CURRENT WORK LOCATIONS AND REASONS FOR JOB CHOICE OF GRADUATES OF MEMORIAL UNIVERSITY SCHOOL OF PHARMACY

STEPHANIE YOUNG

Current Work Locations and Reasons for Job Choice of Graduates of Memorial University School of Pharmacy

By

Stephanie Young

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Abstract

Background: We surveyed Memorial pharmacy graduates to determine attrition rate, and proportions of graduates working in pharmacy in Newfoundland and Labrador (NL) and wanting to leave NL or return to NL.

Methods: We surveyed pharmacists graduating between 1990 and 2007 from Memorial University School of Pharmacy and collected demographic and job characteristics, importance of factors for current job choice, and consideration of relocation to NL or out of NL.

Results: Of the 466 surveys mailed, 300 were returned, for a response rate of 64.4%. Of the 300 respondents, 96.7% were working in pharmacy. Over two-thirds (70.3%) were in NL, and most of those working outside NL were in Canada. Pharmacy graduates originally from NL (OR= 32.84; 95%CI: 10.63-101.53) and with lower incomes (OR=7.06; 95%CI 2.40-20.77) were more likely to work in NL than graduates who worked elsewhere. Among graduates in NL, 11.8% were considering leaving NL while 20.9% of graduates working outside NL considered returning. For both groups, level of remuneration was the most frequently reported important factor for leaving or returning to NL.

Interpretation: Over two thirds of Memorial pharmacy graduates worked in NL in 2008. Increasing the number of seats for local students and improving remuneration for pharmacists may increase provincial retention of locally trained pharmacists.

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List of Abbreviations

CIHI.....Canadian Institute for Health Information

CPhA.....Canadian Pharmacists Association

CSHP.....Canadian Society of Hospital Pharmacists

NAPRA.....National Association of Pharmacy Regulatory Authorities

NL.....Newfoundland and Labrador

NLPB.....Newfoundland and Labrador Pharmacy Board

PEBC.....Pharmacy Examining Board of Canada

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Current Work Locations and Reasons for Job Choice of Graduates of Memorial University School of Pharmacy

Chapter 1: Introduction

1.1 Problem

Memorial University School of Pharmacy graduated its first class of pharmacists in 1990 with a Bachelor of Science in Pharmacy. Prior to Memorial's program, pharmacists in Newfoundland and Labrador (NL) completed a three year diploma program at a technical college. Graduates from the diploma program were not eligible to work outside the province. Diploma graduates had the option, once the degree program was in place, of writing the national licensing exams or upgrading to the degree program if desired. Pharmacists graduating from Memorial's program have the option of working throughout Canada and beyond. Informally, it appears more choose to work outside of NL than in the province, leading to a potential provincial pharmacist shortage.

The role of the pharmacist is evolving within the Canadian healthcare system. (Task Force on a Blueprint for Pharmacy, 2008). The vision for the profession is "optimal drug therapy outcomes for Canadians through patient-centred care". With the increasing number of new and more complex medications available, the demand for the skills and knowledge of pharmacists is expected to increase as we try and achieve this vision. Meeting the demand for pharmacists requires a stable workforce. Understanding the current workforce and the factors that influence it are key components to pharmacy, particularly on a provincial level. Research is lacking on the reasons why Memorial's pharmacy graduates choose to work in NL or outside the province.

1.2 Research Questions and Objectives

Where are Memorial's pharmacy graduates practicing? The purpose of this study is to examine factors that influence the decision of Memorial University pharmacy graduates to work in NL or outside the province.

The objectives of this study are:

1. to identify the proportion of Memorial pharmacy graduates who are no longer working in the profession. The study will also describe the characteristics of graduates who leave the pharmacy profession.
2. to identify the proportion of Memorial pharmacy graduates who work in NL. The study will describe the characteristics of Memorial pharmacy graduates who work in or outside NL and identify the predictors of working in NL.
3. to identify the proportion of Memorial pharmacy graduates working outside NL who are considering returning to NL. The study will describe the characteristics of pharmacists who are or are not considering returning to NL, and identify the predictors of considering returning to NL.
4. to identify the proportion of Memorial pharmacy graduates working in NL who are considering leaving NL to work in pharmacy elsewhere. The study will describe the characteristics of those who are and are not considering leaving NL and identify predictors of considering leaving NL.

1.3 Memorial University Pharmacy Program

The program of study leading to the Bachelor of Science in Pharmacy at Memorial University requires a minimum of five years to complete. Prior to application for admission, courses in biology, chemistry, english, math and physics must be completed. The current admissions process evaluates both the academic performance as well as performance during a structured interview. Once accepted into the program, students receive an extensive education in pharmacy and the related health sciences and intensive practice experience. Graduates of the program are qualified to write the Pharmacy Examining Board of Canada (PEBC) exam, and write the licensing exam in the province they choose to work.

The pharmacy program at Memorial graduated the first class in April of 1990. Prior to this, pharmacists completed a three year program at the College of Trades and Technology and received a diploma in pharmacy. Graduates from the three year program were generally not eligible to work outside NL, as most provinces required a university degree in pharmacy as part of the licensing requirements. The change to a degree program at Memorial from a diploma program has opened up substantially more opportunities for its graduates. They may work anywhere in Canada or abroad, or go on to higher education, opportunities not usually available to the diploma program graduates. Within Canada, there are many job options for pharmacists after graduation, such as community pharmacies, hospital pharmacies, long-term care institutions, home care, ambulatory care, academic settings, the Canadian Armed Forces, pharmaceutical industry, public and private pharmaceutical benefit management companies, professional

and regulatory associations, government, and pharmacy consulting. Some job opportunities may require advanced learning and/or experience. Pharmacists may move through one or more of these job types throughout their pharmacy career.

1.4 Ongoing Work in Pharmacy Human Resources in Canada

In 2001, a comprehensive report titled "A Situational Analysis of Human Resource Issues in the Pharmacy Profession in Canada" was published (Peartree Solutions Inc, 2001). This report was initiated by the Canadian Pharmacists' Association (CPhA), commissioned by Human Resources Development Canada, and conducted with guidance and direction from the CPhA and the Canadian Society of Hospital Pharmacists (CSHP). It reviewed the relevant literature on human resource issues among pharmacists, and focused on material published in the prior five years. Data were also reviewed from national and provincial associations, Statistics Canada, and the Canadian Institute of Health Information. In addition, 23 members of the pharmacy community were interviewed. While American literature was identified about similar issues, the different regulatory and business climate of health care in Canada was thought to limit the generalizabilty of this literature. The report highlighted the strong demand for pharmacists, with a predicted shortfall of about 2000 pharmacists nationwide, and predictions that this number would grow with an aging and retiring workforce, an increase in females and part time work, and increasing volumes of prescription drugs. The main finding of the analysis was that the available literature and data offer an "inconsistent, incomplete, and therefore incoherent picture of the labor market for

pharmacists". Specific to this project proposal, the current knowledge of factors affecting mobility of pharmacists within Canada was noted to be poor.

From the situational analysis of 2001, CPhA and key stakeholders in 2005 launched *Moving Forward: Pharmacy Human Resources for the Future*, a comprehensive body of work to gather information needed to develop a Canadian human resources strategy (Canadian Pharmacists Association, 2005). It was a 30-month, $1.45 million project with four primary aims:

1. To develop an understanding of the pharmacy workforce in Canada.
2. To identify short and long term human resources challenges facing pharmacy.
3. To identify challenges facing the pharmacy sector that might be specific to individual provinces and territories.
4. To offer recommendations for the future Canadian pharmacy workforce.

The project included a series of 12 discrete but related fact finding studies. Consultation with the project coordinator (J. Cooper, personal communication, March 20, 2006) early in the project indicated that while the study may look at issues for individual provinces, these studies would take place later in the project, and may not address the specific issue of why Memorial pharmacy graduates leave NL.

The final report of the Moving Forward studies was released in September 2008 (Management Committee, 2008). The report proposed 36 recommendations for consideration by the stakeholders involved in planning pharmacy human resources for the future. The recommendations were grouped under five themes:

1. Communicating the Value the Pharmacy Workforce Contributes to Canadian Health Care.
2. Managing the Pharmacy Workforce.
3. Educating and Training the Pharmacy Workforce.
4. Regulating the Pharmacy Workforce.
5. Improving the Integration of International Pharmacy Graduates into the Pharmacy Workforce.

The final report dealt with pharmacy human resources in Canada, but did not discuss issues specific to one province or geographical area.

In addition to work by interested stakeholders, data on health personnel trends in Canada are collected and maintained by the Canadian Institute for Health Information (CIHI). CIHI maintains pharmacist information in the recently developed Pharmacist Database (PDB). In 2006, CIHI released their first report on workforce trends of pharmacists using data from the PDB; however it was for selected provinces only and NL data were not available (Canadian Institute for Health Information, 2007b).

There is a lack of information as to why previous graduates choose to remain in NL or to leave the province. Anecdotally, pharmacy managers responsible for hiring in NL report difficulty with filling vacancies (personal communication). However, no formal data or local studies are available to indicate why locally trained pharmacists are leaving, or why they would stay or return to work in this province. Stakeholders consulted were interested in the potential to have research data on why our pharmacy graduates leave the province.

1.5 Study Rationale

This study provides evidence on the retention of locally trained pharmacists in the province. It also provides information on the proportion of Memorial trained pharmacists who work in Canada and remain in the profession. The study identifies factors influencing a pharmacist's choice to leave or remain in NL. It also identifies factors that may influence them to return to work in NL.

This study addresses a critical gap in the literature on pharmacists in Canada. The majority of studies examining human resource issues in the pharmacy profession are from the US. Differences in pharmacy between the two countries such as in education and training, the impact of third party payers, on a background of two contrasting heath care systems limit the generalizability of US literature to the Canadian context. This study also provides much needed local data and will better enable private and public employers to address recruitment and retention issues. Lastly, data on the contribution of Memorial to the provincial pharmacy workforce will provide valuable outcome data for the program and assist in its strategic planning and ongoing accreditation initiatives.

Chapter 2: Literature Review

2.1 Role of the Pharmacist

The role of the pharmacist is expanding within the health care system (Task Force on a Blueprint for Pharmacy, 2008). With the increasing number of new, more complex, and costly medications, pharmacists are the health care professional with the skills and training to ensure the effective and safe use of medications. Reforms in the health care system are recognizing the expanded role of the pharmacist (Commission on the Future of Health Care in Canada, 2002). Drugs are significant health expenditure in the Canadian health care system, and judicious use has been advocated. Pharmacists are well positioned with their skills, knowledge, and education to ensure patients are obtaining the most effective therapy with minimal adverse effects, as well as to contribute to policy governing medication use at the local, provincial, and federal level. Full participation on the health care team is needed to ensure optimal patient outcomes, and appropriate medication use.

2.2 Becoming a Pharmacist

Pharmacists are considered the medication experts of the health care team. The process to become a pharmacist in Canada begins with completing a university undergraduate degree in pharmacy. There are currently ten pharmacy schools in Canada, with two of these in the Atlantic Provinces (Nova Scotia and NL). The programs require a minimum five years to complete. Upon receiving the degree, graduates qualify to write the Pharmacy Examining Board of Canada (PEBC) examinations. After successful

completion of these examinations and an appropriate period of practice experience, graduates are qualified to apply for a license to practice pharmacy in the province of their choice, work abroad, or to further their education by entering graduate study programs. Each province is responsible for licensing pharmacists to practice in that province, and each has their own provincial exam and requirements, in addition to the PEBC exam. While the provincial exams and requirements are similar between provinces, some differences exist. Pharmacists working in one province may move to another province to work, but must satisfy the licensing requirements of the province to which they move. Pharmacists who graduated from pharmacy programs outside of Canada may be eligible to work in Canada provided they meet the licensing requirements of the province where they wish to work. This includes passing the PEBC national exams, which ensure they possess education and ability equivalent to Canadian pharmacists.

2.3 Supply of Pharmacists in Canada and Newfoundland and Labrador

According to the National Association of Pharmacy Regulatory Authorities (2008) report as of Jan 1, 2007 there were 30,245 licensed pharmacists in Canada. The number of active registered pharmacists in Canada grew at an average rate of 2.8% per year from 1995 to 2004 (Canadian Institute for Health Information, 2006). The average age of practicing pharmacists was 38 years for females, and 44 years for males. In 1995, 58% of those graduating with a pharmacy degree in Canada were women (Canadian Institute for Health Information, 2006). By 2004, the percentage of females graduating from pharmacy programs in Canada had increased to 77%, and women made up 50 to

69% of the Canadian pharmacist workforce (Canadian Institute for Health Information, 2006). Approximately 71% of licensed pharmacists in Canada practice in a community setting, 15% in a hospital setting, and 14% in other settings.

Using the statistics provided by NAPRA and Statistics Canada population data from July 1, 2005, there is a national average of one licensed pharmacist for every 1095 people. This number varies by province, from a low of 1 licensed pharmacist per 844 people in Saskatchewan to a high of 1 licensed pharmacist per 1875 people in Nunavut. This range is likely a reflection of population and geography. Newfoundland and Labrador has 1 licensed pharmacist per 882 people.

According to the Newfoundland and Labrador Pharmacy Board (NLPB), as of June 5, 2007, NL had a total of 597 pharmacist members, of which 569 were practicing pharmacists (NLPB, 2007). Of the 569 total, 374 worked full time in 185 community pharmacies, 85 worked full time in 15 hospital pharmacies, 65 worked part time, 30 worked in administrative roles (including teaching), 1 worked at wholesale distributors, 7 had honorary memberships (practice location not specified) and 7 were practicing out of province (and had maintained full NL license). Those registered as non practicing include maternity leaves, pharmacists who have moved out of the province who wish to maintain their membership but not full license, and retired members.

2.4 The Demand for Pharmacists

The 2001 report initiated by CPhA highlighted the strong demand for pharmacists, predicted shortfall of about 2000 pharmacists nationwide, and suggested this number would grow with an aging and retiring workforce, an increase in females and part time work, and increasing volumes of prescription drugs (Peartree Solutions Inc, 2001).

Similar to Canada, in the US there is growing concern and increasing evidence that the supply of pharmacists in the future may not be adequate to meet the nation's needs for pharmaceutical services (Beavers, 2000). In 2008 the US National Association of Chain Drugstores reported that many states face a pharmacist shortage with approximately 5300 full time positions vacant among its members (National Association of Chain Drug Stores, 2008). This shortage has been evident for over 20 years. A 1985 survey showed 27% of chain pharmacy executives were encountering frequent pharmacist manpower shortages, and another 57% reported occasional shortages (Wolfgang, 1987). A survey of hospital based pharmacy directors in the US reported that within the preceding 12 months, 38.1% of the pharmacy directors reported difficulty filling vacant pharmacist positions (Stubson & White, 1988). Vacancies were open for longer periods of time; with almost a quarter of openings left unfilled for three to six months. The rapid increase in vacancies and the inability to fill positions, the rapid growth in prescription volume, the increase in new drugs and their greater complexities, and the growth in the elderly population are all indicators of a rapid and persistent rise in demand for pharmacists (Gershon, Cultice & Knapp, 2000). In addition, the national focus on medication errors has drawn attention to the need for an adequate supply of

pharmacists (Baker et al., 2004). The demand for pharmacists appears to be greater than the supply, and this does not appear to have decreased over the last few decades.

2.5 Pharmacist Turnover

A number of US studies have found a substantial rate of turnover among US pharmacists. Surveying a representative national sample of 3005 US pharmacists, Schondelmeyer, Mason, Miller, and Kibbe (1992) found that in the prior one, three, five and ten years 8.5%, 26.8%, 38.2% and 56.2% of full time pharmacists, respectively, changed jobs at least once. From a mail survey of 1600 licensed pharmacists in four US states, Mott (2000) found that over a 15 year period (1983 to 1997), respondents had held on average a total of 3.6 ± 2.5 pharmacy jobs. The mean annual turnover rate (total turnover events / total respondents employed in the year) across the 15 year period was 11% ± 3.6%. Pharmacists who left jobs typically stayed less than three years. In their study of licensed pharmacists from four US states, Cline and Mott (2000) found that the average pharmacist had 9.34 years of experience and had worked for approximately three employers as a pharmacist.

Other surveys of pharmacists report that roughly one-quarter (Wolfgang, 1987) to one third of pharmacists surveyed expressed an intention to leave their current employer (Gaither, 1999; McHugh, 1999). Given the difficulty in locating and studying former employees, intention to leave is often used in studies to identify prospectively the factors related to turnover.

2.5.1 Overall reasons for job turnover

Schondelmeyer et al., (1992) surveyed a national sample of 3005 US pharmacists and found the reasons for job change included improved working conditions (41%), increase in pay (35.3%), better hours (31.4%), advancement in opportunities (25.2%), better geographical location (12.8%), purchased pharmacy (10.2%), burn out (10.2%), less commuting (7.3%), and spouse relocation (6.1%). Mott (2000) had similar findings in another survey of US pharmacists, and reported the top four reasons for job changes were a) relocation, b) stress level, c) desire for change, and d) salary, respectively.

A number of studies have examined the relationship between quality of work life and intention to leave a job among pharmacists. Stewart and Smith (1987) found that pharmacists intention to leave was inversely related to three organization variables: a) current prospects for promotion, b) way in which management facilitates work, and c) way in which management responds to the feelings of employees. The three variables most likely to influence these pharmacists to stay were: a) current location of my employer, b) kind of job duties, and c) hours I am scheduled to work (Stewart & Smith, 1987). Wolfgang (1987) examined the relationship between job stress and pharmacists turnover intentions using a survey to 215 chain pharmacists from across the US. He found a significant positive relationship between four stressful job situations and pharmacists' intentions to change jobs. These four situations were: (a) not receiving constructive feedback from their superiors, (b) not being able to use one's abilities to the fullest extent on the job, (c) experiencing job policies and procedures which are not

enforced consistently, and (d) having to deal with angry or unappreciative patients/customers.

Burnout has also been suggested to contribute to pharmacist turnover (Schondelmeyer et al., 1992). Lahoz and Mason (1990) surveyed 2780 US pharmacists to examine the degree of burnout and associated individual and job characteristics. They found that more than 50% of the pharmacists experienced moderate to high levels of burnout.

2.5.2 Specific factors related to pharmacist turnover

Turnover rates and reasons for turnover have been shown to vary by gender, work setting, position and years of experience. Again, the literature is almost exclusively derived from US studies, some of which are now more that 20 years old.

2.5.2.1 Gender

Women make up an increasingly larger proportion of the pharmacist workforce. Shih (2000) found that the proportion of women in the US pharmacist workforce grew from 5.8% in the 1968-1970 period to 25% in the 1980s to 33% in the 1994 to 1996 period. Studies from the US suggest that female pharmacists are more likely than their male counterparts to change jobs. For example, a larger proportion of female pharmacists than male pharmacists changed their jobs after one year (9.9% vs. 8%) and after ten years (66.5% vs. 56.2%) (Schondelmeyer et al., 1992). Using a cross sectional mail survey of 507 hospital pharmacists in one US state Quant and McKercher (1982) found that a larger proportion of women than men pharmacists said they intended to leave their job ($p \leq 0.05$).

A number of studies have found that compared to their male counterparts, female pharmacists were less satisfied in their jobs (Quandt & McKercher, 1982; Robers, 1983), had more job related stress (Gaither, 1999) and higher levels of burnout (Lahoz & Mason, 1990). Mott's (2000) survey of licensed pharmacists in four US states found that the four most common reasons for changing jobs among males were a) salary, b) desire for change, c) stress level, and d) employer philosophy whereas the top four reasons cited by females for changing jobs were a) relocation, b) stress level, c) desire for change, and d) opportunity.

Gender related differences in turnover, satisfaction and reasons in turnover may be related to the types of positions and pharmacy related tasks performed by male and females pharmacists (See section 2.5.2.2). For example in their study of US pharmacists in 1990-91, Schondelmeyer et al., (1992) reported that higher proportion of men than women were employed full time in pharmacy (77.4% vs. 61.9%). The majority of full time men pharmacists (57.2%) were in management positions, whereas just over one third (38.4%) of full time women pharmacists were in management positions. More men than women were owners or partners (18.1% vs 4.2%). Quandt and McKercher (1982) reported males spent less time in dispensing functions compared to females ($p \leq 0.01$) and considered their job more challenging.

2.5.2.2 Pharmacist job setting and position

Studies have consistently reported differences in pharmacist turnover and reasons for turnover related to work setting and position. Pharmacists may work in a number of different job settings, with the two most common a) community pharmacy (private or

corporate owned) and b) hospital pharmacy. Within each setting, pharmacists may work in different positions, from the staff pharmacist to higher levels of owner or manager. In hospital pharmacy, pharmacists may have positions with varying amounts of time spent in either direct patient care or dispensary duties.

In community settings pharmacy owners reported a significantly higher level of job satisfaction, organizational commitment and a significantly lower rate of turnover intention compared to staff pharmacists (Gaither, 1999; Robers, 1983). Staff pharmacists reported being the most burned out of all the groups, especially when compared to owners (Lahoz & Mason, 1990). Pharmacists in privately owned community pharmacies reported significantly lower levels of emotional exhaustion than those in large corporate stores or hospital pharmacies (Lahoz & Mason, 1990).

Among hospital pharmacists, pharmacists with direct patient care duties were reported to have the highest mean general satisfaction scores compared to pharmacists with primarily dispensing duties (Robers, 1983). Hospital pharmacists performing dispensing duties half or more of the time had lower ratings for met expectations and job and professional satisfaction than those pharmacists performing more administrative, supervisory or clinical roles (Stewart & Smith, 1987).

2.5.2.3 Pharmacist age and level of experience

Age appears to be related to job satisfaction, with younger pharmacists less satisfied than their older counterparts. Compared to older pharmacists and those with more years of experience, younger (less experienced) pharmacists report greater dissatisfaction (Gaither, 1999; Robers, 1983; Stewart & Smith, 1987) and intention to

leave their current jobs (Wolfgang, 1987). For tenure, it was noted that as years in a position increased, more pharmacists were satisfied (Robers, 1983).The longer the pharmacist had been in practice, the lower the degree of burnout experienced; the younger the pharmacist, the higher degree of burnout (Lahoz & Mason, 1990). Younger pharmacists also reported lower met expectations toward the professional standard and use of professional abilities as well as lower satisfaction with the profession (Gaither, 1999; Stewart & Smith, 1987).

The relationship between age, turnover and satisfaction may be explained by attrition. The younger (and less satisfied) pharmacists may be more likely to leave the profession all together and would be less likely to be included in subsequent surveys of the profession. Few studies have examined attrition from the profession although McHugh (1999) suggest that only 60% of pharmacists surveyed would choose to become a pharmacist again.

2.6 Summary and critique of existing literature

The majority of published studies examining workforce issues in pharmacy originate in the US. With the differences in the health care systems, information on factors affecting job choice and job turnover within pharmacy may not apply in Canada. A number of methodological problems were noted. The studies looked at a variety of pharmacy populations such as community pharmacists, hospital pharmacists, and managers. Comparing these groups may not be valid, as there may be differences in why a particular setting was chosen. The majority of studies were survey based, with

differences in response rates and responder characteristics. In addition, many studies were hampered by small sample size and low response rates. Moreover, survey tools were often different, making comparisons between studies difficult. With surveys, respondents may be different than non-respondents, and recall bias may affect the validity of results.

The lack of Canadian studies on human resources in pharmacy makes it difficult to identify trends, issues or challenges within this country, and within the province. The use of a national database for information pertaining to pharmacist human resources is evolving; however challenges still exist. Each province collects and maintains its own data, primarily for licensing purposes, and the information may not be collected in a consistent manner. These systems also do not take into account mobility between provinces. Given the wide variety of possible practice settings, and small numbers of pharmacists in some settings, data on factors that influence movement between areas or out of the main areas (community and hospital) are not available.

Despite the limitations, some common themes did emerge from the US studies. Consistent with the workforce in Canada, a growing percentage of pharmacy graduates are female. The studies examining reasons for job turnover cited reasons such as salary, spouse/partner relocation, career advancement or promotion, improvement in working conditions, stress level, desire for change, job satisfaction and organizational commitment. Factors related to positive job satisfaction and met job expectations are workplaces with a high level of direct patient care and professional organizations. Negative factors relating to job satisfaction include high workload, working in a staff

pharmacist position, younger age, few prospects for promotion, and being female. Having several jobs throughout a pharmacy career has been noted, with one study citing during a 10 year span over 50% of the pharmacist respondents had changed jobs at least once. Pharmacists who leave jobs often choose the same setting for their new job.

Chapter 3: Methods

This study is a cross sectional survey of pharmacy graduates of Memorial University's School of Pharmacy from 1990 to 2007. Pharmacy graduates were identified and mailed a self administered postal survey.

3.1 Sample Frame

Inclusion criteria for the study were graduation from Memorial University School of Pharmacy between 1990 and 2007, and availability of a valid mailing address. The sample list was constructed from two sources: a) the NLPB register of pharmacists (for those working in pharmacy in NL) and b) Memorial University Alumni Affairs (for those residing outside of NL and/or no longer working in pharmacy).

3.1.1 Graduates working in pharmacy in NL

The NLPB makes available to the public on their website the names and work addresses of all pharmacists registered in NL. The NLPB provided an Excel file limited to registrants since 1990, as any pharmacists registered prior to this would not be a Memorial graduate. This list was cross referenced to the graduate names available in the public domain at the School of Pharmacy. Registrants known to be graduates of other programs were removed from the list.

3.1.2 Graduates outside NL and/or no longer working in pharmacy

To access graduates working outside of NL (in or out of pharmacy), as well as those no longer working in pharmacy within NL, Memorial University's Office of Alumni Affairs provided assistance. This department maintains a database of all

Memorial graduates and regularly updates the information. The Office of Alumni Affairs provided the names and addresses of pharmacy alumni to the Development Officer (Mr. Darcy McMeekin) responsible for the alumni database for the Schools of Pharmacy and Nursing. Mr. McMeekin cross-referenced the NLPB list against the alumni database, and sent surveys to graduates who were not included in the NLPB list. Through these procedures, only staff of Alumni Affairs had access to the Memorial pharmacy graduates alumni list in order to maintain privacy of the graduates.

3.2 Data Collection Instruments

The survey items were developed based on themes identified from the literature, consultations with leaders and managers in pharmacy in NL who may be responsible for pharmacy human resources management, and the NLPB licensing application.

Two surveys were developed and colour coded for easy identification: a) graduates with a NL address (green) and b) graduates with an address or working outside NL (blue). The survey was four pages in length, consisted of 21 questions for graduates in NL (Appendix A) and 23 questions for graduates outside NL (Appendix B). The first section of the survey contained questions about personal characteristics (e.g. gender, date of birth, town of high school graduation, year of pharmacy graduation, and completion of additional education post pharmacy). The next section asked if graduates were currently working in pharmacy, and if not, asked for their current job and reason for leaving pharmacy. Those having left pharmacy did not complete the remainder of the survey.

The rest of the survey contained questions for graduates still working in pharmacy. Questions asked job specific information including size of community of employment, primary place of employment, hours worked per week, job category, job status, position, length of time with current employer, number of different primary employers, and income. Graduates were presented with a list of factors, and asked to rank their importance in accepting their current job. Two additional questions for those outside NL were their current province of employment, and if their previous job had been in NL.

The final part of the survey asked respondents if they were considering moving from NL (for those in NL) or to NL (for those outside NL) to take a pharmacy job. If answered yes, respondents were asked to choose from a list the top three reasons influencing their decision.

The survey was reviewed by the thesis supervisory committee. In addition, five faculty members from the School of Pharmacy pretested the survey and provided feedback. Questions were revised to improve the clarity and reliability of specific items based on the feedback

3.3 Survey Procedures

The survey was conducted using a modified Dillman method (Dillman, 1983). Initial survey packages were mailed during the first week of April 2008 and the second survey was sent about two weeks later. The first mail out consisted of a hand-signed cover letter explaining the purpose of the survey written on School of Pharmacy letterhead (Appendix C), a copy of the survey, and a stamped, pre-addressed envelope for

returning the survey. These items were mailed in a Memorial University School of Pharmacy envelope. The second mailing was similar, with a follow up letter (Appendix D) replacing the original cover letter.

3.4 Data Cleaning

Survey data were entered into a Microsoft Access database, using separate files for respondents in or outside NL. Unique identifiers were assigned to each survey to facilitate retrieval for data verification. Survey data were imported into one SPSS file using version 15.0 (SPSS Inc., 2006). All data cleaning and analysis were done using SPSS. Frequencies were run on all variables to identify incorrect or implausible numbers, unlabeled data values, or cells with cells with missing numbers. The original surveys were consulted to correct data entry errors.

3.5 Outcome Variables

The outcomes of interest were: a) graduates employed in pharmacy, b) graduates working in or outside NL, c) graduates employed in pharmacy outside NL considering a return to NL, and d) graduates employed in pharmacy in NL considering leaving NL.

3.5.1 Graduate employment in pharmacy

Respondents still employed in the profession of pharmacy were coded as "yes" (1) while those not employed in pharmacy were coded as "no" (0). Those not employed in pharmacy were excluded from the main analyses.

3.5.2 Location of graduate

Based on the survey returned (in or outside NL), respondents in NL were coded as "in NL" (1), while respondents outside NL were coded as "outside NL" (0).

3.5.3 Considering a return to NL

Graduates employed in pharmacy outside NL considering a return to NL were coded as "yes" (1) while those not considering a return were coded as "no" (0).

3.5.4 Considering leaving NL

Graduates employed in pharmacy in NL considering moving from NL were coded as "yes" (1) while those not considering leaving were coded as "no" (0).

3.6 Demographic Predictor Variables

Covariates describing graduate demographics and education were considered in the main analyses.

3.6.1 Gender

Females were coded as 1, and males coded as 0.

3.6.2 Age

Age was calculated by subtracting the year they were born from 2008. Age was analyzed as a continuous variable

3.6.3 Age at graduation

Age at graduation was calculated by subtracting year of birth from the year of graduation. Age at graduation was analyzed as a continuous variable.

3.6.4 Had a rural background

Based on the hometown reported, respondents whose hometown had a population of less than 10 000 were coded as having a rural background (1) and those who came from a community with a population of 10 000 or greater were coded as having an urban background (0). Statistics Canada was used to confirm community population sizes (Statistics Canada Community Profiles, 2006).

3.6.5 From NL

Based on the hometown reported, respondents whose hometown was in NL were coded as from NL (1). Respondents whose hometown was outside NL were coded as from outside NL (0). Statistics Canada was used as the directory to determine where the town was located (Statistics Canada Community Profiles, 2006).

3.6.6 Year of Graduation

The year of graduation was grouped into four categories: 1990-1994 (1), 1995-1999 (2), 2000-2004 (3), and 2005-2007 (4).

3.6.7 Completed Additional Education

Graduates completing additional education post pharmacy degree were coded as "yes" (1), and those who had not were coded as "no" (0). Respondents answering "yes" were asked to provide the highest level in progress or completed.

3.7 Pharmacy Job Predictor Variables

The remainder of the predictor variables for the main analysis were related to the pharmacy job(s) the respondents held.

3.7.1 Size of work town

Respondents whose primary place of employment had a population of less than 10 000 were coded as practicing in a rural setting (1) and those who employment location had a population of 10 000 or greater were coded as practicing in an urban setting (0).

3.7.2 Primary place of employment

Based on standard options for place of employment from the literature and the license renewal form, respondents primary place of employment were coded as "community pharmacy" (1), "hospital or health care facility" (2), or "other" (3).

3.7.3 Hours worked per week

Hours worked per week were entered as provided, and analyzed as a continuous variable.

3.7.4 Job category

Respondents' jobs were coded as "full time" (1), "part time" (2) or "casual" (3).

3.7.5 Job status

Respondents' jobs were coded as "permanent" (1), "temporary" (2) or "self employed" (3).

3.7.6 Position

The current position a respondent held was coded as "staff pharmacist" (1), "pharmacy manager" (2), "pharmacy owner" (3), and "other" (4)

3.7.7 Years in current employment

Years in current employment was entered as provided, and analyzed as a continuous variable.

3.7.8 Number of primary employers

Number of employers was coded as categories based on the number indicated by respondents: 1, 2, 3, 4, 5, or >5.

3.7.9 Reasons for choosing current job

Respondents ranking of level of importance for each factor presented were coded as 1 (unimportant) to 5 (very important). Responses were recoded into 2 categories: "Not important" (0), which included unimportant and of little importance, and "Important" (1) which included moderately important, important, and very important.

3.7.10 Currently work for other employers

Respondents working as a pharmacist for other employers were coded as "yes" (1), while those not working for other employers were coded as "no" (0). If "yes" was chosen, the number of employers was entered as provided, and analysed as a continuous variable.

3.7.11 Income

Income was initially coded as four categories: <$40 000 (1); $40 000 – <$55 000 (2); $55 000 – ≤$70 000 (3); and >$70 000 (4). For chi-square and logistic regression analysis, the categories were recoded as ≤$70 000 (1) and >70 000 (2).

3.8 Supplementary variables applicable to a subset of respondents

Several variables of interest applied only to a subset of the respondents. These included the jobs for which respondents had left the pharmacy profession, location of

previous pharmacy job for those outside NL, and the reasons for wanting to leave NL (if in NL) or return to NL (if outside NL).

3.8.1 Non-pharmacy jobs

Respondents no longer working in pharmacy were coded as being/becoming a physician (0) and other (1).

3.8.2 Previous pharmacy job

Respondents working in pharmacy outside NL whose previous job was in NL were coded as "yes" (1), while those whose previous job was not in NL were coded as "no (2). Respondents who were in their first job which was located outside NL were coded as "current job is first job" (3).

3.8.3 Considering a return to NL / reasons

Graduates employed in pharmacy outside NL considering a return to NL were coded as "yes" (1) while those not considering a return were coded as "no" (2). If answered yes, the fourteen criteria presented for choosing up to three reasons influencing their answer were coded as "checked" (yes) or "not checked" (no).

3.8.4 Considering leaving NL / reasons

Graduates employed in pharmacy in NL considering moving from NL were coded as "yes" (1) while those not considering leaving were coded as "no" (2). If answered yes, the fourteen criteria presented for choosing up to three reasons influencing their answer were coded as "checked" (yes) or "not checked" (no).

3.8.5 Other Comments

At the end of the survey, respondents were invited to provide any additional comments. The comments were reviewed and grouped into categories.

3.9 Data Analysis

To assess the representativeness of the sample, we compared data on year of graduation and gender for survey respondents with all MUN pharmacy alumni who had graduated between 1990 and 2007. Comparison was limited to these two variables as they were the only pieces of information publically available for all Memorial pharmacy graduates. Chi square tests were used to look for differences between survey respondents and pharmacy alumni.

For objective one, frequencies were used to identify the number of MUN pharmacy graduates who were no longer working in the profession. Frequencies, means and standard deviation were used to describe the characteristics of these graduates.

For objective two, the sample was restricted to graduates who were still working in pharmacy. Frequencies, means and standard deviation were used to describe the characteristics of the sample and chi square tests (for categorical variables) and ANOVA (for continuous variables) were used to compare characteristics of those in or outside NL. Multiple logistic regression was used to identify significant ($p<0.05$) predictors for working in NL. Potential predictors for each regression model were selected on the basis of the bivariate analyses (i.e. chi square and ANOVA).

For objective three, the sample was limited to only those graduates who were practicing in pharmacy and who were working outside NL. Frequencies, means and standard deviation were used to describe the characteristics of this subset of the sample. Chi square tests and ANOVA were used to compare characteristics of those considering returning to NL and those who were not considering returning to NL. Multiple logistic regression was used to identify significant ($p<0.05$) predictors considering returning to NL. Potential predictors for each regression model were selected on the basis of the bivariate analyses.

For the fourth research objective, the analysis was limited to pharmacy graduates who were working in pharmacy in NL. Frequencies, means and standard deviation were used to describe the characteristics of this subset of the sample. Chi square tests and ANOVA were used to compare characteristics of those considering leaving NL and those who were not considering leaving NL. Multiple logistic regression was used to identify significant ($p<0.05$) predictors for considering leaving NL. Potential predictors for each regression model were selected on the basis of the bivariate analyses.

In supplementary analyses, frequencies were used to describe the reasons and current occupations of graduates who had left the pharmacy profession, describe the work locations for graduates working outside NL, to identify the most commonly cited reasons for wanting to leave or return, and to summarize open-ended comments. Additional chi square tests were conducted to examine differences in factors by year of graduation. These analyses examined whether factors rated as important in work location changed over time.

3.10 Ethics Considerations

This project was approved by the Human investigations Committee, Memorial University on January 29, 2008 (see Appendix E). Consent to participate in the study was implied with the return of the completed survey.

Graduates were informed in the cover letter that the survey was voluntary, they did not have to answer all questions, all answers were confidential, and they would not be identified in any report or presentation. The letter noted every effort would be made to protect confidentiality; however, in some cases it might be possible to identify particular individuals based upon demographic information. Graduates identified through the Alumni database had their privacy protected by having an authorized designate of that department responsible for the mailing. All surveys were stored in a locked room within a locked filing cabinet in the School of Pharmacy, Memorial University. Files were stored on a password protected computer. Only the principal investigator had access to the locked filing cabinet and computer files. No study codes were used that could link respondents names or addresses to the completed survey. Cells with less than five respondents were reviewed to ensure that individual respondents could not be identified.

Chapter 4: Results

4.1 Sample

Between 1990 and 2007, there were 591 graduates from the Memorial University School of Pharmacy. Of these graduates 466 (78.8%) had a valid mailing address. This sample of 466 was comprised of 171 that were outside NL, and 295 that were in NL (Figure 4.1). The overall response rate was 64.4% (300/466). The response rate from graduates in NL was 70.8% (209/295), and from outside NL 53.2 % (91/171).

The majority (96.7%) of respondents were still employed in pharmacy. Of the ten respondents (3.3%) who no longer worked in pharmacy, there were five from each survey group (Appendix F). Of the ten, seven had chosen to pursue medicine as a career. Of the remaining three, one worked in government and two worked in sales jobs not related to pharmacy.

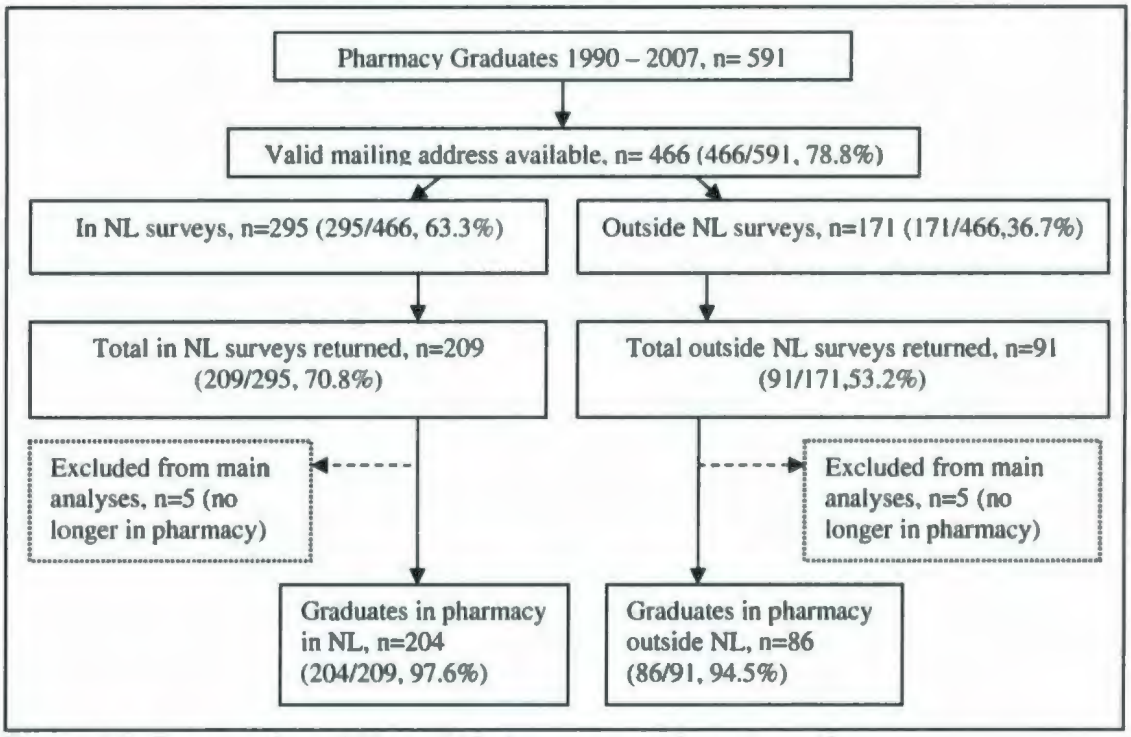

Figure 4.1 *Construction of Memorial pharmacy graduates sample*

4.1.1 Representativeness of sample

Information publically available on the total cohort of Memorial's pharmacy graduates of 591 is limited to the number and gender of graduates per year. Survey respondents included graduates from all years, with response rates based on the year of graduation of 50% (1990 to 1994), 50% (1995 to 1999), 42.3% (2000 to 2004) and 57.1% (2005 to 2007) (Appendix G). The proportion of females of the total graduate population (357/591 females, 61%) is similar to the survey respondents (60.6% females). There was no statistically significant difference between respondents and non respondents based on the available data of year of graduation or gender. The response rate was higher for those in NL (70.8%) versus those outside NL (53.2%, $p<0.01$).

4.2 Characteristics of Sample

4.2.1 Demographic and job characteristics

Table 4.1 lists the demographic characteristics of the graduates who are still in pharmacy. About two thirds (70.3%) of the respondents were practicing pharmacy in NL. Over half (60.6%) were female, and about half (51.8%) had come from a rural background. Most (85.8%) were originally from NL, based on the town where they attended high school. There was representation across all the years of graduation.

Table 4.1 *Demographics of Memorial pharmacy graduate respondents (n=290)*

Characteristic	
Work in NL n (%)	
In NL	204 (70.3)
Outside NL	86 (29.7)
Gender n (%)	
Male	114 (39.4)
Female	175 (60.6)
Age mean (sd)	34.17 (5.96)
Have rural background n (%)	
No	136 (48.2)
Yes	146 (51.8)
From NL n (%)	
No	40 (14.2)
Yes	242 (85.8)
Year of graduation n (%)	
1990-1994	74 (25.7)
1995-1999	82 (28.5)
2000-2004	80 (27.8)
2005-2007	52 (18.1)
Age at graduation mean (sd)	24.91(2.80)
Additional education (in progress or completed)	
No	262(90.7)
Yes	27 (9.3)
Type of additional education (highest level checked) n (%)	
Pharmacy Residency	6 (22.2)
Master's level	4 (14.8)
Pharm.D.	13 (48.2)
Not indicated	4 (14.8)

Almost three quarters (73.8%) were working in community pharmacy (Table 4.2). Most respondents were working in full time (94.1%), permanent (93.8%) positions. Just over half (59%) were working as staff pharmacists, and 40.7% had worked for three or more employers since graduation. Sixty-six (22.9%) worked as a pharmacist for other employers in addition to their primary job. The most common income category chosen was > $70 000 (76.1%). About one-third (32.6%) were practicing in a rural setting.

Of the 86 practicing pharmacists completing the outside NL survey, 15 (17.4%) had worked in NL prior to their current position, and for 30 (34.9%), their current job outside NL was their first job in pharmacy.

Table 4.2 *Job characteristics of Memorial pharmacy graduate respondents (n=290)*

Characteristic	
Practicing in rural setting n (%)	
No	194 (67.4)
Yes	94 (32.6)
Primary place of employment	
Community Pharmacy	214 (73.8)
Hospital / Health Care Facility	50 (17.2)
Other	26 (9.0)
Hours worked per week mean (sd)	39.05 (7.49)
Job category n (%)	
Full time	273 (94.1)
Part time	17 (5.9)
Job status n (%)	
Permanent	272 (93.8)
Temporary	10 (3.4)
Self-Employed	8 (2.8)
Type of pharmacy position n (%)	
Staff Pharmacist	171 (59.0)
Pharmacy Manager	69 (23.8)
Pharmacy Owner	23 (7.9)
Other	27 (9.3)
Years with current employer mean (sd)	5.83 (4.46)
No of different primary employers n (%)	
1	90 (31.0)
2	82 (28.3)
3	61 (21.0)
4	28 (9.7)
5	14 (4.8)
>5	15 (5.2)
Work as a pharmacist for other employers n (%)	
No	222 (77.1)
Yes	66 (22.9)
Income	
< 40 000	9 (3.1)
40 000 – <55 000	7 (2.4)
55 000 – ≤70 000	53 (18.3)
> 70 000	220 (76.1)

Respondents working outside of NL in the pharmacy profession were located primarily in Ontario and the three Maritime Provinces (Table 4.3).

Table 4.3 *Location of Memorial pharmacy graduate respondents outside NL (n=86)*

Characteristic	
Respondents working outside NL n (%)	
Ontario	44 (51.8)
New Brunswick	14 (16.5)
Nova Scotia	12 (14.1)
PEI	6 (7.1)
Alberta	5 (5.9)
British Columbia	3 (3.5)
Florida, USA	1 (1.2)

4.2.2 Factors involved in choosing current pharmacy job

When asked to rank the importance of factors involved in choosing their current pharmacy job, the top four reasons ranked as important by respondents was working conditions (99.3%), job benefits (96.6%), level of pay (96.5%) and hours of work (95.5%) (Table 4.4).

Table 4.4 *Importance of factors in choosing current pharmacy job (n=290)*

Factor	**Not Important** n (%)	**Important** n (%)
Working conditions	2 (0.7)	287 (99.3)
Job benefits	10 (3.4)	280 (96.6)
Level of pay	10 (3.5)	279 (96.5)
Hours of work	13 (4.5)	277 (95.5)
Geographical location	18 (6.2)	272 (93.8)
Direct involvement in patient care	26 (9.0)	263 (91.0)
Employer's philosophy	35 (12.1)	254 (87.9)
Future opportunity for advancement	54 (18.8)	234 (81.3)
Length of commuting required	61 (21.0)	229 (79.0)
Family considerations	65 (22.4)	225 (77.6)
The desire for a change	84 (29.5)	201 (70.5)
Offer of a job promotion	127 (44.1)	161 (55.9)
Job opportunity for spouse / partner	162 (56.1)	127 (43.9)
Return for service agreement	161 (58.1)	116 (41.9)

Supplementary analysis was carried out to assess if the ranking of importance of factors varied by graduation year (Table 4.5). The same top four reasons (working conditions, job benefits, level of pay and hours of work) ranked highly across all years, with no difference between these four categories. Three other factors had a significant difference across years of graduation. A larger proportion of "older graduates" than recent graduates rated family considerations (p=0.008) and desire for change (p=0.048) as important considerations in their current job. In contrast a larger proportion of recent graduates rated return for service agreements as an important consideration in their current job selection than their older counterparts (p=0.033).

Table 4.5 *Importance of factors in choosing current pharmacy job based on graduation year (n=290)*

	Graduation year				
Factor	**1990-1994 N=74**	**1995-1999 N=82**	**2000-2004 N=80**	**2005-2007 N=52**	**P value***
Working Conditions					0.662
Not Important n(%)	1 (1.4)	0	1 (1.3)	0	
Important n(%)	73 (98.6)	82 (100)	78 (98.7)	(100)	
Job Benefits					0.556
Not Important n(%)	3 (4.1)	3 (3.7)	1 (1.3)	3 (5.8)	
Important n(%)	71 (95.9)	79 (96.3)	79 (98.8)	49 (94.2)	
Level of Pay					0.420
Not Important n(%)	4 (5.4)	4 (4.9)	1 (1.3)	1 (1.9)	
Important n(%)	70 (94.6)	78 (95.1)	78 (98.7)	51 (98.1)	
Hours of Work					0.120
Not Important n(%)	7 (9.5)	2 (2.4)	2 (2.5)	2 (3.8)	
Important n(%)	67 (90.5)	80 (97.6)	78 (97.5)	50 (96.2)	
Geographical Location					0.861
Not Important n(%)	4 (5.4)	4 (4.9)	6 (7.5)	4 (7.7)	
Important n(%)	70 (94.6)	78 (95.1)	74 (92.5)	48 (92.3)	
Direct involvement in patient care					0.352
Not Important n(%)	9 (12.2)	6 (7.3)	9 (11.3)	2 (3.9)	
Important n(%)	65 (87.8)	76 (92.7)	71 (88.8)	49 (96.1)	
Employer's philosophy					0.639
Not Important n(%)	11 (14.9)	11 (13.6)	9 (11.3)	4 (7.7)	
Important n(%)	63 (85.1)	70 (86.4)	71 (88.8)	48 (92.3)	
Future opportunity for advancement					0.298
Not Important n(%)	18 (24.3)	14 (17.1)	10 (12.8)	11 (21.2)	
Important n(%)	56 (75.7)	68 (82.9)	68 (87.2)	41 (78.8)	
Length of commuting required					0.114
Not Important n(%)	13 (17.6)	25 (30.5)	14 (17.5)	9 (17.3)	
Important n(%)	61 (82.4)	57 (69.5)	66 (82.5)	43 (82.7)	
Family considerations					0.008
Not Important n(%)	10 (13.5)	14 (17.1)	22 (27.5)	19 (36.5)	
Important n(%)	64 (86.5)	68 (82.9)	58 (72.5)	33 (63.5)	
The desire for a change					0.048
Not Important n(%)	21 (28.8)	23 (28.8)	16 (20.3)	22 (43.1)	
Important n(%)	52 (71.2)	57 (71.3)	63 (79.7)	29 (56.9)	
Offer of a job promotion					0.547
Not Important n(%)	38 (51.4)	35 (43.8)	33 (41.3)	21 (40.4)	
Important n(%)	36 (48.6)	45 (56.3)	47 (58.8)	31 (59.6)	
Job opportunity for spouse/partner					0.726
Not Important n(%)	39 (52.7)	44 (53.7)	46 (58.2)	32 (61.5)	
Important n(%)	35 (47.3)	38 (46.3)	33 (41.8)	20 (38.5)	
Return for service agreement					0.033
Not Important n(%)	43 (60.6)	54 (70.1)	40 (52.6)	24 (46.2)	
Important n(%)	28 (39.2)	23 (29.9)	36 (47.4)	28 (53.8)	

*p value for comparison between groups

4.3 Practicing in or outside NL

4.3.1 Demographic and job characteristics

Tables 4.6 and 4.7 compare the demographic and job characteristics of the graduates working in pharmacy in or outside NL, respectively. Compared to those working outside of NL, a significantly larger proportion of those working in NL were older, were originally from NL, had been with their current employer longer, and had a lower income.

Table 4.6 *Demographics of Memorial pharmacy graduate respondents based on location (n=290)*

Characteristic	Outside NL N=86	In NL N=204	p value
Gender n (%)			0.984
Male	34 (39.5)	80(39.4)	
Female	52 (60.5)	123 (60.6)	
Age mean (sd)	32.93(5.07)	34.7(6.23)	0.021
Have rural background n (%)			0.435
No	44 (51.8)	92 (46.7)	
Yes	41 (48.2)	105 (53.3)	
From NL n (%)			<0.001
No	36 (42.4)	4(2.0)	
Yes	49 (57.6)	193 (98.0)	
Year of graduation n (%)			0.095
1990-1994	14 (16.3)	60 (29.7)	
1995-1999	25 (29.1)	57 (28.2)	
2000-2004	29 (33.7)	51 (25.2)	
2005-2007	18 (20.9)	34 (16.8)	
Age at graduation mean (sd)	24.86 (2.18)	24.93 (3.03)	0.857
Additional education (in progress or completed)			0.670
No	77 (89.5)	185 (91.1)	
Yes	9 (10.5)	18 (8.9)	

Table 4.7 *Job characteristics of Memorial pharmacy graduate respondents based on location (n=290)*

Characteristic	Outside NL N=86	In NL N=204	p value
Practicing in rural setting n (%)			0.052
No	65 (75.6)	129 (63.9)	
Yes	21 (24.4)	73 (36.1)	
Primary place of employment			0.989
Community Pharmacy	63 (73.3)	151 (74.0)	
Hospital / Health Care	15 (17.4)	35 (17.2)	
Other	8 (9.3)	18 (8.8)	
Hours worked per week mean (sd)	39.31 (5.77)	38.94 (8.12)	0.699
Job category n (%)			0.982
Full time	81 (94.2)	192 (94.1)	
Part time	5 (5.8)	12 (5.9)	
Job status n (%)			0.755
Permanent	82 (95.3)	190 (93.1)	
Temporary	2 (2.3)	8 (3.9)	
Self-Employed	2 (2.3)	6 (2.9)	
Type of pharmacy position n (%)			0.117
Staff Pharmacist	53 (61.6)	118 (57.8)	
Pharmacy Manager	16 (18.6)	53 (26.0)	
Pharmacy Owner	11 (12.8)	12 (5.9)	
Other	6 (7.0)	21 (10.3)	
Years with current employer mean (sd)	4.67 (4.01)	6.32 (4.56)	0.004
No of different primary employers n (%)	31 (36.0)	59 (28.9)	0.123
1	16 (18.6)	66 (32.4)	
2	22 (25.6)	39 (19.1)	
3	9 (10.5)	19 (9.3)	
4	2 (2.3)	12 (5.9)	
5	6 (7.0)	9 (4.4)	
>5			
Work for other employers n (%)			0.105
No	61 (70.9)	161 (79.7)	
Yes	25 (29.1)	41 (20.3)	
Income			<0.001
≤70 000	5 (5.9)	64 (31.4)	
> 70 000	80 (95.1)	140 (68.6)	

4.3.2 Factors involved in choosing current pharmacy job based on location

Table 4.8 examines the importance of factors for choosing the current job for graduates working in and outside NL. The top three factors (working conditions, job benefits, level of pay) were the same for both groups. A significantly greater proportion of respondents working outside NL considered job opportunity for spouse / partner as an important factor for choosing their current job (p=0.017).

Table 4.8 *Importance of factors in choosing current pharmacy job based on respondent location (n=290)*

Factor	Outside NL n=86	In NL n=204	p value
Working Conditions			0.360
Not Important n(%)	0 (0)	2 (1.0)	
Important n(%)	85 (100)	202 (99.0)	
Job Benefits			0.466
Not Important n(%)	4 (4.7)	6 (2.9)	
Important n(%)	82 (95.3)	198 (97.1)	
Level of Pay			0.506
Not Important n(%)	2 (2.4)	8 (3.9)	
Important n(%)	83 (97.6)	196 (96.1)	
Hours of Work			0.928
Not Important n(%)	4 (4.0)	9 (4.4)	
Important n(%)	82 (95.3)	195 (95.6)	
Geographical Location			0.051
Not Important n(%)	9 (10.5)	9 (4.4)	
Important n(%)	77 (89.5)	195 (95.6)	
Direct involvement in patient care			0.100
Not Important n(%)	4 (4.7)	22 (10.8)	
Important n(%)	81 (95.3)	182 (89.2)	
Employer's philosophy			0.178
Not Important n(%)	7 (8.1)	28 (13.8)	
Important n(%)	79 (91.9)	175 (86.2)	
Future opportunity for advancement			0.967
Not Important n(%)	16 (18.6)	38 (18.8)	
Important n(%)	70 (81.4)	164 (81.2)	
Length of commuting required			0.121
Not Important n(%)	23 (26.7)	38 (18.6)	
Important n(%)	63 (73.3)	166 (81.4)	
Family considerations			0.932
Not Important n(%)	19 (22.1)	46 (22.5)	
Important n(%)	67 (77.9)	158 (77.5)	
The desire for a change			0.829
Not Important n(%)	24 (28.6)	60 (29.9)	
Important n(%)	60 (71.4)	141 (70.1)	
Offer of a job promotion			0.802
Not Important n(%)	38 (45.2)	89 (43.6)	
Important n(%)	46 (54.8)	115 (56.4)	
Job opportunity for spouse/partner			0.017
Not Important n(%)	39 (45.3)	123 (60.6)	
Important n(%)	47 (54.7)	80 (39.4)	
Return for service agreement			0.434
Not Important n(%)	50 (61.7)	111 (56.6)	
Important n(%)	31 (38.3)	85 (43.4)	

4.3.3 Predictors of working in or outside of NL

Table 4.9 lists the factors that were significant in predicting the work location of pharmacy graduates. After controlling for other significant predictors, graduates from NL were 32.84 times more likely to work in NL than graduates who were not from NL. Graduates who earned less than $70 000 were 7.06 times more likely to work in NL than graduates who earned more than $70 000.

Table 4.9 *Predictors of Memorial pharmacy graduate respondents who work in NL*

Variable	Odds ratio	95% confidence interval	p value
From NL			
No	1.00	-	
Yes	32.84	10.63 – 101.51	<0.001
Income			
>$70 000	1.00	-	
≤ $70 000	7.06	2.40 – 20.77	<0.001

4.4 Graduates working outside of NL considering returning to NL

Of the 86 respondents working in pharmacy outside NL, 18 (20.9%) indicated they are considering moving back to NL to take a job in the pharmacy profession. For these 18, the top three criteria indicated as being important for them to return were: level of pay (16/18, 88.9%), family considerations (9/18, 50%), and job opportunity for a spouse / partner (8/18, 44.4%).

Tables 4.10 and 4.11 compare the characteristics of the 18 graduates outside NL who are considering a return to NL to the 68 who are not. Graduates wanting to return are younger. Compared to graduates who do not want to return to NL, a larger proportion of

those who want to return are from NL. When factors for choosing their current job are compared, a larger proportion of graduates wanting to return to NL considered job opportunities for their spouse or partner as more important than those who did not want to return (Table 4.12). After controlling for other significant predictors, graduates who were from NL were 23.60 times more likely to want to return. With every additional year of age, graduates outside NL are 0.77 times as likely (or 1.3 times less likely) to want to return to NL (Table 4.13).

An additional seven respondents indicated "No" to the question of considering moving back to NL for a pharmacy job, but went on to identify in the comment section the main reason was level of pay. All seven were originally from NL.

Table 4.10 *Demographics of Memorial pharmacy graduate respondents outside NL based on desire to return (n=86)*

Characteristic	Considering return to NL N=18	Not considering return to NL N=68	p value
Gender n (%)			0.545
Male	6 (33.3)	28 (41.2)	
Female	12 (66.7)	40 (58.8)	
Age mean (sd)	29.22 (3.95)	33.91 (4.90)	<0.001
Have rural background n (%)			0.866
No	9 (50.0)	35 (52.2)	
Yes	9 (50.0)	32 (47.8)	
From NL n (%)			<0.001
No	1 (5.6)	35 (52.2)	
Yes	17 (94.4)	32 (47.8)	
Year of graduation n (%)			0.086
1990-1994	2 (11.1)	12 (17.6)	
1995-1999	2 (11.1)	23 (33.8)	
2000-2004	7 (38.9)	22 (32.4)	
2005-2007	7 (38.9)	11 (16.2)	
Age at graduation mean (sd)	23.89 (1.28)	25.12 (2:30)	0.033
Additional education (in progress or completed)			0.920
No	16 (88.9)	61 (89.7)	
Yes	2 (11.1)	7 (10.3)	

Table 4.11 *Job characteristics of Memorial pharmacy graduate respondents outside NL based on desire to return (n=86)*

Characteristic	Considering return to NL N=18	Not considering return to NL N=68	p value
Practicing in rural setting n (%)			0.139
No	16 (88.9)	49 (72.1)	
Yes	2 (11.1)	19 (27.9)	
Primary place of employment			0.554
Community Pharmacy	15 (83.3)	48 (70.6)	
Hospital / Health Care	2 (11.1)	13 (19.1)	
Other	1 (5.6)	7 (10.3)	
Hours worked per week mean (sd)	40.89 (3.60)	38.90 (6.17)	0.194
Job category n (%)			0.236
Full time	18 (100)	63 (92.6)	
Part time	0 (0)	5 (7.4)	
Job status n (%)			0.460
Permanent	17 (94.4)	65 (95.6)	
Temporary	1 (5.6)	1 (1.5)	
Self-Employed	0 (0)	2 (2.9)	
Type of pharmacy position n (%)			0.741
Staff Pharmacist	12 (66.7)	41 (60.3)	
Pharmacy Manager	4 (22.2)	12 (17.6)	
Pharmacy Owner	1 (5.6)	10 (14.7)	
Other	1 (5.6)	5 (7.4)	
Years with current employer mean (sd)	3.28 (2.35)	5.04 (4.29)	0.097
No of different primary employers n (%)			0.623
1	9 (50.0)	22 (32.4)	
2	3 (16.7)	13 (9.1)	
3	4 (22.2)	18 (26.5)	
4	2 (11.1)	7 (10.3)	
5	0 (0)	2 (2.9)	
>5	0 (0)	6 (8.8)	
Work for other employers n (%)			0.892
No	13 (72.2)	48 (70.6)	
Yes	5 (27.8)	20 (29.4)	
Income			0.232
≤70 000	0 (0)	5 (7.5)	
> 70 000	18 (100)	62 (92.5)	

Table 4.12 *Importance of factors in choosing current pharmacy job based on desire to return to NL (n=86)*

Factor	Considering return to NL n=18	Not considering return to NL n=68	p value
Working Conditions			N/A
Not Important n(%)	0 (0)	0 (0)	
Important n(%)	18 (100)	67 (100)	
Job Benefits			0.838
Not Important n(%)	1 (5.6)	3 (4.4)	
Important n(%)	17 (94.4)	65 (95.6)	
Level of Pay			0.458
Not Important n(%)	0 (0)	2 (3.0)	
Important n(%)	18 (100)	65 (97.0)	
Hours of Work			0.292
Not Important n(%)	0 (0)	4 (5.9)	
Important n(%)	18 (100)	64 (94.1)	
Geographical Location			0.067
Not Important n(%)	4 (22.2)	5 (7.4)	
Important n(%)	14 (77.8)	63 (92.6)	
Direct involvement in patient care			0.848
Not Important n(%)	1 (5.6)	3 (4.5)	
Important n(%)	17 (94.4)	64 (95.5)	
Employer's philosophy			0.652
Not Important n(%)	1 (5.6)	6 (8.8)	
Important n(%)	17 (94.4)	62 (91.2)	
Future opportunity for advancement			0.812
Not Important n(%)	3 (16.7)	13 (19.1)	
Important n(%)	15 (83.3)	55 (80.9)	
Length of commuting required			0.911
Not Important n(%)	5 (27.8)	18 (26.5)	
Important n(%)	13 (72.2)	50 (73.5)	
Family considerations			0.513
Not Important n(%)	5 (27.8)	14 (20.6)	
Important n(%)	13 (72.2)	54 (79.4)	
The desire for a change			0.207
Not Important n(%)	3 (16.7)	21 (31.8)	
Important n(%)	15 (83.3)	45 (68.2)	
Offer of a job promotion			0.939
Not Important n(%)	8 (44.4)	30 (45.5)	
Important n(%)	10 (55.6)	36 (54.5)	
Job opportunity for spouse/partner			0.027
Not Important n(%)	4 (22.2)	35 (51.5)	
Important n(%)	14 (77.8)	33 (48.5)	
Return for service agreement			0.541
Not Important n(%)	10 (55.6)	40 (63.5)	
Important n(%)	8 (44.4)	23 (36.5)	

Table 4.13 *Predictors of Memorial pharmacy graduate respondents who work outside NL wanting to return (n=86)*

Variable	Odds ratio	95% confidence interval	p value
From NL			0.004
No	1.00	-	
Yes	23.60	2.74 – 203.11	
Age	0.77	0.65 – 0.90	0.001

4.5. Graduates working in NL considering moving outside NL

Of the 204 respondents working in pharmacy in NL, 24 (11.8%) indicated they are considering moving from NL to take another job in the pharmacy profession. The top three criteria chosen as important for these 24 to *remain* in NL were: level of pay (24/24, 100%), working conditions (11/24, 45.8%), and hours of work (8/24, 33.3%).

Tables 4.14 and 4.15 compare the characteristics of the graduates in NL who are considering leaving NL to work in pharmacy to those who are not. Compared to those who are not considering leaving, larger proportions of graduates who are considering leaving are male, from NL, graduated between 1995 and 1999, and often work for more than one employer. When factors for choosing their current job are compared, a larger proportion of graduates wanting to leave NL consider length of commuting required as less important than those not wanting to leave (Table 4.16). After controlling for other significant predictors, graduates from NL are 0.08 times as likely (or 12.5 times less likely) as non-NL graduates to consider leaving. Compared to their male counterparts, female pharmacy graduates are 0.26 times as likely (or 3.85 times less likely to consider leaving NL (Table 4.17)).

Table 4.14 *Demographics of Memorial pharmacy graduate respondents in NL based on desire to leave (n=204)*

Characteristic	Considering leaving NL N=24	Not considering leaving NL N=180	p value
Gender n (%)			0.007
Male	15 (62.5)	65 (36.1)	
Female	8 (34.8)	115 (63.9)	
Age mean (sd)	33.91 (5.67)	34.80 (6.31)	0.520
Have rural background n (%)			0.576
No	12 (52.2)	80 (46.0)	
Yes	11 (47.8)	94 (54.0)	
From NL n (%)			0.016
No	2 (8.7)	2 (1.1)	
Yes	21 (91.3)	172 (98.9)	
Year of graduation n (%)			0.026
1990-1994	2 (8.7)	58 (32.4)	
1995-1999	12 (52.2)	45 (25.1)	
2000-2004	5 (21.7)	46 (25.7)	
2005-2007	4 (17.4)	30 (16.8)	
Age at graduation mean (sd)	25.22 (2.76)	24.89 (3.07)	0.624
Additional education (in progress or completed)			0.505
No	21 (87.5)	164 (91.6)	
Yes	3 (12.5)	15 (8.4)	

Table 4.15 *Job characteristics of Memorial pharmacy graduate respondents in NL based on desire to leave (n=204)*

Characteristic	Considering leaving NL (n=24)	Not consider leaving NL (n=180)	p value
Practicing in rural setting n (%)			0.226
No	18 (75.0)	111 (62.4)	
Yes	6 (25.0)	67 (37.6)	
Primary place of employment n (%)			0.391
Community Pharmacy	15 (62.5)	136 (75.6)	
Hospital / Health Care	6 (25.0)	29 (16.1)	
Other	3 (12.5)	15 (8.3)	
Hours worked per week mean (sd)	42 (8.04)	38.55 (8.06)	0.055
Job category n (%)			0.192
Full time	24 (100)	168 (93.3)	
Part time	0 (0)	12 (6.7)	
Job status n (%)			0.928
Permanent	22 (91.7)	168 (93.3)	
Temporary	1 (4.2)	7 (3.9)	
Self-Employed	1 (4.2)	5 (2.8)	
Type of pharmacy position n (%)			0.484
Staff Pharmacist	11 (45.8)	107 (59.4)	
Pharmacy Manager	8 (33.3)	45 (25.0)	
Pharmacy Owner	1 (4.2)	11 (6.1)	
Other	4 (16.7)	17 (9.4)	
Years with current employer mean (sd)	5.17 (4.09)	6.48 (4.61)	0.186
No of different primary employers n (%)			0.158
1	8 (33.3)	51 (28.3)	
2	4 (16.7)	62 (34.4)	
3	9 (37.5)	30 (16.7)	
4	1 (4.2)	18 (10.0)	
5	1 (4.2)	11 (6.1)	
>5	1 (4.2)	8 (4.4)	
Work for other employers n (%)			0.017
No	14 (60.9)	147 (82.1)	
Yes	9 (39.1)	32 (17.9)	
Income			0.491
≤70 000	9 (37.5)	55 (30.6)	
> 70 000	15 (62.5)	125 (69.4)	

Table 4.16 *Importance of factors in choosing current pharmacy job based on desire to leave NL (n=204)*

Factor	Considering leaving NL n=24	Not considering leaving NL n=180	p value
Working Conditions			<0.001
Not Important n(%)	2 (8.3)	0 (0)	
Important n(%)	22 (91.7)	180 (100)	
Job Benefits			0.705
Not Important n(%)	1 (4.2)	5 (2.8)	
Important n(%)	23 (95.8)	175 (97.2)	
Level of Pay			0.947
Not Important n(%)	1 (4.2)	7 (3.9)	
Important n(%)	23 (95.8)	173 (96.1)	
Hours of Work			0.950
Not Important n(%)	1 (4.2)	8 (4.4)	
Important n(%)	23 (95.8)	172 (95.6)	
Geographical Location			0.950
Not Important n(%)	1 (4.2)	8 (4.4)	
Important n(%)	23 (95.8)	172 (95.6)	
Direct involvement in patient care			0.266
Not Important n(%)	1 (4.2)	21 (11.7)	
Important n(%)	23 (95.8)	159 (88.3)	
Employer's philosophy			0.664
Not Important n(%)	4 (16.7)	24 (13.4)	
Important n(%)	20 (83.3)	155 (86.6)	
Future opportunity for advancement			0.775
Not Important n(%)	4 (16.7)	34 (19.1)	
Important n(%)	20 (83.3)	144 (80.9)	
Length of commuting required			0.049
Not Important n(%)	8 (33.3)	30 (16.7)	
Important n(%)	16 (66.7)	150 (83.3)	
Family considerations			0.830
Not Important n(%)	5 (20.8)	41 (22.8)	
Important n(%)	19 (79.2)	139 (77.2)	
The desire for a change			0.304
Not Important n(%)	5 (20.8)	55 (31.1)	
Important n(%)	19 (79.2)	122 (68.9)	
Offer of a job promotion			0.128
Not Important n(%)	7 (29.2)	82 (45.6)	
Important n(%)	17 (70.8)	98 (54.4)	
Job opportunity for spouse/partner			0.977
Not Important n(%)	14 (60.9)	109 (60.6)	
Important n(%)	9 (39.1)	71 (39.4)	
Return for service agreement			0.646
Not Important n(%)	12 (52.2)	99 (57.2)	
Important n(%)	11 (47.8)	74 (42.8)	

Table 4.17 *Predictors of Memorial pharmacy graduate respondents who work in NL wanting to leave (n=204)*

Variable	Odds ratio	95% confidence interval	p value
From NL			0.022
No	1.00	-	
Yes	0.08	0.010 – 0.703	
Sex			0.006
Male	1.00		
Female	0.26	0.102 – 0.683	

4.6 Comments provided

For the 91 respondents outside NL, 20 provided comments at the end of the survey. The main comment by 13 of the 20 was that the level of pay in NL was too low. Two other respondents said they had left for family reasons, and another two indicated job opportunities were better outside NL.

For the 209 respondents in NL, 24 provided comments at the end of the survey. There was no clearly identified main theme. About one-third mentioned either pay or job opportunities as important issues.

Chapter 5: Discussion

This study used a mailed survey to Memorial pharmacy graduates to determine attrition rates from the profession and current work locations of those still in the profession. Differences in graduates working in pharmacy in or outside NL were examined to determine predictors of working in NL, and wanting to leave or return to NL.

5.1 Attrition from Pharmacy

While only a small proportion (3.3%) of respondents had left the profession, it is noteworthy that 70% reported going on to medicine as the next career. Pharmacy may be viewed as a desirable first undergraduate degree for applying for entry to medicine, but there was no identified literature published on this topic. While it may be challenging to determine career paths of those applying for admission to the School of Pharmacy, incorporation of questions on intent to remain in the profession should be explored. Attrition rates may have been underestimated, as not all graduates were contacted. In addition, those having left pharmacy may have been less inclined to respond to a survey about pharmacy. Continuing to follow graduates via the Alumni database should be continued. Attrition from the profession should be assessed at regular intervals.

5.2 Work location of pharmacy graduates

More than two thirds (70.4%) of practicing Memorial pharmacy graduates surveyed were working in NL in 2008. From the NLPB list of registrants licensed from

1990 onwards practicing in NL, School of Pharmacy alumni comprise 96.5% (282/292) of BSc trained pharmacists in NL. Memorial's pharmacy graduates also make up about half (282/569, 49.5%) of all practicing pharmacists in NL. These findings suggest that the School of Pharmacy has made a substantial contribution to the provincial pharmacists' workforce.

Other studies that have examined the retention of locally trained health professionals suggest that provincial retention of pharmacists is greater than the retention of locally trained physicians (whether examining the retention of undergraduate (30.7%) or post-graduate training programs (18.8%) (Mathews, Rourke & Park, 2006; Mathews, Park & Rourke, 2007). Moreover, a larger proportion of pharmacy graduates were working in rural community in NL than Memorial medical (undergraduate program) graduates (32.6%, and 6.1% respectively) (Mathews, Park & Rourke, 2008).

Coming from NL and working for less income were associated with graduates who worked in NL. Pharmacy alumni who were originally from NL were 32 times more likely to work in NL than their classmates who were not from NL. This supports CIHI data which showed NL had one of the lowest overall proportions of pharmacists from other provinces (Canadian Institute for Health Information, 2007a). Currently Memorial's School of Pharmacy admits 40 students per year, of which at least 25 are reserved for students from NL. The remaining seats may be offered to either NL or out of province students. These findings suggest that increasing the number of seats reserved for NL students may increase the retention of pharmacy graduates. Fostering an interest in pharmacy among potential NL candidates, such as at the senior high school and early

university level, would help ensure the continued high quality of students in the program. Moreover, among graduates who work outside NL, those who want to return to NL are originally from NL. Few graduates who are not from NL stay to work here or are interested in coming back to NL.

Income for graduates working outside of NL was significantly higher than those working in NL. A larger proportion (95.1%) of pharmacy graduates working outside NL than those working in NL (68.6%) reported annual income greater than $70 000. Regression analysis found that alumni working in NL were 7.06 times more likely to be making lower income (i.e. less than $70,000) than their counterparts working elsewhere. Given that some respondents from outside NL indicated in the comments section of the survey that they had salaries of up to $130 000, our data may have underestimated the magnitude of the salary differential between graduates working in or outside NL. Future surveys would need to take the salary categories into account, and include higher amounts. This survey did not take into account non-monetary incentives for working in NL, such as quality of life, or cost of living. Future research should explore additional reasons for job location.

With the exception of income, there were few differences between graduates working in or outside of NL, including gender composition, having a rural background, age at graduation, and additional education post graduation. Similar numbers of graduates in and outside NL were practicing in rural settings (36.1% and 24.4%, respectively), mainly in community pharmacy (74.0% and 73.3%, respectively). Both groups worked about an average of 40 hours a week in full time permanent positions. There were similar

numbers of graduates in or outside NL with more than one primary employer in their career, and who were currently working for other employers as a pharmacist. These findings highlight that although pharmacist graduates in NL work in similar settings for similar hours each week, their income is lower than their counterparts who work elsewhere. Over 10% of graduates working in NL indicated their interest in moving outside NL to take another pharmacy job. The top reason cited by all 24 as a factor for them to stay in NL was level of pay. The salary differential between pharmacy jobs in and outside of NL is well known within the profession. Future research should examine differences in remuneration.

5. 3 Factors for choosing current pharmacy job

The factors for choosing their current job were similar between graduates working in or outside NL, with working conditions reported as important by the largest proportion of respondents, followed by job benefits and level of pay. The top four factors chosen by respondents as most important in choosing their current job (working conditions, job benefits, level of pay, and hours of work, respectively) are consistent with the literature. One US study found the top four reasons were working conditions, pay, hours of work, and advancement opportunities (Schondelmeyer, 1992). Working conditions was ranked first both in our survey and the literature, indicating the work environment, in addition to income, is important in job selection and satisfaction.

Job opportunity for spouse or partner was important for 54.7% of graduates working outside NL compared to 39.4% of those working in NL. Graduates outside NL

who want to return to NL are more likely to be from NL than those not wanting to return. This suggests that new graduates may leave the province, perhaps for higher salaries, but soon want to return to NL. The older graduates who leave NL likely get established in their jobs and communities, and besides salary, job for spouses or partners would be important for their return. Graduates in NL had worked an average of 1.65 years longer with their current employer. When examined by years of graduation, three factors were significantly different in their ranking across years of graduation: a) family considerations, b) desire for change, and c) return for service agreement. Family considerations were considered more important in choosing the current job the longer a graduate had been working, from 86.5% for the older graduates to 63.5% for the youngest graduates. The older graduates are likely to have established more family connections than their younger counterparts. The desire for change is more important the longer a graduate had been working, ranging from 71.2% ranking as important for the older graduates down to 56.9% for the younger graduates. Wanting a job change would likely take several years to develop, and the younger graduates likely have not been in their current positions long enough for this to occur.

Return for service agreement was ranked as more important the younger a graduate. Offering of these agreements has increased in recent years, and were not available to the early graduates. Often, return for service agreements are incentives used to hire staff, and may be more important during staff shortages, which has been more prominent in recent years. Younger graduates may be incurring more debt as a student, making the return for service agreements more attractive. More research is needed to

examine who is offering return for service agreements, and how effective is this strategy to retain locally trained pharmacists.

Over one-third (40.7%) of our respondents had three or more primary employers, indicating mobility within the profession is high. The average years with their current employer were 5.8 years. These numbers are consistent with US literature, where one study found in the prior ten years, 56.2% of pharmacists changes jobs at least once (Scholndelmeyer, 1992). Another study found over a 15 year period, pharmacists surveyed held an average of 3.6 ± 2.5 pharmacy jobs (Mott, 2000). Given that over half our respondents had been graduated at least 8 years, job change appears common among Memorial pharmacy graduates. This suggests that pharmacists are willing to change jobs, and may provide an opportunity to use incentives important to NL graduates to have them return to and stay in NL to work. No Canadian statistics are available for comparison.

5.4 Characteristics of Memorial pharmacy graduates

Practicing Memorial pharmacy graduates are comparable to other provincial jurisdictions examined in the 2007 CIHI pharmacy workforce report (which did not include NL) (Canadian Institute for Health Information, 2007b). Based on the CIHI data, our respondents are comparable to the other jurisdictions when examined by primary place of employment, job category, job status, type of pharmacy position, number of employers, additional education and gender. The CIHI report noted 7.4% to 25.8% of pharmacists worked in a rural practice. In contrast, almost one third (32.6%) of Memorial pharmacy graduates worked in rural practice. The proportion of pharmacists

working in rural practice is linked to geography and population of the provinces in which they work. However, the proportion of pharmacy graduates working in rural community in greater than the proportion of Memorial medical graduates (Mathews et al, 2008).

The proportion of females in pharmacy in our survey (60.6%) is comparable to the proportion reported by CIHI of between 50 and 69% (Canadian Institute for Health Information, 2007b) and in the US (Shih, 2000). Shih et al. reported that the proportion of females in pharmacy have increased from 5.8% in 1968-70, to more than 25% in the 1980s to 33% in 1994-1996. The CIHI report noted between 66.4% and 79.7% of new graduates in 2006 were female. There is a scarcity of literature that has examined this issue in detail. The "Moving Forward: Pharmacy Human Resources for the Future" report did not address the issue of feminization beyond the recommendation to identify and monitor supply and demand indicators (Management Committee 2008). Females may choose different work patterns than males, may be absent from the work force for periods of time (i.e., maternity leave), and may choose to work part time more often. These factors have the potential to affect the projected human resources need. This study indicates females are less likely than males to want to leave NL. Increased feminization of pharmacy may increase the provincial retention of graduates, particularly those from NL.

5.5 Study Strengths

This is the first study to examine work location of Memorial pharmacy graduates. The study is based on a representative sample (based on gender and year of graduation)

of graduates and provides valuable information on the contribution of the Memorial School of Pharmacy to provincial pharmacy workforce and on factors related to the retention and turnover of pharmacists in the province.

Response rates of published pharmacist surveys range from 35% to 70%, with most indicating a 50% or lower rate (Gaither, 1999; Lahoz & Mason, 1990; McHugh, 1999; Mott, 2000; Quant & McKercher, 1982; Schondelmyer, et al, 1992; Stewart & Smith, 1987). Our overall response rate of 64.4% and response rate in NL of 70.8% is higher than many surveys reported in the literature.

We designed the project based on literature indicating appropriate survey wording, formatting and processes for mailing shown to increase response rates (Edwards et al., 2002). Demographic information and categories contained in the survey were similar to those on current pharmacy licensure applications, and would be familiar to most respondents. The target audience was a defined group (pharmacists graduating from Memorial) with the researcher part of this group and known to many of the respondents.

5.6 Study Limitations

This was a cross-sectional survey capturing information at one point in time. A limitation of this survey type is the potential for different answers if the survey were administered at a different point in time. The survey did not determine if those in NL had previously been away and returned, or how long they had been working in NL.

Addresses were available for 79% (466/591) of pharmacy graduates for the years 1990-2007. Due to privacy restrictions and/or missing information, information about the

remaining 21% was not available. Information on graduates still working in pharmacy in NL was easily accessible; therefore the 21% may contain graduates no longer working in pharmacy, or who have moved outside NL. Our survey may have underrepresented these populations.

The response rate of 53.2% for those outside NL, while in keeping with published literature of mailed surveys to pharmacists, was lower than the overall response rate of 64.4% or the response rate of those in NL (70.8%). The lower response rate of those outside NL may have underrepresented those no longer working in pharmacy. The magnitude of the odds ratio of the predictor variables may have been less if more respondents outside NL were still working in pharmacy and were from NL or were making less money, Many of the demographic and job characteristics, and factors for choosing their current job were similar between in or outside NL, and would be unlikely to change significantly with a higher response rate from outside NL.

Due to resource limitations, only one follow up consisting of a letter and second questionnaire was sent. More follow up letters may have increased the response rate, although the effect may be marginal compared to the original and first follow up mailings.

Recall bias may be a factor in some of the responses. Respondents were asked to rank the importance of factors in choosing their current job. If they had been in their current job a number of years, it may have been difficult to recall why they chose that job.

This study considered all work locations (community pharmacy, hospital pharmacy, others) together in assessing factors for job choice. Given the differences in the type of work environments, we may have missed differences in these groups.

Chapter 6: Conclusions and Recommendations

Between 1990 and 2007, 591 students graduated from the Memorial University School of Pharmacy. Through a mailed survey, we received completed surveys from 300 graduates. This survey was the first that examined work locations, characteristics and opinions of this cohort. Of the 300 respondents, almost all (96.7%) were still working in pharmacy, with 70.3% of practicing pharmacists working in NL and 29.7% working outside NL. Of the small number who had left the profession, 70% pursued medicine as a career.

Knowledge of the similarities and possible differences is important as the profession moves forward to take its place in the health care system. The final report of the "Moving Forward: Pharmacy Human Resources for the Future" project was released in September of 2008 (Management Committee, 2008). This detailed analysis of the current environment and future needs of the profession discusses increasing public awareness of pharmacist roles, to education and training, regulation, and incorporation of international pharmacy graduates and pharmacy technicians. Knowledge of our own local pharmacy environment is important to identify whether the national strategies will work in NL.

Based on this study, the following recommendations are made:

- *maintain or possibly increase the number of seats reserved at the School of Pharmacy for NL students.* Graduates from NL were significantly more likely to work in NL than those from outside the province. While current admission processes result in at least 25 of the 40 pharmacy seats awarded

to NL residents, retention of additional graduates may have to re examine this process, while still maintaining the high quality of students in the program. Any expansion of enrolment should consider NL residency status.

- *employers and government in NL should explore ways of increasing salaries or employment incentives to increase recruitment and retention of graduates.* This study highlighted three areas that may improve the retention of pharmacists in NL, especially among those from NL: income, working conditions, and return for service agreements. Incentives that retain new graduates in particular may increase retention, as those who move away and become established with jobs and families are less likely to return.

- *continue researching the pharmacy workforce supply in NL and Canada, including:*
    - *the impact of the feminization of the pharmacy workforce.* The increase in females in pharmacy has been well noted, but the impact on the profession has not been well studied. The continued increase in female pharmacy students will result in an even higher proportion of female pharmacists in the provincial workforce.

Further study should examine the impact of feminization of pharmacy practice and retention.

- *attrition rates and reasons why graduates leave the profession.* Our sample may have underrepresented this subgroup of graduates. Understanding why graduates leave the profession may help identify areas for improvement either pre or post graduation.

- *data systems that track or study the pharmacy workforce.* Several provincial and national organizations track primarily administrative data for pharmacists. Understanding the strengths and limitations for each system and working to improve data collection and synthesis will give a more complete picture of the pharmacist workforce.

The training and recruitment of pharmacists represents a substantial investment of education and health resources. This study suggests that 70% of the pharmacists responding to the survey who graduated from the Memorial University School of Pharmacy were working in the province. Research and initiatives to ensure the stability of our pharmacy workforce in NL are key to continuing pharmacists' positive contribution to the healthcare system.

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Appendix A

Current Work Locations and Reasons for Job Choice of Graduates of Memorial University School of Pharmacy

Please answer each of the following questions unless otherwise instructed

SECTION I – Personal Characteristics

1. What is your gender? ☐ female ☐ male

2. In what year were you born?_____ (day/month/year)

3. What was the name of the town where you graduated high school?
   _____

4. In what year did you graduate from the Memorial University School of Pharmacy?_____

5. Have you completed additional education after your pharmacy degree? ☐ Yes ☐ No

   a. If yes, what is the highest level?

   ☐ Accredited Residency __Completed __In progress
   ☐ Masters (specify discipline_____) __Completed __In progress
   ☐ Pharm.D. __Completed __In progress
   ☐ Doctorate (PhD) (specify discipline_____) __Completed __In progress

SECTION II – Employment Status

6. What is your current employment status?
   ☐ Employed in the profession of pharmacy - ***GO TO QUESTION 9***
   ☐ Employed in other than pharmacy – ***GO TO QUESTION 7***

7. If not employed in pharmacy, what is your current job?_____

8. Why did you leave the profession of pharmacy?

_____

_____

Please go to QUESTION 21 when QUESTION 8 is answered

9. What is the population of the town or city of your ***primary place*** of employment?
   - ☐ Rural Area (<2,000)
   - ☐ Small Town (2,000 – 10,000)
   - ☐ City (10,000 – 40,000)
   - ☐ Regional Centre (40,000 – 100,000)
   - ☐ Large City (>100,000)

10. Which of the following best describes your ***primary place*** of employment (choose one)?
   - ☐ Community Pharmacy
   - ☐ Hospital /Health Care Facility
   - ☐ Community Pharmacy Corporate Office
   - ☐ Group Professional Practice/Clinic
   - ☐ Post Secondary Educational Institution
   - ☐ Health related Industry/Manufacturing/Commercial
   - ☐ Association/Government
   - ☐ Other (Specify_____)

11. How many hours on average do you work per week in your primary place of employment?

    _____ hours

12. Which of the following best describes your ***job category*** (choose one)?
   - ☐ Full time
   - ☐ Part time
   - ☐ Casual

13. Which of the following best describes your ***job status*** (choose one)?
   - ☐ Permanent
   - ☐ Temporary
   - ☐ Self-Employed

14. Which of the following best describes your ***position*** (choose one)?
   - ☐ Staff Pharmacist
   - ☐ Pharmacist Consultant
   - ☐ Institutional Leader/coordinator
   - ☐ Pharmacy Owner
   - ☐ Research
   - ☐ Director of Pharmacy
   - ☐ Pharmacy Manager
   - ☐ Industrial Pharmacist
   - ☐ Educator
   - ☐ Other

15. How long have you worked for your current employer? _____year(s)

16. How many *different* primary employers have you worked for as a pharmacist since graduating from pharmacy (including your current employer)?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ >5

17. When thinking about why you accepted your current job at your primary place of employment, how important were the following?

	Unimportant	Of little Importance	Moderately Important	Important	Very Important
The level of pay	O	O	O	O	O
Hours of work	O	O	O	O	O
Job benefits	O	O	O	O	O
Working conditions	O	O	O	O	O
Future opportunity for advancement	O	O	O	O	O
Geographical location	O	O	O	O	O
The length of commuting required	O	O	O	O	O
Job opportunity for spouse/partner	O	O	O	O	O
Family considerations	O	O	O	O	O
Offer of a job promotion	O	O	O	O	O
Direct involvement in patient care	O	O	O	O	O
The employer's philosophy	O	O	O	O	O
The desire for a change	O	O	O	O	O
Return for service agreement	O	O	O	O	O

18. Do you *currently* work as a pharmacist for other employers (besides your primary place of work)?

☐ Yes ☐ No

a. If yes, how many?_____

19. Are you considering moving from Newfoundland and Labrador to take another job in the pharmacy profession? ☐ Yes ☐ No

a. If yes, which of the following criteria would be important for you to remain in Newfoundland and Labrador (choose up to three)?

☐ The level of pay
☐ Hours of work
☐ Job benefits
☐ Working conditions
☐ Future opportunity for advancement
☐ Geographical location
☐ The length of commuting required
☐ Job opportunity for spouse/partner
☐ Family considerations
☐ Offer of a job promotion
☐ Direct involvement in patient care
☐ The employer's philosophy
☐ The desire for a change
☐ Other (Please specify)_____

20. Please indicate your total income from pharmacy related work?

☐ <$25 000
☐ $25 000 – <$40 000
☐ $40 000 – <$55 000
☐ $55 000 – <$70 000
☐ >$70 000

21. Do you have any other comments?

_____

_____

Thank you for your time. Please mail questionnaire in the return envelope provided.

Appendix B

Current Work Locations and Reasons for Job Choice of Graduates of Memorial University School of Pharmacy

Please answer each of the following questions unless otherwise instructed

SECTION I – Personal Characteristics

1. What is your gender? female male

2. In what year were you born?_____ (day/month/year)

3. What was the name of the town where you graduated high school?
   _____

4. In what year did you graduate from the Memorial University School of Pharmacy?_____

5. Have you completed additional education after your pharmacy degree? Yes No

   a. If yes, what is the highest level?

Accredited Residency	__Completed	__In progress
Masters (specify discipline_____)	__Completed	__In progress
Pharm.D.	__Completed	__In progress
Doctorate (PhD) (specify discipline_____)	__Completed	__In progress

SECTION II – Employment Status

6. What is your current employment status?
   Employed in the profession of pharmacy - ***GO TO QUESTION 9***
   Employed in other than pharmacy – ***GO TO QUESTION 7***

7. If not employed in pharmacy, what is your current job?_____

8. Why did you leave the profession of pharmacy?

_____

_____

Please go to QUESTION 23 when QUESTION 8 is answered

9. What is the population of the town or city of your ***primary place*** of employment?
   - ☐ Rural Area (<2,000)
   - ☐ Small Town (2,000 – 10,000)
   - ☐ City (10,000 – 40,000)
   - ☐ Regional Centre (40,000 – 100,000)
   - ☐ Large City (>100,000)

10. In which province or territory is your primary place of employment?

    _____

11. Which of the following best describes your ***primary place*** of employment (choose one)?
    - ☐ Community Pharmacy
    - ☐ Hospital /Health Care Facility
    - ☐ Community Pharmacy Corporate Office
    - ☐ Group Professional Practice/Clinic
    - ☐ Post Secondary Educational Institution
    - ☐ Health related Industry/Manufacturing/Commercial
    - ☐ Association/Government
    - ☐ Other (Specify_____)

12. How many hours on average do you work per week in your primary place of employment?

    _____ hours

13. Which of the following best describes your ***job category*** (choose one)?
    - ☐ Full time
    - ☐ Part time
    - ☐ Casual

14. Which of the following best describes your ***job status*** (choose one)?
    - ☐ Permanent
    - ☐ Temporary
    - ☐ Self-Employed

15. Which of the following best describes your ***position*** (choose one)?
    - ☐ Staff Pharmacist
    - ☐ Pharmacist Consultant
    - ☐ Institutional Leader/coordinator
    - ☐ Pharmacy Owner
    - ☐ Research
    - ☐ Director of Pharmacy
    - ☐ Pharmacy Manager
    - ☐ Industrial Pharmacist
    - ☐ Educator
    - ☐ Other

16. How long have you worked for your current employer? _____year(s)

17. How many *different* primary employers have you worked for as a pharmacist since graduating from pharmacy (including your current employer)?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ >5

18. Was your last job in pharmacy (before your current job) in Newfoundland and Labrador?

☐ Yes ☐ No ☐ Current job is my first job in pharmacy

19. When thinking about why you accepted your current job at your primary place of employment, how important were the following?

	Unimportant	Of little Importance	Moderately Important	Important	Very Important
The level of pay	O	O	O	O	O
Hours of work	O	O	O	O	O
Job benefits	O	O	O	O	O
Working conditions	O	O	O	O	O
Future opportunity for advancement	O	O	O	O	O
Geographical location	O	O	O	O	O
The length of commuting required	O	O	O	O	O
Job opportunity for spouse/partner	O	O	O	O	O
Family considerations	O	O	O	O	O
Offer of a job promotion	O	O	O	O	O
Direct involvement in patient care	O	O	O	O	O

The employer's philosophy	O	O	O	O	O
The desire for a change	O	O	O	O	O
Return for service agreement	O	O	O	O	O

20. Do you *currently* work as a pharmacist for other employers (besides your primary place of work)?

☐ Yes ☐ No

b. If yes, how many?_____

21. Are you considering moving to Newfoundland and Labrador to take a job in the pharmacy profession? ☐ Yes ☐ No

c. If yes, which of the following criteria would be important for you to take a job in Newfoundland and Labrador (choose up to three)?

☐ The level of pay
☐ Hours of work
☐ Job benefits
☐ Working conditions
☐ Future opportunity for advancement
☐ Geographical location
☐ The length of commuting required
☐ Job opportunity for spouse/partner
☐ Family considerations
☐ Offer of a job promotion
☐ Direct involvement in patient care
☐ The employer's philosophy
☐ The desire for a change
☐ Other (Please specify)_____

22. Please indicate your total income from pharmacy related work?

☐ <$25 000
☐ $25 000 – <$40 000
☐ $40 000 – <$55 000
☐ $55 000 – <$70 000
☐ >$70 000

23. Do you have any other comments?

_____

_____

_____

Thank you for your time. Please mail questionnaire in the return envelope provided.

Appendix C

MEMORIAL
UNIVERSITY
School of Pharmacy

Date:

Dear :

The MUN School of Pharmacy has graduated over 590 students since its first class in 1990. Researchers from MUN are surveying pharmacy graduates to find out whether they are still working in pharmacy, whether they are working in Newfoundland and Labrador, as well as their reasons for choosing to work in or outside the province. This study will provide important information to plan pharmacy human resources in the province.

Enclosed you will find the survey and a stamped return envelope. This survey will take about 15 minutes to complete. The survey is **voluntary**. All answers are confidential and you will not be identified in any report or presentation. Every effort will be made to protect your anonymity; however, in some cases it might be possible to identify particular individuals based upon demographic information. You do not have to answer every question.

If you would like to take part in this study, please fill in the survey and return it in the stamped envelope provided. If you do not want to participate please return the blank survey in the envelope.

If you have any questions, please contact me at swyoung@mun.ca or by phone at 777-8833.

Thank you in advance for your assistance with this project.

Stephanie Young, BSc(Pharm),Pharm.D.
Assistant Professor and Primary Health Care Pharmacist
School of Pharmacy, Memorial University
300 Prince Phillip Drive
St. John's, NL A1B 3V6
e-mail: swyoung@mun.ca phone: 777-8833

Appendix D

MEMORIAL
UNIVERSITY
School of Pharmacy

Date:

Dear :

Recently you received a survey for pharmacy graduates of Memorial University. The purpose of the survey is to find out whether graduates are still working in pharmacy, whether they are working in Newfoundland and Labrador, as well as their reasons for choosing to work in or outside the province. If you have already completed this survey, we thank you for your time.

If you have not yet had the opportunity to complete the survey, we encourage you to do so. Enclosed you will find a copy of the survey and a stamped return envelope. This survey will take about 15 minutes to complete. The survey is **voluntary**. All answers are confidential and you will not be identified in any report or presentation. Every effort will be made to protect your anonymity; however, in some cases it might be possible to identify particular individuals based upon demographic information. You do not have to answer every question.
If you would like to take part in this study, please fill in the survey and return it in the stamped envelope provided. If you do not want to participate please return the blank survey in the envelope.

If you have any questions, please contact me at swyoung@mun.ca or by phone at 777-8833.

Thank you in advance for your assistance with this project.

Stephanie Young, BSc(Pharm),Pharm.D.
Assistant Professor and Primary Health Care Pharmacist
School of Pharmacy, Memorial University
300 Prince Phillip Drive
St. John's, NL A1B 3V6
e-mail: swyoung@mun.ca phone: 777-8833

Appendix E

MEMORIAL UNIVERSITY

Faculty of Medicine

Human Investigation Committee
Office of Research and Graduate Studies Memorial
The Health Sciences Centre
St. John's, NL Canada A1B 3V6
Tel: 709 777 6974 Fax: 709 777 7501
www.mun.ca

January 29, 2008

Reference #08.08

Dr Stephanie Young
School of Pharmacy

Dear Dr Young:

This will acknowledge your correspondence dated, January 15, 2008, wherein you provide a revised cover letter for your research study entitled **"Current work locations and reasons for job choice and graduates of Memorial University School of Pharmacy".**

The Co-Chairs of the HIC reviewed your correspondence, approved the revised cover letter and granted ***full approval*** of your research study. This will be reported to the full Human Investigation Committee, for their information at the meeting scheduled for January 31, 2008.

Full approval has been granted for one year. You will be contacted to complete the annual form update approximately 8 weeks before the approval will lapse on **January 17, 2009**. It is your responsibility to ensure that the renewal form is forwarded to the HIC office not less than 30 days prior to the renewal date for review and approval to continue the study. The annual renewal form can be downloaded from the HIC website
http://www.med.mun.ca/hic/downloads/Annual%20Update%20Form.doc

The Human Investigation Committee advises THAT IF YOU DO NOT return the completed annual update form prior to or on the aforementioned date of renewal:

- *Your ethics approval will lapse*
- *You will be required to stop research activity*
- *You will not be permitted to restart the study until you reapply for and receive approval to undertake the study again*

In addition, the Human Investigation Committee will inform the appropriate authorities. To ensure proper action is taken; the appropriate officials will be notified to terminate funding.

Modifications of the protocol/consent are not permitted without prior approval from the Human Investigation Committee. Implementing changes in the protocol/consent without HIC approval may result in the approval of your research study being revoked, necessitating cessation of all related research activity. Request for modification to the

protocol/consent must be outlined on an amendment form (available on the HIC website) and submitted to the HIC for review.

For a hospital-based study, it is **your responsibility to seek the necessary approval from Eastern Health and/or other hospital boards as appropriate**.

This Research Ethics Board (the HIC) has reviewed and approved the application and consent form for the study which is to be conducted by you as the qualified investigator named above at the specified study site. This approval and the views of this Research Ethics Board have been documented in writing. In addition, please be advised that the Human Investigation Committee currently operates according to the Tri-Council Policy Statement and applicable laws and regulations. The membership of this research ethics board complies with the membership requirements for research ethics boards defined in Division 5 of the Food and Drug Regulations.

Notwithstanding the approval of the HIC, the primary responsibility for the ethical conduct of the investigation remains with you.

We wish you every success with your study.

Sincerely,

John D. Harnett, MD, FRCPC
Co-Chair
Human Investigation Committee

Richard S. Neuman, PhD
Co-Chair
Human Investigation Committee

JDH;RSN\jed

C Dr. C. Loomis, Vice-President (Research), MUN
Mr. W. Miller, Senior Director, Corporate Strategy & Research, Eastern Health

Appendix F

Characteristics of Memorial pharmacy graduate respondents not employed in pharmacy (n=10)

Characteristic	
Respondents n (%)	
In NL	5 (50.0)
Outside NL	5 (50.0)
Gender n (%)	
Male	5 (50.0)
Female	5 (50.0)
Age mean (sd)	34.70 (4.88)
Have rural background n (%)	
No	5 (50.0)
Yes	5 (50.0)
From NL n (%)	
No	2 (20.0)
Yes	8 (80.0)
Year of graduation n (%)	
1990-1994	2 (20.0)
1995-1999	5 (50.0)
2000-2004	2 (20.0)
2005-2007	1 (10.0)
Age at graduation mean (sd)	23.70 (0.82)
Additional education (in progress or completed)	
No	1 (10.0)
Yes	9 (90.0)
Current job as MD n (%)	
No	3 (30.0)
Yes	7 (70.0)

Appendix G

Characteristics of Survey Respondents and Non-Respondents

Characteristic	Respondents	Non-Respondents	p value
Gender* n (%)			>0.10
Male	114 (39.4)	120 (39.7)	
Female	175 (60.6	182 (60.3)	
Year of graduation* n (%)			>0.10
1990-1994	74 (25.7)	74 (24.4)	
1995-1999	82 (28.5)	81 (26.7)	
2000-2004	80 (27.8)	109 (36.0)	
2005-2007	52 (18.0)	39 (12.9)	
Location**			<0.01
In NL	209 (69.7)	86 (51.8)	
Outside NL	91 (30.3)	80 (48.2)	

* Based on total cohort of 591 graduates

**Based on those with mailing addresses available (n=466)