WHY ARE FEWER MEDICAL STUDENTS CHOOSING FAMILY MEDICINE AS A CAREER CHOICE

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WHY ARE FEWER MEDICAL STUDENTS CHOOSING FAMILY MEDICINE AS A CAREER CHOICE?

by

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Abstract

There is a downward trend in Canadian medical students choosing family medicine residencies. Through the study of graduating medical students from two different universities located in Atlantic Canada, but with a wide variance in the proportion of their students choosing family medicine the researcher aimed to satisfy the following objectives: (1) to determine the factors that had the greatest predictive value in influencing medical students to choose family medicine as a career choice during the 2005 CaRMS match; (2) to learn why students who had once considered a career in family medicine later chose a specialty as a residency; (3) to establish if there were significant differences in the opinions of those who selected family medicine and those who selected a specialty as a first choice for residency; and (4) to conclude if institutional factors played a decisive role in the medical career decision making process of the students.

Of the 137 medical students who were eligible for participation in the study, a total of 68 students completed the survey, which resulted in a combined response rate of 49.64%. A variety of statistical tests were used to examine the factors associated with choosing (or not choosing) family medicine. A career choice of family medicine was shown to be attributed to *a mentor before medical school* and *placed a stronger weight on workload predictability*. They were also inclined to be less concerned about *earning potential, intellectual stimulation/ challenge* and the *ability to work in a hospital environment*. Six themes emerged within the data with respect to the reasons why those who chose a

specialty did not choose family medicine: lifestyle (better, free-time, do not want office obligations; greater income); negativity surrounding profession (lack of respect by other physicians), patients served (did not want to refer patients, time spent with patients), research (greater opportunities for research). Recommendations regarding the recruitment of students toward family medicine are given and future research directions discussed.

Acknowledgments

This thesis is dedicated to my late husband, Christopher Sullivan and to the many wonderful physicians who helped tend to Chris' diverse and often complicated medical needs. I will always be grateful to Drs. Stewart Rorke, Susan McDonald, Pat O'Shea, Ron Whelan, Adrian Major and the staff of the Bliss Murphy Cancer Centre. It is through these people I learned the value of life and the importance of family physicians and specialists in palliative care.

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Definitions and Usage of Terms

CaRMS - Canadian Residency Matching Service: In Canada, the Canadian Resident Matching Service (CaRMS) provides a systematic method for matching graduating medical students to residency training programs located across the country. Each year, CaRMS performs two match iterations (www.carms.ca).

Clinical Clerkship: The clinical phase of the medical school curriculum occurs during the last two years of medical school and is devoted to education in the clinical setting. The periods of instruction are called clerkships. Required clerkships include internal medicine, pediatrics, psychiatry, surgery, obstetrics/gynecology and family medicine. During a clinical clerkship students work in a hospital or community setting and are assigned to a medical team, participate in the ongoing clinical care of patients, gain skills in clinical decision-making and patient management and learn about the discipline (www.medterms.com).

CFPC – College of Family Physicians of Canada: The College plays an important role in family medicine training at both the undergraduate and graduate level across the country. It is responsible for evaluating, setting standards and accrediting family medicine residency training programs at all 17 medical schools throughout Canada. It also conducts a national exam for certification in practice family medicine in Canada (www.cfpc.ca).

Family Medicine: "The medical specialty which provides continuing and comprehensive health care for the individual and family. It is the specialty in breadth which integrates the biological, clinical, and behavioral sciences. The scope of family practice encompasses all ages, both sexes, each organ system, and every disease entity" (www.medterms.com).

Family Physician : A specialist who has been board certified to practice family medicine. These physicians serve as an advocate to their patients with respect to all health-related matters, including the appropriate use and/or referrals to consultants, health services (laboratory tests), and community resources (www.medterms.com). In Canada, certification requirements are set by the College of Family Physicians of Canada which conducts the certification examination.

Residency: The residency phase of medical training occurs after a student has graduated from medical school and has received their MD. During this period, the physician receives specialized training in a specialized area, for example, family medicine, radiology or general surgery. The successful completion of a residency program is required for board certification (www.medterms.com). In Canada, graduating medical students register with CaRMS to be matched to residency training programs.

Specialty: For the purpose of the research study, specialty refers to any medical discipline outside of family medicine.

ACRONYMS USED IN THIS PAPER

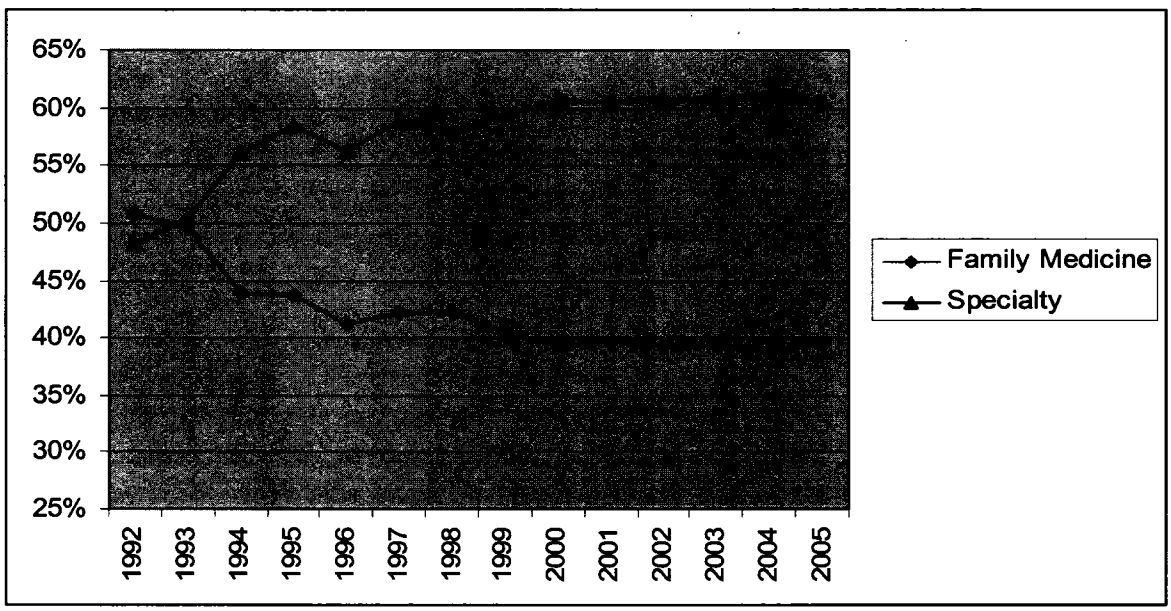
AMWAC	Australia Medical Workforce Committee
ANOVA	Analysis of Variance
CAIR	Canadian Association of Interns and Residents
CAPER	Canadian Post-MD Education Registry
CaRMS	Canadian Residency Matching Service
CFPC	College of Family Physicians of Canada
CFMS-	Canadian Federation of medical Students
Dal	Dalhousie University
FamMed12	Those respondents who chose family medicine as a first and/or second choice for a residency
FM	Family medicine
MUN	Memorial University of Newfoundland
NPS	National Physician Survey
SP	Royal College Specialty

CHAPTER 1 INTRODUCTION

1.1 The Problem

There is a precipitous downward trend in Canadian medical students choosing family medicine residencies. For the past two decades, the goal in Canada has been to sustain a 50:50 split between family physicians and Royal College specialists (Shortt et al., 2003, CFPC, 2004). However, since 1994, this target has not been met; an alarmingly high number of Canadian medical students have been eschewing family medicine for Royal College specialties.

Figure 1.1 Number completing postgraduate training and entering practice by field of training, 1992-2005



Note: Graduates of Canadian faculties of medicine exiting post-MD training after having proceeded directly through post-MD training from graduation plus graduates of foreign medical schools who were Canadian citizens or permanent residents. Figures for 2000 and later include only those trainees with a rank level consistent with completion of training.

Source: Adapted from - CAPER: Annual Census of Post-MD Trainees 2005-2006.

In 2005, the Canadian Residency Matching Service (CaRMS) reported less than 28% of students chose family medicine as a first choice for residency, which is significantly less than the 44% which was achieved in 1992. Despite this decline there has been limited research examining the career choices of students at Canadian medical schools. An understanding of the multifaceted issues stimulating this decrease is necessary to aid in the development of strategies to recruit more medical graduates into family medicine.

1.2 Why this Problem is Important

Family doctors are the backbone of the Canadian health care system. Being highly valued by their patients, family physicians are considered integral to access-to-care decisions. Most Canadians rely on family doctors as their primary provider for routine, ongoing and immediate care for undifferentiated health care concerns. Family physicians are considered to be the "most important person in the health care of themselves and their families" by the vast majority of Canadians (CFPC, 2003; Dhillon, 2005).

Table 1.1 Common set of functions performed by family physicians

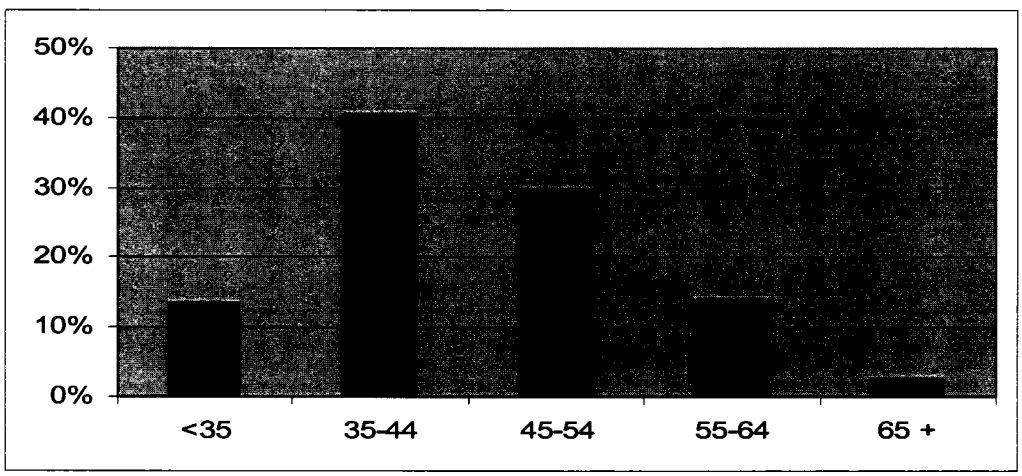
• Health assessment • Clinical evidence-based illness prevention and health promotion • Appropriate interventions for episodic illness and injury • Primary reproductive care • Early detection and initial and ongoing treatment of chronic illnesses • Care for the majority of the illnesses (in conjunction with specialists as needed) • Education and support for self-care • Support for in-home, long-term care facility, and hospital care	• Arrangements for 24-hour, 7-days-a-week response • Service coordination and referral • Maintenance of comprehensive client health records for all rostered patients in primary health care agencies • Advocacy • Primary mental health care including psychosocial counseling • Coordination and access to rehabilitation • Support for people with terminal illnesses

Source: Verbatim, College of Family Physicians, Family Medicine in Canada Vision for the Future (2004), p.11.

Repeatedly public surveys and consultation processes have affirmed the importance of access to healthcare for Canadians. In recent years, many Canadians have experienced great difficulty finding or accessing the care of a family doctor in a timely manner. Shortages of family physicians persist in both urban and rural settings. Approximately 4.2 million Canadians do not have a family doctor, seriously impeding their ability to efficiently access primary care (CFMS, 2005; CFPC, 2003).

There are several factors that will warrant the need for an increased supply of family physicians in the future. Most importantly, the proportion of the Canadian population over the age of 65 is expected to rise significantly over the next twenty years. In addition, 12% of today's physicians are over the age of 60 and will retire before this "baby boom" effect takes hold (Southam Medical Database, 2002).

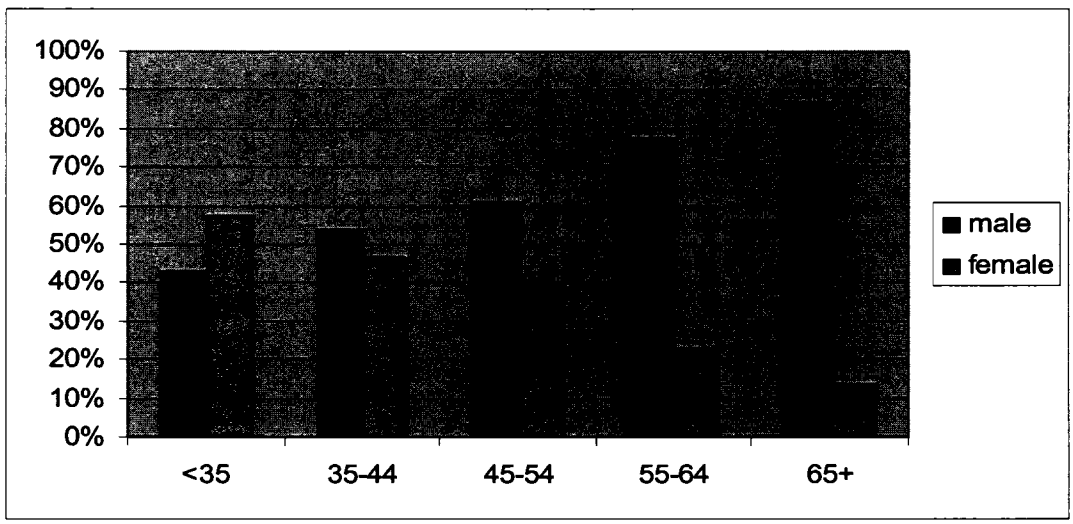
Figure 1.2 Percent distribution of physicians by general practice (family medicine and general practice) and age, Canada, 2006



Source: CMA Master file, January 2006, Canadian Medical Association.

While a predominantly male generation of physicians faces retirement in the coming years, an increasing female physician population is occurring (CFPC, 2004). Female family doctors under the age of 35 now comprise 60% of the total supply (NPS, 2004). The feminization of the physician workforce is predicted to have a significant effect on the total hours worked by physicians. The 2004 National Physician Survey revealed that female doctors work on average 7 to 8 hours a week less than their male counterparts (CFPC, 2004).

Figure 1.3 Number of general practitioners/family physicians by age and sex, Canada, 2006



Note: Excludes residents and physicians over age 80; includes non-clinicians licensed to practice.
Source: CMA Master file, January 2006, Canadian Medical Association.

During the past couple of decades, Canada has had fewer medical school entry positions per capita available to applicants than has the United Kingdom, Australia and many other industrialized nations (Tyrell et al., 1999). Part of this imbalance is attributed to the 1991

Barer-Stoddart Report which called for a reduction in the number of medical school entry and residency training positions across Canada and the resulting federal and provincial cutbacks. From 1992 onwards, there has been a documented decrease of 250 to 300 entry positions to family medicine programs. In 2002, the College of Family Physicians of Canada estimated there was a shortage of 3000 family physicians in Canada and that by the end of the decade this number would double unless new recruitment and retention strategies were developed and instituted (CFPC, 2004, Thurber and Busing, 1999).

Prior to 1993, the route to family practice by Canadian medical graduates required the successful completion of a rotating internship and/or a two-year family medicine residency program. The elimination of the rotating internship resulted in the need for 250 to 300 more positions to be added to the two-year family medicine program. However, these new positions were never created and resulted in a cumulative loss of approximately 2500 to 3000 family doctors (CFPC, 2004).

The high number of Canadian medical students not choosing to pursue family medicine coupled with the aging population, past reductions in medical school enrollment, the removal of rotating internships, the feminization of the physician work force and the pending retirement of older physicians are all anticipated to translate into a prolongation of reduced access for patients and a heightened demand for the services performed by family physicians.

1.3 Relevant Research

Surprisingly, limited research has been conducted to determine how graduates of Canadian medical schools choose their career. The declining interest in family medicine is not limited to Canada; Australia, the United Kingdom and the United States have experienced a similar downward trend (Laughren, 2005). Past studies have shown a number of extrinsic variables to be closely associated with the selection of family medicine as a career choice. Students with low income expectations, an interest in a diverse group of patients and health problems, and less interest in high technology and surgery have been shown to be more likely to choose residencies in family medicine (Bland et al., 2001).

Many demographic characteristics have been found to be common among recent family medicine graduates; those students who are older, female, married, from smaller communities, from a broad undergraduate background and/or have non-physician parents tend to be more prone to choose residencies in family medicine (Senf et al., 2004, Bland et al., 2001, Wright et al., 2004). However, women who practice in rural areas have been found to be significantly less likely to be married or have a long term partner. Those with children are more likely to be primary caregivers. Rural women physicians are unique in that the vast majority of them have been in practice for less than 10 years when compared to their male counterparts who have practiced in rural areas for 10 to 30 years (Incitti et al., 2003).

Institutional differences have also been cited; medical schools with a higher proportion of matriculating students who express an interest in family medicine, a greater representation of faculty in family medicine, and a larger rural student body have been recognized as producing more family physicians (Senf, 2004). Conversely, the difficulty in recruiting medical students to pursue family medicine has been attributed to negative clerkship experiences, negative examples set by family physicians during clinical clerkships and other specialists denigrating the profession by making derogatory comments about family medicine as being the less intellectual choice and not being as prestigious as other specialties (Laughren, 2005; Schafer et al., 2000).

1.4 What Key Stakeholders Have to Say

Due to the current dearth of published Canadian research, it was decided that consultation with key stakeholders was necessary. The purpose of this exercise was to gain a better understanding of how medical education is delivered within the country and to gather background information to help inform the construction of the research instrument. The researcher met individually with the CEO of the CFPC and several family physicians, first year medical residents and third year medical students to learn about the factors thought to be fueling the decrease in popularity of family medicine.

The College considered the following factors to be closely linked to the current situation:

- medical education in Canada is primarily taught by Royal College specialists

- family medicine is not promoted as a distinct and respected discipline to students during undergraduate medical training
- family medicine, as a discipline, is promoted negatively to students throughout their medical training
- there is a growing income gap between family physicians and Royal College specialists
- the rising cost of tuition are resulting in increased student debt loads (Gutkin, 2004).

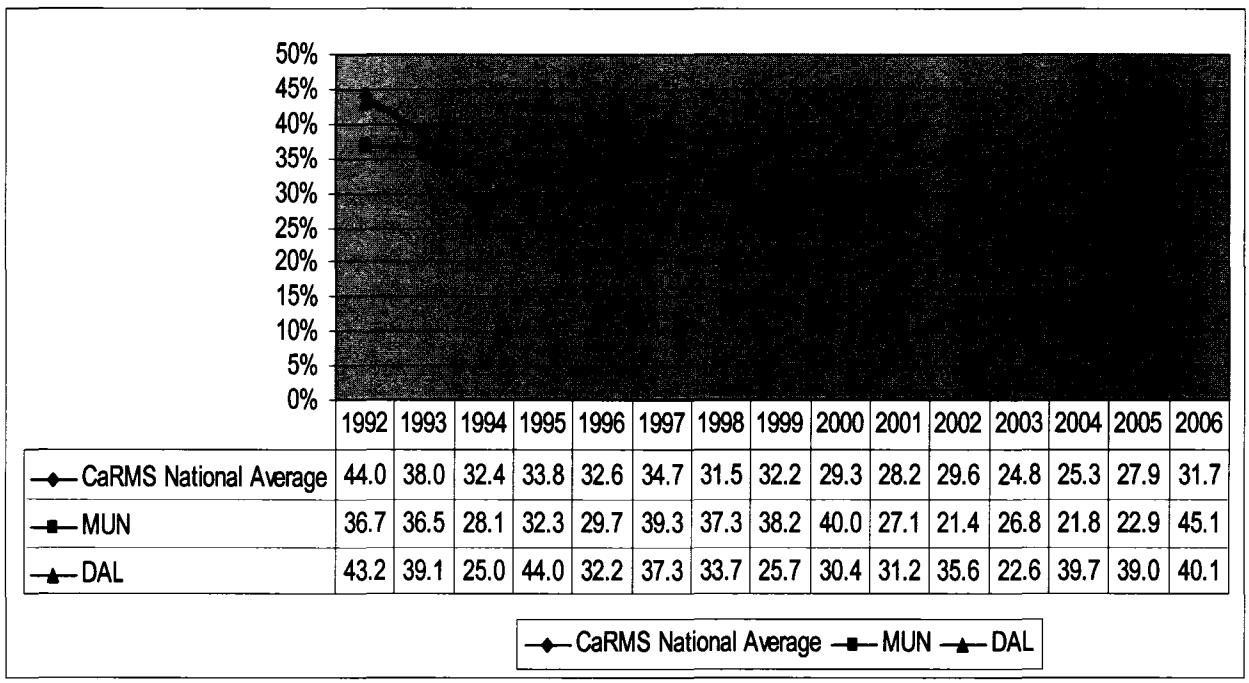
Many of the students and residents expressed similar viewpoints. However, the majority of their comments revolved around the negativity which surrounds the discipline. It was not uncommon for the students and residents to hear denigrating comments about family medicine during their medical education. One resident who was matched to a Royal College specialty, but who had considered practicing family medicine, said that family physicians are perceived as being "pencil pushers" and "triage nurses" by many Royal College specialists.

1.5 History of Family Medicine as a Career Choice at Atlantic Canadian Universities

Within Atlantic Canada, two universities offer an undergraduate degree in medicine: Memorial University of Newfoundland (MUN) and Dalhousie University (Dal) in Nova Scotia. Despite recent national trends, Dal has regularly produced a high proportion of

graduates who choose family medicine. When compared to the thirteen universities registered with CaRMS, the highest proportion of graduating medical students choosing family medicine in the 2004 and 2005 matches have been from Dal (39.7% and 39.0% respectively). During this same time period, MUN has had considerably fewer medical students select family medicine (21.8% and 22.9% respectively). Since 1992, MUN has placed below the national average on nine separate occasions. However, in 2006 there was a significant increase in the proportion of MUN medical students choosing family medicine (45.1%), whereas the proportion of Dal student who chose family medicine remained similar to the previous two match years (40.1%).

Figure 1.4 History of family medicine, Memorial University of Newfoundland and Dalhousie University, Canada, 1992-2006



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CaRMS National Average	44.0	38.0	32.4	33.8	32.6	34.7	31.5	32.2	29.3	28.2	29.6	24.8	25.3	27.9	31.7
MUN	36.7	36.5	28.1	32.3	29.7	39.3	37.3	38.2	40.0	27.1	21.4	26.8	21.8	22.9	45.1
DAL	43.2	39.1	25.0	44.0	32.2	37.3	33.7	25.7	30.4	31.2	35.6	22.6	39.7	39.0	40.1

Source: Canadian Residency Match Service – Statistics - 1992–2003, supplied by Carolynn Schmidtke on 23 September 2005. The 2004—2006 statistics were retrieved form the CaRMS website (www.carms.ca).

1.6 Purpose of the Study

The primary purpose of this study was to develop an understanding about why fewer graduating medical students are choosing family medicine as a career choice. Through the study of graduating medical students from two different universities located in similar geographic regions, but with a wide variance in the proportion of their students choosing family medicine the researcher aimed to satisfy the following objectives: (1) to determine the factors that had the greatest predictive value in influencing medical students to choose family medicine as a career choice during the 2005 Match, (2) to learn why students who had once considered a career in family medicine later chose a Royal College specialty as a residency, (3) to establish if there were significant differences in the opinions of those who selected family medicine and those who selected a Royal College specialty as a first choice for residency, and (4) to determine if institutional factors played a decisive role in the medical career decision-making process of the students.

1.7 Significance of the Study

The findings of this study will contribute to the underdeveloped knowledge base in this area. This study will be the first study to provide findings at an Atlantic Canadian university level with respect to influences that stimulate medical student career choices. Insight into the intrinsic and extrinsic factors that influence medical students' career choices will assist faculties of medicine at Canadian universities in developing combative

strategies to help reverse the disengagement towards family medicine. The findings will have implications for medical education and will benefit future research due to the paucity of knowledge in this important area.

CHAPTER 2 REVIEW OF THE LITERATURE

2.1 Purpose

The purpose of this literature review is to: (1) review literature on the factors that influence medical students to choose family medicine as a career choice, (2) identify similar themes amongst the studies, (3) summarize findings and examine the methodologies employed in key studies, (4) determine the research gaps that exist within the scope of family medicine as a career choice in Canada, and (5) generate a research plan based on the information derived from the literature review.

2.2 Method for Obtaining Literature

The literature review was conducted using two CD-ROM databases, PUBMED and MEDLINE. The criteria for inclusion of an article in the review are as follows: (1) the article had to pertain to the decline in interest in family medicine as a career choice, (2) the articles had to be published between 1993 and 2005 or be a seminal paper in the subject area if published prior to this time frame, and (3) the article had to be considered relevant to the issues that are related to career choice by medical students. The search was conducted in English-language medical journals and medical education journals, using keywords such as: (1) family medicine and career, (2) family medicine and interest, (3) medical schools and career, (4) medical students and residencies, and (5) medical

students and clerkships. Following retrieval, the articles were organized by content, from which two dominant themes emerged: (1) intrinsic factors and (2) extrinsic factors.

2.3 Intrinsic Factors

Optimal career planning requires an individual to have a good understanding of the factors that motivate or drive them, their talents, their knowledge and skill, and the psychological attributes that constrain them (AMWAC, 2002). These factors, along with others like age and personality, are 'intrinsic' to the individual. The literature indicates that a variety of intrinsic factors have been found to be associated with medical students choosing family medicine as a career choice.

2.3.1 Personal Characteristics, Professional & Systemic Factors

There is little Canadian research that documents why students choose (or do not choose) careers in family medicine. To help shed light on this topic, it was determined that a review of international literature was required. In countries which have also experienced a decline in students choosing family medicine, several "personal, professional and systemic influencing factors" have been recognized (Jordan et al., 2003).

For example, Blades et al (2000) asked junior doctors in northern England about what stimulated them to not choose family medicine. The respondents stated that they were seeking work that would allow them to readily apply their clinical skills in an

environment where their "personal needs were recognized." The doctors also expressed concern about managerial orientation, professional isolation and the required paper work of general practice.

A similar downward trend in family medicine exists in the United States. Between 1998 and 2002, there was a 35% decline in US medical students selecting family medicine (Kahn, 2003). Schafer (2000) suggests that the decline in family medicine may be associated with students' worries about having to master too broad of a content area, insufficient prestige and low intellectual content as reasons for their rejection. It was concluded by Burkett (1982) that students who choose family medicine place a higher weight on "the desire to help people as a career motivation, were more oriented toward considering the socio-psychological context of patients' problems, and were more likely to perceive a need for change to improve health care" delivery.

Funkenstein (1978) investigated medical graduate career choice and determined that students' interests in medicine falls into two groups: bio-social and bio-scientific. Those who have biosocial characteristics tend to have a greater interest in helping people through the application of medical therapies, while those who are bio-scientific in nature have a greater aptitude in the scientific aspect of medicine and technology. He found that most of those who choose to practice family medicine fall into the bio-social group.

An American study by Xu et al. (1997) compared career choices between two age groups of medical graduates. It was found that older graduates were more likely to choose family medicine and had a different background than the younger graduates. Most of the older graduates came from either a rural or inner city environment, had an advanced degree, and pre-existing family commitments.

In 1995, a non-statistical meta-analysis of international literature on the determinants of primary care as a career choice was conducted by Bland et al. The study analyzed and synthesized 73 international papers published on this topic between the years 1987 and 1993. The study determined that there were seven intrinsic characteristics that are common to those who choose family medicine. Students that chose family medicine tended to:

- be married
- have a broad undergraduate background
- have non-physician parents
- have lower income expectations
- have less interest in prestige
- have an interest in a diverse patients and health problems
- have less of an interest in high technology and surgery.

2.4 Extrinsic Factors

Extrinsic factors constitute the external factors that are experienced by an individual, such as, social and educational influences. An abundance of literature was found on extrinsic factors and their role in choosing family medicine as a career choice. Hence, this section will be broken down into multiple sub-headings with a summary of key studies:

- characteristics of universities that produce a high proportion of family physicians
- negative comments by faculty and students
- financial (cost of tuition).

2.4.1 Characteristics of Universities That Produce a High Proportion of Family Physicians

Bland et al. (1995) through their in-depth meta-analysis determined that there are four main characteristics of universities that produce a higher proportion of family physicians compared to those that graduate more specialists. These universities have:

- mandatory family practice clerkships (sooner in clerkship, rather than later)
- longitudinal exposure to primary care
- a higher number of required weeks studying family medicine
- an active family medicine department on campus.

The role of medical schools in determining career choice has been studied mostly from the perspective of total contact hours between students and family medicine faculty, the type of courses taught, and the presence or absence of a family medicine clerkship. The

Kutob et al. (2003) study was unique in that it investigated the characteristics of medical school departments and the role of family medicine faculty in career choice. A common theme that emerged from their study was that there is an inverse relationship between research activity and graduates choosing family medicine.

2.4.2 Negative Comments by Faculty and Residents

It was found that at the start of medical school many students have a preference for careers in family medicine. As they advance in their studies, students' desire to enter primary care diminishes, particularly during their clinical clerkship (CaRMS, 2001; Sewell, 2003). It is thought that some of the disengagement towards family medicine can be attributed to negative comments expressed by physicians and residents. For instance, Danielle Martin, while a fourth-year student at the University of Western Ontario, and president of the Canadian Federation of Medical Students expressed concern about the many denigrating comments she heard during her studies. In an interview with the Canadian Medical Association, she said: "During my clerkship year, one of my preceptors said I was too smart to be a family doctor. And you'd hear things like "the family doctor screwed up, and then the patient was taken to a real doctor" (CMAJ, 2003).

Some researchers have attributed the decline in interest in family medicine to negative attitudes towards its education and practice obtained while in medical school (Bland et. al., 1995; Bloom, 1989; Block et al., 1996). It is common for students to frequently hear throughout their studies the problems with "physician shortages, excessive workloads, increased difficulty keeping up, and declining financial rewards compared with other

specialties" (Rosser, 2002). According to Hotson (2002), family medicine clerks and residents are often mistreated. The positive influence of a mentor and/ or faculty advisor was found to be a significant factor in attracting students to pursue family medicine (Osborn, 1993).

The former director of professional affairs for College of Family Physicians of Canada, Dr. Claude Renaud, recently reported that "family medicine is under the gun on all sorts of levels because of primary care reform. Insecurity has been building for 5 or 6 years because of talk about 24/7 coverage and increased roles for nurse practitioners and pharmacists, and students have started to view family medicine as less of an important role." He thinks the future of family medicine is "being threatened by the glamour of the subspecialties" (CFPC, 2003).

The 2001 CaRMS study of Canadian medical graduates determined that three of the top influences in medical career selection are:

- positive role models within the discipline
- positive clerkship experience within the discipline during medical school
- encouragement from medical professionals to pursue a particular career (CaRMS and CFPC, 2001).

The 2001 CaRMS study of medical graduates reported that most students (58%) decide to choose family medicine as a career choice during their first year of clinical clerkship (CaRMS, CFPC, 2001). Only 15% of those entering family medicine have their decision

made prior to starting medical school and 19% make their decision during second-year. Similarly, a longitudinal study of MUN medical students that tracked students' interests in family medicine during each year of the study had similar results (Hansen et al., 2003). Medical students are keenly focused on making career decisions during their required clinical clerkships (Woolley, 2003). It is essential for students to be exposed to family medicine at this point in their studies.

An American study by Campos-Outcalt et al. explored the hypothesis that negative comments from faculty and residents about family practice are related to the recent decline in student selection of this career choice. A questionnaire was sent to all family physicians and to an equal number of other primary physicians who graduated from one of 24 medical schools from 1997 to 1999. Half of the selected universities had increasing proportions of graduates choosing family practice during the specified time period and the remaining twelve had decreasing proportions. A total of 2,985 questionnaires were mailed and a response rate of 51.5% was achieved.

The questionnaire was divided into two sections. The first set of questions asked about negative comments about family practice heard during medical school by faculty, residents and students. Respondents had to select how often they heard these comments from a three-point list (often, sometimes, or never). The next set of questions asked about graduates' contact with and perception about family medicine faculty during medical school and whether the faculty were respected, influential, clinically competent,

and enthusiastic. Each characteristic was ranked by a 5-point Likert scale (1 as the best rating and 5 as the worst).

The findings clearly indicated that negative messages about family medicine were constantly being heard by the students who participated in the study and have a role in students deciding to choose family medicine. The fact that only family medicine and primary care physicians participated in the study was viewed as a limitation in this study. Greater insight may have been achieved if medical graduates that had chosen to specialize had been included in the study; this would have yielded more comprehensive and comparable results.

Schafer et al. conducted a survey of 397 graduating University of California, after the National Resident Matching Program (NRMP) match and before graduation in 1996, 1997 and 1998. The study was the first retrospective quantitative study to explore the intrinsic and extrinsic "factors that distinguish students who reject family practice from students who reject other specialties" and achieved a response rate of 81% (Schafer et al., 2000).

A noticeable difference in retention rates was found amongst those who indicated a pre-clinical preference for family medicine. Of the 41 respondents who indicated family medicine as their first choice prior to the commencement of clinical rotations, only 15 matched to family practice. This decline was found to be associated with the following

factors: (1) a negative clerkship experience, (2) a negative example set by a family physician during the pre-clinical clerkship, (3) worries about having to master too broad of a content area, (4) insufficient prestige within family medicine, and (5) perceived low intellectual content within the profession (Schafer et al., 2000).

The first question asked to rate the degree to which "the following factors positively influenced my choice of specialty in the match". A list of 28 examples of positive influences was given for the students to rank. A 5-point Likert scale was used for the ratings (1= strongly agree, 3 = neither agree or disagree and 5 = strongly disagree). Some of the positive influences were: "*excellent clerkship experience*" and "*opportunity for greater flexibility in determining professional lifestyle.*" The second part of the two-part question asked the students to rate the degree to which "the following were important factors in excluding alternative specialties." A list of 28 negative influences was given to the students to rank using the same scale. All of the positive questions asked in Part 1 were posed in the form of the negative complement in Part 2. For example, "*negative clerkship experience*" and "*lack of flexibility in determining professional lifestyle.*" Most students who did not select family medicine as a career choice rated *negative clerkship experience* as their main reason for not choosing family medicine (Schafer et al., 2000).

A qualitative study by Woolley et al (2003) investigated the effect of clerkship teachers, course directors and attending physicians on fourth-year students' career choices. Four focus groups were conducted at two campuses of a large medical school in the United

States. Each focus group session lasted about 60 minutes and had an average of five informants. Participants consisted of those who were interested in pursuing family medicine as well as those who were interested in pursuing other specialties. The students were asked to "*reflect on personal experiences during 3rd-year clerkships when faculty, attending, or supervising residents asked about your career interest.*"

Many students reported that they received negative feedback from specialist and residents about the discipline of family medicine. Some of the students felt "*intimidated, threatened, suspicious, apprehensive, belittled, uncomfortable, prejudged, on trial, embarrassed, put down, hurt, guilty, awkward, vulnerable, annoyed, anxious, defenseless, discouraged, and afraid.*" Students that had a lot to say about their negative experiences gave reports such as this:

- *When I said I was interested in family practice, right away my attending shunned me from day one. He didn't learn my name the whole month. I was referred to as "puppy". I didn't get to participate in much.*
- *When a student revealed he was interested in family medicine he was basically shunned for the rotation by the residents. They just left him out of the loop whenever they were doing anything, on call, or whatever like that.*
- *She was brought to tears because someone told her she was talking like a family practitioner. They said "Don't say things like that! You sound like a family physician."*

This study clearly indicated that negative comments from other specialists were commonly heard on the campus by students. These comments led some to not choose family medicine as a career. Although the study showed the effects of negative comments, it can not be generalized for every medical school; only one university was used in this study.

Semi-structured interviews were used in a study of eleven of 29 Class of 2001 University of Western Ontario medical graduates matched to a Canadian family medicine residency program (Jordan et al., 2003). It was found that an ongoing and meaningful exposure to family physicians both prior to and during medical school was influential and helped to reinforce their decision to pursue family medicine as a career. The study identified three possible pathways which students may take in choosing family medicine: (1) students have an early conviction prior to medical school to become family physicians, (2) students are uncertain at the start of medical school and utilize an exploration and exclusion process to making their career decision, and (3) students have an early choice of another specialty and re-evaluate their decision throughout experiences gained while at medical school. A major limitation to this study was that some interviews were conducted with participants at their commencement of a family residency program. For comparative purposes, it would have been beneficial to have gained insight from those that had entered other specialty programs.

Wright et al. (2004) conducted a quantitative study of first year medical students at three western Canadian universities (University of Calgary, University of British Columbia and

University of Alberta) in 2001 and 2002. A questionnaire was distributed to 583 students and a response rate of 89% was achieved. Students were asked to identify their top three career choices and to rank the importance of 25 variables in relation to their choice. Only 20% of those surveyed ranked family medicine as one of their top three choices. Factor analysis was utilized to group the 25 variables into a smaller number of related influences (medical lifestyle, societal orientation, prestige, hospital orientation, and varied scope of practice). Logistic regression indicated that students who chose family medicine as their first choice tended to be older, from smaller communities, concerned about medical lifestyle, and were less hospital-oriented than those that did not select family medicine (Wright et al., 2004). A limitation to the study was that the students were not surveyed at various points throughout their studies. It would have been beneficial to determine if experiences gained while in medical school had a predictive value on final career decisions.

2.4.3 Tuition / Debt Loads

Since the early 1990s, Canadian tuition for medical school has increased dramatically. In the past five years medical tuition fees have nearly doubled. Currently, the University of Toronto and the University of Western Ontario have the highest tuition fees in Canada, both in excess of $16,000 (OMA, 2005).

Canadian medical student debt loads are now at an all-time high. Rosser (2002) estimates that by the time students graduate from Canadian medical schools, they already have an educational debt of $100,000. Moreover, for those interested in family medicine,

he concedes it will cost close to $75,000 to launch a comprehensive practice. Thus, many students may feel compelled to "maximize their earning potential by pursuing those specialties that generate high incomes", rather than choosing family medicine (Task Force Two, 2003). Furthermore, an increased debt load may lure physicians into practicing in the United States. Many American recruiters are willing to pay off student debts, thereby offering a tremendous incentive to practice in the United States.

2.4.4 Family Medicine and CaRMS

There are seventeen faculties of medicine in Canada that offer programs of study that lead to a MD degree. Thirteen of these faculties are registered with CaRMS. During the fall semester of the final year of undergraduate medical studies, students must rank their preferred residency choices and register with CaRMS. Late in the winter semester students are notified of their matched results. Until 1992, there had been close to a 50:50 split between students choosing Royal College specialties versus those selecting family medicine (Canadian Family Physician, 2003). The majority of today's medical students are now seeking Royal College specialty training.

2.5 Research Gaps

The determinants of medical student career choices are multifactorial. The literature review identified several influential intrinsic and extrinsic factors that play a role in the medical career decision-making process. However, the most disturbing findings of this literature review is the lack of Canadian published research on family medicine and career choices.

Table 2.1 Influences on medical career choice (as found in literature review)

Intrinsic Factors	Extrinsic Factors
age	clerkship experience within the discipline during first year clinical clerkship
gender	encouragement from medical professionals
marital status	timing of family practice clerkships
undergraduate degree (broad background vs. intensive background in science)	amount of required weeks for the study of family medicine within the clerkship
parental occupation	strength of family medicine department on campus
income expectations	degree of financial debt
interest in prestige	'political' climate of family medicine (media influence)
degree of interest in high technology and surgery	
socioeconomic upbringing	

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Purpose of Research

The purpose of the study was to develop an understanding about why fewer medical students are choosing family medicine as a career choice. The objectives of the research are:

1. to determine the factors that have the greatest predictive value in influencing medical students to choose family medicine as a career choice during the 2005 match
2. to learn why students who had once considered a career in family medicine later choose a Royal College specialty as a residency
3. to establish if there are significant differences in the opinions of those who select family medicine and those who select a Royal College specialty as a first choice for residency
4. to conclude if institutional factors play a decisive role in the medical career decision-making process of the students.

3.2 Target Population

In Canada, CaRMS is responsible for matching graduating medical students to residency training placements at the thirteen universities registered with CaRMS (*see Appendix*). The target population selected for this study consisted of all graduating medical students

from the class of 2005 at MUN and Dal who had registered with the CaRMS for the first iteration of the 2005 CaRMS match.

Table 3.1: Target population for study

Medical School	Memorial University of Newfoundland	Dalhousie University	Total
Total Target Population (Class of 2005 Graduates Registered with CaRMS)	56	80	136

Source: CaRMS

3.3 Rationale for Selection

The researcher chose to study this group of students for the following reasons:

(1) during the past two CaRMS matches, Dal has had the highest proportion of its graduates choose a career in family medicine, while MUN has placed below the CaRMS national average for family medicine. The inclusion of two universities within the same geographic region (Atlantic Canada), but with significant differences in the proportion of students choosing to pursue family medicine, allowed for institutional comparisons at several levels.

(2) Due to the fact that a student's report of career decision-making can be "biased by recall, reconstruction and rationalization", the researcher collected data shortly after the students had made their career decisions and had registered with CaRMS (Morgan, 1988). By this point in their studies, the students should have been exposed to all of the core clinical rotations (Family Medicine, Internal Medicine, Obstetrics/Gynecology, Pediatrics, Psychiatry, and Surgery).

(3) The researcher and her supervisory committee are located within the Faculty of Medicine at MUN. This aided in getting the research instrument distributed to the target populations and was beneficial in assisting the researcher with the interpretation of the results.

3.4 Development of Research Instrument

Prior to constructing the research instrument, the researcher met with key stakeholders and her supervisory committee to discuss the factors believed to be associated with the decrease in popularity of family practice. The researcher met individually with the CEO of CFPC and several family physicians, first-year medical residents and third-year medical students. The purpose of this exercise was to gain a better understanding of how medical education is delivered within the country and to gather additional background information. The consultation notes and literature review were then utilized to create the research instrument.

3.5 Data Collection

Data were collected by means of a security-protected web-based questionnaire which allowed for automatic entry into an SPSS database for statistical analysis *(see Appendix).* A coding template was created for responses given to open-ended questions and to questions that had an "other, please specify" category.

Table 3.2 List of variables examined in the study

Demographic Variables	Other Variables
1. University Presently Attending	1. First Choice for Residency Placement
2. Age in Years	2. Second Choice for Residency Placement
3. Marital Status	3. When Definite Decision was Made for First Choice Residency
4. Gender	4. Ever Consider Family Medicine as Career Choice
5. Spouse/ Partner: medical student, physician, other health care provider, neither	5. When Definite Decision was Made to Pursue a Career in Family Medicine
6. Have Children	6. Reasons for Not Wanting to Pursue Family Medicine as Career Choice
7. Age of Youngest Child (in Years)	7. Reasons why Family Medicine was Never Considered as a Career Option
8. Degrees/ Diplomas Completed Prior to Medical School	8. Level of Importance Associated with the Following Factors in Selection of First-Choice Residency Placement: a) ability to pursue non-work related interests, b) earning potential, c) financial debt as a result of tuition, d) a mentor before medical school, e) positive experience in discipline during clinical clerkship, f) intellectual stimulation/ challenge, g) prestige, h) research opportunities, i) workload predictability, j) encouragement from medical professionals, k) ability to work in a hospital environment, l) acceptable hours of practice, m) desire to practice in community where childhood was spent, n) ability to work with a wide variety of patient problems, o) desire to work in same community as spouse or partner, p) interest in high technology, q) other, please specify, r) other, please specify, s) other, please specify
9. Highest Education Level of Father	9. Completion of Clinical Clerkship in First Choice Residency
10. Highest Education Level of Mother	10. Satisfaction with Clerkship Experience
11. Community Spent Most of Life Prior to University (based on population size)	11. Completion of Clerkship in Family Medicine
12. Born in Canada	12. Satisfaction with Family Medicine Clerkship Experience
13. Status in Canada: Canadian citizen, permanent resident, other (please specify)	13. Level of Agreement or Disagreement with the Following Statements: a) family medicine is financially rewarding, b) family physicians work reasonable hours, c.) family medicine is intellectually stimulating, d) family physicians are able to have time to pursue non-work related interests, e) family physicians are highly respected bys specialists, f) family physicians play an important role in the delivery of health care, g.) physicians care for a reasonable number of patients, h) family medicine is promoted positively by the family medicine department on campus, i) family medicine was promoted positively by specialists during clinical rotations.

3.6 Recruitment Procedure

Complicated processes, such as career decision-making, necessitate "the use of many research designs and methods to arrive at a comprehensive and valid interpretation" (Mutha et al., 1997). A program of cooperative research that utilizes more than one technique within the same research project compensates for the inherent weaknesses in both techniques and provides a means of triangulation (Bowling, 2003). This study used a web-based questionnaire with both quantitative and qualitative elements as a mode for data collection (see *Appendix*).

Critical to the success of this study was the support from the Deans of Medicine from the participating institutions in terms of encouraging graduating student participation. Medical students who fell within the target population received an e-mail from the dean's office of their respective university in April 2005 (see *Appendix*). The e-mail: (1) informed the class of 2005 medical students about the medical career choice study, (2) outlined the benefits of participation, (3) stated the expected time required to complete the questionnaire, (4) summarized the anonymity measures that would be taken, (5) provided a link to the questionnaire website, and (6) gave information about the incentive for participation (a prize of an iPOD – MP3 player was awarded to a randomly chosen respondent from each of the participating universities). In an effort to increase response rate, a total of three e-mails were sent to the target population of each institution.

3.7 Validity and Reliability

To ensure validity and reliability of this research study the researcher undertook the following measures: (1) the research committee selected for supervision of this study consisted of seasoned health services researchers proficient in research methodology and possessing sound knowledge of the subject area, (2) the questionnaire was pre-tested on a group of 10 Class of 2004 MUN medical students – students were asked to give feedback on the clarity of content, language and length of time required to complete the questionnaire; necessary changes were made to the research instrument prior to the administering the questionnaire, and (3) close collaboration with the supervisory committee allowed for the discovery and refinement of common themes embedded within the analysis.

3.8 Ethical Considerations

Prior to the commencement of this study, permission was requested and received from the Human Investigation Committee at MUN. All necessary steps were taken to ensure that the rights of the respondents were recognized and protected.

All respondents were ensured of measures to protect their anonymity. The following measures were taken: (1) names of the respondents were kept separate from the data base, (2) during the second week of May 2005, two prize winners were selected and the names of the respondents were destroyed after the winners have been notified, (3) the data base was password-protected, (4) respondents were informed that their contribution

would be described in a manner that would protect their identity, (5) only the researcher had access to the identities of the study participants, and (6) informants were told that only aggregate results would be published.

All students were informed of the potential benefits from participating in the study. They were informed how it was anticipated that their contribution would enhance the knowledge and understanding of the factors that influence medical students' career choices. Due to the fact the survey questions were not foreseen to be highly sensitive in nature, the researcher did not anticipate that there would be any anticipated risk to the respondents. The only inconvenience to the participants was the length of time that was required to complete the questionnaire.

3.9 Statistical Analysis

Responses to the questionnaire were entered into SPSS and then divided into two key groups and studied at both an aggregate and an institutional level: (1) those that selected family medicine as a first choice and/or second choice for a residency placement, and (2) those that chose a Royal College specialty as their first and second choice for residency placement.

Descriptive statistics were produced to give a demographic overview of the respondents with respect to their age, gender, marital status, whether or not they had children, spouse or partner affiliated with medicine, community where most of their childhood was spent, citizenship and level of education completed prior to commencing medical school. In

addition, frequencies were conducted to determine the proportion of students from MUN and Dal who chose family medicine or a Royal College specialty as a first choice for residency and when the respondents had made a definitive career decision.

Analysis of variance and independent samples t-test results were produced to compare the mean scores on how 17 different intrinsic and extrinsic factors influenced the two different groups of students. To determine if the means of the two groups of students were statistically significant, the statistical outputs were evaluated at three different levels of significance: 1% ($p < 0.01$); 5% ($p < 0.05$); and 10% ($p <0.\ 10$).

Two-way ANOVA with replacement and a critical level of significance of 1% ($p < 0.01$); 5% ($p < 0.05$); and 10% ($p <.0\ 10$) was utilized and evaluated to determine:

(1) if there were significant differences in the opinions between those who selected family medicine as a first and/or second choice for residency and those who selected a Royal College specialty as a first choice and second choice for residency,

(2) if institutional factors were associated with the medical career decision-making process of the respondents, and

(3) if there was an interaction effect between career choice and the university attended.

In addition, binary logistic regression was conducted on the dichotomous dependent variable (those who chose family medicine as first and/or second choice for a residency and those who chose a Royal College specialty as both a first and second choice for a residency) and several intrinsic and extrinsic independent variables to determine if significant correlations existed within the dataset.

CHAPTER 4 RESULTS

4.1 Response Rate

For the purpose of response rate calculation, the assumption was made that all medical students from the graduating Classes of 2005 at MUN and Dal received a notification e-mail with a web link to the survey. Table 4.1 describes the derivation of the response rate calculation. Of the 137 medical students who were eligible for participation in the study, a total of 68 students completed the survey, which resulted in a total response rate of 49.64%.

Table 4.1 Calculation of response rate

	MUN	Dal
Graduates registered with 2005 CaRMS Match	63	89
Prior year graduates	1	7
Students registered with CaRMS 2005 Match	58	87
Withdrawn from competition	1	0
Final participation in CaRMS 2005 Match	57	87
Eligible respondents to survey (N)	57*	80*
Respondents to survey (n)	32	36
Response rate	**56.14%****	**45.0%****
Total Response Rate	**49.64%**	

Notes: * = Number of students who participated in the CaRMS 2005 Match minus prior year graduates who participated in the CaRMS 2005 Match.
** = n/N

Source: CaRMS, Match Report 2005, Applicant Pool by Medical School: 2005 Match First Iteration, http://www.carms.ca, retrieved 12 August 2005.

4.2 Demographic Characteristics of Respondents

Table 4.2 describes the demographic characteristics of the students who participated in the study. Slightly less than three-quarters (49, 72.1%) of the respondents were female. The average age of the respondents was 27.8 years with a standard deviation of 2.6. Both the age and gender of the respondents were comparable to that of all graduating students from the Class of 2005 (*see Table 4.3*). Just over half (36, 52.9%) of the respondents were single. Of those who were married or living with a partner (32, 47.1%), only 12 (37.5%) had spouses or partners who were involved in the medical/health care profession. The vast majority (63, 92.6%) of the respondents did not have any children. Most of the students (61, 89.7%) had completed a Bachelor of Science prior to commencing their medical degree. Ten (14.7%) of the respondents held advanced degrees (7, 10.3% Masters; 3, 4.4% PhD).

Just over two-thirds of the students stated that the community where most of their life was spent prior to university was either in a rural community or small town with a population of less than 10,000 or from a moderately size city with a population of 50,000 to 499,999 (23, 33.8% and 22, 32.4%) respectively. Only 9 (13.2%) of the students were from a large city with a population of 500,000 or greater. All but 4 (5.9%) students were Canadian citizens.

Table 4.2 Demographic characteristics by university; no. (%) of students

	MUN n = 32	Dal n= 36	Total n = 68
Gender			
Male	7 (21.9)	12 (33.3)	19 (27.9)
Female	25 (78.1)	24 (66.7)	49 (72.1)
Mean age, yr	28.9	27.9	27.8
Marital Status			
Single	19 (59.4)	17 (47.2)	36 (52.9)
Married or living with partner	13 (40.6)	19 (52.8)	32 (47.1)
Spouse/ Partner			
Medical student	*	*	5 (15.6)
Physician	*	*	3 (9.4)
Other health care provider	*	*	4 (12.5)
None of the above	9 (69.2)	11(57.9)	20 (62.5)
Children			
Have child(ren)	*	*	5 (7.4)
Do not have children)	30 (93.8)	33 (91.7)	63 (92.6)
Community where most of life was spent prior to university (population)			
A rural community or small town (</ 10,000)	14 (43.8)	9 (25.0)	23 (33.8)
A small city (10,000 to 49,999)	5 (15.6)	9 (25.0)	14 (20.6)
A moderately sized city (50,000 to 499,999)	11 (34.4)	11 (30.6)	22 (32.4)
A large city (500,000 or more)	*	*	9 (13.2)
Status in Canada			
Canadian citizen	29 (90.6)	35 (97.2)	64 (94.1)
Not a Canadian citizen	*	*	4 (5.9)
Education prior to medical school			
Bachelor of Arts	*	*	3 (4.4)
Bachelor of Science	29	32	61 (89.7)
Bachelor, Other	5	3	8 (11.8)
Masters	3	4	7 (10.3)
Doctorate	*	*	3 (4.4)

- in situations where n = 2 or less, results are not shown for each university to protect anonymity of respondents. This include cases where one university may have had n>2 and the other university n<2.

Table 4.3 Demographic characteristics of Class of 2005 compared to respondents of survey by university; no. (%) of students

	Male	Female	Age
MUN Respondents to Survey (n = 32)	7 (21.9)	25 (78.9)	28.9
MUN Class of 2005 Graduates (N = 63)	23 (36.5)	40 (63.5)	27.0
Dal Respondents to Survey (n = 36)	12 (33.3)	24 (64.7)	27.9
Dal Class of 2005 Graduates (N= 89)	40 (44.9)	49 (55.1)	27.5

4.3 Career Choice of Respondents

Table 4.4 shows the first and second choice career responses (family medicine vs. Royal College specialty) by university. Slightly over two-thirds (46, 67.6%) of respondents stated a Royal College specialty as a first choice for residency, while only 22 (32.4%) stated family medicine. Those students who completed the survey from Dal showed a much higher preference for family medicine (16, 44.4%) than MUN students (6, 18.8%). This is reflective of the 2005 CaRMS Match, where the highest proportion of graduating medical students choosing family medicine were from Dal (34, 39.0%) and the second lowest proportion of students, by university, were from MUN (13, 22.9%). Overall, there was close to an even split between the respondents who chose family medicine as a first or second choice (33, 48.5%) and those respondents who selected a Royal College specialty as a first or second choice for a residency (35, 51.5%).

Table 4.4 Summary of career choice by university; no (and %) of students

	Family Medicine	Specialty
MUN (first choice)	6 (18.8)	26 (81.3)
Dal (first choice)	16 (44.4)	20 (55.6)
Total	**22 (32.4)**	**46 (67.6)**
MUN (first and /or second choice)	13 (40.6)	19 (59.4)
Dal (first and/or second choice)	20 (55.6)	16 (44.4)
Total	**33 (48.5)**	**35 (51.5)**

Table 4.5 displays the responses of those who had selected a Royal College specialty as first choice for residency and family medicine as a second choice (11, 23.9%). Of the 26 MUN students who chose a Royal College specialty as a first choice, 7 (26.9%) selected

family medicine as a second choice. Of the 20 Dal students who chose a specialty as a first choice, 4 (20.0%) chose FM as a second choice. These students may be classified as students who were "potential" family medicine candidates.

Table 4.5 Potential students of family medicine by university; no (%) of students

First Choice for Residency	MUN Family medicine as a Second Choice for Residency	Dal Family medicine as a Second Choice for Residency	Total
Specialty	7 (26.9)	4 (20.0)	11 (23.9)

Table 4.6 describes the respondents who selected a Royal College specialty as a first and second choice for a residency, but had considered a career in family medicine prior to registering for the CaRMS 2005 match. Of the students who ranked a Royal College specialty as first and second 77.1% had initially considered family medicine.

Table 4.6 Respondents who selected a specialty as first and second choice for residency, but had once considered a career in family medicine, no (and %)

Respondents who selected a specialty as first and second choice for residency, but had once considered a career in family medicine	MUN n = 19	Dal n= 16	Total n = 35
yes	15 (78.9)	12 (75.0)	27 (77.1)
no	4 (21.1)	4 (25.0)	8 (22.9)

4.4 When Career Decision was Made

Table 4.7 details when the respondents made their definite decision on their first choice for residency. The vast majority (60, 88.3%) made their decision during medical school (either before or during their clinical clerkship). What is interesting to observe is that far

fewer Dal students (5, 13.9%) made their decision prior to their clinical clerkship, while far more MUN students (10, 31.3%) made their decision at this time.

Table 4.7 When definite decision was made on first choice for residency, no (and %)

Decision on first choice for residency	MUN n = 32	Dal n= 36	Total n = 68
Before high school	1 (3.1)		1 (1.5)
During high school	1 (3.1)	1 (2.8)	2 (2.9)
During bachelor's degree		1 (2.8)	1 (1.5)
After bachelor's degree	1 (3.1)		1 (1.5)
During medical school, but prior to clerkship	10 (31.3)	5 (13.9)	15 (22.1)
During clerkship	18 (56.3)	17 (47.2)	45 (66.2)
Other	1 (3.1)	2 (5.6)	3 (4.4)

Table 4.8 indicates that those who chose a Royal College specialty tended to make their career decision a little later than those who chose family medicine. Although, this was shown to be statistically different between the mean scores, ($t = -1.184$, $p = .013$), the timing of decisions is very similar. In other words, both groups of students made their decisions during medical school, but prior to clerkship. The students who chose a Royal College specialty tended to make their decision closer to the clerkship than those who chose family medicine.

Table 4.8: When career decision was made

When Decision was Made on Definitive Career Choice 1= Before high school 2 = During high school 3 = During bachelor's degree 4 = After completing my bachelor's degree 5 = During graduate studies (masters and / or PhD) 6 = After completing graduate studies (masters and /or PhD) **7 = During medical school, but prior to clerkship** **8 = During clerkship** 9 = Other	**Mean (Family Medicine)**	**Mean (Specialty)**	**t-diff**
	7.1818	7.6286	-1.184

4.5 Factors Affecting Career Choice of Respondents

T-tests were used to examine the extent to which 17 different intrinsic and extrinsic factors influenced two different groups of students (those that chose family medicine and/or specialty as first or second choice for a residency) in their first choice for a residency. Most of the responses to the different factors were rated on a 4-point Likert scale ranging from 1 (very important) to 4 (not important at all). Only two factors, experience in discipline and desire to work in same community as spouse or partner, had a 5-point Likert scale with 0 (not applicable).

Of the 17 factors examined in the study, 7 were shown to be statistically different at a 90% confidence interval between the mean scores for family medicine and for a Royal College specialty *(see Table 4.9).* Those choosing Royal College specialties placed a higher degree of importance on these 7 factors than those who chose family medicine:

1. *earning potential ($t = -1.955, p = .055$)*
2. *experience in discipline during clinical clerkship ($t = -1.988, p = .051$)*
3. *research opportunities ($t = -2.161, p = .034$)*

4. *intellectual stimulation/challenge (t = -2.880, p = .006),*

5. *ability to work in a hospital environment (t = -2.859, p = .006)*

6. *desire to be an expert in a very specialized area of medicine (t = -6.405, p = .000)*

7. *an interest in high technology (t = -2.739, p= .008).*

Table 4.9 Level of importance of factors associated with first choice for residency

	Mean Family Medicine	Mean Specialty	t-diff
Desire to be an expert in a very specialized area of medicine	1.5152	2.8286	-6.405***
Ability to work in a hospital environment	2.4242	2.9714	-2.859***
Intellectual stimulation/challenge	3.4242	3.8571	-2.880***
Interest in high technology	1.5455	2.1176	-2.739***
Research opportunities	2.1515	2.6286	-2.161**
Experience in discipline during clinical clerkship	3.4848	3.7714	-1.998**
Earning potential	2.4242	2.8000	-1.955*
Encouragement from medical professionals	2.6364	2.9143	-1.435
Desire to practice in community where I spent my childhood	2.0000	1.6857	1.279
A mentor before medical school	2.1818	1.8857	1.215
Desire to work in same community as spouse or partner	2.4667	2.1852	0.905
A mentor during medical school	2.9394	3.1429	-0.940
Ability to pursue non-work related interests (leisure activities)	3.3939	3.2571	0.802
Prestige	2.1212	2.2286	-0.592
Acceptable hours of practice	3.2424	3.3143	-0.363
Financial debt	2.3939	2.3714	0.112
Workload predictability	2.7273	2.7143	0.077

+/-1.645 = significant at 90% conf. *
+/-1.96 = significant at 95% conf. **
+/-2.576 = significant at 99% conf. ***

4.6 Reasons for Not Pursuing Family Medicine

A total of 35 (51.5%) respondents did not choose family medicine as a first or second career choice. This group of students was asked in the survey why they decided not to pursue family medicine as a career choice. A total of 24 students (response rate = 24/35 = 68.6%) responded to this open-ended question. All of the responses were examined

and collapsed into five common themes: lifestyle, negativity surrounding the discipline of family medicine, type of patients served, research and other interests. Responses to this question are summarized in Table 4.10.

Table 4.10 Reasons for not pursuing family medicine as a career choice

Lifestyle
I believe that what I will miss in family medicine, I can find much of it outside of my professional life.
A better lifestyle.
At the end of the day in radiology, I was tired but I still had interpersonal energy left for my family.
Because I wanted to have a greater income.
Did not want to run my own office.
Family doctors see a high volume of patients and are often drained interpersonally.
I know several family physicians who are not living an extravagant life and are struggling to repay large debt acquired in medical school.
I wanted to do obstetrics, but on call 24-7 - didn't enjoy this.
I was attracted to other specialties more--more free time and more personal independence in my chosen specialty.
Lifestyle and remuneration issues.
Lifestyle, salary issues.
Lifestyle/income as family practitioner not ideal for me.
My experience has been that family physicians are overworked.
Office obligations.
Wanted the freedom to travel with my career and not feel like I was abandoning my patients
Negativity Surrounding the Discipline of Family Medicine
I have seen many more family physicians unhappy with their career than physicians who are happy. In my experience those that are on salary tend to be more content (but work much less). They see a significantly lower number of patients per day.
In the real world of fee-for-service or even salary in a remote place with only a few doctors, there appears to be very little job satisfaction.
Most family physicians I had met were displeased with the current state of family practice in Canada.
My experience has been that family physicians are under respected.
The lack of respect by other physicians within the specialties.
Type of Patients Served
Although FM also provided fantastic experiences I felt I enjoyed the patient population in pediatrics more.
Did not enjoy the +++psych in family medicine.
I was markedly discouraged from Family because I did not want to be a doctor who simply referred on- which the demanding changing patient population is starting to develop into.

Table 4.10: Reasons for not pursuing family medicine as a career choice (continued)

The opportunity to treat my patients to the final stage of their ailment discouraged me from Family, and towards a specialty.
One of my reasons was that if I had been a family doctor I would have wanted to return home but I did an elective there and I found it very hard seeing people I know suffering. I don't think that emotionally I could handle treating people that I know and I would want to work rurally so I don't know how the two could ever work out.
The time spent with patients.
[redacted]
I would prefer to work in the context of an academic centre/teaching hospital, and internal medicine offers greater opportunities for academic physicians.
The academic world of research and teaching is more accessible in Radiology.
[redacted]
Absence/lack of surgery in family med.
Because I wanted to specialize.
Found something more interesting to me.
I am a detail oriented person and thought that by narrowing down the scope of practice I could more easily achieve the level of detail I feel I need in order to be comfortable.
I am a generalist who enjoys brief procedures and radiology meets those interests (as family would have).
I became more and more interested in psychiatry throughout medical school.
I definitely want to live and practice in a large urban centre, but I don't like the type of work that is encompassed in being a family physician in this setting (mainly clinic-based, non-acute care, little to no hospital work except for obstetrics, which I am not interested in).
I felt that I was more suited to a specialty because I prefer to focus on becoming an expert in one area rather than knowing a little about everything.
I felt that pediatrics was a better suited specialty for me and I had many positive experiences in my electives.
I just felt that my interests would be better served in the specialty of internal medicine.
I liked working in a hospital environment and I was interested in a career in a surgical subspecialty.
I preferred paeds.
I simply enjoyed internal medicine more than family medicine.
I wanted to do a surgical specialty.
Interested in subspecialty training.
It was a question of what I loved most and that was what I chose.
My background, personality and interests would suit family medicine well and I was torn between radiology and family.
Neurology is more interesting and challenging.
Not procedure orientated enough.
Realized I enjoyed pediatrics more.

4.7 Institutional Differences in the Selection of Family Medicine as a Career Choice

In order to determine:

(1) if there were significant differences in the opinions between those who selected family medicine and those who selected a specialty as a first choice for residency

(2) if institutional factors were associated with medical career decision-making

(3) if there was an interaction between career choice and university attended

the scores of these 17 different factors were subjected to a two-way analysis of variance with university (MUN versus Dal) and career choice (family medicine as first and/or second choice for residency) as the independent variables.

Table 4.11 shows the results of the two-way ANOVA. Significant main effects were found for:

1. intellectual stimulation/challenge ($F = 3.72$, $p = .0582$)
2. research opportunities ($F = 4.04$, $p = .0488$)
3. ability to work in a hospital environment ($F = 7.15$, $p = .0095$)
4. desire to be an expert in a specialized area of medicine ($F= 38.06$, $p = .0000$)
5. interest in high technology ($F = 8.03$, $p =.0062$)

which indicated the mean score was significantly greater for those who chose a Royal College specialty than those who chose family medicine.

Earning potential ($F = 3.72$, $p = .0582$) and experience in discipline during clinical clerkship ($F = 3.91$, $p = .0524$) were found to be very close to being significant at the .05 significance level. There were no significant effects for university attended. However, encouragement from medical professionals ($F = 1.83$, $p = .1808$) scored just under the .20 level of significance.

Interaction effects were proven significant at the .05 level for:

1. interest in high technology for those who chose a Royal College specialty for a career and were a MUN medical student ($F = 5.50$, $p = .0222$) and
2. desire to practice in the community where childhood was spent for those students from Dal who chose family medicine as a career choice ($F = 5.04$, $p = .0282$).

A mentor before medical school ($F= 3.68$, $p =.0596$) was shown to be very close to having significant interaction effect at the .05 level (for those students from MUN who chose family medicine as a career choice). Desire to work in same community as spouse or partner ($F = 2.62$, $p = 0.1107$) was close to having a significant interaction effect at the .10 level (for those students from MUN who chose a specialty for a career choice).

Table 4.11 Level of importance of factors associated with first choice for residency; F statistics

	University (F)	Fammed12 (F)'''	Interaction (F)
Ability to pursue non-work related interests (leisure activities)	0.49	0.45	0.01
Earning potential	0.24	3.72+ (SP)^	0.64
Financial debt	0.13	0.00	0.11
A mentor before medical school	0.79	0.94	3.68+ (MUN) (FM)^
A mentor during medical school	1.25	1.30	0.55
Experience in discipline during clinical clerkship	0.13	3.91+ (SP)^	0.94
Intellectual stimulation / challenge	0.11	8.47*** (SP)^	0.01
Prestige	0.12	0.27	0.00
Research opportunities	0.66	4.04** (SP)^	0.06
Workload predictability	0.51	0.04	0.18
Encouragement from medical professionals	1.83+	1.40	0.16
Ability to work in a hospital environment	0.41	7.15*** (SP)^	0.10
Acceptable hours of practice	0.37	0.17	0.26
Desire to practice in community where I spent my childhood	0.13	1.20	5.04**(Dal) (FM)^
Desire to be an expert in a very specialized area of medicine	0.04	38.06*** (SP)^	0.35
Desire to work in community as spouse or partner	0.79	0.36	2.62+ (MUN) (SP)^
Interest in high technology	1.10	8.03*** (SP)^	5.50** (MUN) (SP)^

''' = Fammed12 = those respondents who chose family medicine as a first and/or second choice for a residency.
^ FM = family medicine and SP = Specialty
* P < 0.1
** P < 0.05
*** P < 0.01
+ P < 0.20

4.8 Opinions of Family Medicine

All students were asked to rank the level they agreed or disagreed with the following eight statements about family medicine:

1. Family medicine is financially rewarding
2. Family physicians work reasonable hours

3. Family medicine is intellectually stimulating
4. Family physicians are able to pursue non-work related interests (leisure activities)
5. Family physicians are highly respected by specialists
6. Family physicians play an important role in the delivery of health care
7. Specialists play an important role in the delivery of health care
8. Primary care renewal will create a bad situation for family doctors

The responses to the eight statements were cross-tabulated by university, by specialty and by level of agreement with the statements. Table 4.12 displays the results.

Table 4.12 shows the results of the two-way ANOVA for the opinions of family medicine as a discipline. Significant main effects were found for:

1. family medicine is intellectually stimulating ($F = 9.06$, $p = .0037$ with mean higher for those who chose family medicine)
2. family physicians play an important role in the delivery of health care ($F = 4.65$, $p = .0348$ with the mean higher for Dal students)
3. primary care renewal will create a bad situation for doctors ($F = 4.25$, $p = .0437$ with the mean score significantly higher for those who chose a Royal College specialty).

Due to the small sample size and the few factors that were statistically significant at conventional levels, it was thought that this discussion should be expanded to include results which fell outside of conventional levels of significance. *Primary care renewal will create a bad situation for doctors* ($F = 1.65$, $p = .2043$) was found to be close to being significant at the .20 level for university. Although, no interaction effects were

found, the interaction for *family medicine is financially rewarding* fell within the .20 level of significance (F= 5.50, p =.0222).

Table 4.12 Opinions of family medicine as a discipline

Level of agreement with statements:	University(F)	Fammed12 (F)	Interaction (F)
Family medicine is financially rewarding.	3.51+ (MUN)	1.37	1.81+ (FM) (MUN)^
Family physicians work reasonable hours.	0.27	0.01	1.36
Family medicine is intellectually stimulating.	0.52	9.06** (FM)^	0.61
Family physicians are able to have time to pursue non-work related interests (leisure activities)	0.39	0.03	0.14
Family physicians are highly respected by specialists.	0.24	1.12	0.17
Family physicians play an important role in the delivery of health care.	4.65** (Dal)	0.85	0.29
Family physicians encouraged family medicine as a career during my clerkships.	0.57	0.13	0.05
Specialists encouraged family medicine as a career during my clerkships.	0.39	0.41	1.49
Primary care renewal will create a bad situation for family doctors.	1.65+ (Dal)	4.25** (SP)^	0.02

^ FM = family medicine and SP = Specialty

* P < 0.1
** P < 0.05
*** P < 0.01
\+ P < 0.20

4.8 Size of Community Desired for Practice

Table 4.13 shows that all four dependent variables with respect to community size were proven to be statistically significant through two-way ANOVA:

1. Desire to practice in a large city (population 500,000 or more)

F = 4.05, p = .0484 with the mean score being significantly higher for those who chose a Royal College specialty versus those who chose family medicine.

2. Desire to practice in a moderately sized city (population 50,000 to 499,999)

F = 18.54, p = .0001 with the mean score being significantly higher for those who chose a Royal College specialty versus those who chose family medicine.

3. Desire to practice in a small city (population 10,000 to 49,999)

F = 6.09, p = .0164 with the mean score being significantly higher for those who chose family medicine versus those who chose a Royal College specialty.

4. Desire to practice in a rural community or small town (population less than 10,000)

F = 18.06, p = .0001 with the mean score was significantly higher for those who chose family medicine than those who chose a specialty. The interaction effect was also proven to be highly significant (F = 8.18, p = .0057) for those students from Dal who chose family medicine as a first and/or second career choice.

Table 4.13 Level of importance of factors associated with first choice for residency

1 = no desire at all; 2 = desire 3 = strong desire			
	University (F)	Fammed12 (F)'''	Interaction (F)
A large city (population 500,000 or more)	0.00	4.05** (SP)^	0.06
A city of moderate size (population 50,000 to 49,999)	0.12	18.54*** (SP)^	1.49
A small city (population 10,000 to 49,999)	1.50	6.09** (FM)^	0.10
A rural community or small town (population less than 10,000)	5.27** (Dal)	18.06*** (FM)^	8.18+ (FM, Dal)^

''' Fammed12 = those respondents who chose family medicine as a first and/ or second choice for a residency.
^ FM = family medicine and SP = Specialty

* P < 0.1
** P < 0.05
*** P < 0.01
\+ P < 0.20

4.9 Binary Logistic Regression Outputs

Table 4.14 shows the results of the binary logistic regression analysis that was performed on the selection of family medicine as a first and/or second career choice as an outcome variable and a combination of demographic and attitudinal predictors.

It was found that students who chose family medicine as a first and/or second choice for a career were more likely to not be married (B = -2.232, P = .037) and have non-medical parents (B = -13.728, P = .047). Those who chose family medicine attributed their career choice to a mentor before medical school (B = 3.580, P = .028) and placed a stronger weight on workload predictability (B = 4.998, P = -.039). They were also inclined to be less concerned about earning potential (B = -10.663, P = .048), intellectual stimulation/ challenge (B = -4.814, P =.037) and the ability to work in a hospital environment (B = -5.920, P =.033).

Those who chose family medicine tended to be from smaller communities (B = 3.642, P = .055) and less interested in research opportunities (B= -3.914, P = .083). Dalhousie students chose family medicine at a higher rate than MUN students (B = -9.047, P = .083).

Although not proven to be statistically significant, on average, students who chose family medicine tended to be older (B = .601, P = .194); female (B = 9.380, P = .117); less concerned about acceptable hours of practice (B = -1.844, P =.139) and high technology

(B = -1.939, P = .119). They also, on average, had a stronger desire to practice in the community where they spent their childhood (B = 2.406, P = .157). Students' satisfaction with their clerkship in family medicine appeared to have minimal effect on their career choice (B = .780, P = .501).

Table 4.14 Binary logistic regression analysis outputs of family medicine as a first and/or second choice for career as a function of demographic and extrinsic variables

	B	Odds Ration (EXP) B	P-value
University	-9.047	0.000	0.083*
Marital Status	-2.232	0.107	0.037**
Type of community where childhood was spent	3.642	38.168	0.055*
Gender	9.380	11849.015	0.117
Age	0.601	1.062	0.194
Father and/or Mother a Medical Doctor	-13.728	0.000	0.047**
Level of Importance Associated with factors and interest in Family Medicine as a first and/or second career choice			
Earning potential	-10.663	0.000	0.048**
Intellectual stimulation/challenge	-4.814	0.008	0.037**
A mentor before medical school	3.580	35.874	0.028**
Research opportunities	-3.914	0.020	0.083*
Prestige	8.326	-4129.865	0.061*
Workload predictability	4.998	148.117	0.039**
Ability to work in a hospital environment	-5.920	0.003	0.033**
Satisfaction with clerkship in family medicine	0.780	2.181	0.501
Desire to practice in community where I spent my childhood	2.406	11.090	0.157
Acceptable hours of practice	-1.844	0.158	0.139
Interest in high technology	-1.939	0.144	0.119

* statistically significant at 90% confidence interval
** statistically significant at 95% confidence interval

Table 4.15 shows the results of the second binary logistic regression. It was found that students who chose family medicine as a first and/or second choice for a career had a weaker desire to practice in a city of moderate size (B = -1.509, P .020) and had a stronger desire to practice in a small town or rural community (B = 1.019, P =.043). On average, students tended to female (B = 1.280, P =.129) and older (B = .137, P =.278). The other demographic variables (university, marital status, the type of community where childhood was spent, and whether or not a parent had a medical degree) were not proven to be statistically significant.

Table 4.15 Binary logistic regression analysis outputs of family medicine as a first and/or second choice for career as a function of demographic and intrinsic variables

	B	Odds Ratio EXP(B)	P-value
University	-4.31	0.013	0.533
Marital Status	.082	1.085	0.799
Type of community where childhood was spent	.073	1.076	0.833
Gender	1.280	3.597	0.129
Age	.137	1.147	0.278
Father and/or Mother a Medical Doctor	-.160	0.852	0.859
Desire to Practice in a city of moderate size (population 50,000 to 49,999)	-1.509	0.221	0.020**
Desire to Practice in a rural community or small town (population less than 10,000)	1.019	2.770	0.043**

* statistically significant at 90% confidence interval
** statistically significant at 95% confidence interval

Chapter 5: Summary and Conclusions

5.1 Background

For the past two decades, the goal in Canada has been to sustain a 50:50 split between family physicians and Royal College specialists (Shortt et al., 2003). During the past several years, the proportion of medical students selecting family medicine as a first choice for a residency has decreased substantially, from 44% in 1992 to 28% in 2005. The high number of Canadian medical students not choosing to pursue family medicine coupled with the aging population, past reductions in medical school enrollment, and the pending retirement of older physicians are anticipated to translate into reduced access for patients and a heightened demand for the services performed by family physicians. Despite this decline there has been limited research examining the career decision-making process of students at Canadian medical schools. It is important for medical schools to produce the right number and mix of physicians needed by Canadian society (Health Canada, 2001). One way to help reverse the disengagement towards family medicine is to develop a better understanding of the cause of the problem through the study of medical students.

5.2 Purpose of the Study

The purpose of this study was to develop an understanding about why fewer medical students are choosing family medicine as a career choice. Through the study of graduating medical students from two different universities located in similar geographic

regions (Atlantic Canada), but with a wide variance in the proportion of their students choosing family medicine, the researcher aimed to satisfy the following objectives:

(1) To determine the factors that had the greatest predictive value in influencing medical students to choose family medicine as a career choice during the 2005 CaRMS match.

(2) To learn why students who had once considered a career in family medicine later chose a Royal College specialty as a residency.

(3) To establish if there were significant differences in the opinions of those who selected family medicine and those who selected a specialty as a first choice for Royal College residency.

(4) To conclude if institutional factors played a decisive role in the medical career decision making process of the students.

5.3 What We Did

We designed and pre-tested a security-protected web-based questionnaire which allowed for automatic entry into a SPSS database for statistical analysis. The target population selected for this study consisted of all graduating medical students from the Class of 2005 at Memorial University of Newfoundland and Dalhousie University who had registered with CaRMS for the 2005 first match iteration.

Medical students who fell within the target population received an e-mail from the Faculty of Medicine of their respective university during April 2005. At that point in their studies, the students had been exposed to all of the core clinical rotations and had

selected their career preference with CaRMS. This helped minimize the potential for bias with respect to recall, reconstruction and rationalization.

In an effort to increase the response rate, a total of three e-mails were sent to the target population of each institution and an incentive for participation (a prize of an iPOD – MP3 player was awarded to a randomly chosen respondent from each of the participating universities). Of the 137 medical students who were eligible for participation in the study, a total of 68 students completed the survey, which resulted in a combined response rate of 49.64%.

Slightly less than three-quarters (49; 72.1%) of the respondents were female. The average age of the respondents was 27.8 years with a standard deviation of 2.6. Both the age and gender of the respondents were comparable to that of all graduating students from the Class of 2005 (*see Table 4.3*). Just over half (36; 52.9%) of the respondents were single. Of those who were married or living with a partner (32; 47.1%), only 12 (37.5%) had spouses or partners who were involved in the medical / health care profession. The vast majority (63; 92.6%) of the respondents did not have any children. Most of the students (61; 89.7%) had completed a Bachelor of Science prior to commencing their medical degree. Ten (14.7%) of the respondents held advanced degrees.

Close to two-thirds (45; 66.2%) of the students stated that the community where most of their life was spent prior to university was either in a rural community or small town with

a population of less than 10,000 or from a moderately size city with a population of 50,000 to 49,999 (23; 33.8% and 22,;32.4%) respectively. Only 9 (13.2%) of the students were from a large city with a population of 500,000 or greater. All, but , 4 (5.9%) students were Canadian citizens.

5.4 What We Found

Just over two-thirds (46; 67.6%) of respondents stated a Royal College specialty as a first choice for residency, while only 22 (32.4%) stated family medicine. Those students from Dal showed a much higher preference for family medicine (16; 44.4%), than MUN students (6; 18.8%). This is reflective of the 2005 CaRMS match, where the highest proportion of graduating medical students choosing family medicine were from Dal (34; 39.0%) and the second lowest proportion of students by university, were from MUN (13; 22.9%).

Overall, there was close to an equal split between the respondents who chose family medicine as a first or second choice (33; 48.5%) and those respondents who selected a Royal College specialty as a first or second choice for a residency (35; 51.5%).

Of the 26 MUN students who chose a specialty as a first choice, 7 (26.9%) selected family medicine as a second choice. Of the 20 Dal students who chose a specialty as a first choice, 4 (20.0%) chose family medicine as a second choice. These students may be

classified as students who were "potential" family medicine candidates. Over three-quarters (27; 77.1%) of the students who had once considered family medicine as career choice later changed their preference to a Royal College specialty. These groups of students may be classified as students who were "potential" family medicine candidates.

The vast majority of students (60, 88.3%) made their final decision on their first choice for residency during medical school (either before or during their clinical clerkship). What was interesting to observe is that far fewer Dal students (5, 13.9%) made their decision prior to their clinical clerkship, while far more MUN students (10, 31.3%) made their decision at this point in their medical education; suggesting that MUN students are making definitive career decisions earlier in their medical education.

A variety of statistical tests were used to examine the factors associated with choosing (or not choosing) family medicine. T-tests were used to examine the extent to which 17 different intrinsic and extrinsic factors influenced two different groups of students (those that chose family medicine and/or a Royal College specialty as first or second choice for a residency) in their first choice for a residency. Of the 17 factors examined, 7 were shown to be statistically different at a 90% confidence interval. T-tests results indicated that those choosing specialties placed a higher degree of importance on these 7 factors than those who chose family medicine:

- earning potential
- experience in discipline during clinical clerkship;
- research opportunities

- intellectual stimulation/challenge
- ability to work in a hospital environment
- desire to be an expert in a very specialized area of medicine and
- an interest in high technology.

Two–way analysis of variance resulted in significant main effects for: *intellectual stimulation/challenge* ; *research opportunities*; *ability to work in a hospital environment*; *desire to be an expert in a specialized area of medicine* and *interest in high technology* which indicated that the mean score was significantly greater for those who chose a specialty than those who chose family medicine. Interaction effects were proven significant at the .05 level for: *interest in high technology* (for those who chose a specialty for a career and attended MUN) and *desire to practice in the community where childhood was spent* (for those students from Dal who chose family medicine as a career choice).

All four independent variables with respect to community size were proven to be statistically significant through two-way ANOVA:

- *Desire to practice in a large city (population 500,000 or more)* with the mean score being significantly higher for those who chose a Royal College specialty versus those who chose family medicine.

- *Desire to practice in a moderately sized city (population 50,000 to 499,999)* with the mean score being significantly higher for those who chose a Royal College specialty versus those who chose family medicine.
- *Desire to practice in a small city (population 10,000 to 49,999)* with the mean score being significantly higher for those who chose family medicine versus those who chose a Royal College specialty.
- *Desire to practice in a rural community or small town (population less than 10,000)* with the mean score was significantly higher for those who chose family medicine than those who chose a specialty. The interaction effect was also proven to be highly significant for those students from Dal who chose family medicine as a first and/or second career choice.

Binary logistic regression analysis revealed that students who chose family medicine as a first and/or second choice for a career were more likely to *not be married* (which was contrary to what was found in the literature) and to have *non-medical parents*. Those who chose family medicine attributed their career choice to *a mentor before medical school* and *placed a stronger weight on workload predictability*. They were also inclined to be less concerned about *earning potential, intellectual stimulation/challenge* and the *ability to work in a hospital environment*. Those who chose family medicine tended to be from *smaller communities* and less interested in research opportunities. Dal students chose family medicine at a higher rate than MUN students.

Although not proven to be statistically significant, on average, students who chose family medicine tended to be *older, female, less concerned about acceptable hours of practice,* and less interest in *high technology.* They also, on average, had a *stronger desire to practice in the community where they spent their childhood.* Students' satisfaction with their clerkship in family medicine appeared to have minimal effect on their career choice.

Two-way analysis of variance showed significant main effects for: *family physicians play an important role in the delivery of health care* (with the mean higher for Dal students); *family medicine is intellectually stimulating* (with mean higher for those who chose family medicine); and *primary care renewal will create a bad situation for doctors* (with the mean score significantly higher for those who chose a Royal College specialty).

Six themes emerged within the data with respect to the reasons why those who chose a Royal College specialty did not choose family medicine: lifestyle (better, free-time, do not want office obligations, greater income); negativity surrounding profession (lack of respect by other physicians), patients served (did not want to refer patients, time spent with patients), research (greater opportunities for research).

5.5 Research Limitations

There were limitations to this study. Only two medical schools participated in this study and the results, therefore, may not be representative of other graduates of other Canadian medical schools. Although several medical students, physicians and researchers aided

with the development of the questionnaire, there may have been other important factors attributed to career choice that were not included on the survey.

This study was of one year's graduating class at two medical schools. As shown on figure 1.4, there are significant year to year fluctuations at each of these two medical schools in the number and percent of graduating medical students choosing family medicine in the CaRMS Match. Indeed, in the 2006 CaRMS Match, 45.1% of Memorial graduating students matched to family medicine - the highest in the nation. For Dalhousie, the percent was 40.1%. This may in part explain the lack of statistical significance in comparing the institutional factors between MUN and Dalhousie. The use of two medical school graduating classes however, would help offset the individual year to year variation effect of the medical schools. Further studies involving more years and more students would clearly be beneficial.

Due to the fact the students had to recall past events that may have influenced their career choice, there was a potential for recall bias. A longitudinal cohort study which follows medical students through their studies to graduation would have been more beneficial in tracking the issues that influence Canadian medical students' choice of career, both positively and negatively, and would have minimized the potential for recall problems.

5.6 Interpretation of Results

In light of the preceding discussion regarding the research limitations of the study, it is appropriate to offer a final summary of the contribution which the research has made to current knowledge. The results of the study are consistent with the findings found in the review of Canadian and international research. There are three main areas in which universities can aim to attract more students towards family medicine.

Medical Education

The role of the medical school in promoting the merits, opportunities and benefits of family medicine is closely associated with medical students pursuing family medicine as a career choice. Over three-quarters (27; 77.1%) of the students who had once considered family medicine as career choice later changed their preference to a Royal College specialty. These groups of students may be classified as students who were "potential" family medicine candidates. Due to the fact that most students make their definitive career choice during medical school (prior to clerkship), active and consistent promotion of the positive aspects of family medicine throughout the entire undergraduate medical training process may stimulate an increased interest in family medicine by students. Repeated exposure by students to competent family medicine faculty and/or advocates of family medicine will help pique students interest towards family medicine and the diverse opportunities available within the discipline.

Selective Recruiting

Given the declining interest in family medicine residencies by students of Canadian universities during the past 10 years, it appears that medical schools should also aim at accepting the 'right' type of students. Upon entry to medical school, many students' career decisions have already been made. The careful screening of medical school applicant by admissions committees may increase the probability that more students will choose family medicine residencies at the end of their undergraduate medical education. Concentrated efforts at selecting students who are older, who come from rural communities, who have non-medical parents and who are of a lower socioeconomic status could help increase the proportion of graduating classes choosing family medicine as a career.

Financial Reasons

Since the early 1990s, Canadian tuition for medical school has increased dramatically. Canadian medical student debt loads are now at all time high. By the time students graduate from Canadian medical schools they already have an educational debt of $100,000 (Rosser, 2002). Moreover, for those interested in family medicine, it can cost close to $75,000 to launch a comprehensive practice (Rosser, 2002). Thus, many students may feel compelled to "maximize their earning potential by pursuing those Royal College specialties that generate high incomes", rather than choosing family medicine (Task Force Two, 2003). In order to lessen the financial burden on students, universities should partner with government and increase incentives for students to

pursue family medicine. Bursaries, stipends, scholarships and research prizes for students interested in family medicine should be expanded and actively promoted to students.

Table 5.1 Intrinsic and extrinsic characteristics common to those who choose family medicine as a career choice

Findings - Intrinsic Factors	Findings - Extrinsic Factors
Age – tend to be older	Experience during first year clinical clerkship in family medicine
Gender – tend to be female	Encouragement from medical professionals
Marital status – less likely to be married	timing of family practice clerkships
Undergraduate degree - no direct relation	amount of required weeks for the study of family medicine within the clerkship
Parental occupation – have non-medical parents	Strength of family medicine department on campus
Less concerned about earning potential	
Less concerned about intellectual stimulation/ challenge	
Less of an interest in high technology	
Less of an interest to practice in a hospital environment	
A stronger desire to practice in the community where childhood was spent	
Less concerned about acceptable hours of practice	
More interested in workload predictability	
More likely to have had a mentor prior to medical school	

5.7 Overview of Current Initiatives to Attract Students to Family Medicine at Atlantic Canadian Universities

Both Dalhousie University and Memorial University have recently instituted several strategies to attract more students towards family medicine. The success of these efforts should be able to be measured once students have completed and have been exposed to a full four-year undergraduate program with these new initiatives in place. The following is a summary of these initiatives by university.

Dalhousie University (McLean, 2006; Cormier, 2006)

Introduction of an aggressive electives program

- Recently introduced and actively promotes an electives program during first and second year medicine.
- Approximately 50% of the class now completes an elective in family medicine.
- The electives are highly variable – office-based, hospital-based, sports medicine, family medicine obstetrics, women's health, leadership, patient education, family medicine research.

Stronger presence of family medicine within the medical school

- Faculty who are family physicians attend many functions.
- Arranged for more students to spend time with family doctors (mentorship).

Family Medicine Day

- Every two years Dalhousie University has a 'Celebrating Family Medicine Day'. This whole day event is highly educational and enjoyable for the students.
- It addresses the issues and myths surrounding the discipline of family medicine. The students are informed about how family physicians stay up-to-date, how they get paid, that family physicians make a good living, how varied the scopes of practice can be, that it is possible to do research and get published and the fact that the top students often go into family medicine.

Strengthened Awards for Students

- Strengthened prizes for students (a $100 prize was increased to up to $1000) .
- Actively promotes CFPC research prizes to students.

Family Medicine Interest Group (FMIG)

- Dal was the first university to launch a FMIG and it has received tremendous support from students, faculty, and staff.
- Last year the FMIG hosted two speaker nights - one with family doctors with different areas of interest and the second with residents from all of the Maritime program locations.
- The FMIG also held an extremely popular clinical skills night mostly for first and second year students where all the teaching was done by family medicine residents. Due to the success of the clinical skills night, the FMIG plans to offer additional evenings during the next academic year.
- Two Dalhousie students travelled across Canada last year and interviewed family doctors in order to produce a family medicine promotional video for CFPC. The video will be distributed to all FMIGs in the near future.
- Representatives of the FMIG met with the Undergraduate Dean of Medical Education to try and advocate for more input by family physicians in the curriculum especially in the first two years of the program. The Dean supports

the FMIG engaging in discussion with the Undergraduate Medical Education Committee.

- An educational road trip to Cape Breton is planned for the fall to expose students to one of the rural residency sites and to meet some of the family doctors.
- A wine and cheese for the students who matched to family medicine from Dal.
- Provide informational sessions to students about what it is like to be a family doctor at 'Lifestyles and Medicine' nights. Issues such as motherhood and medicine are discussed. According to students they find such sessions to be very informative.

Family Physicians Act as Mentors to Students

- Dal clerks are sent to great family doctors in the community. It is a tough clerkship with a lot of objectives and students can fail. Family medicine is being promoted as an academically rigorous discipline.

Memorial University of Newfoundland (Parsons, 2006)

Family physicians teach first year clinical skills

- Family medicine is very involved in teaching first year clinical skills. This occurs weekly in small groups on Wednesday mornings from September to March and involves a family physician and a community facilitator (often a social worker) with the same group for this entire time.

- Several family medicine faculty are also involved in teaching second-year clinical skills. Family physicians are also involved in teaching palliative care, geriatrics, musculoskeletal, 'Day in Violence' to name a few as well as selected lectures in other systems.
- The expectation in the discipline is that each faculty member is involved in clinical skills teaching at some level. There is no doubt though that the visibility of family physicians is highest in first year and declines with each year.

Black Bag Project

- Launched the "Black Bag" project which is the addition of two weeks of clinical experience in family medicine during the second year of medical studies.

Sponsor students to attend Family Medicine Forum

- Sponsors students to attend the annual Family Medicine Forum which is the National Meeting of Family Physicians in Canada.

Family Medicine Interest Group (FMIG)

- In 2003, FMIG was launched at MUN. The FMIG is very active and currently has 40-60 members.
- Regular events are scheduled with presentations by family physicians showing the scope that family medicine has to offer. All MUN medical students are invited to these events.

- In the interest of maximizing student exposure to faculty and residents in family medicine, FMIG has initiated a new session called 'Fridays with Family'. This casual lunch-time session is an open session for undergraduate students to have lunch with family medicine faculty, residents and academic staff.

New Dean

- In 2003, a new dean (Dr. James Rourke) was appointed to the Faculty of Medicine. Dr. Rourke is a family physician who is an advocate of family medicine, an active researcher and is well published. It is thought that his involvement with the faculty will help launch several new initiatives to attract more students towards family medicine. A recent initiative was the opening of the Primary Care Research Centre. This centre should increase the level of awareness of how family doctors can conduct research and make valuable contributions through published research.

5.7 Recommendations

As evidenced in this paper, the health human resource planning must aim to ensure a sustainable supply of family physicians within Canada. Based on this study, the following recommendations are made:

- Universities should investigate methods to allow for more careful screening of applicants to medical schools to target students who are more likely to select family medicine and are more likely to practice in rural areas.

- The positive aspects of family medicine should be promoted continuously to students throughout their entire undergraduate medical training.
- Faculties of medicine must identify and recruit positive role models within the discipline of family medicine to promote the discipline to students (especially during the first two years of the undergraduate medical curriculum).
- More subsidies and debt relief should be made available to students who choose to pursue family medicine as a career choice. Students should be made aware of this opportunity during their first year of medical studies and throughout their undergraduate medical education.
- Universities should promote the fact that family medicine offers exciting research opportunities and actively seek to engage students in the research process.
- The merits, importance and visibility of the discipline of family medicine must be enhanced through targeted promotion to both the general public and among medical students and specialists.
- Further research at both a local and a national level should be conducted into the career decision-making process of medical students.

Bibliography and References:

AMWC - Australia Medical Workforce Committee (2002). Career decision making by doctors in their postgraduate years

Barer, M. , Stoddart, G (1991). Toward integrated medical resource policies for Canada. Prepared for the F/P/T Conference of Deputy Ministers of Health.

Blades, D et al. (2000). A study of junior doctors to investigate the factors that influence career decisions. *British Journal of General Practice*, Vol. 455, No. 50, 483-5.

Bland, C. et al. (1995). Determinants of primary care specialty choice: A non-statistical meta-analysis of the literature, *Journal of Academic Medicine*, July 1995, Vol. 70, No. 7, 620-41.

Block, S. et al. (1996). Academia's chilly climate for rrimary care, *Journal of American Medical Association*, Vol. 276, 677-82.

Bowling, A. (2002). Research methods in health: investigating health and health services, Open University Press, Philadelphia, PA, p. 212.

Bloom, S. (1989). The medical school as a social organization: the sources of resistance to change, *Journal of Medical Education*, Vol. 23, p.228-41.

Burkett, G. (1982). Characteristics of students preferring family practice/primary care careers. *Journal of Family Practice*, September 1982, Vol. 3, 505-12.

CAIR (Canadian Association of Interns and Residents (2001), Discussion Paper, retrieved: 6 November 2003 at http://www.cair.ca/position

Campos-Outcalt, D. (2000). Comments heard by US medical students about family practice, *Journal of Family Medicine*, May 2000, Vol. 35, No.8, 573-578.

Campos-Outcalt et al. (2004). A comparison of primary care graduates from schools with increasing production of family physicians to those from schools with decreasing production. Family Medicine,: 36(4): 260-264.

Canadian Resident Matching Service (2001 and 2003). Family medicine as a career choice, retrieved: 24 October 2005 at www.carms.ca

CaRMS/CFPC study of 2001 graduates, supplied by Dr. Cal Gutkin.

CFPC - College of Family Physicians (2004), Family medicine in Canada, Vision for the future, C*anadian Family Physician* , November, pp.18-21.

Cormier, A. (2006): e-mail correspondence with researcher.

Dhillon, J. (2005). Pride and prejudice: The future of general practice in Canada, *BCMJ*, Vol. 4. Available at: http://www.bcma.org

Funkenstein, D. (1978). Medical students, medical schools and society during five eras: Factors affecting the career choice of physicians, 1958-1976, Ballinger, Cambridge, Massachusetts.

Gutkin, C. – Interview with researcher during September 2004.

Hansen et al. (2003). The medical career choices project, Memorial University of Newfoundland.

Haq, C. (2003). Family medicine soup, *Journal of Family Medicine*, Vol. 33, No.2, 135-137.

Health Canada, 2001. Social accountability: A vision for Canadian medical schools

Hotson, K. (2002) Don't Tread on Me: Why would you go into family medicine?, Resident's page, *Canadian Family Physician*, April 2002, Vol. 48.

Incitti, F. (2003). Rural women family physicians: Are they unique?, *Canadian Family Physician,* Vol. 49:320-327.

Jordan. J. et al. (2003) Choosing family medicine, *Canadian Family Physician* , Vol. 49, 1131-7.

Kahn, N. (2003). Power point presentation to Regional Medical Campus Deans, retrieved at: http://www.schulich.uwo.ca/

Kutob, R. et al. (2003). Declining interest family medicine: Perspectives of department heads and faculty. *Family Medicine* 2003: vol. 35, no. 7, 504-9.

Laughren, J. (2005). Fixing family medicine in Ontario: Is increasing the number of residency positions enough?, *University of Toronto Medical Journal*, Vol.82, No. 3, 210-11.

Martin, D. Interview with *CMAJ*, Family medicine attracts smallest-ever share of residency applications, 4 March 2003, retrieved at: www.cmaj.ca/news

McLean, C. (2006). E-mail correspondence with researcher.

McPherson, D. et al. (2003). Entry of US medical graduates into family practice residencies: 2002-2003 and 3-year Summary, *Journal of Family Medicine*, Vol.35, No. 8, 555-563.

Mutha S. et al. (1997).. Insights into medical students' career choices based on third- and fourth-year students' focus-group discussions. *Academic Medicine*, 72:635-40.

MedTerms Medical Dictionary, retrieved at: www.medterms.com.

National Physician Survey Database (2004), part of the NPS project co-led by the CFPC, the Canadian Medical Association (CMA), and the Royal College of Physicians and Surgeons of Canada (RCPSC), and supported by the Canadian Institute for Health Information (CIHI) and Health Canada.

OMA - Ontario Medical Association (2005). MD shortage: A place for foreign doctors, retrieved at: http://www.oma.org/students/press/2004-09-01.htm

Osborn E. (1993). Factors influencing students' choice of primary care or other specialties, Journal *of Academic Medicine*, July 1993 Vol. 68 (7), 572-4.

Parsons, W. (2006). E-mail correspondence with researcher.

Rosser, W. (2002). The decline of family medicine as a career choice, *CMAJ*, 28 May 2002, Vol. 166, No. 11, 1419-20.

Schafer, S. et al (2000). Rejecting family practice: Why medical students switch to other specialties, *Journal of Family Medicine*, Vol. 32, No.5, 320- 325.

Shortt, S (2003). The Decline of family practice as a career in Ontario: A discussion paper on interventions to enhance recruitment and retention, a report for the Ministry of Health and Long-Term Care.

Senf J. et al. (2005). Family medicine specialty choice and interest in research. *Family Medicine,* Vol. 37, No. 4: 265-272.

Sewell, J. (2003). Atmosphere, culture and influence of consultants and mentors, Presentation given at ARCHI Toolkit Seminar: Innovations in Health Workforce Management, 24 April 2003. Retrieved at:www.archi.net

Task Force Two (2003): A physician human resource strategy for Canada Retrieved: 28 September 2003 at: http://www.physicianhr.ca/reports

Thurber, AD and Busing, N (1999). Decreasing supply of family physicians and general

practitioners. Serious implications for the future, *Canadian Family Physician*: 45:2084-9

Tyrell, L. Dauphinee, D. (1999) Report of the Task Force on Physician Supply in Canada (CMFF, Nov 1999).

Wooley, D. et al (2003) Treatment of medical students during clerkships Based on their stated career interests, *Journal of Teaching and Learning in Medicine*, Summer 2003, Vol. 15, No.3, 156-162.

Wright B, Scott I, Woloschuk W, Brenneis F. Career choice of new medical students at three Canadian universities: family medicine versus specialty medicine. *CMA J* 2004;170:1920-4.

Xu, G. (1987). Comparison between older and usual-aged medical school graduates on the factors influencing their choices of primary care specialties, *Journal of Academic Medicine*, Vol. 72, 1003-7.

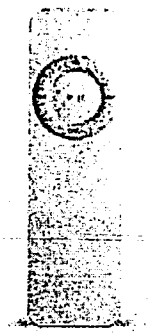
APPENDIX A

MEDICAL CAREER STUDY

(WEB QUESTIONNAIRE)

Welcome to the Medical Career Study

Welcome to the Medical Career Study



As part of my graduate studies in Applied Health Services Research, I am conducting a survey of medical students in their final year of studies. The aim of the survey is to describe the factors that influence students in their medical career decision making process. I would be most grateful if you can spare 5 - 10 minutes to complete this anonymous survey.

By participating in this survey you will have the opportunity to win an iPod Shuffle **One iPod Shuffle will be awarded to a randomly drawn winner per participating university on 16 May 2005. There is a limit of one entry per student.** Your privacy will be respected and your contact information will be used solely for the awarding of the prize.

Your participation is voluntary. You may decline to answer any question that you are not comfortable with and may withdraw from the study at any time. This study has been reviewed and has received ethics clearance through the Human Investigation Committee at Memorial University of Newfoundland.

Thanks in advance for your time and consideration.

Melissa Sullivan

Click here to start survey.

Question 1 of 17

Question 1 of 17

At which university are you CURRENTLY a medical student?

Select University

Next

- DALHOUSIE UNIVERSITY
- MEMORIAL UNIVERSITY OF NEWFOUNDLAND

Question 2 of 17

Question 2 of 17

What were your FIRST and SECOND choices for residency in the 2005 CaRMS Match?

	Residency Options	FIRST choice for residency	SECOND choice for residency
1	Anatomical Pathology	○	○
2	Anesthesia	○	○
3	Cardiac Surgery	○	○
4	Community Medicine	○	○
5	Dermatology	○	○
6	Diagnostic Radiology	○	○
7	Emergency Medicine	○	○
8	Family Medicine	○	○
9	General Pathology	○	○
10	General Surgery	○	○
11	Hematological Pathology	○	○
12	Internal Medicine	○	○
13	Laboratory Medicine	○	○
14	Medical Biochemistry	○	○
15	Medical Genetics	○	○
16	Medical Microbiology	○	○
17	Neurology	○	○
18	Neurology — Pediatric	○	○
19	Neuropathology	○	○
20	Neurosurgery	○	○
21	Nuclear Medicine	○	○
22	Obstetrics and Gynecology	○	○
23	Occupational Medicine	○	○
24	Ophthalmology	○	○
25	Orthopedic Surgery	○	○
26	Otolaryngology	○	○
27	Pediatrics	○	○
28	Physical Medicine and Rehabilitation	○	○
29	Plastic Surgery	○	○
30	Psychiatry	○	○
31	Radiation Oncology	○	○

Urology 32	○	○

Next

Question 3 of 17

Question 3 of 17 f0301

When did you DEFINITELY decide on your FIRST CHOICE for residency?

1 ○ Before high school
2 ○ During high school
3 ○ During my bachelor's degree
4 ○ After completing my bachelor's degree
5 ○ During graduate studies (masters and/or Ph.D.)
6 ○ After completing graduate studies (masters and/or Ph.D.)
7 ○ During medical school, but prior to clerkship
8 ○ During clerkship
9 ○ Other, please specify f0302

Next

Question 4 of 17

Question 4 of 17

At any time in your life did you EVER consider a career in FAMILY MEDICINE?

f0401

- (●) yes = 1
- ( ) no = 0

When did you DEFINITELY decide that you would NOT want to pursue a career in FAMILY MEDICINE?

f0402

1 ( ) Before medical school
2 ( ) During medical school, but prior to clerkship
3 ( ) During clerkship
4 ( ) Other, please specify f0403

f0404

Why did you decide to NOT pursue family medicine as a career choice? → Note: Only asked to those who answered "no" to f0401.

Next

Question 5 of 17

Question 5 of 17

Considering all of the areas in medicine, how important were the following factors in your decision to select your FIRST CHOICE for a residency?

		Importance 1 Very	2 Moderately	3 Not very	4 Not at all	5 Not applicable
0501	Ability to pursue non-work related interests (leisure activities)	○	○	○	○	
f 0502	Earning potential	○	○	○	○	
f 0503	Financial debt	○	○	○	○	
f 0504	A mentor BEFORE medical school	○	○	○	○	
f0505	A mentor DURING medical school	○	○	○	○	
f0506	Experience in discipline during clinical clerkship rotation	○	○	○	○	○
f 0507	Intellectual stimulation/challenge	○	○	○	○	
f0508	Prestige	○	○	○	○	
f0509	Research opportunities	○	○	○	○	
f0510	Workload predictability	○	○	○	○	
f0511	Encouragement from medical professionals	○	○	○	○	
f0512	Ability to work in a hospital environment	○	○	○	○	
f0513	Acceptable hours of practice	○	○	○	○	
f0514	Desire to practice in community where I spent my childhood	○	○	○	○	
f0515	Desire to be an expert in a very specialized area of medicine	○	○	○	○	
f0516	Desire to work in same community as spouse or partner	○	○	○	○	○
f0517	Interest in high technology	○	○	○	○	
	Other, please specify f0518	○	○	○	○	○
	Other, please specify f0519	○	○	○	○	○
	Other, please specify f0520	○	○	○	○	○

Next

Question 6 of 17

Question 6 of 17

Did you COMPLETE a clinical rotation in your FIRST CHOICE for a residency prior to registering with CaRMS?

f0601

- (●) yes → 1
- ( ) no → 0

Please indicate your **level of satisfaction** with your clinical rotation.

	1 Very Satisfied	2 Moderately Satisfied	3 Not very Satisfied	4 Not at all Satisfied
f0602 Level of satisfaction with clinical rotation	○	○	○	○

Did you COMPLETE a clinical rotation in FAMILY MEDICINE prior to registering with CaRMS?

f0603

- (●) yes → 1
- ( ) no → 0

Please indicate your **level of satisfaction** with your rotation in family medicine.

	1 Very Satisfied	2 Moderately Satisfied	3 Not very Satisfied	4 Not at all Satisfied
f0604 Level of satisfaction with family medicine rotation	○	○	○	○

Next

Question 7 of 17

Question 7 of 17

Please indicate your **level of agreement or disagreement** with the following statements.

		1	2	3	4
		Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
f0701	Family medicine is financially rewarding.	○	○	○	○
f0702	Family physicians work reasonable hours.	○	○	○	○
f0703	Family medicine is intellectually stimulating.	○	○	○	○
f0704	Family physicians are able to have time to pursue non-work related interests (leisure activities).	○	○	○	○
f0705	Family physicians are highly respected by specialists.	○	○	○	○
f0706	Family physicians play an important role in the delivery of health care.	○	○	○	○
f0707	Family physicians encouraged family medicine as a career during my clerkship.	○	○	○	○
f0708	Specialists encouraged family medicine as a career during my clerkships.	○	○	○	○
f0709	Primary Care Renewal will create a bad situation for family doctors.	○	○	○	○

Next

Question 8 of 17

Question 8 of 17

What degrees/diplomas did you complete PRIOR to entering medical school?

f801

- [ ] None f0801
- [ ] Diplome d'étude Collegial (CEGEP) f0802
- [ ] Bachelor's of Arts f0803 — f0808 (please indicate your major)
- [ ] Bachelor's of Science f0804 — f0809 (please indicate your major)
- [ ] Other bachelor's degree f0805 — f0810 (please specify)
- [ ] Master's f0806 — f0811 (please indicate your concentration)
- [ ] Doctorate f0807 — f0812 (please indicate your concentration)

Next

Question 9 of 17

Question 9 of 17

What is your marital status?

f0901

1 ○ Single
2 ○ Separated, divorced or widowed
3 ◉ Married or living with partner

If you are married or living with partner, please indicate if your spouse/partner is a:

f0902

1 ○ Medical student,
2 ○ Physician,
3 ○ Other health care provider, or
4 ○ None of the above.

Next

Question 10 of 17

Question 10 of 17

Do you have children?

f1001

- ○ no – 0
- ◉ yes – 1

If yes, please indicate:

How many children do you have?		f1002
What is the age of your youngest child?	(years)	f1003

Next

Question 11 of 17

Question 11 of 17

Which of the following describes the **highest education level** attained by your parents?

		f1101 Father	f1102 Mother
No degree, certificate or diploma	1	○	○
Some high school	2	○	○
High school graduation certificate	3	○	○
Trades certificate or diploma	4	○	○
College certificate or diploma	5	○	○
University certificate or diploma below bachelor level	6	○	○
Bachelor's degree	7	○	○
University certificate or diploma above bachelor level	8	○	○
Master's degree	9	○	○
Medical degree	10	○	○
Earned doctorate	11	○	○
Other, please specify f1103	12	○	○
Other, please specify f1104	13	○	○

Next

Question 12 of 17

Question 12 of 17

Select the ONE statement which best describes the community in which you spent MOST of your life PRIOR to university.

f1201

1 2 3 4

○	A large city	(population 500,000 or more)
○	A moderately sized city	(population 50,000 to 499,999)
○	A small city	(population 10,000 to 49,999)
○	A rural community or small town	(population less than 10,000)

Do you consider your community to be remote?

f1202

1 ◉ yes

0 ○ no

Next

Question 13 of 17

Question 13 of 17

Please indicate your level of desire to practice in the following types of communities:

		1 Strong Desire	2 Desire	3 No desire at all
f1301 A large city	(population 500,000 or more)	○	○	○
f1302 A moderately sized city	(population 50,000 to 499,999)	○	○	○
f1303 A small city	(population 10,000 to 49,999)	○	⊖	○
f1304 A rural community or small town	(population less than 10,000)	○	○	○

Next

Question 14 of 17

Question 14 of 17

Please enter the first three digits of the postal code where you lived during your final year of HIGH SCHOOL If you lived at a boarding school, please enter the postal code of where your family lived during that year. If you did not live in Canada, please indicate the country where you lived.

If in Canada, first three digits of postal code:	f1401
If not in Canada, type in the country:	Select Country f1402

Next

Question 15 of 17

Question 15 of 17

What year were you born?

f1501

19 ____

Next

Question 16 of 17

Question 16 of 17

Are you:

f1601

1 ○ male
2 ○ female

Next

Question 17 of 17

Question 17 of 17

Were you born in Canada?

f1701

1 ← ○ yes
0 ← ○ no

Please indicate your status in Canada. f1702

1 ← ○ Canadian citizen
2 ← ○ Permanent resident (landed immigrant)
3 ← ○ Other, please specify f1703

Finish Survey and Enter Contest

Enter Contest

Enter Contest

Thank you for completing the Medical Career Study. You may enter to win an Apple iPod Shuffle.

iPod Shuffle Contest Entry Form

iPod Shuffle Contest Entry Form

Thank you for completing the Medical Career Study. You may enter to win an *Apple iPod Shuffle*. **One iPod Shuffle will be awarded to a randomly drawn winner per participating university on 16 May 2005. There is a limit of one entry per student.** Your privacy will be respected and your contact information will be used solely for the awarding of the prize. Your personal information will not be associated with the survey results.

First Name:	
Last Name:	
Address:	
City:	
Province:	
Postal Code:	
Telephone:	
E-mail:	
University;	Select University
Year of graduation from medical school:	20

Enter Contest

Contest Entry Accepted

Contest Entry Accepted

Thank you, your contest entry has been recorded. One winner per univeristy will be randomly selected on May 16, 2005.

APPENDIX B

MEDICAL CAREER STUDY

(E-mails sent to students to announce the study)

From: <dean.medicine@mun.ca>
To: <eskinner@mun.ca>
Date: 4/14/2005 10:27:40 AM
Subject: Message from the Dean of Medicine

(Evelyn, please send this email to all 4th year students please on behalf of the dean)

Dear students of Meds 2005,

Congratulations! You're almost there. I look forward to sharing in the celebration of your graduation soon. I am sending you this email to ask if you would kindly take a few minutes of your time to complete a survey about factors that influence your medical career decision making process. This survey has been developed by Melissa Sullivan, a graduate student in Applied Health Services Research. It is also being completed by the Dalhousie Meds 2005 students. The information obtained will be non-identifiable, but will help us get a greater understanding of important factors for both you and the Faculty of Medicine. Attached below is the information about the study and the web link to complete it. Thank you very much in advance for your help.

Sincerely,

Dr. James Rourke
Dean of Medicine

Medical Career Study - by Melissa Sullivan

As part of my graduate studies in Applied Health Services Research, I am conducting a survey of medical students in their final year of studies. The aim of the survey is to describe the factors that influence students in their medical career decision making process. I would be most grateful if you can spare 5 - 10 minutes to complete this anonymous survey.

By participating in this survey, you will have the opportunity to win an iPod Shuffle. One iPod shuffle will be awarded to a randomly drawn winner per participating university on 16 May 2005. There is a limit of one entry per student. Your privacy will be respected and your contact information will be used solely for the awarding of the prize.

Your participation is voluntary. You may decline to answer any question that you are not comfortable with and may withdraw from the study at any time. This study has been reviewed and has received ethics clearance through the Human Investigation Committee at Memorial University of Newfoundland.

To complete the survey and to enter the draw for the iPod shuffle, please visit:

http://www.medicalcareerstudy.ca

Thanks in advance for your time and consideration.

Melissa Sullivan

From: Melissa Sullivan <globalquest@nl.rogers.com>
To: <eskinner@mun.ca>, <raudas@mun.ca>
Date: 4/21/2005 5:54:18 PM
Subject: Reminder e-mail - Medical Career Study

Hi Evelyn,

The response rate to my Medical Career Study from MUN students has been low in comparison to Dal sturdents. Perhaps this may be due to the difficulties encountered with the web link on the first day the survey was made available to students. Would it be possible to send a reminder e-mail to graduating Medical students (Class of 2005 students via Listserv)? It would be great if you could enter "Reminder" as the Subject heading for the e-mail. The e-mail text can be copied and pasted from the text that appears below.

Thanks kindly,
Melissa Sullivan

Hello Class of 2005 Medical Students,

I am conducting a survey of medical students in their final year of studies. By participating in this survey, you will have the opportunity to win an iPod Shuffle. *One iPod shuffle will be awarded to a randomly drawn winner per participating university. There is a limit of one entry per student. *Your privacy will be respected and your contact information will be used solely for the awarding of the prize.The aim of the survey is to describe the factors that influence students in their medical career decision making process. I would be most grateful if you can spare 5 - 10 minutes to complete this anonymous survey.

<>To complete the survey and to enter the draw for the iPod shuffle, please visit:

http://www.medicalcareerstudy.ca

Many thanks,
Melissa Sullivan
MSc candiadate - Atlantic Regional Training Centre of Applied Health Services Research

From: sgraham@tupdean2.med.dal.ca
To: Melissa Sullivan <globalquest@nl.rogers.com>
Date: 4/25/2005 11:57:04 AM
Subject: Re: Medical Career Study Reminder

Hi Melissa:
I sent the message out to students this morning reminding them of the survey. I figured I would wait until today since they were in ACLS training all weekend and finished their last 4th year rotation on Friday. So now they are finished those things they are all studying for the MCC's so hopefully timing will work out.

Let me know how this goes as per return rate.

Sharon

On 21 Apr 2005 at 22:01, Melissa Sullivan wrote:

> Hi Sharon,
>
> Thanks for sending an e-mail to graduating medical students at Dal about
> the medical career study. Responses have slowed down a little the past
> couple of days. I thought it might be a good idea to to send a quick
> reminder e-mail to the Class of 2005 students via Listserv. I would be
> most appreciative if you could send an e-mail to the students and enter
> "Reminder" as the Subject heading for the e-mail. The e-mail text can
> be copied and pasted from the text that appears below.
>
> If you should have any questions, please do not hesitate to contact me
> or my Supervisor for the study (Dr. Rick Audas).
>
> Thanks kindly,
> Melissa Sullivan
>
>

>
>
> I am conducting a short survey of medical students in their final year
> of studies. By participating in the survey, you will have the
> opportunity to win an iPod Shuffle. *One iPod shuffle will be awarded to
> a randomly drawn winner per participating university.* There is a limit
> of one entry per student. Your privacy will be respected and your
> contact information will be used solely for the awarding of the
> prize.The aim of the survey is to describe the factors that influence
> students in their medical career decision making process. I would be
> most grateful if you can spare 5 - 10 minutes to complete this anonymous
> survey.
>
> To complete the survey and to enter the draw for the iPod shuffle,
> please visit:
>
> http://www.medicalcareerstudy.ca
>

APPENDIX C

MEDICAL SCHOOLS REGISTERED WITH CaRMS

MEDICAL SCHOOLS REGISTERED WITH CaRMS

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
DALHOUSIE UNIVERSITY
UNIVERSITÉ LAVAL
UNIVERSITÉ DE SHERBROOKE
UNIVERSITÉ DE MONTRÉAL
MCGILL UNIVERSITY
UNIVERSITY OF OTTAWA
QUEEN'S UNIVERSITY
UNIVERSITY OF TORONTO
MCMASTER UNIVERSITY
THE UNIVERSITY OF WESTERN ONTARIO
UNIVERSITY OF MANITOBA
UNIVERSITY OF SASKATCHEWAN
UNIVERSITY ALBERTA
UNIVERSITY OF CALGARY
UNIVERSITY OF BRITISH COLUMBIA