Factors Associated with Employment for Graduates of Canadian Health Sciences Undergraduate University Programs

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Abstract

This project seeks to study the patterns of employment arising from an undergraduate education in health-related sciences. We employed descriptive and multivariate statistical methods to analyze two existing databases retrieved from Statistics Canada. The first source is the National Graduate Survey (NGS), and the second is the Labour Force Survey (LFS). We applied ordinary logistic regression to both the NGS and LFS to determine the statistically significant factors associated with successful employment in the health sector. Our results show that employability is associated with province, educational attainment, occupation, and industry. This study suggests that employed recent graduates employed in health-related industries were mainly employed in public sectors. Individuals who were employed in health-related industries were commonly young individuals. Individuals who graduated from health-related field of study also had one of the highest rates of working in their degree field. Most individuals working in a health science-related industry were part-time workers. A study of this nature can allow for the development of policies and standards to ensure students receive the appropriate training in health science-related university programs for future job prospects. Further research is needed to assess how much impact these factors have on the employability in health science-related industries for Canadian university graduates.

Ce projet vise à étudier les résultats d'emplois découlant d'un baccalauréat relié au secteur de la science de la santé. Nous avons utilisé des méthodes statistiques descriptives et multivariées afin d'analyser deux bases de données existantes procurées de Statistique Canada. La première source est l'Enquête nationale auprès des diplômés (END), et la seconde est l'Enquête sur la population active (EPA). Nous avons appliqué la régression logistique ordinaire à la END et EPA afin de déterminer statistiquement les facteurs associés aux profils d'employabilité. Cette étude a démontré que la province, leur profession, et l'industrie aux succès d'employabilités.Cette étude suggère que les récents diplômés employés dans l'industrie de la science de la santé ont été principalement engagés dans le secteur public. Les personnes qui ont été employées dans le secteur de santé sont généralement jeunes. Les personnes qui ont obtenu un diplôme lié au secteur de santé ont également l'un des taux d'employabilité le plus haut dans leur domaine d'études. La plupart des personnes qui travaillent dans un secteur lié à la science de la santé étaient embauchées à temps partiel. Une étude de cette nature permet le développement de nouvelles politiques et normes afin d'assurer que les étudiants reçoivent les formations nécessaires dans les disciplines liées à la science de la santé et d'assurer leurs réussites rendues sur le marché du travail. De plus amples recherches sont nécessaires pour évaluer à quel point ces facteurs impactent l'employabilité des diplômées des universités canadienne dans les industries associées aux sciences de la santé.

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Introduction

According to a report by the Toronto Workforce Innovation Group, education level is one of the most important factors in determining success in the labour market. The report used data from Statistics Canada's Labour Force Survey and indicated that "during the first eight months of 2015, Ontario added 45,600 jobs for people 25 and older," yet all of these jobs "were concentrated among those with postsecondary credentials."(Toronto Workforce Innovation 7) In contrast, 91,000 people with a high school diploma or less lost their jobs during the same period (Miner, 2014). Unsurprisingly, education is a primary predictor of employment success.

The number of high school graduates enrolling in Canadian universities has been increasing (Council of Ontario Universities, 2013a), and health-dominated fields have been recorded as having one of the fastest growing enrolment rates (The Association of Universities and Colleges of Canada, 2011b). This is not just an undergraduate trend. Students are choosing to pursue studies in health-dominated fields at all levels of education, as it is also one of the top disciplines to study at the Master's level (The Association of Universities and Colleges of Canada, 2011b). However, little is known about how student preference for health-related fields of study translates to activity within the Canadian labour system.

The research described in this thesis sought to examine the patterns of employment arising from an undergraduate education in health-related sciences. I explored perceived gaps between postsecondary educational choices and actual patterns of employment. In other words, I sought to understand the extent to which our educational infrastructure services sectorial needs, specifically those of the health and related industries.

Recently, there has been a growing interest in Canadian youth's transition from formal education into the workforce (Davies, 2000). Transitioning to the workforce is a work in progress rather than a landmark event. For university graduates, finding a permanent job can take up to five years, making the process very stressful as well as lengthy (Finnie, 2000). The CIBC 2013 World market report attributes this to universities misusing resources to fund out-of-demand fields of study, thus producing a disconnect between skills acquired and skills needed for a job (Tal et al, 2013).

Part of the policy debate surrounding educational reform is around the degree to which curricula must be refined to reflect industry standards and demand. One argument is that universities could and should leverage students' strengths and interests to better channel the acquisition and development of certain necessary labor force skills This is in contrast to the more purist stance that the purpose of formal education is to provide life skills, personal development, and intellectual perspective, without necessary regard for employability or industry needs (Casner-Lotto et al, 2006). Those adhering to the former position argue that greater investment in students' marketable skills could ease the transition to the workforce, thus taking the burden off employers, who otherwise have to initiate remedial training sessions for ill-equipped graduating students (Casner-Lotto et al, 2006).

We hope that in some small part, results from this research exploring the gap between education and employment expectations will provide policy makers (governmental and institutional) with perspective and evidence changing curricula or standards for certain fields of study, if indeed increased workforce participation is the goal. When considering this goal, it is important to always keep in mind the fact that individuals pursue higher education for a host of

reasons. The degree to which education offers a competitive advantage in the workforce is but one reason.

The thesis demonstrates interdisciplinary through means of health science discipline, education, epidemiological methodology and the impact on policy. Epidemiology was exemplified by employing statistics methods to analyze incidences, distributions and correlations. Furthermore interdisciplinary was seen by examining educational postsecondary institution criteria and skill acquisition in health science related fields of studies and the relationship and effects on current policies at hand.

After doing some digging, I found very little information regarding employment patterns for health- sciences related fields. Seeing as how I graduated from a health science background, I wanted to investigate the subject to comprehend the future trajectories of my program relating to employment opportunities. This study appealed to me as I pursued further education after my Bachelors of Health Science, in order to be qualified for a job in the Government of Canada.

Objectives

Through the secondary analysis of existing data, I seek to achieve the following objectives:

1. Demographically describe the population of Canadian students presently pursuing undergraduate education in health sciences.
2. Describe the factors associated with workers currently employed in health-related sectors.

3. Determine the factors at which graduates of sub-disciplines of health-related sciences find work in related and unrelated sectors.

Given the aforementioned objectives, I seek to answer the following research questions:

1. What factors are associated with recent Canadian graduates currently employed in health-related disciplines?
2. What factors are associated with currently being enrolled in the health sciences field of studies?

Summary of the Literature:

Fields of study and Canadian Universities

There are approximately 1.2 million students enrolled in Canadian universities, and enrolment has been increasing steadily since the late 1990s (The Association of Universities and Colleges of Canada, 2011c). However, a recent demographic shift has caused post-secondary enrollment to drop 2.9% for the first time in 15 years. This decline is believed to be due to people having smaller families, and to baby boomers' children having already finished their education (Brown, 2014).

As a collective, Ontario universities have awarded the most degrees, relative to the overall Canadian average (Council of Ontario Universities, 2013b). The most common major field of study with either college diploma or university in Canada was "business, management, marketing and related support services" (Statistics Canada, 2011). Programs pertinent to health studies have obtained the highest increase in applicants and enrollment; health-science and related programs almost doubled in the last decade and a half (The Association of Universities and Colleges of Canada, 2011b; Council of Ontario Universities, 2013c).

Canadian Health Science Graduates and Employment

The health-science related field of study is the most pursued field among postgraduate students. As well, individuals who have completed a bachelor's degree in health-related sciences had higher than average rates of attaining further education (Statistics Canada, 2014a). Health professionals, including doctors, nurses, anesthesiologists, and other specialized professionals, are the most likely to see their employment well matched to their field of study (Hango et al, 2007). Yet there are few data that focus on the employment experiences of graduates of health sciences, beyond clinical professions, possibly due to these disciplines being traditionally grouped with vaguely related programs, such as the professional sciences (Hango et al, 2007; Statistics Canada, 2014a). Most relevant research has focused on the more specialized health professionals, like doctors and nurses.

What little information exists about the workplace outcomes of health sciences graduates indicates fortuitous employment experiences. For example, a longitudinal study following the income of 82,000 University of Ottawa graduates between 1998 and 2010 found that graduates from a health-related field reported having the second-highest income earning in the first year, after computer science and engineering. After 12 years, health graduates' incomes were on par with those of Social Science and Humanities graduates, which are one of the lowest earning groups (Finnie et al, 2014).

The Disconnection between Skills Acquired and Market Value Skills

Those skills deemed as critical assets for success in the workforce are a combination of basic knowledge and applied skills, professionalism, teamwork, creativity and knowledge of foreign languages (Fadel, 2012; McLester et al, 2006; Morin-Parsons, 2009). According to "The

Workforce Readiness Report Card", which lists skills deemed necessary in the 21st century workforce; over a third of employers rated four year university graduates as "deficient" in leadership skills, written communication and professionalism (Casner-Lotto et al, 2006). About a third of university graduates are in the lower range for literacy and numeracy skills (Hango, 2014). Clearly, there is a gap between young people's educational experiences and the expectations of the workplace. Employers are placing the blame for this gap on educational institutions (Casner-Lotto et al, 2006; Morin-Parsons, 2009).

Specifically health professions may be better positioned than other fields of study to breach this perceived gap. The relationship between job knowledge requirements and the subject matter of health professionals' programs is somewhat or closely related, at least when assessed after six months of graduation, according to the 2103 Ontario Grad Survey (Council of Ontario Universities, 2014).

The U.S Department of Education reports that 60% of all new jobs in the 21st century will require skills that are possessed by only 20% of the current workforce. Canada estimates that by 2031, 77% of the workforce will need to have post-secondary credentials to sustain the workforce, up from 60% in YEAR. The Toronto Workforce Innovation Group predicted in their report that in the future, Canadians will be faced with large numbers of workers looking for jobs that require skills they do not possess, thus a large number of jobs will go unfilled. And the number of people retiring will be highest among occupations requiring skills (National Math + Science Initiative, 2013; Toronto Workforce Innovation Group, n.d.) It seems likely that the perceived gap between skills acquired in formal education and those required in the will expand.

Part of the challenge in elucidating the extent to which this gap applies to the health sciences is disentangling this field from the physical, natural, or medical sciences that tend to

receive most of the attention, with respect to employment prospects. According the Human Resources and Skills Development of Canada, information and communication technology, science services and health care services have the highest number of future job opportunities. Despite Canada's high university enrollments, it ranks lower than other countries such as China, for participation in science, technology; engineering and mathematics (STEM) related programs (McLester et al, 2006).This applies for advanced degrees in STEM as well (Employment and Social Development Canada, 2014; Komarnicki, 2012).

Although we have seen a decrease in employment rates among graduates across all programs in Ontario Universities, both 6 months and 2 years after graduation (Council of Ontario Universities, 2013d). In 2001, the average employment rate was 94% 6 months after graduation, which decreased to 86% in 2010 (Council of Ontario Universities, 2013d). Graduates reporting that their work was closely related to their field of study also decreased in the time period, from 80% to 75% (Council of Ontario Universities, 2010). These trends exist despite the fact that employment during school terms and summer, through various government-run organizations aimed at students, has been steadily increasing in the last several decades; about 70% of full-time university students work during the summer vacation (Marshal, 2010).

Gender

More Canadian women than ever before are in enrolling in postsecondary studies, which may explain in part why there is an overall increase in university enrollment (Allen et al, 2003). Since the early 1990s in Canada, more women than men have enrolled in or completed undergraduate degrees (Turcotte, 2010). Since 2008, women have also represented over 50% of the master's student population, but they remain the minority in PhD programs (Turcotte, 2010).As well, in the last three decades, there has been a steady increase of women entering the

workforce(Ferrao, 2010). Women also comprise more than 60% of university graduates between the ages of 25 and 29 (Frenette et al, 2007). In 2014, women comprised 47.3% of the labour force in Canada (Status of Canada, 2015). In recent years, the employment gap between genders has diminished as women's participation in the labour force has increased (Status of Canada, 2015). Nonetheless, women still account for the majority (70%) of part-time workers in Canada. This statistic has not changed in the last several decades (Ferrao, 2010). Men are still dominant in managerial positions in the workforce in most employment sectors (Ferrao, 2010; Turcotte, 2010). Many STEM-related programs and professions remain male-dominated fields, with the exception of the health domain, which is female-dominated (Allen et al, 2003; Fadel, 2012). Indeed, according to Statistics Canada, women represent over half of employees in health and medical professions (Statistics Canada, 2010).

The gender gap in education attainment and employment has narrowed in the past decade, but there are still considerable differences among the sexes when it comes to income (Finnie et al, 2014). The most considerable gender difference in income is among the computer science and engineering fields; there was an average $15,000 difference per year, with men making more. Among other fields, including health, the gender gap in income is minimal to nothing in the first year of employment, but overtime increases to an average $20,000 difference annually by end of career (Finnie et al, 2014).

Immigrants

Students who are landed immigrants or have obtained a student visa remain the minority among registered university students in Canada. The majority of the immigrants registered in Canadian universities are landed immigrants from Asia. However, half of STEM-related degrees from Canadian universities are held by immigrants. Even though immigrants represent just under

a quarter of Canada's overall population, over a third have Canadian university degrees (Statistics Canada, 2011). Research has shown a strong connection between immigrant parents' education levels and their children's educational choices (Statistics Canada, 2001).

Parental influences

Parental belief in higher education is one of the most influential predictors of student academic achievement. In the last couple decades, parents' views of the importance of university education has risen over 30%; parents are more likely to expect and encourage their children to enroll in university (Abdul-Alim, 2010). Having parents who obtained a university degree is a strong predictor of whether an individual will attend university. Since the late 1990s, however, the number of students who pursue a university education has almost doubled, despite whether their parents having university degrees or not. Women whose parents did not attend university are now three times as likely as to obtain a degree than they were two decades ago (Turcotte, 2011).Second-generation student immigrants are also more likely to obtain a university degree than those with Canadian-born parents. University registration was also dependent upon their parents'annual income; higher parental income increased the likelihood of university enrollment (Turcotte, 2011).

Reasons Individuals Enroll in Universities

Individuals pursue higher education for numerous reasons, including for overall intellectual growth and personal development. There is no denying, however, that many choose to pursue higher education, often at great expense, to improve employment opportunities (OECD, 2013a). Research shows that those who attend university are: more likely to live longer,

less likely to commit crimes or be incarcerated, more likely to give back to the community, and perform better in the labor market (OECD, 2013a). Students who enroll in university tend to have more varied and diverse social networks compared to those who don't attend university. A strong social network is important for career development and personal growth (OECD, 2013b). Other job-related reasons for pursuing higher education include, advancing one's present career and obtaining further certifications and qualifications. Others' expectations are another employment-related factor motivating individuals to enroll in universities: peers, parents, and future employers often expect young adults to obtain recognizable degrees with perceived value on the job market. Indeed, people start thinking about higher education at a young age, and career plans can start to develop as early as elementary school (Wahl & BlackHurst, 2000).

It is therefore important to stress that while this thesis focuses on the relationship between education and employment, formal education has a wider role to play both societally and in terms of individual growth, that simply as a lever for career growth.

Socioeconomic Status

Socioeconomic status is a multidimensional construct defined by a variety of indicators, including education level, occupation, social class, and income. The importance of education is usually emphasized more in families of higher socioeconomic status than in families of lower socioeconomic status (American Psychological Association, 2016). Poorer families typically prioritize food and safety over receiving a higher education (American Psychological Association, 2016). Research shows that students belonging to families of lower socioeconomic status have lower and slower academic achievements relative to students born in families of high socioeconomic status (American Psychological Association, 2016). Education is also representative of income; earnings increase with each additional level of education. Higher

education paves the way to obtaining a skill set, or specific qualities for acquiring jobs (American Psychological Association, 2016).

Different occupations are categorized as either high or low socioeconomic status positions. Jobs pertaining to a high socioeconomic status include physicians, lawyers, and chemical and biomedical engineers. These positions are considered by many to be more challenging, have higher educational requirements, and be more autonomous. Occupations of lower socioeconomic status include food preparation workers, bartenders, maids, and janitors. These jobs pay lower wages and don't require post-secondary education; they may require more labor-intensive skills but they are also less autonomous (American Psychological Association, 2016). Clearly, higher education is more closely associated with the former group.

Methodology:

We employed a series of descriptive and multivariate statistic methods to answer the research questions noted above. Two data sets were analyzed, both obtained from Statistics Canada. Two different data sets were used because each describes a different population: one samples recent graduates, while the other describes the entire workforce. Since the sample size is large (50,000 & 100,000 respondents) we did an online power test as a rough estimate and it was well over power, therefore no need for further exploration.

The research questions were addressed by employing descriptive statistics to both the data sets, with special attention to demographic, geographic, institutional, co-educational factors, and the nature of students employed in health related industries. Ordinary logistic regression was applied to both data sets to answer both research questions.

According to Statistics Canada, health-related industries variable was defined to include and health care and social assistances such as hospitals clinics, medical and diagnostic laboratories, ambulatory services, nursing care facilities, community housing services and child care services (Innovation, Science and Economic Development, n.d.). Health science related fields of study included dentistry, medicine, surgery, nursing, optometry, pharmacy, public health, rehabilitation sciences, and more (Statistics Canada, 2016).

Ethics

This project does not require ethics approval by the University of Ottawa Research Ethics Board due to the public nature of the data being used.

Data Description

We used pre-existing and publicly accessible databases from Statistics Canada to assess patterns of employment arising from an undergraduate education in health-related sciences. This study used data from the 2013 Labor Force Survey (LFS) and 2013 National Graduates Survey (NGS).

The LFS is a mandatory survey that is conducted and released monthly. It is a sample survey with a cross-sectional design. It provides information relating to employment, unemployment, and other labour market indicators. Variables of this survey include industry, occupation, and hours worked. The main objective of the survey is to gather descriptive and statistical information on individuals who are employed, non-employed, and not in the labour market. The average number of respondents for the LFS is an estimated 100,000. The NGS is a voluntary Canadian Survey whose frequency of data collection is random; 2013 was the most recent data collection year. It is a sample survey with a cross-sectional design. This survey addresses variables such as success in obtaining employment after post-secondary graduation

and job satisfaction. The main objective of the survey was to gather information on recent graduates' experiences entering employment and examine the relationship between employment and education. The number of respondents for the NGS for 2013 is estimated at 400,000 (Statistics Canada, 2015).

Data collection:

The Labour Force Survey data was retrieved through a web-based data exploration, extraction and analysis tool called <odesi>, provided by the University of Ottawa's Library. It acts as a data repository in which data from different sources, such as surveys from Statistics Canada, can be extracted. Data for the Labour Forces survey was extracted from <odesi> and further analyzed using SPSS.

Access to the National Graduate Survey was achieved by obtaining approval to the Carleton, Ottawa, Outaouais Research Data Centre (COOL-RDC), which offers secure access to detailed microdata from Statistic Canada's Surveys. This application process was necessary to gain access at the variable: Field of Study/Specialization graduate students enrolled in, which was not publicly available. The application process to gain entry to COOL-RDC data included extensive personal security checks on each researcher involved, a current Microdata Research Contract and an access key card to enter the secure and locked room. My thesis supervisor, Dr. Raywat Deonandan, and I were granted "reliability status" following a security check, and after having taken the Oath of Office and Acknowledgement of Compliance of Terms. We were required to work with the microdata in the same manner as Statistics Canada employees: ensuring the protection of all confidential data. This involved following a set of rules designed to ensure survey respondent privacy, including submitting all data manipulations to an analyst to

ensure maintenance of proper confidentiality. At the end of the contract, the researchers must provide Statistics Canada with the final product of their data analysis.

Data analysis:

Labour Force Survey (LFS)

Univariate Methods:

Univariate analysis was first employed to describe the samples in the data set. Frequencies, means, skewness, and other descriptors were generated on the data set to determine the distribution of the variables. The purpose of this step was to identify any missing values, and to determine whether recoding of variables or the collapsing of variable levels was necessary. The variables chosen were on relevance to type of work (industry, etc.), demographics and educational factors found in the Labour Force Survey.

The most important recoding task was to group the different industries of employment into meaningful categories, with health-related industries defined accordingly. The table below summarizes the response levels that were re-coded and which level is the reference variable for the logistic regression performed. The Labour Force survey variables were aligned as well as possible with the National Graduate Survey variables for consistency while presenting results. Some variables were dichotomized, such as setting educational credit boundaries; below high school achievement and high school and above.

Table 1: List of variables and recoding for first and second logistic regression using the Labour Force Survey to determine the factors associated with employability status and being employed in health-related industries.

Variable	Levels	Recoded to
Province	Newfoundland	Atlantic provinces

	Prince Edward Island	
	Nova Scotia	
	New Brunswick	
	Québec	Québec
	Ontario	Ontario
	Manitoba	Western provinces, territories
	Saskatchewan	
	Alberta	
	British Columbia	
Age of respondent (5 year gap)	15 to 19	Less than 25
	20 to 24	
	25 to 29	25 to 29
	30 to 34	30 to 39
	35 to 39	
	40 to 44	40 or more
	45 to 49	
	50 to 54	
	55 to 59	
	60 to 64	
	65 to 69	
	70+	
Marital Status	Married	Married
	Common-law	
	Widowed	Single
	Separated	
	Divorced	
	Single, never marry	
Highest degree, certificate or diploma obtained	0 to 8 years	Post-secondary diploma and below
	Some secondary	
	Grade 11-13,grad	
	Some post-secondary	
	Post-secondary diploma	
	University: bachelor degree	Above a post-secondary diploma
	University: graduate degree	
Current Student Status	Non-student	Non- Student
	Primary/secondary school, Full time	Student
	Primary/secondary school, Part time	
	University Full time	
	University Part time	
	College/CEGEP Full time	
	College/CEGEP Part time	

	Other Full time	
	Other Part time	
Industry of main job	Health service	Health Related industry
	Agriculture/Forestry/Fishing/Mining, oil and gas extraction	Other Industry
	Construction	
	Goods-producing industries and utilities	
	Trade, transportation and warehousing	
	Finance, insurance, real estate and public administration	
	Professional, scientific and technical services	
	Management, administration and other support	
	Educational service	
	Other	
Respondents occupation	Health Care and social assistance	Health Related occupation
	Management, admin and other support	Other occupation
	Finances, insurance, real estate and public administration	
	Professional, scientific and technical services	
	Education, law, social and government services	
	Sales and services	
	Trade, transportation and warehousing	
	Occupations in manufacturing	
	Other	

Bivariate Methods:

After coding was complete, the bivariate analysis was run to identify which variables already demonstrated a degree of association with being employed or unemployed. Following standard procedure, all variables showing a bivariate association with the employment outcome with a p-value of less than 0.05 were retained for further multivariate modelling. All the variables were included because they all satisfied this criterion. Categorical variables were

assessed using chi-square analysis, while continuous variables were examined using two-sample t-tests. In addition, we tested for multicollinearity using a bivariate correlation matrix which compared all continuous variables to one another using Spearman's correlation coefficient.

Multivariate Methods:

As a final step, two binary logistic regressions were run to model covariates against the outcome of "being employed vs unemployed" (for the LFS data set) and "employed in health related industries vs employed in non-health related industries" (for the NGS data set). Post-hoc diagnostic techniques were employed to assess the goodness of the models: classification plots, the Hosmer-Lemeshow test, and an analysis of casewise listings. The identification of confounders was not necessary for this type of model, because of the nature of the forced-entry logistic regression model, which would accommodate all putative modelled confounders.

Various suspected interaction terms were tested by examining the change in regression coefficients in both the presence and absence of the tested interaction terms. Identified interaction terms were then forced into the final regression models.

National Graduate Survey (NGS)

Univariate Methods, Bivariate Methods and Multivariate analysis:

The same univariate, bivariate and multivariate methods were applied to the National Graduates survey but with the dichotomous outcomes being "health related field of study" or "Other fields of study". The table below summarizes the response levels that were re-coded and which level is the reference variable for the logistic regression performed on the National

Graduate Survey. The most important recoding task was to group the fields of study into meaningful categories.

Table 2: List of variables and recoding for third logistic regression using the National Graduate Survey to determine the factors associated with being enrolled in health science-related fields of study in Canadian Universities.

Variable	Levels	Recoded to
Language spoken at time of graduation	English only	English
	French only	French
	English and French	
Studies completed at time of graduation	College or CEGEP diploma or certificate	Below Bachelor's degree
	BA degree, 1st prof. degree diploma/certificate Below BA	Bachelor's degree and above
	Master's degree, doctorate, university diploma/certificate above BA	
Status in Canada	Canadian Citizen by birth	Canadian citizen
	Canadian Citizen by naturalization	
	Landed immigrant	Immigrant
Highest educational attainment at time of survey	College or CEGEP diploma or certificate	Below Bachelor's degree
	BA degree, 1st prof. degree diploma/certificate Below BA	Bachelor's degree and above
	Master's degree, doctorate, university diploma/certificate above BA	
Job education requirement	No postsecondary education	Below Bachelor's degree
	Trade/vocational diploma or certificate	
	College or CEGEP diploma or certificate	
	University diploma or certificate below bachelor level	
	Bachelor's degree or first professional degree	Bachelor's degree and above
	University certificate, diploma, degree above the BA	
Job qualification	No qualifications specified as needed	Respondent has less than required
	No education requirements specified	
	Respondent has less than required	

	Respondent has same as required	Respondent has the same or more than required
	Respondent has more than required	
Undergraduate Field of study	Health, Parks, Recreation and Fitness	Health-related field of study
	Mathematics, Computer and Information Sciences	Other fields of study
	Education	
	Visual and Performing Arts, and Communications Technologies	
	Humanities	
	Social and Behavioural Sciences and Law	
	Business, Management and Public Administration	
	Physical and Life Sciences and Technology	
	Architecture, Engineering, and Related Technologies	
	Agriculture, Natural Resources and Conservation	
	Personal, Protective and Transporation Services	
	Other	
Academic Ranking	In the top 10%	In the top 25%
	Below the top 10% but in the top 25%	
	Below the top 25% but in the top half	Below the top 25%
	Below the top half	

Results

Labour Force Survey: Employment Status

Table 3 describes the variables that were included in the logistic regression analysis to determine the factors associated with employability. Furthermore in Table 4, the study has shown that employability is associated with province, higher educational attainment, occupation and industry ($p<0.05$). The factors that were associated with the outcome of being unemployed were: higher education, most occupations, and most industries ($OR<1$). It was not surprising that provinces were positively associated with status of unemployability with respect to the western provinces. Thus the western provinces were the most employable provinces across Canada

($p<0.05$; $OR>1$). Higher education was positively associated with employment status ($p<0.05$; $OR<1$). The occupations with positive associations with employment were: management, administration and other support; finances, insurances, and real estate; professional, scientific, and technical services; healthcare and social assistance; and education, law, social and government services ($p<0.05$; $OR<1$). The industries with the strongest positive associations with being employed were finance, insurances, and real estate; and education, and health care and social assistance ($p<0.05$; $OR<1$).

The model fails the Hosmer and Lemeshow test; this suggests that the model is a "good fit" for the included variables ($p>0.05$). The Cox & Snell R square value should be large, but is small (0.017). This value indicates that the amount of variance in the database. This is mainly relevant if one is making predictions, but this study aims to explore patterns of employment against educational choices rather than to make predictions. The Omnibus tests of model coefficients yielded a p-value of <0.001, which suggests that the model is significant and is not describing random associations. Lastly, collinearity between variables was tested for teasing out any strong inter-variable relationships, defined as having coefficients higher than 0.8. For this model, there was no presence of collinearity.

We tested for the following interaction terms, as they showed moderate to high bivariate relationships: Age x Marital status; Age x Education; Age x Student Status; Province x Industry. There was a suspected interaction between the variables of age and marital status, so these were introduced in the final model. This is an obvious interaction term, as the likelihood of being married increases as one gets older.

Table 3: Univariate Analysis: Frequencies, distribution of the variables and the presence of missing values for the variables used in the Labour Force Survey (LFS) data set to determine the factors associated with being employed.

Variable	N	Missing Values	Mean	Standard Deviation	Kurtosis	Skewness
Province	57636	0	2.94	1.074	-0.949	-0.597
Sex of respondent	57636	0	1.48	0.500	-1.994	0.079
Age	57636	0	3.21	1.076	-0.291	-1.074
Highest educational attainment	57636	0	1.89	0.319	3.843	-2.417
Current student status	57636	0	1.09	0.284	6.400	2.898
Class of worker	57636	0	1.77	0.420	-0.318	-1.297
Occupation of main job	57636	0	5.20	2.431	-0.870	-0.316
Marital status	57636	0	1.49	0.500	-1.99	0.027
Permanent	49007	8629	1.12	0.328	3.289	2.300
Industry (outcome variable)	57636	0	1.87	0.338	2.750	-2.179

Table 4: Variables used in the logistic regression to determine factors associated with being employed in Canada

Variables	Unadjusted p-value (obtained from t-test and chi-square)	Adjusted p-value (obtained from logistic regression)	Odds ratio
Province	.000*		
Atlantic Provinces		.000*	6.567
Quebec		.000*	3.534
Ontario		.000*	2.236
Western Provinces and territories (reference variable)		.000*	2.236
Sex	.000*		0.935
Age* Marital status		.217	
Age(1)* Marital status		.637	1.1620
Age(2)* Marital status		.149	2.198
Age(3)* Marital status		.099	1.550
Age	.171		N/A
Less than 25		.680	.434
25 to 29		.104	.184
30 to 39		.070	.441
40 or more(reference variable)			
Marital	.000*	.125	1.217
Highest Educational Attainment	.000*	.000*	.629
Current Student Status	.012*	.144	.708
Class of Work	.000*	.526	1.165
Occupation	.000*		N/A
Management, admin and other support		.000*	.219
Finances, insurance, real estate and public administration		.021*	.237
Professional, scientific and technical services		.524	.792
Health Care and social assistance		.067	.287
Education, law, social and		.257	.705

government services			
Sales and services		.546	1.166
Trade, transportation and warehousing		.000*	2.689
Occupations in manufacturing		.000*	4.004
Other (reference category)			
Industry	.000*		
Agriculture/Forestry/Fishing/Mining, oil and gas extraction		.079	.613
Construction		.000*	2.939
Goods-producing industries and utilities		.500	1.157
Trade, transportation and warehousing		.032	.665
Finance, insurance, real estate and public administration		.004*	.262
Professional, scientific and technical services		.846	.931
Management, administration and other support		.486	1.202
Educational service		.013*	.272
Health service		.034*	.425
Other (reference category)			

Table5. Diagnostics Tests for first logistic regression analysis

Test	**Significance**
Hosmer and Lemeshow Test	.238
Cox & Snell R Square	.017
Omnibus Test	<0.001

Labour Force Survey: Employment in Health-Related Industries

Table 6 describes the variables that were included in the logistic regression analysis to determine the factors associated with employability within health-related industries. Skewness and kurtosis analyses revealed nothing untoward that would disqualify those factors from inclusion in the multivariate model. As seen in Table 7, Province, occupation, sex, age, and class of work are all shown to be factors associated with being employed in health-related sectors ($p<0.05$). The odds ratio values less than unity represent a negative association between the outcome of being employed in industries other than those that are health-related. Therefore, of

those factors found to be significant, provinces, some occupations, being female, and being 25 years old or younger yielded the most positive associations with being employed in health-related industries (OR<1). Being less than 25 years old had the greatest association with being employed in health-related industries compared to the reference group of 40 years of age and over ($p<0.05$, OR< 1). The occupations that included management, administration and other support; health care and social industries, and education, law, social and government services were more likely to be employed in health related industries. ($p<0.05$, OR< 1).

For the goodness of fit statistics, the Hosmer and Lemeshow test showed a significance value of $p<0.001$, suggesting a poor fit. But it's likely that a data set larger than 1000 cases fails the R squared value because the differences between the observed and expected values within each group are relatively small. So this might be a large oversampling issue. Also, in this model the Cox & Snell R squared value is high (0.279), as it should be. The Omnibus tests of model coefficients, the p-value value is <0.001, therefore the model is significant. As above, collinearity was tested for by applying a bivariate analysis again and teasing out any strong coefficients (higher than 0.8), for this model there was no presence of collinearity (see Table 12).

We tested for the following interaction terms: Age x Marital status, Age x student status, and Age x education. Of these, the former two were found to be significant, and were therefore introduced into the final model. **Table 6 : Univariate Analysis: Frequencies, distribution of the variables and the presence of missing values for the variables used in the Labour Force Survey (LFS) data set to determine the factors associated with being employed in health-related industries.**

Variable	N	Missing Values	Mean	Standard Deviation	Kurtosis	Skewness
Province	105194	0	2.87	1.089	-1.068	-0.507
Sex of respondent	105194	0	1.51	0.500	-1.996	-0.060
Age	105194	0	3.25	1.117	-0.241	-1.162
Marital status	105194	0	1.51	0.500	-1.997	-0.051
Highest educational attainment	105194	0	1.79	0.410	-0.041	-1.400

Current student status	85375	19819	1015	0.355	1.926	1.981
Class of worker	71662	33532	1.78	0.413	-0.148	-1.361
Industry of main job	71662	33532	5.78	2.919	-1.339	0.122
Industry	71662	33532	5.34	2.407	-0.782	-0.393
Labour force status	58132	47062	1.01	0.092	112.220	10.687

Table 7: Variables used in the logistic regression to determine factors associated with being employed in a health-related industry in Canada

Variable	Unadjusted p-value (obtained from t-test and chi-square)	Adjusted p-value (obtained from logistic regression)	Odds ratio
Province	.000*		
Atlantic Provinces		0.041*	.900
Quebec		.005*	.867
Ontario		.113	1.073
Western Provinces and territories (reference variable)			
Sex	.000*	.000*	.330
Age	.000*		
Less than 25		.020*	.274
25 to 29		.444	1.288
30 to 39		.004*	2.163
40 or more (reference variable)			
Marital Status	.000*	.122	.929
Highest Educational Attainment	.000*	.363	1.072
Current Student Status	.000*	.180	1.243
Class of Work	.000*	.000*	1.934
Occupation	.000*		
Management, admin and other support		.010*	.832
Finances, insurance, real estate and public administration		.000*	4.423
Professional, scientific and technical services		.000*	2.053
Health Care and social assistance		.000*	.017
Education, law, social and government services		.000*	.521
Sales and services		.000*	1.340
Trade, transportation and warehousing		.000*	7.694
Occupations in manufacturing		.000*	38.776
Other (reference category)			
Permanent or not	.000*	.314	.947
Age*student status			
Age(1)*student status		.004*	1.791

Age(2)*student status		.063	.657
Age(3)*student status		.350	.626
Age*marital status			
Age(1)*marital status		.066	1.640
Age(2)*marital status		.087	1.260
Age(3)*marital status		.234	.898

Table 8: Diagnostics Tests for second logistic regression analysis

Test	**Significance**
Hosmer and Lemeshow Test	<0.001
Cox & Snell R Square	.279
Omnibus Test	<0.001

National Graduate Survey: Enrollment in Health-related Industries

Our results indicate an association between province, sex, citizenship, studies completed at time of graduation (2009-10), language, educational attainment, job educational requirements, full-time job status, job qualification, further education program or training for job, permanent status, whether employer specified field of study or work experience as a requirement for current job, job in relation to education, academic ranking, coop opportunity, with the outcome of having enrolled in a health-science related field of study in 2007.

Table 9 describes the variables that were included in the logistic regression analysis to determine the factors associated with individuals being previously enrolled in a health-related field of study. Much like table 6, these results show nothing that would disqualify these variables from inclusion in the multivariate model. The third and final logistic model as seen in Table 10, showed an association province, sex, status in Canada, studies completed at time of graduation (2009-10), language, educational attainment, job educational requirements, full-time job status, job qualification, further education program or training for job, permanent status, whether employer specified field of study or work experience as a requirement for current job, job in relation to education, academic ranking, coop opportunity, with the outcome of having enrolled in a health-science related field of study in 2007. Of the above-mentioned significant factors, the

Western provinces had the most positive association with studying in health-related field ($p<0.05$, $OR>1$). Most individuals who were enrolled in a health-related field of study in university were least likely to have obtained co-op experience before graduation and had completed less than a bachelor's degree at time of graduation in 2007 ($p<0.05$, $OR<1$). Canadian citizens were more likely to be enrolled in health-related fields of study($p<0.05$, $OR>1$). Health science and related fields seemed to be associated with being ranked below the top 25% academically among peers ($p<0.05$, $OR>1$), and not taking any additional educational programs after graduation ($p<0.05$, $OR<1$). Individuals who were enrolled in a health-related fields had higher chance of obtaining permanent jobs, and feeling that their job was related to their education ($p<0.05$, $OR>1$).

Furthermore, being female was strongly associated with having been enrolled in a health-related fields of study ($p<0.05$, $OR<1$). As for industry and occupation neither was significant because none of the individual p values were below 0.05. Individuals who graduated from a health related field were associated with being employed in areas in which the employer had specified work experience or field of study as a requirement ($p<0.05$, $OR>1$). Current job education requirement for these individuals was a bachelor's degree and above ($p<0.05$, $OR<1$). As for the variable job qualification, the study showed that the individuals demonstrated less qualifications than required($p<0.05$, $OR<1$). Language seemed to also demonstrate a significant association in that English speaking individuals were more likely to have been enrolled in health-related field of study($p<0.05$, $OR>1$). In the logistic regression, working full-time before graduation, and feeling as if one's has the skills to cope with job demands no longer demonstrated an association with the outcome of previously being enrolled in a health-related field of study.

The significance value for the Hosmer Lemeshow test is low (<0.001) and therefore significant, so the model does not fail the test. The Cox & Snell R square the Cox & Snell R squared value is high (0.433), as it should be. The Omnibus tests of model coefficients' p-value value is <0.001, making the model significant.

Table 9: Univariate Analysis: Frequencies, distribution of the variables and the presence of missing values for the variables used in the National Graduate Survey (NGS) data set to determine the factors associated with being enrolled in a health-related field of study.

Variable	N	Missing Values	Mean	Standard Deviation	Kurtosis	Skewness
Province	431921	0	2.81	.885	-.857	-.165
Worked full-time before graduation	431716	205		.454	-1.159	.917
Language spoken at time of graduation	290999	140922	1.15	.352	2.030	2.007
Sex of respondent	431921	0	1.57	.494	-1.910	-.301
Status in Canada	419375	12546	1.04	.203	18.169	4.491
Highest known level of studies completed at time of graduation	430424	1497	1.62	.486	-1.775	-.475
Classification of job 2013 survey week as full-time or parttime	369804	62117	1.13	.338	2.722	2.173
Job education requirement of last weeks job	217185	214736	1.65	.478	-1.617	-.619
Job Qualification	307567	124354	1.05	.225	13.630	3.953
Taken programs towards certificate, diploma or degree since graduation	428567	3354	1.61	.489	-1.812	-.433
Is this first job after graduation	368229	63692	1.52	.499	-1.991	-.093
Job Permanent or Not	345398	86523	1.19	.393	.467	1.571
Employer specified specific field of study	262505	169416	1.27	.446	-.973	1.013
Employer specified related work experience	342661	89260	1.46	.498	-1.972	.167
Feel have skills to cope with demanding duties	342877	87371	1.13	.334	2.937	2.222
Job held lastw eek related to certificate, diploma or degree	345797	86123	1.20	.403	.155	1.468
Academic Ranking	369055	62866	1.18	.385	.722	1.650
Co-op	382708	49213	1.85	.354	1.976	-1.994

Highest educational attainment	430237	1684	1.53	.499	-1.981	-.136
Industry grouping for job last week	431921	0	23.96	30.035	1.888	1.939
Broad occupational category for job held last week	431921	0	17.94	32.523	1.934	1.934
Field of study (outcome variable)	431921	0	1.85	.356	1.91	-1.976

Table 10: Variables used in the logistic regression to determine factors associated with being enrolled in a health-related field of study in Canada

Variables	Unadjusted p-value (obtained from t-test and chi-square)	Adjusted p-value (obtained from logistic regression)	Odds ratio
Province	.000*		
Atlantic Province		.000*	1.291
Quebec		.256	1.131
Ontario		.000*	1.290
Western Provinces and territories (reference variable)			
Worked full-time before graduation	.000*	.768	.991
Sex	.000*	.000*	.545
Language spoken at time of graduation	.000*	.001*	1.430
Status in Canada	.000*	.000*	1.488
Studies completed at time of graduation	.000*	.003*	1.170
Full-time/part-time status	.000*	.000*	1.325
Current job educational requirements	.000*	.003*	.870
Job qualification	.000*	.000*	.741
Taken any educational programs for job since graduation	.000*	.000*	.559
First job after graduation	.000*	.000*	1.500
Permanent status	.000*	.000*	1.399
Employer specified field of study as requirement	.000*	.000*	1.466
Employer work experience as requirement	.000*	.000*	1.302
Feel as if have the skills to cope with job demands	.000*	.016*	1.096
Job related to education	.000*	.000*	3.328
Academic ranking	.000*	.000*	1.221
Program had coop	.000*	.000*	1.402
Highest educational attainment	.000*	.000*	1.632
Industry for job held last week	.000*		
Goods-producing industries		1.000	.968
Trade, transportation and warehousing		1.000	1.000

Finance, insurance, real estate, public administration		.993	.000
Professional, scientific and technical services		.994	.000
Educational services		.994	.000
Health care and social assistance		.994	.000
Other (reference category)			
Occupation for job held last week	.000*		
Management occupations		.994	.000
Business, finance and administrative occupations		.994	.000
Natural and applied sciences and related occupations		.994	.000
Health occupations		.993	.000
Social science, education, government service and religion		.995	.000
Occupations in art, culture, recreation and sport		.994	.000
Sales and service occupations		.994	.000
Trades, transport and equipment operators and related		.995	.000
Primary industry, processing, manufacturing and utilities		.994	.000
Other (reference category)			

Table. 11 Diagnostics Tests for regression: determine factors associated with being enrolled in a health-related field of study in Canada

Test	**Significance**
Hosmer and Lemeshow Test	<0.001
Cox & Snell R Square	.433
Omnibus Test	<0.001

Table 12: Bivariate correlation matrix for the Labour Force Survey (LFS) to determine multicollinearity

		Province	Age	Sex	Marital Status	Highest educational attainment	Current student status	Labour force status	Class of work	Industry of main job	Occupation
Province	Pearson Correla	1	-.045**	-.008*	-.033**	.035**	.008*	-.062**	.032**	-.025**	.004

	tion										
	Sig. (2-tailed)		.000	.010	.000	.000	.018	.000	.000	.000	.318
	N	105194	105194	105194	105194	105194	85375	58132	71662	71662	71662
Age	Pearson Correlation	-.045**	1	.019**	-.431**	.087**	-.587**	-.005	-.114**	-.073**	-.182**
	Sig. (2-tailed)	.000		.000	0.000	.000	0.000	.258	.000	.000	0.000
	N	105194	105194	105194	105194	105194	85375	58132	71662	71662	71662
Sex of respondent	Pearson Correlation	-.008*	.019**	1	.025**	.016**	.021**	-.046**	-.168**	.323**	-.132**
	Sig. (2-tailed)			.000	.000	.000	.000	0.000	0.000	.000	
	N			105194	105194	105194	85375	58132	71662	71662	71662
Marital Status	Pearson Correlation				1	-.119**	.308**	.021**	.071**	.050**	.136**
	Sig. (2-tailed)					0.000	0.000	.000	.000	.000	.000
	N				105194	105194	85375	58132	71662	71662	71662
Highest educational attainment	Pearson Correlation					1	-.254**	-.041**	-.141**	.063**	-.193**
	Sig. (2-tailed)						0.000	.000	0.000	.000	0.000
	N					105194	85375	58132	71662	71662	71662
Current student status	Pearson Correlation						1	-.011*	.041**	.115**	.129**
	Sig. (2-tailed)							.012	.000	.000	.000
	N						85375	56008	68643	68643	68643
Labour force status	Pearson Correlation							1	.038**	-.057**	.061**
	Sig. (2-tailed)								.000	.000	.000
	N							58132	58132	58132	58132
Class of worker	Pearson								1	-.245**	.109**

	Correlation										
	Sig. (2-tailed)									0.000	.000
	N								71662	71662	71662
Industry of main job	Pearson Correlation									1	-.046**
	Sig. (2-tailed)										.000
	N									71662	71662
Occupation of job	Pearson Correlation										1
	Sig. (2-tailed)										
	N										71662

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Discussion

After performing the logistic regression on the outcome variables of employability status, some variables were initially significant, but were found not statistically significant after adjusting for the influence of other factors. This change was observed in the model for the outcome of employed or unemployed for the following variables: sex, marital status, current student status and class of work. The other variables in this model either stayed not statistically significant (age), or significant. Province, higher education, occupation and industry variables all proved to be influential in predicting employability status.

The second model was created to predict whether individuals are employed in health-related industries or other sectors, and their unadjusted p-values showed a statistically significant relationship between all the variables and outcome. When the p values were adjusted via

multivariate methods, marital status, higher educational attainment, student status, and employment type were no longer significantly associated with being employed in the health-related industries. Province and occupation again showed an association, as well as sex, age, and class of work. The bivariate analysis showed that all the variables demonstrated a significant association with having been enrolled in health-related field of study in 2007.

The third logistic regression was employed to describe the population of Canadian students who pursued undergraduate education in health sciences or related field of study. After employing the logistic regression, it was determined that the following factors were associated with having enrolled in a health science-related field of study in 2007: province, sex, status in Canada, studies completed at time of graduation (2009-10), language, educational attainment, job educational requirements, full-time job status, job qualification, further education program or training for job, permanent status, whether employer specified field of study or work experience as a requirement for current job, job in relation to education, academic ranking, and coop opportunity.

Province:

One of the key findings is that residents of western provinces tend to be more employed in health-related industries than residents of other provinces, although overall employability in general across all provinces is deemed high (>98%). In the logistic regression, influential factors for determining status of unemployability were positively correlated with all provinces with the reference category being Western Provinces and territories. It is no surprise that the western provinces, which include Manitoba, Alberta, Saskatchewan, and British Columbia, exhibited the highest rates collectively of employment in Canada (Statistics Canada, 2015a). British

Columbia's employment and job growth also continues to rise, while other provinces exhibit job losses due to manufacturing jobs disappearing with half of them belonging to Alberta (Statistics Canada, 2015a).

The National Graduate Survey shows that western provinces exhibited higher incidence rates than other provinces for students enrolling in health-related field of study. More individuals in the Western Provinces and Territories had enrolled in health-related fields of study than any other provinces in Canada, That said, health programs are mostly concentrated within the

Gender:

Previously, men made up the majority of the labour force, comprising over 50% of labour market jobs (Status of Women Canada, 2015). These data show that women generally are reported to be more employed in health related-industries, which is confirmed by previous literature (Statistics Canada, 2010). According to these data, women are more likely to be employed than they are to be unemployed, which is not surprising, given Canada's overall low unemployment rate relative to OECD nations (Finnie et al, 2014). According to some, the gap between genders in labour market participation is diminishing (Finnie et al, 2014). In the logistic regression it was seen that sex was not associated with status of employability or field of study, which can be explained by the diminishing gender gap in the workforce in general. According to literature, the gap is closing in on both female and male genders. The narrowing of the gender gap was shown in the first model of this thesis, where sex was not deemed as an influential factor for predicting employability status (Statistics Canada, 2015). Women comprise slightly less than half of the working force in Canada (Statistics Canada, 2015). Sex was also a strong predictor for working in health-related industries; females were more likely to work in health-related fields

than in other industries ($p<0.05$; $OR>1$), which is also demonstrated in current literature (Statistics Canada, 2015).

The data also indicates that females continue to dominate the health-related field of employment and studies in universities, as nearly 16% of all females are enrolled in health-related fields of studies.

Education:

There were some obvious trends in the bivariate analysis; higher education is positively correlated with higher employment rates and employability in health-related industries. These trends are comparable to the rates reported in the literature (American Psychological Association, 2016).

Age:

Surprisingly enough, there was no significant difference between age groups, which was further verified during the logistic regression with the outcome of being employed or not. Furthermore, being under the age of 25 demonstrated the strongest positive association for being employed in health-related industries relative to the reference group of 40 or more years of age. Younger individuals are pursuing jobs in the health-related industries between 2004 and 2013 main because of the Baby Boomers working in this industry were ageing and retiring resulting in more job opportunities (Allison, 2014).

Occupations and Industries:

There was a significant trend towards the majority of employees and employees in health-related industries being in the public sector more so than in the private sector. Across all occupations, employment rates tended to be higher than unemployment. With the highest unemployment rate of 2.6% seen in trade, transportation, and warehousing occupations. The results are similarly consistent for industries; employment rates across industries are quite high, but the highest unemployability rate of 3.2% is seen in construction-related industries. Unlike the vast majority of employees, employees in health-related fields had a higher rate of being employed part-time, since they mostly work in casual contracts in hospital settings (Statistics Canada, 2010). In this study, marriage seemed to show another significant relationship with being employed and working in health-related industry fields.

The industries and occupations remained significant for the most part; half were negatively correlated and the other half was positively correlated. Unsurprisingly for occupations, management, administration and other support; finances, insurances, and real estate; professional, scientific and technical services, healthcare and social assistance, and education, law, social and government services yielded the strongest positive association for the chance of being employed (Statistics Canada 2015). Industries of finance, insurances, and real estate; education, and health care and social services were positively correlated with unemployment, and therefore had lower employability rates than the other industries (Statistics Canada 2015).

Unsurprisingly the occupations which include management, administration and other support; health care and social industries, and education, law, social and government services were more likely to be employed in health related industries. This is evident because management and administration occupations exist in health related industries, such hospitals and

research sectors. The same applies to education, law, social and government services which are commonly interrelated with health-related industries.

Marital Status:

It was seen that married individuals were positively associated with being employed and employed in a health-related industry. Marriage has been seen as positive factor possibly because of the stability and need to supply for one another. Social relationships benefit employment because it instills a sense of responsibility and concern that lead the individual to engage in positive behaviors (Umberson, 2010).

Co-op

The thesis demonstrated that health-science and related fields of study graduates had less co-op experience before graduating. That said, it could be primarily due to the fact that different terms are used across university programs, such as nursing undergo a mandatory internships not co-op programs.

Job Related to Work:

The individuals who graduated from these programs were also shown to have jobs with higher relation to their education than other programs and were employed in areas in which the employer had specified work experience or field of study as a requirement (Hango et al, 2007). This thesis further verified that those who graduated from health-related studies found employment, and found employment in an area close to their field of study (Hango et al, 2007). Unsurprisingly, the individuals who were previously enrolled in a health-related field of study demonstrated fewer qualifications than required for their current main job and that their current

job education requirement was a bachelor's degree and above. This is not surprising because the variable used in this study included nurses, physicians, which specialize in their education to be able to work a certain job that is obviously related to their field of study.

Other findings:

A higher percentage of those enrolled in health-related field of studies were Canadian citizens than immigrants. Students enrolled in health-related fields also had one of the highest percentages for having a job that is related to their education. Moreover, health-related fields of study were mostly studied under the bachelor's degree level at time of graduation and interview.

Furthermore language seemed to also demonstrate a significant association, in that English-speaking individuals were more likely to have pursued their studies in health-related fields.

Limitations/Future research

The data retrieved from Statistics Canada for both the Labour Force Survey and the National Graduate Survey used their own rigorous methods to define the different classes of occupations, industries, and field of studies. This was seen as a minor limitation because, according to the National Occupational Classification (NOC), health-related industries include health services that directly are given to patients and most of the time requires post-secondary education specifically related to said field. Health and defined terms health-related industries include establishments in which patients are provided health care by direct relation such as diagnosis and treatment for social and health care, which includes child care services. The term also excludes any health policy or government related sectors related to health. The field of health professions and related clinical sciences which was used in the data set includes any

specialization programs such as pre-med programs, or physiotherapy which are programs that require further training and educational requirements.

Another limitation of this study is that Statistics Canada retrieves these data sets through interviews, mainly telephone interviews. The results from these interviews are self-reported, and so come with several limitations, namely that participants may not be fully honest with their responses. Even if respondents try to be honest, they may lack the knowledge or introspective ability to accurately respond to each question.

A major limitation is the high non-response/missing observation (>30%) of some variables. Data set with high missing observations in large variables were weighted accordingly especially when applying unconditional logistic regression.

Further research is needed to determine the employability of health-related industries, excluding specialized health care fields such as medicine and physiotherapy. This will help determine factors associated with being employed in public health sectors, government, and research focused-areas.

Conclusion

As health-related industries and fields of study continue to grow in popularity it is imperative to continue studying their future projections. This study suggests that employed recent graduates employed in health-related industries were mainly employed in public sectors. It was also seen that sex was not associated with status of being employed or not; neither with field of study but it was seen that more women than men were employed in health-related industries Among those employed, younger individuals demonstrated the strongest positive association for being employed in health-related industries. Among those employed, the occupations which include management, administration and other support; health care and social industries, and

education, law, social and government services were more likely to be employed in health related industries.

People in western provinces and territories tend to be more employed in health-related industries and higher rates for students enrolling in health science-related fields of studies, more than Atlantic Provinces, Quebec and Ontario. Health-science and related fields of study had less co-op experience. Lastly, Individuals who graduated from health-related fields of studies were also shown to have jobs with higher relation to their education than other programs

To summarize, it is hoped that this study will give rise to further research exploring further the future projections of students enrolling in health science-related programs and give policy makers evidence toward changing curricula or standards for certain fields of study or labor force industries. Furthermore, by knowing this type of information, it will allow prospective students who wish to enter in a health science-related field of study knowledge regarding projections of their future educational choices.

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