BRIDGING THE RURAL DIVIDE:
AN EXPLORATORY STUDY
OF A MEDICAL SCHOOL'S RURAL APPLICANTS

by

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Abstract

It is widely recognized that rural students are underrepresented in medical schools in Canada and many other countries. Some have argued that this underrepresentation stems from admissions selection biases. This study explores the relationship between the location of high school of graduation and applicant demographics, performance on several admissions measures, and incorporates a comparison of rural and non-rural applicant autobiographical submissions. For this study I allocated 1963 UBC medical school applicants from the 2014-15 application cycle into three categories (rural, regional and urban). Three primarily analyses were conducted: a comparison of demographic characteristics (age, gender, highest level of education earned at time of application, Aboriginal identity, and BC residency) across the applicant subgroups, a univariate and multivariate statistical analysis reviewing the relationship between location of high school of graduation and measures of performance in the admissions process, and a quantitative content analysis that compared rural, regional, and urban applicant non-academic and employment history experiences. Results suggest that subtle differences existed across the applicant subgroups. Primarily, rural applicants were more likely to be female, to identify as an Aboriginal person, to perform more poorly on the Medical College Admissions Test (MCAT), to work, and to mention employment in trades and forestry related professions than their non-rural peers. These differences, however, were unrelated to the rate at which applicants from the different subgroups advanced through the various stages of the admissions process. Because medical schools struggle to balance the goals

and values of their programs with the metrics used to evaluate these traits and characteristics, results reinforce the importance of admissions policies designed to evaluate candidates in a background-appropriate manner so that a diversity of applicants, including those from rural areas, can adequately demonstrate their readiness for a career in medicine.

Lay Summary

It is believed by many that rural students are disadvantaged in competitive post-secondary application processes because they do not have the experiences or training to do well. However, programs like medicine are interested in admitting rural students because they are more likely than non-rural students to return to rural areas (which have severe doctor shortages) once they graduate medical school. This study identifies similarities and differences in the application documents of rural and non-rural individuals at one medical school. Knowing this information can help schools that are interested in admitting rural students do a better job making and using admissions selection tools that allow rural applicants to fairly compete for program positions.

Preface

This thesis is an original, unpublished work by the author, Catherine Macala. I was primarily responsible for the concept, data analysis, and composition of the manuscript.

My research committee, overseen by my research supervisor Dr. Lesley Andres, comprised of Dr. Pam Ratner and Dr. Kevin Eva. They provided expert advice regarding all aspects of my thesis including several iterations of manuscript revisions.

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List of Abbreviations

AAMC: Association of American Medical Colleges

AFMC: Association of the Faculties of Medicine in Canada

AGPA: Adjusted Grade Point Average—a grade point average calculated upon the removal of up to 30 credits in one year (the year with the lowest overall average), provided an applicant has 90 credits remaining after the removal of these 30 credits

AQ: Academic Quotient— a number generated to describe an applicant's competitiveness as based on their overall or adjusted grade point average. It ranges from 0-50 and has a mean of 25. It, along with the non-academic qualities score ranks a candidate for interview.

CA: Census Agglomeration— Statistics Canada term that describes an urban area, known as an urban core, with a population of at least 10,000 people that has extensive economic and social interaction with surrounding urban and rural fringe areas.

CMA: Census Metropolitan Area—Statistics Canada term that describes an urban area, known as an urban core, with a population of at least 100,000 people that has extensive economic and social interaction with surrounding urban and rural fringe areas.

IMP: Island Medical Program— the location of UBC medical school located in Victoria

GPA: Grade Point Average

MCAT: Medical College Admissions Test— this exam is administered by the Association of American Medical Colleges, and the majority of medical schools in North America use it as an indicator of candidate preparedness for medical school. Applicants can attend any number of schools therefore this tool is seen as a standardized mechanism by which to compare their academic potential.

MDUP: Medical Doctor Undergraduate Program—the common abbreviation for the UBC Doctor of Medicine degree program.

MMI: Multiple Mini Interview— a form of interview that uses a series of short interactions to assess a candidate. At UBC, MMI scores are confidential, but unsuccessful applicants are provided with a broad generalization of how they performed (below average, average, or above average).

NAQ: non-academic qualities score— ranges from 0-50 with a standardized mean of 25. This score, along with the academic quotient (a conversion of an applicant's overall GPA or adjusted GPA (OGPA/AGPA)), ranks applicants for interview to the UBC MD Program

NMP: Northern Medical Program— the location of UBC medical school located in Prince George

NOC: National Occupational Classification— a classification system used by the Canadian government to document and report human resources, employment and labour statistics; used in this thesis to classify applicant paid and unpaid activities

OGPA: Overall Grade Point Average— the grade point average calculated from all university equivalent courses, including courses taken at any number of accredited colleges, through distance education, and during post-graduate education.

RST: Rural and Small Towns— A definition of location classification created by Statistics Canada.

SMP: Southern Medical Program—the location of UBC medical school located in Kelowna

UBC: University of British Columbia

VFMP: Vancouver Fraser Medical Program— the location of UBC medical school situated in Vancouver and the Fraser Valley

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Dedication

To my grandfathers

"I know for certain that we never lose the people we love, even to death.
They continue to participate in every act, thought and decision we make.
Their love leaves an indelible imprint in our memories.
We find comfort in knowing that our lives have been enriched by having shared their love."
- Leo Buscaglia

Chapter 1: Introduction

On June 22, 2000, seven thousand people gathered in the Prince George Multiplex to protest the state of health care in the northern part of the Canadian province of British Columbia. This rally, motivated by the shortage of physicians in the North and other sparsely populated areas of the province, inspired two conversations: a critical examination of the types of students historically enrolled in the Province of British Columbia's only Doctor of Medicine (MD) Program and a discussion of the lack of rural or northern medical training provided in the University of British Columbia's (UBC) MD curriculum. As a direct outcome of this rally, the Province of British Columbia provided the funds for a joint venture between the University of Northern British Columbia (UNBC), the University of Victoria, and UBC to expand medical education throughout the province. To populate the newly distributed medical school with students who represented the province's population, the collaborative created a selection process that attempts to not only select the best students but one that selects students from a wide variety of cultural, economic, and geographic backgrounds. This study is situated in the context of this complex selective admissions process.

Although the distributed medical education program has been in operation for over a decade, few studies have reviewed the relative competitiveness of applicants from various backgrounds. Through this study I identify some types of applicants who benefit from current selection methods and highlight those that may be disadvantaged. I pay specific attention to how rural students fare throughout the process; the extent to

which the current selection methods facilitate the entry of rural students into the medical program remains unknown. What is known is that the academic literature describes rural student underrepresentation in Canadian medical programs as a continuing problem.

In general, university admissions practices act as sieves — tools that sift for those that fit and filter out those that do not. And yet, admissions processes are also bridges — spans over which individuals gain access to the fulfillment of their academic and professional dreams. Therefore, admissions departments have the moral and ethical responsibility to ensure that their selection practices enable students from a wide variety of ethnic, religious, gender, cultural, and location specific backgrounds to equally access their education programs.

1.1 Rationale for the Study

Rural students are underrepresented in post-secondary education, specifically in universities (Andres & Looker, 2001; Canadian Council on Learning, 2009; Frenette, 2003; Looker, 2009). There are multiple reasons for their underrepresentation, including their distance from post-secondary teaching settings, parents' education, familial background, socio-economic status, and personal expectations (Andres, 1992; Andres & Looker, 2001; Looker, 2009; Tucker, 2010). In addition, advocates for better representation argue that young adults from rural areas have a difficult time competing with their urban peers, particularly for positions in programs such as medicine, because they do not participate in the "correct" extra-curricular or co-curricular experiences (Rourke, 2005), they lack access to necessary academic preparation, especially science

courses (Nielsen, 2009), they have difficulty accessing standardized testing centres (for exams such as the Medical College Admissions Test) because they are typically located in urban areas (Eskander, Shandling, & Hanson, 2013[1]), and because they are not as "worldly" as urbanites. Although some of these beliefs are more conjecture than substantiated fact, they are pervasive enough as to be discussed in admissions committee meetings and in opinion pieces written about rural student selection for medical programs (Rourke, 2005).

Although opinions about selection processes may not have been confirmed empirically, the onus is on Canadian universities to ensure that students from a variety of backgrounds can compete and gain entry while conforming to human rights and other legislation. It is, therefore, important to learn how rural applicants compare with their non-rural peers. Understanding more about who they are, as well as where they succeed, where they struggle, and how they express themselves in their applications will help to identify whether current systems of admission adequately capture their abilities. Additionally, because admissions evaluation methods change over time, if certain methods promote rural student selection and others limit it, these methods should be documented to avoid inadvertent consequences of future evaluation changes.

[1] Eskander et al. (2013) describe the distance to MCAT testing centres as a barrier for rural and northern Indigenous students of Canada. However, the problem applies equally to Indigenous and non-Indigenous students from these areas.

1.2 Research Questions

To explore how rural and non-rural applicants compare in UBC's medical school selection process, answering the following research questions interested me: 1) How do rural, regional (non-urban and non-rural), and urban applicants compare demographically to one another? 2) Is rurality associated with admissions scores (grades, MCAT scores, scores about extracurricular experiences, and interview scores) and do any associations hold true when accounting for applicants' demographic factors (age, gender, BC residency status, Aboriginal identity, and highest level of education completed)? 3) How do rural, regional, and urban applicants describe their extra-curricular activities, co-curricular activities, and employment experiences in their application documents? and finally 4) What, if anything, makes rural applicants' employment experiences and non-academic entries unique?

Given the documented disparities in rural students' participation in post-secondary education, as well as in medical school, I hypothesized that notable differences in the performance of rural and urban students existed across admissions measures. Additionally, I hypothesized that noticeable differences existed in the extra-curricular, co-curricular, and employment involvement of rural and urban students.

1.3 Dataset

I used secondary data for this study. UBC collected these data from individuals during the summer of 2014 as part of their medical school application for the 2014-2015 application cycle. The data included some demographic information and extensive

documentation of academic and non-academic merits and experiences. Of the 2322 applicants that applied UBC invited a subset of 655 individuals to be interviewed in early 2015 using the processes outlined below. Additional data were available for 647 of these applicants; the medical program excluded 8 of the 655 from consideration for a variety of reasons. A more in-depth discussion of the dataset can be found in Chapter 3.

1.4 Study Context: UBC's Medical School and Admissions Process

1.4.1 UBC Medical School Structure

British Columbia (BC), the western most province of Canada, hosts only one medical school, that of the University of British Columbia. Although originally expanded to three areas, four regional campuses currently comprise the UBC Doctor of Medicine (MD) Program — the Island Medical Program (IMP) in Victoria, the Northern Medical Program (NMP) in Prince George, the Southern Medical Program (SMP) in Kelowna, and the Vancouver Fraser Medical Program (VFMP) in Vancouver. As indicated by their names, each program's site targets a specific area of the province and is bound through its social accountability mandate to the people of that area. Designed to increase medical education participation by students from outside the Vancouver Metropolitan Area, the regional nature of the UBC medical program engages students in academic experiences and with physician mentors in communities "closer to home." The distributed campuses operate on the belief that regional training opportunities will increase the likelihood that students will one day choose rural medical practice and that both Aboriginal and non-Aboriginal students from rural areas will be more likely to strive to continue their education if an educational institution targeted to them is

nearer to home (Crump, Barnett, & Frickler, 2004; University Presidents' Council of British Columbia, 2003). Three of the sites, the Northern Medical Program, the Southern Medical Program, and most recently, the Island Medical Program, specifically seek to admit rural students who are determined by a rurally focused subcommittee of the MD Admissions Selection Committee[2] to be potentially well suited to a career in rural medicine.

1.4.2 UBC Medical School Application Process

Applying to the UBC medical school is a long and complicated process. In the cycle under review, candidates began completing their applications in June 2014 and offers of admission were made in May 2015. By September 15, 2014, applicants had submitted their transcripts from all post-secondary institutions attended, provided their Medical College Admissions Test (MCAT) scores, answered several demographic questions, provided information regarding their academic history, described in detail their extracurricular and work experiences, explained their connection to rural locations (if applicable, as part of the process to determine if a candidate might be suitable for rural medical training and practice), produced a list of people to verify the truthfulness of their claims, and, in some cases, submitted documentation proving their BC residency. Eligibility was achieved if the candidate submitted all documentation by the stated deadlines, met the minimum GPA and MCAT standards, and demonstrated an ability to complete the prerequisite requirements. Of the 2,322 individuals who applied,

[2] Following the 2014-2015 application cycle, the UBC Faculty of Medicine made a series of governance changes that resulted in the renaming of the MD Admissions Selection Committee to the MD Admissions Selection Subcommittee. For consistency, I refer to this body as the MD Admissions Selection Committee.

2066 were deemed eligible and were ranked in December 2014 following an evaluation of each applicant's academic and non-academic merits. The top 655 (31.7%) were invited to be interviewed. Those invited for an interview also submitted supplemental applications, which consisted of three references (an academic reference, a community service reference, and a professional reference). Additionally, interviewed applicants submitted a form ranking the UBC medical education sites in order of preference from most desired to least desired.[3] In total, 650 applicants (99.2% of those invited) participated in a multiple mini-interview (MMI), a type of interview that relies on a series of short interactions between each candidate and several different assessors (Eva, Rosenfeld, Reiter, & Norman, 2004), in February 2015. The 11 station UBC MMI consisted of 10 "active" interview stations, during which assessors made judgments about the candidates' personal traits and competencies and one "rest" station, during which the candidates took a break. Following their interview, the applicants completed a 30-minute proctored writing assignment.

In March 2015, admissions personnel read each applicant's writing assignments and letters of reference as well as reviewed each applicant's file, an additional time, for completeness and to resolve outstanding issues such as concerns with activity verification or BC residency status. The Admissions Selection Committee met in April 2015 to determine whom to admit. All aspects of each candidate's file were considered, including their grades, academic achievements, extracurricular and co-curricular

[3]Applicants must submit a "site preference form" to indicate where they prefer attending UBC medical school. This preference does not determine admissibility (this is determined by a committee that does not consider site preference when making admissions decisions), but it does determine to which medical school campus an applicant who has been deemed suitable receives an offer of admission.

experiences, and employment activities. Following the committee's review, the most highly ranked individuals received offers of admission. The remaining admissible candidates were added to a waitlist. Those deemed less strong or unsuitable for the program were sent letters of refusal.

UBC's MD Undergraduate Program applies a broad-based or holistic admissions process that is designed to select the variety of students best suited for the program. Such admissions processes use tools beyond test scores and grades to select students. Common methods include qualitative assessments such as profile evaluations and portfolio assessments (Duda, 2015) that are intended to holistically reveal applicants' attributes and experiences in ways that value them as complete individuals, not simply as academic numbers (About holistic admissions, n.d.). The UBC medical program's broad-based admissions process seeks, through a structured profile assessment, to identify applicants with strong leadership skills, capacity to work with others, service ethic, a diversity of experience, and some degree of high performance in an area of human endeavour (Evaluation Criteria, nd). Assessors read applicants' descriptions of their extracurricular activities, work experience, research experience, and, if provided by the applicant, a short paragraph discussing any additional hardship. The assessors grade the characteristics against a rubric. In the past, the UBC MD Admissions Office also screened personal essays as part of the interview selection process. However, because of the prevalent use of writing services and the generic nature of the essays, the Admissions Selection Committee removed personal essays from the application process in 2011.

Assessors grade each applicant's non-academic qualities (NAQ) on a scale of 0 to 50 based on the five attributes described above.[4] Each attribute receives a specific number of points that contribute to an applicant's score. Once scores are entered by assessors into the UBC MD online application system, they are standardized to account for potential reviewer bias and the overall strength of the applicant pool. NAQ scores are added to an Academic Quotient (AQ)[5] (which also ranges from 0 to 50) and generates a "total file review score" out of 100 possible points. Applicants are ranked from first to last based on their total file review score. The higher the score, the better the ranking, and therefore the more likely the candidate is to be invited for an interview. The admissions office invites the top 80-90 "out of province" candidates and 550-560 British Columbia (BC) residents to participate in an interview (approximately 650 applicants in all).[6]

Over the past five years, the number of applications to the UBC medical program increased dramatically. In 2009, 1793 applicants applied for 256 positions (7.0 applicants for every space). In 2014, 2322 applicants applied for 288 positions (8.1

[4] Leadership, service ethic, capacity to work with others, diversity of experience, and high performance in an area of human endeavour.

[5] A computer program generates an Academic Quotient (AQ) by converting each applicant's grades, from every course taken at a university level (including college transfer courses) to a standard scale of 100 and then uses a confidential formula to convert that grade into a number out of 50.

[6] Because the UBC medical program is provincially funded with the design to train and produce doctors for the province, priority is given to BC residents. In the 2014-2015 application cycle, BC residency was determined by whether an applicant held a valid BC Services Card, which indicates enrolment in the BC health insurance plan. The eligibility criteria for BC health insurance includes being a citizen of Canada or lawfully admitted to Canada for permanent residence, having a home in BC, and being physically present in BC for at least six months in a calendar year. Under special conditions other individuals who hold valid work, study or other permits may be allowed to enroll in the plan, however, these individuals are not allowed to apply to the UBC Medical Program. Permanent Residency and citizenship status documents are verified for all applicants being considered for program enrolment.

applicants for every space).[7] Even with the expanded number of positions, the acceptance rate dropped from 14% to 12%. UBC medical school admissions committees and administrators are increasingly interested in the impact this competitive environment is having on the type of students admitted to the program.

1.5 Personal Background of the Author

Hired originally as an Admissions Coordinator for the UBC MD Admissions Office, over the last eight years my role steadily progressed, and I am now the department manager. Throughout my tenure, I have heard many rumours about rural applicants and their performance on admissions tools. These, much like the conjectures previously mentioned, include comments about their inability to perform on the MCAT, their inability to achieve high grades in university due to their need to work, their lack of awareness about the admissions process, and their underperformance in the MMI. Although some researchers have looked at these claims at other Canadian medical schools, none has yet reviewed the UBC medical school selection process or determined whether these claims have any merit.

From my experience performing non-academic evaluations, it seems that rural applicants more commonly write less and share different non-academic activity and employment experiences than do urban applicants. This seems to lend credence to some of the concerns listed above. However, my perception has never been

[7] The program expanded from 256 to 288 positions in 2011.

substantiated and without a thorough and comprehensive analysis I think it unwise to engage in too much conjecture.

Additionally, due to my involvement in providing information to our Admissions Selection and Policy Committees, I am curious about the perception that rural applicants are less competitive in the admissions process than non-rural applicants. In 2012, in collaboration with the Faculty of Medicine's Evaluation Studies Unit, I examined the relationship between a candidate's rural remote suitability score (RRSS)[8] and her/his performance on the multiple-mini-interview. In 10 years of data, we found no statistically significant relationship between the two. Because the RRSS is primarily calculated from where an applicant has lived, this finding raises questions about the relationship of rural upbringing and performance in the UBC medical school interview process. Through my research, I hope to shed light on which concerns and rumours are supported by data and which need more examination.

1.6 Structure and Organization of Thesis

This thesis is structured into five main chapters. In this first chapter, I have introduced the topic of rural students' access to higher education and its relationship to medical school admission. After discussing my research questions, I outlined the context of my study, including an overview of the UBC medical school selection process and my relationship to the UBC medical school. The second chapter explores the current literature as it relates to and informs my questions. It includes definitions of

[8] The Rural and Remote Suitability Scoring System in an internally designed tool used to help assess a candidate's suitability for living and practising medicine in a rural and northern community.

rurality in the Canadian context, known issues facing rural students in accessing post-secondary education and how rural students have been described in the medical education literature. This chapter concludes with a discussion of the theoretical lens through which I analyzed my data. In Chapter 3 I discuss my research design and provide more refined definitions of the variables analyzed. In Chapter 4, I present my results, including grouped applicant demographic information, the predictive power of rurality and other demographic variables, and applicants' non-academic experiences. In my final chapter, I discuss the implications and limitations of this research along with ideas for future studies.

Chapter 2: Literature Review

My area of interest lies at the intersection of research related to the societal and institutional factors that affect participation in higher education (often referred to as educational access), research related to student decision making regarding post-secondary education, research related to medical school admission and enrolment, and research related to extra- or co-curricular accessibility and involvement. Where these broad bodies of knowledge intersect is in how they affect prospective rural students. This review of the literature therefore focuses on the areas specifically addressing rural students' differences and disadvantages in university attainment, and where possible, in university admission. Additionally, I dedicate a section of this review to a discussion of extra- or co-curricular involvement, particularly as it relates to access and how this may affect rural students. This review continues with an examination of what is known about how rural students engage with medical school admissions processes and concludes with an exploration of the theoretical underpinnings of this study.

2.1 Defining "Rural" in the Canadian Context

Depending on the goal of a study, the information available, and the analyst's approach, there are many differing definitions of "rural" in Canadian literature. Statistics Canada alone identifies six definitions of geographic rurality that consider and emphasize various traits and characteristics of "rural" areas (du Plessis, Beshiri, Bollman, & Clemenson, 2002). Thus, challenges arise when comparing rural cohorts in various studies, particularly across disciplines, because these studies are not always

about precisely the same things, or even the same people. For example, depending on the definition used, between 22% and 38% of Canada's population is considered "rural" (du Plessis et al., 2002, p. 9). As du Plessis and colleagues noted, "The difference between the share of Canada's population that is 'rural' according to the RST [Rural and Small Town] definition and that of the OECD's [Organization for Economic Cooperation and Development] 'rural communities' is a difference of 16 percentage points or 4.6 million people" (p. 18). This can be problematic when an institution or agency attempts to determine service requirements, or creates policies or practices based on 'rural' population needs. While du Plessis et al. write, "We strongly suggest that the appropriate definition should be determined by the question being addressed" (p. 1), they go on to say,

> If we were to recommend one definition as a starting-point or benchmark for understanding Canada's rural population, it would be the "rural and small town" definition. This is the population living in towns and municipalities outside the commuting zone of larger urban centres (i.e. outside the commuting zone of centres with population of 10,000 or more). (p. 1)

The report on rural definitions from Statistics Canada serves three useful purposes. It 1) informs analysts of the factors that matter when deciding how to measure rurality, 2) cautions readers to pay attention to the definition of rural used in coding any set of data to understand that two studies comparing the "same group" (rural people) may be measuring information about two entirely different groups of

people, and 3) provides a common definition of rural that is useful when comparing a cohort of rural people to a broadly used and now largely adopted standard.

Most Canadian medical admissions studies published after 2002 use the rural and small town definition to categorize applicants as rural or non-rural (Hensel, Shandling, & Redelmeier, 2007; Hutten-Czapski, Pitblado, & Rourke, 2005; Wright & Woloschuk, 2008). However, this definition of "rural" is problematic in that it does not always provide an accurate picture of the life-style or lack of access to health care, amenities, or higher education that many of the towns and communities that fall into or above this population level face. Indeed, in 2009, the scientific editor of the *Canadian Journal of Rural Medicine* wrote an editorial about the limitations of the rural and small town definition and its inadequacy in determining medical human resource needs or identifying how doctors practice medicine. He argued that defining certain towns – such as Williams Lake, BC with its approximate 19,000 residents – as "non-rural" results in their health care and other needs being underrepresented (Hutten-Czapski, 2009). This occurs because family physicians and specialists in such towns must practice medicine fundamentally differently than physicians and specialists in urban centres with large tertiary hospitals. Doctors in low health-resource areas must possess a wider array of skills than doctors in urban centres. In cities, doctors can rely on a greater range of specialists to care for the variety of concerns patients experience (Hutten-Czapski, 2009).

Despite concerns with the rural and small town definition, to align with other studies in my field, I too categorized applicants in this manner. The rural and small

town definition is formulaic and easily reproducible and, as previously mentioned, has been widely used in the field of medical education. Because my study is an exploratory study, I wanted to ensure that other researchers could easily replicate my research methods. Additionally, I wanted my findings to speak to previous medical education research, therefore enhancing the comparability of my findings.

Definitions of rural are important in Canadian medical school admissions because school policies, programs, and often funding are based on initiatives designed to ensure that provincial and federal health human resource needs are met by the medical students admitted in any given year. The idea behind this position is two-fold: 1) the physician workforce should reflect the population it serves (Association of Faculties of Medicine of Canada, 2010) and 2) those who are raised in a specific community or environment are most likely to return to serve people of that community or environment (Collier, 2010; Crump, Barnett, & Frickler, 2004). While this latter position has been debated by some (Pearson, 2009; Pearson & Andres, 2010), the return rate of rural individuals to rural areas, although not overwhelming, indicates that rurally raised people are more likely than urbanites to practise medicine in these areas following completion of their medical residency. As Rourke, Incitti, Rourke, and Kennard (2005) found, rural physicians were 2.4 times more likely to have grown up in a rural community than in communities of a greater size. Therefore, for the UBC medical program, one of the solutions to addressing the rural physician shortage has led to improving ways to recruit and select students from particularly underserviced areas, especially those in Northern British Columbia.

2.2 Rural Students' Access to Higher Education

Research in Canada consistently shows that rural students are less likely to participate in post-secondary education than are urban students (Andres & Looker, 2001; Canadian Council on Learning, 2009; Frenette, 2003; Looker, 2009). Yet, studies examining rural and non-rural students' differences are limited in scope in that they often observe only one subset of the population (Andres & Looker, 2001; Looker, 2009; Smith, Beaulieu, & Seraphine, 1995), exclude the Canadian Territories in their analyses (Frenette, 2003; Looker, 2009), and use definitions of rural that may not account for proximity to metropolitan areas (Dhalla et al., 2002; Kwong et al., 2005; Looker, 2009). These issues limit the comparability of the studies. Furthermore, not accounting for metropolitan influence when subdividing population groups causes researchers to categorize some people living in small communities influenced by suburban and urban areas as rural. The significance of any of these issues depends on the study and the sample size. Yet, because these problems limit so many studies conducted by notable rural researchers, the complexity of fully accounting for rurality in any set of data is clear.

As with the rest of Canada, rural youth in British Columbia attain distinguishably less education than do their non-rural peers. In 2011, BC Statistics shared that nearly 37% of 18-year-olds residing in the Northern Health Authority did not graduate from high school.[9] In addition, of the Northern residents between the ages of 25 and 54,

[9] The Northern Health Authority covers an area spanning 592,115 square kilometers and, according to the 2006 Canadian Census, has an overall population density of 0.4 persons per square kilometer. In BC, the second least dense population area is in the Interior Health Authority with 2.9 persons per square

49.8% did not have post-secondary credentials. These statistics are considerably higher than the BC average, and are significant when compared with the more densely populated Vancouver Coastal area, where only 28.3% of 18-year-olds did not graduate from high school and 28.7% of adults did not have post-secondary credentials (Kashaninia, 2011).

An element contributing to the disparity in educational attainment between Northern BC and the Vancouver Coastal Area is that Aboriginal people account for 17.5% of the population in Northern BC, compared with only 2.4% in the Vancouver Coastal Area (BC Statistics, 2006). Tragically, Aboriginal people experience a complex history of colonization and are consequently one of the poorest, least educated, and most physically unhealthy populations in Canada (Loppie Reading & Wien, 2009). In Northern British Columbia, 35% of Aboriginal residents between the ages of 25 and 64 have post-secondary credentials, while the rate for the whole region is approximately 50% (BC Statistics, 2006). Aboriginal people experience many of the greatest challenges in reaching, participating in, and completing post-secondary education (Andres, 2015). Yet, there is reason to be optimistic about the future of Aboriginal people in the Canadian educational system as many post-secondary institutions are beginning to create services, resources, and educational pathways tailored to the needs of Aboriginal students. But, as Andres (2015) argues, the key to improving Aboriginal student participation in post-secondary education is to radically increase their high school

kilometer (Kashaninia, 2011). Although living in the Northern Health Authority does not mean that someone is defined as living in a rural location, it is generally understood that most of the population has extremely limited access to vital health services.

graduation rate (p. 30) as opposed to these other strategies that can only help once this considerable hurdle is overcome.

While there are many theories as to why rural residents generally have less education than non-rural residents, one theory posits that educated people flock to cities, leaving rural areas devoid of knowledge workers. In 2005, Andres and Licker explored this premise by reviewing the migration patterns of BC high school students from the class of 1988 over the course of 10 years. They found that a noticeable "brain drain" from rural areas did in fact exist. Yet, they found that it also tended to be more gender based than formerly believed. Educated young men from rural areas tended to leave their home communities for the cities, especially if they were from the northern areas of the province, while educated young women gravitated towards all areas of the province. Although this study consisted of only one cohort of students, it raises many questions about the complex relationship between location, educational attainment, and the likelihood of educated rural individuals returning to their home communities.

Recent data suggest that the articulated college system[10] and the expansion of university colleges to teaching intensive universities in BC have drawn more students into degree granting programs (Andres & Offerhaus, 2012; Heslop, 2012). Heslop (2012) observed that even in areas of British Columbia where students were unlikely to enroll immediately in post-secondary education (such as in the Rockies, Okanagan, and

[10] Articulation enables distinct educational institutions to act like an educational system. It enables students to attend courses and receive credit in one institution, then transfer those credits to a new institution so that they do not have to begin their education again. The articulated system functions best when course equivalencies are able to be determined. (BCCAT, n.d)

Northern Lights catchment areas) following completion of their secondary school education, over a nine-year period, more than 64% of those same students eventually enrolled in post-secondary studies (p. 4). These findings indicate that students from rural and remote areas of BC are likely to be older when they obtain their post-secondary credentials. Additionally, both studies show that those who enter education at a later age are more likely to attend BC colleges or teaching-intensive universities, rather than research-intensive universities (Andres & Offerhaus, 2012; Heslop, 2012).

2.3 Factors Affecting Rural Students' Post-Secondary Participation

The following characteristics are negatively associated with rural students' university attendance: low socio-economic status (Looker, 2009; Tucker, 2010), parents without post-secondary education (Andres & Looker, 2001; Looker, 2009; Smith, Beaulieu, & Seraphine, 1995; Tucker, 2010), low educational expectations (Andres, 1992; Andres & Looker, 2001; Hu, 2003; Looker, 2009; Tucker, 2010), lack of participation in preparative secondary school courses (Andres, 1992), lack of senior level high school science and math course offerings (Nielsen, 2009), lack of community and family supports (Andres, 1992; Looker, 2009; Smith, Beaulieu, & Seraphine, 1995; Tucker 2010), and distance from institutions of higher education (Andres & Looker, 2001; Hu, 2003; Looker, 2009; Tucker, 2010). Conversely, community and social encouragement, guidance counsellors that promote and support university attendance, and parental expectations all increase the likelihood that rural students will attend institutions of higher education (Andres, 1992; Smith, Beaulieu, & Seraphine, 1995; Tucker, 2010). Studies reviewing these connections generally include objectives to

understand rural students' perspectives of post-secondary education as well as the environmental factors that contribute to or detract from their likelihood of attendance. These studies most commonly link survey data with educational outcomes.

Unlike the studies described above, Beasley's (2011) ethnographic study of rural students in a high poverty county in southern West Virginia explored students' experiences with making decisions about life, college, university, careers, and goals. Her work supports the claim that family and community influences are integral to rural students' post-secondary attendance. She writes, "Leaving, returning, or staying is a decision that is made more difficult for rural students given the strong attachment to family, place, and community, yet the lack of economic opportunity in the rural area weighs heavily in the decision as well" (Beasley, 2011, p. 261). Her findings provide critical insight into the struggles rural students face. They demonstrate the nuances rural students consider when deciding to attend university — such as the possibility that they may never return to their home, to their families, to their lives, or their community. Given that selection for medical programs in Canada occurs after students have attended several years of post-secondary education, the rural students in my study have likely needed to demonstrate a certain level of courage, independence, commitment, tenacity, and maturity to be prepared to leave their hometowns.

While seemingly unrelated, Beasley (2011) also found that greater levels of involvement in school and extracurricular activities positively contributed to student attendance of college or university — which means that it is likely the rural students who apply for medical school will have had some type of high school and, quite

possibly, university extra- or co-curricular involvement. What remains to be seen is whether Beasley's findings are relevant to people from other rural communities, particularly rural Canadian communities.

One Canadian study that may provide insight into this connection is Lesley Andres' 1992 dissertation about BC high school students' post-secondary decision making. While this dissertation did not focus solely on rural students, it did focus extensively on the factors that contributed to a high school student's future education choices. Much like Beasley, Andres found that a student's own expectations for their future, as well as their parents' expectations, could predict their educational choices. Additionally, these choices persisted despite the knowledge held by all students, even those who did not plan to enroll in additional education, that post-secondary attendance would help their future career options. She writes,

> Those planning to continue to post-secondary education, by doing what the game [the social game constructed by the higher education system] required, were indeed good players. Curricular choices made and grade point averages earned led to the next step in life, a step that had been envisioned for years and one that opened the way to the future. . . .
>
> Those who lacked a 'feel' for the post-secondary game were left not knowing how to play or even that they had a place in the game. Yet, they appeared well aware of the consequences. They held few pretenses about the life that awaited them. Limited job opportunities, monotonous work, and bleak futures were anticipated. (Andres, 1992, p. 311)

Although these statements are not explicitly about rural individuals, Andres' sample included a representative cohort across geographic regions. Additionally, as the sentiments about post-secondary education did not vary by region, the voices of rural students are captured in these statements. As such, her findings raise additional questions about the types of students one will see in the medical school selection process. Rural students applying for admission to medical school have already navigated the post-secondary admissions game and have previously demonstrated the ability to achieve the grades and take the courses needed for entrance. Therefore, rural students applying for medical school may be more similar, relative to urban students, than is currently believed.

2.4 Access to Extracurricular Activities and Participation of Rural Students

Researchers interested in adolescents' extracurricular activities have examined the relationship between wealth and extracurricular participation (Covay & Carbonaro, 2010), as well as the replication of participation across generations (Ashbourne, 2013; Ashbourne & Andres, 2015). As one would expect, socioeconomic status is positively correlated with adolescents' extracurricular participation, even though Covay and Carbonaro (2010) found that a surprising 60% of children in the lowest socioeconomic quartile participated in some formal extracurricular activity. Additionally, Covay and Carbonaro (2010) discovered that parental education is positively associated with the participation of children in structured extracurricular activities — in their study, less than 50% of children whose parents had less than a high school diploma participated in

structured extracurricular activities, whereas 95% of children who had parents with a master's degree or higher participated.

Similarly, Ashbourne (2013) found that while parents generally see the value in extracurricular enrolment for their children, the strongest predictor of whether a child enrolled in activities was whether the parent had participated in any extracurricular experiences in high school. She wrote, "If a parent did not have the opportunity to participate in certain types of ECAs [extracurricular activities] my findings suggest that this may decrease the odds of their children participating in certain types of ECAs" (p. 115). Because rural youth generally have parents who are not as wealthy, not as educated, and live at a greater distance from organized resources compared with non-rural youth, it is possible that their extracurricular experiences differ from those of urban youth, although no direct evidence presently supports this claim. Such factors underlie the concerns expressed by many rural advocates.

2.5 Rural Medical School Applicants and Admission

Rural students' post-secondary non-attendance affects professional programs, such as medicine, because the proportion of rural people who apply and are admitted to these programs represent only a fraction of Canadians living in rural areas. According to an often cited study, Dhalla et al. (2002) identified only 10.8% of Canadian medical students as rural whereas 22.4% of Canadians lived in rural areas.[11] However, Dhalla et

[11] In this study, "rural" was defined with the Canada Post definition of rural. The authors defined a student's rurality based on the first three digits of their postal code at the time of high school graduation (Dhalla et al., 2002).

al. wrote prior to the expansion of many Canadian medical schools as well as before the implementation of programs such as the Northern Ontario School of Medicine and the University of British Columbia's Northern Medical Program — two programs specifically designed to recruit and select medical students from rural areas (Northern Medical Program, 2014; Northern Ontario School of Medicine, 2014). While this calls into question the relationship between their study and the current context, several more recent studies of rural students' enrolment and representation in medical school classes found similar issues (Hensel, Shandling, & Redelmeier, 2007; Hutten-Czapski, Pitblado, & Rourke, 2005; Wright & Woloschuk, 2008). Interestingly, none of these studies reviewed information about rural students admitted through recruitment and selection initiatives specifically designed for them. As such, they did not discuss whether these measures resulted in increased medical school participation for rural students (as one would expect).

Other literature about rural-urban medical school applicants generally addresses these issues: the prediction of which medical students will choose to practice in rural areas and whether rural students are disadvantaged in the medical school admissions process. Key findings with respect to the former, include the following: rural students are more likely than urban students to become practising physicians in rural areas (Avery et al., 2012; Hyer et al., 2007; Owen, Conaway, Bailey, & Hayden, 2007; Rourke, Incitti, Rourke, & Kennard, 2005; Royston, Mathieson, Leafman, & Ojan, 2012) and that rural medical students are significantly more likely to choose to specialize in family medicine than are non-rural students, no matter where they end up practising (Avery et al., 2012; Hyer et al., 2007).

Studies of rural students' competitiveness in medical school admissions generally consist of comparing rural and non-rural applicants' grade point averages, test scores, and interview scores (e.g., Hensel, Shandling, & Redelmeier, 2007; Wright & Woloschuk, 2008). Overall, these studies found that rural students are not disadvantaged in medical school admissions processes. Instead, they are equally as likely as applicants from other backgrounds to be admitted (Hensel, Shandling, & Redelmeier, 2007; Wright & Woloschuk, 2008). Yet, medical school applicants are disproportionately urban and therefore medical classes do not reflect the population each province serves. While these two statements seem to contradict one another, both are true. To clarify, if only 11% of applicants applying to medical schools are from rural areas (as Dhalla et al. (2002) found) and 11% of admitted medical students are from rural areas, then the tools used for medical student selection facilitated proportionate admission of rural applicants. However, for the medical school population to fully reflect the population of Canada, 22.4% of medical school applicants must be from rural areas and 22.4% of medical school classes (across institutions) must consist of rural students; recent evidence suggests this is still not the case (Hutten-Czapski, Pitblado, & Rourke, 2005; Wright & Woloschuk, 2008). Both studies assume that rural and non-rural applicants are similar and that if selection tools enable proportionate representation of these applicants in the medical class, then the selection tools are unbiased predictors of applicant performance.

The findings of Hensel, Shandling, and Redelmeier (2007) and Wright and Woloschuk (2008) are controversial. The Society of Rural Physicians of Canada believes that disadvantage pervades medical school admissions processes because rural

students are not able to access similar opportunities in high school relative to their urban peers:

> Many rural high schools can provide neither the breadth or depth of academic programs or enrichment activities that are available to urban high school students . . . this is not only a direct educational disadvantage, but can also be a disadvantage when a rural student's CV is comparatively assessed without rural appreciation. (Rourke, 2005, p. 6)

This comment underpins the perception that activities and employment experiences available in urban centres count in current selection processes more than those available in rural settings. Even if true (which remains to be seen) this may not actually be an issue in medical school admissions because applicants apply to medical programs after several years of undergraduate education. It is plausible that because rural students must attend university to be eligible for medical programs, they are able to access the same opportunities as their non-rural peers. Yet, given that the literature underscores the familial nature of structured activity involvement (Ashbourne, 2013; Ashbourne & Andres, 2015), and that rural students are more likely to participate in articulated post-secondary education (Heslop, 2012), there may still be truth to Rourke's concern.

Demographic comparisons of rural and non-rural medical school applicants are limited. However, a 1981 American study found that although non-urban applicants were more likely to be of a majority racial background (i.e., "white") and have parents with less education than urban students' parents have, they demonstrated similar

"academic, biographical, and psychosocial characteristics" to those of urban applicants (Willoughby, Arnold, & Calkins, 1981, p. 719). A more recent Canadian study found that rural students were more likely to be slightly older, have lower household incomes, have parents with less education, and have more financial debt upon entrance into medical school than urban students (Kwong et al., 2005). These findings correspond with similar broader population data and serve to once again emphasize the unique barriers rural students must overcome to reach medical school.

2.6 Theoretical Framework

Taken together, the generational and other factors that seem to influence the composition of medical school classes suggest that the work of French philosopher Pierre Bourdieu can help us to understand the complexities inherent in developing a medical workforce that is representative of the population. His social reproduction theory involves the concept that social systems are passed from generation to generation based on cultural, social and economic capital. Bourdieu posits that individuals wield these forms of capital throughout their lives to maintain or improve their social condition. Bourdieu's theory supports the notion that dominant classes, advertently and inadvertently, attempt to reproduce themselves through various social constructions, one of which in modern society is the field of higher education and, by default, post-secondary student selection practices.

Within Bourdieu's (1990) theory is the concept of habitus—an idea that values and social structures are constructed and adopted by members of a society and are subconsciously perpetuated by them. Bourdieu (1977/2013) writes,

> Every established order tends to produce (to very different degrees and with very different means) the naturalization of its own arbitrariness. Of all the mechanisms tending to produce this effect, the most important and the best concealed is undoubtedly the dialectic of the objective chances and the agents' aspirations, out of which arises the *sense of limits,* commonly called the *sense of reality* (p. 164)

This is to say, that the societies and class systems that best reproduce themselves have members who feel as though they belong in their congenital role. Their self-concept aligns with the rules given by society and they participate in both carrying out these rules and passing them on to the next generation. Bourdieu argues that this is true for all people, regardless of class at birth. The way one speaks, what one values, how one behaves, one's view of one's self and the world, all depend on where and how one is raised.

In his 1977/2013 work *Outline of a Theory of Practice,* Bourdieu demonstrates how members of a society unknowingly adopt and conform to their predestined roles, by describing the nature or habitus of individuals living in an Algerian agrarian community. In this community, women kept the home, performing tasks such as cooking and weaving, and did not engage in community leadership activities. Conversely, men performed tasks involving manual labour, such as farming and road building, and acted as community leaders and decision makers (pp. 159-160). While neither the women nor the men may have loved their dictated role (though presumably some did), they conformed based on a strong commitment to community and

acceptance of their place in society at birth (Bourdieu, 1977/2013). Bourdieu calls these self-concepts "arbitrary" because individuals do not choose the family or society in which they are born. Therefore, the pressures, rules, and values that apply to any one individual are not inherent, but socially constructed.

Modern researchers have adopted Bourdieu's theory to describe how education reproduces dominant social structures. In fact, as Nash (1990) writes, "In modern societies the school has become the most important agency for the reproduction of almost all social classes" (p. 432). For post-secondary selection processes, Bourdieu's theory supports the view that meritocratic selection practices covertly reproduce dominant social structures because they are designed to maintain the class and power of those in positions of authority (Andres, 1994). In fact, in the 1990 edition of his work, *Reproduction in Education, Society and Culture,* Bourdieu himself writes,

> In societies which claim to recognize individuals only as equals in right, the educational system and its modern nobility only contribute to disguise, and thus legitimize, in a more subtle way the arbitrariness of the distribution of powers and privileges which perpetuates itself through the socially uneven allocation of school titles and degrees. (Bourdieu & Passeron, 1990, p. x)

Throughout his various works, Bourdieu attacks the notion that individuals achieve certain social status through their own merit. Instead, he suggests that systemic inequality pervades the social hierarchy, even in societies purporting the idea of social mobility and equality (Bourdieu & Passeron, 1990, p. xi). For example, in *The Inheritors*

Bourdieu and Passeron (1979) outline evidence that educational systems exacerbate social and economic disparity. They write,

> Even if there were no other evidence and if we knew nothing of the numerous and often very indirect ways in which the school system steadily eliminates children originating from the least privileged backgrounds, proof of the magnitude of the cultural obstacles which these children have to overcome could be found in the fact that even at the level of higher education, one still finds differences in attitude and ability that are significantly related to social origin, although the students whom they differentiate have all undergone fifteen or twenty years of the standardizing influence of schooling. (Bourdieu & Passeron, p. 8)

In addition to habitus, Bourdieu's theory contains the concepts of culture and field. As Andres (1992) describes, culture can be defined as the "dispositions, behaviour, habits, good taste, savoir faire, and attitudes" (p. 76) that individuals express. Much like habitus, Bourdieu argues that individual preferences, which we often describe as "tastes," that are so often believed to be "inherent" are largely dictated by the communities in which we are raised and the means of our parents to educate and enculturate us in them. In his 1984 work, *Distinction*, Bourdieu explains the hereditary and arbitrary nature of culture by using the following example,

> Differences linked in social origin are no doubt most marked in personal production of visual art or the playing of a musical instrument, aptitudes which, both in their acquisition and performance, presuppose not only dispositions associated with long establishment in the world of art and culture but also economic means (especially in the case of piano playing) and spare time. (Bourdieu, 1984/2010, p. 68)

While we might suppose that some children are more naturally interested in learning to play the piano, and certainly this may be true between children from similar social backgrounds, Bourdieu argues that when one considers the broader picture, the child most likely to play the piano is the child from a family where this musical instrument is valued, whose parents can afford to own this expensive instrument, who has time to practise, and whose parents can pay for the cost of lessons. Moreover, Bourdieu argues that societal institutions, including educational institutions, privilege and encourage dominant cultural knowledge and practices. Therefore, individuals who are raised to adopt dominant cultural knowledge receive rewards and are advantaged by society, including by educational institutions.

The final component of Bourdieu's theory is the idea of the "field." A field is a theoretical arena in which the "game of life" is played. Fields can be large, like the field of international post-secondary education, or they can be small, like the University of British Columbia's Faculty of Medicine. Even small fields can often be subdivided into even smaller fields, like the field of the UBC MD Undergraduate Program, or the field of

the UBC MD admissions process.[12] Fields are not mutually exclusive. One can simultaneously hold a position in many fields and an individual's position in a field may vary based on the forces or rules of play exerted or demanded by that field (Bourdieu, 1984/2010). For example, one might be an undergraduate student navigating an educational field in one program at one institution while simultaneously acting in a much broader "economic field" as an individual attempting to be hired for a part-time job. Bourdieu argues that the power and ability for an individual to navigate a certain field is dependent on her or his culture and habitus.

All told, Bourdieu describes the relationship between habitus, capital, and field in the following formula: [(habitus) (capital)] + field = practice (Bourdieu, 1984/2010, p. 95). This means that the ability for an individual to achieve an outcome (like being admitted to medical school) is dependent upon how their "nature" interacts with the forms of capital they possess and is contingent upon how and what forces are exerted by the field on which they are playing. Advocates for rural students believe that rural individuals do not, due to the location of their upbringing, possess the same social or cultural capital as individuals raised in urban areas. Moreover, they believe that the field of medical school admissions is fundamentally biased against rural individuals as they presume that this field is meant to perpetuate the norms of urban, upper-middle class, white, males as they have dominated the field of medicine in Canada over the last

[12] In *Distinction* Bourdieu demonstrates the depth of the term "field" by discussing the differences in categories of words like drinks, which can be their own field, or can be subdivided into smaller categories of "mineral waters, wines and aperitifs" (Bourdieu, 2010/1984, p. 223).

century. They advocate for changing the field in order to graduate medical students who reflect the populations they will serve.

In addition to concerns with the field of medical school admissions, advocates articulate the fear that rural individuals are less refined and maintain different values than those of urbanites. This implies that their habitus will not correspond with the habitus necessary to perform in such a competitive system.

What remains unknown is the impact previous post-secondary education has had on rural medical school candidates. Given that several years of post-secondary education is a requirement for medical school, rural candidates will already have had to navigate geographic and other barriers to achieve this milestone. This indicates that their cultural and social capital is sufficient to make this leap. Yet, medical school selection is a different field than either undergraduate post-secondary selection or participation. Many would argue that it is a more competitive field in that there are fewer positions per applicant nationally than in many other degree programs. It is therefore plausible that individuals need different social and cultural capital to navigate it. As such, the capital rural candidates used to participate in undergraduate education may not be entirely applicable to that needed to perform in the highly competitive medical school selection field. I explore these questions and assumptions through the analysis of my data.

2.7 Gaps in the Literature

As mentioned in Chapter 1, advocates argue that rural applicants are, by their very nature, disadvantaged in the medical school selection process. Through this review of the literature I explored some of the reasons these assumptions exist, as well as how they may appear in the medical school application process. Additionally, I reviewed the ways in which other researchers with similar interests have attempted to explore these assumptions. In conducting this exercise, I identified several gaps in the literature.

Primarily, previous medical school studies reviewed the correlation between applicant upbringing (usually by the categorization of high school experiences into location classifications) and these applicants' performance on various admissions measures. These studies, while compelling, did not address advocates' concerns about rural applicant differences. They instead, emphasized the success or failure of the selection tools, postulating that if a tool facilitated proportionate rural student admission then it acted as an unbiased measure of performance. The gap in knowledge therefore lies less in whether the tools facilitate admission (though, certainly this remains important as tools can be constructed differently or be used in different ways at different institutions), but more the extent to which admissions selection measures capture the nature and capability of rural applicants. To this end, no studies, to my knowledge, have attempted to explore actual content of admissions documents, to better understand how rural applicants present themselves.

Secondly, other Canadian studies have focused on the selection practices of institutions in provinces other than British Columbia. Contrasting the results from this

study with others can provide more insight into the broader Canadian context. And, as a study occurring several years after the expansion of many medical schools to include seats targeted to rural, Aboriginal, and other underrepresented students, it can provide a better barometer about the current state of medical student selection.

Chapter 3: Research Design

My research questions, as outlined in Chapter 1, aimed to identify the ways in which rural medical school applicants are distinct from their non-rural peers. As previously stated, my research questions are 1) How do rural, regional (non-urban and non-rural), and urban applicants compare demographically with one another?2) Is rurality associated with admissions scores (grades, MCAT scores, scores about extracurricular experiences, and interview scores) and do any associations hold true when accounting for applicants' demographic factors (age, gender, BC residency status, Aboriginal identity, and highest level of education completed)? 3) How do rural, regional, and urban applicants describe their extracurricular activities, co-curricular activities, and employment experiences in their application documents? and 4) What, if anything, makes rural applicants' employment experiences and non-academic entries unique?

Given the nature of my research questions, I used multiple quantitative methods to conduct this study. Primarily, I focused on statistical data analysis. Also, I incorporated content analysis at critical junctures. In this chapter, I describe the context of my study, materials used, sample characteristics, and analyses conducted.

3. 1 Context

Because of the numerous suppositions about the disadvantages rural individuals face when competing in medical school selection processes, I needed to narrow the scope of my research to focus on those I could feasibly explore for a master's level

project. As such, I decided to develop my research questions to address concerns that could be answered by analyzing data from the UBC MD Admissions database.

Based on my research questions, I identified the following factors as important to my research: applicant's age, gender, highest level of education received at time of application, Aboriginal identity, BC residency status, location of high school, interview scores, non-academic evaluation score, overall GPA, MCAT score, non-academic activities entries, and employment history entries. I would have liked to consider each applicant's race/ethnicity and socioeconomic status as well, but the UBC application did not capture that information.

3.1.1 Ethical Considerations

During the design phase, because I wished to analyze a pre-existing data set for secondary purposes, my committee and I first considered the issue of consent. I did not have the opportunity to obtain explicit consent for my research from each applicant at the time they applied to the program. However, upon applying, all application forms contained the following statement: "UBC Faculty of Medicine is committed to continuous quality assurance with regard to its selection process. Research studies are conducted in order to evaluate and improve the admissions process; however, data collected for this purpose will not be used for admissions decision-making."

Although performing a "quality assurance" evaluation was only one motivation for this study, I applied the principle of protecting the integrity of the admissions decision-making process in all aspects of my work. I used data from the 2014-2015

application cohort because at the onset of this study, these applicants had most recently completed the admissions process. As such, my study could not impact selection committee members' judgment or change the final outcome for these applicants. Additionally, I took measures to protect the identity of individual applicants, including performing group analyses and highlighting only generic examples of common experiences to underscore my findings.

Because of the nature of my position in the MD Admissions Department, my judgment had the potential to be inadvertently biased when conducting extraction and anonymization of the data. As the manager of the MD Admissions Office, I can technically retrieve any piece of applicant information needed for this or other MD admissions studies. However, to create separation between me and the study data, a different staff member from my team gathered and anonymized the study data (removing applicants' names, email addresses, phone numbers, and any other identifiers which were all irrelevant to the study). The UBC Research Ethics Board approved these considerations and techniques on March 1, 2016 (certificate #H16-00302).

3.2 Materials

The UBC MD Admissions Database contains confidential applicant information. The current database holds information from the 2011-2012 application cycle onward.[13] Every admissions cycle, individuals aspiring to be admitted to the UBC

[13] The reason that the current database contains only this fraction of data is because it is the most recent online application system to be adopted by the MD Undergraduate Program and it stores only the

medical program enter personal, educational, research, extracurricular, and employment information into this database by way of an online form (also referred to as an application). Additionally, the database stores the suitability scores and assessments conducted about the applicants. These include the MCAT scores, non-academic activity scores, overall grade point average calculations, academic quotient, interview scores, and other similar data.[14] As such, I could choose a wide variety of demographic, academic, and non-academic variables to evaluate for my study.

3.2.1 Choosing a Variable to Identify Rurality

Given that the similarities and differences between rural and non-rural applicants is the focus of this research, the first and arguably most important variable I needed to select was the classification of candidates as rural or non-rural. As the primary concern of this study involves an individual's upbringing and its effect on their life-course, I decided that the location of the high school where each applicant graduated was the best determinant of upbringing that was systematically collected for all applicants. Other possible indicators of rurality included the applicant's address at time of application, their emergency contact's address, or parsing through their non-academic activity descriptions to determine the location where the majority of activities occurred.

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information it collected. Applicant data from previous years is retained in a variety of other secure locations within the Faculty of Medicine.

[14] For ease of understanding, a definition of each of the aforementioned scores is provided in the list of acronyms.

While using addresses at the time of application seemed appealing, given that most applicants to the UBC MD program are currently enrolled in some form of post-secondary education, it seemed reasonable to assume that many of the candidates who grew up in the most rural locations would no longer be living there as they would instead be living in an area with a post-secondary institution. As is widely known, most post-secondary institutions in Canada are in urban or semi-urban areas.

Similarly, using emergency contact information as an indicator of an applicant's background was also riddled with problems — it assumes that emergency contacts are parents, guardians, or spouses, and that those parents, guardians, or spouses currently live in the same location as the applicant lived during his/her youth. Given the mobility of parents, partners, and students, this assumption seemed illogical.

The final option, reviewing each candidate's non-academic activity descriptions for location indicators appeared too time consuming and riddled with potential inaccuracies—specifically the implausibility that applicants account for their entire lived experience in this section of the application. Additionally, if rural applicants wrote less or shared different experiences than urban applicants in their non-academic experiences, using these experiences as an additional evaluative factor might confound the analyses.

3.2.2 Defining Rurality within the Study Context

As mentioned in Chapter 2, the many definitions of rurality emphasize the complexity of this concept. Each definition highlights specific characteristics of an

area—whether that is economic integration, social systems, or geographic hierarchy. For this study, I explored several potential definitions, including the OECD definition, which identifies an area based on its population density per square kilometer (OECD, 2011), the classification Andres and Looker (2001) used, which accounts for an individual's access to university level courses, the Statistics Canada Rural Postal Code definition, which categorizes areas based on their mail service, and the Statistics Canada Rural and Small Towns definition, which considers population size and economic integration of a particular area (du Plessis, Beshiri, Bollman, & Clemenson, 2002).

Ultimately, I decided to use the Rural and Small Towns (RST) definition. While focused on labour market analysis, the RST is designed to account for community level issues. Also, it acts as a proxy for access to educational facilities, health resources, and shopping centres (du Plessis, Beshiri, Bollman, & Clemenson, 2002). Furthermore, using the RST definition facilitates comparison with other Canadian medical school studies; the most recent studies of rural applicants to medical school used it as well (e.g., Hensel, Shandling, & Redelmeier, 2007; Hutten-Czapski, Pitblado, & Rourke, 2005; Wright & Woloschuk, 2008). By contrast, the OECD definition would have defined a much greater percentage of applicants as rural compared with the RST definition, thereby losing the nuances that exist within the Canadian reality.[15]

[15] One could argue that, due to the size of the country and limited population size, most of Canada is rural or resource scarce (which the OECD definition would have indicated). Yet, that would not allow for a complex analysis of the different lived experiences of people within the country.

The Statistics Canada Rural and Small Towns definition states that a rural area is a "population outside the main commuting zone of larger urban centres (of 10,000 or more)" (du Plessis, Beshiri, Bollman, & Clemenson, 2002, p 8). More precisely, RST rural areas are those areas of less than 10,000 people that are not part of a Census Metropolitan Area (CMA) or Census Agglomeration (CA). Statistics Canada defines a Census Metropolitan Area as:

> a very large ***urban area*** (known as the ***urban core***) together with adjacent urban and rural areas (known as ***urban and rural fringes***) that have a high degree of social and economic integration with the urban core. A CMA has an urban core population of at least 100,000, based on the previous census. (Statistics Canada, 1999, p 183)

This means that while some areas may have a small or dispersed population, if Statistics Canada determines that this area interacts extensively with an adjacent urban area, it will not be considered rural. The same logic applies to Census Agglomerations, which are

> large ***urban area[s]*** (known as the ***urban core***) together with adjacent urban and rural areas (known as ***urban and rural fringes***) that have a high degree of social and economic integration with the urban core. A CA has an urban core population of at least 10,000, based on the previous census. (Statistics Canada, 1999, p 183)

As the definitions describe, the difference between a CMA and a CA is the base population size of the urban core. A CA has a significantly smaller core than a CMA.

Once I decided to use high school location as the determinant of rural upbringing, I coded these locations using the 2011 population and dwelling counts population centres table (Statistics Canada, 2012) and the 2011 Census profiles, which listed the communities that were part of each province's CAs and CMAs. Because applicants entered the location of their high schools themselves, several communities were not listed on the 2011 population and dwelling count table. For these locations, I searched for the high school and community on the internet and located the place that best fit the applicant's entry.

3.2.3 Demographic Variables

I used Bourdieu's Social Reproduction Theory as a guide when selecting which demographic variables to analyze. Given current conversations regarding diversity and inclusion in medical education (Cohen, 2003; Jones, 2016), I assumed that the dominant culture of medicine aligns with that of the upper-middle class white male. I therefore attempted to find variables in the MD Admissions Database that accounted for some of these factors and might help to identify whether they influence the admissions selection outcomes.

Unfortunately for this study, in the 2014-2015 application, applicants were not asked about their parents' education, occupation, or income, all of which have been linked to indicators of socioeconomic status (Gbric, Jones, & Case, 2015). Similarly, due to Human Rights legislation, the MD Admissions Application did not ask the majority of applicants to identify their race or ethnicity. The one notable exception to this rule is that applicants were asked if they would like to identify as an Aboriginal person for

both analysis and evaluation purposes. The UBC Faculty of Medicine has an admissions pathway program that seeks to attract and select Aboriginal students in a way that might better align with their world view. The only way to be eligible for this pathway is to be an Aboriginal person; hence, self-identification is a prerequisite to inclusion. Therefore, only Aboriginal identity could be accounted for when comparing the demographic makeup of the rural applicant sample. In addition, the 2014-2015 admissions application captured gender, and therefore I could use it as part of my analysis.

Despite these setbacks, I dug deeper into the perceived normative medical student characteristics. Doing so, I identified two other factors: the idea that medical schools prefer candidates with undergraduate degrees (despite UBC only requiring three years of undergraduate education) and that medical students are typically young[16] (Rourke, 2005). I therefore identified two other demographic variables I could use in my analysis: age and highest degree earned at the time of application. Additionally, because UBC is the only medical school in the province and the BC Provincial Government provides substantial taxpayer funds to the UBC medical program, the school gives priority consideration to candidates from BC. Therefore, I added BC residency status to my demographic variables, as I thought it could potentially influence some of the analyses.

[16] While Rourke (2005) does not explicitly indicate that age is of relevance in selection, he places great emphasis on the disparity of rural high school students' experiences compared with non-rural students'. This implies that high school experiences have more relevance in the medical school selection process than other experiences. Logically, this implies that applicants are likely young, as it would seem odd to place great significance on experiences that occurred many years before the time of application.

3.2.3.1 Gender Identity

All applicants entered the gender they most identified with into the 2014-2015 application. Although the academy increasingly accepts non-binary gender identity, which may or may not conform to the individual's identified sex at birth (Cayley, 2016), the 2014-2015 application contained only two gender choices (male or female). Therefore, I only analyzed the influence of these two identities.

3.2.3.2 Age

It is generally assumed that applicants to medical school are young, typically in their early 20s (Rourke, 2015). Based on recent statistics, this assumption seems correct, with the average age for entrance into the UBC medical school hovering around 24 years old in the three years prior to the entering class of 2015 (University of British Columbia, 2014). However, some evidence suggests that rural candidates attend post-secondary education at a different pace than do urban candidates (Heslop, 2012). Therefore, they may be slightly older than urbanites when applying for medical school.

The database contained applicants' birthdates instead of age. I therefore calculated each applicant's age based on the years of life lived by September 15, 2014 (the application deadline). I did not calculate partial years.

3.2.3.3 Aboriginal Identity

As discussed in Chapter 2, because of the well-known disparities in educational attainment and educational performance of Aboriginal youth, and the propensity for

rural areas to have a higher percentage of Aboriginal youth compared with urban areas, it was important to determine the extent to which identifying as an Aboriginal person could impact my findings. In the 2014-15 application cycle, candidates were asked whether they were an Aboriginal person, and if they wished to apply through the Aboriginal admissions selection stream (also known as the Aboriginal Admissions Pathway). Because the latter is simply a technical classification leading to an administrative process, and the former asks about identity, I used the former as the indicator of Aboriginal identity for this study.

3.2.3.4 BC Residency Status

As previously mentioned, the Province of British Columbia funds the UBC Medical Program with the intention of generating doctors who are going to provide medical care to British Columbians. Therefore, preference is given to individuals who can demonstrate their connection to the province. In this admission year, BC residency status was based on an applicant's BC medical services plan enrolment on the application deadline.

There were several instances whereby the Admissions Policy Committee waived an applicant's residency status. These included: 1) consideration for the Aboriginal Admissions Pathway, 2) consideration for the MD/PhD combined program, and 3) enrolment in the medical services plan of a Canadian Territory. Because the first two pathways make selection decisions throughout the application cycle, it is possible for someone to have had BC residency status at the beginning of the application cycle but to have lost that status prior to or after the interview. The data I retrieved for this study

were based on each applicant's final BC residency status at the completion of the application cycle.

3.2.3.5 Highest Degree Earned at the Time of Application

On the MD application form candidates were asked to describe their educational attainment through a series of questions. However, the only relevant statement was, "identify the highest level of education you have completed **currently**." The drop-down menu gave applicants the following choices: no degree, diploma, bachelor's degree, master's degree, PhD, or other. To code these variables into something more meaningful for this study, I combined applicants who had no degree (191 in total) with those who had earned a diploma (13 individuals) and created the category "less than undergraduate degree." Additionally, I combined the data from applicants who had completed master's degrees (268 candidates) with those who had completed PhD degrees (37 candidates) and created the category "graduate degree." All other bachelor's degrees and professional degrees I considered "undergraduate degrees." Finally, I reviewed all the educational information provided by applicants who had indicated "other" as their highest degree and categorized their education into the most appropriate of the three categories.[17]

[17] Only four applicants in the sample selected "other." Two of them had Pharmacy degrees, which I classified as undergraduate degrees. One indicated they had a science degree, which I classified as an undergraduate degree. The fourth individual had a chiropractic degree, which I classified as less than university, as most chiropractic degrees are not university transferable.

3.2.4 Admissions Variables

3.2.4.1 Overall Grade Point Average (OGPA)

Overall Grade Point Average, or OGPA, is a measure used to determine the academic capability of applicants. Many studies have demonstrated that a candidate's performance in previous schooling predicts their ability to perform in their next level of schooling (Burns & Garrett, 2015; Geiser & Santelices, 2007; Kreiter & Kreiter, 2007; Siu & Reiter, 2009). As such, GPA is considered to some extent in every medical school across Canada. However, courses taken at the post-secondary level can be graded on a variety of scales. These range from a series of numbers, to a series of letters, to percentages, to many things in between. Because of the variety of grading schemes, UBC, like many other institutions, converts all grades to a standard scale (see Appendix 1). As an institution, UBC uses primarily percentages to grade a student's course work; therefore, the MD Admissions Office does the same. At UBC grades can range from 0-100, though students need at least 50% to pass most undergraduate courses. Because of this, and the highly competitive nature of medical school admission, grades less than 50% rarely occur on applicants' transcripts.

3.2.4.2 Medical College Admissions Test (MCAT)

The Medical College Admissions Test (MCAT) is an exam created and evaluated by the Association of American Medical Colleges (AAMC). Most medical schools in North America use it as an indicator of a candidate's preparedness for medical school. As applicants can attend any number of post-secondary schools, and not all schools teach,

grade, or examine academic content in the same manner, this tool is viewed as a standardized mechanism by which to compare their academic potential (Donnon, Paolucci, & Violato, 2007).

In 2014, the UBC MD Program required all candidates to take and obtain a minimum score on the MCAT to be eligible. At the time the MCAT tested an individual's knowledge of introductory biological and physical sciences, as well as their verbal reasoning skills. The AAMC scored each section of this test independently on a scale from 1 to 15 and amalgamated these three scores into a total score ranging from 3-45 (Association of American Medical Colleges, 2015). According to one publication, the mean for all exams taken from January 2012 to September 2104 was 25.2 with a standard deviation of 6.4 (Association of American Medical Colleges, 2015).

3.2.4.3 Non-Academic Qualities Score (NAQ)

As described in Chapter 1, the UBC MD non-academic evaluation contains five sections: leadership, service ethic, capacity to work with others, diversity of experience, and high performance in an area of human endeavor. Candidates enter their extra and co-curricular activities into a form akin to a standardized curriculum vitae. Assessors then read these entries and grade them. Each candidate's composite score ranges from 0-50 points and is called a non-academic qualities score (NAQ score).

3.2.4.4 Multiple Mini Interview (MMI)

The multiple mini interview is an interview format that involves assessing a candidate through a series of short interactions (Eva, Rosenfeld, Reiter, Norman, 2004).

As previously mentioned, in 2014, UBC's interviewed applicants proceeded through a circuit of 11 interview stations. The MD Admissions Office amalgamated and standardized scores from 10 of these stations[18] to create a final interview score.

3.3 Sample

During the 2014-2015 admissions cycle, 2322 prospective students applied. Of these, the MD Admissions Office disqualified or withdrew 256 applicants for failure to meet the stated admissions requirements. Of the 2066 applicants remaining, the MD Admissions Office invited 655 for an interview. Only 647 candidates remained eligible following their interview.[19] Subsequently, 327 individuals received a final offer of admission for the 288 positions in the medical program.[20]

3.2.1 Coding the Sample for Rurality

In total, I coded the high school data of 2063 eligible applicants[21] as rural, regional, or urban depending on each high school's community size. Specifically, I mimicked the terminology "regional" from the Wright and Woloshuk (2008) study because I could not accurately identify communities in the middle group as suburban. Regional communities depend on themselves, not on cities, for their social, cultural,

[18] One station was a rest station and did not contain an assessor.
[19] Eight applicants were made ineligible for a variety of reasons: not booking an interview, not appearing for their interview, withdrawal, or inability to complete requirements for the program (confirmed post interview offer).
[20] This was due to several individuals receiving offers from the waitlist. Every year more than 288 offers are made as some applicants decline their offer, withdraw their acceptance, or defer their entry to another year.
[21] I excluded from my analysis the three applicants who were invited for interview, interviewed and then were subsequently made ineligible, as they should not have been considered for the program in the first place.

economic, and often healthcare needs, which makes them distinct from "suburban" communities. The word "regional" seemed to better capture their relationship to both rural and urban communities. Following the RST definition of rural, I coded communities with 10,000 people and less as rural, communities ranging from 10,001 to 99,999 people as regional, and any community over 100,000 people as urban. Additionally, I adjusted the community size for any community that was identified as part of a census metropolitan area or census agglomeration to account for population interaction. For example, according to the 2011 census, North Vancouver, BC had a population of 84,412. However, North Vancouver interacts economically and socially with British Columbia's Vancouver Metropolitan Area and is categorized by the Canadian Census as part the Vancouver Metropolitan Area. Therefore, I categorized North Vancouver as urban and included it in the combined Vancouver Metropolitan Area of 2,313,328 people. Thus, I changed North Vancouver's classification from regional to urban.

I made population adjustments accounting for metropolitan or agglomeration influence on the high school locations of 1818 applicants. Overall, I coded 84 locations as rural, 233 as regional and 1646 as urban. The remaining 100 locations were international or contained unidentifiable information (such as an entry which contained what I believe to be the applicant's name) and I therefore removed them from the analysis. This left 1963 applicants in the final study sample (Table 1).

Table 1

Geographic Classification of the Sample

Variable	Frequency	%
Rural	84	4.3
Regional	233	11.9
Urban	1646	83.9
Total	1963	

3.3.2 Characteristics of the Sample

Overall, the 1,963 applicants in the study sample represent 95.2% of the total eligible applicants. Within the study sample, 619 applicants were interviewed. They constituted 95.7% of the 2014-2015 applicants eligible for the MD program after the interview. Of the applicants in the study sample, 319 received offers of admission. This constituted 97.6% of those individuals who received an offer. Table 2 provides an overview of the demographic makeup of the sample.

Table 2

Demographic Characteristics of the Sample (N=1963)

Variable	Frequency	%
Gender		
Male	1020	52.0
Female	943	48.0
Most Advanced Degree Earned		
Less than Bachelor's Degree	207	10.6
Bachelor's Degree	1451	73.9
Graduate Degree	305	15.5
Age		
<=20	302	15.4
21-25	1395	71.1
26-30	220	11.2
31-35	36	1.8
36+	10	0.5
High School Location		
Rural	84	4.3
Regional	233	11.9
Urban	1646	83.9

3.3.3 Non-Academic Qualities of the Sample

During the application process, the MD Admissions Office instructed candidates to enter their activities, positions, or employment experiences only once into the application. While some candidates did not follow these instructions, many did. Therefore, the statistics imply that candidates participated in and discussed an average of 21 unique life experiences.

The 1,963 candidates in the sample generated 32,998 entries in the non-academic activities section of the application and 8,898 entries in the employment history section of the application. This equates to approximately 21 entries per candidate.

The advice provided to applicants about what to enter in their application consisted of the following:

> We want to know about activities that you consider significant and that have helped you prepare for a career in medicine. We would also like to know about any significant experiences in your life that have helped you develop capacities like altruism, leadership, the ability to work with others, etc. (Help Guide 2014-2015, p. 12).

Candidates entered a wide variety of activities in their applications— anything from participation in or formation of student clubs, to childhood hobbies, to long term volunteer experiences, commitment to research, to owning and operating a personal business. For example, one candidate included five volunteer experiences, four student leadership activities, participation in two sports teams (one in high school, another during university), an interest in travelling, an arts and crafts hobby, several non-academic awards, five employment experiences (ranging from part-time tutoring to acting as a respite worker), a notation about a family member's health challenges and their role in caring for said individual, and two entries related to volunteer research experiences. This candidate was not atypical, nor did the assessors deem this application exceptional.

3.4 Analysis

3.4.1 Statistical Analysis

After coding the sample into demographic subgroups based on the location of each applicant's high school, I analyzed each subgroup using descriptive statistics. By doing so I summarized the data and began observing each subgroup's basic characteristics—such as the proportion of men and women in each subgroup, their highest degree achieved, and whether they identified as being an Aboriginal person. I also analyzed the spread of their grades, MCAT, and non-academic scores. In instances where I compared means as measures of performance, I used an analysis of variance (ANOVA) test to determine whether statistically significant differences existed (Agresti & Finlay, 2014). These comparisons served to answer my first research question—the likeness in demographic makeup of rural, regional and urban applicants.[22]

I then performed additional inferential statistical analyses to understand if admissions outcomes for the rural medical school applicants were associated with the variables examined. As I wanted to see if a correlation existed between an applicant's location of high school graduation and each of the admissions measures of performance, I conducted a simple regression analysis of each admission score (OPGA, MCAT, NAQ, and MMI) on the location variable (rural, regional, or urban). In these linear regression equations, I used the location variable as the explanatory variable

[22] See Chapter 4 for results.

(independent variable) and the admissions score as the response variable (dependent variable).

Following this simple linear regression analysis, I added the demographic variables (gender, age, highest education earned, Aboriginal identity, and BC residency status) into the equation and performed multivariate regression analysis. Doing so determined if the associations found in the original analyses remained when accounting for sample characteristics that could have influenced the findings. Finally, I performed statistical tests to ensure I had used a suitable statistical model for each analysis and to ensure that I had not violated the Ordinary Least Squares (OLS) assumptions. I conducted all of the aforementioned analyses using STATA. Results from these analyses can be found in Chapter 4.

3.4.2 Content Analysis

Although conducting these statistical tests provided insights into the rural applicants' competitiveness in the application process, they did not elucidate the ways the rural applicants presented themselves or their experiences within their medical school admissions documents. Considering the voiced concerns of rural advocates regarding this domain, I examined the 2014-2015 MD applicant employment and non-academic activities using content analysis. I counted entries and mined the data for words and phrases that could pinpoint potential similarities and differences of applicants who graduated from high school in rural, regional or urban locations. I used both Excel® and NVivo® for this analysis.

In their discussion of how educational institutions reproduce social systems, Bourdieu and Passeron (1979) write,

> Educational inequalities most often remain unnoticed and are always what is least mentioned when students are discussed and especially when students talk about themselves. But they are sufficiently visible, at least as regards their strictly economic aspect, to make it necessary to look for the unity of the student world in identical university practice rather than in identical conditions of existence (p. 28)

To paraphrase, when students discuss their university experiences they often share similar attributes: they attend lectures, they experience stress studying for exams, they interact with other students. It is therefore easy to gloss over the inequities that exist in their experiences of university life and their interactions with their educational environment. But if one is to probe more deeply, the ways in which students live are highly dependent on their economic and cultural means. Bourdieu and Passeron (1979) argue that students from wealthy families do not share the monetary stress and lack of ability to fully engage in the leisurely educational environment that students from less wealthy families experience. One can therefore find vast differences in the activities and extra-curricular pass-times of students from wealthy and less wealthy families.

Applying this principle to the research in question, if Bourdieu and Passeron are correct, one should be able to identify differences in the lived experiences of various types of students if one explores their backgrounds, even beyond their socioeconomic status. For although they will have some unifying similarities, they will also engage in

very distinguishable experiences that arise out of their upbringing. In medical school documents, therefore, if rural applicants truly live their lives differently than urban students, their extra-curricular, co-curricular, and work experiences should differentiate them from urban students. As such, I performed a preliminary content analysis of these data to see if any identifiable trends or patterns could be determined.

3.4.2.1 Content Analysis Methodology

According to Krippendorff (2013), "*Content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use*" (p. 24). Although there are many versions of content analysis (e.g., it can be used to describe the characteristics of communications, to make inferences about the psychological state of a speaker, to assess a text's impact), the intention of content analysis is to dissect and interpret a text in such a way it can be replicated by others (Breuning, 2015). Common versions of content analysis include coding manifest content (surface content) such as by using word frequency counts or identifying latent or symbolic meaning in a phrase or "meaning unit" such as by coding words or phrases into themes based on a theoretical principle (Breuning, 2015).

Given the flexibility and variety of uses of content analysis, there are many ways for it to be used incorrectly. However, Krippendorff (2013) suggests that following a structured pattern of unitizing, sampling, coding, reducing data to manageable representations, inferring contextual phenomena, and narrating the findings (p. 84) helps produce an analysis that is clear and easily reproducible, which enhances its reliability. Mayring (2000) describes this as deciding which aspects of the material to

code, followed by a detailed step by step procedure, revising the procedure based on preliminary analysis (a "feedback loop"), and ending with a comparison of the findings to those of similar studies (p. 3). I have thus endeavored to design the content analysis in my study using these methods.

3.4.2.2 Design of Content Analysis Component of Study

Given the extensive number of applicant entries, and that this study is exploratory, I performed content analysis designed to capture a "bird's eye" view of rural, regional and urban applicants' experiences. I used Microsoft Access to link the high school location data with the two Excel® spreadsheets of activity information (the non-academic activity spreadsheet and the employment history spreadsheet). These two spreadsheets included many pieces of information, including activity start and end dates, the number of hours the individual spent on the activity, a brief description of the activity,[23] and an additional section in which the candidate could clarify anything about the activity that they felt was not captured in their previous explanations. For example, in the employment history spreadsheet one candidate discussed an experience as a university residence advisor. In addition to a brief explanation of his or her duties and responsibilities, s/he indicated that s/he worked 20 hours a week at this position for two years. S/he provided no additional information about the period of time or duties. Conversely, another applicant discussed working as a bakery clerk in a grocery store for two years. However, as s/he had a more complicated work schedule, s/he provided an additional explanation that consisted of the following, "I worked about 25 hours per

[23] The description box limited the number of characters an applicant could enter to 350.

week during the school year and 40 hours per week during summers. Start and End Dates are approximated."[24] Similarly in the non-academic activities spreadsheet a candidate discussed a leadership experience as a divisional training coordinator for a first response healthcare organization: "I plan and monitor the ongoing training of Divisional members and oversee the Divisional Training Program as a whole. Each session I provide a brief summary of the subject being covered, e.g. burn management or stroke care. I prepare practice scenarios, put members into groups, observe their performance and correct mistakes." In addition to this explanation s/he discussed the timeframe in which s/he had held that role, but instead of indicating the number of hours per week s/he had volunteered, s/he provided the total number of hours s/he had contributed (105) during the timeframe listed.[25]

As an initial data analysis, I created a series of pivot tables that provided information about the distribution of NAQ entries across activity categories and the number of employment entries by location subgroup. For the non-academic experiences section, I calculated the average number of activities applicants from each region had included in their applications; I counted the number of non-academic entries applicants from each region had identified as "service ethic," "leadership," "capacity to work with others," "diversity of experience," and "high performance in an area of human endeavor" and I calculated the average number of hours applicants from each region said they contributed to these activities. For employment history I reviewed the

[24] See Appendix for a random sample of employment history experiences (I removed the identifying information from these descriptions to maintain the anonymity of the applicants).
[25] See Appendix for a random sample of non-academic activity experiences.

average number of entries applicants from each region included in the employment history section and I calculated the average number of hours they said they contributed to these roles. These pivot tables helped to summarize the data by condensing the spreadsheets into a series of comparable numbers. Reviewing the data in this way helped me identify trends in how applicants across the various regions categorized and identified their own extra- and co-curricular experiences. This analysis also helped me discover aspects of the data that needed further exploration or clarification.

Next, I conducted a formal content analysis. As previously mentioned, the foundation of content analysis is deciding what information to code, and what entails an entire "unit" of meaning. For the purposes of my study, I decided that one meaningful unit was the individual words in the position titles of the activities applicants entered into their application. The reason I identified this as a unit of meaning is because in so doing I could identify trends in both the manifest and latent content by reviewing the most commonly discussed types of positions. I reasoned that although these position titles often contain more than one word (for example, one might describe the title of their volunteer position as "volunteer" or "emergency room volunteer"), if a word appears frequently enough that it shows up in a most frequently used words list, it demonstrates something about the types of activities candidates from that area have access to and in which they are engaged. Additionally, due to the limitations of word frequency counts (particularly the potential for unimportant or unidentifiable words to be used frequently), I decided that due to their shortness in length, position titles would likely help to limit the identification of erroneous words (as opposed to using the

activity descriptions, which contain up to 350 characters and thus the software has a greater capacity for picking up inconsequential words).[26]

Using NVivo® , I created word frequency queries for each of these units as separated by applicant subgroup, reviewing the top 100 words with three characters or more and barring a series of "stop words" (such as "only" "does" "will" and "what"). I then used Excel® to compare the lists to see which words appeared only in the list of applicants from a particular region, which words appeared in the lists from two regions, and which words appeared in all three. To clarify, I compared the top 100 words of rural candidates' employment history position titles with those of regional candidates and those of urban candidates, then compared the top 100 words of regional candidates' employment history and position titles to those of urban candidates. I followed the same procedure for the top 100 most frequently used words in the position titles of rural, regional, and urban applicants' non-academic activities.

3.4.2.3 Thematic Coding

As I wanted to explore the idea that rural applicants engage in experiences that are fundamentally different in character than those of urban applicants, I needed a framework by which to code the identified most frequently used words into themes. In particular, I wanted to focus on themes that had the potential to highlight many of the concerns rural advocates share: specifically, the idea that rural students participate in activities that revolve around customer service or manual labour and that they do not

[26] I tested this by running the word frequency query in the activity description box and the lists generated were almost nonsensical when applying the lens of social reproduction theory.

have access to preparative experiences in the field of health care or community social work.

Although I considered many coding options, I ultimately used the Government of Canada National Occupational Classifications of 2011 (NOC) document as a framework for coding. The NOC is "the nationally accepted reference on occupations in Canada. It organizes over 40,000 job titles into 500 occupational group descriptions" (Government of Canada, 2017). These 500 occupational group descriptions are further broken down into ten main categories of job classification. These ten categories are: 0) management occupations, 1) business, finance, and administration occupations, 2) natural and applied sciences and related occupations, 3) health occupations, 4) occupations in education, law and social, community and government services, 5) occupations in art, culture, recreation and sport, 6) sales and service occupations, 7) trades, transport and equipment operators and related occupations, 8) natural resources, agriculture and related production occupations, and 9) occupations in manufacturing and utilities (Government of Canada, 2017). Each of these categories hold several sub-classifications, including frequently used job titles, as well as descriptions of common duties and responsibilities that fall within each role.

To help identify the appropriate category of classification, I used NVivo® to conduct word-in-text searches for the words in each of the six frequently used words lists.[27] I conducted these text searches to understand the ways in which applicants were

[27] There were six frequently used words lists: top 100 most commonly used words in rural, regional, and urban applicant's employment position titles, and the top 100 most commonly used words in rural, regional, and urban applicant's non-academic experiences titles.

using the identified words in their descriptions. These word-in-text searches created both a list of all of the entries in which the word was used, along with a word tree diagram that helped identify any commonly associated words that could provide more context to the word's usage. It was through this process that I learned that words such as the word "end," which appeared in the top 100 words used by the rural applicants in describing their employment experiences and is not an identifiable position title, was used in the context of a customer service role (e.g., "bakery front end" or "front end cashier"). I could therefore code it into the sales and service occupations classification (NOC 6). Similarly, in using the word tree diagrams, I was able to easily identify that words such as "counsellor," when used by rural applicants, typically meant "camp counsellor." As such, I felt confident in coding this word as an occupation classification 4: occupations in education, law and social, community and government services, which is the category in which most childcare positions are classified.

When the word-in-text searches were not clear enough to identify a particular word, as was the case with the word "maintenance" which only occurred in the top 100 employment position words of urban applicants, I read the descriptions provided by the applicants about their activities. In reading these descriptions, I learned that when these applicants described themselves as "maintenance engineers" they provided services that better aligned with those described in the "natural resources, agriculture and related production occupations" (NOC 8), than those in the "natural and applied sciences and related occupations" category (NOC 2) where engineers would typically fall. The descriptions of being "maintenance engineers" aligned with the bulk of other "maintenance" roles described by the urban applicants which were activities such as

"grounds maintenance" and "lawn maintenance" which were also NOC 8 roles. I therefore categorized the word "maintenance" into the NOC 8 classification.

As words can be used in many different ways, there were a number of instances in which I classified the word into a category based on its most frequent manifestation. For example, when I reviewed the word "child," which appeared in the list of urban employment positions, I found that the vast majority of positions related to child care (NOC 4). However, one position referred to a research role for an organization with the word "child" in it and a second addressed fundraising for a children's charity. Despite these discrepancies I maintained the NOC 4 classification since the remaining 24 entries aligned in employment purpose.

There were cases where the uses of the word were so disparate that I refrained from classification entirely. For these words I used the notation "NA" as in "not applicable." As can be seen in Tables 21 and 22 the number and types of unclassifiable words ranged from 16 to 32 and were based solely upon the word's context within each location classification. Overall, I classified words into a particular NOC category if over 50% of the described positions related to the classification.

In general, I classified management roles into NOC 0; administrative related words into NOC 1; science research roles including laboratory volunteering into NOC 2; medical positions and volunteer work in NOC 3; education and childcare roles and words into NOC 4; sports and hobbies, including recreational travel into NOC 5; sales and customer service positions into NOC 6; general labour and construction roles into

NOC 7; farm work and forestry roles, including forest firefighting into NOC 8; and specialized manufacturing and production roles into NOC 9.

3.4.2.4 Thematic Coding: Protecting Against Bias

To protect against bias, I engaged several tactics: first, as previously mentioned, to identify the most common uses of a word, I reviewed word tree diagrams which showed specific counts of how often certain words co-occurred. If the word tree diagram identified one string of words as the most common (appearing at least 50% of the time out of the total number of times it was used by one group of applicants), I coded it into the most obvious NOC category. Next, if the usage was not clear, I identified the top three categories into which the word could fall (as based on the word tree diagrams). I then reviewed the first 100 uses (where the word was used 100 or more times. For words with fewer uses, I reviewed all of them) of the word and tabulated the usage, placing any extraneous uses into a fourth category. If, after this exercise, one NOC category appeared more than 50 times in the first 100 uses, I coded the word into that category. Where usage was unclear, I reviewed the entire position description for further clarification. If a word did not appear more than 50% of the time in one NOC category, I did not categorize it. Finally, I reviewed the same or similar words across the location categories, to ensure that I did not inadvertently classify a word in one NOC category for one group of applicants, and in a different category for another group of applicants, unless their usage of the word did, in fact, differ.

3.5 Summary

In summary, I performed descriptive statistics on the applicants' demographic data and their admissions scores, looking for general similarities and differences between applicants who graduated from high school in rural, regional or urban areas. I then conducted basic linear regression analysis between the admissions scores and the location variables. This helped to identify whether statistically significant relationships between location of high school and admissions scores existed. Afterward, I added the demographic variables of gender, age, Aboriginal identity, degree at time of graduation, and in many cases BC residency to the linear regression model to determine whether correlations between the location variables appeared or disappeared with the inclusion of these factors. This last step helped to isolate whether correlations between location and the scores were likely to be explained by the location variables, as opposed to the other characteristics of the sample. All of these analyses provided insight into rural applicants' competitiveness on common selection tools.

Following these analyses, I performed quantitative content analysis, reviewing applicant employment (paid) and non-academic (unpaid) experiences. In so doing, I identified general trends in how applicants described their experiences in their applications, specifically with respect to the number of entries they provided and the number of hours they engaged in these experiences. I reviewed both application sections using word frequency queries based on the locations where the applicants had graduated from high school. I then compared these lists to see how many similar words appeared. Once completed, I delved more deeply into the analysis by using word-in-text

queries to identify how applicants from the various regions used these words. I coded the words into categories using the National Occupational Classification system created by the Government of Canada. One can find the results of these analyses in Chapter 4.

Chapter 4: Results

4.1 Demographic Characteristics

To answer my first research question, I compared the demographic characteristics of each subgroup of applicants. Specifically, I compared the applicants' age, gender, and highest degree earned at the time of application. In addition, I reviewed the extent to which each subgroup of applicants identified as Aboriginal persons.

In this sample, the average age for rural applicants was 23.3 years old. While the oldest rural applicant was 41 years old, the majority were under the age of 24 and the youngest was 19. Similarly, the average age for regional applicants was 23.5 years old, with the oldest being 37 years of age. The majority of regional applicants were 25 years or younger and the youngest was 19 years old. Urban applicants were on average 22.7 years old, and their ages ranged from 18 to 40 years with the majority falling 24 years old or younger (see Table 3).

Table 3

Applicants' Age at Time of Application Stratified by Location of High School Education

Variable	Mean (Years)	Lower Quartile (Years)	Higher Quartile (Years)
Rural	23.3	21	24
Regional	23.5	21	25
Urban	22.7	21	24
Total Sample (N= 1963)	22.8	21	24

Statistically, there was a significant difference between the ages of the rural, regional, and urban applicants; $F(2, 1960) = 11.08$, $p < .01$. Yet, in practical terms, the age difference was negligible.

In terms of gender, a noticeable difference existed across the geographic regions. Female applicants comprised 61.9% of the rural sample, whereas they formed only 42.9% of the regional applicants, and 48.1% of the urban applicants (Table 4). A chi-squared test of independence ($\chi^2 = 8.9$, $p < .01$) demonstrated that there was a statistically significant relationship between the applicants' gender and the location of the high school from which they graduated.

Table 4

Applicants' Gender Stratified by Location of High School Education

Variable	Male		Female	
	Frequency	%	Frequency	%
Rural	32	38.1	52	61.9
Regional	133	57.1	100	42.9
Urban	855	51.9	791	48.1
Total (N=1963)	1020	52.0	943	48.0

With regard to educational achievements, the distribution of degrees across geographic areas was not statistically different. Of the rural applicants in my sample 13.1% reported attaining less than a bachelor's degree, 76.2% a bachelor's degree, and 10.7% a graduate degree by the time they applied to the MD program. The distribution of degrees from the regional applicants indicated that 12.4% attained less than a

bachelor's degree, 73.4% a bachelor's degree, and 14.2% a graduate degree. And, of the applicants who graduated high school in an urban area 10.1% reported attaining less than a bachelor's degree, 73.9% a bachelor's degree, and 16.0% a graduate degree (Table 5). A chi-squared test of independence demonstrated that the degree earned at the time of application and the location of high school graduation were not statistically associated ($\chi^2 = 3.4$, $p < .50$).

Table 5

Applicants' Most Advanced Degree Earned at time of Application Stratified by Location of High School Education

	Less than Bachelor's Degree		Bachelor's Degree		Graduate Degree	
Variable	Frequency	%	Frequency	%	Frequency	%
Rural	11	13.1	64	76.2	9	10.7
Regional	29	12.4	171	73.4	33	14.2
Urban	167	10.1	1216	73.9	263	16.0
Total (N=1963)	207	10.5	1451	73.9	305	15.5

To review the number and distribution of individuals identifying as Aboriginal people in the sample, I used the answers to the question, "Do you identify yourself as an Aboriginal person of Canada?" Rural applicants were more likely than were regional or urban applicants to identify as an Aboriginal person (Table 6; $\chi^2 = 46.6$, $p < 0.001$).

Table 6

Identification as an Aboriginal Person Stratified by Location of High School Education

Variable	Frequency	%
Rural	7	8.3
Regional	15	6.4
Urban	18	1.1
Total (N=1963)	40	2.0

Overall, these analyses demonstrated key differences and similarities among the rural, regional and urban candidates in the sample. The rural candidates were more likely to be female and to identify as an Aboriginal person than were the candidates from the other regions. All three groups of applicants were similar in age. Also, all three groups attained similar levels of education by the application deadline.

4.2 Impact of Rurality on Admissions Scores

In addition to demographic comparisons, I compared each subgroup's scores on the admissions metrics, specifically examining the mean scores and any variation found therein. I did this to partially answer my second research question: whether the location of medical school candidate's high school of graduation impacted their achievement on measures of importance in the admissions process. Following these basic comparisons, I conducted a regression analysis between each admissions score and the high school location data to determine which relationships remained significant when the covariation between variables was taken into account.

4.2.1 Comparison of Means; Univariate analyses

As can be seen in Table 7, the grades achieved by the three groups of applicants were similar. I found it interesting that no applicants who graduated from high school in a rural area had an overall GPA (OGPA) that fell at or below 75%, whereas a few regional and urban applicants did (2.6% and 1.9%, respectively). Calculating the mean OGPA demonstrated that rural applicants had a very marginally higher GPA, on average, than the regional and urban applicants (rural M=85.1%, SD= 4.38; regional M=84.1%, SD= 4.88; urban M= 85.0%, SD=4.62). Analysis of variance test (ANOVA), indicated that these means were statistically different ($F(2, 1960)= 3.3$; $p < 0.04$), but the effect size was small (Cohen's d=0.03 when comparing rural to urban and d=.18 when comparing regional applicants to urban applicants). This indicated that although the differences were statistically significant, they were not likely to be practically meaningful.

The mean MCAT scores for the rural, regional and urban applicants were dissimilar with rural applicants performing the poorest and the urban applicants performing the best. The mean MCAT score for the rural applicants was 29.9 (SD = 3.8), the mean MCAT score for the regional applicants was 30.0 (SD = 3.6), and the mean for the urban applicants was 31.6 (SD = 3.6). ANOVA indicated that these differences were statistically significant; $F(2,1960)= 24.74$, $p < .001$ and Cohen's d revealed a medium effect size between the rural and urban applicants' MCAT scores (d = .47). Similarly, Cohen's d indicated a medium effect between the means of the regional and urban applicants' scores (d = .42). This illustrated that the differences were both statistically significant and meaningful despite the appearance of small differences between the means.

To understand how these small differences can be meaningful, one must first understand that MCAT scores fall within a small range. As mentioned in Chapter 1, UBC Medicine decided the lowest acceptable MCAT score was 21. The highest possible score on the test was 45. However, according to the AAMC, of the 287,494 tests taken between January 2012 and September 2014, tests with scores 39 points or higher (the highest six scores of a 24 point range) were in the 100th percentile. In this sample, 2 rural and 2 regional applicants obtained a score 39 points or higher (2.4% and 0.9% respectively), while 50 urban applicants scored in this range (3.0%). For comparison, of the scores falling in the middle of the range of allowable scores at UBC (scores between 30 and a 36) the test takers scoring 30 points were in the 79th percentile of all tests taken, while the test takers scoring 36 were in the 97th percentile (Association of American Medical Colleges, nd). This is to say that obtaining a high score on this exam is difficult and applicants do not proportionately achieve at all ends of the range (Table 8). In addition to the lack of available testing centres in northern and rural areas of Canada (Hudson, Tesson, & Strasser, 2009), some advocates argue that fewer MCAT preparatory courses are available to rural individuals. Although there is a lack of demonstrable proof that preparatory tutoring and courses create better outcomes on the MCAT (McGaghie, Downing, & Kubilius, 2010), the prevalence of these services and belief in their effectiveness is largely ingrained in pre-medical circles. It is possible that one or both of these issues may be contributing to the lower scores identified in my findings.

In terms of the candidates' adjusted non-academic qualities scores (which is the score applicants receive for their non-academic traits and characteristics and is

adjusted to account for reviewers' differences), the mean NAQ scores for the applicant subgroups were very similar (rural M= 25.6, SD= 5.7; regional M = 25.1, SD= 6.8; urban M = 25.1, SD = 7.0). ANOVA indicated that these means were not statistically different ($F(2, 1960) = 0.2$, $p < .83$). However, while means offer an indication of the centre of the distribution, admissions processes being competitive it is equally important in this context to consider the rate at which applicants achieve the highest range of scores. As can be seen in Table 10, only 14.3% of rural applicants received a NAQ score above 30, whereas 22.3% of regional and 23.1% of urban applicants received scores in this range. One can see that the NAQ scores for rural applicants fell primarily in the middle of the range with 70.2% of rural applicants receiving a score between 20-30 points, whereas only 54.9% of regional candidates and 53.7% of urban candidates scored similarly.

As mentioned in Chapter 3, UBC Medicine invited 619 of the applicants in this sample to attend an interview. By conducting a chi-squared test for independence, I found that a statistically significant association existed between high school location and the rate at which candidates were invited for an interview ($\chi^2=6.26$, $p<0.05$). The greater rate of regional candidates (38.6%) interviewed relative to rural (32.1%) or urban (30.5%) applicants drove the association. When I compared the mean interview scores across the geographic groups, ANOVA indicated no statistically significant differences between these scores ($F(2,616) = 1.83$, $p < .16$).

Table 7

Overall GPA Stratified by Location of High School Education

	GPA <= 75%		GPA >75% to <=80%		GPA >80% to <=85%		GPA >85% to <=90%		GPA >90% to <=95%		GPA >95%	
Variable	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Rural	0	0.0	8	9.5	34	40.5	30	35.7	12	14.3	0	0.0
Regional	6	2.6	48	20.6	81	34.8	70	30.0	28	12.0	0	0.0
Urban	31	1.9	214	13.0	562	34.1	596	36.2	241	14.6	2	0.1
Total (N=1963)	37	1.9	270	13.8	677	34.5	696	35.5	281	14.3	2	0.1

Table 8

MCAT Scores Stratified by Location of High School Education

	<=25		26-30		31-35		36-40		41-45	
Variable	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Rural	13	15.5	36	42.9	28	33.3	7	8.3	0	0.0
Regional	26	11.2	102	43.8	90	38.6	15	6.4	0	0.0
Urban	81	4.9	537	32.6	811	49.3	207	12.6	10	0.6
Total (N= 1963)	120	6.1	675	34.4	929	47.3	229	11.7	10	0.5

Table 9

NAQ Scores Stratified by Location of High School Education

	<=10		>10 to <=20		>20 to <=30		>30 to <=40		>40 to <=50	
Variable	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Rural	0	0.0	13	15.5	59	70.2	12	14.3	0	0.0
Regional	2	0.9	51	21.9	128	54.9	49	21.0	3	1.3
Urban	16	1.0	366	22.2	884	53.7	361	21.9	19	1.2
Total (N=1963)	18	0.9	430	21.9	1071	54.6	422	21.5	22	1.1

Table 10

Categorization of Applicants by Location of High School and by Interview Status

	Not Interviewed		Interviewed	
Variable	Frequency	%	Frequency	%
Rural	57	67.9	27	32.1
Regional	143	61.4	90	38.6
Urban	1144	69.5	502	30.5
Total (N=1963)	1344	68.5	619	31.5

Pearson $chi^2(2) = 6.26$ $p<0.05$

Table 11

Linear Regression Analysis Results: Relationship between Admissions Variables and Demographic Characteristics

Variables	OGPA	OGPA	NAQ	NAQ	MCAT	MCAT	MMI	MMI
Rural	0.12	0.74	0.49	-0.02	-1.70**	-1.08**	0.43	0.27
Regional	-0.82*	-0.17	0.02	-0.76	-1.5**	-1.01**	-0.76	-0.83
Male		0.59**		-0.27		1.31**		-0.73*
Age		-0.67**		0.77**		-0.32**		0.03
Less than Bachelor's Degree		0.54		-0.13		-0.02		0.43
Graduate Degree		-0.05		1.04*		-0.07		0.03
Aboriginal Person		-2.11**		-0.11		-2.53**		0.37
BC Resident				-1.06**		1.11**		-0.28
R^2	0.00	0.18	0.00	0.13	0.02	0.16	0.01	0.02
N	1,963	1,963	1,963	1,963	1,963	1,963	619	619

First models demonstrate the relationship between the location variables and each admissions variable without the addition of demographic control variables. Second models demonstrate the relationship between each variable listed and the admissions variable with all other listed variables held constant.

* $p < .05$; ** $p < .01$

4.2.2 Relationship between Location of High School and Admissions Scores

To determine which relationships remained significant when considering the covariation between the variables, I conducted two linear regression analyses; a simple model that correlated just the location variables and admissions variable, and a more complex model that included several demographic "control" variables. In the more complex model I added age, gender, level of education, Aboriginal identity, and BC residency as control variables to the regression equations. For all analyses I coded the location variables into dummy variables, (rural = 1 and others = 0; regional = 1, others = 0). As mentioned in Chapter 3, I condensed the education categories into three broader categories: less than bachelor's degree, bachelor's degree, and graduate degree. I then recoded these into dummy variables. Gender, Aboriginal identity, and BC residency status, I coded as follows: males as 1, females as 0; individuals identifying as Aboriginal people as 1, all others as 0; out-of-province applicants as 1, BC residents as 0.

Reviewing Table 11 one can see that the only statistically significant relationships that remained when accounting for demographic factors were the relationships between graduating high school in a rural or regional area and the MCAT. Based on these linear regression analyses rural applicants could be expected to perform 1.08 points worse on the MCAT than urban applicants ($p<.01$) and regional applicants could be expected to perform 1.01 points worse on the MCAT than urban applicants ($p<.01$).

4.2.3 Model Diagnostics

I tested my models to see if they violated the Ordinary Least Squares (OLS) assumptions. When reviewing the multivariate regression equation for OGPA I found that the residuals formed almost a completely straight line and that the mean of the error was approximately 0, indicating that the error was normally distributed. Additionally, when looking to see if the variance was constant across cases, it appeared to be. However, when performing the Breusch-Pagan test the χ^2 value was 21.30 with a $p < .01$, meaning that the error was heteroscedastic. When I plotted the residuals of the independent variables, the results were inconsistent. The residuals were similar for regional upbringing (location of high school), age, gender, and holding a graduate degree, yet, they were dispersed for rural upbringing, having less than a bachelor's degree and being a BC resident. To address the OLS violations, I attempted to take the logarithm of the dependent variable (OGPA) however, this made the Breusch-Pagan test worse (χ^2 value was 34.97 with $p < .01$). I then removed the control for BC residency from the model. This reduced the χ^2 value to 1.17 with $p = .28$, indicating that the model's errors were now homoscedastic. The removal of this control variable was appropriate for the GPA regression equation because there is an admission standard specifically linked to BC residency which is not true for the other admissions tools. I dropped the BC residency control variable for only the GPA regression analysis.

I then conducted the same tests for the other multivariate regression equations. For the NAQ multivariate equation, all tests showed no issues. The Breusch-Pagan test of the model with BC residency included had a χ^2 value of 0.06 with $p < .81$ (indicating homoscedasticity of the errors). Similarly, the MCAT tests showed no issues with the distribution of the errors, the

mean of the residuals (which was approximately 0), or the error variance. The Breusch-Pagan test generated a χ^2 value of 0.02 with p=0.89, indicating homoscedastic errors. And finally, the model with the interview results indicated the same. There were no issues with any of the tests and the Breusch-Pagan test generated a χ^2 value of 2.32 with p = .13, which was enough to determine that the error was homoscedastic for this model as well.

4.3 Impact of Rurality on Admissibility

Overall, UBC's medical school offered 319 of the 1,963 applicants a position in the MD program. Of these, 18 attended rural high schools (21.4% of the 84 rural applicants), 42 attended regional high schools (18.0% of the 233 regional applicants), and 259 attended urban high schools (15.7% of the 1646 urban applicants). In conducting a chi-squared test for independence, I determined that these proportions were not significantly different from one another; χ^2=2.5, p<0.3 (Table 12). This meant that the location of an applicant's high school was not associated with admission into the UBC medical school. Table 13 outlines the proportion of applicants admitted to the medical program based on each identified demographic measure.

Table 12

Categorization of Location of High School by Application Status

	High School Geographic Categorization			
Application Status	Rural	Regional	Urban	Total
Not Admitted	66	191	1,387	1,644
Admitted	18	42	259	319
Total	84	233	1,646	1,963

Pearson $chi^2(2) = 2.52$, $p = .28$.

Similarly, reviewing the enrolment data, the proportion of rural, regional and urban applicants who decided to join the program did not differ statistically significantly; (13 rural (72%), 40 regional (95%), 232 urban (89%) accepted their admissions offer, $\chi^2=1.6$, $p<0.45$). This finding differed from that of the Hensel, Shandling and Redelmeier (2007) study which found that despite the relative competitiveness of rural applicants in the University of Toronto's application process, rural applicants were more than twice as likely as urban applicants to decline an admission offer.

Table 13

Applicant Admissibility by Demographic Characteristics

	Sample Total		Admitted	
Variable	Frequency	%	Frequency	%
Gender				
Male	1020	52	177	55.5
Female	943	48	142	44.5
Most Advanced Degree Earned				
Less than Bachelor's Degree	207	10.6	46	14.4
Bachelor's Degree	1451	73.9	246	77.1
Graduate Degree	305	15.5	27	8.5
Age				
<=20	302	15.4	57	17.9
21-25	1395	71.1	224	70.2
26-30	220	11.2	31	9.7
31-35	36	1.8	5	1.6
36+	10	0.5	2	0.6
High School Location				
Rural	84	4.3	18	5.6
Regional	233	11.9	42	13.2
Urban	1646	83.9	259	81.2

4.4 Impact of Rurality on Descriptions of Non-Academic Experiences

My third research question called for an examination of candidates' extra-curricular and co-curricular activities and identification of any differences found amongst the applicant subgroups. I reviewed the non-academic activity entries and the employment history entries candidates provided with their applications. As mentioned previously, the total sample of 1,963 applicants generated 32,998 non-academic activity entries. Subdivided into location sub-

groups, the 84 rural applicants were responsible for 1,414 non-academic activity entries or 4.3% of the total number of entries, the 233 regional applicants generated 4,026 non-academic activity entries or 12.2% of the total, and the 1,643 urban applicants entered 27,558 non-academic activity entries or 83.5% of the total. These proportions aligned, approximately, with the percentages of the overall sample represented by rural, regional and urban candidates (Table 14).

Of the 8,898 employment history entries, rural applicants generated 507 or 5.7% of the total. Regional applicants were responsible for 1,244 or 14.0% of the employment history entries, and the urban candidates generated 7,147 or 80.3% of the total (Table 14).

Table 14

Distribution of Non-Academic and Employment History Activities Stratified by High School Location

	Non-Academic Activities		Employment History		Candidates	
Variable	Frequency	%	Frequency	%	Frequency	%
Rural	1414	4.3	507	5.7	84	4.3
Regional	4026	12.2	1244	14.0	233	11.9
Urban	27558	83.5	7147	80.3	1646	83.9
Total (N=41896)	32998	100	8898	100	1963	100

4.4.1 Details of Non-Academic Experiences

Due to the compulsory nature of the non-academic activity section all candidates in the sample entered at least one activity (Table 15). On average, candidates who graduated from

high school in a rural area entered 16.8 activities, candidates who graduated from high school in a regional area entered 17.3 activities, and candidates who graduated from high school in an urban area entered 16.7 activities; $F(2, 1960)= 0.73$, $p < .48$).

Table 15

Non-academic Activity Distribution Stratified by High School Location

		Number of Entries		
Variable	Total	Minimum	Maximum	Average
Rural	1414	3	26	16.8
Regional	4026	1	26	17.3
Urban	27558	1	26	16.7
Total	32988	1	26	17.0

As discussed previously, the non-academic activities section is divided into five sub-sections (capacity to work with others, diversity of experiences, high performance in an area of human endeavor, leadership, and service ethic). Because applicants choose how to categorize their own experiences, reviewing their entry trends may shed light on how they thought about their experiences. As can been seen in Table 16, the distribution of entries was similar no matter where the candidates graduated from high school.

In addition to category classification, the UBC MD Admissions Office asked candidates to include the number of hours they participated in each of their activities. For some experiences, like one day experiences, applicants entered as few as five or ten hours. For activities or hobbies that lasted many years and took a significant amount of time, candidates entered hours ranging from the hundreds to thousands. For example, one applicant described volunteering for 325 hours in a hospital emergency room, while another applicant described

playing on a competitive soccer team for over 1,000 hours (see Appendix G for an example of the non-academic experiences). Furthermore, the candidates sometimes used the non-academic experiences section to discuss circumstances that impacted their lives. In those cases, some candidates entered "placeholder" numbers like 99,999 hours or 0 hours. These numbers, while not an accurate reflection of the actual hours contributed, demonstrated to the evaluator that this experience fell outside the entry norm.

Despite the fact that not all hours reflected the specific time someone contributed to a particular activity, I thought it worthwhile to examine how many hours, on average, the applicants of the various regions attributed to the activities they classified in each non-academic category. To account for the discrepancies and inconsistencies in the data, I found the mean and standard deviation of all of the non-academic experience hours entered by the applicants in the sample. Then, in my calculation of each subgroup's average number of hours, I included only the hours that fell within three standard deviations of the sample's mean (Table 17).

Reviewing the findings from this exercise, one can see that average number of hours reported by the three groups of applicants in each of the non-academic activity sections of the application, appears to be fairly similar. The only statistically significant differences were the hours reported as "capacity to work with others" $F(2,6484)= 15.1$, $p<.01$, "diversity of experiences" $F(2,14935)= 11.4$, $p<.01$, and "service ethic" $F(2,5103)= 5.3$, $p<.01$. However, when looking at the effect size of these differences between rural and urban applicants, only the hours reported for "capacity to work with others" demonstrated a small effect or greater ($d=.24$). This indicated that despite the statistically significant differences in hours reported by

rural and urban applicants in the “diversity of experiences” and “service ethic” categories the differences were so small (d=.19 and d=.10, respectively) they could be considered trivial.

Table 16

Non-academic Activity Subcategorized Distribution Stratified by Location of High School Education

	Capacity to Work with Others		Diversity of Experience		High Performance		Leadership		Service Ethic		Total Sample	
Variable	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Rural	278	19.7	654	46.3	58	4.1	207	14.6	217	15.3	1414	4.3
Regional	759	18.9	1866	46.3	226	5.6	565	14.0	610	15.2	4026	12.2
Urban	5471	19.9	12525	45.4	1234	4.5	4043	14.7	4285	15.5	27558	83.5
Total	6508	19.7	15045	45.6	1518	4.6	4815	14.6	5112	15.5	32998	100

Table 17

Non-academic Activity Average Hours Distribution Stratified by Location of High School Education

Variable	Capacity to Work with Others	Diversity of Experience	High Performance	Leadership	Service Ethic
Rural	403.3	748.3	1149.3	357.6	253.5
Regional	355.8	569.5	1350.9	321.9	154.6
Urban	238.3	517.8	1113.4	292.0	207.7

4.4.2 Details of Employment Experiences

The employment history category, in contrast to the non-academic activities, was not compulsory. Therefore, applicants had the option of not entering anything at all (Table 18).

Table 18

Distribution of Employment History Entries Stratified by Location of High School Graduation

	Applicants with Entries		Applicants without Entries	
Variable	Frequency	%	Frequency	%
Rural	84	100	0	0
Regional	230	98.7	3	1.3
Urban	1605	97.5	41	2.4
Total	1919	97.8	44	2.2

As can be seen in Table 19, the average number of entries provided by applicants varied by location of high school of graduation. On average, applicants from rural areas entered 6 employment entries, whereas regional applicants entered 5.3 entries and urban applicants entered 4.3 entries. ANOVA showed that the relationship between high school location and the number of employment activities entered was significant ($F(2, 1961) = 27.0$, $p < .01$). I calculated a medium to large effect between rural and urban applicant employment experiences ($d = .62$) and a small to medium effect between regional and urban employment experiences ($d = .36$).

Table 19

Employment History Distribution Stratified by Location of High School Education

		Number of Entries		
Variable	Total	Minimum	Maximum	Average
Rural	507	1	19	6.0
Regional	1244	0	14	5.3
Urban	7147	0	20	4.3
Total	8898	0	20	4.5

In terms of how much each applicant subgroup reported working, the rural applicants indicated that they worked an average of 29.5 hours per week, the regional applicants indicated that they worked an average of 27.3 hours per week, and urban applicants indicated that they worked an average of 23.8 hours per week. These differences were statistically significant $F(2,1918) = 15.28$, $p < .01$ (rural and urban effect size d = .40, regional and urban effect size d = .30), which demonstrated that on average rural applicants reported working more hours than did the urban applicants.

These findings demonstrate, yet again, how useful socioeconomic status data would have been in understanding and interpreting these results. Because rural areas are known to have proportionally more individuals of lower socioeconomic status than urban areas, it would make sense for these findings to correlate with socioeconomic status. However, there are some questions as to whether individuals applying from rural areas are truly socioeconomically disadvantaged. Because wealthy people with significant social capital do live in rural areas, it is possible that the majority of rural individuals applying to medical programs come from these families. If this is the case, these findings may be attributed to a strong work culture, or some

other uniquely rural trait yet to be defined. Future researchers will have to shed more light on these findings.

4.5 Descriptions of Non-Academic Experiences

To more deeply explore the differences in non-academic and employment experiences between rural, regional and urban applicants, I performed a word search query of the position titles listed in their non-academic and employment experience entries. I chose to search for the top 100 words as a function of the location of high school graduation, so that I could compare the region-specific lists with one another. Doing so, as previously described in Chapter 3, I created a list of common words found in the position titles of applicants from all of the regions, lists of words found in two of the three regions (in the rural and regional frequently used words lists, the regional and urban frequently used words lists, and the rural and urban frequently used words lists), and a list of words found only in the region-specific lists. All told, I created 14 lists: seven for non-academic activities and seven for employment experiences (see Appendix E and F for details).

Through this exercise I found that many of the words appeared in the lists of all the applicant subgroups. In the lists generated from the employment history position titles, 62 of the words could be found in the lists of all three regions. Similarly, 65 of the words from the non-academic position titles appeared in all three lists. This indicated the likelihood that many experiences are similar for applicants who graduated from high school in rural, regional and urban locations.

To further examine the differences, I reviewed the lists of the unique words and noticed that words such as “framer” and “truck” appeared in the rural applicants’ employment experiences, while “piano” and “private” appeared in the urban applicants’ employment experiences. Similarly, in the non-academic experiences the unique rural applicants’ words were such things as “church” and “work” while the urban applicants’ words were such things as “clinical” and “researcher.” This indicated that although the bulk of the words may be the same there were differences between the applicant subgroups that were worth exploring further.

Because limited access to healthcare volunteering and employment is a particular deficit that advocates argue exists in rural areas, I combined all of the words from the employment experiences into one list (removing repeated words and effectively blinding myself from the location from which each word came) and identified the words that could be easily identified as “health” related words. I then reviewed the subdivided lists to see how many times these words appeared in each of the rural, regional, and urban lists. In conducting this exercise, I found that only eight words from the employment positions could be identified as purely medical. These words were “clinical,” “neurophysiology,” “nurse,” “paramedic,” “pharmacist,” “pharmacy,” “health,” and “medical.” Of these eight words, only three appeared in the words most frequently used by the rural applicants to describe their employment positions. These were “clinical,” “nurse,” and “health.” However, both the regional and urban applicants had six of the eight words in their frequently used word lists.

I conducted the same analysis for the non-academic experiences and found that nine of the words clearly related to health care or medicine. These words were “blood,” “cancer,”

"clinic," "clinical," "health," "hospital," "medical," "medicine," and "patient." Of these nine words, five appeared in the top 100 words found in the rural applicants' experiences ("health," "hospital," "medical," "medicine," and "patient") and five appeared in the experiences of urban applicants ("clinic," "clinical," "health," "hospital," and "medical"). The regional applicants mentioned six of these words: "blood," "cancer," "clinic," "health," "hospital," and "medical." This indicated that in their 200 most frequently used words, rural applicants used the fewest medically-related words of any of the applicant subgroups (i.e., 8 words used compared to 11 by the regional applicants and 10 by the urban applicants).

4.5.1 Thematic Coding

Recognizing that the word frequency queries, by themselves, could not offer meaning beyond the identification of similarities and differences because the words were taken entirely out of context, I performed word-in-text searches for all of the words in each of the three initial employment history lists (top 100 words used by rural applicants, top 100 words used by regional applicants, top 100 words used by urban applicants, and the same for NAQ). In so doing, I was able to identify how the words were being used by the various cohorts of applicants.

By coding the words into themes as based on the National Occupational Classification system, I found that on occasion, even when applicants from all three regions used the same word, they did not always use it to refer to the same type of roles. For example, the word "crew" appeared in the lists of employment position words of all three groups of applicants. However, when the rural applicants used it, they were most frequently referring to a construction position or forestry roles, such as being on a "grounds crew" or in a "wildfire

response crew," while the regional applicants used it so divergently that I refrained from classification, and the urban applicants typically used it to describe working in a customer service role such as being a "crew member" in fast food restaurant. In such cases these words were classified into different categories—NOC 8 (natural resources, agriculture and related production occupations) for rural applicants and NOC 6 (sales and service occupations) for urban applicants.

Overall, I coded all but 16 of the rural applicants' employment position words, 25 of the regional applicants' words, and 24 of the urban applicants' words (Table 21 and Appendix). Based on the results of this exercise, I found that fewer of the rural applicants' employment words could be classified into the "health occupations" (NOC3) category than classified for the regional and urban applicants, but that the difference was very small. The greatest difference between the applicants who graduated from high schools in rural areas and those who graduated from high schools in urban areas lay in NOC 7 (9 more words than urban applicants), NOC 2 (6 more words than urban applicants), NOC 5 (6 fewer words than urban applicants), and NOC 8 (5 more words than urban applicants). These classifications are as follows: 7) "trades, transport and equipment operators," 2) "natural and applied sciences and related occupations", 5) "occupations in art, culture, recreation and sport," and 8) "natural resources, agriculture and related occupations." This indicated that although there may be many similarities in the positions and fields of work between candidates from across the geographic regions, rural applicants report unique activities and share experiences that are different from those of applicants from other regions (Table 21).

I then coded the non-academic activity words, much in the same way as I had the employment experience words. I found coding these words much more challenging because the NOC classification system was created for occupations and paid positions as opposed to unpaid roles and activities. I therefore extrapolated the NOC category based on the role one might be paid for if it had not been voluntary. For example, an unpaid tutoring role I classified as NOC 4 (education, law and social, community and government services) because this is similar to paid teaching or, in some cases, child care. Another challenge in coding the non-academic experiences arose because the applicants entered a wider variety of positions and activities into the non-academic experiences section compared with the employment history section, which meant that the types of words they used to discuss their experiences varied significantly. As such, I found I was unable to code 25 words used by rural applicants, 30 words used by regional applicants, and 32 words used by urban applicants. Despite this challenge, I managed to classify the remaining words into one of six categories. While the bulk of the words could be incorporated into relatively similar categories, the rural applicants used more words that related to "arts, culture, recreation, and sport" (NOC 5) than did either the regional or urban applicants (14 words more than the urban applicants and 6 words more than the regional applicants) (Table 22).

If one reviews the two categories combined, the largest difference between the rural and urban applicants arose in NOC 7 (unchanged from the previously reported 9 more words for rural applicants), NOC 5 (8 more words for rural applicants), NOC 1 (7 more words for urban applicants), and NOC 8 (5 more words for rural applicants). These differences highlight key trends in the data and demonstrate that rural advocates are correct in that rural individuals describe experiences that differ from those of urban applicants. Additionally, many

of the experiences they discussed seemed to align with labour and natural resource positions, while many of the experiences discussed by urban applicants aligned with administrative or office type positions. Interestingly, regional applicants tended to have the most identifiably medically related positions (NOC 3, 16 words, compared to 10 of rural applicants and 11 of urban applicants). However, as previously mentioned this classification did not preclude the obvious inclusion of medical-like words found in the applicants' experiences. In fact, based on the word in-text queries, I found that urban applicants were more likely to discuss acting in an administrative capacity in a medical office or similar environment than did either the rural or regional applicants. Further discussion of these findings can be found in Chapter 5

Table 20

Classification of Top 100 Words Used in Employment Position Titles

Variable	NOC 0	NOC 1	NOC 2	NOC 3	NOC 4	NOC 5	NOC 6	NOC 7	NOC 8	NOC 9	NA
Rural	1	2	14	2	20	4	23	11	6	1	16
Regional	2	4	7	7	13	8	23	6	3	2	25
Urban	1	5	8	4	24	10	21	2	1	0	24

Table 21

Classification of Top 100 Words in Non-Academic Position Titles

Variable	NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
Rural	1	8	3	8	22	35					25
Regional	1	9	4	9	18	29					30
Urban	2	12	6	7	20	21					32

Table 22

Classification of Top 100 Words in Employment and Non-Academic Activities Combined

Variable	NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
Rural	2	10	17	10	42	39	23	11	6	1	31
Regional	3	13	11	16	31	37	23	6	3	2	55
Urban	3	17	14	11	44	31	21	2	1	0	56

Chapter 5: Discussion

On May 1, 2018 the Globe and Mail published an opinion piece entitled "Is every medical school graduate entitled to become a doctor?" (Picard, 2018). While seemingly unrelated to the issue of rural applicant selection, the article discusses the continued need for medical schools to select students who will one day become rural physicians. Given that the best known evidence about rural physicians is that they tend to have been raised in rural areas (Avery et al., 2012; Hyer et al., 2007; Owen, Conaway, Bailey, & Hayden, 2007; Rourke, Incitti, Rourke, & Kennard, 2005; Royston, Mathieson, Leafman, & Ojan, 2012), the questions raised in this study address the on-going need to learn more about these coveted students and how they can be best supported through rigorous selection processes.

5.1 Summary of Research Findings

This study was performed in an attempt to contribute to the conversation about whether rural applicants are, by virtue of their geographic upbringing, disadvantaged when it comes to admission into competitive programs such as medical school. Bourdieu's social reproduction theory provided the theoretical underpinning of this study. As such, I sought to answer the following research questions:

i. How do rural, regional (non-urban and non-rural), and urban applicants compare demographically to one another?
ii. Is rurality associated with admissions scores (grades, MCAT scores, scores about extracurricular experiences, and interview scores) and do any associations hold true

when accounting for applicants' demographic factors (age, gender, BC residency status, Aboriginal identity, and highest level of education completed)?

iii. How do rural, regional, and urban applicants describe their extra-curricular activities, co-curricular activities, and employment experiences in their application documents?

iv. What, if anything, makes rural applicants' employment experiences and non-academic entries unique?

I used applicant data from the 2014-15 UBC MD Admissions cycle to answer these questions. I took a quantitative approach to analysis, condensing data into numbers, searching for relationships between location information and admissions metrics through statistical means, and reviewing applicants' self-descriptions in a largely quantifiable way.

5.1.1 Findings about Applicant Demographics

Applicants from rural areas were more likely to be female and to identify as an Aboriginal person than were applicants from the other regions. These findings align with other Canadian studies in that researchers have found that women from rural areas are more likely to obtain post-secondary credentials than men (Andres & Licker, 2005; Corbett, 2005). Additionally, the northern and rural areas of BC have higher percentages of Aboriginal people than urban areas (BC Statistics, 2011).

In contrast, no meaningful distinctions were found between the mean age of the applicants at the time of application (which were all around the age of 23) or in their level of education achieved. Given that previous studies indicate that students from rural areas attend post-secondary studies at different rates and in different patterns than urban students (Andres & Offerhaus, 2012; Heslop, 2012), these findings raise questions about the educational paths of

pre-medical students and whether they are more or less similar to rural students who choose to pursue other careers.

5.1.2 The Relationship Between Location of High School of Graduation and Admissions Metrics

Overall, the univariate and multivariate analyses demonstrated that rural applicants performed similarly to non-rural applicants across the majority of admissions measures (grades, non-academic evaluation scores, and interview scores). Candidates' mean overall grade point averages, which all hovered at approximately 85%, were not meaningfully different across the cohorts. Nor was the location of high school of graduation correlated with the grades students achieved in their university coursework. These findings illustrate that concerns regarding the ability of rural students to achieve high marks may be overstated, particularly as this finding aligns with other Canadian medical school studies (Hensel, Shandling & Redelmeier, 2007; Hutten-Czapski, Pitblado & Rourke, 2005; Wright & Woloschuck, 2008).

Much like GPA, the location of high school of graduation was not correlated with assessments of non-academic qualities or interview scores, as was the case in other Canadian medical school studies (Hensel, Shandling & Redelmeier, 2007; Hutten-Czapski, Pitblado & Rourke, 2005; Wright & Woloschuck, 2008). However, when I reviewed the distribution of non-academic qualities (NAQ) scores (which are scores candidates receive based on the assessment of their structured resume) I found that rural applicants received scores that were less dispersed than regional or urban applicants. None of the previously mentioned studies reported such a finding. Yet, because medical schools are highly selective, it remains important

to consider to what extent individuals are able to achieve scores at the highest ends of the score range. Additionally, findings from this analysis incite questions about the driver of this difference. Are they attributed to rater perceptions, the structure of the scoring rubric, or the types of experiences applicants entered into their applications (Siu & Reiter, 2009)? All of these factors may contribute to such a scoring anomaly, and without further exploration could become inadvertently exacerbated and impact future applicant outcomes.

The finding regarding rural students' poorer performance on the MCAT is consistent with other studies (Basco, Gilbert, & Blue, 2002). It has been conjectured that rural applicants' poorer performance on the MCAT is due to a lack of access to MCAT test centres (as they are generally located only in cities) (Hudson, Tesson, Strasser, 2009); however, this cannot be determined for this cohort. A cursory review of the Association of American Medical Colleges (AAMC) website shows that the current MCAT testing centres in British Columbia are located in Vancouver and Victoria (MCAT, nd), which suggests that accessibility may be an issue (McGaghie, Downing, & Kubilius, 2010).

In addition, there exists an extensive market for tutoring and other preparative material and instruction. According to an investment report, in 2017, the Kaplan test preparation company, which provides practice exam questions, small group instruction and many other standardized test study aides, brought in $273.3 million of revenue (Cooney, 2018). While not all of this money is attributable to sales related to MCAT preparation, these earnings demonstrate the extensive reach and profitability of these types of "shadow

education"[28] services for those who can afford them. The accessibility of appropriate and economically viable test-preparation services for rural individuals remains largely unknown and could potentially be another factor leading to lower performance on the MCAT.

Another possibility that could explain the MCAT scores is the potential for rural applicants to be underprepared for the exam's content based on their previous experiences with foundational science concepts. Teacher shortages in northern and rural Canadian settings are widely documented as is the even more dire shortage of specialist teachers in subjects like chemistry, physics, and mathematics (Kitchenham & Chasteauneuf, 2010; Nielsen, 2009). While these issues seemed not to affect rural applicant GPAs (as evidenced by the outcomes of this study), one cannot simply use GPA to dispute the possibility that high school education impacts MCAT outcomes. GPA can be manipulated, to some extent, by the student. They have the power to choose their degree, institution, and course-load. However, the MCAT is one structured examination, testing the same content in every setting, and does not account for individual preferences or strengths. Further exploration is necessary to determine the extent to which a lack of pre-university science curriculum impacts pre-medical student performance, particularly on measures like the MCAT.

5.1.3 Findings about Applicants' Self-descriptions in their Admissions Documents

In the non-academic experiences section of the application, rural, regional, and urban applicants entered a similar number of activities, placed the bulk of their experiences in similar

[28] Shadow education refers to tutoring and learning that occurs outside of standard educational environments. While shadow education can be offered by private or public entities, it is most commonly provided at great additional cost to parents and students and is considered vital to the student's edification.

sections, and committed a similar number of hours to those activities. However, in the employment experiences section of the application, rural applicants entered significantly more experiences and reported working more hours compared with the regional or urban applicants. These findings indicate that rural advocates may be correct in postulating that rural applicants have more work experience than do non-rural applicants. However, my findings suggest that their concern that rural individuals do not have access to extra-curricular and unpaid experiences may not be warranted. However, rural applicants may still participate in experiences that are different than their urban peers. This latter finding is discussed in more detail below.

5.1.4 Findings about the Types of Experiences Reported by Applicants

Inside of the non-academic experiences themselves, thematic coding of the word frequency queries indicated that rural applicants generally participate in similar types of activities as do regional and urban applicants. However, I noted subtle differences in use of medically related words, the types of experiences rural applicants participated in when using those words, and the frequency with which they reported words that related to unpaid recreational experiences. Conversely, coding of their employment experiences indicated that rural applicants were more likely to engage in manual labour and forestry related roles than were either regional or urban applicants, although regional applicants described participation in more of these activities than did the urban applicants.

As stated previously, these findings present contradictory information. They cannot confirm nor refute the idea that rural applicants share fundamentally different experiences in their medical school applications than their non-rural peers. Although there appear to be a

number of unique qualities to rural applicant experiences, particularly in their employment experiences, they also participate in similar "pre-med" type experiences, like clubs, community service, and academic research. If greater differences exist during high school as postulated by some (Rourke, 2005), the intervening time period may compensate for some of this "disadvantage." Other researchers will have to explore this possibility in more detail and determine the extent to which a student's activity involvement remains constant across their educational journey.

5.1.5 Findings as they Relate to the Theoretical Framework

As previously stated, Bourdieu's Social Reproduction Theory discusses the interaction between one's nature (habitus), one's ability to use one's nature to improve one's situation (cultural capital), and the outcome or system one wants to influence (the field). Findings from the content analysis suggest that rural applicants have a different habitus than non-rural applicants. The finding that rural applicants work more hours and have held more paid experiences by the time they apply to medical school indicates that the way they navigate the educational environment and the experiences it offers differs from non-rural applicants, particularly those raised in urban settings. Additionally, rural and non-rural applicants seem to participate in slightly different experiences, with rural applicants engaging in fewer activities directly related to medicine and more related to the trades and natural resources.

Although it is difficult to speculate the composition of the cultural capital of rural applicants in comparison to that of urban applicants, the fact that they seem to be admitted in proportional numbers, indicates that they are able to exert their cultural capital in ways that enable them to achieve their desired outcomes. Additionally, findings regarding grade point

averages, non-academic scores, and interview scores, all seem to indicate that their cultural capital is sufficient for the field on which they are competing.

However, the same does not appear to be true for the MCAT. Although it is not possible to know for certain, this finding may be more related to the structure of the field, in that rural applicants must travel to the exam, than to either their capital or their habitus, though certainly their capital does not seem to be able to compensate for the challenges this hurdle poses. Regardless, findings demonstrate that once players are engaged in the field of medical school admission, current selection practices enable a fair number to enter medical school. In this way, the field, as it is currently constructed at UBC medical school and similar schools, may not be disadvantaging rural applicants.

Yet, findings from this study also suggest that changes to the field, through the change in value of various selection tools, could easily shift the field against rural applicants and make it difficult or impossible for them to play. Additionally, given that so few players even choose to participate (only 4.3% of this sample), there may be systemic issues preventing them from considering "playing the game" to begin with. Future researchers will have to explore how rural applicants identify their suitability for the medical school admissions game, if improvement is to be made to the number who choose to apply.

5.2 Implications

Admissions processes are school and often program specific. As such, one must be careful about over-generalizing the relationship of rural applicant experiences and performance on the admissions selection tools mentioned in this study. Because UBC's medical

school specifically and purposefully incorporates the opinions and insights of rural individuals into the creation of its selection rubrics, it is not possible to say whether the observed lack of relationship between location of high school of graduation and the non-academic selection measures (NAQ, MMI) results from that sensitivity to contextual differences, reflects a genuine lack of disadvantage, or some combination therein. As mentioned before, other programs and schools should review their selection processes for similar relationships before deciding that rural applicants are similar to others.

As many medical schools use the MCAT as a pre-interview selection tool, they may be inadvertently disadvantaging rural applicants in their admissions processes. It may be worthwhile for institutions to explore the extent to which they use the MCAT for applicant selection and whether the other factors they consider in their admissions process counteract this negative relationship.

Moreover, findings from this study demonstrate that although statistical tests may indicate a lack of relationship between location of upbringing and final admissions outcomes, it is worthwhile looking at selection practices in a more in-depth manner. Subtle differences in the assessment of rural applicant's experiences, particularly as they relate to scoring at the upper end of the range, as well as the indication that their experiences are not entirely similar to non-rural applicants, provide insight into how assessment measures can be adapted to better promote rural applicant performance.

Additionally, this study, unlike the studies of the Canadian comparisons (Hensel, Shandling & Redelmeier, 2007; Hutten-Czapski, Pitblado & Rourke, 2005; Wright & Woloschuck, 2008), is situated in a medical school that was expanded to help recruit, admit,

and train rural medical students. Therefore, the fact that rural applicants comprised only 4.3% of the sample indicates that having a local institution geared towards these types of students is not motivation enough to encourage a representative portion of rural candidates to apply. As others have suggested, barriers to medical school likely begin significantly before the application process. Therefore, in order to address the systemic shortfall of competitive rural applicants, significant effort likely needs to be focused on students at the secondary and post-secondary level, well in advance of medical school application.

5.3 Limitations

There are several limitations to this study. Primarily, it only looks at one year of admissions data. Additionally, there have been two recent changes to the UBC medical school admissions policy, which could profoundly impact the applicant pool: 1) as of the 2016-2017 application cycle the program stopped requiring applicants to take a specific series of prerequisite science courses (though they remain highly recommended) and 2) in 2015, the Association of American Medical Colleges (AAMC) changed the content and scoring system of the MCAT. This change has added complexity into the admissions process, in that not all recent applicants to the UBC MD program have taken the same standardized test. This means that while there are notable trends in these data, it remains to be seen if they are reproducible across application years, particularly the most recent two years.

One factor that limited the analysis was the lack of socioeconomic status data for this applicant pool. Had socioeconomic status data been available, the correlation of high school of graduation and socioeconomic status could have been explored. Additionally, this information may have illuminated whether the rural applicants represented in the sample, and admitted to

the medical program, characterized the diversity of rural areas, or whether those in the sample represented the most privileged of rural individuals.

Another limitation of this study is that UBC has a unique non-academic file evaluation process that attempts to consider a wide variety of applicant traits and characteristics—including those identified with rural applicants such as the valuation of performing manual labour or working full time as equal or more than activities traditionally identified with urban candidates such as traveling internationally. Additionally, the UBC non-academic assessment does not give credit to applicants for engaging in prestigious activities. Therefore, I did not review the impact that this might have on the assessment outcomes. Although I found that rural applicants scored similarly to non-rural applicants on this particular factor, other schools should review their own selection processes to ensure that their rural applicants do not perform poorly on their own non-academic selection tools, including essays and curriculum vitae assessments. Based on the findings of this study, special attention should be paid to the assessment of work experiences. Additionally, if experience prestige is an important factor in these assessments, it may be worthwhile reviewing the impact of this on rural applicants. My impression of the rural applicant experiences in this sample, while unsubstantiated, is that they occurred in different locations than those of urban applicants.

However, the content analysis aspects of this study also have significant limitations. The foremost limitation is that coding and analyses were conducted by one reviewer who was not blinded as to the location of the applicants who generated specific words and entries and, hence, the results could be biased by reviewer opinion. There were many reasons for this, some of which arose out of the computer software's functionality and the way in which

information could be extracted. Yet, as mentioned in Chapter 3, I engaged several tactics to help limit the influence of bias.

Another limitation to this study is that the word frequency queries generated a list of words that could be confounded by a number of issues including 1) a co-occurrence with another word that could over emphasize the prevalence of a theme, 2) excessive use of a word by very few applicants which could skew the results (more likely a problem for rural and potentially regional applicants than for urban applicants, due to smaller sample size), 3) the inability to code a word into a classification due to its variety of uses, and 4) the inability to account for all uses of a word during classification. All of these challenges could lead to an artificial over- or under- representation of themes. However, as an initial foray into rural applicants' backgrounds, these results provide an impression of the similarities and differences that are worth considering further. I encourage other researchers to explore more comprehensively applicants' representations of their experiences, as there are likely many more differences, subtle and otherwise encapsulated within.

5.4 Possible Future Research

At the close of this study, I am left with more questions than answers. As this study demonstrates, there are vast amounts of information about applicants' lived experiences that are yet to be explored. Many of the questions that arise ask why. Why are rural and regional applicants' MCAT scores lower than those of urban applicants? Why, given that grades and MCAT scores are intended to indicate an applicant's readiness for the academic rigor of the medical program, are grades unrelated to high school of graduation, yet MCAT scores are? And, overall, why are so few rural individuals applying to medical school?

Similarly, in formulating this thesis, questions arose as to where rural applicants attended post-secondary school. Other research indicates that applicants are most likely to attend institutions closer to home, which, for rural students, tend to be teaching intensive universities or colleges. If this is true of rural medical school applicants, are there differences between those who attend the teaching intensive versus research intensive universities? And what impact does this choice have on the classes they take, their pre-medical degrees, their grades, and their preparation for the medical school (or similar) admissions process?

Additionally, questions about how applicants decide what to enter into their applications, how they choose to describe their activities, and the impact of those descriptions on raters' perceptions, all remain unclear. In the same vein, questions about the impact of socio-economic status on these choices, descriptions, and experiences, particularly as they relate to rural applicants, remain unanswered.

And, within the efforts to classify applicants by rurality more questions arise. Given that this study's findings point to some similarities between rural and regional applicants, I wonder to what extent my definitions of rural influenced these results. I wonder, at what point one's lived experience more closely resembles that of an urban or suburban raised person, than a rurally raised person. For example, is the lived experience of someone who grew up in a remote place with a population of 10,000 people or 20,000 more similar to a rural person than an urban person? And also, are these distinctions important to downstream admissions processes, such as those of medical programs? Do the converging factors of university education and experience help to erase any previous "deficits" that may have existed? I hope that other researchers will contemplate these and other questions.

5.5 Conclusions

These findings address the belief that rural individuals do not compare with their non-rural counterparts. There are several subtle differences between rural applicants and others that should not be under emphasized or ignored despite the fact that rural applicants scored very similarly to other applicants across medical school admissions tools (apart from the MCAT). As is widely known by administrators of selection processes, even minute differences in admissions criteria can significantly have an impact on one's program eligibility and admission.

Results of this study reinforce the importance of admissions policies that evaluate applicants in a background appropriate manner. Programs wishing to admit rural students need to be cognizant of what they consider to be "standard" or desirable preparative or "pre-med" experiences, including what they consider to be appropriate MCAT scores and non-academic accomplishments. As previously mentioned, results suggest that rural applicants are more likely to engage in paid-employment and to work more hours per week than their non-rural peers. If these activities are not considered in non-academic assessments, schools may inadvertently disadvantage these applicants. This study also raises questions about the comparativeness of applicant experiences. Although there may be some aspects of their experiences that are very similar, many questions remain as to the impact of less obvious factors, such as a candidate's choice or use of certain position titles, the words they use to describe their experiences, and the relative weight of acquiring experiences in prestigious or non-prestigious locations.

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Appendices

Appendix A: From UBC MD Admissions Help Guide 2014-2015

Leadership:
Leadership is defined as the capacity or ability to lead, a person who commands, guides or inspires others. Qualities include, but are not limited to, initiative, motivation of others, providing vision and implementation, personal and professional development, and decision making.

Service Ethic:
These experiences exhibit involvement in activities that demonstrate participation for the benefit or welfare of others. They can include volunteer activities (generally considered positions without monetary compensation) as well as work experiences (which, as a reminder, should be listed in the Employment History section). Consideration is given to length of time not only in any particular activity, but overall continuous service ethic for a significant duration of time, level of involvement, roles and responsibilities, activities considered outside an applicant's "comfort zone", and demonstrated preparation for a career in medicine.

When considering your entries for this section, please note that experiences demonstrating service ethic are not limited to those pursued as part of a formal volunteer organization. Applicants are encouraged to include experiences that occur within both recognized agencies/organizations and those that are done independently or in an unstructured environment. Applicants will need to ensure that they are able to provide verification for each of their listed activities.

Capacity to Work with Others:
This category recognizes applicants' abilities to work with groups which take them beyond their peers, friends, school and co-workers. Consideration is given to an applicant's experience and knowledge gained from working with groups and individuals including, but not limited to, customer service teams, diverse age groups, cultures different from one's own (immersion), socio-economic background other than own, individuals with physical, emotional and psychological disabilities, sexual orientation, etc.

Diversity of Experiences:
Active participation in events or activities leads to the accumulation of knowledge and skills. These experiences can be attained through, but are not limited to: travel, sports, cultural, music/theatre/arts, non-academic awards and scholarships.

High Performance in an Area of Human Endeavour:
Occasionally, applicants have been or are involved in one or more activities at a level that exceeds what can be expected of a typical, average applicant. These individuals receive recognition by way of non-academic awards, honours, etc., that are reserved for only the highest examples. If you have attained a high level of performance in an activity or received an exceptional level of recognition, please provide the details.

Appendix B: Non-academic Evaluation

(Taken from UBC Faculty of Medicine Admissions Website July 19, 2015)

Motivation, social concern and responsibility, creativity, scientific and intellectual curiosity, attitude toward continuing learning, maturity, integrity, and realistic self-appraisal, are just a few examples of important non-academic qualities.

In an effort to select well-rounded, mature, empathetic and caring individuals who will be best suited for success in medicine, the non-academic section of the application is given significant weight in our evaluation.

The evaluation of non-academic criteria is based on the following:
Report of Non-Academic Experiences
Employment History
Research
Awards
Interview, when offered
Three References (only for applicants invited for an interview)
Aboriginal Essay, if applicable
Rural Remote Suitability Evaluation, if applicable

Activities and achievements are reported and evaluated using the following categories: leadership, service ethic, capacity to work with others, diversity of experience, and high performance in an area of human endeavor. Within each category, a variety of factors are considered when assigning a score. Generally, higher scores are assigned to activities that demonstrate significant levels of responsibilities, initiative, and commitment over activities with minimal duration or degree of responsibility. We seek activities which showcase intentional, genuine concern for others, demonstrated by long-standing volunteer commitments or employment in a caring industry. No preference will be given for applicants gaining experience abroad, versus those seeking to choose activities close by. We also look for significant involvement and interaction with people from various backgrounds and abilities beyond your normal peer group. We also consider additional skills, competencies, and understandings gained as a result of diverse life experiences.
Each category looks at different experiences with concepts such as life experience in general, life experiences outside one's comfort zone, degree of involvement, roles and responsibilities, levels of accomplishment and duration of activity.

Applicants are evaluated on their non-academic activities and interests which demonstrate the following aptitudes: motivation, social concern and responsibility, creativity, scientific and intellectual curiosity, attitude toward continuing learning, maturity, integrity, and realistic self-appraisal, among other qualities.

If applicants are intending to strengthen the non-academic portion of their application, they should pursue activities that are of interest to them and which will prepare them for a career in medicine. Intentional community involvement is valued and can encompass a variety of experiences within and outside of the health care setting, in paid or volunteer positions. The intensity of the activity as well as the time commitment are just two aspects which are considered by evaluators. Please note that just as applicants are required to demonstrate above-average academic abilities, a good NAQ score requires demonstration of above-average non-academic qualities.

Verifiers for non-academic experiences (including activities and employment history) can be contacted at any time from the date of application submission until mid-April of the following year.

Verifiers are contacted to confirm specifics of an activity and can also be contacted at random. Discrepancies between the details in your application and those confirmed by the verifier are noted and may affect your file. Applicants are strongly encouraged to ensure the information they provide is accurate.

Applicants interested in pursuing medicine in northern, rural or remote communities are encouraged to complete the Rural and/or Northern Training section of the application, used to help determine the suitability of applicants for the Northern Medical Program and a select number of positions in the Southern Medical Program. Experiences in rural/remote/northern/Aboriginal settings, along with evidence of self-reliance, community ties, and relevant activities, factor into the assessment.

Appendix C: Grade Conversion Chart

This grade conversion chart can be found on the UBC MD Admissions website: http://mdprogram.med.ubc.ca/admissions/evaluation-criteria/ It has been in use since 2010 to convert the grades for students from institutions that do not use a numeric scale out of 100 to calculate GPA. This scale was originally adapted from the scales used by UBC graduate studies and the Ontario Medical Schools Admissions System, to provide the fairest conversion of grades possible for students from across Canada's many post-secondary institutions.

Table 1	
Letter Grade	Converted Value
A+	95
A	87
A-	82
B+	78
B	74
B-	70
C+	66
C	62
C-	58
D+	54
D	50
D-	46
F	25

Table 2	
Letter Grade	Converted Value
A+	n/a
A	92
A-	84
B+	78
B	74
B-	70
C+	66
C	62
C-	58
D+	54
D	50
D-	46
F	25

Appendix D: Excerpt from MED 2019 Admissions Statistics

Table 1
GENDER DISTRIBUTION

ENTERING CLASS BY GENDER				ALL APPLICANTS BY GENDER				B.C. APPLICANTS BY GENDER			
	2013	2014	2015		2013	2014	2015		2013	2014	2015
WOMEN	154	161	**131**	♀	944	1087	**1138**	♀	620	642	**735**
%	53.5%	55.9%	**45.5%**		49.2%	51.2%	**49.0%**		48.9%	49.7%	**49.6%**
MEN	134	127	**157**	♂	976	1037	**1184**	♂	647	649	**748**
%	46.5%	44.1%	**54.5%**		50.8%	48.8%	**51.0%**		51.1%	50.3%	**50.4%**
TOTAL	288	288	**288**		1920	2124	**2322**		1267	1291	**1483**

Table 2
AGE DISTRIBUTION FOR ENTERING CLASS

Age / year	<20	21-23	24-26	27-29	30-32	33-35	36-38	39+	Mean Age
2013	8 (3%)	151 (52%)	84 (29%)	29 (10%)	8 (3%)	5 (2%)	2 (0.5%)	1 (0.5%)	23.93
2014	11 (4%)	144 (50%)	84 (29%)	29 (10%)	9 (3%)	7 (2%)	3 (1%)	1 (.05%)	24.11
2015	**14 (5%)**	**166 (58%)**	**72 (25%)**	**20 (7%)**	**10 (3%)**	**4 (1%)**	**0 (0%)**	**2 (1%)**	**23.65**

Appendix E: Top 100 words found in the NAQ Position titles

ALL			Rural	Rural/ Regional	Regional	Regional/Urban	Urban	Urban/Rural
aid	leader		academic	band	blood	ambassador	clinical	centre
assistant	leadership	travel	activities	students	canada	clinic	events	children
athlete	life	trip	athletic	travelling	cancer	competitive	facilitator	head
award	medical	tutor	church		cross	dance	field	recreational
basketball	member	undergraduate	class		education	director	general	senior
camp	mentor	university	course		exchange	emergency	manager	service
canadian	music	varsity	fitness		food	event	presenter	ubc
captain	organizer	volleyball	fundraising		fundraiser	executive	researcher	
care	orientation	volunteer	grade		junior	family	vancouver	
chair	participant	youth			level	founder	week	
club	peer		house		national	lab		
coach	piano		learning		royal	outreach		
committee	player		living		running	poster		
community	presentations		medicine		unbc	summer		
conference	president		outdoor			support		
coordinator	program		patient			teacher		
council	project		recipient			vice		
day	representative		recreation			year		
experience	research		relay					
first	school		rural					
group	science		scholarship					
health	shadowing		study					
high	soccer		trainer					
hockey	society		treasurer					
hospital	sports		victoria					
instructor	student		work					
international	team							
intramural	training							

Appendix F: Top 100 words found in the Employment History Position titles

ALL		Rural	Rural/Regional	Regional	Regional/Urban	Urban	Urban/Rural
advisor	nurse	business	clean	director	consultant	private	health
aid	operator	cafeteria	construction	electrician	data	referee	hostess
assistant	program	caretaker		engineer	senior	work	nserc
associate	project	carpenter	desk	founder	youth	math	peer
attendant	receptionist	day		ballet	analyst	medical	school
barista	registered	dishwasher	farm	biol	chemistry	junior	
bartender	representative	driver		centre	food	maintenance	
biology	research	end	field	4th	office	academic	
camp	researcher	exploration		agent	pharmacist	administrative	
care	residence	facilitator	shop	dance	pharmacy	child	
cashier	Sales	fighter		delivery	specialist	community	
clerk	science	fire		department	study	course	
clinical	server	firefighter		landscaper	swim	english	
coach	service	framer		line		mentor	
cook	services	framing		neurophysiology		officer	
coordinator	staff	french		paramedic		organic	
counsellor	student	fun		production		personal	
counselor	summer	geologist		provider		piano	
crew	supervisor	guide		technologist		support	
customer	teacher	hand		year		swimming	
employee	teaching	helper				trainer	
first	team	invasive					
front	technician	lead					
general	tutor	shift					
graduate	undergraduate	store					
head	worker	truck					
instructor		usra					
intern		waitress					
lab							
laboratory							
laborer							
labourer							
leader							
lifeguard							
manager							
member							

Appendix G: Random Selection of Non-Academic Activity Entries

Activity Type	Title	Organization	Start Date	End Date	Time Period	Activity Description	Hours	Time Clarification
Capacity to Work with Others	Spring break volunteer group leader	University program office	12-Feb-14	16-Feb-14	School Year (Sep - Apr)	Instilled confidence in a group of 5 children from socially and economically disadvantaged backgrounds in inner city school by providing guidance and mentorship on their science project and encouraging participation in classroom activities. Acknowledged the lack of resources, showed empathy and support through 1on1 interactions with the children.	30	
Service Ethic	Caresitter	Health Authority	08-Sept-12	30-Dec-12	School Year (Sep - Apr)	I was assigned an individual in the community that wanted someone to visit with them once a week. I visited a man who was bedridden. He loved hockey, current events and telling old war stories. I would visit him for four hours and we would watch hockey while he told me stories about the good old days.	50	

Activity Type	Title	Organization	Start Date	End Date	Time Period	Activity Description	Hours	Time Clarification
Service Ethic	Hospital Emergency Volunteer	Hospital	1-Mar-06	01-Jul-11	Year-Round	Duties involved: directed patients to various units in hospital; liaison between hospital staff and friends/family members of patients; greeting and talking with incoming friends/family/patients in waiting area; assisting patients; restocking hospital equipment; being able to handle new or unexpected events in a dynamic emergency environment.	325	I volunteered two hours each week on average except when I was volunteering out of the country, and when I was taking small trips elsewhere. I've been volunteering less lately due to my work.
Diversity of Experiences	Social Justice Committee	Women's Shelter	01-Sept-13	01-Dec-13	Year-Round	The purpose of the committee is to develop annual social justice priorities and organizational positions on social issues. The committee identifies and actively addresses current and emerging issues. It ensures the principles of feminism are consistently reflected and active at the shelter and it will promote social justice in the broader community	100	Monthly meetings with committee (3 h), meet with shelter clients to identify issues (4h/mnth), contribute to internal and external communications ie. blogs, newsletters (10h/mnth).

Activity Type	Title	Organization	Start Date	End Date	Time Period	Activity Description	Hours	Time Clarification
Diversity of Experiences	Travel to tropical country	none	20-Feb-14	01-Mar-14	Once per year	Went to a tropical country for several days, explored the mountains and the jungle. I explored the slums with the assistance of a local guide, went to the coral reef, learned how to use a catamaran, climbed a waterfall with the assistance of a local guide we went up the centre of the waterfall, also went to see a local museum.	240	I counted all of the hours that I was gone.
Diversity of Experiences	Musical Theatre	Theatre Company	14-Feb-10	07-Aug-11	Year-Round	Various musical theatre performances where proceeds were donated to the local theatre to maintain its function in the community	200	Rehearsal schedule ranged from 1-4 times a week with rehearsals lasting 2-4 hours, total is approximate for all 3 shows

Activity Type	Title	Organization	Start Date	End Date	Time Period	Activity Description	Hours	Time Clarification
Leadership	Recreation Volunteer	Seniors Centre	15-Sep-12	01-Jun-13	Year-Round	My role was to encourage and motivate senior residents to participate in physical, mental and cultural recreational activities. Despite a clear age gap I grew my leadership skills by implementing and directing events such as bowling, game days, and art classes. Most importantly, I excelled at building deep and honest relationships with the seniors.	41	1-2 hours/week were performed weekly since the start date.
Leadership	President	Chemistry Graduate Society	25-Sep-14	01-Jun-15	Year-Round	I am responsible for delegating tasks between 17 other chemistry society members. I oversee the organization of weekly meetings, departmental socials, sporting events and obtainment of liquor licenses. Keeping track of inventory, the budget and selling lab coats to new chemistry undergraduate students are all a large part of this position.	120	Weekly, the society meets for about one hour. Per semester, event organization and lab coat sales each take at least 20 hours in planning and performing. Random events take about 10 hours to organize.

Activity Type	Title	Organization	Start Date	End Date	Time Period	Activity Description	Hours	Time Clarification
Leadership	First Response Division Training Coordinator	First Response Organization	01-Jan-10	30-Jun-10	Year-Round	I plan and monitor the ongoing training of members and oversee the Training Program as a whole. Each session I provide a brief summary of the subject being covered, e.g. burn management or stroke care. I prepare practice scenarios, put members into groups, observe their performance and correct mistakes.	105	Jan. 2010-Jun. 2010:4-5 hrs/week preparation (reviewing the modules and preparing 4-5 practice scenarios),2hrs/month: meetings with Division Manager and other first responders

Appendix H: Rural Applicant Employment Word Classifications

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
manager	business	assistant	nurse	advisor	coach	associate	carpenter	crew	operator	aid
	receptionist	exploration	registered	biology	head	attendant	clean	farm		care
		field		camp	instructor	barista	construction	fighter		caretaker
		geologist		clinical	teacher	bartender	driver	fire		coordinator
		invasive		counsellor		cafeteria	framer	firefighter		employee
		lab		counselor		cashier	framing	hand		facilitator
		laboratory		day		clerk	general			first
		nserc		french		cook	helper			lead
		project		fun		customer	laborer			leader
		research		graduate		desk	labourer			member
		researcher		health		dishwasher	truck			shift
		technician		intern		end				student
		undergraduate		lifeguard		front				summer
		usra		peer		guide				supervisor
				program		hostess				team
				residence		representative				worker
				school		sales				
				science		server				
				teaching		service				
				tutor		shop				
						staff				
						store				
						waitress				

Appendix I: Rural Applicant Non-Academic Activities World Classifications

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
president	chair	presentations	children	award	athlete					academic
	committee	research	experience	camp	athletic					activities
	coordinator	undergraduate	health	church	band					aid
	council		hospital	class	basketball					assistant
	fundraising		medical	community	captain					canadian
	organizer		medicine	conference	club					care
	representative		patient	leader	coach					centre
	treasurer		shadowing	leadership	fitness					course
				life	grade					day
				mentor	high					first
				orientation	hockey					group
				peer	instructor					head
				program	international					house
				recipient	intramural					learning
				relay	living					member
				scholarship	music					project
				science	outdoor					rural
				service	participant					student
				society	piano					students
				tutor	player					study
					recreation					ubc
					recreational					victoria
					school					volunteer
					senior					work
					soccer					youth
					sports					
					team					

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
					trainer					
					training					
					travel					
					travelling					
					trip					
					university					
					varsity					
					volleyball					

Appendix J: Regional Applicant Employment Word Classifications

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
director	data	engineer	care	advisor	ballet	agent	clean	farm	operator	4th
manager	office	field	neurophysiology	biol	coach	associate	construction	landscaper	production	aid
	project	lab	nurse	biology	dance	attendant	electrician	member		analyst
	receptionist	laboratory	paramedic	camp	head	barista	general			assistant
		research	pharmacist	chemistry	instructor	bartender	laborer			centre
		researcher	pharmacy	clinical	lifeguard	cashier	labourer			consultant
		undergraduate	registered	graduate	swim	clerk				coordinator
				leader	teacher	cook				counsellor
				provider		customer				crew
				residence		delivery				first
				science		department				founder
				teaching		desk				intern
				tutor		employee				program
						food				senior
						front				services
						line				staff
						representative				student
						sales				study
						server				summer
						service				team
						shop				technician
						specialist				technologist
						supervisor				worker
										year
										youth

Appendix K: Regional Applicant Non-Academic Activities Word Classifications

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
president	committee	lab	blood	ambassador	athlete					aid
	representative	poster	cancer	camp	band					assistant
	council	presentation	care	conference	basketball					award
	executive	research	clinic	education	captain					canada
	fundraiser		emergency	event	coach					canadian
	organizer		hospital	food	competitive					club
	chair		junior	founder	cross					community
	director		medical	health	dance					day
	coordinator		shadowing	leadership	exchange					experience
				mentor	high					family
				orientation	hockey					first
				outreach	instructor					group
				peer	intramural					international
				students	music					leader
				support	national					level
				teacher	piano					life
				tutor	player					member
				vice	royal					participant
					running					program
					school					project
					soccer					science
					sports					society
					team					student
					travel					summer
					travelling					training

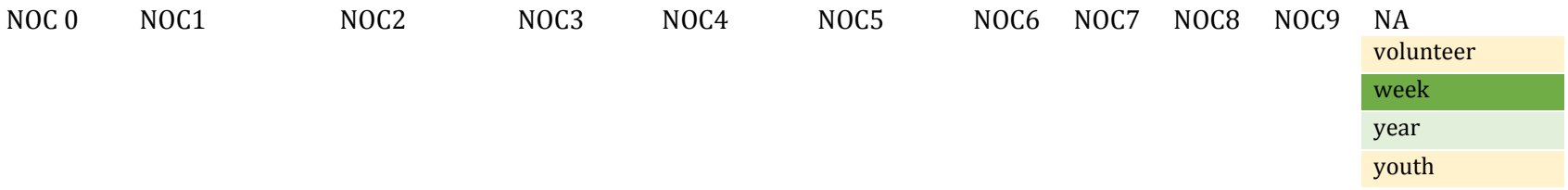
NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
					trip					unbc
					varsity					undergraduate
					volleyball					university
					year					volunteer
										youth

Appendix L: Urban Applicant Employment Word Classifications

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
manager	administrative	clinical	nurse	academic	coach	associate	general	maintenance		aid
	data	graduate	pharmacist	advisor	head	attendant	labourer			assistant
	medical	lab	pharmacy	analyst	instructor	barista				care
	office	laboratory	registered	biology	lifeguard	bartender				community
	project	nserc		camp	personal	cashier				consultant
		research		chemistry	piano	clerk				coordinator
		researcher		child	referee	cook				course
		undergraduate		counsellor	swim	crew				employee
				counselor	swimming	customer				first
				english	trainer	food				health
				leader		front				intern
				math		hostess				junior
				mentor		member				officer
				organic		receptionist				operator
				peer		representative				program
				private		sales				senior
				residence		server				staff
				school		service				student
				science		services				study
				support		specialist				summer
				teacher		supervisor				team
				teaching						technician
				tutor						work
				youth						worker

Appendix M: Urban Applicant Non-Academic Activity Word Classifications

NOC 0	NOC1	NOC2	NOC3	NOC4	NOC5	NOC6	NOC7	NOC8	NOC9	NA
manager	chair	lab	care	ambassador	athlete					aid
president	committee	poster	clinic	award	basketball					assistant
	coordinator	presentation	clinical	camp	captain					canadian
	council	presenter	emergency	children	coach					centre
	director	research	hospital	community	competitive					club
	event	researcher	medical	conference	dance					day
	events		shadowing	founder	field					experience
	executive			group	high					family
	facilitator			leadership	hockey					first
	organizer			life	instructor					general
	representative			mentor	intramural					head
	vice			orientation	music					health
				outreach	piano					international
				peer	player					leader
				science	recreational					member
				service	soccer					participant
				society	sports					program
				support	travel					project
				teacher	trip					school
				tutor	varsity					senior
					volleyball					student
										summer
										team
										training
										ubc
										undergraduate
										university
										vancouver


NOC 0
NOC1
NOC2
NOC3
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NOC7
NOC8
NOC9
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volunteer
week
year
youth