting to plan for a sustainable Atlantic workforce. The Newfoundland and Labrador workforce is expected to remain stable indefinitely given current arrangements and continued availability of funding.

RADIATION THERAPISTS (cancer treatment) ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)	17	Not applicable
Vacancies (number as of November 2002)	3 to 4	Not applicable
Projected Retirements (number turning 58, 2003 to 2007)	1 ²	Not applicable
Total Requirements ¹ (total supply required 2003 to 2007)	11	Not Applicable
Total Graduate Supply (Michener number from 2003 to 2007)	11	
Total Other Supply (number other than graduates 2003 to 2007)	0	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)	0	
Forecast: No gaps in supply projected for the next five years provided existing seat purchase and bursary arrangements continue with successful return-in-service results. Close annual monitoring is required.		

Notes

1. Total requirements based on data from the Newfoundland Cancer Treatment and Research Foundation.
2. Retirement data for this group as indicated by the Newfoundland Cancer Treatment and Research Foundation.

10.13 Respiratory Therapists

About 75 to 80 respiratory therapists work in Newfoundland and Labrador. Health boards employed 68 in 2001, or more than 85 per cent of the workforce. Population per professional ratios were not available for national comparisons. In health boards, positions are mostly full-time, absenteeism is low, and retirement projections show just one in the next five years. This group has an average age of less than 34 years. Turnover was high at 19 per cent in 2000 and 20 per cent of hires were filled externally. This translates into an annual requirement of about three respiratory therapists. In November 2002 there was one vacant position in the St. John's region. With little previous data for this group, close monitoring is required.

In a report titled "Respiratory Disease in Canada" released in September 2001 by CIHI, the Canadian Lung Association, Health Canada, and Statistics Canada, conclude that Canada is facing a wave of chronic respiratory diseases. Because many respiratory diseases affect adults over the age of 55, the report states that the number of people with respiratory diseases will increase as the population ages. This predicted increase in demand is expected to increase the need for respiratory therapists in the private sector in Newfoundland and Labrador who currently service home-based public needs.

RESPIRATORY THERAPISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		68	80
Vacancies (number as of November 2002)		1	Unknown
Projected Retirements (number turning 58, 2003 to 2007)		1	2
Total Requirements¹ (total supply required 2003 to 2007)		15	18
Total Graduate Supply² (number from 2003 to 2007)			43
Total Other Supply² (number other than graduates 2003 to 2007)			Unknown
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)			+25
Forecast: Surplus in supply projected over the next five years. Annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Based on an 85 per cent retention rate of new graduates. There are also an unknown number of others entering the workforce besides graduates from Newfoundland and Labrador.

10.14 Social Workers

About 950 social workers are registered in Newfoundland and Labrador. Health boards employ 740, including unionized and management employees, or 77 per cent of the workforce. The health boards workforce is about 73 per cent community-based, 24 per cent acute care and three per cent long-term care. Accurate population per professional ratios were not available for national comparisons. This group has an average age of less than 40 years. The projected number of retirements in the entire workforce shows that from 2003 to 2007 inclusive, there will be an estimated 58 retirements. A significant portion of the health board workforce is temporary at 22 per cent, with an additional three per cent casual. Five per cent of all earned hours, or the equivalent of 24 full-time equivalents, were attributed to sick leave in fiscal year 2000/01. Turnover was 16 per cent in calendar year 1999 and 12 per cent in fiscal year 2000/01. Most positions were filled internally at 60 per cent. Note that external hire rates can be misleading, as much movement may be from one organization to another, artificially inflating the perceived need for “new” supply. Current new supply requirements are estimated to be from 41 to 52 annually, for health boards. In November 2002 there were 11 vacant positions. Health Labrador Corporation has had ongoing difficulties filling some positions, despite retention bonuses for some remote communities. Graduates from the Memorial University program number about 45 annually. If the workforce outside of health boards turns over at the same rate and has similar external hiring rates as health boards’ social workers, the total annual provincial requirements would be approximately 52 to 67 new graduates.

The report “Social Work Workload Review” (September 2002) by IHRD Group and Goss Gilroy Incorporated found that while there are currently insufficient means to track social worker workload, many social workers reported experiencing excessive workload, excessive on-call in some rural areas, being ill-prepared for program-specific duties, and being poorly supported by employers in terms of professional development and supervision. The report also showed there were opportunities for improvements to social worker’s scope of practice that could increase their client focus. The report recommended 15 to 20 per cent additional staffing requirements, based on existing models of practice, in targeted areas. Discussions on the appropriate number of positions in Labrador are ongoing.

Finally, the role of social work in *Healthier Together* will be significant, particularly where Mental Health and Primary Health Care Reform and Renewal initiatives are concerned. It is not known at this time how the overall requirements for social workers will change as the plan is implemented. Recommendations around better orientation practices and ongoing professional development are particularly important for this group.

SOCIAL WORKERS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		740	950
Vacancies (number as of November 2002)		11	Unknown
Projected Retirements (number turning 58, 2003 to 2007 including managers)		44	58
Total Requirements¹ (total supply required 2003 to 2007)		202 to 262	260 to 336
Total Graduate Supply² (number from NL 2003 to 2007)			192
Total Other Supply² (number other than graduates 2003 to 2007)			Unknown
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)			-144 to -68
Forecast: A gap is projected in the supply of social workers in the next five years (entire social work workforce considered) based on high turnover rates, however a stable or decreasing turnover could narrow or eliminate the gap. Rural areas, notably Labrador, require special attention to avoid critical shortages. Close annual monitoring is required. Reduced absenteeism could reduce total requirements for this group.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Based on an 85 per cent retention rate of new graduates. There are also an unknown number of others entering the workforce besides graduates from Newfoundland and Labrador.

10.15 Speech-Language Pathologists

In 2001 there were 79 speech-language pathologists in the province including 40 in six health boards (including managers). For speech-language pathologists in health boards, absenteeism is low and only one retirement is expected in the next five years. This group has an average age of 36 years. Turnover was 12 per cent in 1999 and 13 per cent in 2000, and 35 per cent of hires were filled internally. This translates into an annual requirement of about two to four new speech-language pathologists for the health and community services system. Speech-language pathologists are not educated in Newfoundland and Labrador. A total of six \$5000 bursaries have been offered since 2000 (three years), with two accepted. In November 2002 there were two vacant positions in provincial health boards. Recently, school boards have been experiencing high vacancy rates.

National population per provider benchmarks show Newfoundland and Labrador had a significantly higher (worse) ratio than the Canadian average in 2002. In 2002 the Newfoundland and Labrador ratio was estimated as 6563 population per professional while for Canada it was 5647 (source: Canadian Association of Speech-Language Pathologists and Audiologists and Statistics Canada post-census population estimates). Recruitment to rural areas of the province and problems associated with sole-practice positions are the biggest supply issues for this group.

SPEECH-LANGUAGE PATHOLOGISTS	ESTIMATES >>	BOARD LEVEL	PROVINCIAL LEVEL
Workforce (number of employees including managers)		40	79
Vacancies (number as of November 2002)		2	Unknown
Projected Retirements (number turning 58, 2003 to 2007)		1	2
Total Requirements¹ (total supply required 2003 to 2007)		10 to 20	20 to 40
Total Graduate Supply (number from 2003 to 2007)		Not applicable	
Total Other Supply² (number other than graduates 2003 to 2007)		4	
Potential Surplus (+) or Gap (-) (cumulative 2003 to 2007)		-6 to -16	
Forecast: Current trends suggest continued gaps in supply resulting from recruitment difficulties and excessive turnover. This group relies on effective recruitment and retention techniques such as bursaries. Recommendations provided in Section 6 to improve recruitment and retention are critical, especially in rural areas, to avoid shortages. Close annual monitoring is required.			

Notes

1. Total requirements based on historical turnover rates, the number of external hires, and retirements expected in the next five years.
2. Based on bursary acceptance in last four years and continued recruitment success rate.

10.16 Gaps Analysis

The Allied Health Forecasting Working Group used three methodologies to determine gaps in services for occupational therapy, physiotherapy and speech-language pathology. Only these groups were the focus of the working group due to the availability of data and the presence of provincial consultants/coordinators. The three methods used to determine gaps included national population per professional ratios, expert opinion, and regional services analysis, based on the current service delivery model. The working group concluded:

- Approximately 29 to 33 new positions are required in the health and community services system to eliminate gaps in **occupational therapy** services, primarily in community services, long-term care and mental health;
- Approximately 38 to 42 new positions are required in the health and community services system to eliminate gaps in **physiotherapy** services, primarily in community services, long-term care, ambulatory services and adult rehabilitation;
- Approximately 17 to 21 new positions are required in the health and community services system to eliminate gaps in **speech-language pathology** services, primarily in community services, long-term care, and pediatrics.

These findings have been summarized in a consultation paper circulated to health boards in March 2003. The implications of the Healthier Together on these professional groups, particularly in the areas of Primary Health Care Reform and Renewal, the Wellness Strategy, Mental Health Services, and Long-term Care and Supportive Services, are unknown at this time. If these gaps are closed with the creation of new positions, new demands will be placed on the current system of supply. In the current environment of fiscal restraint it is unlikely this will occur very quickly, and the supply should be able to accommodate growth in this respect. The working group notes that growth in public sector allied health groups over the last two decades has not kept up with growth in other health profession groups.

10.17 Other Groups

For several groups, detailed forecasting has not been performed, however they are included in the Newfoundland and Labrador Health and Community Services Retirement Analysis (April 2003). These groups include: ancillary staff, behaviour management specialists, cardiology technologists, combined laboratory/x-ray technologists, child management specialists, electroneurophysiology technologists, nurse practitioners, paramedics, prosthetists and orthotists and recreation/development specialists. These groups will fall within the scope of future HR work. Some speciality groups, although small in size, may cause serious challenges to sustaining health programs to the public, if they are not available for hiring. For example, combined laboratory/x-ray technologists are vitally important to rural regions of the province where it is not possible to maintain separate medical laboratory and medical radiation technologist positions. Although the College of the North Atlantic has restarted the program to educate medical laboratory technologists in medical radiation, and the Newfoundland and Labrador Association of Medical Radiation Technologists has agreed to give combined laboratory/x-ray professionals the opportunity to obtain membership with that organization, close annual monitoring is required.

Further forecasting work is planned around physicians, including general practitioners and specialists. Much of the demand data currently available is centered on physician practice, although salaried physician data are lacking.

Circumstances change very quickly in the health and community services system, and the best forward-looking plans are based on up-to-date data and analysis. Monitoring trends is necessary to keep abreast with new developments and effectively plan for the future.

RECOMMENDATION 22.

Government update health human resource forecasts on an annual basis and closely monitor all professional groups for shortages. Stakeholders continue to develop and explore systematic approaches to supply and demand forecast modeling.

Good forecasting relies on the ability of planners to identify reasons why employees leave health boards besides the more quantifiable patterns of retirement. Knowing these reasons can help health boards devise strategies to avoid employee separations where circumstances are within the control of employers, thereby reducing turnover by improving retention of health professionals.

RECOMMENDATION 23.

Health boards implement a standard exit survey to capture information on reasons why employees leave health boards.

11 Planning Support Systems

The availability of data has been one of the most challenging aspects of the committees' work. It has delayed the completion of reports and challenged the committee's ability to meet its mandate. This issue has been highlighted on several occasions in the past including the provincial Task Force on Health Human Resources Information in 1995, the July 2000 and July 2002 Status Reports of the provincial Health and Community Services Human Resource Planning Steering Committee as well as from health boards. It remains a very limiting factor to the planning process. To improve some specific data issues the following recommendations are proposed:

RECOMMENDATION 24.

Government continue to work closely with health boards and the Newfoundland and Labrador Centre for Health Information to develop and implement standards for abstracting of financial and statistical data, including human resource data.

RECOMMENDATION 25.

Government work with professional associations to identify and implement a suggested minimum data set to be submitted by professional associations annually.

Human resource information systems and standards are needed for managing and planning purposes. The Health Care Corporation of St. John's purchased a human resource information system in 2002, which will interface with the Meditech system. It will be phased in over the next year. A human resource information system can have several elements and will vary to some degree based on the user and the vendor. Basic elements include leave management, recruitment, employee health, education and development, pension management, workers compensation, and others. Standardized data definitions are essential across health boards to facilitate provincial and national reporting from these systems. Current Management Information Systems (MIS) standards in Canada contribute significantly to this standardization yet further uniformity is also needed at the operational level of data entry.

The Canadian Policy Research Networks and The Canadian Health Services Research Foundation, in a comprehensive review "Creating High-Quality Health Care Workplaces" (January 2002), recommended integrated human resource information systems as one of eleven priority recommendations. The cost of inaction is highlighted. In a provincial review commissioned by the Human Resource Planning Steering Committee, the addition of a computerized scheduling system has been deemed necessary in larger organizations and proponents indicate that a cost saving business case exists in these environments (Management Engineering Services, 2002).

Although it is difficult to build a business case around the need for an electronic human resource information system, the need clearly exists. Health human resources represent an annual expenditure of \$1.0 billion in this province, and modern tools are required to properly manage the resource.

RECOMMENDATION 26.

Government support the implementation of human resource information systems in health boards using a provincial framework.

As outlined in the introductory sections of this report, there are multiple factors that will continue to influence future workforce requirements. There is a need to monitor trends, revise forecasts and advise government and health boards on emerging human resource issues and solutions. In their budget submission to government of March 2002, the Newfoundland and Labrador Health Boards Association supported the need for ongoing human resource planning. Most jurisdictions have dedicated human resource planning staff to support such activities and this is seen as a growing priority with an aging workforce and increasing competition for recruitment and retention of professionals in the health and community services system.

As the committee's work is concluded and a new health human resource planning process is initiated, it is important to maintain close relationships with key stakeholders developed over the last three years and equally important to maintain a system-wide perspective. To this end it is recommended that a Human Resources Advisory Committee be established to support the work of the HR Planning Unit, and more formal stakeholder links be established. The following recommendations are proposed to maintain and strengthen existing human resource planning activities:

RECOMMENDATION 27.

Government establish a Newfoundland and Labrador Health and Community Services Human Resource Advisory Committee.

RECOMMENDATION 28.

Upon evaluation of previous experiences, government establish formal mechanisms that ensure stakeholder groups continue to have adequate input into human resource planning.

RECOMMENDATION 29.

Government continue its mandate of centralized human resource planning in partnership with the Newfoundland and Labrador Health Boards Association.

Tremendous knowledge and experience has been developed in government and health boards related to planning for and managing health human resources. Bringing together key people to address human resource issues on a provincial level has many benefits, including the identification of best practices and the sharing of experience. It also provides an opportunity to bring in external experts to provide additional insight, where appropriate.

RECOMMENDATION 30.

Government and health boards work with stakeholders to facilitate regular workshops on key topics such as wellness, workplace injuries, scope of practice, continuing education, recruitment and retention, and others, with the goal of identifying best practices and sharing information.

The recently formed Research/Knowledge Transfer Committee organized through the Newfoundland and Labrador Health Boards Association is also interested in bringing together stakeholders from health boards, the research community, and other stakeholders, to pool knowledge and identify innovative approaches for health service delivery. Opportunities to partner with this group should be pursued.

12 Conclusion

The committee has made great strides in gathering basic data and monitoring key workforce trends but there is much left to do. The list of unknowns is very long, and every effort must be made to identify what core information is needed and how it is to be obtained.

In conclusion, all organizations including government, health boards, professional associations, unions, and educational institutions, have a role to play in implementing the recommendations contained in this report. Each of these organizations should examine the list of recommendations, identify the required actions, and form implementation plans to realize the goal of sustaining and strengthening Newfoundland and Labrador's health workforce.

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14 Appendix A - Forecasting Discussion

Forecasting Discussion

To effectively forecast HR requirements for the Health and Community Services system, it is imperative that best supply and demand estimates be constructed. Many education programs extend to four years or beyond and effecting changes demands extended projections. Forecasting ideally accounts for a multitude of variables pushing and pulling on the underlying need for HR, yet data are virtually non-existent where many of these interacting relationships are concerned.

The Terms of Reference of the Health and Community Services Health Human Resources Planning Steering Committee as of March 2001 include:

- Recommend, based on an analysis of various models, a model(s) which can be used for provincial, integrated, health human resources planning taking into account population needs and fiscal realities. In evaluating models, realities relating to data availability and collection need to be considered;
- Applying the approved model(s), prepare a five year forecast of the demand and supply for various categories of health and community services human resources;
- Make recommendations concerning identified gaps between forecasted demand and supply that reflect fiscal and other realities.

Much data has been collected, and tremendous effort has gone into understanding the mechanics of forecasting. Forecasting results for selected groups have been achieved and are presented in Section 10. Several pieces that contribute to the overall forecasting picture have been assembled.

Section 14 is intended to dissect the main components of forecasting and lay the foundation for future work. It is important to note that this analysis is preliminary and subject to change upon review by various stakeholders and content experts. It is convenient to discuss forecasting in the two main streams of supply and demand. These are defined and further broken down in the following sections.

14.1 Supply

Supply forecasts are concerned with the flow of people into and out of the workforce. Flow in includes new graduates and experienced workers. Flows out include those leaving the workforce because of retirement, out-migration, or personal reasons. The movement of people is variable and often difficult to estimate however historical trends do provide some indication of patterns. For example, as a new class of students graduate, there may be a downturn in the number of available positions, resulting in a low recruitment rate, or location and type of jobs available may not match preferences. Similarly, the number of employees leaving the workforce changes from year to year, depending numbers reaching retirement age and other factors.

Retirement data provides one important piece of the supply forecasting picture. Summary data are provided in Table 10:

Table 10 Retirement Projections - Overview.

Description	Average Age in 2003	Number Reaching 58 by 2013 or Achieving Early Retirement at age 55^{2,3}	Percentage Reaching age 58 by 2013 or Achieving Early Retirement at age 55^{2,3,4}
Cardiology Technologists	48.9	18	64%
Prosthetist-Orthotists	43.5	7	58%
Managers ^{1,4}	46.1	404	48%
Medical Radiation Technologists ⁴	42.3	84	36%
Medical Laboratory Technologists ⁴	42.6	131	36%
Electroneurophysiology Technologists	45.3	4	33%
Licensed Practical Nurses	44.2	883	33%
Ancillary Occupations, Clinical	43.0	336	32%
Ancillary Occupations, System	44.4	1941	32%
Other Occupations	45.8	11	30%
Paramedics	42.7	34	30%
Radiation Therapists	38.5	3	27%
Registered Nurses	41.1	1048	22%
Clinical Psychologists	41.1	9	20%
Social Workers	38.9	107	18%
Combined laboratory/x-ray Technologists	42.8	2	17%
Nurse Practitioners	40.6	7	14%
Nuclear Medicine Technologists	38.5	2	13%
Child Management Specialists	38.8	3	13%
Pharmacists ⁴	39.2	9	13%
Occupational Therapists	34.9	10	11%
Physiotherapists	36.0	10	11%
Dietitian	38.0	6	10%
Behaviour Management Specialists	35.9	4	9%
Speech-Language Pathologists	36.2	2	5%
Respiratory Therapists	33.6	1	2%
Recreation/Development Specialists	33.5	0	0%
Audiologists	34.8	0	0%

Source: Newfoundland and Labrador Health and Community Services Retirement Analysis (April 2003). Data as of December 31, 2001 and only represents employees of provincial health boards.

Notes

1. Analysis of the management group reveals that 34 per cent of managers have a nursing background. As these managers retire it is likely they will be replaced by registered nurses who in turn may require replacement. Similarly, nine per cent have a social work background.
2. The figure of 58 years was thought to be representative of an average age of retirement for public sector employees. This is based on anecdotal evidence, past calculations, and age distribution graphs for various professionals.
3. Retirement analysis for managers, medical laboratory technologists, medical radiation technologists, and pharmacists shows these groups have higher numbers achieving early retirement at age 55, compared to the numbers reaching age 58, and figures shown in above reflect the number and percentage achieving early retirement.
4. This represents the number turning 58 (or achieving early retirement) between 2003 and 2013 inclusive divided by the total number not already 58 (or not yet achieving early retirement).

Further breakdown by year turning age 58 (or achieving early retirement) for those groups showing more than 17 per cent in Table 10 is provided in Table 11:

Table 11 Retirement Projections - Detail.

Year Turning 58	Registered Nurses ²	Licensed Practical Nurses	Managers ^{3,4}	Social Workers	Medical Radiation Technologists ⁴	Medical Laboratory Technologists ⁴	Cardiology Technologists	Radiation Therapists	Prosthetist-Orthotists	Paramedics	Clinical Psychologists	Electroneurophysiology Technologists	Other Occupations	Ancillary Occupations, Clinical	Ancillary Occupations, System
<2003 ¹	155	106	31	5	4	7	1	0	0	1	2	1	4	36	296
2003	54	47	21	2	5	6	1	0	0	3	0	0	1	13	96
2004	63	72	27	3	9	10	1	0	0	1	1	2	0	18	100
2005	66	85	39	7	5	9	0	0	0	3	0	0	1	28	144
2006	72	99	44	6	5	8	2	0	0	2	0	0	2	36	161
2007	93	102	27	12	7	5	2	0	1	2	1	1	2	28	181
2008	75	78	36	8	7	8	2	0	1	2	0	0	1	37	197
2009	106	76	44	7	7	13	2	1	0	1	1	0	0	26	198
2010	106	83	39	23	4	18	1	1	0	5	3	0	0	37	205
2011	118	68	40	13	11	12	0	1	1	5	1	0	0	27	222
2012	158	80	35	16	18	26	5	0	2	4	2	1	3	47	222
2013	144	93	52	10	6	16	2	0	2	6	0	0	1	39	215
>2013	3406	1526	392	497	98	167	9	8	5	79	34	7	22	571	3462
Unknown or GMPP ⁵	14	35	45	0	52	65	0	0	0	0	0	0	0	25	68
Total	4630	2550	872	609	238	370	28	11	12	114	45	12	37	968	5767

Source: Newfoundland and Labrador Health and Community Services Retirement Analysis (April 2003). Data as of December 31, 2001 and only represents employees of provincial health boards.

Notes

1. These are employees already 58 years (or already achieving early retirement) of age or older. This group is not included in retirement projections below as they represent a “wave” of employees older than 58 (or already achieving early retirement) that will turnover but probably remain constant in quantity.
2. Includes nurse practitioners.
3. Analysis of the management group reveals that 34 per cent of managers have a nursing background. As these managers retire it is likely they will be replaced by registered nurses who in turn may require replacement. Similarly, nine per cent have a social work background.
4. Retirement analysis for managers, medical laboratory technologists, medical radiation technologists, and pharmacists, shows these groups have higher numbers achieving early retirement at age 55, compared to the numbers reaching age 58, and figures shown in above reflect the number achieving early retirement.
5. For age 58 analysis, these are the numbers with unknown birth dates. For early retirement analysis these are the numbers in the Government Money Purchase Plan (GMPP) and date of early retirement is not applicable.

Another consideration is that many managers have registered nurse backgrounds and their departure likely means a unionized registered nurse may move into the position, ultimately creating a need in the system for one or more registered nurse. The committee's work around management reveals that 34 per cent of managers have registered nursing backgrounds. Therefore it is possible to estimate the true registered nurse retirements estimates by also considering 34 per cent of the management group. Results are shown in Table 12. Additionally, registered nurse figures above do not include those employed outside of health boards, and a further correction is required as shown in column F below.

Table 12 Projected Provincial Registered Nurse Retirements.

Year A	Board Unionized RN Retirement¹ B	Total Board Management Retirement² C	RN Management Retirement D = 0.34C	Total Retirement Boards E = B + D	Total Retirement Province F = 1.04E
2003	54	21	7	61	63
2004	63	27	9	72	75
2005	66	39	13	79	82
2006	72	44	15	87	90
2007	93	27	9	102	106
2008	75	36	12	87	90
2009	106	44	15	121	125
2010	106	39	13	119	124
2011	118	40	14	132	136
2012	158	35	12	170	176
2013	144	52	18	162	168
Total	1055	404	137	1192	1236

Source: Newfoundland and Labrador Health and Community Services Retirement Analysis (April 2003). Data as of December 31, 2001.

Notes

1. Based on retirement at age 58.
2. Based on date of early retirement.

Registered nurse retirements are estimated to be about one quarter of the net loss in practicing registrations with the ARNNL in recent years. Understanding why employees leave organizations is vitally important for modeling future change and for forming better recruitment and retention policy.

As with registered nurses, a certain portion of managers have a social work background and their departure likely means a unionized social worker may move into the position, ultimately creating a need in the system for one or more social workers. The committee's work around management reveals that nine per cent of managers have social work backgrounds. Therefore it is possible to estimate the true social work retirements estimates by also considering nine per cent of the management group. Results are shown in Table 13. Additionally, social workers in health boards constitute about 76 per cent of the provincial social work workforce and a further correction is required as shown in column F.

Table 13 Projected Provincial Social Worker Retirements.

Year	Board Unionized SW Retirement ¹	Total Board Management Retirement ²	SW Management Retirement	Total Retirement Boards	Total Retirement Province
A	B	C	D = 0.09C	E = B + D	F = 1.302E
2003	2	21	2	4	5
2004	3	27	2	5	7
2005	7	39	4	11	14
2006	6	44	4	10	13
2007	12	27	2	14	19
2008	8	36	3	11	15
2009	7	44	4	11	14
2010	23	39	4	27	35
2011	13	40	4	17	22
2012	16	35	3	19	25
2013	10	52	5	15	19
Total	107	404	36	143	187

Source: Newfoundland and Labrador Health and Community Services Retirement Analysis (April 2003). Data as of December 31, 2001.

Notes

1. Based on retirement at age 58.
2. Based on date of early retirement.

As with registered nurses, retirements are only a piece of the workforce exits puzzle.

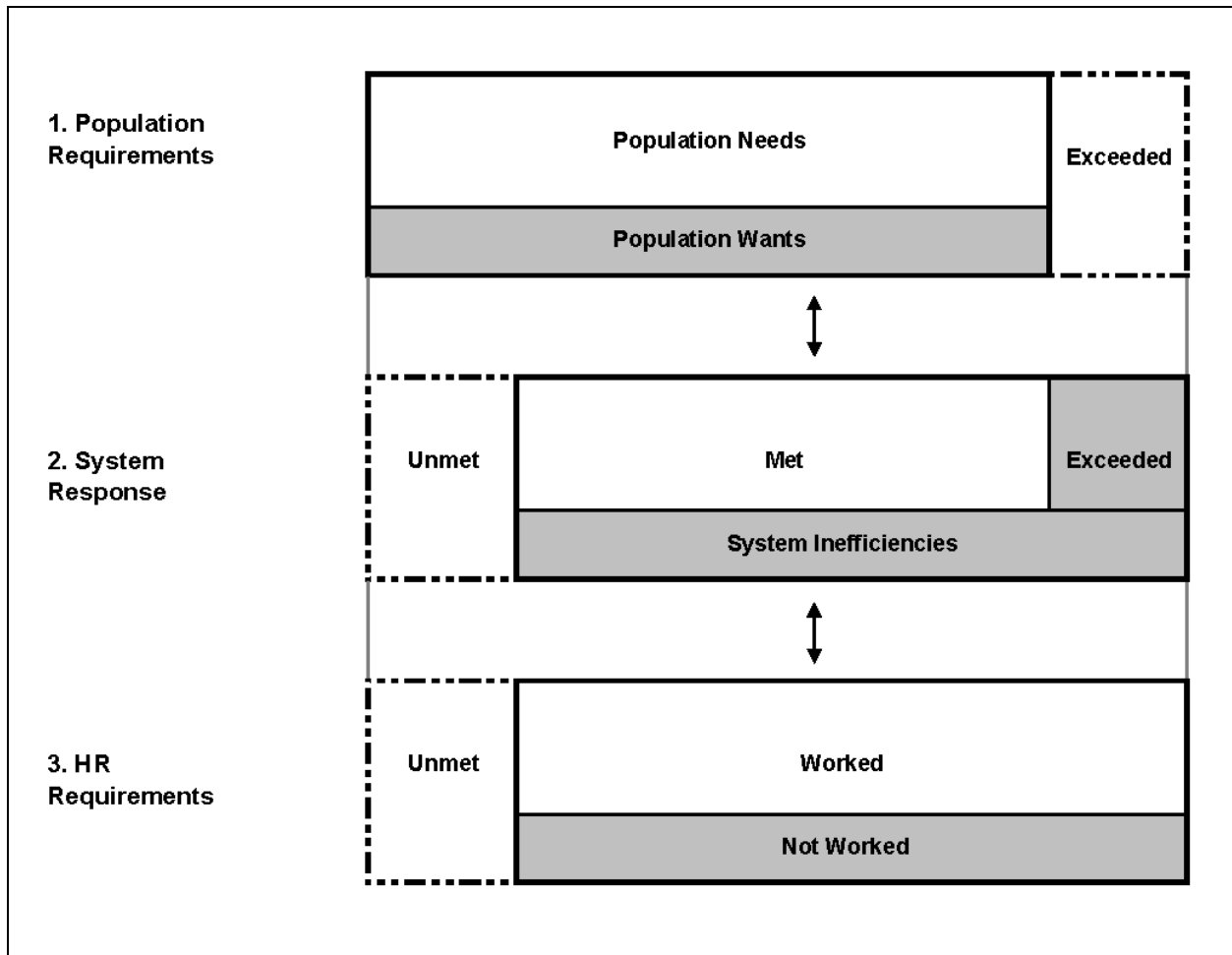
14.2 Demand

The term demand is multi-faceted. For the purposes of this document, it is defined as the system's requirements for health workers. A purer definition might indicate that population need is the true demand; however many other factors affect the need for health workers. For example, population wants, core staffing requirements, workforce patterns, fiscal capacity, and numerous other factors contribute to the resulting need for health workers. It is important to note that in the above definition of demand, the system providing health services is in itself an important driver of demand, and perhaps the most important to consider.

To examine how the demand will change in the future, it is necessary to identify what drives it. After identifying the drivers, it is necessary to then identify trends for each of these influences and the magnitude of their impact on demand. The word "system" is used in this section to refer to the system providing health services of any sort, publicly or privately funded.

For example, a system over-servicing a given population could require less human resources than a similar system under-servicing the same population, if the former was more efficient. When discussing demand it is imperative to identify the elements making up the need for human resources, and try and gauge the direction of each of these drivers so that planners can anticipate future demand. Note that there are no tools or benchmarks currently available to guide decision makers on areas of over/under servicing. A representation of the system is provided in Figure 7:

Figure 7 Health and Community Services System Human Resource Requirements.



Source: Wells, 2003, Newfoundland and Labrador HR Planning Unit.

This diagram represents factors that impact health human resource requirements. At the top, the overall **Population Requirements** are made up of needs and wants. The **System Response** is to meet, exceed, or not meet the population requirements. It can also do this efficiently or inefficiently. At the bottom, the **HR Requirements** are split between Worked and Not Worked hours.

The purpose of the figure is to highlight that there are disconnects between true population need and bottom-line requirements for human resources that must be considered and provide a visual tool to begin considering all possible drivers of human resource requirements. In addressing opportunities for reducing human resource requirements, the highest level on the diagram will yield the best results. For example, reducing the needs of the population through better population health focus means a corresponding decrease in the service required, and all downstream inefficiencies/excesses associated with this piece of dropped need are also dropped. More realistically, it would mean improvements to other services, reducing gaps in service, or simply reducing pressure in the system.

The committee has studied certain areas shown in the above diagram, for certain groups. For example, much data has been collected around population utilization of health services and a sample is presented below. The committee has also studied unmet population needs for occupational therapists, physiotherapists, and speech-language pathologists identifying potentially significant gaps in service. Finally, much is known around the Worked and Not Worked hours' breakdown as discussed in Section 7. Much more remains unknown including implications of changing scope of practice, skill mix, location of services analysis, appropriate utilization volumes, etc. An overview and further explanation is provided in the following sections for these three primary categories of demand forecasting.

Population Requirements for Health Services

One method for performing population-based projections is to examine past patterns of utilization on a per capita basis and then use population projections to project overall growth. Unfortunately utilization reflects actual usage of health services, i.e. needs and wants that were met, unmet, or over serviced, and must be viewed with caution. Further discussion on the pros, cons and cautions associated with utilization data is provided under the heading "Using Utilization Data" on page 81. What follows are general data and examples of results, to give the reader a sense of the magnitude of the demographic shift and the potential on the need for health services. Population projections are provided in Table 14:

Table 14 Newfoundland and Labrador Population Projections by Age Group.

Year	0-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	65+	Total
2001	89,508	73,044	70,108	87,142	83,926	53,455	35,788	21,634	6,595	64,017	521,200
2002	86,702	71,392	68,340	86,017	84,906	56,583	36,059	21,993	6,751	64,803	518,743
2003	83,927	69,879	67,009	84,482	85,747	59,771	36,599	22,096	6,917	65,612	516,427
2004	81,254	68,486	65,845	82,713	86,411	62,855	37,287	22,213	7,145	66,645	514,209
2005	78,191	67,531	64,906	80,904	86,943	65,942	37,922	22,309	7,521	67,752	512,169
2006	75,653	66,269	63,931	79,061	87,336	69,257	38,515	22,629	7,670	68,814	510,321
2007	73,588	64,657	62,930	77,514	87,508	72,220	39,420	22,802	7,924	70,146	508,563
2008	71,832	62,889	62,207	75,795	87,478	74,855	40,749	23,149	8,018	71,916	506,972
2009	70,362	60,950	61,763	73,942	87,199	77,376	42,411	23,429	8,086	73,926	505,518
2010	69,060	58,974	61,341	72,170	86,767	79,779	44,110	23,777	8,134	76,021	504,112
2011	67,927	57,317	60,845	70,838	86,142	81,027	46,857	23,928	8,399	79,184	503,280
2012	66,927	55,957	60,365	69,538	85,240	82,093	49,721	24,194	8,549	82,464	502,584
2013	66,150	54,464	59,934	68,612	83,926	83,011	52,618	24,617	8,609	85,844	501,941
2014	65,423	52,959	59,643	67,849	82,383	83,802	55,375	25,161	8,703	89,239	501,298
2015	64,685	51,067	59,725	67,295	80,812	84,407	58,154	25,695	8,873	92,722	500,713
2016	63,980	49,684	59,497	66,732	79,202	84,923	61,117	26,200	9,059	96,376	500,394
Percent¹	12.8%	9.9%	11.9%	13.3%	15.8%	17.0%	12.2%	5.2%	1.8%	19.3%	100.0%
Rate²	-2.21%	-2.54%	-1.09%	-1.76%	-0.39%	3.13%	3.63%	1.28%	2.14%	2.76%	-0.27%

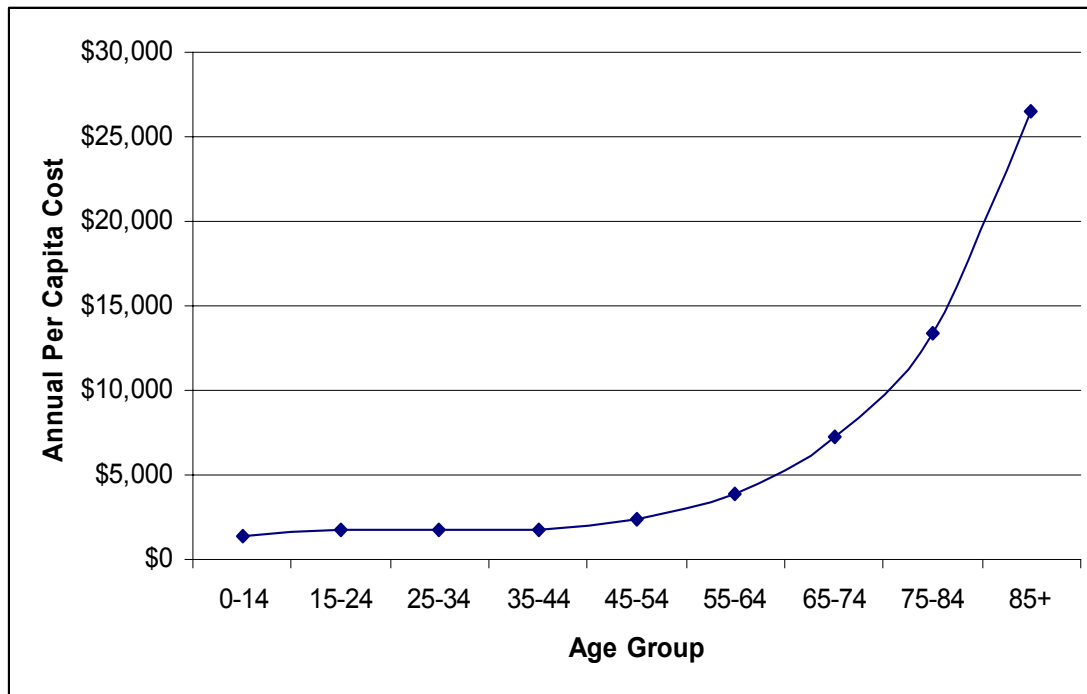
Source: Government of Newfoundland and Labrador, Department of Finance, Economics and Statistics Division 2002.

Notes

1. The "Percent" is the proportion of the total population that a particular group represents in 2000.
2. The "Rate" is the average annual increase of the population, compounded annually.

Ages 55 and under have shown a projected decrease in overall numbers of people, while those age groups over 55 display substantial annual increase. Besides demographic shift, utilization data are required. Statistical data are available for certain focused areas, usually related to physician practice and institutional care. Other financial data are system-wide but reflect rising costs, making it difficult to see the pure utilization changes. Much of the data follows similar patterns, generally low utilization for younger groups and high utilization for the elderly. An example is provided in Figure 8 which shows costs by age group:

Figure 8 Newfoundland and Labrador Annual Health and Community Services System Costs per Capita by Age Group, 2000.

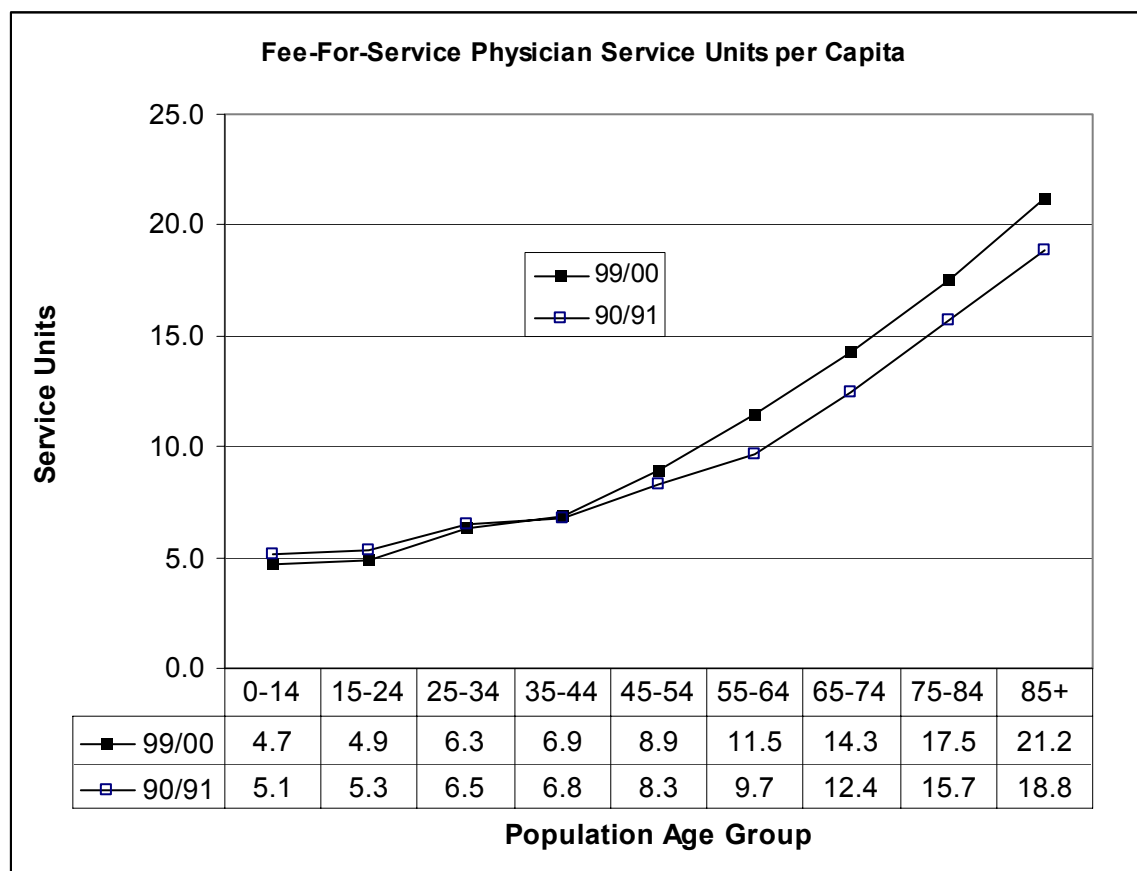


Source: Costs: Health Canada http://www.hc-sc.gc.ca/english/care/expenditures/exp_age_sex.html July 2002.
Demographics: Government of Newfoundland and Labrador, Department of Finance, Economics and Statistics Division 2002.

Per capita costs grow rapidly after age 55, precisely the group projected to grow in numbers despite overall population decline. This will result in a growth in need for health services. Graphs showing physician utilization measured in a predefined “units of service” and total days stay in hospital also show similar patterns by age group.

Additionally, per capita utilization has been changing. Elderly people are using more health services *each* than they did 10 years ago. This is apparent when comparing Newfoundland and Labrador fee-for-service (FFS) data for Physician services (definition noted under Figure 9) rendered in a ten-year time span, shown in Figure 9:

Figure 9 Changes in per Capita Physician Utilization 1990 – 1999.



Source: Newfoundland Medical Care Commission Annual Reports, 1990 - 1999.

Notes

1. “Service Units are units of medical and dental services received by a beneficiary” (Medical Services Branch of the Department of Health and Community Services definition).

Utilization patterns are changing; those under 35 are using fewer services *each* while those over 35 are using more services *each*. Lines for intermediate years show a smooth trend over the ten-year timeframe. The percentage change is given in Table 15:

Table 15 Percent Change in per Capita Physician Utilization 1990 – 1999.

Age Group	0-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Percent Change 90/90 to 99/00	-8.2%	-8.1%	-3.7%	1.1%	6.9%	18.5%	14.7%	11.6%	12.8%

If the demographic profile of the population was held constant (i.e. the same numbers of people at the same age) changing utilization patterns would show a net increase in physician services if the trend continues. Similarly, if utilization patterns were held constant (i.e. a 65 year old using exactly the same amount of services in the future as a 65 year does today) changing demographics would show a net increase in physician services. When factors are combined there is also a compounding effect that does not exist when examining each factor in isolation. Salaried physicians are not included in the above analysis. It is not known if similar patterns of changing utilization have been experienced by this group.

To summarize, we can expect larger numbers of elderly people, each needing an ever-increasing amount health services, and fewer numbers of younger people each using fewer health services. While this sounds alarming, projected growth has been described by experts as a slow but steady “glacier” and not an “avalanche”, and is well within the system’s capacity, if proper planning steps are taken. Preliminary calculations considering a combined demographic/changing utilization model based on data for FFS physicians indicates an annual growth rate of about 1.5 per cent, compounding annually. That is to say if demographic trends shown earlier are accurate and utilization patterns displayed over the last ten years continue, the amount of physician services rendered would grow annually by 1.5 per cent if left unfettered (FFS physicians only). It is important to note that this preliminary calculation is not a financial one, and does not address rising costs.

System Response

The system response is to under-service, meet or exceed population requirements. The first consideration is “Is the service provided or not?” Secondly, when the system does provide the service, it may do so in an efficient or inefficient manner.

On the first consideration, unmet needs are difficult to quantify with data however some committee work has been done on this issue. The Allied Health Forecasting Working Group has attempted to identify gaps in service in Newfoundland and Labrador for occupational therapists, physiotherapists and speech-language pathologists. Their methods included population per professional ratios, estimated staffing standards, and expert opinion. Preliminary findings are contained in Section 10.16.

Where they exist, gaps in service overshadow changes in population needs. Similarly, it is difficult to identify over-servicing without first establishing standards for what constitutes a fair and reasonable service. *Healthier Together* and other initiatives are focused directly on better matching the service to population needs, by addressing unmet needs and over-servicing.

Inefficiencies are an attribute of the systems’ response. These could result from a less than optimal: team mix, utilization of employee’s scope of practice, business processes, infrastructure, etc. Much of the system’s inefficiency may be difficult to “reclaim” without major system reform as it might be associated with minimum staffing levels, geographic limitations, etc.

Each health board provides a unique group of services. The HCCSJ provides the only tertiary care service in the province and other health boards may provide unique services that are not available in other boards. This and other factors results in significant movement of the population for health services. This affects most discussions on the delivery of health services and is important to consider for demand forecasting i.e. which health boards might be affected by a particular forecasting result and to what extent? An analysis of fiscal year 1999/2000 data gives some measure of health board trends where medical inpatient services and surgical daycare are concerned as shown in Table 16:

Table 16 Health Board Trends for Medical Inpatient and Surgical Daycare Services.

Health Board	Population ¹	Separations Originating in Health Board ²	RIW Originating in Health Board ³	Separations Occurring in Health Board ⁴	RIW Occurring in Health Board ⁵
HCCSJ	37%	31%	35%	44%	53%
WHCC	16%	18%	18%	17%	16%
CWHC	12%	12%	11%	10%	8%
AHCIB	10%	10%	10%	6%	5%
PHCC	10%	10%	10%	7%	5%
CEHCIB	8%	9%	9%	8%	7%
HLC	5%	5%	3%	4%	2%
GRHS	3%	4%	3%	4%	3%
Total	100%	100%	100%	100%	100%

Source: Newfoundland and Labrador Centre for Health Information, Discharge Abstract Database, 1999/2000.

Notes

1. Share of total population within this health board boundaries
2. Share of all separations originating from within this health board's boundaries. For the purposes of this document, a separation may closely be considered as an admission to a health board but also includes births and deaths.
3. Share of all RIW (Resource Intensity Weight) originating from within this health board's boundaries. RIW is a standard measurement of the resource requirements associated with a separation. It can be considered units of work.
4. Share of all separations actually occurring in this health board.
5. Share of all RIW actually occurring in this health board.

For example, the HCCSJ population represents 37 per cent of the provincial total population, its population generated 31 per cent of the separations and 35 per cent of the Resource Intensity Weight (RIW) or “work”, but the health board handled 44 per cent of the province’s separations and 53 per cent of the province’s “work” within the scope of the data. Most health board populations seem to generate their fair share of separations and workload, however the movement of the population for services is reflected in the last two columns. When considering needs-based demand modeling, movement of the population for health services is a critical factor. Data on the patterns of movement broken down by health board, physician type, diagnostic code, etc. are very useful for the purposes of selective demand modeling. This may serve as a proxy measure of requirements for several professional groups associated primarily with medical inpatient services.

Using Utilization Data

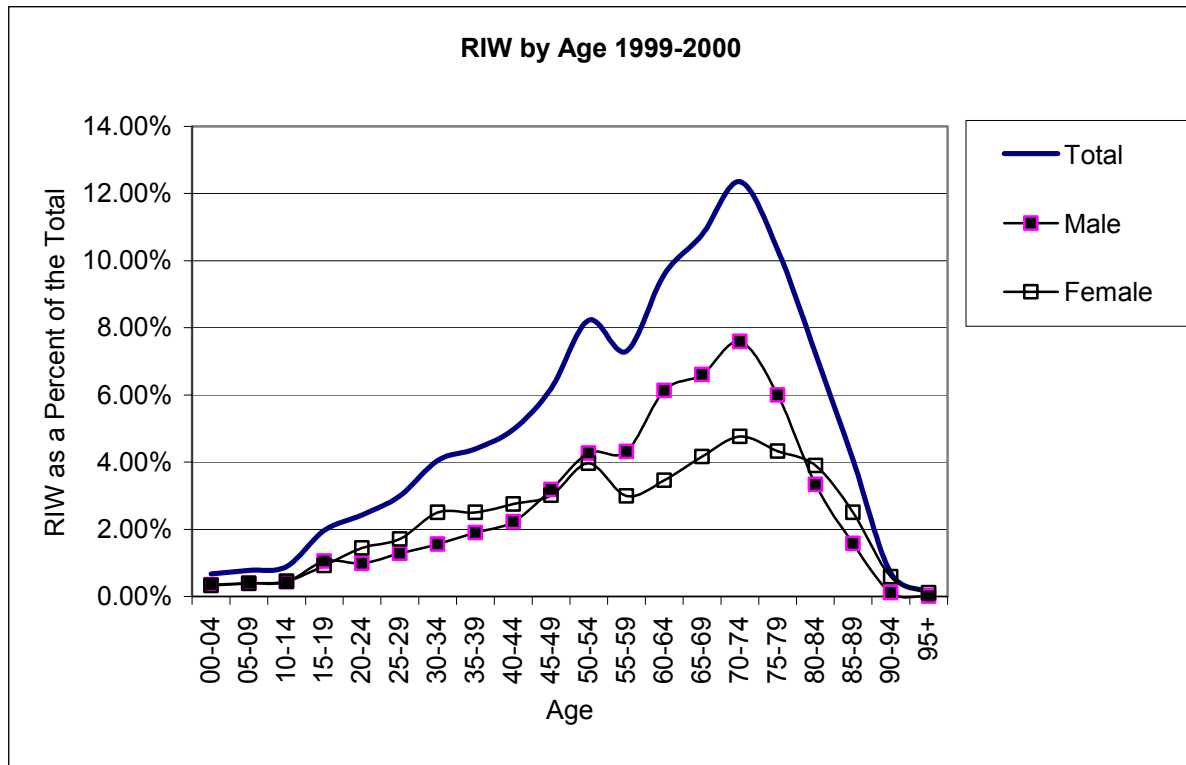
Utilization data reflect population needs and wants for health services and the system’s response to these needs and wants (see Figure 7), making it difficult to dissect the data into component pieces. It generally links client demographics and types/volumes of services provided. Much confusion is generated when speaking about utilization data; does it reflect true population needs or not?

Besides inherent problems with existing utilization data, certain areas have little or no data available. In Newfoundland and Labrador, areas to highlight include services provided in:

- Outpatient clinics;
- Health and Community Services Boards;
- Private organizations.

Additionally, utilization data is lacking for salaried physicians and selected FFS specialists. Utilization data are rarely tied directly to professional groups, although some inferences may be possible for registered nurses in acute care settings, licensed practical nurses, and other groups. True utilization data for allied health groups is poor. Despite problems with existing data and gaps in data, useful work can be accomplished with information at hand. Consider utilization data for general surgeons shown in Figure 10:

Figure 10 Weighted Cases Associated with General Surgeons by Age 1999/2000.



Source: Newfoundland and Labrador Centre for Health Information, Discharge Abstract Database, 1999-2000.

RIW or Resource Intensity Weight is a standard measurement of the resource requirements associated with a separation. It can be considered units of work. Clearly, more than 2/3 of general surgery work is derived from patients over the age of 45. The implications of an aging population are clear for this specialty, and calculations can easily be performed to give some general trends on how fast an increase can be expected. More sophisticated calculations can incorporate changing patterns of utilization, an example of which was shown in Figure 9.

HR Requirements

The part of Figure 7 labeled HR Requirements covers the manner in which the requirements for worked hours are achieved. One must consider the combination of full-time and part-time staff (see Figure 2) and the split between worked and benefit (or not worked) hours (see Figure 1) to determine the appropriate staffing numbers. Many benefit hours are unavoidable, but significant gains can be realized in the reduction of absenteeism described in Section 8. For example, if licensed practical nurse time lost due to sick leave and injury was reduced by 10 per cent, 33 more full-time equivalents would be available in the system. The utilization of existing HR is clearly an area that must be considered when constructing forecasts. Note that in the framework discussed in Section 14, skill mix, team mix, and scope of practice are *system efficiency* issues.

Forecasting Conclusions

Forecasting models suffer greatly from lack of data in many areas, and a multi-faceted approach is imperative as there is no single best method. A suite of methods is needed to paint the best picture possible and minimize risk when making policy decisions. Used cautiously, utilization-based forecasting can be useful for determining future requirements for HR. While imperfect, it is necessary to consider all components described in previous sections individually (for example: new graduates, retirements, population needs, population wants, system inefficiencies, fiscal capacity etc), construct best estimates using the data at hand for each, and finally combine results into a forecast. Additionally, one may assume some or many pieces of the picture will remain constant, as long as results are clearly qualified. Forecasting is not about predicting the future; it is an exercise in scenario running and sensitivity analysis.