An Exploration of the Factors That Influence The Practice Choices of Family Medicine Residents

Catherine Cervin MD

Mount Saint Vincent University

Halifax, Nova Scotia

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Abstract

Background and Objective: Comprehensiveness of practice is declining among family physicians. This study was undertaken to discover what educational factors might influence family medicine residents to undertake a more comprehensive practice.

Method: A survey was administered to first year residents at the beginning of their residency asking them: their intentions to include 11 clinical and 4 non-clinical aspects of family medicine in their future practice; the reasons for these choices and which province, type of community and type of practice they envisioned for their future. They were also asked to rank the importance of a series of factors influencing choice of community. A model of career (practice) choice was developed from the literature, which informed survey development and interpretation of the survey results.

Results: The response rate was 80% or 36/45 residents. Many aspects of the proposed career choice model were supported by the survey results. Influences on practice choice included: resident attributes (personality, values, background), significant others, educational and life experiences and aspects of future practice that were viewed as attractors or detractors. A definition of comprehensive practice was created. Fifteen (47%) of the respondents intended to undertake comprehensive practice and a further 14 (32%) were undecided (i.e. could still be considering comprehensive practice). Twenty-seven (75%) intended to practice in the Maritimes at some time and 12 (33%) were planning a rural practice. Employment for their spouse was the most important factor in choosing a community for all respondents. The practice aspects were sorted into two clinical groups: *practice core* and *clinical challenges* and a third *non-clinical* group. Respondents chose many reasons to include the practice core and clinical challenges. At the same time residents indicated that the clinical challenges could interfere with their family

lives, be too stressful and they feared not being well trained by the end of residency. Among the non-clinical aspects of practice, teaching was viewed very positively and administration very negatively.

Conclusion: Based on the survey results, the proposed career choice model and the literature, recommendations for changes to family medicine residency programs to encourage graduates to undertake a more comprehensive practice are suggested.

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CHAPTER I: INTRODUCTION

Statement of Problem

Are you able to see a family physician when you need one? Will the physician be able and willing to take care of your particular needs? Many Canadians are having a difficult time finding a family doctor and even when they do, that doctor may only take responsibility for a portion of their medical needs. Until the 1980s, the general practitioner did it all—cared for patients in the office, at home, in-hospital, delivered babies, assisted at or even performed surgery and worked in the Emergency Department. How are we to deliver the generalist part of health care when fewer family physicians are practicing comprehensive family medicine? What are the forces driving this trend toward limited practice? How could a family medicine residency program influence residents to choose a model of practice that would ensure Canadians receive the health care they need?

While director of the family medicine residency program at Dalhousie (1997-2007) many of my colleagues and I became concerned about what seemed to be a growing trend. We were seeing increasing numbers of our graduating residents choosing to practice exclusively in an Emergency Department, walk-in or sports medicine clinic, rather than taking on the responsibility of comprehensive care for a practice population.

Another worrying trend from 2000 – 2003 was the steady decrease in the number of medical students who chose family medicine as their first career option. Before 1994, when the rotating internship still existed, more than 50 percent of medical students went into general practice. Between 1994 and 1997 the percentage of Canadian medical students choosing family medicine stayed around 32 percent, peaking at 34.7 percent in 1997. Then between 1997 and

2003 there was a steady decline to a low of only 25 per cent of students choosing family medicine (CaRMS, 2003). Since then there has been a gradual resurgence of interest in family medicine in Canada. In 2010, 31.8 percent of applicants to the Canadian Residency Matching Service (CaRMS) chose family medicine first.(CaRMS, 2010).

Residents are making these choices for undoubtedly complex reasons, from the personal to the social. However, Canadian communities need comprehensive primary care. The solo practitioner who provided this kind of care is rapidly disappearing. Although alternative models of primary care, designed to provide a full basket of services to the patient population, are being developed across the country (CFPC, 2000) we will always need skilled family physicians capable of providing a wide variety of services in all communities throughout Canada.

Residency programs can affect future practice choices of residents both positively and negatively. Educators need to better understand these influences before being able to modify the residency programs to move the practice choices of graduates toward more comprehensive care. A deeper understanding of residents' future practice choices should also be important to policy makers, to facilitate more accurate projections of human resource needs in primary care.

Purpose

This project undertook to explore the influences on the practice intentions of family medicine residents to determine whether educational experiences might lead residents to undertake more comprehensive practice. The primary research question posed was:

"What are the factors that influence family medicine residents as they make decisions about which aspects of family medicine to include in their future practices?"

Within the larger question, the objectives of this study were:

a. To document the baseline for residents' future practice plans so we can determine if these plans change during their residency.
b. To discover whether there is an association between size of hometown and size of community of future practice, between community and academic residency site and practice choices, and between demographic characteristics (gender, age, marital status, children) and practice choices.
c. To discover the characteristics of communities that attract family medicine residents.
d. To discover some of the reasons residents make particular practice choices.

Literature Review

The literature, which informs the study question, is multifaceted and complex. For easier comprehension the literature has been organized into four sections as follows:

a. First the evidence of a decline in comprehensiveness of family physicians' practices will be presented.

Next the literature used to develop a model of career (or practice) choice will be presented in the following three sections corresponding to the model:

b. Conceptual Frameworks (decision making theories) that were used as the basis for the overall structure of the model
c. Research on a variety of factors affecting career or practice choice. These studies include the influence of:
    i. Student attributes
    ii. Student context both immediate (significant others) and more peripheral (societal norms)
    iii. Life experiences
    iv. Attributes of the practice environment that influence residents to undertake or to avoid aspects of family medicine.
    v. Other factors
    vi. Educational experience as one among a number of factors. However, studies in the third section were not designed to look *primarily* at educational effects on practice choice

d. Studies specifically designed to discover the effect of educational influences on practice or career choice

Section (d) on educational influences will form the bulk of the literature review, as the principal aim of this study was to understand how educational experience influence practice choices.

Decline in Comprehensiveness of Practice

Comprehensive care as used in this paper refers to care by family physicians in a variety of settings (office, home, nursing home, hospital including Emergency Department, Labour and Delivery wards, inpatient units), and for a wide range of patients (all ages, both sexes, healthy and with chronic and acute illnesses).

The most thorough study documenting a decline in comprehensiveness of care by Canadian family physicians was published in the CMAJ in 2002 by Chan(Chan, 2002a). The study used Ontario Health Insurance Plan (OHIP) billing data to measure the percentages of physicians working in emergency departments, making home visits, caring for patients in nursing homes, delivering babies and with office-only practices. The change was measured over a decade comparing 1989—1990 to 1999—2000. This decline was evident among all physician groups (recent graduates, established physicians, men and women) and in all sizes of communities. The percentage of physicians with office-only practices rose from 14 percent in 1989/90 to 24 percent in 1999/2000. Even in rural communities the decline was evident. In 1999 – 2000 only 66 percent of physicians worked in the emergency department (75% in 1989-1990), 27 percent delivered babies (52% in 1989-1990), 43 per cent cared for nursing home patients (53% in 1989-1990), 66 percent did home visits (76% in 1989-1990) and 80 percent did inpatient

care (86% in 1989-1990). Although the percentage of rural physicians with an office-only practice was very small (6.3 percent), even this was an increase from 1989—1990 when 3.4 percent of rural physicians had an office-only practice.

A later study looked at a comparison of comprehensiveness of practice between two Ontario groups of family physicians over the years 1996 – 2004 – those who went into practice immediately after the two year residency, the Post Graduate Year 2 (PGY2) group, and those who undertook a further year of training in a specialized field (Emergency Medicine (EM), Anesthesia, Health Care of the Elderly, Palliative Care etc.), the PGY3 group(Green, Birtwhistle, Macdonald, Kane, & Schmelzle, 2009).

The trend over time is for a higher percentage of physicians to move towards an office-only practice – the antithesis of comprehensive care. Twenty percent of the physicians in the PGY2 group who had been in practice for 6 years or more had an office-only practice. This was in contrast to the PGY3 group whose office-only practice varied from essentially zero (anesthesia and EM trained) through 12 percent for graduates of unspecified PGY3 programs to 17 percent for graduates of palliative care programs and those from Northern Ontario. The conclusion of this study was that the majority of family physicians still cared for patients in hospital or home and those with PGY3 training included more aspects of family medicine in their practice. The more comprehensive practice of the PGY3 group was not limited to their area of special training. Twenty percent as office-only practitioners, although lower than Chan's figure above still represented a significant number of family physicians. Although office practice is the cornerstone of Family Medicine, it is not the only aspect of primary care that a community needs and that a family physician can provide. Physicians with office-only practices are not

delivering babies, seeing people at home, doing nursing home care or looking after patients in hospital.

The changes in choices by recent graduates are of particular interest. Chan found that recent graduates in the 1999-2000 group had less comprehensive practices than their counterparts from the previous decade(Chan, 2002b) and Godwin found that recent graduates were less likely to commit to full time practice in 1991 than they were before 1985(Godwin, Hodgetts, Wilson, Pong, & Najgebauer, 1998). Reasons for these changes are not well studied or understood. Studies of medical students' decision-making about residency programs suggest possible hypotheses for residents' choices about practice. These hypotheses include lifestyle expectations (Evans & Sarani, 2002; Lind & Cendan, 2003), debt load (M. Rosenthal, Marquette, & Diamond, 1996), the increasing number of women in medicine with consequent family responsibilities(Johnson et al., 1993), educational experiences during medical school(Bunker & Shadbolt, 2009; Campos-Outcalt, Senf, & Kutob, 2004; Rabinowitz, Diamond, Markham, & Wortman, 2008) positive role models(Bunker & Shadbolt, 2009; Campos-Outcalt et al., 2004), student values (Wright, Scott, Woloschuk, Brenneis, & Bradley, 2004)and the increasing complexity of medicine leading to the perception of a need for more specialization.

Therefore since training in a generalist *discipline* may not guarantee a generalist *practice*, enticing medical students toward generalist residency programs is only a preliminary step. Educators, and policy makers need to understand how residents determine the content and scope of their future practices.

A residency program is a small and relatively short period in the life of a doctor as he or she develops from a medical student into a practicing physician. Although the influence of postgraduate training on full spectrum family practice may be small every effort should be made

to ensure it is positive. There is considerable scope for research in this area. What are the influences of role models? How can altruism and a tradition of service be fostered where needed? How can the prestige of family medicine be improved? Will changing the atmosphere in labour delivery suites and emergency departments change the practice of our graduates? How is independence balanced with adequate supervision so residents gain mastery without feeling overwhelmed? These questions deserve both qualitative and quantitative research.

There is also a need to explore how undergraduate medical education, admissions policies and procedures, community social norms, supportive practice groups and financial rewards influence the practice choices of family physicians.

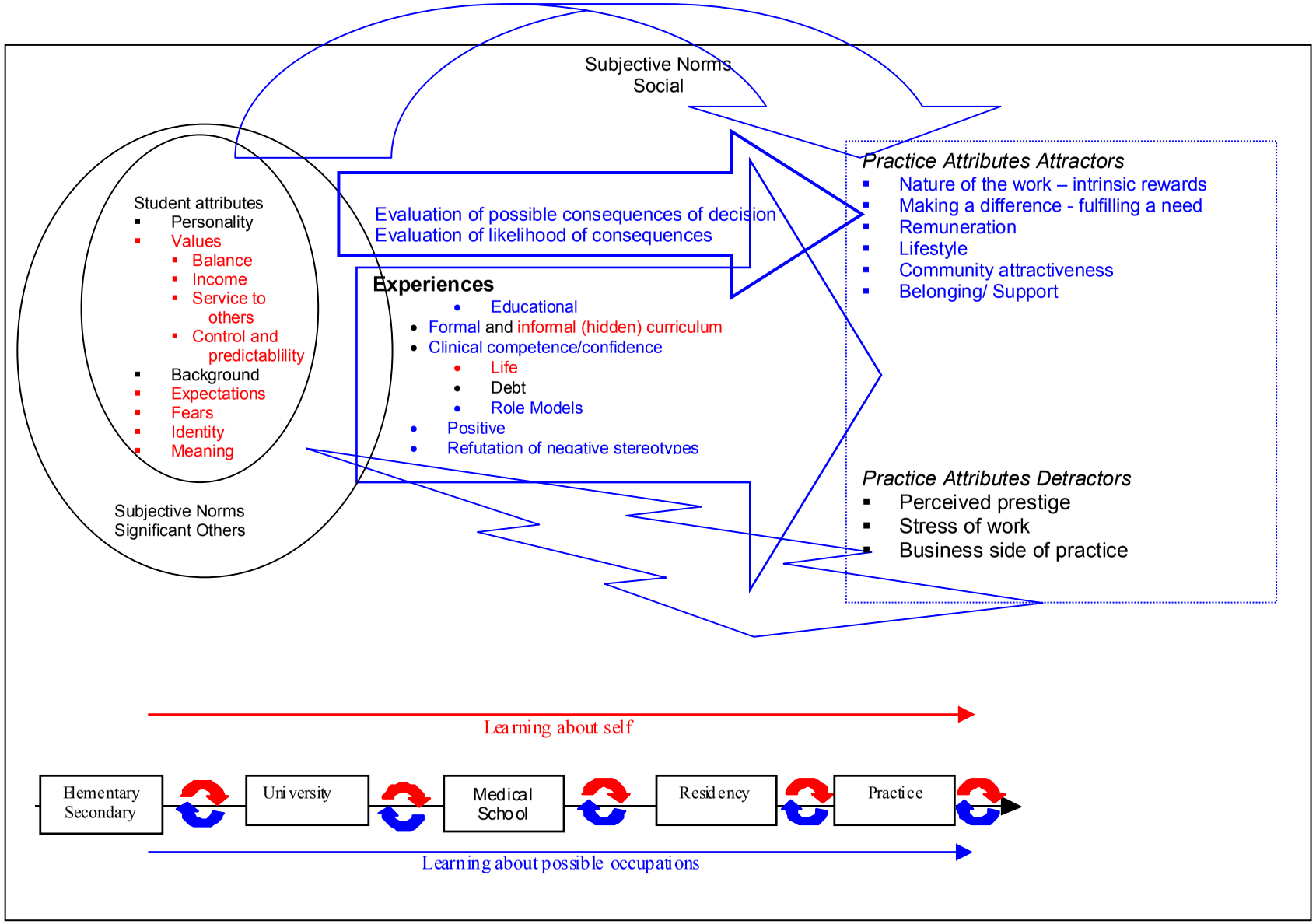
Development of a Career Choice Model

With these questions in mind the literature on career choice for physicians was searched and from the studies a model of the lifelong process of career choice was developed.
The key search words were “occupational choice”, “practice choice”, “residents” and “family medicine”. The databases searched were PubMed, PsychInfo and Social Science Citation Index. Many of the articles were related to medical students’ choices regarding primary care careers. Four of those articles were included either because they used a qualitative approach, reviewed a decision-making theory or considered medical students’ personal values. Most Canadian studies looking at residents’ practice choices were included in this review, and because Canadian and American medical education systems share some similarities, American studies looking at educational influences on residents’ practice choices were included as well. There is a substantial American literature on educational interventions to enhance recruitment and retention of rural physicians. Summary and literature review articles addressing rural physicians are included here.

The proposed career choice model is found in Figure 1. The model conceptualizes career choice as a lifelong process that begins in childhood or adolescence and continues through all stages of education into practice life. The circular arrows emphasize the iterative nature of the process. As one learns more about life and possible occupations one also learns more about oneself – reflection on one's life experience leads to reflection about self and vice versa.

The model illustrates a process of development for people as they move through their lives and their education—learning more about themselves and about possible occupations. Outside these internal processes, the person is embedded in a context; the smaller circle represents the particular needs, wishes and expectations of their significant family and friends while the larger square represents broad societal norms and expectations. The student has certain attributes influencing their career choices including: their values, background, identity, how they bring meaning to their lives and the expectations and fears that drive them. The large arrows represent ongoing experiences including educational and life events that change the student's understanding and self-knowledge vis a vis potential occupations. The model also contains an evaluation of the possible consequences of occupational decisions and an evaluation of the likelihood of possible outcomes (smaller arrow). The growing knowledge about practice life and work includes aspects that will attract or discourage a student – named "*attractors"* and "*detractors*" in the model

Figure 1: Proposed Career Choice Model



Conceptual frameworks (decision making theories).

"Trying on Possible Selves"

Burack, et al. (1997) conducted focus groups with the graduating class of 1995 at the University of Washington. The researchers particularly wanted to explore what they call the "black box" of the actual cognitive and emotional process that students experience while choosing specialties. They point out that the literature is replete with before and after studies on, for instance, which personal attributes of entering medical students predicted specialty choice or which medical school educational experiences were associated with choice of primary care and non-primary care careers. However, rarely has anyone studied what students thought and felt as they chose careers.

Burack et al.'s study has many strengths. The researchers chose a random sample of students who were pursuing one of six possible career paths and invited them to participate in a focus group. They used both quantitative and qualitative analysis of themes arising from the transcripts. Students described comparisons between themselves, others in the specialty and the content of the specialty. One process was described as "*confirmation*", meaning no change in specialty choice. As students learned more about themselves, the specialty, and the life of physicians in the specialty, their choices were confirmed. There were also processes of "*inclusion*"—the feeling of belonging as well as "*elimination*" of specialties where one did not belong. They found that role models were important in refuting negative stereotypes, that lifestyle was important in different ways and that students who switched specialties were often misinformed about specialty life or about themselves(Burack et al., 1997). Wright, Scott, Woloschuk, Brenneis, and.Bradley,(2004) also found that students who switched their career

intentions from another specialty to family medicine had been initially misinformed about the reality of family medicine. Students also described being influenced away from specialties by negative educational experiences(Wright et al., 2004).

Burack et al.'s study has a number of weaknesses: it was done with a single American medical graduating class; students were retrospectively asked to recall their initial career preferences; there were a small number of "switchers" (Primary Care (PC) to non-PC and non-PC to PC); no member checks were done in the analysis; and there is no description of the setting, making it difficult to determine applicability to another setting.

Despite these weaknesses the findings are interesting and deserve further exploration in other settings. Because this concept of "trying on possible selves" has a broad applicability in organizing the literature, it has been used as a basis for the proposed Career Choice Model previously described in Figure 1.

Experiential place integration.

Cutchin, a geographer, conducted a qualitative study in rural Kentucky exploring the aspects of successful integration of rural physicians into their communities and practice.(Cutchin, 1997) He interviewed fourteen primary care physicians and ten medical key informants (hospital and health administrators, clinic board members and a physician recruiter). He used a grounded theory approach to analyze themes arising from the interviews.

Cutchin's findings are interesting as he focused on process and used a narrative approach to explain and develop his principles of integration. According to his definition "place" is where several levels of action occur together simultaneously including large scale events, interpersonal or group events and autonomous self-actions. He stated that "place emerges as central to human life because it is the most common context for the unique obstacles or problems that occur in the

midst of ongoing interactions."(Cutchin, 1997) (p 27) In other words, human action never occurs in a vacuum; the locality has a varying degree of effect on that action but is never neutral.

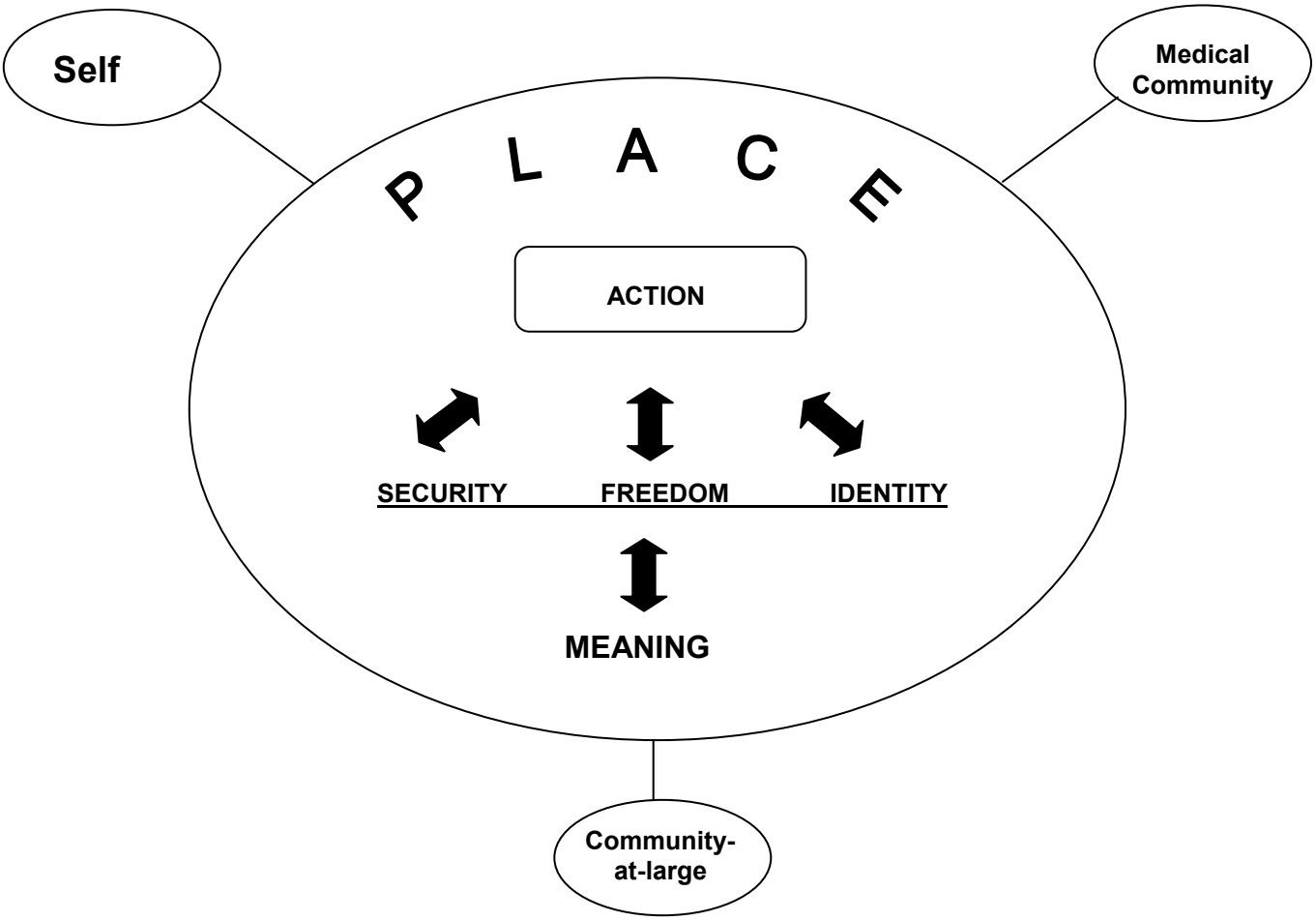
Cutchin then established his theory of "experiential place integration" as developed from the narratives of the rural physicians. He saw integration taking place along three dimensions with a number of subcategories; security, identity and freedom mediated by actions and giving rise to meaning. The context for the integration included the self, the medical community and the community at large. (Table 1, Figure 2)

Table 1. Dimensions of security, freedom and identity

Dimensions of security • Confidence in medical abilities • Commitment to aspirations and goals • Ability to meet family needs • Comfort with medical community and institutions • Degree of on call coverage • Practice group environment and the "anchorpersons" • Community and medical institution development • Social and cultural networks available • Respect of medical and at-large community
Dimensions of Freedom • Challenge and diversity in medical work • Ability to consult more with patients • Cooperation with the medical community and the community at large • Respect of the medical and at-large community • Power in medical relations • Ability to develop health care resources • Diversity in social interaction possibilities • Involvement in community affairs • Personal and family activities • Developed perspective on self and place
Dimensions of Identity • Loss of anonymity • The "like-minded" group • Roles played and responsibilities taken • Respect of medical community and at-large community • Fulfilling aspirations in place • Seeing self as belonging to the community • Awareness of self in time and place • Creation of future goals in place

(Cutchin, 1997) (p 31)

Figure 2: Experiential Place Integration



(Cutchin, 1997) (p31)

Security as Cutchin used it refers to the level of safety, stability and confidence achievable in a situation. For the physicians in his study, security meant the ability to trust their own medical skills, find housing that suited their spouses and schooling for their children, and feeling that the medical community was compatible in terms of standards of practice, on call coverage, and available facilities. Security also had personal and social aspects. "Anchorperson" refered to a mentor who guided and supported the physician as they found their way in a new community. Respect turned up in all three dimensions, underlining its importance.

The development of self-knowledge, the search for meaning, learning about oneself through one's occupation, imagining oneself as part of a community and creating goals and aspirations for a future in the community, all fit into the concepts of "Trying on possible selves" Rural physicians who stayed had tried on the self of a rural doctor and found that it fit well, they had integrated into their place (community).

The serious limitation of this study was that all participants were men, all but one were married and only three had spouses who worked outside the home. Thus the applicability to men or women physicians with working spouses could be limited.

Theories of planned behaviour and reasoned action.

Several other theories of decision-making have been reviewed and critiqued in the medical education literature. Two articles specifically addressed the determinants of behaviour. Bower, Wolkomir and Schubot used Ajzen's Theory of Planned Behaviour(Ajzen, 1988) as the basis for their analysis of the effect of an Advanced Life Support in Obstetrics (ALSO) course on residents' intention to practice obstetrics (Bower, Wolkomir, & Schubot, 1997). Feeley used

Fishbein and Ajzen's Theory of Reasoned Action(Fishbein & Ajzen, 1975) to evaluate the literature on retention of rural physicians(Feeley, 2003).

The Theory of Planned Behaviour and the Theory of Reasoned Action are similar in that they state that behaviour occurs as a result of a series of influences including beliefs about outcomes of behaviours, attitudes towards the behaviour, beliefs of important others in the environment, and perceived control over behaviour, which all coalesce into an intention to undertake the behaviour. Thus, intention to engage in a particular behaviour is a powerful predictor of that behaviour. This is an important point as many of the career choice studies use intention to engage in a specific practice or career as the outcome measure.

The important determinants of behaviour used in these two studies were: attitudes towards the behaviours (seeing that particular aspect of practice as satisfying, stressful, valuable, fear-inducing); subjective or social norms (expectations of significant others); personal motives (values of service, obligation, interest); perceived behavioural control based on ability (confidence/competence); perceived behavioural control based on available opportunities and perceived behavioural control based on resources (supportive practice environment, call group, adequate remuneration).

Bower et al. evaluated the effect of an Advanced Life Support in Obstetrics (ALSO) course at the University of Wisconsin in 1992 -1993, on a self-selected group of family medicine residents' intentions to include intrapartum maternity care in their future practice. They assessed confidence and intentions before and after the ALSO course, using Bandura's concept of self-efficacy (Bandura 1977 as cited in (Bower et al., 1997). The results showed a significant increase in confidence but no significant change in attitudes or intentions.

The strengths of Bower et al.'s study include: the application of Ajzen's theory and the high response rate. Possible reasons for the lack of effect on intentions include: the self-selected and already highly committed nature of the group—there was very little room for their intention to change in a positive direction—and the possibility that a two day intervention may be insufficient to influence a practice intention. The weaknesses of the study include the non-random selection of participants, and the limitation to a single American medical school.

The article by Bower et al. included an extensive bibliography of articles that addressed each of these determinants of behaviour as they related to maternity practice in family medicine.

These various determinants of behaviour have been incorporated into the model.

Feeley's article used the Theory of Reasoned Action, to review the literature on retention of rural physicians(Feeley, 2003). His review cited two studies of rural physicians showing that intention predicted behaviour. Seventy-six and 79 percent of physicians intending to stay 5 years or longer in their practice remained and 53 percent & 68 percent of those who intended to leave, did so.

Attitudes, according to Feeley, are usually measured in the literature by job satisfaction which is typically moderate to high for most rural physicians. Feeley listed a number of factors associated with high satisfaction including practice type; number of colleagues; earnings; hospital consultants; professional interaction; enjoyment of outdoor activities; adequate personal time and quality of schools for children. Many of the other studies he cited under the attitude part of the model did not seem to address attitudes except one which indicated, "desire to work in a rural area" as one of the top responses to an open-ended question about reasons for staying or leaving.

Subjective or social norms (see Figure 1) seemed to have an important influence on retention. “Opinion of the spouse” was the number one factor reported by respondents in one of the studies cited by Feeley. Support from other professionals and the community were valued by rural physicians.

Feeley’s work highlighted the general occupational turnover literature, which should be addressed in future medical education research. The most provocative point was that attitudes may follow behaviour rather than the other way around.

Feeley pointed out that traditional measures such as satisfaction may be too simplistic and not capture the lived experience of rural physicians. Therefore he recommended qualitative research on issues of physician retention.

Subjective Expected Utility Theory applied to medical student career choice.

Reed, Jernstedt and Reber (2001) applied the Subjective Expected Utility theory (SEU) to conduct a literature review on medical student selection of primary care specialties(Reed, Jernstedt, & Reber, 2001). Expected Utility is the value applied to an outcome multiplied by its probability. Subjectivity enters into it when probabilities are unknown and thus estimated by the decision-maker.

Subjective Expected Utility Theory assumes that decision-making is a rational process whereby a decision-maker systematically takes into account their own assets or attributes, the consequences of the decision and the likelihood of each of those consequences occurring.

Reed’s review of each aspect of Subjective Expected Utility theory is described in the following sections.

Assets of the decision-maker.

Assets included the student's attributes, strengths and knowledge of the specialties. A substantial body of literature was described demonstrating that primary care experiences in medical school are associated with more students choosing primary care specialties (Brooks, Erney et al., Fincher et al., Jones, Rucker et al.) (as cited in (Reed et al., 2001) p 119-120). There was a tantalizing reference to imprinting; that is, medical students might be more likely to choose a specialty that they experience early in medical school because they've been imprinted with it as their idea of what it is to be a physician. Literature both supported (Rabinowitz as cited in(Reed et al., 2001)p 120) and refuted that idea (Potts and Brazeau as cited in (Reed et al., 2001) p 120.

Academic performance showed no influence on specialty choice (Golden as cited in (Reed et al., 2001) p 120. Women were more likely to choose primary care than men (Bergquist et al. as cited in (Reed et al., 2001) p 121. Faculty evaluations influenced men and women in different ways. The gender that scored higher overall in a certain specialty was more likely to choose that specialty but men were more influenced by objective evaluations and women more responsive to subjective evaluations (Pamies et al. as cited in (Reed et al., 2001) p 121.

Personality and specialty selection have been frequently studied. Particular traits and attributes, Meyers Briggs profiles and Machiavellianism (perceived ability to manipulate others in interpersonal interactions) all had some predictive value in specialty selection (Paiva and Haley, Friedman and Slatt, Merrill et al., Christie and Geist) as cited in (Reed et al., 2001) p 121-122)

Possible consequences.

Reed et al.'s review looked at the association among aspects of practice that medical students favour, student expectation and specialty selection. Students oriented towards primary care specialties favoured different aspects of practice (direct patient care, longitudinal care, psychosocial issues, keeping options open, lower peak income expectations) from students oriented toward non-primary care specialties (money, prestige, lifestyle, research, technology, lesser degree of uncertainty) (Rogers et al., Kassler et al. Osborn, as cited in (Reed et al., 2001) p. 122) Thus the literature supported the idea that students consider the consequences of choosing a specialty as they make their decisions.

Evaluation of consequence's likelihood.

There were no studies that looked at whether students considered the likelihood of a given outcome (i.e. being accepted into a particular specialty as they made their decision). However Reed pointed out that because 84 percent of students ranked only one specialty in the U.S. match and 81 percent were matched to one of their top three choices, students must have had a fairly accurate perception of the likelihood of their acceptance into particular residency(Reed et al., 2001).

Quality of decisions made.

Reed considered studies that looked at how frequently residents changed specialties. Most studies found that a significant minority of students (13 – 27 percent) changed specialties (Tardiff et al., David and Blosser, Jarecky et al. as cited in (Reed et al., 2001), p 126 thus suggesting that the process of choosing a specialty could benefit from improvement.

Reed et al.'s recommendations included: improving knowledge about the decision-making process (research, collecting contemporaneous information, exploring the developmental

nature of the process), helping students develop self-knowledge, and providing better information about specialties.(Reed et al., 2001)

Subjective Expected Utility is incorporated into the proposed Career Choice Model (Figure 1): assets of the decision-maker falls under student attributes, and developing self-knowledge. Possible consequences are part of the process of educational and life experiences that help students learn about possible occupations. Evaluation of likelihood is included as a separate process.

Reed et al's review was very useful. It highlighted areas that still need attention. The limitations included the exclusive focus on American data, and the lack of any assessment of the quality of articles reviewed.

In summary, the five conceptual models of decision making theory as applied to physician practice or career choice have formed the basis for the proposed Career Choice Model. Trying on Possible Selves with its ideas of learning about self and learning about occupation forms the foundation of the model. The concepts from this theory resonate with the ideas from Experiential Place Integration where personal and family values and expectations interweave with the community to form a successful or unsuccessful outcome. The theories of Reasoned Action and Planned Behaviour appear as the influences on behaviour: intentions – signified by the two arrows, subjective norms (both social and family), attitudes and personal motives (found under student attributes). The concepts from Subjective Expected Utility are found also in student attributes (assets of the decision maker) and in the arrow representing the evaluation and likelihood of possible consequences.

Factors Affecting Career or Practice Choice

This category of research asked residents, students and practicing physicians which factors were important in their career or practice choices. Many studies fell into this category.

Obstetrics.

Ruderman, Holzapfel, Carroll and Cummings studied the obstetric practice plans of University of Toronto family medicine residents longitudinally at entry and exit over four years (1991-1994)(Ruderman, Holzapfel, Carroll, & Cummings, 1999). Factors associated with intent to practice obstetrics on exit included: intent on entry, being "turned on" by educational experiences, intent to do rural practice, attending a higher mean number of deliveries and participating in a happy family event. Lifestyle, adequate compensation and the fact that residency had "turned them off" were cited as important negative factors by a significant proportion. Of those not intending to practice obstetrics on entry only 13% were planning to practice obstetrics on exit. No positive effect of family medicine role models was demonstrated despite good evaluations of family medicine teaching.

The strengths of the study included the moderately good response rate with 215/358 (60 percent) paired responses available for analysis, the variety of possibly important factors considered, its prospective nature and the fact that it is Canadian. However it was done at a single residency program, looked only at intent to practice obstetrics and relied on self-report of important factors.

Reid and Carroll studied the influence of family medicine training on residents' decisions to practice obstetrics(Reid & Carroll, 1991). They used a pre-tested survey mailed to all final year residents in 1990 at the University of Toronto. Fifty-one percent of the 53 respondents (67 percent response rate) were planning to practice obstetrics on exit. Cited factors

influencing the decision were: participation in a happy family event; the addition of young families to the practice; family medicine role models; lifestyle; confidence level and level of anxiety. Residents were also asked to describe positive and negative experiences during the residency. Positive experiences included personal and professional rewards, continuity, participating in decision-making, bonding with family, exposure to low intervention approach, good teaching and a good environment. Negative experiences cited were bad outcomes, resident being ignored or not allowed to participate, emergencies**,** mismanagement, poor teachers, and a heavy workload. Residents were also asked what could be done to promote obstetrics in the residency. Their suggestions included: increasing the number of family practice deliveries, increasing resident responsibility, exposing residents to enthusiastic family medicine supervisors and role models, ensuring that residents attend an adequate number of births, moving training to the peripheral hospitals, addressing the lifestyle issues and ensuring that residents receive neonatal resuscitation training.

This was a very interesting study because it was Canadian, it included residents with a variety of educational experiences (eight different hospital programs) and it employed both qualitative and quantitative methods. It was done at the end of the residency so the experiences were fresh. However there were several limitations: residents were asked to recall their intentions at the beginning of their residency; the study was done at a single residency program; residents were asked only about intent to practice and it relied on self-report about important factors.

Practice location.

Szafran, Crutcher and Chaytors (2001) studied factors affecting physician choice of practice location by contacting all 702 graduates of University of Calgary and University of Alberta from 1985-1995(Szafran, Crutcher, & Chaytors, 2001). The response rate was 63

percent. The top three factors cited overall were spousal influence, type of practice (not further described) and proximity to extended family. The least influential factors were the political environment, potential teaching opportunity, incentives for loan repayment and having done a locum in the area. Physicians practicing in rural areas differed from those in metropolitan areas with respect to the importance they gave to various factors. Type of practice, income, community effort to recruit, medical need and loan repayment were significantly more important to rural physicians. Proximity to extended family, working hours, professional opportunities, familiarity with medical community, being brought up in the community, education for children, cultural influences, and teaching opportunities were all significantly more important to metropolitan physicians.

This was a well done, relevant study, as it was Canadian, included a large number of physicians over a ten-year period and studied their actual practice rather than their intent. The limitations included the fact that it was retrospective (asking physicians to recall decisions made sometimes many years earlier), limited to a single province and relied on self-report of influences.

Influence towards generalist or specialty careers.

DeWitt, Curtis and Burke studied 88 of the 92 residents in an American general internal medicine residency who graduated between 1979-1993 to determine what influenced them toward generalist or sub-specialty careers(DeWitt, Curtis, & Burke, 1998). Both a questionnaire and a qualitative telephone interview were included. Internal medicine is considered a primary care discipline in the U.S. but not in Canada.

Sixty-eight percent of the graduates were still practicing generalists at the time of the survey. The proportion of graduates choosing generalist careers had increased over the years

from roughly equal numbers of specialists and generalists in the early 80s to virtually all generalists from 1988 - 1992

There were no differences between the generalists and specialists with respect to gender, age, patient load administrative hours, rural background, participation in community or rural experience or initial commitment to primary care. Salary was not important for the majority in either group. Areas of clinical practice more important to generalists were breadth of knowledge or clinical skills, breadth of clinical problems addressed, opportunity for continuity of care. Mentors were more important to specialists. When asked about strategies to improve primary care selection, better publicity and the imbalance in prestige and financial remuneration were mentioned frequently. Residents experienced an environment that steered them away from primary care but also, paradoxically, specialist mentors who steered them in the direction of generalism. Seventy-three percent of respondents felt that being a specialist was easier than being a generalist; only three percent felt being a generalist was easier. The "hassles" of managed care were cited as one of the deterrents to a generalist practice.

The strengths of this study included the 92 percent response rate, the length of the study (14 years), the inclusion of qualitative data and the study of actual practice rather than intention.. However the study was limited by the retrospective nature of the reflections on decision-making, introspective self-report and that it deals with a single residency in the U.S.

` ***Qualitative studies of career influences*** .

One interesting study used focus groups to examine career influences for a variety of health care providers for urban underserved.(Li, Williams, & Scammon, 1995).

Personal values and identity were strong themes with this group of people. They described a deep philosophical orientation towards humanity, particularly the belief that there is no blame in the plight of the underserved. The roots of this philosophy seemed to be in their childhood and family experiences. They were caring, compassionate, non-conformist and with an empathic ability to identify with the underserved. Their philosophy of practice was team oriented and holistic. They saw the need to pay attention to multiple facets—cultural, social, economic, political, spiritual, physical. Creativity and innovation were called for and support within the team was essential for survival. Communication among practitioners led to sharing points of view and decision-making, having back-up, venting frustrations, nurturing, gaining perspective and avoiding burn-out. Rewards came from seeing the positive impact on patients' lives and from a genuine liking for their patients. An approach of attainable goals— "Let me just plant the seed for them" (Li et al., 1995) p 131)—led to satisfying encounters. All of this was summed up in one participant's statement: "Feeling a positive sense of challenge, practicing high quality work, and having enough time off"(Li et al., 1995).p 131

In their discussion Li et al. emphasized the hardy nature of the participants but also pointed out that the care providers are vulnerable. They commented that we need to create environments to sustain these providers. They introduced the concept of "*communitas* – a social antistructure that frees participants from their normal roles and brings them into an egalitarian, transcendent camaraderie" (Turner (1969) as cited in (Li et al., 1995) (p131). They also discussed the concept of "hardiness" (Kobasa et al. as cited in (Li et al., 1995). "People with this kind of personality view encounters as challenging rather than frustrating, patients as interesting rather than difficult. They see that their own efforts hav[e] an impact [as opposed to their efforts] …not being observed or appreciated. They have a high curiosity about the meaningfulness of

life, believe and act as if they can influence events, and regard life changes to be the norm and a stimulus to growth". (Li et al., 1995) p131

Li et al. concluded that team structure was essential to the ongoing survival and prevention of burn-out, and that curriculum must articulate the intrinsic rewards of working with underserved as well as developing skills for dealing with ambiguity, becoming self-reliant, resourceful, creative and holistic. Attention in the curriculum must also be given to team skills—working together and recognizing incremental changes in behaviour as achievements. Exposure to underserved populations should happen so residents can connect with them as human beings.

Although the group was relatively small, this study provided much food for thought. It underlined the importance of values in making satisfying career choices and the need for a supportive environment if providers are to do difficult and challenging work.

An underserved, rural community in Northern Ontario benefited from the application of some of the principles outlined by Li et al. Marathon has had a stable physician base since 1999 because a group of family physicians introduced a novel approach to practice including fostering a supportive team through good communication, regular meetings and retreats, allowing flexibility and predictability in scheduling, providing support for maternity care and paying people for non-clinical, health related work(Orrantia, 2005)

Another qualitative study looked at medical students who were deciding on their specialties at a university that had undergone a curriculum change to encourage generalist practice(Kuzel & Moore, 1999). Interviews were conducted with second-year students who had experienced the curriculum first hand and fourth-year students who had second hand knowledge of the curriculum. There was no description of the make-up of the focus groups. Students were asked to identify themselves with respect to orientation toward primary care. Second-year

students could have been leaning towards primary care, leaning away from primary care or undecided. Fourth years could have been planning on a primary care or non-primary care career from the beginning of medical school or they could have switched their orientation during medical school. These investigators undertook a thorough qualitative analysis with critique by other investigators, checked earlier findings with subsequent groups and with students from the admissions committee. There was an unsuccessful attempt at member checking.

The authors discovered that students wanted control over their lives, intellectual challenge, fair compensation for their work, rewarding relationships with their patients and their own families. They had also been anxious about the future and fearful that outside forces would prevent them from realizing their dreams. Students from all groups saw managed care as a negative force—treating doctors as commodities, taking control away from physicians, forcing primary care, pursuing profit at the expense of quality. The authors pointed out that medical students were among the most individualistic and autonomous members of a society that valued individual rights and did not value subjugating personal needs to the good of the community. They concluded that medical students need practical unbiased career counseling.

Although the study used purposive sampling to elicit qualitative information from a wide range of students and the data were carefully interpreted and analyzed, these were American data and Canadian students may have different points of view.

This study offered a contrast to Li et al.'s study of urban underserved whose participants demonstrated a strong sense of altruism and service to the community(Li et al., 1995). Quality of care was clearly important to the students in Kuzel's study but they were also focused on their personal well-being more than the needs of the community.

A third study examined the range of beliefs and values expressed by medical students as they chose their careers (Mutha, Takayama, & O'Neil, 1997). The study combined focus groups from three California medical schools with varying degrees of commitment to generalism. Students were randomly selected with fifty-two participants in total. They completed a survey before the focus group to elicit possible factors of importance, and afterward, to assess participation and see if any responses were inhibited in the group.

The authors discovered four themes important to students.

a. *The ability to have an effect on patients* was interpreted differently by those oriented toward surgical specialties –(definitive interventions with immediate and tangible results) as compared to students oriented toward primary care specialties (relationships with patients and long-term incremental results).

b. *Scope of required knowledge – mastery or breadth.* Many students were frightened by the breadth of knowledge in primary care and felt they would not be competent.

c. The effect of *role models* was explored in depth; they could be positive, negative or absent. Positive role models may have steered a student toward a particular specialty or they may have simply emphasized for the student the kind of physician to be. Negative role models may have powerfully dissuaded students away from particular specialties. Women in particular spoke of having difficulty finding any role models.

d. *Money* seemed not to be a major factor in career choice for these students.

The authors concluded that "making a difference" (Mutha et al., 1997) p 639) is an important yardstick and realistic primary care settings are needed to give students the experience of how one makes a difference in primary care. Negative role models could be very influential,

so educators need to be very sensitive to how students perceive faculty. Gender specific issues were only raised in groups that were at least 50 percent women.

The strengths of this study were many. It was well designed with careful content and thematic analysis. Attention was paid to inter-investigator reliability. Trustworthiness was established by using several schools with differing approaches, by reporting findings from all students not just the majority opinions and by triangulation (with the survey data, the literature, other students, medical educators and administrators). Seventy percent of students contacted agreed to participate. The only limitation was the American setting.

General studies of factors influencing practice choice.

Senf, Campos Outcalt and Kutob (2003) reviewed the literature on factors affecting family medicine as a specialty career choice. Rural background, parents' socioeconomic status, intention on entry to medical school, belief that primary care was important and not planning a research career all were associated with choice of family medicine as a career. Large-scale, program-level, educational interventions to increase the number of students entering primary care were effective as were required rotations in family medicine. Role models could have a positive or a negative influence. The reasons students gave for avoiding family medicine included: prestige, low income and the breadth of knowledge required.

This was a systematic, rigourous literature review that looked comprehensively at factors affecting family medicine choice from student characteristics on admission through to views of family medicine at graduation.

Haq, et al. studied medical students at the University of Wisconsin Medical School using a validated survey instrument to determine the influential factors on generalist and non-generalist oriented students. They found no decline in interest in generalist careers among entering medical

students between 1997 and 2001. However, interest among graduating students fell from 50 percent in 1997-98 to 38 percent and 28 percent for 1999 and 2000 respectively ((Haq et al., 2002). It seemed something happened during medical school to contribute to this decline in interest. They also determined that pre-existing beliefs and values influenced career selection. Generalist students valued long term relationships, continuity, variety, needs of underserved, community health while the non-generalist oriented students valued mastery of an area of expertise, working with new developments, technology, higher income, prestige and challenge. Again, although the numbers are large, this is American data from a single medical school.

A representative, longitudinal, national survey studied the effect of medical education on primary care orientation in both medical students and residents (Zinn, Block, & Clark-Chiarelli, 1998). The instrument was developed through focus groups and literature reviews and was tested and validated. It was administered via twenty-minute telephone interviews. The researchers were interested in studying both developmental change (how students change as they progressed from first to fourth year and from fourth to Post Graduate Year 3 (PGY3) and secular change (how the 1997 PGY3 group differed from the 1994 PGY2 group and how did the 1997 fourth year group differ from the 1994 fourth year group.

There appeared to be a positive shift in the environment for primary care over the three years but a decline in primary care orientation of students as they moved from first to fourth year and from fourth year to PGY3.

In 1997 more students and residents reported positive specialist attitudes toward primary care; more were satisfied with primary care teaching; fewer people perceived top students being directed toward specialties, and more people perceived peers and faculty as steering them toward primary care. This was perceived to be a secular change. Conversely there was a change of

attitude in terms of an increasing need for expertise from 1994 to 1997. In 1997 a significantly lower percentage of people felt a primary care physician was the most appropriate one to manage a complicated illness and an increased percentage felt that a higher degree of expertise should be associated with performing technical procedures.

From a developmental perspective there was steady erosion of orientation toward primary care over the course of medical school and residency. As students moved from first to fourth year and from fourth year to PGY3, the percentage who felt that dealing with psychosocial problems made primary care attractive declined. A lower percentage of the 1997 PGY3s felt that dealing with socioeconomic issues made primary care more attractive than they had as fourth years in 1994. For students who switched away from primary care there was a decline in the percentage showing interest in socioeconomic issues. Debt and financial issues were not associated with switching.

This was an excellent carefully done study with a national representative sample. The attention to both developmental and secular change is important and the authors dealt with it by longitudinally comparing two cohorts at different times through medical school and residency and by also comparing fourth years in 1994 with fourth years in 1997 and PGY2s in 1994 with PGY3s in 1997. Again this was American data, which may not be relevant to Canada, and PGY3s may not be comparable to PGY2s. Nevertheless the erosion of primary care orientation and the secular change of an increasing perceived need for expertise both rang true and suggested further investigation. The more positive climate for primary care was encouraging.

Bethune et al. found a similar erosion of interest in family medicine as students progressed through medical school at Memorial University. Overall interest in family medicine

declined among all cohorts from first year (61 – 78 percent – 4 cohorts) to graduation (46 – 60 percent – same 4 cohorts)(Bethune et al., 2007)

Three UK studies looked at factors affecting practice choice in several ways.

Rowsell, Morgan and Sarangi studied the career intentions of all registrars in South West England in their final training year in 1993 using a qualitative and quantitative survey design(Rowsell, Morgan, & Sarangi, 1995). Participants were asked about their interest in various kinds of work, their beliefs and attitudes about general practice and demographic information. The response rate was 73 percent. The authors discovered that a higher percentage of women were interested in less than full-time work, job sharing, or being on a retainer. Women participants were significantly less likely to have children than their male counterparts (11 percent vs 43 percent), maternity/paternity leave was significantly more important to women than men (81 percent vs 34 percent).

Seventy percent of trainees were interested in hospital work, 34 percent in academic and 71 percent in locum work. The factors that were important to more than 60 percent of respondents were: time for leisure, on-call rota, weekend work, child care, evening work, on-call overnight, flexible working pattern, partner's paid work/interests. Salary was important to less than 60 percent as were several other factors.

The qualitative data gave rise to three themes from these registrars; what was enjoyable about being a GP, what was negative, and a sense of uncertainty about the future. The enjoyable aspects of general practice were found to be: continuity, the relationship between family and social circumstances and health, caring for the whole person, seeing patients in their home environment, variety, breadth of clinical challenge, independence, responsibility, being part of the community and working with a good team. On the other hand, patient demands and

expectations, out of hours work, on-call, workload, paperwork, government directives, fear of litigation, lack of respect, negative attitude of hospital doctors, sense of isolation and lack of social life were viewed as the negative aspects.

These registrars expressed a sense of uncertainty as a fear of commitment, lack of readiness for the role, general disillusionment with medicine as a career, political instability and stress. The authors concluded that although 96 percent of their respondents were interested in some form of general practice, these physicians' job enjoyment was being eroded by an overwhelming workload. They also determined that the ability to determine one's own style of work is essential to job satisfaction, the impact of work on personal life is important and uncertainty about the future of general practice may lead to a wait-and-see attitude as evidenced by the high percentage who were interested in locum work.

This is a well-done mixed methods study. The differences between men and women are important to note. The high percentage interested in hospital sessions is interesting.

Another earlier study done in 1991 in NW Thames surveyed all the GP trainees (90) in that area about important factors in choosing a practice (Beardow, Cheung, & Styles, 1993). This survey asked about willingness to work in an area or size of practice rather than actual intent. Only 12 percent had considered a solo practice and 28 percent a two-doctor practice. Twenty eight percent had considered working in inner London and 51 percent had considered a rural area. The top five factors that influenced practice choice were: good relationship with partners, staff and the local hospital, a nurse in the practice, and opportunity for postgraduate education,

Other factors scoring 3.0 or greater on the 5 point Likert scale were: access to diagnostic facilities, having a practice manager, attached health authority staff, computerization, work schedule fits social schedule, screening targets achieved, easy parking, access to hobbies, safe

area, good schools, same area living now, deputizing service for on-call coverage, hospital work available, spouse works in area, teaching practice, good local transport and large patient list (number of patients belonging to the practice).

These data were from a single area of the U.K. but it was interesting to see the lack of willingness to consider solo practice and the importance of relationships in choosing a practice. There was little difference between men and women in the importance given to the various factors.

In 1993, Johnson et al. studied the career histories of all GPs who had completed training between 1974 and 1989 in the Oxford region (Johnson et al., 1993). The response rate was excellent: 776/970 (80 percent). Repsondents were divided into 4 cohorts: graduates from 1974-1978,1979-1983, 1984-1987 and 1988-1989. In the three earlier cohorts more women than men had been unemployed, either voluntarily or involuntarily. Ninety-eight per cent of men worked full time compared to 51 percent of the women. A higher percentage of women were in locum or salaried positions. The factors impeding choosing or following a career were all more significant for women and included their gender, their children, other family, availability of local posts, inflexibility of hours. An increasing percentage of men over time found it difficult to choose a career: (6.5 – 16 percent) and to follow a career (2 – 8 percent). There were no trends over time for the women, although a higher percentage of them reported difficulty both choosing and following a career (11 – 20 percent and 7 – 14 percent) The level of discontent was relatively low at 10 percent and 10.6 percent said they were not doing the job they wanted to do.

Respondents also noted concerns about too much paperwork, conflict with family life, molding a career to fit with a spouse's, problems with partners and onerous workload.

Johnson et al. studied actual practice history over a long time frame, had a good response rate and a large sample size.

In summary, this area of research underlines the complexity of practice and career choice. The list of influencing factors is very long and ranges from childhood experiences, through personal values and beliefs, heavily influenced by medical school, residency, the realities of practice life, family, friends and societal expectations. Most of these factors have been taken into account in the detail of the career choice model.

Limitations of introspective self-report.

All of this interesting data on self-reported factors influencing career choice is called into question by the psychological literature on the inaccuracies of introspective causal reports. Pathman and Agnew undertook a literature review in 1993 and reported on a number of biases that may affect the accuracy of self-report(Pathman & Agnew, 1993). Salience bias referred to the human tendency to perceive stimuli that are more prominent in the environment. Thus if there was a lot of literature or discussion of a certain factor physicians would be more likely to report it as an influence. For example, despite the fact that many physicians reported that malpractice insurance rates were a prime reason for leaving obstetric practice, one study demonstrated that when insurance rates were reduced no physician returned to the practice of obstetrics.

Actor-observer bias referred to the tendency people had to overemphasize the role of external factors in causing their own behaviours particularly when there were negative outcomes. Similarly *self-serving bias* meant that people would take credit for success and deny responsibility for failure; positive career decisions would be attributed to their own virtues while failures would be attributed to others' shortcomings. *Self-centred bias* led people to exaggerate

their own contribution to group decisions and activities whether the outcomes were positive or negative. Lastly *false consensus bias* referred to people's belief that everyone would respond the same way in their particular situation.

This is an important article given the reliance of much of the career choice literature on self-report of influential factors. The alternative to self-report is statistical association or observation.

It is possible that qualitative information gathered during the process of decision-making may be more valuable although Nisbett called this assumption into question (Nisbett & Wilson, 1977) when he reviewed the literature and presented a series of conclusions about people's inability to report their own cognitive processes. He offered evidence to support three conclusions

a. People often could not report accurately on the effects of stimuli on higher order inference- based responses
b. When reporting the effects of a stimulus, people tended to base their report on a previously held belief about the likelihood that the stimulus in question would cause a particular response. If the stimulus was a plausible cause of the response they reported it as causal. If it did not fit their idea of a plausible cause of the response they did not report it.
c. Even when subjective reports were accurate it was due to a coincidental reporting of a perceived solution.

These two articles suggest caution in acting on the results of self-reports. Self-reports should probably form part of the input into more experimental, behaviorally based studies with evaluation of actual outcomes.

Attributes of students or residents.

Another group of studies considered the effect of students' and residents' attributes such as values, attitudes, gender, background, etc. on eventual practice.

Values.

Curlin, Dugdale, Lantos and Chin (2007) studied American physicians to discover if religious physicians were more likely to care for underserved populations. Although there was no association between the traditional definition of being religious and service to the underserved, physicians who described themselves as highly spiritual, agreed that their religious beliefs influenced their practice and said that the family in which they were raised emphasized service to the poor, were more likely to be working among the underserved.(Curlin, Dugdale, Lantos, & Chin, 2007)

Hojat et al. (1998) looked at the career histories of all graduates from Jefferson Medical College from 1974 and 1975 (391), 25 years after they graduated.(Hojat et al., 1998) All the graduates had been given a validated questionnaire assessing their personal values in the first and fourth year of medical school. They found that physicians practicing in people-oriented specialties scored significantly higher on the social values scale than physicians who chose technologically oriented specialties. Students with higher income expectation scored higher on the economic values scale. There was a negative correlation between scores on the religious and social values scale and expectation of income.

This study was of interest because it explicitly considered values and looked at actual practice as opposed to intentions. However the data were from a single American medical school and the participants are overwhelmingly men (344 out of 391 physicians)

Eliason and Schubot surveyed the 330 nominees for the Family Physician of the Year award (U.S.) from 1988-1993 using the Schwartz Values Questionnaire—a validated tool for assessing personal values(Eliason & Schubot, 1995). There was an excellent response rate of 83 percent. The exemplary family physicians rated benevolence, conformity and achievement as the top three values of importance to them and hedonism, stimulation and power the lowest. The benevolence and tradition ratings showed a positive correlation with practice satisfaction while power showed a negative correlation. The authors concluded that values related to helping and serving communities led to greater practice satisfaction and that ambition and focus on money led to lower practice satisfaction.

This study was unique in its focus on values and exemplary physicians. However the sample was virtually all older men (average age 63, 94 percent male) and 52 percent rural

Wright , Scott, Woloschuk and Brenneis (2004) undertook a factor analysis of career choices of entering medical students. Values of students with an interest in family medicine were more likely to include a societal orientation (a focus on patients in the community, a desire for long-term relationships with patients, a social commitment and an interest in promoting health).(Wright et al., 2004)

Attitudes.

Greenberg and Hochheiser (1994) undertook an extensive national survey of American family medicine residents in 1992 to determine their attitudes toward the future practice of obstetrics(Greenberg & Hochheiser, 1994). The response rate was 85 percent.

Seventy-two percent of respondents indicated they would include obstetrics in their future practice. The top five reasons given for practicing obstetrics included: the attitude that obstetrics is an important part of family health (96 percent), diversity in practice (84 percent), personal interest (81 percent), community need (73 percent), positive role model (most important for 3 percent, top three for 51 percent).

Three principal reasons given for not practicing obstetrics included: interference with personal life (41 percent), fear of lawsuits (21 percent) and cost of insurance (15 percent)

Statistically significant associations with the intent to practice obstetrics included: being a woman, planning rural practice, number of months of obstetric training, solo practice or small partnership, planning to work in the Northwest, having a rural background.

Residents choosing to provide obstetric care were more likely to give their obstetric department a positive rating and more likely to say that their residency program encouraged the practice of obstetrics.

The association between length of training and intent to practice obstetrics supports a positive effect of education on practice, as does the indication of the importance of role models and the negative effect of perceived lack of training.

This was a strong study because it used a randomly selected national U.S. sample representing rural, suburban and urban residency program and had a high response rate. Factors such as months of obstetric training may have reflected a self-selection bias; students who were

more interested in obstetrics may have chosen or designed their residency programs to include more obstetric months. However intent did not reflect actual practice and the self-reported reasons or factors leading towards and away from the practice of obstetrics may not have reflected actual decision-making. The reported rate of intent to practice obstetrics seemed unusually high even for 1994. The authors noted the discrepancy between the high numbers of residents intending to practice obstetrics and the low numbers of practicing physicians actually including obstetrics could have indicated that the problem was with the conditions of practice, not with the residency programs.

Levitt et al. (1997) surveyed family medicine residents at McGill in 1992-1994 before and after an obstetric /neonatology educational intervention to determine their attitudes toward and confidence in practicing obstetrics. They included a case-matched control group of University of Montreal (U of M) family medicine residents who had no curriculum change(Levitt et al., 1997).

This was a well-designed study using the Dillman method(Dillman, 1978). Face validity and internal reliability of the instrument were tested.

The intervention included offering the obstetric and neonatology rotations back to back, emphasizing family physician role models, and including Neonatal Resuscitation Program (NRP) and Advanced Life Support in Obstetrics (ALSO) courses. As well, the objectives were changed to clearly define conditions that family physicians should manage definitively, those that family physicians manage with consultation and those where family physicians would have only a very limited role.

Attitudes were assessed with respect to four scales; general attitudes about family physicians and obstetrics, attitudes toward low risk obstetrics, attitudes toward obstetrics without back-up and attitudes toward neonatology.

This study showed a positive effect of the neonatology curriculum; an increase in positive attitudes and confidence over time that was significantly different between the McGill (intervention) group and the U of M (control) group. There was no demonstrable effect of the changed obstetric curriculum and the results were discouraging, as participants indicated low confidence in their ability to practice obstetrics overall in both groups and a lessening of confidence from year one to year two in both groups.

This study demonstrated careful attention to design, administration and analysis of the questionnaire, the inclusion of a control group, the administration of the survey at the beginning and end of the residency and the focus on attitudes. However the numbers overall were small (57), it was not clear that the control group was comparable, confidence was used as a proxy for competence and one of the outcomes was intention to practice rather than actual practice.

Klein, Kelly, Spence, Kaczorowski, & Grzybowski, 2002) compared characteristics of practicing family physicians who were planning to leave or stay in maternity care. Among other factors, having negative attitudes towards non-traditional maternity care was associated with intention to leave intrapartum care.

Gender.

Women are more likely than men to practice obstetrics(Ruderman et al., 1999).

With respect to choosing a practice location, women rated spousal influence as most important while men rated type of practice. A significantly higher percentage of men ranked

rated income, high medical need, climate or geography as important. A significantly higher percentage of women ranked working hours, familiarity with the medical community, resources and availability of support facilities or staff, education system for children and teaching opportunity as important.(Szafran et al., 2001)

Men were much more likely than women to practice emergency medicine. Of those who intended to do emergency medicine at the beginning of residency 52 percent of the women did not practice emergency medicine while only 13 percent of the men changed their minds. (Ovens, Allen, & Cohen, 1993)

Other attributes.

Szafran et al., 2001) showed that physicians tended to practice in same size community as their hometown.

DeWitt et al., 1998) demonstrated that there were no differences between generalists and specialists with respect to gender, age, patient load, administrative hours, rural background, participation in community or rural experience or initial commitment to primary care.

In Geyman, Hart, Norris, Coombs, & Lishner, 2000)'s study, attributes of students that predicted rural practice included: being male, slightly older, married with children, Caucasian , having attended public medical school, having expressed a preference for family medicine, having taken rural or international electives, and having participated in volunteer work programs for the underserved. Factors that influenced initial practice choice included spouse, community receptivity, partners in the practice, geographic location, proximity to residency, recreation, call schedule and after-hours coverage(Geyman et al., 2000)..

Lifestyle.

Newton, Grayson, & Thompson, 2005) studied the influence of lifestyle and income on fourth year medical students' career choices at the Brody School of Medicine and the New York Medical College. Over the years 1998 – 2004 lifestyle was found to have an increasing influence on medical students' career choices. Students viewed primary care as intermediate on the lifestyle friendly continuum of specialty choices.

Lind & Cendan, 2003) used a data base to look at trends in career choices by medical students at the University of Florida from 1982-2002. They divided residency programs into three categories; surgical, primary care and "lifestyle friendly" – (anaesthesia, radiology, dermatology, pathology, ophthalmology and psychiatry). They also compared the grade point average (GPA) of the students entering specialties in the three categories. The percentage of students choosing primary care specialties was constant over the 20 years at 54 percent. The percent choosing lifestyle-friendly specialties increased from nine percent in 1983 to 22 percent in 2002. The GPA of women entering lifestyle-friendly specialties was significantly higher than the GPA of all students entering surgical specialties. There was no mention of the GPA of students entering primary care specialties(Lind & Cendan, 2003).

Schwartz, Jarecky, Strodel, Haley, Young and Griffen Jr. earlier undertook a similar analysis of three medical schools over a ten (1978-1987) or a six-year (1981-1987) period. They defined "controllable lifestyle" specialties a bit differently, adding neurology, otolaryngology and emergency medicine to the list above. They also discovered that the percentage of top students choosing controllable lifestyle specialties steadily increased over the period studied (statistically significant). During this same time period the percentage of top students entering "non-controllable lifestyle" residencies (primary care and surgical) steadily declined at two of

the colleges (also statistically significant). The third college had one set of data points that was contrary to the trends in other years and at the other institutions(Schwartz et al., 1989).

These two studies provided some support for the idea that lifestyle is one of the major factors driving student and resident career planning. However it was not certain that lifestyle was the reason to choose those specialties. The data were American and limited to a few medical schools.

Godwin et al. (1998) studied the practice choices of Queen's family medicine graduates over a 15-year period between 1977 and 1991. They compared an earlier cohort (1977-1984) with the later cohort (1985-1991) with respect to type of practice immediately after residency and length of time in first practice. The response rate was 76 percent. There was a slight demographic difference between the two cohorts; the early group was 63 percent men and the later was 48 percent men. The early group was more likely to go into full-time practice immediately (OR 3.9). Gender and other demographics did not affect this association. The early group was also more likely to be in full-time practice within two years of graduation. (OR 2.51) (Godwin et al., 1998).

This was an important study—the only one of its kind in Canada. It encompassed a long time frame and had a good response rate. However, there was no educational correlation with practice, no exploration of reasons for choosing the type of practice and no open-ended or qualitative data.

In summary there is evidence that attitudes, values, gender, rural upbringing and lifestyle expectations (another value) influence career and practice choices.

Educational Influences on Practice Choice.

A number of studies examined the effect of educational experiences on specific aspects of family medicine. These include emergency medicine, obstetrics, geriatrics, behavioural medicine and patient education. Other studies looked at factors affecting recruitment and retention of rural physicians, the effects of funding to departments of family medicine, residency training site and clinical confidence.

Emergency medicine.

Ovens, Allen and Cohen (1993) surveyed 302 family physicians who graduated from the Toronto program between 1988 and 1991 about the factors leading them to practice Emergency Medicine (EM) or not and whether they felt their clinical skills were adequate for EM. The questionnaire was developed from the literature and contained open- and closed-ended questions. Each author categorized the responses to the qualitative questions and reached consensus on a set of themes to categorize responses. The response rate was 50 percent.

The two most important reasons for practicing EM were the interesting and/or challenging nature of the work and community or practice need. The two most important reasons respondents gave for <u>not</u> practicing EM were stress and feelings of incompetence. The variables that were significant predictors of eventual practice of EM were intent to do so at the beginning of residency, number of months of EM experience and additional EM electives.

Respondents were asked to report good and bad experiences in the emergency department. The good experiences were challenging clinical problems, supportive learning environment, and acquiring specific skills. Bad experiences included tragic cases, difficult patients, and inadequate supervision or support.

This study demonstrated links, both positive and negative, between training and practice. Those who had more months of EM experience were more likely to practice EM but whether this was cause or effect was difficult to determine. From the physicians' point of view a minority felt the training had a positive influence and a much larger percentage (40 percent) felt training had a negative influence. Once again, it seemed educational experiences can discourage physicians from undertaking practice in a particular area. There was a fine line between good and bad experiences. A potential good experience (a challenging case) could end up being a bad experience if the outcome was not good and the resident felt unsupported.

Ovens et al. concluded that more months of EM, better objectives and didactic teaching in areas where patient exposure is not adequate could positively influence residents toward EM practice(Ovens et al., 1993).

This study had several strengths. It was Canadian; it studied actual practice rather than intent and it included open-ended qualitative questions. However there was only a 50 percent response rate, and the information was retrospective, sometimes asking people to recall decisions they had made six years previously.

Obstetrics (maternity care).

Godwin, Hodgetts, Seguin and MacDonald (2002) undertook a well-done, systematic, prospective study to determine how educational experiences were associated with family medicine graduates' practice of obstetrics. All Ontario FM residents were surveyed at three points during their residency (at entry, mid-way, at the end) and two years after graduation. Data were analyzed for correlations with obstetric practice.

The response rate was sixty-six percent. Overall 16 percent of respondents were practicing obstetrics. Three factors at the practice level were independently associated with the practice of obstetrics: practicing in a community of <15,000 (Odds Ratio [OR] 6.0), stated intention to practice obstetrics at the end of residency (OR 11.7), and holding the belief that intrapartum care is not overly disruptive of personal life (OR 9.1) . Three factors during residency were independently associated with intent to practice obstetrics at the end: stated intention at the beginning (OR 5.5), number of deliveries (>40 OR 5.4, >80 OR 5.9), and believing that intrapartum care isn't too disruptive of personal life (OR 5.1). There were a number of factors that were not significant, including beliefs about adequacy of remuneration, number of family medicine patients followed and beliefs about midwives.

The authors concluded that identifying residents early who intend to practice obstetrics, ensuring that they deliver at least 40 and preferably 80 babies and paying attention to their attitudes about disruption of their personal lives – family medicine role models, supportive call groups etc., would increase the number of residents choosing to practice obstetrics after graduation. Paying attention to and supporting the obstetric learning of residents who intend to practice in rural communities who are also more likely to practice obstetrics, would also increase the number of family medicine accoucheurs(Godwin, Hodgetts, Seguin, & MacDonald, 2002).

This was an excellent study for many reasons. It was a Canadian study with a good sample size and a good response rate. Actual practice was the endpoint rather than intent. Statistical correlations were sought rather than asking residents for opinions. Residents were surveyed at the time they were making choices and attitudes were taken into consideration. Drawbacks include the single province (Ontario) and the lack of any qualitative information.

In the above-mentioned studies by (Reid & Carroll, 1991) and (Ruderman et al., 1999), residents who intended to practice obstetrics had also attended a higher mean number of deliveries during their residency.

Helton, Skinner, and Denniston (2003) reported on the results of an educational intervention at the University of Carolina family medicine residency program designed to improve the maternity care curriculum and the proportion of graduates including obstetrics in their practice. The study period extended over 13 years from 1988-2001 (92 residents). The intervention was implemented in 1994-1995.

The educational intervention was extensive: only faculty enthusiastic about and practicing maternity care themselves were able to supervise residents; a new maternal and child health care service (MCH) was created with only FM residents as caregivers; the volume of MCH deliveries was increased; continuity of care for PGY2s and PGY3s was ensured with an emphasis on child health care after delivery; ample evidence-based didactic teaching was provided; and changes to enhance the independence of the family medicine department were made so that family physicians were credentialed by their own department, not the department of obstetrics and mandatory consultations were eliminated. The positive spin-offs of this intervention meant more of a family medicine presence on the labour delivery floor because of increased volume of deliveries in the MHC, a positive local reputation and support for local family physicians to do obstetrics.

The educational and practice results showed a statistically significant improvement in residents' ratings of the educational quality of the experience on the new MHC as compared to the old obstetric rotation. The percentage of residency graduates including obstetrics in their

practice increased from 27.5 percent in 1988-1994 to 52 percent between 1994-2001(Helton, Skinner, & Denniston, 2003).

This was an important study for several reasons. The outcome was actual practice as measured by graduates' applications for hospital privileges. Distinct from many other studies, this one looked at the outcome of an intervention, not self-reported reasons or factors. The intervention was described in detail and thus could be replicated. The time frame was long. The increase in numbers deciding to practice obstetrics happened during a time when the trend in the U.S. and Canada was in the other direction; therefore it was even more significant.

The drawbacks to the study included the small sample size (only six – eight residents per year); the fact that it was a U.S. study; only fifty-two percent of evaluations forms were returned, and an application for obstetric privileges may not reflect long-term practice of obstetrics.

Bower Wolkomir and Schubot (1997) studied the effects of a two-day Advanced Life Support in Obstetrics (ALSO) course and demonstrated a significant increase in residents' confidence in handling obstetric emergencies. The sample was a self-selected group of 55 family practice residents from The University of Wisconsin in 1992-93 who chose to take an ALSO course. As discussed above in the section on theories there was no change in residents' plans to practice obstetrics. Confidence was measured using Bandura's well-validated concepts of self efficacy (Bandura 1977 as cited in(Bower et al., 1997).

Geriatrics (care of the elderly).

Richardson, Fredman and Daly (1993) studied the relationship between residency training and subsequent practice of geriatric medicine(Richardson, Fredman, & Daly, 1993). They surveyed all the graduates of a single family medicine program (University of Maryland)

between 1973-1990 . Education in geriatrics was quite comprehensive, including: nursing home patients; a geriatric rehabilitation unit; residents acting as medical consultants to an acute rehabilitation unit; house calls once weekly for one month; a one-month rotation in second year at a chronic care nursing home and weekly didactic teaching.

Two cohorts of graduates were compared: those who graduated before the division of geriatrics came into existence and those who graduated afterwards. Univariate and multivariate analyses were conducted.

The response rate was 89 percent. Fifty-nine percent of the respondents made house calls, 51 percent made nursing home visits and 10 percent were directors of a nursing home. Being a member of a group practice was significantly associated with making nursing home visits and house calls. Rural practice was also associated with house calls. The variables significantly associated with having more elderly patients in the practice (> 25 percent of patients over 65), were: physician age (older physicians had a higher percentage of elderly patients) and having a CAQGM (Certificate of Added Qualifications in Geriatric Medicine).

Physicians with post-residency training other than a CAQGM were significantly less likely to make nursing home visits or house calls. Residents who rated their geriatric training more highly were significantly more likely to make nursing home visits.

There was no difference between the two cohorts (before and after the establishment of the geriatric division) in any of the indicators of geriatric practice.

The strengths of this study included the long time period, the measurement of actual practice and the high response rate. It seemed that the practice environment was the major factor driving the practice of these physicians. It was difficult to draw any meaningful conclusions

about education since there was no clear educational intervention and it was difficult to sort out educational effects from self-selection and interest of residents. Perhaps those who were inherently more interested in geriatric practice rated their educational experience more highly.

The assessment of training adequacy was done retrospectively; some of the respondents would have been commenting on training that occurred as long as 17 years earlier. There was no comment on the finding that other forms of post-residency training were associated with lower likelihood of nursing home visits.

Behavioural medicine.

Prislin, Lenahan, Shapiro and Radecki (1997) studied the effect of an educational intervention on the practice of behavioural medicine. The participants were graduates from the family medicine residency program at the University of California, Irvine. The pre-intervention cohort (graduates between 1984-1988) were surveyed in 1990. The post-intervention cohort (graduates between 1993-1995) were surveyed in 1996. The intervention included the introduction of Problem Based Learning(PBL) modules to replace didactic teaching and longitudinal clinic-based counseling sessions to replace a block rotation. Participants were asked about their actual practice, their perceived competence and the adequacy of their training for ten aspects of behavioural medicine (eg situational stress, anxiety, marital counseling etc.).

The response rate was 50 percent for the 1990 cohort and 85 percent for the 1996 cohort. Perceived competence was high in both groups for the majority of conditions. Seventeen to 45 percent of the 1990 cohort felt marginally or poorly prepared to manage sexual dysfunction, child abuse and eating disorders, while 22-57 percent of the 1996 cohort felt marginally or poorly prepared to manage sexual dysfunction, child abuse, eating disorders, Attention Deficit Disorder (ADD) and other learning disorders. With respect to frequency of practice activity, the

1990 cohort more frequently cared for patients with alcohol and substance abuse problems, while the 1996 cohort more frequently cared for patients with depression, marital counseling, eating disorders, situational stress and sexual dysfunction. The 1990 cohort reported higher perceived competence than practice activity for marital counseling while the 1996 cohort reported higher practice activity than perceived competence for ADD, learning disorders and eating disorders. The scores on the PGY3 in-training exam for psychiatry were similar for both groups(Prislin, Lenahan, Shapiro, & Radecki, 1997).

The strengths of this study included the measurement of actual practice activity rather than intent, a clear educational intervention and a before-and-after comparison group.

Limitations included the 50 percent response rate for the 1990 cohort and the fact that it is difficult to attribute the differences to the intervention. The two cohorts differed significantly in number of years in practice and the practice environment had undergone a significant change in the period between the two surveys. The authors suggested that the finding of higher level of practice activity than perceived competence in some areas for the 1996 cohort possibly could be attributed to the problem-based approach that encouraged self-directed independent learning.

Patient education

Plorde-McCann, Wollitzer and Blossom (1986) studied the effect of a patient education training program for 24 family medicine residents at Valley Medical Centre, California in 1982 and 1983 on their attitudes and behaviours related to patient education(Plorde-McCann, Wollitzer, & Blossom, 1986). The comparison group was 65 residents at other family medicine programs in California. The intervention consisted of intensive tutorials, observation and feedback sessions. Attitudes and self-reported behaviour were assessed by a pre and post-intervention questionnaire. The response rate was 100 percent for the study group and 50

percent for the control group. There was no significant difference in attitudes between study and control group. The study group showed a significant decline in reported difficulty conducting patient education while no such change occurred in the control group. The study group also reported significantly fewer problems with educating patients in their PGY3 year than the control group.

There were a number of limitations with this study. The data are from a single American medical school. Self-reported behaviour is not actual behaviour. The study period was quite short (nine months) so it is hard to know if there was a lasting effect. However this study did demonstrate a reduction in perceived difficulties and problems with a skill, as the result of an educational intervention.

Recruitment and retention of rural physicians

Woloschuk, Crutcher and Szafran studied graduates of the family medicine residency programs at the University of Calgary and the University of Alberta between 1996 and 2000 to discover what factors were associated with rural practice. Out of eight possible factors analysis revealed that training in rural leadership and preparedness for small town life were associated with a higher likelihood of rural practice(Woloschuk, Crutcher, & Szafran, 2005).

Geyman, Hart, Norris, Coombs and Lishner (2000) undertook a comprehensive American literature review to examine the success of educating physicians for rural practice. The technique for the literature search was defined. The authors stated that the articles were critically appraised but there was no direct description of how their quality was assessed. The Physician Area Shortage Program (PSAP) and the Rural Training Tracks (RTT) both seemed to be successful. PSAP had a special admission procedure (students from rural backgrounds with stated intention to do family medicine) and a special educational program (faculty advising,

required third-year clerkship in family medicine, fourth-year clinical family medicine experience). The graduates of PSAP were ten times more likely to combine a career in family medicine with rural practice. Eighty-five percent of the graduates were either in a primary care or in a rural or small metropolitan area. Seventy-six percent of the 99 graduates of RTTs (13 across the U.S. started in the early 1990s) had entered rural practice as of 1996. Rosenthal (2000) identified characteristics of successful RTTs. They had an academically sound urban component, a supportive urban medical centre, a financially viable rural hospital, a modern rural practice unit and a robust rural community(T. C. Rosenthal, 2000) as cited in (Geyman et al., 2000)

Family medicine programs were more likely to produce rural physicians when they offered more rural and obstetric months, a full or partial rural mission, location in a rural state, a Post Graduate director with rural experience, a procedural emphasis, fewer rotations from other specialty services and had fewer women or minority residents, (Bowman and Penrod (1998) as cited in(Geyman et al., 2000)

Factors that influenced initial practice choice included the spouse, community receptivity, partners in the practice, geographic location, proximity to residency, recreation, call schedule and after-hours coverage. (Costa et al. (1996) as cited in(Geyman et al., 2000).

This was a comprehensive review of the American literature. The authors included unpublished material in their review and reported on the studies in considerable detail. They did not offer any comments on the quality of the articles and they did not include non-American literature. There seemed to be a clear message from this paper that length of training influences practice. This was best illustrated by the positive linear correlation between number of required rural months and ultimate rural practice and the negative correlation between number of months of other programs' rotations and choice of rural practice.

Brooks, Walsh, Mardon, Lewis and Clawson(2002) reviewed the literature to determine which educational factors were associated with recruitment and retention of rural physicians. The review was done systematically with a well-described search that included PubMed, Medline, bibliographies and personal communication with authors. The studies were scored for methodologic quality.

Rural upbringing was the best-studied and strongest pre-medical school predictor for recruitment to a rural area. Undergraduate (pre-medical) training in a geographic area was positively associated with retention in that area in only one study (Homer et al. (193) as cited in(Brooks, Walsh, Mardon, Lewis, & Clawson, 2002).

A number of medical school factors were positively associated with rural recruitment including the Physician Area Shortage Program, specialized medical school curriculum for students with rural background or interest, decentralized rural experiences, public funding, medical school in a rural state, lower National Institutes of Health (NIH) funding, higher production of family physicians, recruiting students with generalist interest, service commitments and primary care training (Rabinowitz et al. 1999, Fryer et al. (1994). ,Rosenblatt et al.(1992), Basco et al. (1998), Homer et al. (1993),Rosenthal et al. (1997, 2000) as cited in(Brooks et al., 2002)

Medical school factors positively associated with rural retention included longer National Health Services Corps (NHSC) commitment (financial incentive for service obligation), family practice experience, specialized medical school curriculum for those with rural background or interest and decentralized rural experiences. (Cullen et al. (1997) Rabinowitz et al. (1999), Fryer et al. (1994) Rabinowitz et al. (1994)as cited in(Brooks et al., 2002) Medical school factors that had no effect on retention included NHSC commitments in general, public v.s private funding of

medical school, rural rotations, level of NIH funding and percent of students going into Family Practice (Pathman et al (1992,1994, 1999) as cited in (Brooks et al., 2002)

Residency factors that positively influenced recruitment included generalist or family medicine residency programs, residents who came from out of state, rural rotations during residency, rural residency programs and rural residency tracks (Homer et al. (1993), Bowman, Penrod (1998), Rosenthal et al. (1997, 2000) as cited in (Brooks et al., 2002). The factors associated with retention included rural rotations, an emphasis on caring for the underserved, and preparedness for small town living (more important than preparedness for rural medicine) (Pathman et al. (1994, 1999) as cited in (Brooks et al., 2002).

This was a systematic, well-done review. However, many of the studies reviewed are small and without multivariate analysis. The best studies are cohort ones. The conclusion seemed to be that training does affect practice; rural residency programs and rural training tracks seem to have very positive effects. Length and duration of rural rotations in residency and the ability to live in a small town were important to retain physicians in rural practice.

Funding to departments of family medicine.

A large U.S. national study using database information sought to determine the relationship between Title VII grants (government grants to departments of family medicine (FM)) and choice of FM as a career by medical students and graduates' practice in underserved areas(Fryer et al., 2002). Fryer et al. compared schools receiving Title VII grants to schools not receiving these grants and also compared results from schools before and after receiving the grants. They studied physicians who had graduated between 1981-1993. The results showed a clear effect of the Title VII grants. Graduates of those schools receiving some Title VII funding were significantly more likely to go into FM or another primary care specialty and significantly

more likely to be practicing in an underserved or rural area. Schools receiving grants directed toward predoctoral training and the development of departments of family medicine, graduated students who were more likely to choose family practice. Faculty development grants had a modest effect in these areas. Similar results were demonstrated when 30 schools were compared before and after receiving grants. Graduates in the post-grant period were more likely to choose family practice or another primary care specialty and more likely to be practicing in a rural or an underserved area.

Rittenhouse et al. (2008) found that physicians who attended medical schools with Title VII funding were more likely to practice in community health centres and more likely to undertake NHSC work (in underserved areas) than physicians who had attended medical schools without Title VII funding (Rittenhouse et al., 2008)

These studies indicated that support for departments of family medicine had a positive effect on career choice and practice location of graduates.

The strengths of this research lay in the use of large numbers from a national database (177,558 physicians in direct patient care from 2000 AMA Masterfile) and the measurement of outcomes such as actual specialty choice and location of practice. However, association did not necessarily mean cause and effect and this kind of research could not provide insight into how this effect was brought about. There are some limitations to the AMA Masterfile since it is cross-sectional data and does not indicate how long those physicians were in their practice or specialty, or how long they stayed.

Residency training site.

Lebel and Hogg (1993) used a mail-in survey to study the differences between community based and hospital-based FM residents in Ontario in 1990 and 1991 (random sample of 220)(Lebel & Hogg, 1993). The response rate was 71 percent. Community-based residents did significantly more house calls, felt they knew their community better and were more likely to see members of the same family. There was no difference in enjoyment of their residency, familiarity with their patients or the ability to see patients in follow-up. From the point of view of career plans, community-based residents were significantly more likely to plan to practice in smaller communities. Hospital-based residents expected to use allied health professionals more often.

This was an interesting study because it was Canadian and had a large random sample of residents from all five Ontario training sites (offering a good variety of residency programs). The study asked about residency experience and practice plans and thus was not an introspective self-report of factors. However the authors did not control for residents' birthplace nor was it possible to determine whether the interest in smaller community practice was a result of the community-based training or a self-selection bias. Despite the fact that they were community-based programs, all training centres were in large urban areas (>100,000). Ontario experience may not be generalizable to other Canadian provinces.

The hidden curriculum

Students learn much in medical school that is not part of the formal curriculum including how to speak to patients, the norms of ethical behaviour, which specialties enjoy high prestige, how to treat other team members and where the power lies in the medical school and the clinical institutions. This is often referred to as the hidden curriculum. Hafferty and Franks (cited

in(Chuang et al.) state that “only a portion of the “medical culture” is conveyed within the formal curriculum hours…… most of what medical students accept as the values, attitudes, beliefs, and related behaviors is learned through the hidden curriculum”.

The erosion of interest in family medicine and primary care specialties that occurs as students progress through medical school may be a result of positive attraction to other specialties but it may also be a result of a hidden curriculum that denigrates primary care specialties(Hunt, Scott, Zhong, & Goldstein, 1996). In family medicine residency programs it could be the hidden curriculum that discourages residents from some aspects of practice; for example, faculty members complaining about or devaluing certain types of patients or conveying the message that some aspects of practice are too stressful.

Needless to say the hidden or informal curriculum can be positive if teachers role model happy, healthy lives and positive attitudes and behaviours towards patients, learners and team members.

Literature Review Summary

In summary the literature indicates that educational experiences and programs can have a positive effect on practice decisions. Exposure to clinical disciplines in medical school and residency increases the likelihood that students will consider those disciplines as careers and residents will include them in their practice. Residency experiences have been shown to positively influence practice in Emergency Medicine, Obstetrics, Psychiatry and Geriatrics. Large scale interventions in educational programs increases the likelihood of practicing in a rural location.

However, it is also evident that training may discourage people from undertaking certain areas of practice. This was true for emergency medicine, obstetrics and psychiatry and maybe related to the hidden curriculum.

Educational experience may also have no influence on physicians' future practice plans. This was true for educational experience in under-served areas, emergency medicine, obstetrics, and psychotherapy and for the rural training stream at the University of Calgary which produced only a small percentage of graduates who planned to enter rural practice.(Lu, Hakes, Bai, Tolhurst, & Dickinson, 2008)

Sense of competence also influences practice. Medical students may be hindered from entering family medicine because they are fearful of the broad knowledge required. A higher willingness to practice in areas of lesser-perceived competence was attributed to skills in self-directed learning arising out of a problem based learning curriculum. While no one wants physicians to practice outside their competence, neither do we want physicians who are so fearful that they feel compelled to severely limit their practice. This leads to the question "How do we foster appropriate clinical courage in our graduates?"

Needs and expectation of a community can have a significant influence on practice. Making a difference, aspects of practice that were needed or expected in the community and managed care, with its expectations of more primary care all influence practice. Practice in a rural community is associated with a higher likelihood of undertaking procedures, nursing home visits and obstetrics. Other important influences on rural practice choice include preparation for small town living, type of practice, income, community effort to recruit, medical need in the area, and loan repayments.

Debt load has influenced specialty choice but has not been shown to be important in all studies. Student attributes, attitudes, the influence of significant others, the practice environment, and a *pot pourri* of other factors also influence practice choices.

Challenging or difficult clinical work can be enjoyable and sustainable when undertaken with a supportive team in an environment that allows enough personal and family time to prevent burn out.

The literature review includes many studies, which are now quite old but still relevant today. All the studies reveal important information and grapple with problems that have not yet been solved. The extent and variety of the literature underlines the complexity of career and practice choice and encourages further research. If the influences on career and practice choice are better understood, society's needs for comprehensive primary care could be more fully met.

There are no Canadian studies looking at the global intentions of family medicine residents toward the shape of their future practice upon entry to residency or how those intentions change during the two years of residency. Because practice choice is complex and most of the studies looked at one or two aspects of practice, the current study was designed to explore factors influencing residents' intentions to undertake most of the important aspects of family medicine in a Canadian context.

CHAPTER II: METHODOLOGY

Reflection and reading led to the decision that a sequential mixed methods approach with quantitative and qualitative data collection at two points in the residency— near the beginning and at the end(Creswell, 2003) would be the best approach to answer the research question and meet the study objectives. The thesis itself focuses on the first part of the quantitative arm—the development of the survey and the analysis of the data from the first survey administration. .

The Survey Method

Survey methodology allows the investigator to contact all members of an entire population, or sample. Survey questions are very precise, enabling comparison between individuals and subgroups. Interviews or focus groups take time while surveys allow subjects to respond quickly. The researcher's specific questions are answered and statistical analysis should be straightforward. If appropriate survey methods are followed (i.e. Dillman(Dillman, 1978)) then the probability of a high response rate increases.

The survey method also has limitations. If there are no open ended questions (as in many surveys) respondents must choose among pre-selected answers. Limited options present the risk of degrading complex issues through oversimplification (Mertens, 1998). The survey also relies on self-report about beliefs, attitudes and future behaviour. Accuracy is heavily reliant on respondents' honesty and self-awareness. Though not deliberately dishonest, respondents may genuinely be unaware of the reasons for some of their behaviour or they may report attitudes and intentions that are socially acceptable rather than accurate. The true reasons for some of the practice choices may not appear on the survey and may be obscure even to the resident making the choice.

Participants

Description of the Dalhousie family medicine residency program

At the time of the survey the Dalhousie family medicine residency was a two-year program with approximately 40 residents in each year. Residents were based at one of five sites (Halifax, Moncton, Sydney, Fredericton and Saint John). Four of the sites would be considered community sites (Moncton, Sydney, Fredericton and Saint John) and one is a university site (Halifax). Residents come to the program from all across Canada and around the world, choosing the site they would prefer as their home base.

The ideal sample for the survey would be a national, random sample of family medicine Post Graduate Year One residents (PGY1s). For three reasons, Dalhousie family medicine PGY1s were chosen as the sample population: time constraints, cost restraints and the fact that the main goal of the research is the improvement of the Dalhousie family medicine residency program. Although the Dalhousie PGY1s cannot be considered to be representative of all family medicine residents they were a diverse group from a number of different provinces and countries, with a wide age range and varied family situations.

Variables

The primary independent variables of interest were

a. Educational experiences influencing particular choices (role models, positive and negative experiences).
b. Education site (community-based vs. Halifax- based)
c. Perception of competence in a given aspect of family medicine practice
d. Gender
e. Debt load at completion of residency

Other independent variables that were explored include age, family situation (attached, single, with or without children), size of hometown and medical school of graduation.

The primary dependent variables of interest were:

a. Comprehensiveness of practice as measured by the number of aspects of family medicine a resident intends to include in their future practice and factors influencing those choices
b. Size and type of community of practice

Instruments and Materials

The principal investigator (CC) developed the survey *Intended Practice Scope of Dalhousie Family Medicine Residents* (Appendix A) in consultation with others. Questions were derived from a number of sources: the literature review, the career choice model, personal experience and feedback from residents following the pilot administration. In developing the survey, attention was given to the design and structure of the questions as outlined by Dillman (Dillman, 1978)who emphasizes the importance of writing high-quality questions. Close attention was given to the order of the questions. to engage respondents and lead them to feel that they were making a valuable contribution by their responses.

The survey was reviewed by three family medicine faculty and a research associate in the Department of Family Medicine. It was piloted with a group of second-year family medicine residents who provided feedback on the comprehensibility of the questions, the ease of completion and the length of time it took to complete the survey. Minor changes to a few questions were made following the pilot phase

The relationships among the variables, the research questions and the survey questions are outlined in Appendix B

Procedures

The Department of Family Medicine's research director alerted residents by e-mail about the survey and encouraged them to participate. The director has no significant evaluative responsibility for residents, thus they were likely to have felt free to accept or decline. The survey was designed to be as attractive and user-friendly as possible (Mertens, 1998) and was administered to residents during an educational session. Each survey was addressed to the resident in a sealed envelope. An information sheet was included with the survey. Completing and returning it was taken as implied consent to participate in the survey part of the study.

Residents had three options: to complete the survey during the educational session; complete it later at their convenience; or leave the survey blank and be free to leave. Blank surveys and surveys completed at the educational session were placed in a box by the residents. An administrative staff member distributed, collected and returned them to the research associate. Residents who wished to complete the survey at a later date were provided with a stamped return envelope.

Each survey was identified with a unique number allowing researchers to link completed surveys over time. The research associate was the only person who had access to the identifying numbers, which are kept, locked in a separate location from the completed surveys. The identifying numbers are not available to any of the investigators nor to anyone else in the Department of Family Medicine.

Follow-up mailings went to those absent from the educational session and to those who indicated that they would complete the survey at a later date but failed to do so. At no time was the principal investigator able to identify by name residents who had or had not completed the survey.

Ethical approval was obtained from the Research Ethics Boards of Mount Saint Vincent University and Dalhousie University.

Data Analysis

With a group of 36 participants, most dependent variables were collapsed to give two possible outcomes for bivariate and multivariate analysis, in order to increase the possibility of results reaching statistical significance. For example, rural vs. urban practice location, Maritimes/Atlantic vs. the rest of Canada and comprehensive vs. limited practice.
For comprehensiveness of practice, size and type of community, type and province of intended practice, data were analysed by calculating frequencies (descriptive statistics). We then performing a bivariate analysis using the chi square test (reporting p values) and /or univariate logistic regression followed by multivariate logistic regression analysis to obtain odds ratios and their 95 percent confidence intervals.

Secondary analyses were performed to look at type of practice, province of intended practice, and characteristics of attractive communities,

For the characteristics of an attractive community, which are rated on a five point Likert scale, the mean and standard deviation for each characteristic were calculated. A t-test was used to determine any differences between community-based residents and university-based residents and between men and women. Because the performance of multiple comparisons can increase the probability of a type 1 error, a Bonferroni correction factor was incorporated.

Each of the fifteen aspects of intended practice were rated on five point Likert scale (1.“definitely exclude” to 5. “definitely include”). For each aspect the mean and the standard deviation of the responses were calculated. Respondents were sorted into two categories (comprehensive practice or focused practice) - based on the number of aspects of family

medicine that they intended to include in their future practice, in order to perform the bivariate analysis and/or univariate logistic regression. Comprehensive practice was defined after the results were collected as the intention to include five or more of the clinical aspects of family medicine.

The factors influencing inclusion or exclusion of particular aspects of practice were summarized according to the frequency of their citation.

Bivariate analysis (chi square) and multivariate logistic regression were calculated for three independent variables (educational site, medical school of graduation and perceived competence)

The educational significance of the findings was analyzed and discussed.

CHAPTER III: RESULTS

Introduction

The results are presented in two parts, with the first major part including descriptive statistics presented as follows:

a. Respondents' intent to include each of the 17 aspects of family medicine (AFM),

b. Sense of competence in each of these aspects,

c. Reasons respondents gave for including or excluding each of the AFM.

d. Quality of educational experience for each AFM

e. Respondents' plans for future type of practice, province of practice and intended type of community of practice

f. Factors that make a community attractive to respondents intending to set up practice

The second major part reports on the association of the independent variables with:

a. Intended comprehensiveness of practice

b. Intent to include each AFM

c. Intended type of practice

d. Community type and province of intended practice

The association of perceived competence with intent to include each AFM is described.

Finally, an outline of the results of the multivariate analysis of resident characteristics and sense of competence with intent to undertake comprehensive practice, province and type of community of practice is presented.

Information by subgroup is not presented where sample size was inadequate to maintain anonymity. Thus information from subgroups smaller than five individuals is not presented. If it

seemed that information from a subgroup larger than five individuals might threaten anonymity, that information is not presented. No individuals are identified.

Independent Variables

Table 2 provides a complete list of all the independent variables used in the analysis.

Table 2. The Independent Variables

Sex
Age
Partner status (partner *vs*. no partner)
Children (children *vs*. no children)
Year of graduation
School of graduation (Canadian vs International),
Home town population (<1000; 1000 – 9,999; 10,000 – 49,999; 50,000 – 300,000; >300,000)
Home town type (rural remote, rural close (<2 hours to regional hospital), urban with regional hospital, urban with tertiary care hospital)
Residency site (Halifax or community-based)
Debt level (<50,000; 50,000 – 100,000; >100,000)
Educational experience (positive, neutral, negative)
Sense of perceived competence in each aspect of Family Medicine

Description of Respondents

Thirty-six out of 45 first-year residents in the Dalhousie Family Medicine Residency completed the survey for a response rate of 76 percent. Table 3 outlines the characteristics of the respondents. Most were young Canadian graduates but a significant minority (34 percent) were international graduates and 20 percent were over 34 years of age.

Table 3: Characteristics of Respondents

Characteristic		n (%)
Age	< 30	19 (53)
	30 - 34	9 (25)
	>34	7 (19)
Sex	Male	12 (33)
	not indicated	1 (3)
School of graduation	Dalhousie	8 (22)
	Other Canadian (CDN)	9 (25)
	International (INT)	9 (25)
	not indicated	10 (28)
Year of graduation	2004	22 (61)
	1998 - 2002	10 (28)
	prior to 1998	2 (6)
Family situation	Partners	22 (61)
	Children	11 (31)
Educational site	Community-based	25 (69)
	Halifax-based	11 (31)
Home town	population <10,000	6 (17) 1 rural remote 5 rural close
	population 10,000 - 49,999	10 (28) 6 rural close 4 urban with regional hospital
	population 50,000 – 300,000	8 (22) 7 (19) urban with regional hospital 1 (3) urban with tertiary hospital
	population >300,000	11 (31) 3 (8) urban with regional hospital 5 (14) urban with tertiary hospital 3 (8) unknown
Debt	< $50,000	9 (25)
	$50,000 - $100,000	13 (36)
	> $100,000	13 (36)

n does not always add to 36 because of non-responses to some questions

Intent to Include Various Aspects of Practice and Sense of Competence

Residents were asked to indicate on a Likert scale which of 15 aspects of family medicine they intended to include in their practice. The scale ranged from 1 (*definitely exclude)* through 3 *(undecided)* to 5 *(definitely include).* There were 11 clinical aspects and four non-clinical aspects (teaching, research, practice management and administration).

They were also asked to indicate their perceived sense of competence in each of these areas. Next they were asked to choose among reasons important to them personally, to *include* (12 choices given) or *exclude* (9 choices given) an aspect of practice (see Appendix A for a copy of the survey). In the tables below, *Practice Core* includes those aspects that form the basis of family medicine office outpatient practice: seeing patients in the office, prenatal care, psychotherapy, home visits, on-call and nursing home care. *Clinical Challenges* includes those aspects that deal with more acute medicine or seriously ill people. The final category is *Non-Clinical Aspects* which includes: teaching, research, practice management and administration. The self-reported ratings for these results are found in Tables 4-6.

Table 4: Respondents' Intent to Include Each Aspect of Family Medicine

Intent to Include Aspect	Yes* n (%) n = 32	Mean (out of 5)	Standard Deviation
Practice Core			
Office	30 (94)	4.5	0.62
Prenatal	24 (75)	4.1	0.92
Psychotherapy	18 (56)	3.69	0.93
Home visits	11 (34)	3.40	0.91
On-call	10 (31)	3.21	1.07
Nursing home	5 (16)	2.75	1.08
Clinical Challenges			
Emergency	16 (50)	3.66	1.00
Hospital	17 (53)	3.59	1.19
Palliative care	11 (34)	3.03	1.28
Deliveries	6 (19)	2.69	1.00
ICU	3 (9)	2.25	1.08
Non-Clinical			
Teaching	23 (72)	4	1.11
Practice management	10 (31)	3.31	1.06
Administration	6 (19)	2.56	1.16
Research	6 (19)	2.53	1.19

**respondents who chose 4 or 5 on Likert scale of intent to include*

Table 5: Respondents' Perceived Sense Competence in Each Aspect of Family Medicine

Sense of Competence Aspect	Mean (out of 5)	Standard Deviation
Practice Core		
Office	3.69	0.78
Prenatal	3.83	0.93
Psychotherapy	3.19	1.18
Home Visits	3.74	0.82
On-call	3.59	0.837
Nursing home	3.18	1.03
Clinical Challenges		
Emergency	3.28	0.89
Hospital	3.59	0.95
Palliative care	2.97	1.03
Deliveries	3.00	0.95
ICU	2.09	1.06
Non-Clinical		
Teaching	3.66	1.07
Practice management	2.43	1.05
Administration	3.00	1.27
Research	2.66	1.38

Perceived sense of competence was rated on a scale of 5 from 1 "not at all competent" to 5 "very competent"

Table 6: Proportion of Respondents Feeling Competent and Not Competent in Each Aspect of Family Medicine

Aspect	Frequency (%) Competent *(4&5 Likert scale)* n = 32	Frequency (%) Not competent *(1&2 Likert scale)* n = 32
Office	20 (63)	2 (6)
Prenatal	20 (63)	3 (9)
Psychotherapy	12 (37)	8 (25)
Home visits	18 (56)	1 (3)
On-call	16 (50)	2 (6)
Nursing home	12 (38)	8 (25)
Emergency	12 (38)	7 (22)
Hospital	11 (34)	4 (13)
Palliative care	11 (34)	10 (31)
Deliveries	10 (31)	9 (28)
ICU	2 (6)	20 (63)
Teaching	18 (56)	4 (13)
Practice management	13 (41)	13 (41)
Administration	9 (28)	15 (47)
Research	3 (9)	17 (53)

Fifteen (47 percent) respondents met the criteria of an intention to undertake a comprehensive practice (defined as the definite intent to include five or more of the eleven clinical aspects of family medicine) However, at this early stage in their residency many respondents remained undecided about including many aspects of family medicine. A score of three (undecided), could indicate that the resident was still considering including this aspect of family medicine. Using this definition, 29 [79 percent] respondents were considering eight or more of the 11 clinical aspects of family medicine. Therefore, even though only 15 had a definite

intent to undertake a comprehensive practice, if the undecided are considered, up to 79 percent of respondents were still open to the idea of a comprehensive practice.

Of the clinical aspects, deliveries, nursing home visits and ICU had the smallest number of respondents [6 (19 percent), 5 (16 percent) and 3(9 percent) respectively] indicating that they would definitely include that aspect. Of the non-clinical aspects only 6 (19 percent) people intended to include research and administration in their future practice.

Reasons to Include or Exclude Aspects of Practice

The results for the reasons to include or exclude aspects of practice are outlined in the Figures in Appendix C.

Summary of Reasons

Practice core: (including office practice, on-call, prenatal care, nursing home care, home visits, psychotherapy).

Many respondents chose numerous reasons to include, and few reasons to exclude, the core aspects of family practice. "Office practice*"* in particular had at least 10 people choose every reason **except** *"financially rewarding"* as a reason to include.

Clinical challenges: (including hospital care, emergency medicine, delivering babies, palliative care and ICU).

Respondents cited many reasons to include hospital care, delivering babies, palliative care and emergency medicine (EM) Very few people chose any reasons to include ICU. The most common reasons chosen for excluding the "Clinical challenges" were "*interferes with family life", "too stressful"* and *"unlikely to be well trained by the end of residency".*

Non-clinical aspects of practice: (including teaching, research, administration, practice management).

The most common reasons to include teaching were that it is "*essential to family medicine", "intellectually stimulating", and "rewarding"*. A significant number of respondents reported a "*positive medical school experience*" and being *"turned on to teaching by a role model or mentor"*. Practice management was seen as "*essential to family medicine"* and "*financially rewarding*". However, for research the only reason chosen by a significant number of people was "*intellectually stimulating"*. Interference with work and family life, lack of financial reward and lack of intrinsic interest were the commonly cited reasons to exclude administration, practice management and research.

Categories of reasons.

When reviewing the responses it seemed that some respondents chose specific reasons to include aspects quite frequently while others chose reasons to exclude aspects of family medicine frequently. Reasons to exclude or include aspects were analyzed across all the aspects for each respondent and sorted into three categories.

Altruism.

There were three reasons classified as altruistic. These included "able to make a significant difference to patients", "enhances relationships with patients", "meets a community need".

Physician rewards.

There were five reasons that reflected rewards for the physician. These included "does not interfere with family life", "financially rewarding", "intellectually stimulating", "offers hands-on opportunities [procedures]", "rewarding aspect of practice".

Negative reasons.

"Not interesting or rewarding", "negative experience in medical school", "turned off by mentor or role model", "too stressful", and "unlikely to be well trained by the end of residency" were classified as negative reasons.

The data were reviewed to see if there were patterns that might reflect respondents' general outlook on clinical practice. For instance, were there certain respondents who were primarily altruistic or who put an emphasis on physician rewards? Conversely, were there some respondents who had many negative views of clinical practice and were unable to envision either the altruistic or rewarding characteristics of family medicine? There was no pattern to any individual respondent's choices. The sample size was too small to apply meaningful statistical analysis to these categories.

Reasons for considering full-time emergency medicine.

Many residents are choosing to go into full-time Emergency practice. Respondents were asked to indicate the reasons why they would consider this career path. Table 7 summarizes these reasons.

Table 7: Summary of Reasons Respondents Gave for Choosing Full-Time Emergency Medicine

Reasons for choosing fulltime Emergency Medicine	Number of respondents n=9 (25%)
Challenge	8
Diversity	6
Procedures	6
Income	5
Work hours	5
Intellectual content	4
Work in remote areas	4
Freedom from ongoing responsibility	2
Focused expertise	2
Prestige	1

Quality of Previous Educational Experience

Table 8 summarizes the educational experiences of the respondents for each of the aspects. Educational experience was classified as positive if a respondent chose either: "*positive medical school experience"* or *"turned on by role model or mentor";* as negative if they chose any of: *"negative medical school experience", "turned off by mentor or role model"* or *"unlikely to be well trained by the end of residency"*.

Table 8: Quality of Respondents' Previous Educational Experience in Each of the Aspects of Family Medicine

Aspect	Educational experience positive n(%)	Educational experience neutral n(%)	Educational experience negative n(%)
Teaching	18 (56)	7 (22)	7 (22)
Office	13 (41)	16 (50)	3 (9)
Emergency	13 (41)	11 (34)	8 (25)
Prenatal care	12 (34)	13 (41)	6 (16)
Nursing home	7 (22)	20 (62)	5 (16)
Hospital care	10 (31)	16 (50)	6 (19)
Home visits	7 (22)	18 (56)	7 (22)
Deliveries	6 (19)	14 (44)	12 (38)
Palliative care	4 (12)	18 (56)	10 (31)
Psychotherapy	3 (9)	16 (19)	13 (41)
ICU	3 (9)	10 (31)	19 (59)
On call	1 (3)	21 (66)	10 (31)

Short and Long-Term Plans After Graduation

Respondents were asked to indicate both their short term (2-3 years after graduation) and their long-term plans for type of practice (full-time, part-time, group, solo, locums) and location (province and type of community) of practice. They were invited to choose multiple options for both the short and long term.

Practice Type

Table 9 summarizes respondents' short and long terms plans for full-time, part time or locum practice or further training

Table 9: Respondents' Choices for Future Practice

Type of practice	Short term single choice[a] (n)	Short term one of several choices[a] (n)	Long Term single choice[a] (n)	Long Term one of two choices[a] (n)
Full-time practice	8	2	23	1
Part-time practice	0		3	1
Locums	6	1	2	1
Further training	10	1	1	

[a]Respondents were able to choose multiple options for their short and long term practice plans. However, many chose *only one option*, indicating more certainty about their future practice. This is called "single choice" in the table.

Nine residents indicated in the short-term and six in the long-term that they were undecided as to the type of practice they would pursue

Plans for further training included a third year of residency training in Emergency Medicine (n=6, 17%), Palliative Care (n=2, 6%), Health Care of the Elderly (n=2, 6%) or another discipline (n=1, 3%).

Practice Organization Type (Group, Solo, Focused etc.)

Most respondents had not yet decided at the beginning of their residency (indicated by their choice of many options for practice organization type) and for most, broad-based Family Medicine was on their list of options. Six people (17 percent) were considering the focused

practices -EM, walk-in clinics and other kinds of limited practice but most of those (5/6) were considering them among *many* options.

Location (province)

Table 10 summarizes the long term and short term plans for province of practice for the respondents

Table 10: Respondents' Intended Province of Future Practice

Province	Short term single choice[a] (n)	Short term one of several choices[a] (n)	Long Term single choice[a] (n)	Long Term one of 2-3 choices[a] (n)
Maritimes	16	1	9	4
Maritimes among options		4		3
Non-Maritime	4	4 (same four people as above cell)	4	6 (including 3 above)
Undecided	10	1	12	

[a]Respondents were able to choose multiple options for their short and long-term practice plans. However many chose *only one option,* indicating more certainty about their future practice. This is called "single choice" in the table.

One person did not indicate any choice for long-term province of practice.

Trajectories – short-term to long-term province of intended practice.

Respondents could choose multiple options for their short-term or long-term province (or community) of practice. Despite this, many chose a single option for the short-term and a single option for the long-term. This is labeled below as "single choice".

The intended provincial trajectory as a single choice for 9 respondents (25 percent) was Maritime province to Maritime province. A further three (8 percent) considered a Maritime-to-Maritime trajectory as one option among several. Four (11 percent) considered returning to the Maritimes after starting elsewhere and 11 (31 percent) considered starting in the Maritimes before moving elsewhere. Four (11 percent) people were undecided in the short and the long term.

Location (type of community)

Table 11 summarizes respondents' short and long term plans for type of community of practice

Table 11: Respondents' Intended Community of Future Practice

Community	Short term single choice[a] (n)	Long Term single choice[a] (n)
Rural remote	4	1
Rural close	11	9
Urban with regional hospital	11	16
Urban with tertiary hospital	4	4
Inner city	0	1
International	0	0

[a]Respondents were able to choose multiple options for their short and long-term practice plans. However, many chose *only one option* indicating more certainty about their future practice. This is called "single choice" in the table.

Trajectories – short-term to long-term community of intended practice.

The most common trajectory of intended community practice was an urban regional centre in both the short and the long-term. Nine people (27percent) indicated this as their single choice. The next most common trajectory was to remain in a rural/close community in both the short and the long-term with five (15percent) people indicating this as their only option.

Of the other respondents with single choices, eight (24percent) indicated they would practice in a rural community in the short term. Of those, three (9percent) indicated long-term plans in rural practice. Two (6 percent) people intended to start in an urban region and then move to a rural community.

A significant number, 11 people (33 percent), chose "rural close" as a long-term option. Nine (27 percent) of those were a single choice while two people saw that as one option among several.

Factors Influencing Choice Of Community For Long-Term Practice

Respondents were asked to rank on a five-point Likert scale the importance of a variety of factors that would determine their choice of community for long-term practice. These factors are summarized in Figure 3.

Figure 3: Importance of Community Factors in Choosing a Future Practice Location

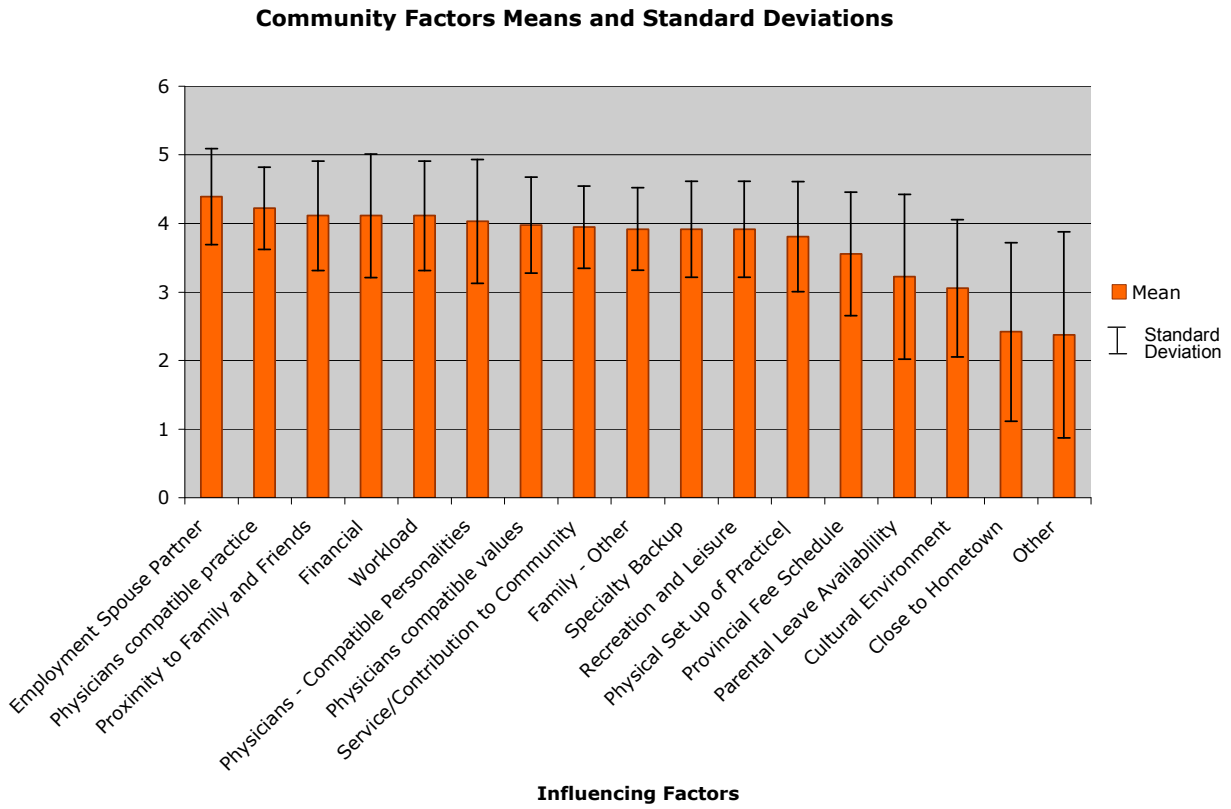


Table 12 summarizes the top four factors of attractive communities out of the 17 factors offered for:

a. All respondents
b. Men,
c. Women
d. International Medical Graduates (IMGs)
e. Canadian Medical Graduates (CMGs)

Table 12: Top Four Factors of Attractive Communities for Different Groups of Respondents

Characteristic	Men (12)	Women (23)	CMG (17)	IMG (9)	All (36)
Employment for spouse	1	1	1	1	1
Compatible practice quality standards	4	2	4	4	2
Workload	3	4	2	4	3
Financial considerations	4	3		2	3
Proximity to family/friends	2			3	3
Physicians compatible personalities		4	3		4
Other family issues	4		3		
Physicians' compatible values			4		
Appropriate specialty back-up				4	
Physical set-up of practice	3			4	

CMG – Canadian Medical Graduate, IMG – International Medical Graduate

For all respondents, the least important factor of the 17 offered was proximity to their hometown. Cultural environment, recreation and leisure were also ranked on the low end of the

importance scale. Finally, parental leave availability was of relatively low importance to men and IMGs.

The association and relationships between resident characteristics and characteristics of attractive communities were analyzed by performing a bivariate analysis using a chi square test

The significant associations included ($p \leq 0.05$):

a. Men rated "availability of parental leave" as less important than women.
b. Residents without partners rated "physicians with compatible personalities", "physicians with compatible values", specialty backup" and "workload" as more important than those with partners.
c. Residents without children rated "recreation and leisure" and "workload" as more important than those with children.
d. International graduates rated "family other", "physicians with compatible values" as more important than Canadian graduates and "proximity to hometown" as less important
e. Residents at community sites rated "physicians with compatible values", and "specialty backup" as less important than Halifax-based residents
f. Residents from rural hometowns rated "family other" and "specialty backup" as less important than residents from urban hometowns and "provincial fee schedule" and "workload" as more important than residents from urban hometown.

Association Between Independent Variables and Comprehensiveness of Practice

There was no association between any of the respondent characteristics and comprehensiveness of intended practice. Nor was there an association between intended community of long-term practice (rural *vs*- urban) and comprehensiveness of practice. There was no association between any of the respondents' characteristics and intent to do full-time Emergency Medicine.

Associations Between Independent Variables and Intent to Include Aspects of Family Medicine

Sense of Competence

Associations and relationships were examined between participants' sense of competence in a given aspect of family medicine and their intent to include that aspect in their future practice. Table 13 summarizes these results.

Table 13: Association Between Sense of Competence and Intent to Include Individual Aspects of Family Medicine

Aspect	Intent to Include (Mean)	Association of intent to include aspect with sense of competence in that aspect *Chi Square Value*	P value
Sense of competence high (mean >3.5)			
Office	4.5	17.00	0.01
Prenatal care	4.1	15.68	0.02
Teaching	4.00	48.05	0.00
Hospital care	3.59	19.52	0.07
Home visits	3.40	11.35	0.5
On call	3.21	9.03	0.7
Sense of competence medium (mean 3.0 – 3.5)			
Psychotherapy	3.69	26.93	0.01
Emergency shifts	3.66	24.46	0.08
Administration	2.56	25.13	0.07
Nursing home visits	2.51	31.08	0.01
Sense of competence low (mean <3.0)			
Palliative care	3.03	50.91	0.00
Practice management	3.31	31.25	0.01
Deliveries	2.69	10.67	0.56
Research	2.53	55.72	0.00
ICU	2.25	64.89	0.00

Sense of competence is rated on a Likert scale where 1 is “not competent” and 5 is “very competent”. Intent to include is rated on a Likert scale from 1 “definitely exclude” to 5 “definitely include”

For some aspects of family medicine residents’ sense of competence in a given area and their intent to include this aspect in their future practice were strongly associatedin one of two ways: either a strong sense of competence in a given aspect associated with a definite intent to include that aspect or a strong sense of not being competent associated with a definite intent to

exclude that aspect For several aspects (deliveries, on call, emergency shifts, home visits and administration) there was no association between intent to include and a feeling of competence.

Association Between Independent Variables and Intent to Include Each Aspect of Family Medicine

Table 14 reports the significant associations between the independent variables (see Table 2) and the intent to include each aspect of family medicine.

Table 14: Association Between Educational Experience in Medical School (positive, neutral or negative) and other independent variables and Intent to Include Individual Aspects of Family Medicine

Respondent Characteristic	Intent to Include	Association (Chi square)	Chi square	P - value
Educational experience	Prenatal care	Those with a positive educational experience more likely to include prenatal care	5.83	0.05
Residency site	Hospital practice	Community-based residents more likely to intend to include hospital practice	12.09	0.00
	Psychotherapy	Halifax residents more likely to intend to include psychotherapy	4.23	0.04
Sex	Office practice	Men less likely to intend to do office practice	4.69	0.03
Age	ICU	Older respondents more likely to intend to include ICU	6.76	0.03
Year of graduation	Administration	More distant grads more likely to include administration	13.92	0.05
	ICU	More distant grads more likely to intend to include ICU	19.60	0.01
Partner status	Office practice	Those with partners more likely to intend to do office practice	3.89	0.05
	Prenatal care	Those with partners more likely to intend to do prenatal care	4.49	0.03
Children	Hospital care	Those with children more likely to do hospital care	3.77	0.05

There was no association between School of Graduation (Canadian *vs*. International), home town population or type, or debt level with intent to include any aspect of family medicine.

Province of intended practice.

Residents with children were more likely to choose the Maritimes in the long-term p = 0.02 but not the short term.

Choice of community type (rural remote, rural close, urban with regional hospital, urban with tertiary centre) in the short and the long-term.

There was no association between any of the respondent characteristics and type of community.

Multivariate analysis.

Four regression models were developed examining the relationship between resident characteristics (including their perception of competence) with

a. Plans for comprehensive practice
b. Province of practice for the short term
c. Province of practice for the long term
d. Type of community of practice (urban vs rural)

An odds ratio (OR) < 1 indicates a negative association with the characteristic in question while an OR > 1 indicates a positive association with the characteristic in question.

There were no significant associations between respondents' characteristics and their plans to undertake a comprehensive practice. Two associations approached significance: a sense of competence in the clinical challenges was associated with a higher likelihood of planning a comprehensive practice OR 1.3 (1.0,1.7) adjusted 1.3 (0.9,1.7) $p < 0.1$; a sense of competence with the core aspects of family medicine was also associated with a higher likelihood of planning a comprehensive practice OR 1.2 (1.0,1.5) $p<0.1$, adjusted OR 1.2 (0.9,1.4). With a larger sample size these associations may have reached significance.

In the short term the only variable that was significant was being educated in Halifax. These respondents were less likely to plan to practice in the Maritimes in the short term (OR 0.2 (0.0,0.8) $p <0.05$.

In the long term, having at least one child OR 16.5 (95% CI 1.8,150.4) $p<0.05$ was associated with plans to practice in the Maritimes. The association of a higher sense of competency with core aspects of family medicine and plans to practice in the Maritimes OR 1.5 (1.0,2.0) $p<0.05$ approached significance

The association of resident characteristics with plans for urban practice was analyzed using multiple regression. Debt loads of $50,000 to 100,000 and >$100,000 compared to debt loads of <50,000, were significantly associated with plans to practice in an urban community but there were significant problems with small cells and extreme values. (OR 10.6 [0.9, 132.1], and 24.6 [1.9,322.2] respectively)

Having an urban hometown was the only other variable significantly associated with planning to practice in an urban community in the short term (OR 6.9[1.2,40.4]) $p<0.1$ Although there were no significant associations for long term plans to practice in an urban location, urban hometown was the most associated predictor. (OR 3.0[0.7, 13.7]) $p = 0.016$.

No variables were significantly associated with a residents' long-term desire for type of community they wished to practice in.

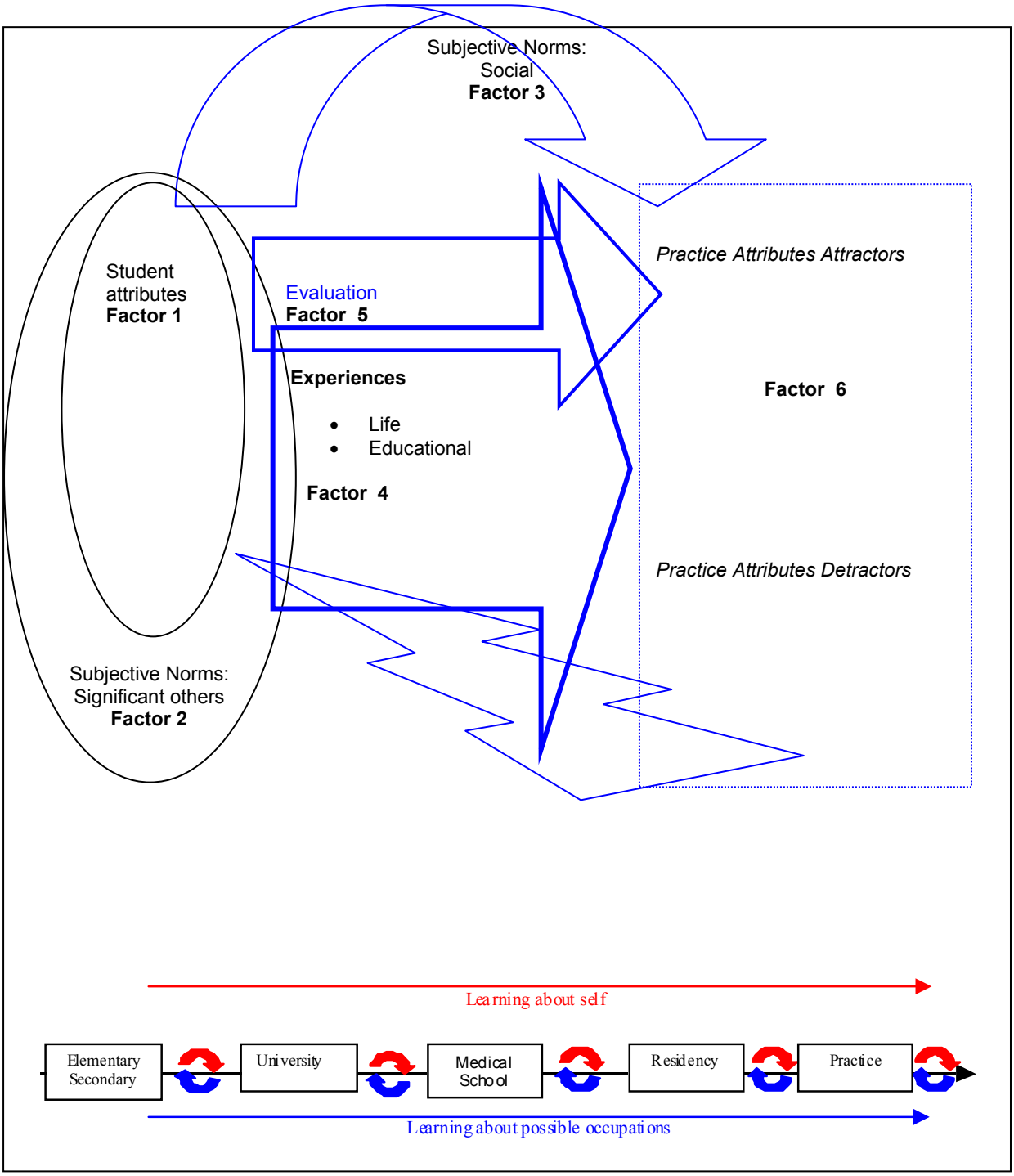
CHAPTER IV: DISCUSSION AND CONCLUSION

Discussion

This study was undertaken to determine which factors might influence residents to include fifteen aspects of family medicine in their future practice—and more specifically— how educational factors might influence future choices. To facilitate comprehension and analysis, the fifteen aspects were placed in three categories. Practice Core included office practice; prenatal care; on call; nursing home care; home visits and psychotherapy. Clinical Challenges included emergency shifts; delivering babies; hospital care; palliative care and Intensive Care Unit (ICU). Non-Clinical Aspects included teaching; research; practice management and administration.

The discussion will describe how the survey results fit with the career choice model developed from the literature and then outline an approach to residency education that could increase the likelihood that residents would undertake a more comprehensive practice upon graduation.

Figure 4: Career Choice Model Skeleton View



How Do the Survey Results Relate to the Career Choice Model Developed from the Literature Review? (See Figure 4)

The proposed Career Choice Model conceptualizes career/practice choice as an iterative, lifelong process of learning about oneself and about possible occupations. The six factors included in the model describe the learner (student or resident) bringing to the educational program:

a. A number of personal attributes (factor 1)
b. Within a personal context (subjective norms, significant others—factor 2)
c. And a social context (subjective norms social—factor 3)
d. Educational and life experiences (factor 4) develop the learner's self-knowledge and knowledge of potential practice environments
e. Throughout, the learner is evaluating the consequences of decisions and the likelihood of these consequences (factor 5)
f. Finally, political and social forces shape the practice environment which has attributes (factor 6) viewed either as "attractors" or "detractors".

The following section will outline how the findings of this study provide insight into four of these factors: resident (student) attributes, personal subjective norms, experiences (both educational and life) and practice attributes.

Resident attributes (Factor 1).

Personality, values, background, expectations, fears, identity, meaning.

The literature focuses mainly on attributes of students, residents and physicians that may predict rural, obstetric and emergency practice (Acosta, 2000; Brazeau, Potts, & Hickner, 1990;

Godwin et al., 2002; Ovens et al., 1993; Woloschuk & Tarrant, 2002, 2004) This study focused on many resident attributes and most of the important aspects of family medicine

Given the need for comprehensive family practitioners many of these results provide an encouraging view of residents' intentions at the start of their residency. Seventy-nine percent of residents were considering including most of the aspects of family medicine and 42 percent indicated they intended to undertake comprehensive practice. The positive view of the clinical challenges and the practice core aspects of family medicine, reported by respondents, was also encouraging. Furthermore, residents from all demographic groups were equally likely to be considering comprehensive practice, since there was no association between any of the independent variables such as age, sex, school of graduation, educational institution, hometown etc. (see Table 2 for a complete list of independent variables) and intent to have a comprehensive practice.. There was one exception: community-based residents were more likely to intend to include hospital-based care in their future practice.

Personal and subjective norms (Factor 2).

The survey asked what participants viewed as rewarding or daunting, allowing the researchers to extrapolate about the kind of work participants viewed as meaningful and about their fears regarding practice.

Several questions addressed:

a. values (family life, making a difference to patients, financial or intellectual rewards)

b. expectations (likelihood of being well-trained, types of community for future practice)

c. fears (too much stress, unlikely to be well-trained).

There were no other questions that might reflect further aspects of respondents' views of their own identity, what brings meaning to their lives, the influence of significant others (family and friends) or the norms of their social group.

The majority of respondents held a positive view of core clinical family medicine (listing many reasons to include all these aspects), indicating that these parts of family medicine were rewarding or meaningful and congruent with their values and beliefs about practice. The majority also viewed the clinical challenges quite positively; seeing those aspects of practice as intellectually stimulating, an enhancement of patient relationships and meeting a community need. Yet the majority also feared the negative impact on their lives such as personal stress and time away from family.

The respondents with definite exclusions comprise a significant minority; (28 - 34 percent) who will exclude deliveries, palliative care and nursing home care and even more (59 percent) who will exclude ICU. These aspects of care are seen as stressful, disruptive to family life, not intellectually stimulating or financially rewarding (deliveries) or simply unrewarding (nursing home care).

If residents hold positive views of many diverse aspects of practice at the beginning of residency, there should be an opportunity to enhance the positive characteristics and, perhaps more importantly, specifically address ways of practice that mitigate some of the stress and help residents find time for personal and family life. Faculty whose practices address these potential negatives by working in supportive teams, employing effective stress management and being explicit about the joys and rewards of these aspects of practice may help encourage residents to undertake many aspects of family medicine in their own practices.

As outlined in the Results section, the reasons chosen by respondents for including or not including the aspects of family medicine were sorted into three categories that could reflect the values of respondents: altruism, physician rewards, and negative reasons. Although there was no pattern to any individual's response the landscape of practice is broad and allows for many values to be reflected in practice choices. This could be a fruitful area for future research.

Interestingly a higher number of respondents viewed the clinical challenges as providing physician rewards, compared to the core aspects. One quarter of respondents held this view for both core aspects of family medicine and the clinical challenges. An additional 30 percent viewed the clinical challenges as providing physician rewards. It is encouraging to see that residents early in their training view the clinical challenges as rewarding. Residency educational experiences should seek to focus on the rewarding aspects of these clinical challenges and address the potential downside of undertaking care of patients who are more acutely ill. The literature provides evidence that support and encouragement from teachers modeling competence in clinically challenging work (geriatric psychiatry and psychotherapy) increases the likelihood that residents will undertake this work in practice(Hadjipavlou & Ogrodniczuk, 2007; Lieff, Andrew, & Tiberius, 2004)

Experiences (educational and life – Factor 4).

This section refers to the middle segment of the model and will discuss the aspects of educational and life experiences as listed in the box.

The survey does not directly address formal curriculum although sense of competence at this stage of training is likely a result of the previous formal curriculum. The aspects of the survey that refer explicitly to the hidden curriculum are the questions on negative medical school experience and being turned off by role models or mentors. Distressingly, one-third of

respondents had negative experiences in medical school with family medicine office practice while a small percentage reported negative experiences with on-call and research. Role models did not have a significant negative effect on these respondents. More subtle references to the hidden curriculum could be found in what these respondents view as "not interesting or rewarding". A small percentage of people chose this as a reason to exclude practice management, research and palliative care, while one-third chose this as a reason to exclude nursing home care and almost half felt administration was not interesting or rewarding. Educational experiences should be carefully chosen to avoid conveying negative messages about important aspects of family medicine—particularly core aspects such as office practice. Family physicians take part in administration at the practice, institutional, regional and provincial levels—therefore we could better prepare learners for this aspect of practice life by encouraging them to be involved in committee work, meetings and organizations.

The study by Green et al. indicating that family medicine residents who undertook a third year of training were more likely to include hospital work, home visits, nursing home care, emergency work and obstetrics(Green et al., 2009) could indicate that offering more PGY3 options to family medicine residents would increase comprehensiveness of practice. This study did not analyze the practice intentions of those planning third year programs separately from the rest of the group.

Quality of past educational experience.

Plans to include prenatal care, nursing home care and ICU were associated with positive previous educational experience in these and approached statistical significance. Since nursing home care and ICU were two of the aspects *least* likely to be included, it is possible that with a

larger sample size this association would become statistically significant. This might then indicate that positive educational experiences can have a strong influence on practice intentions.

More than 40 percent of respondents reported positive educational experiences for teaching, office practice and emergency medicine. Conversely more than 40 percent reported negative educational experiences for ICU and psychotherapy.

Residents (25 percent) felt they would not be well trained by the end of residency in psychotherapy, ICU, palliative care, deliveries, practice management or research. This finding is more an anticipation of a poor educational experience than an actual one as it indicates an expression of concern about future inadequate experience. Residents come to a residency program with a variety of positive and negative experiences and preconceived expectations of their future training that will shape their future practice intentions. Positive educational experiences in residency are associated with higher likelihood of including that area in future practice(Lieff et al., 2004), therefore it may be important for residency educators to understand the previous experiences and expectations of their learners so as to better individualize a residency education.

Sense of competence.

For many aspects of family medicine, as would be expected and as the literature states (Hadjipavlou & Ogrodniczuk, 2007; Levitt et al., 1997; Ovens et al., 1993; Prislin et al., 1997), sense of competence (or lack thereof) is associated with plans to include or exclude that aspect. The strongest associations between sense of competence and intent to include an aspect of practice occur for teaching (likely to include/high sense of competence), ICU, palliative care and research (unlikely to include/low sense of competence). In the multivariate analysis a sense of competence in the core aspects and the clinical challenges of practice was associated with a

higher likelihood of plans to undertake comprehensive practice. Educational interventions to enhance competence and confidence in the less popular areas would increase the likelihood of residents considering practicing in them. Surprisingly, however, for hospital care, home visits, on-call, administration, emergency shifts and deliveries there was no association between sense of competence and intent to include those aspects. Educational interventions by themselves may not be sufficient to increase the likelihood of residents choosing to practice in these areas. Because there must be other strong influences on decisions in these last areas, educators may need to focus on other aspects of practice such as lifestyle, work/life balance and intrinsic rewards of certain aspects, as well as ensuring that residents feel competent in clinical areas. Competence in a given area may be a necessary but not sufficient condition to decide to undertake that aspect of practice.

Influence of role models.

Role models were mentioned as important in a positive way by thirty percent of respondents for office practice and teaching and by several people for each of prenatal care, home visits, hospital care, emergency, palliative care and practice management. As stated above, negative role models were few. The literature indicates that refutation of negative stereotypes is an important effect of positive role models (Burack et al., 1997).

Influence of educational site.

Residents at community-based sites were more likely to intend to undertake hospital care in their future practice, Halifax based residents were more likely to plan to include psychotherapy and were less likely to plan to practice in the Maritimes in the short term. Since these residents were at the beginning of their program these findings could be the result of undergraduate educational experiences.

Life experiences.

In contrast to earlier literature (Woodworth, Chang, & Helmer, 2000) but congruent with the findings of a more recent study(Kahn et al., 2006) these respondents indicated that debt was not a significant influence on their future practice choices, as no association was found between debt and plans to include any aspect, nor was it a significant influence on community or type of future practice. Literature suggests that debt may operate at actual time of discipline choice for post-graduate training; heavier debt leading to shorter training or disciplines with higher expected incomes(M. Rosenthal et al., 1996).

As expected, employment for partners was the leading factor for all respondents in choosing a community. Beyond that, partners or children were not significantly associated with any aspect or type of practice. Respondents with children were more likely to plan to practice in the Maritimes in the long term. Proximity to family and friends and other family issues were among the top four factors for choosing a community for future practice for respondents. These results emphasize that social and family support are important influences on choice of practice location.

Practice attributes (Factor 6).

Attractors

The results indicated that many expected factors about future practice were important to respondents

a. compatible practice
b. quality standards
c. workload
d. physicians with compatible personalities

e. physicians with compatible values

f. financial considerations

g. appropriate specialty back-up

h. the physical set-up of practice.

It is encouraging that a high proportion of respondents cited "*Meets a community need"* as an important reason to include each of the practice core aspects and clinical challenges (except for ICU). A number of people also cited community need as an important reason to include teaching and administration. Serving communities and making a difference are important for medical students making career choices and for practicing physicians to find satisfaction in their career choice.(Eliason & Schubot, 1995; Mutha et al., 1997)

Although many of the factors that would attract a resident to a particular community are not amenable to educational intervention, it is important for educators to communicate this information to communities looking to attract residents. Educational programs should also allow residents to experience different communities for hands-on experience about how a particular type of community might suit them.

Detractors

Concerns about work interfering with family life were mentioned by an unexpectedly high proportion of people for many aspects of practice. Clearly, addressing future lifestyle issues is important for an educational program working to encourage comprehensive practice.

Among the factors in the practice environment that might be viewed as detractors are: perceived low prestige of the work, the stress associated with work and the business side of practice. The literature suggests that prestige is important to medical students and residents as they choose careers(DeWitt et al., 1998; Haq et al., 2002; Reed et al., 2001)The common

perception is that people may choose full-time Emergency Medicine in part because of prestige but this was important to only one person in our sample.

However the stress of the work emerged as important when considering the clinical challenges. As cited in the literature review Li, et al. have outlined a successful approach to clinically challenging work. The hardiness of participants and the supportive, rewarding work environment , the experience of "*communitas"* that brings people "into an egalitarian, transcendent camaraderie" all mitigate the strains and stresses of difficult clinical work(Li et al., 1995) p 131. Residency programs could seek educational venues that allow trainees to experience hardy, resilient practitioners and the sense of camaraderie and "*communitas*".

Clinical courage may need to be fostered in family medicine residents wishing to undertake comprehensive practice. Clinical courage is the ability to undertake clinical acts and care for people with acute illnesses without being too fearful. It does not mean recklessly entering into situations where one is not qualified but rather the ability to tolerate some anxiety and uncertainty in undertaking tasks for which one is trained but which may contain some inherent risk or discomfiture.

The business side of practice needs attention yet was viewed as having a negative effect on families. As well a high proportion of people felt it was unlikely they would be well trained in this area on graduation. Residency programs could consider delivering a robust program of practice management that addresses residents' worries about future family life.

In summary, a number of features of the career choice model are supported by the results of the survey.

Factor 1 includes demographic and personal attributes (values, expectations, fears and meaning). No demographic attributes were found to predict comprehensive practice. However,

respondents indicated that family medicine, both core and the clinical challenges was compatible with their values. Expectations and fears are important to these respondents in shaping their practice intentions.

The importance of Factor 2, subjective norms and the importance of significant others, is demonstrated by the frequent reference to family life as important when considering reasons to exclude or include various aspects and the importance given to employment for spouse and proximity to family and friends when choosing a community of practice. .

Educational experiences have significant influence on practice intentions, many of them positive. Unfortunately some students have come to residency with negative undergraduate experiences and an anticipation of inadequate training in some areas, indicating a possible influence of the hidden curriculum. Perceived competence is a necessary but not sufficient condition for many of these respondents to consider including many aspects of family medicine in their future practice. It is important to understand this issue in more depth to address the other important factors influencing practice choices for these aspects.

Factor 6, practice *attractors* and *detractors,* also influenced our respondents. Encouragingly, *meeting a community need* was a significant influence in this study, which would indicate that if communities make their needs known to new family physicians they would respond. Stress and negative effects on family life were the most important detractors so strategies to mitigate these negative effects such as fostering a sense of *communitas* could encourage comprehensive practice.

Other Findings

One important finding of this study, supported by the literature that indicates that residents practice where they train,(Heng et al., 2007; Mathews, Rourke, & Park, 2006), is that even at this early stage of their residency the majority of residents planned to practice in the Maritimes at some point in the future.

Another important finding is that 30 percent of residents in the short term and 25 percent in the long term planned to practice in a rural community. One result approached significance—those from rural towns were more likely to practice in rural towns in the short-term $p = 0.082$. but not the long term. Had the sample size been larger this association may have been significant. This finding is congruent with the large body of literature indicating that those with rural backgrounds are more likely to practice in rural communities.(Rabinowitz et al., 2008; Woloschuk et al., 2005)

The Dalhousie residency program aims to educate family physicians for the Maritimes and rural communities. This study would indicate that the program has the potential to meet these goals if residents carry out their intentions.

Strengths of the Study.

The survey was based on a thorough review of the literature and encompassed a wide scope of influences on future practice intentions. It was easy to administer and analyze. Respondents were given some open-ended questions and options to write in their own comments if the reasons or categories supplied did not suit them.

Despite the small numbers there were comparisons that reached a high level of statistical significance, primarily those that looked at the association between sense of competence and intent to include an aspect of family medicine.

Limitations of the Study.

Career or practice choice is a complex phenomenon, open to many external and internal influences. The actual ways in which these choices are made are not well understood and self-report may be misleading, i.e. decisions may be based on reasons other than what people believe and report. The nature of a survey means that respondents' choices are largely restricted to the ones offered.

This is a small study and only considers intent rather than actual practice. Because of the small numbers the chance of a Type 2 error is more likely. The Halifax-based residents are underrepresented and at the time of the study the Halifax site had a higher proportion of International Medical graduates (IMGs). Therefore some of the differences may reflect not the choice of residency site, but the difference between IMGs and Graduates of Canadian Medical (CMGs). If there had been a larger group from the Halifax site some of the educational site comparisons might have reached statistical significance. The ranking of factors related to choosing a community for practice could also have been affected.

Because we did multiple analyses on a small data set, the possibility of a significant association by chance is high. The Bonnferoni correction was performed to decrease the likelihood of that occurrence.

The survey had a large number of questions and even though the survey was piloted, some questions were similar. This may have been confusing to the participants and could have affected the accuracy of the data they provided.

Future Directions

Table 15 outlines a series of recommendations for family medicine residencies derived from the career choice model, the results of the survey and the literature, which could enhance

the likelihood of comprehensive practice. The recommendations are organized to address "Learning about Self", "Learning about Practice Reality" and the formal and hidden curriculum.

The first *caveat* in considering educational interventions to address practice choices is that a number of factors affecting practice choice are not amenable to educational influence (e.g the practice environment, a learner's life experiences). As well in addition to meeting learners' needs, educational experiences must meet the needs of society by providing the means to develop competent family physicians.

Beyond the educational recommendations other questions have been brought to light by this project. With some modifications this survey could be useful in a national context to understand residents' practice intentions.

For future surveys on this topic, the recommendation would be to streamline the survey, reword and combine similar questions such as those about short and long term practice, location and type of community. The survey question about solo or group practice contributed little useful data and should be eliminated. Rather than asking only about reasons for choosing Emergency Medicine that question could become one about all focused practices—the data would be more inclusive and meaningful.

A larger sample size from multiple residency programs would give more robust data and more meaningful comparisons. Including a question about home province would be useful in discovering any associations between province of origin and province of intended practice.

The separation of aspects of family medicine into Core Aspects of Practice, Clinical Challenges and Non-Clinical Aspects may be helpful in future research on practice choice since the issues and concerns may be similar within each of these groups and different among the groups.

Comprehensive practice has not been well defined in the literature. This study proposes one definition—making it easy to classify respondents and do statistical analyses—and could be used to track future resident groups to see what influences residency education has on their intent to include a significant number of aspects of family medicine in future practice.

This survey is a first step in exploring the reasons behind practice choices of residents. Once the second administration of the survey is complete we will also analyze the percentage and direction of change in residents' practice choices; i.e. is a resident's intended practice broader or narrower at the end of the residency as compared to the beginning and how has it changed?

In the future, a mixed methods approach with focus groups and semi-structured individual interviews would give richer data and allow us to better understand and modify our educational programs to take into account some of the educational influences on practice choices

Table 15: Educational Recommendations to Enhance Learning About Self and Learning About Practice Reality

Attribute	Recommendations			
	Learning about Self		Learning about Practice Reality	
	Formal Curriculum	Hidden Curriculum	Formal Curriculum	Hidden Curriculum
Values: Altruism	Select residents for altruistic values and approaches "making a difference, "serving the underserved"	Feedback and guided reflection would help residents clearly identify where they have a chance to make a significant difference in the health of patients.	Provide opportunities for residents to experience altruism in action – working with underserved populations at home and off shore	
	Be explicit about how patient care meets the needs of communities – encourage resident and faculty reflection on these community needs			
Values: Personal rewards	Encourage reflection and self knowledge to understand him/her self to match future practice with own values to determine what it is that residents find rewarding and meaningful		Be explicit about the rewards of the work and encourage residents to reflect on rewards: intellectual stimulation, enhancing patient relationships, hands on opportunities	
Values: aspects that are seen as unrewarding or uninteresting	Explicit self reflection to determine what it is that makes this aspect of practice unrewarding.		Pairing with enthusiastic preceptors who enjoy and are good at these aspects e.g nursing home care	
Values: time for family	Initial assessment to determine the importance of this to an individual resident. Encouragement to address this value as they work in various clinical situations		A manageable work load	
Fears: too stressful	Explicitly address stress management.	"Legitimate peripheral participation" (Wenger 1998) Residents would be given appropriate autonomy (independent decision making with back up when needed)		Enthusiastic and competent role models to demonstrate to residents that stressful aspects of practice (e.g. deliveries, palliative care, on call) can be managed and enjoyed by family physicians who have balanced lives
	Debriefing of critical incidents,		A collegial environment that provides good team support for difficult clinical work, models the concept of "communitas"	
Fears: unlikely to be well trained by the end of residency	Individualized residency planning to meet career goals.	Curriculum mapping to help residents understand where and when they will learn essential aspects of family medicine		
	Feedback and evaluation to demonstrate competency to residents			

Table 15: Educational Recommendations to Enhance Learning About Self and Learning About Practice Reality [reference in Table to (Wenger, 1998)]

Attribute	Recommendations			
	Learning about Self		Learning about Practice Reality	
	Formal Curriculum	Hidden Curriculum	Formal Curriculum	Hidden Curriculum
Negative experience and/or turned off by role models in medical school	Initial assessment on admission to residency to determine previous negative experiences (e.g. on call, administration or gaps where residents have no experience (e.g. research, practice management)	Selection of positive experiences and role models with guided reflection on these experiences. Teaching occurs in an environment that views family medicine as valuable		
Intention to engage in a particular behaviour is a powerful predictor of that behaviour	Explicitly assess resident intentions at the beginning of residency.			Pay particular attention to those who intend to practice certain aspects and those who are undecided
Need to be competent and confident in clinical work	Modeling and learning of reflective practice coupled with guided self assessment would help residents grow personally, increase their self knowledge, and skills in self assessment and independent learning		The residency learning environment would provide several different practice environments allowing residents to experience the different realities of future family practice	Comprehensive family medicine with continuity of care is the norm, practiced in interdisciplinary primary care teams
	A competency-based residency curriculum and assessment system would allow residents to mark their progress towards a competency level appropriate for a graduating resident			
Need to be competent and confident in clinical work	Explicit assessment is done to determine, for each resident, those aspects of practice where competency is necessary but not sufficient to include in their future practice. If any of these factors are amenable to educational intervention these are put in place (see above re role models)			

Conclusion

The findings of this survey support many aspects of the proposed Career Choice Model. Respondents' attributes such as their values, expectations and fears were found to have an influence on their practice intentions as did some aspects of their educational experiences: the formal and hidden curriculum, role models and sense of competence. However sense of competence alone was not always associated with intent to include an aspect of practice. Debt was not found to be a major influence. The model outlines a number of practice attributes considered to be attractors and these were all deemed important by our respondents, as were two out of the three detractors.

Future research using mixed methods could explore residents' values, identity, and sources of meaning as well as provide more in-depth understanding about the hidden curriculum, what is important beyond sense of competence for some aspects of practice and whether role models are important to refute negative stereotypes. The importance of family and societal expectations could also be addressed in more detail through a mixed methods approach. The respondents' positive view of teaching and their negative view of research and administration would be another fruitful area for qualitative exploration.

If residents view many diverse aspects of practice positively at the beginning of residency there should be the potential to enhance the positive characteristics and specifically address approaches to practice that mitigate some of the stress and help residents have time for their personal lives and families. Faculty who model practice that addresses all of these potential negatives by working in supportive teams, modeling effective stress management and being explicit about the joys and rewards of these aspects of practice may help encourage residents to undertake many aspects of family medicine in their future practice. The concept of *communitas*

as a means to experience the joys more than the stresses of clinically challenging work deserves future exploration.

Educational experiences could be carefully chosen so as to avoid conveying negative messages about important aspects of family medicine, particularly core aspects like office practice, administration, (including practice management) and research. The need for positive experiences in office practice is self-evident. As well, family physicians take part in administration at the practice, institutional, regional and provincial levels therefore we could pay attention to encouraging learners to take part in administration by involving them in the business side of practice, committee work, meetings and organizations.

High quality, community-based family medicine research is essential to the development of the discipline to effectively meet the needs of society. Learners could experience family medicine research during their residency training to encourage them to be involved in research while in practice.

Residency programs could deliver a robust program of practice management and address residents' fears of the effects of administration and research on family life.

The educational changes recommended in this paper would require new approaches for faculty in their day-to-day clinical teaching and for residency programs in their approach to resident education. Faculty development and support for these changes would be essential to implement these recommendations.

Clearly, addressing future lifestyle issues is important for an educational program that would like to encourage comprehensive practice. Educators could inform communities of the importance of spousal influence and of family and social support to residents seeking future places to practice. Educational programs could also allow residents to experience different

communities to allow them to learn first-hand how a particular type of community might suit them.

If they fulfill their intentions outlined in this survey residents trained in the Dalhousie Family Medicine Residency Program will contribute to the comprehensive primary care needed in the Maritimes and rural Canada.

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Appendix A

Survey

Family Medicine

DALHOUSIE University FACULTY OF MEDICINE
Maritime Canada's Medical School

INTENDED PRACTICE SCOPE OF DALHOUSIE FAMILY MEDICINE RESIDENTS

Please check ✓ the one best response, unless noted otherwise.

Section A – Practice Information

We realize that many residents have different plans for the short term and the long term so we have divided most questions into two parts to let you answer both what your short term (2-3 years after residency) plans are and what your more long term goals may be.

1.1 A) After your residency, do you plan to:

Short Term (next 2-3 years)

- ☐ *1* ***Begin a full-time practice***
- ☐ *2* ***Begin a part-time practice***
- ☐ *3* ***Do locums***
- ☐ *4* ***Pursue further training:***
  - ☐ *4.1* ***Emergency***
  - ☐ *4.2* ***Palliative Care***
  - ☐ *4.3* ***Health Care of the Elderly***
  - ☐ ***Other (please specify)***

_____

- ☐ *5* ***Fulfil commitment to Department of National Defense[1]***
- ☐ *6* ***Undecided***
- ☐ *7* ***Other (please specify)***

_____

Long term (>3 years)

- ☐ *8* ***Begin or continue a full-time practice***
- ☐ *9* ***Begin or continue a part-time practice***
- ☐ *10* ***Do locums***
- ☐ *11* ***Pursue further training:***
  - ☐ *11.1* ***Emergency***
  - ☐ *11.2* ***Palliative Care***
  - ☐ *11.3* ***Health Care of the Elderly***
  - ☐ *11.4* ***Other (please specify)***

_____

- ☐ *12* ***Fulfil commitment to Department of National Defense[1]***
- ☐ *13* ***Undecided***
- ☐ *14* ***Other (please specify)***

_____

[1] If you have a commitment to the DND please answer the rest of the survey AS IF you were not committed.

B) Please specify where you plan to work when you finish your residency – after completion of your PGY2 or PGY3 year. Please check (✓) all that apply

Short Term (next 2-3 years)	Long Term (> 3 years)	
☐ 1	☐ 2	Newfoundland
☐ 3	☐ 4	Prince Edward Island
☐ 5	☐ 6	Nova Scotia
☐ 7	☐ 8	New Brunswick
☐ 9	☐ 10	Quebec
☐ 11	☐ 12	Ontario
☐ 13	☐ 14	Manitoba
☐ 15	☐ 16	Saskatchewan
☐ 17	☐ 18	Alberta
☐ 19	☐ 20	British Columbia
☐ 21	☐ 22	Northwest Territories
☐ 23	☐ 24	Yukon
☐ 25	☐ 26	Nunavut
☐ 27	☐ 28	International (e.g. Doctors Without Borders)
☐ 29	☐ 30	United States
☐ 31	☐ 32	Undecided

1.2 What kind of community would you choose to work in ?

Short Term (2-3 years)

- ☐ 1 ***Rural remote (> 2 hours from a regional centre)***
- ☐ 2 ***Rural close (< 2 hours from a regional centre***
- ☐ 3 ***Urban with regional hospital***
- ☐ 4 ***Urban with tertiary care hospital***
- ☐ 5 ***Inner-city practice***
- ☐ 6 ***International***

Long term (>3 years)

- ☐ 7 ***Rural remote (> 2 hours from a regional centre)***
- ☐ 8 ***Rural close (< 2 hours from a regional centre)***
- ☐ 9 ***Urban with regional hospital***
- ☐ 10 ***Urban with tertiary care hospital***
- ☐ 11 ***Inner-city practice***
- ☐ 12 ***International***

1.3 What factors determined (or do you think will determine) your choice of community for practice? Please circle the one number for each factor. Please answer this question as it applies to your long term goals.

Factor	**Not Important**				**Very important**
A) Proximity to family/friends	1	2	3	4	5
B) Ability of your partner/spouse to find employment	1	2	3	4	5
C) Other family considerations	1	2	3	4	5
D) Characteristics of the group of physicians i) Compatible personalities	1	2	3	4	5
ii) Compatible values	1	2	3	4	5
iii) Compatible standards or quality of practice	1	2	3	4	5
iv) Appropriate specialty back-up	1	2	3	4	5
E) Physical set-up of practice	1	2	3	4	5
F) Sense of contribution or service to the community in question	1	2	3	4	5
G) Financial considerations (e.g. salary vs. fee-for-service, overhead etc	1	2	3	4	5
H) Provincial fee schedules	1	2	3	4	5
I) Recreational and leisure opportunities	1	2	3	4	5
J) Cultural environment (need to be part of compatible religious or cultural community)	1	2	3	4	5
K) Workload (expected hours/week, on-call frequency etc.)	1	2	3	4	5
L) Would like to practice in (or close to) the community where I grew up	1	2	3	4	5
M) Availability of parental leave	1	2	3	4	5
N) Other – please specify	1	2	3	4	5

_____

2. *What kind of practice do you plan to do after residency? If still uncertain check all that you are considering*

- ☐ 1 Solo
- ☐ 2 Group (shared space/*overhead*)
- ☐ 3 Group (sign-out only)
- ☐ 4 Community Health Centre
- ☐ 5 Combination Emergency Medicine and Family Medicine
- ☐ 6 Full time Emergency Medicine
- ☐ 7 Walk-in clinic
- ☐ 8 Other focused practice (e.g. Sports Medicine, Hospitalist)
- ☐ 9 Not practicing Family Medicine
- ☐ 10 Other

If you plan to do family medicine, in either a solo practice, a group practice, or a community health centre (CHC) please answer questions 4 – 17 about which aspects of family medicine you plan to include in your practice, how competent or comfortable you feel in this area and the reasons that have led you to make this decision.

I do not plan to do solo practice, group practice or CHC practice ☐

(Please go on to question 18)

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE family medicine office based practice in your practice** **Please check all that apply**		**Reasons to EXCLUDE family medicine office based from your practice** **Please check all that apply**	
4. Family medicine office based practice Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE Emergency Shifts in your practice** **Please check all that apply**		**Reasons to EXCLUDE Emergency Shifts from your practice** **Please check all that apply**	
5. Emergency Shifts Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE after-hours/on call coverage in your practice** **Please check all that apply**		**Reasons to EXCLUDE after-hours/on call coverage from your practice** **Please check all that apply**	
6. After-hours/On call coverage Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	*Reasons to INCLUDE In-hospital care of patients in your practice* **Please check all that apply**		**Reasons to EXCLUDE In-hospital care of patients from your practice** **Please check all that apply**	
7. In-hospital care of patients Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE after-hours/on call coverage in your practice** **Please check all that apply**		**Reasons to EXCLUDE after-hours/on call coverage from your practice** **Please check all that apply**	
8. Prenatal care Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	*Reasons to INCLUDE delivering babies in your practice* **Please check all that apply**		**Reasons to EXCLUDE delivering babies from your practice** **Please check all that apply**	
9. *Delivering babies* Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE nursing home care in your practice** **Please check all that apply**		**Reasons to EXCLUDE nursing home care from your practice** **Please check all that apply**	
10. Nursing home care Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	*Reasons to INCLUDE home visits in your practice* **Please check all that apply**		**Reasons to EXCLUDE home visits from your practice** **Please check all that apply**	
11. *Caring for patients at home – home visits* Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE palliative care in your practice** **Please check all that apply**		**Reasons to EXCLUDE palliative care from your practice** **Please check all that apply**	
12. Palliative Care Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	*Reasons to INCLUDE ICU/CCU in your practice* **Please check all that apply**		**Reasons to EXCLUDE ICU/CCU from your practice** **Please check all that apply**	
13. *ICU/CCU* Definitely Exclude … Undecided … Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent … Fairly competent … Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE supportive counselling/psychotherapy in your practice** **Please check all that apply**		**Reasons to EXCLUDE supportive counseling/psychotherapy from your practice** **Please check all that apply**	
14. Supportive counselling/ psychotherapy Definitely Exclude … Undecided … Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent … Fairly competent … Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	*Reasons to INCLUDE administrative responsibilities in your practice* **Please check all that apply**		**Reasons to EXCLUDE administrative responsibilities from your practice** **Please check all that apply**	
15. *Administrative responsibilities (eg hospital committees)* Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Include or exclude this aspect? **How competent do you feel?**	**Reasons to INCLUDE teaching in your practice** **Please check all that apply**		**Reasons to EXCLUDE teaching from your practice** **Please check all that apply**	
16. Teaching medical students or residents Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

Which aspects of family medicine do you plan to include in your practice, how competent or comfortable do you feel in this area and what reasons that have led you to make this decision?

Include or exclude this aspect? **How competent do you feel?**	*Reasons to INCLUDE practice management in your practice* **Please check all that apply**		**Reasons to EXCLUDE practice management from your practice** **Please check all that apply**	
17. *Practice management (the business side of the practice* Definitely Exclude Undecided Definitely Include 1 2 3 4 5 **a) How competent do you feel in this aspect of family medicine?** Not competent Fairly competent Very competent 1 2 3 4 5	b) Positive experience in medical school		n) Negative experience in medical school	
	c) "Turned on" by mentor or role model		o) "Turned off" by mentor or role model	
	d) Essential part of family medicine		p) Unlikely to be well trained by the end of residency	
	e) Rewarding aspect of practice		q) Too stressful	
	f) Intellectually stimulating		r) Not interesting or rewarding	
	g) Does not interfere with family life		s) Interferes with family time	
	h) Offers hands on opportunities (procedures)		t) Interferes with other work responsibilities	
	i) Able to make a significant difference to patients		u) Not financially rewarding	
	j) Enhances relationships with patients		v) Other – please write in	
	k) Meets a community need			
	l) Financially rewarding			
	m) Other – please write in			

18. *If you plan to do full time Emergency work, please check (✓) all the reasons that attract you to this line of work.*

I do not plan to do full time Emergency work ☐
(please go on to question 5)

- ☐ 1 ***Income***
- ☐ 2 ***Work hours***
- ☐ 3 ***Prestige***
- ☐ 4 ***Challenge***
- ☐ 5 ***Freedom from ongoing responsibility for patients***
- ☐ 6 ***Diversity of patients***
- ☐ 7 ***Ability to develop focused expertise***
- ☐ 8 ***Opportunities to do procedures***
- ☐ 9 ***Intellectual content***
- ☐ 10 ***Ability to work in remote areas***
- ☐ 11 ***Other (please specify***

_____

19. How do you plan to handle after-hours coverage for your patients. Please check (✓) all that apply.

- ☐ 1 Call group
- ☐ 2 Cover own calls
- ☐ 3 Sign out to Emergency Department
- ☐ 4 After hours clinic
- ☐ 5 Other (please specify) _____

20. Please add any additional comments about practice choice, which you think, are relevant

_____

_____

_____

_____

Section B – General Information

Please check the appropriate box

21. Sex

☐ 1 Male ☐ 2 Female

22. Age

☐ 1 < 30 ☐ 2 30-34 ☐ 3 >34

- **Family Situation**
  a) Please check the appropriate box(es)
  ☐ 1 Unattached (no partner)
  ☐ 2 Attached (married or with a partner)

  b) Do you have children?
  ☐ 3 Yes ☐ 4 No

24. a) What is the population of your hometown?

☐ 1 < 1,000
☐ 2 1,000 – 9,999
☐ 3 10,000 - 49,999
☐ 4 50,000 – 300,000
☐ 5 >300,000

- **What type of community is your hometown ?**

☐ 1 ***Rural remote (> 2 hours from a regional centre)***
☐ 2 ***Rural close (< 2 hours from a regional centre***
☐ 3 ***Urban with regional hospital***
☐ 4 ***Urban with tertiary care hospital***

25. What medical school did you graduate from? (optional) _____

26. What year did you graduate from medical school? _____

27. What will your approximate level of indebtedness be when you finish residency? Please check the appropriate box.

☐ 1 *<$50,000* ☐ 2 *$50,0000 – $100,000*
☐ 3 *> $100,000*

28. Where are you in your residency? Please check the appropriate box.

☐ 1 Beginning (early PGY1 year) ☐ 2 Middle (end PGY1 year early PGY2 year) ☐ 3 End (end PGY2 year)

29. At which site are you based? Please check the appropriate box.

☐ 1 Halifax ☐ 2 Fredericton ☐ 3 Cape Breton

☐ 4 Northumberland ☐ 5 Saint John

☐ Please check if you would like a summary of the report when it is available.

Thank you very much for completing the survey!

Appendix B

Table 16: Relationships Among Variables, Research Questions and Survey Items

Variable Name	Research Question	Item on Survey
Independent variable Training site *Dependent variables* Any aspect of choice of practice	What is the relationship between residency site (community vs. academic) and practice choices?	29 and 4 - 17
Independent variable Demographic characteristics *Dependent variable* Any aspect of practice choice	What is the relationship between demographic characteristics (gender, age, marital status, children) and practice choices.	21 - 23 and 4 - 17
Independent variable Perception of competence *Dependent variable* Any aspect of practice choice	What is the relationship between perception of competence and practice choices?	4 - 17
Independent variable Reasons for excluding or including an aspect *Dependent variable* Aspect of choice of practice	What are the factors that residents think influence their practice choices?	4 - 17
Independent variable Debt load *Dependent variable* Any aspect of choice of practice	How does debt load influence practice choices?	27 and 4 - 17
Independent variable Community characteristics *Dependent variable* Influence on choice of community	What aspects of communities make them attractive to graduating physicians?	1.3 A)—J)
Independent variable Size of hometown *Dependent variable* Type of community of practice	What is the relationship between the size and type of hometown and the type of community of future practice?	24 and 1.2

Appendix C

Graphs of Reasons to Include or Exclude the Various Aspects of Family Medicine

*Figure 5: Reasons to **include** Practice Core Aspects of Family Medicine*

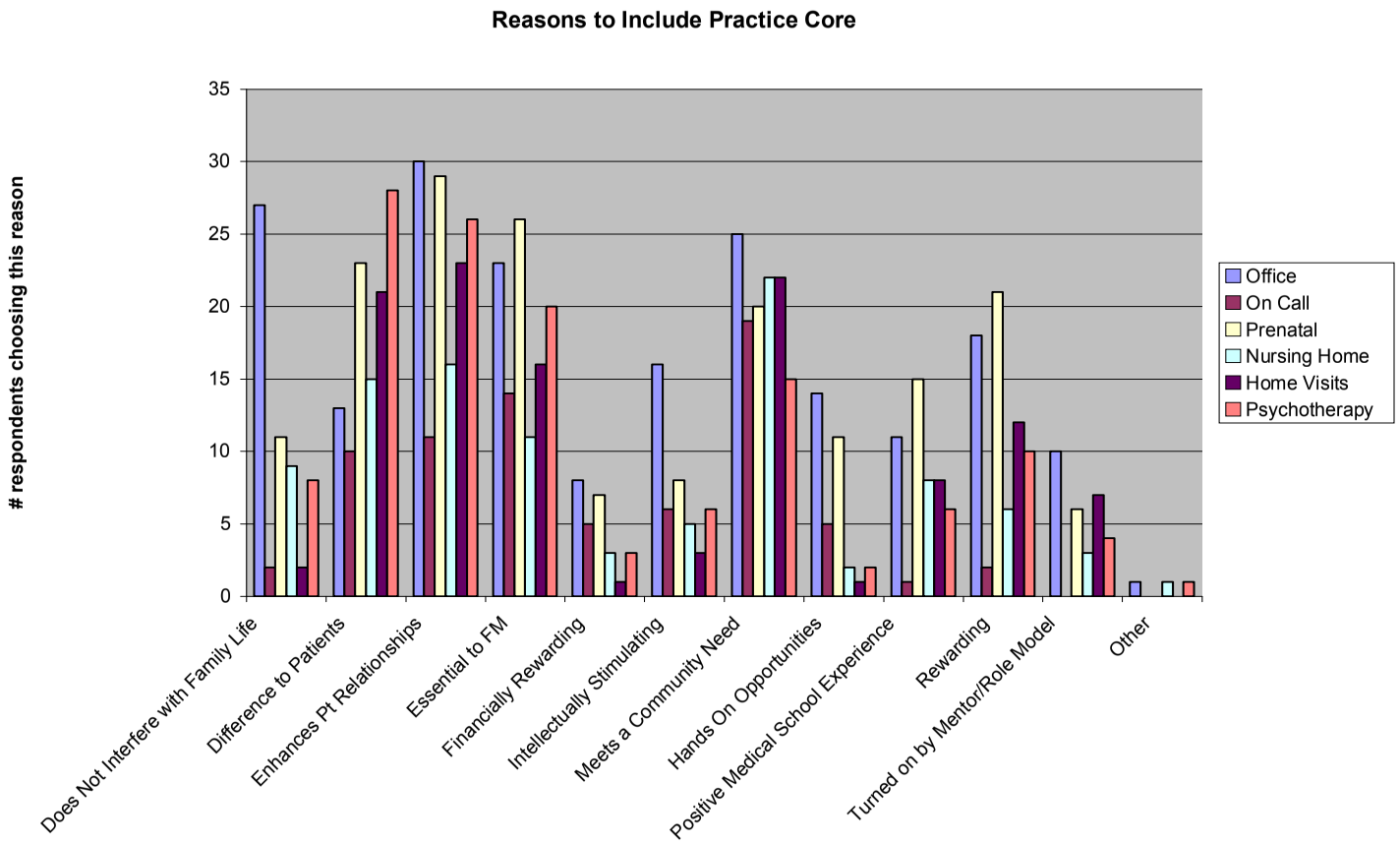


*Figure 6: Reasons to **exclude** Practice Core Aspects of Family Medicine*

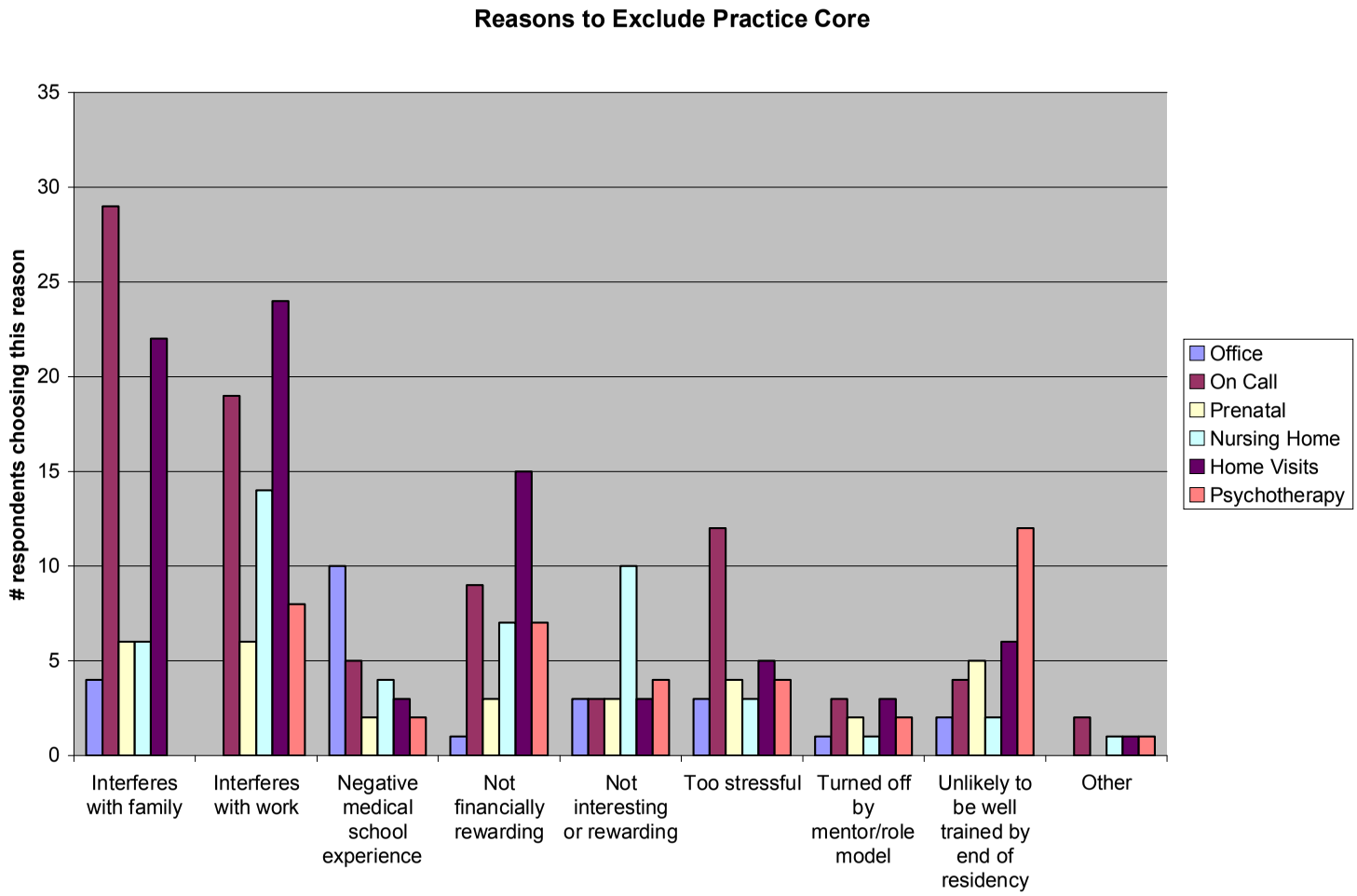


*Figure 7: Reasons to **include** Clinical Challenges*

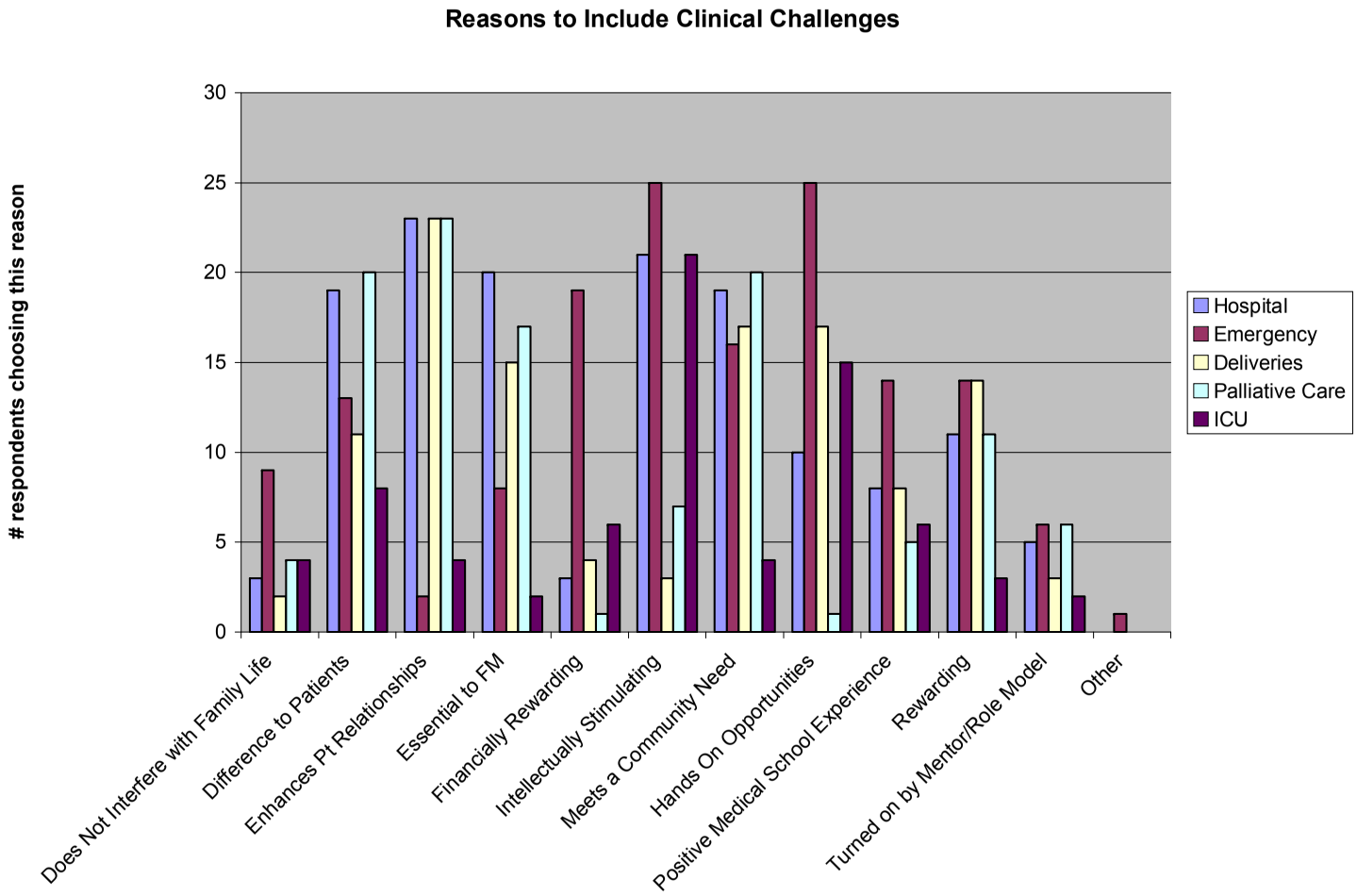


*Figure 8: Reasons to **exclude** Clinical Challenges*

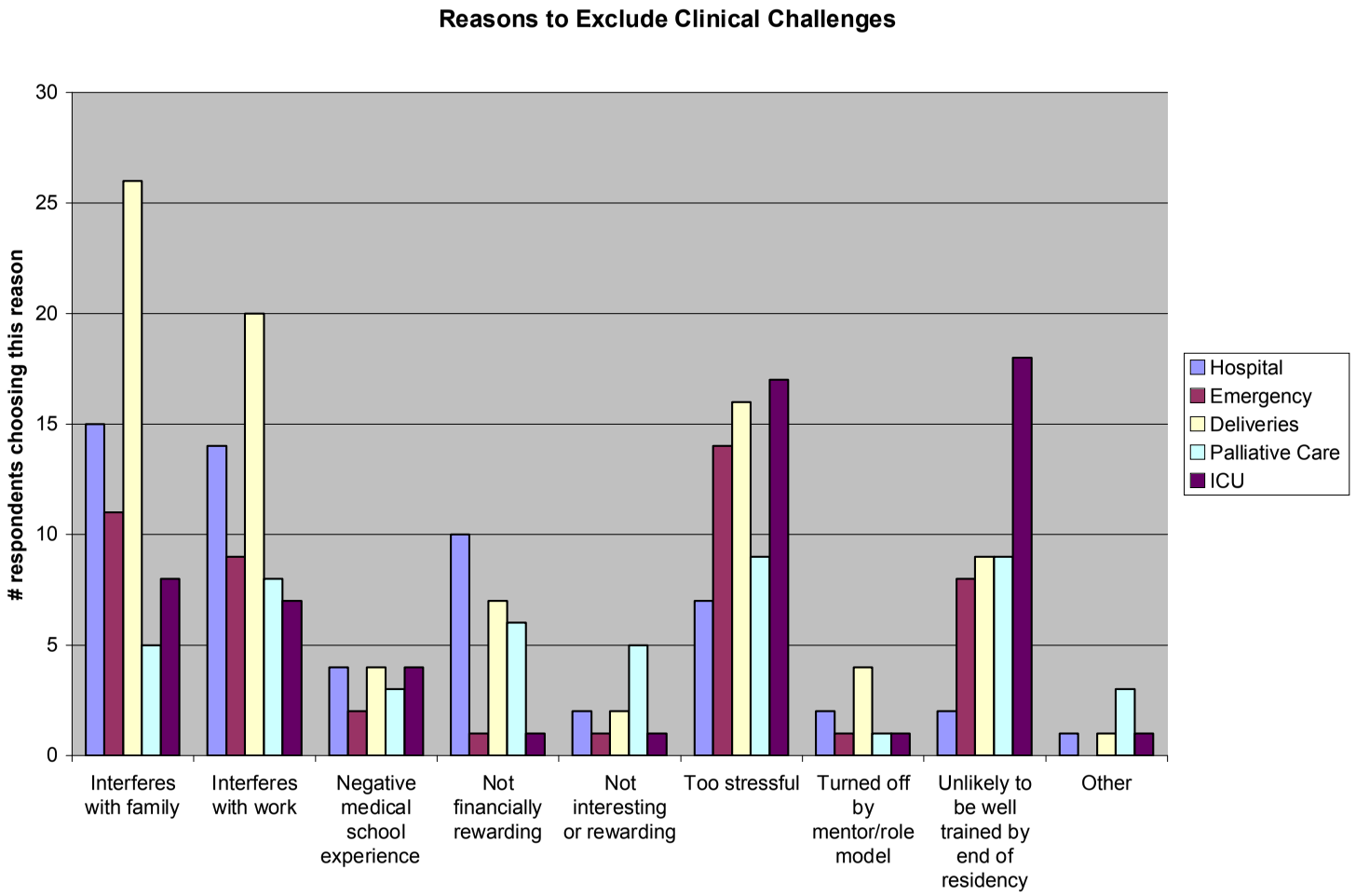


*Figure 9: Reasons to **include** Non Clinical Aspects of Practice*

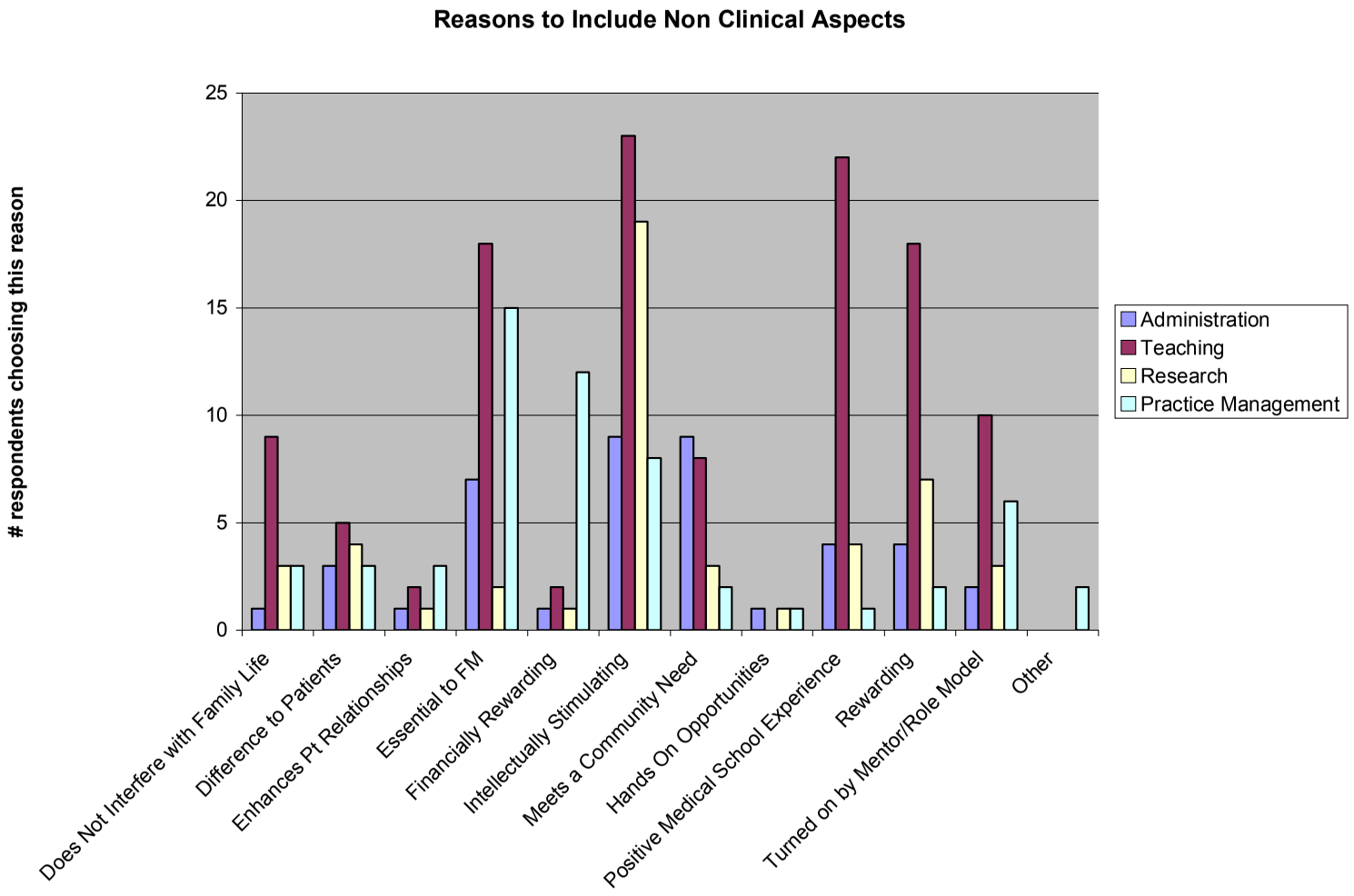
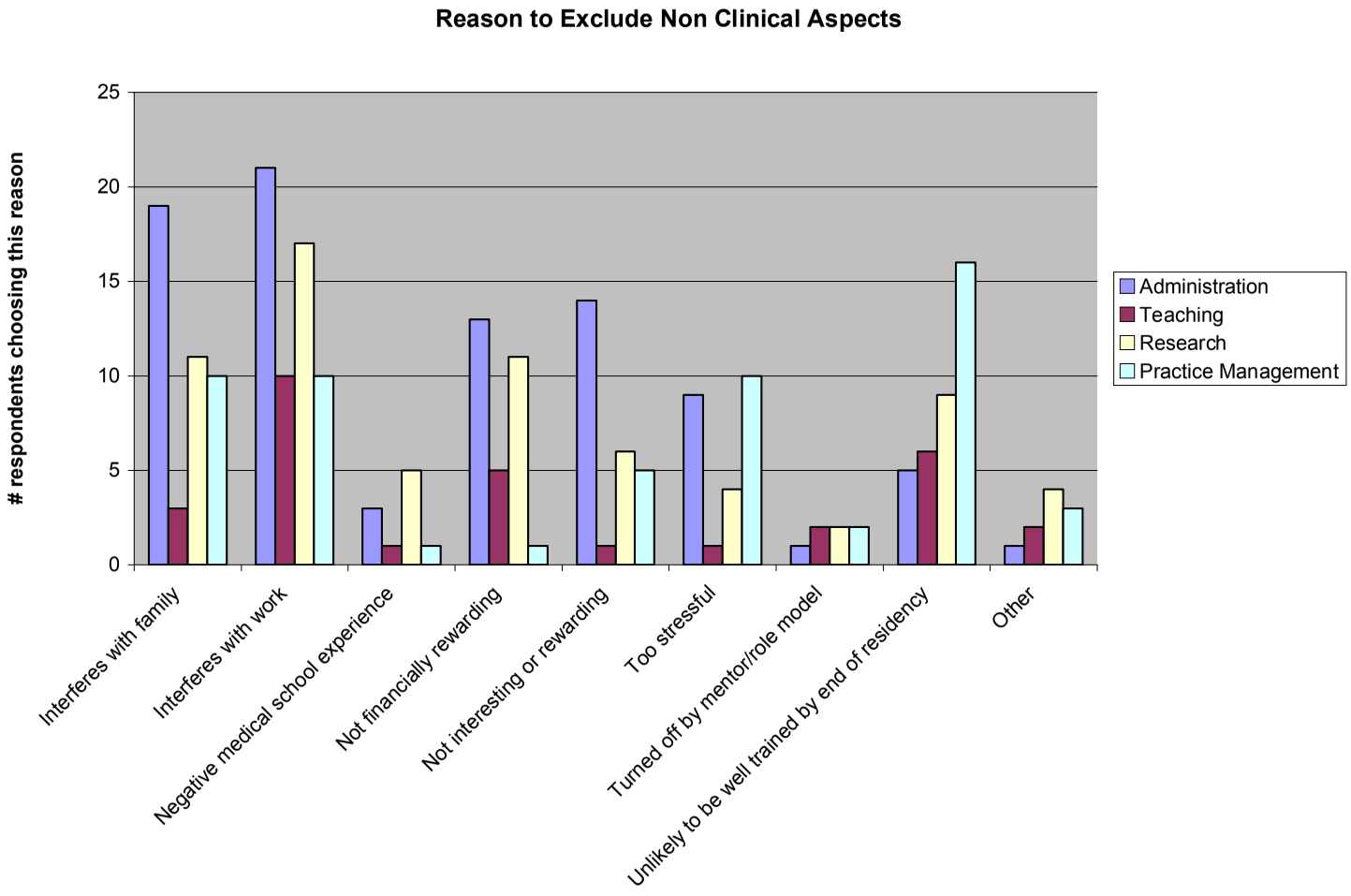


*Figure 10: Reasons to **exclude** Non Clinical Aspects of Family Medicine*



Appendix D

Tables

Table 17 represents the association between resident characteristics and perception of competence with plans to undertake comprehensive practice (*versus* focused)

Table 17: Association between resident characteristics and intent to undertake a comprehensive practice

Resident Characteristic	Odds ratio [OR] (95% confidence interval CI])	
	Unadjusted model	Final model
Sex (*vs*. male) Female	1.8 (0.4, 7.8)	-
Age (*vs*. <35 years) > 34 years	2.1 (0.4, 11.0)	-
Partner status (*vs*. no partner) Partner	3.0 (0.6, 14.1)	-
Child status (*vs*. no child) Child	1.1 (0.3, 4.6)	-
Medical school (*vs*. Canadian) International	1.8 (0.3, 9.6)	-
Education site (*vs*. other communities) Halifax	0.4 (0.1, 1.9)	-
Debt load (*vs*. <$50k) ≥$50 k	1.7 (0.4, 8.4)	-
Hometown type (*vs*. rural) Urban	0.6 (0.1, 2.4)	-
Competency with challenging aspects of family medicine	1.3 (1.0, 1.7) *	1.3 (1.0, 1.7) *
Competency with core aspects of family medicine	1.2 (1.0, 1.5) *	-

* <0.1, ** < 0.05,

There was a small cell problem: one age category predicted desire for a focused practice perfectly. With no variability an estimate could not be provided. Closer examination suggested this was due to the inclusion of medical school of graduation in the same equation. As well,

additional estimates provided extreme values. Therefore only 3 variables were included in the saturated model.

Table 18 represents the associations between resident characteristics and perception of competence with the short-term intent of practicing in the Maritimes (*versus* elsewhere in Canada or undecided)

Table 18: Association Between Resident Characteristics and Short-Term Plans to Practice in the Maritimes

Resident characteristic	Odds Ratio [OR] (95% confidence interval [CI])	
	Unadjusted	Final model
Sex (*vs*. male) Female	1.6 (0.4, 6.8)	-
Age (*vs*. <35 years) > 34 years	1.3 (0.2, 8.3)	-
Partner status (*vs*. no partner) Partner	4.7 (1.0, 21.9)**	-
Child status (*vs*. no child) Child	3.1 (0.5, 17.8)	-
Medical school (*vs*. Canadian) International	1.1 (0.2, 6.0)	-
Education site (*vs*. other communities) Halifax	0.2 (0.0, 0.8) **	0.2 (0.0, 0.8) **
Debt load (*vs*. <$50k) ≥$50 k	1.2 (0.3, 5.6)	-
Hometown type (*vs*. rural) Urban	0.7 (0.2, 2.8)	-
Competency with challenging aspects of family medicine	1.1 (0.9, 1.4)	-
Competency with core aspects of family medicine	1.2 (0.9, 1.4)	-

* <0.1, ** < 0.05

Table 19 represents associations of resident characteristics and perception of competencies with the long-term intent of practicing in the Maritimes (*versus* being elsewhere in Canada, or undecided)

Table 19: Association Between Resident Characteristics and Long-Term Plans to Practice in the Maritimes

Resident Characteristic	Odds Ratio [OR] (95% confidence interval [CI]) Unadjusted model	Parsimonious model[2]
Sex (*vs*. male) Female	0.3 (0.1, 1.3)*	-
Age (*vs*. <35 years) > 34 years	1.7 (0.3, 8.9)	-
Partner status (*vs*. no partner) Partner	3.2 (0.7, 15.4)	-
Child status (*vs*. no child) Child	9.6 (1.6, 56.9)**	16.5 (1.8, 150.4)**
Medical school (*vs*. Canadian) International	2.0 (0.4, 10.9)	-
Education site (*vs*. other communities) Halifax	0.3 (0.1, 1.4)	-
Debt load (*vs*. <$50k) ≥$50 k	1.0 (0.2, 4.6)	-
Hometown type (*vs*. rural) Urban	1.0 (0.2, 4.3)	-
Competency with challenging aspects of family medicine	1.2 (0.9, 1.5)	-
Competency with core aspects of family medicine	1.3 (1.0, 1.7)**	1.5 (1.0, 2.0)

* <0.1, ** < 0.05

Table 20 shows the association between resident characteristics and perception of competence with the long-term plans to practice in an urban community (*versus* rural)

Table 20: Association Between Resident Characteristics and Long-Term Plans to Practice in an Urban Community

	Odds Ratio [OR] (95% confidence interval [CI])

Resident characteristics	Unadjusted model	Final model
Sex (*vs*. male) Female	0.7 (0.1, 3.5)	-
Age (*vs*. <35 years) > 34 years	0.3 (0.0, 2.1)	-
Partner status (*vs*. no partner) Partner	0.8 (0.2, 4.1)	-
Child status (*vs*. no child) Child	2.4 (0.4, 14.5)	-
Medical school (*vs*. Canadian) International	3.1 (0.5, 19.9)	-
Education site (*vs*. other communities) Halifax	1.3 (0.3, 6.5)	-
Debt load (*vs*. <$50k) ≥$50 k	3.2 (0.6, 18.4)	-
Hometown type (*vs*. rural) Urban	3.0 (0.7, 13.7)	3.0 (0.7, 13.7) (p=0.16)
Competency with challenging aspects of family medicine	1.1 (0.8, 1.4)	-
Competency with core aspects of family medicine	0.9 (0.8, 1.2)	-

* <0.1, ** < 0.05,