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EXPLAINING GEOGRAPHICAL VARIATION IN HAPPINESS IN CANADA

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Abstract

The objective of this paper is to ascertain whether persons living in certain regions or cities in Canada experience higher levels of life satisfaction or happiness, and if so why? To address this question, the paper uses micro-data from the Canadian Community Health Survey for 2007 and 2008. After a descriptive analysis of the data on happiness in Canada, the paper identifies through an econometric analysis of both individual and societal variables the most statistically and economically significant determinants of individual happiness. It then uses this information to explain variation in happiness at the provincial, CMA, and health region level, given the characteristics and state of the population in these geographical units. A key finding is that the most important reason for geographical variation in happiness in Canada is differences in the sense of belonging to local communities, which is generally higher in small CMAs, rural areas, and Atlantic Canada. A second finding is that mental health is an important explanation in the geographical variation in happiness.

Explaining Geographical Variation in Happiness in Canada

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Explaining Geographical Variation in Happiness in Canada

Executive Summary

The objective of this paper is to ascertain whether persons living in certain regions or cities in Canada experience higher levels of life satisfaction or happiness, and if so why? To address this question, the paper uses micro-data from the Canadian Community Health Survey for 2007 and 2008. After a descriptive analysis of the data on happiness in Canada, the paper identifies through an econometric analysis of both individual and societal variables the most statistically and economically significant determinants of individual happiness. It then uses this information to explain variation in happiness at the provincial, CMA, and health region level, given the characteristics and state of the population in these geographical units. A key finding is that most important reason for geographical variation in happiness in Canada is differences in the sense of belonging to local communities, which is generally higher in small CMAs, rural areas, and Atlantic Canada.

There is surprisingly little variation in average happiness in Canada both over time and across space, the focus of the paper. Based on a scale of 1 to 5, the average level of the happiness of the Canadian population 20 and over in 2007-8 was 4.26. At the provincial level, it ranged from a high of 4.33 in Prince Edward Island to a low of 4.23 in Ontario, a total variation of 0.10 points (2.5 per cent) out of a potential maximum variation of 4 points. At the level of the 32 CMAs, average happiness ranged from a high of 4.36 in Brantford to a low of 4.16 in Toronto, a range of 0.2 points or 5 per cent. At the level of the 102 health regions, average happiness ranged from a high of 4.40 in Renfrew County and District Health Unit to a low of 4.11 in the City of Toronto Health Unit, a range of 0.29 points or 7.5 per cent.

Based on 83,000 observations for Canada from the 2007 and 2008 CCHS, an equation was estimated, using happiness as the dependent variable and both individual and societal variables as independent variables. The individual variables produced the most statistically significant results, and the largest coefficients. The societal variables added little explanatory power to the equations, were in most cases not statistically significant, and had small coefficients. It appears that happiness in Canada is primarily determined by the individual characteristics of the population, not the average characteristics of the geographic unit in which the person lives. Individual variables that were found to be statistically significant at the highest level (1 per cent) included mental health, health, stress level, sense of belonging to the local community, and income. No societal variable was found to be statistically significant at this level.

The regression results were used to calculate the expected happiness, that is the average happiness for a variable when all other variables for that individual assume average values. These expected happiness estimates were then compared to actual happiness estimates. In many case, these controls reduced the variation between the categories with the highest and lowest average level of happiness. For example, the observed or actual estimates show a 1.72 points difference in happiness between the life satisfaction of those with poor mental health (2.65) and those with excellent mental health (4.57). But once all other factors such as income are controlled for, the gap drops to 0.97 points. This is still a very large gap, by far the greatest of any variable. The next largest gap, again after controlling for all other variables, was for health (0.46 points between poor and excellent health), followed by stress (0.40 points between no stress and

extreme stress), sense of belonging to the local community (0.26 points between very weak and very strong), household income (0.20 points between the bottom and top decile), marital status (0.20 points between married and never married), and immigration status (0.13 points between non-immigrants and recent immigrants). All other variables had variation in happiness between the top and bottom categories of 0.06 points of less, after controls were applied.

Geographical variation in the relative importance of the different categories of a variables, combined with the relative importance of the variable in determining happiness based on its regression coefficient, are then used to explain geographical variations in happiness. For most geographical units with the largest deviation in happiness from the national average, these variables were able to account for much of the variation in happiness. It is found that differences in the sense of belonging to the local community is the most important explanation for the geographic variation of happiness in Canada. Differences in mental health is second.

Explaining Geographical Variation in Happiness in Canada¹

I. Introduction and Motivation

The objective of this paper is to ascertain whether persons living in certain regions or cities in Canada experience higher levels of life satisfaction or happiness, and if so why? To address this question, the paper uses micro-data from the Canadian Community Health Survey for 2007 and 2008. After a descriptive analysis of the data on happiness in Canada, the paper identifies through an econometric analysis of both individual and societal variables the most statistically and economically significant determinants of individual happiness. It then uses this information to explain variation in happiness at the provincial, CMA, and health region level, given the characteristics and state of the population in these geographical units. A key finding is that most important reason for geographical variation in happiness in Canada is differences in the sense of belonging to local communities, which is generally higher in small CMAs, rural areas, and Atlantic Canada.

The concept of subjective well-being (SWB) has garnered much interest among economists and social scientists in recent years. For example, the Stiglitz Commission, released in September 2009, recommended greater attention be given to the issue of subjective well-being.² It is being increasingly recognized that it matters how individuals rate their happiness or life satisfaction..

There is a large literature on the determinants of subjective well-being, happiness, and life satisfaction.³ Society, personality, and individual experience and circumstances have all found to be important. Personality has been shown to vary genetically, and the differences between personalities have been found to be associated with variations in subjective well-being at the individual level, (Inglehart and Klingemann, 2000). Personality and genetic traits are closer correlates of individual well-being, while cultural and societal practices and norms are determinants of well-being at a group level.

Many studies have analyzed international differences in subjective well-being, but comparatively few have analyzed differences within a country, due in part to sample size limitations. And most studies that

¹ The authors thank Ben Evans for initial work on this project and Jim Milway for comments.

² The tenth recommendation of the Stiglitz commission was "measures of both objective and subjective well-being provide key information about people's quality of life. Statistical offices should incorporate questions to capture people's life evaluations, hedonic experiences and priorities in their own survey." For a discussion of the Stiglitz Commission recommendations, see Osberg and Sharpe (2010)

³ There are differences between these three concepts, but they are all strongly correlated. The data used in this paper are for life satisfaction, but the three terms will be used interchangeably.

have explored within-country differences in happiness have been for the United States (e.g. Pluat *et al.* (2002) and Florida *et al.* (2009)).

To our knowledge, there has been no comprehensive study of the geographical variation in happiness in Canada, largely due to the lack of existence of a large micro-data set. The inclusion of a question of on happiness in the Canadian Community Health Survey (CCHS), which has a large sample size, now makes such a study possible.

The objectives of this paper are two-fold: to document the geographical variation in subjective well-being in Canada and to explain this pattern. Does the variation across space reflect just individual differences affecting happiness (e.g. age, income, education, marital status, and ethnicity) or does it also reflect the societal environment (e.g. size of community, sense of belonging, trust)? What are the social and economic characteristics of individuals and communities that lead to geographical variation in subjective well-being?

This is the first paper in a joint project on happiness undertaken by the Centre for the Studies of Living Standards (CSLS) and Institute for Competitiveness and Prosperity (ICP). A final report will be published in the fall of 2010 and will include a discussion of the policy implications of the findings of this paper.

II. Background and Literature Review

This section provides a discussion of a number of issues related to subjective well-being.

A. Well-being: Origins of the Concept and its Evolution

The origins of the study of happiness can be traced to Aristotle and his famous discussion on eudemonia.⁴ Aristotle was of the view that happiness was the search for pleasure from a person's body and material possessions. He saw good birth accompanied by a lifetime of good friends, good children, health, wealth and a content old age all contributing to an individual's happiness. He emphasized the importance of a lifetime of virtuous activity which in turn required sufficient supply of material goods to sustain it. He was, however, very clear that material goods were a means and not an end, and that wealth accumulation is not the goal towards happiness in the long term. (Aristotle, *Rhetoric*, 1360b, 14–23 cited by Helliwell, 2003).

In the late 19th century economists were very interested in the connection between happiness and economic success. They considered a person's happiness as in principle measurable, like temperature which could be compared with another person's happiness. They also theorized that extra income brought less and less extra happiness as a person got richer. According to Marshall, "... the influence exerted on a person's character by the amount of his income is hardly less, if it is less, than that exerted by the way in which it is earned. It may make little difference to the fullness of life of a family whether its yearly income is £1000 or £5000; but it makes a very great difference whether the income is £30 or £150: for with £150 the family has, with £30 it has not, the material conditions of a complete life." (Marshall 1890, p. 2)

Psychologists began to test the theories of happiness in the 1920s. Their approach was seemingly based on the belief that measuring social and psychological states of individuals in society is the key to understanding the social change and the quality of their life. The era of Behaviorism took place in the 1930s as classic free-market economists began to believe that individuals are rational, or at least act rationally: thus free decisions in a free market deliver optimal economic results. This brought the scientific study of feelings of happiness to an end as emphasis was increasingly placed on income and wealth as key components of happiness. The scientific study of the feelings of happiness re-emerged in 1960s. Wilson⁵ (1967) surveyed the real components of happiness. His list of indicators influencing happiness was similar to the one proposed by Aristotle; he attributed happiness to the young, healthy, well-educated, well-paid, extroverted, optimistic, worry-free, religious married person with high self-esteem, job morale, and modest aspirations, of either sex or a wide range of intelligence. Wilson's determinants of happiness defined an objective form of well-being, based on ideal situations and norms. These determinants would later act as a foundation for the most atomistic form of well-being which in contemporary literature is known as subjective well-being. This composite dimension of well-being would later serve to be a pathway for most of the studies in contemporary literature.

Recent studies see subjective well-being closely linked to a positive self-reflection or an assessment of one's own life. Helliwell *et al.* (2009) suggest that "happiness is a state of contented pleasantness and is one of many specific emotions that people can feel in response to life events and daily experiences." Layard (2005) has put forth a similar definition of happiness. According to him happiness is "feeling good, enjoying life and wanting that feeling to be maintained." He studied the World Values Surveys and found that the response rates for the happiness question were very high, showing that people are in touch with

⁴ <http://www.seop.leeds.ac.uk/entries/aristotle-ethics/>. Stanford Encyclopedia of Philosophy.

⁵ Cited by Helliwell (2003)

their feelings of happiness and are able to express them. However, Helliwell *et al.* (2009) use the term ‘well-being’ even though they believe that it is not different from the term ‘happiness’. They do this to avoid confusion between the broad and the narrow connotations of happiness. For instance, in health related studies, happiness with the quality of life would be defined as being healthy. In the economic realm, happiness would be often defined as being wealthy. Even though the terms life satisfaction and happiness are used inter-changeably, Deaton (2008) believes that the term ‘life satisfaction’ is actually closer to well-being than happiness. When individuals report their life satisfaction, they make an overall evaluation of their lives. Well-being refers to general life satisfaction; an overall evaluation of an individual’s life rather than one specific area. In this report, however, the terms happiness and life satisfaction will be used interchangeably keeping the original construct in mind.

B. Subjective vs. Objective Well-being

The distinction between subjective and objective well-being depends on the perspective from which lives are being evaluated. Objective well-being requires a detached point of view that is independent of an individual’s own subjective values and norms. Evaluation would include features that would be considered ideal rather than personal. In contrast, subjective well-being is a reference to an individual’s own interests, needs, preferences or desires. It captures both rich and adverse life experiences. Just like health has positive elements beyond disease the absence of disease or disability, subjective well-being has both negative and positive components (Eisdorfer, 1981).

It is also possible for subjective definitions to include objective indicators. For example, a subjective definition of well-being could specify that the availability of food, water and shelter is essential for well-being. This definition would be subjective if it specified that these objective indicators influence well-being because they effect individuals’ evaluation of their lives. Thus, well-being definitions that focus on the satisfaction of basic needs are inherently subjective in nature—they imply that objective factors like food and water are components of well-being because everyone evaluates them as desirable.

A subjective definition of well-being is essentially identical to the concept of utility. Utility is the satisfaction derived from the consumption of goods. Just like subjective well-being, utility is defined exclusively from the perspective of an individual. Economic theory tends to rely on the amount of money a person is willing to spend on a good as a useful measure of utility that he or she derives from that good. Having a lot of money is not well-being. Standard economic theory assumes that well-being is achieved by using wealth for consumption, not simply by accumulating it, and that people spend their money in exchange for market goods to realize their preferences (Osberg, 1985).

C. Happiness and the Conventional Methods of Utilitarianism and Income Approach

Utilitarianism, as originally put forward by Bentham, considers the well-being of a society to be the sum of individual utilities. The development of microeconomic theory has been strongly influenced by this tradition. However, there are structural weaknesses in the utilitarian concept of measuring a society's welfare. If a given level of consumption produces the same level of utility for everyone, then utilities can be compared across individuals and aggregations can be made to arrive at a welfare estimate. However, individual utility cannot be measured in such an objective manner. There is no guarantee that two individuals derive the same level of utility and satisfaction from the last dollar of consumption. Utility has an immeasurable component and one cannot be sure that it is related to the measurable component such as income and wealth. The origins of individual preferences (which help gauge utility) need to be explored as preferences may change according to circumstances. For instance, when income is low, human aspirations are also low. When incomes are high, new tastes emerge. Preferences are sometimes argued to be adaptive, and tastes may therefore be consciously manipulated (Osberg, 1985).

Sen (1999) also argues that due to its informational base, the utilitarian method tends to measure well-being without accounting for any distributional inequalities in happiness of individuals. He stresses the importance of accounting for the welfare of those at the lower economic strata of society. This group, according to him, is traditionally disadvantaged and will suffer the most from the utilitarian approach as it comes to accept 'deprivation' and lacks courage and resources to demand any sort of change. By adapting to conditions in society, the economically challenged do not provide accurate feedback of their well-being. Therefore, this utilitarian approach does not give 'intrinsic importance' to other immeasurable components of utility such as individual freedom and rights. He lays particular emphasis on the well-being of these people and the need for it to be taken into account when formulating policy on basic health, education and employment. Therefore, there is a need to broaden the information base to take the limitations of the utilitarian approach into account and provide equality and opportunity for all (Sen 1999 : 61-63)

The role of income and wealth in well-being has been of particular interest to economists in the post-Behaviourism era of the 1930s. According to Layard (2005), GDP is an inappropriate measure of happiness. He believes that people have a tendency to compare incomes across a reference group where an individual's reference group is comprised of people close to the individual in question in terms of income and status. Standard economics states that when a person's income rises and nobody's falls, things have improved (Pareto efficiency), ignoring any concerns individuals may have their relative. If individuals are driven by a desire to keep up with their reference group, then social comparisons will be important. Layard refers to this as a "status race." Frank (1985) has developed a model, echoing the work of Dusenberry (1949), showing how people's concerns for their relative position in the income hierarchy of an organization can lead to wage compression. The role of income, along with financial status, as a determinant of subjective well-being is discussed, with other determinants, in Appendix I.

D. Measurement Scales and Methods

Subjective well-being is gauged mainly through surveys where people are asked to provide an overall evaluation of their lives, or a particular aspect of it. The information from these surveys is relatively easy to collect. Since these surveys are conducted in the local language of a country, one could question whether the word ‘happy’ or ‘satisfaction’ mean the same thing in different languages. If this is the case using the same term in surveys across different countries will lead to measures of different concepts. As a check, responses to questions on happiness and satisfaction in two bi-lingual countries have been compared, and they do not show a linguistic bias (Veenhoven 2002 and Layard 2005).

The questions used to survey life satisfaction are relatively straightforward and usually require simple answers. Below are the standard questions used in happiness surveys.

“Taken all together, how would you say things are these days--would you say that you are:

1) Very happy 2) Pretty happy or 3) not too happy?”- United States General Social Survey (GSS)

“Taking all things together, would you say you are:

1) Very happy 2) Quite happy 3) Not very happy 4) Not at all happy 9) don't know” – World Values Survey

“All things considered, how satisfied are you with your life as a whole these days? Please use this card to help with your answer.” (The respondents are asked to rank their satisfaction on a scale of 1 to 10 with 1 being the lowest 10 being the highest level of satisfaction with an additional option for ‘Don’t Know’) – World Values Survey

“All things considered how satisfied are you with life as a whole these days? Use a 0-10 scale, where 0 is dissatisfied and 10 is satisfied.” – Gallup World Poll

“Taking all things together, how would you say things are these days—would you say you are:

1) very happy 2) fairly happy 3) not too happy these days?” – Eurobarometer

“How satisfied are you with your life in general?

1) very satisfied 2)satisfied 3)neither satisfied nor dissatisfied 4)dissatisfied 5)very dissatisfied)” Canadian Community Health Survey (CCHS)

“Using a scale of 1 to 10 where 1 means “Very dissatisfied” and 10 means “Very satisfied”, how do you feel about your life as a whole right now?” General Social Survey Canada, 2008-2009

E. Issues in Geographical Comparisons of Happiness

Society, personality, and individual circumstances are important factors in determining the different levels of well-being. Individual characteristics and circumstances have been shown to affect the self-assessments of well-being and to influence how an individual responds to unfolding events. Cultural and societal differences are mostly determinants of regional differences in well-being.

Most of the studies that have explored geographical differences have undertaken cross country comparisons. A lack of surveys with adequate sample size has been the main obstacle in exploring life satisfaction at a more localized level. By using microdata sets from surveys such as World Values Survey, Gallup and Eurobarometer, researchers have used a cohort of countries to explore the determinants of life satisfaction at the individual level and a combination of political, economic, institutional and human development factors at the national level.⁶ However, for such studies, specific sub-groups within a country's population such as recent immigrants cannot be distinguished and compared with other groups. Another problem with cross-country surveys is that they may be influenced by cultural and social traits. Some poor countries are very happy when their average life satisfaction is measured as individuals in some of these countries are naturally jovial and cheerful when responding to survey questions (Graham, 2010).

There are significant differences in economic and social indicators within a country. Do these differences lead to differences in happiness? For instance, ethnically diverse cities will have people from different cultural backgrounds and different belief systems – factors that may play an important role in the regional variation of happiness. In terms of economic factors, in Canada there are significant differences with median household income⁷ as high as \$72, 329 for Oshawa and as low as \$40, 617 for Trois-Rivières. The cost of housing⁸ also varies to a great extent, with prices of newly completed units as high as \$628,900 for Vancouver and as low as \$125,000 for Sherbrooke. A geographical study of subjective well-being shed light on such questions as are people happier where average household income is higher?

Plaut *et al.* (2002) examined well-being in mid-life in the nine regions of the United States. They used various metrics of well-being and sense of self used by psychologists from the Midlife Development in the United States (MIDUS) survey to examine the distinctive regional features of well-being and self. Specifically, they developed portraits of well-being in five of the regions. They hypothesized that well-being is dependent on cultural context, which is a composite of the American context, and the specific regional context. They were able to show this to some extent as their results demonstrated that some regions like New England (that includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut) had higher levels of psychological, social and physical well-being than East South Central region (that includes Kentucky, Tennessee, Mississippi and Alabama).

However, Plaut *et al.*'s work did not attribute these regional differences to any social, cultural or even economic indicators of well-being. Florida *et al.* (2009) have partially filled this gap in their study on "Happy States of America: A state level analysis of psychological, economic and social well-being." Using Gallup's Well-being Index that is comprised of six sub-indices – life evaluation, emotional health, physical health, healthy behaviour, work environment and basic access, they studied the correlates of well-being with

⁶ Some of the studies are by Diener *et al.* (1995, 2003), Schyns (1998), Helliwell (2003), Bjornskov *et al.* (2006), Steveson and Wolfers, (2008) Barrington - Leigh and Helliwell (2008), Inglehart *et al.* (2008), Helliwell *et al.* (2009a) and Helliwell *et al.* (2009b)

⁷ Data from the Canada Census Profiles (2006)

⁸ Data on Median Prices of Newly Completed and Absorbed Single-Detached and Semi-Detached Dwellings - Canadian Mortgage and Housing Corporation – February 2010

four categories of state level indicators that were based on personality, inclusiveness, economic and educational and occupational outcomes. They found that average well-being at the state level was positively correlated with output (Gross Regional Product per capita), average income levels and median housing value, human capital, tolerance of diversity, and emotional stability.

Florida *et al.*'s study revealed some interesting results and their analysis is a useful contribution to a very scant literature on well-being differences within a country in well-being. This paper is largely motivated by the lack of comparable research on Canada.

III. The Happiness Landscape in Canada

This section provides a comprehensive discussion of the happiness landscape in Canada. It uses data on 116,569 individuals aged 20 years or older from the combined waves of 2007-2008 Canadian Community Health Survey to explore the variation of happiness across three layers or levels of geography: provinces, census metropolitan areas (CMAs), and health regions. It also examines levels of life satisfaction in terms of an individual's situation or state and personal characteristics.

A. Sources of Data on Happiness in Canada

There are two main surveys for studying happiness in Canada, the Canadian Community Health Survey (CCHS) and the General Social Survey (GSS). This sub-section will discuss and compare the merits of both these surveys for this study along the lines of data availability, sample size, scale consistency of the life satisfaction question and flexibility that will allow for a geographical analysis of well-being.

i. General Social Survey

The General Social Survey is one of the main Statistics Canada surveys which includes questions on the quality of life of Canadians. There have been numerous cycles of the GSS from 1985 to the present. The life satisfaction question has been asked a number of times, but unfortunately, the scales have not been kept constant over time. For example, in the 1980s, the questions were on a five point scale with options for 'no opinion' and 'not stated'. In 1996, the response choices were limited to 'satisfied' and 'dissatisfied', and they were again changed to a four point and five point scale in 1998 and 2002. After 2002, the GSS life satisfaction question has been on a 10 point scale (Table 1). The GSS provides data at the provincial level, and for a few major Census Metropolitan Areas. Given that this research initiative is to explore happiness and life satisfaction at as detailed a geographical level as possible, the GSS is not the best source, because of its relatively small sample size. Until 1998, the target sample size was approximately 10,000 persons. It increased to 22,000 in 2010.

Table 1: GSS Canada, Life Satisfaction, Historical Questions and Response Choices*

1985	1986	1989	1991	1996	1998	2002	2003,2005,2006, 2007,2008
Very Satisfied		Strongly satisfied	Very Satisfied			Excellent	Scale of 1-10 where '1' is least satisfied and '10' is most satisfied, with an option for 'no opinion'
Somewhat Satisfied		Somewhat satisfied	Somewhat Satisfied			Very good	
Somewhat Dissatisfied		Somewhat dissatisfied	Somewhat Dissatisfied			Good	
Very Dissatisfied		Strongly dissatisfied	Very Dissatisfied			Fair	
						Poor	

*Questions not asked in a consistent manner across survey-years

ii. Canadian Community Health Survey (CCHS)

The CCHS is a large survey conducted by Statistics Canada on various health issues and quality of life at the detailed health region level. The survey began in 2001 and continued for 2003, 2005, 2007 and 2008. Prior to 2007, the CCHS collected data from 130,000 persons aged 12 and over. This was changed and from 2007 onwards, the sample is 65,000 respondents per year. In all of the survey waves, there was a five-scale question asked about satisfaction with life in general (SWL). The consistency of the life satisfaction question in the CCHS waves allows greater flexibility with regards to pooling waves and performing the analysis on a relatively larger sample size. Therefore, for this study, we have combined the waves of 2007 and 2008 CCHS surveys. In addition to the larger sample size, another advantage of pooling two waves was the elimination of fixed effects such as the interference of unmeasured heterogeneity between provinces or communities. For instance, the variation in unmeasured cultural effects on subjective well-being in Newfoundland and Labrador that stays constant over time is eliminated.

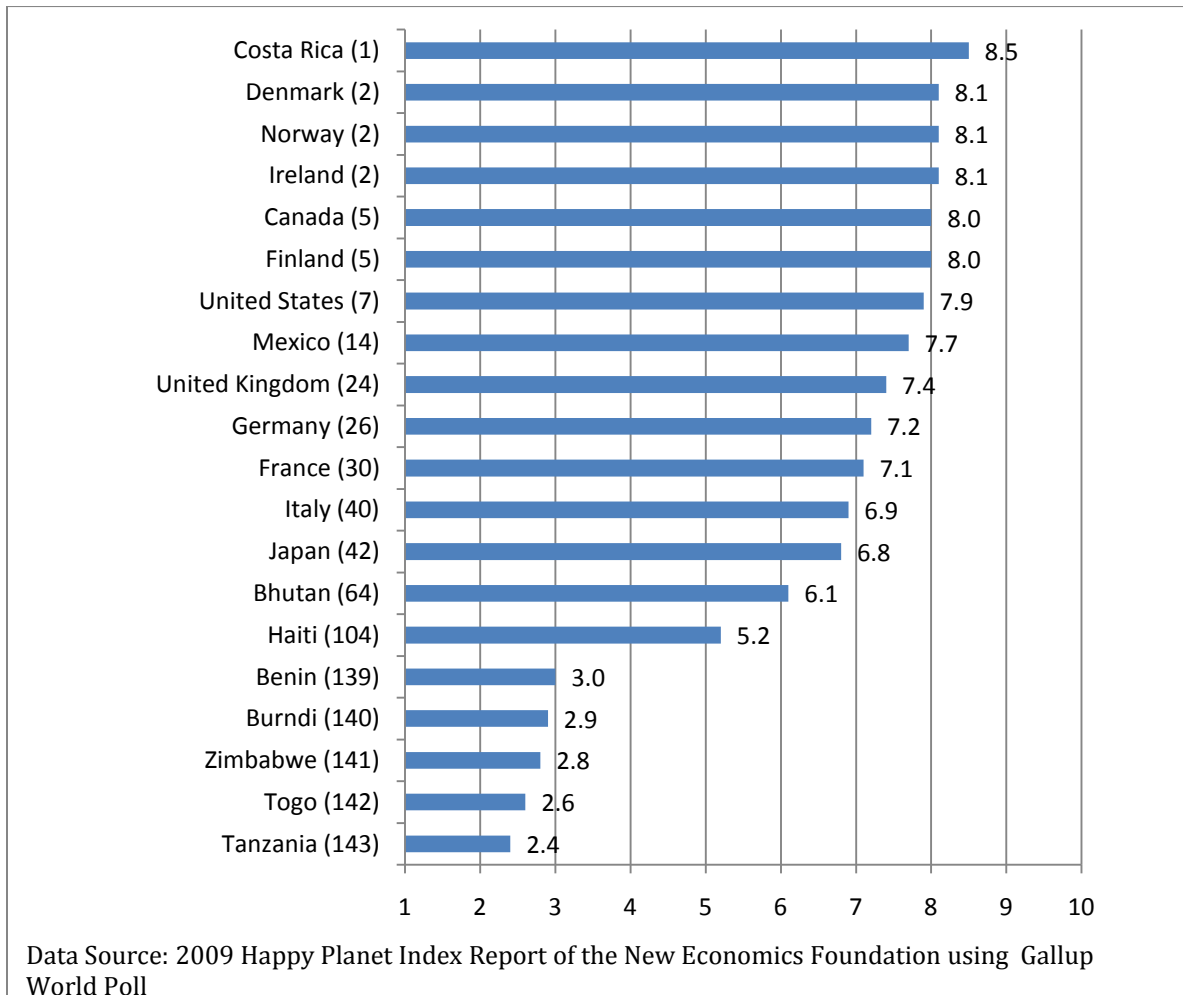
The GSS would in principle be better suited for the purposes of this study as it has various modules on social issues. For instance, a key weakness of the CCHS is the poor articulation of the labour market variables. No distinction in the 'not working' category has been made between the unemployed and persons out of the labour force. However, the larger sample size of the CCHS does make it easier to obtain reliable estimates about small groups within the population such as persons with disabilities and people belonging to visible minorities. In addition, the geographic unit of the CCHS is the Health Region (HR). The use of CCHS will therefore enable variation in happiness to be studied at an additional geographical layer. For this report, we have also attempted to look at the distribution of happiness at the CMA level. Even though there is no perfect concordance between a Health Region and a Census Metropolitan Area (CMA), we have undertaken a mapping scheme through which we have roughly aligned the HRs to onto the geographical limits of the CMAs.

B. Life Satisfaction in Canada: International and Historical Perspectives

Canada has consistently ranked as one of the happiest nations on earth. The *Happy Planet Index* (New Economics Foundation, 2009) reported Canada's life satisfaction in 2005 at 8.0 on a scale of 0-10 using the Gallup World Poll. Only Costa Rica (8.5), Denmark (8.1), Norway (8.1) and Ireland (8.1) had happier populations.

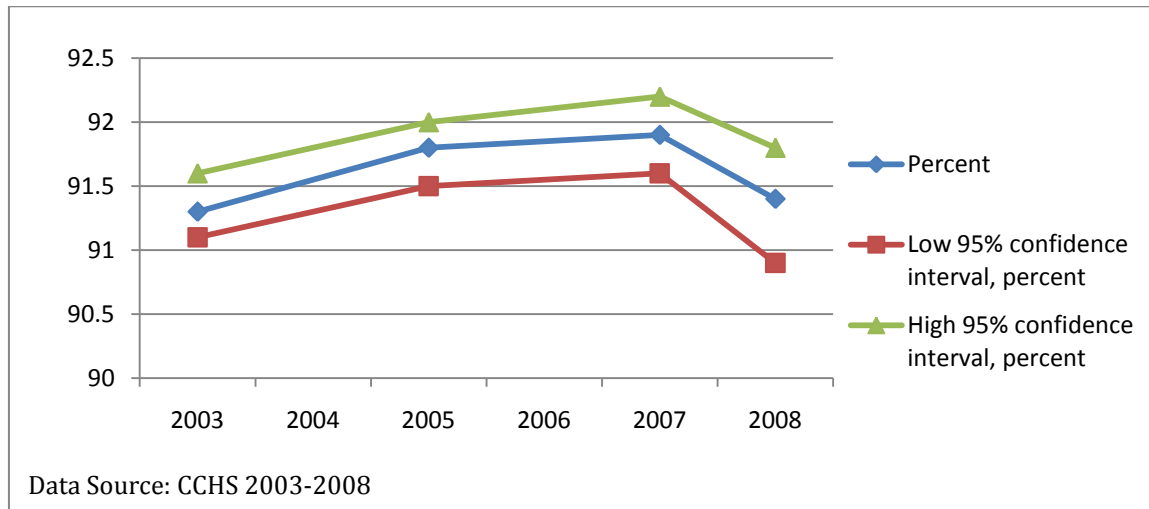
Canada was the happiest counties in the G-7. While the United States was close behind at 7.9, other G-7 countries were significantly unhappier: United Kingdom (7.4), Germany (7.2), France (7.1), and Japan (6.9). Many African countries exhibited very low levels of happiness. Tanzania was the lowest at 2.4, less than one third the level of happiness enjoyed in Canada.

Chart 1: Average Life Satisfaction at the International Level, 2005



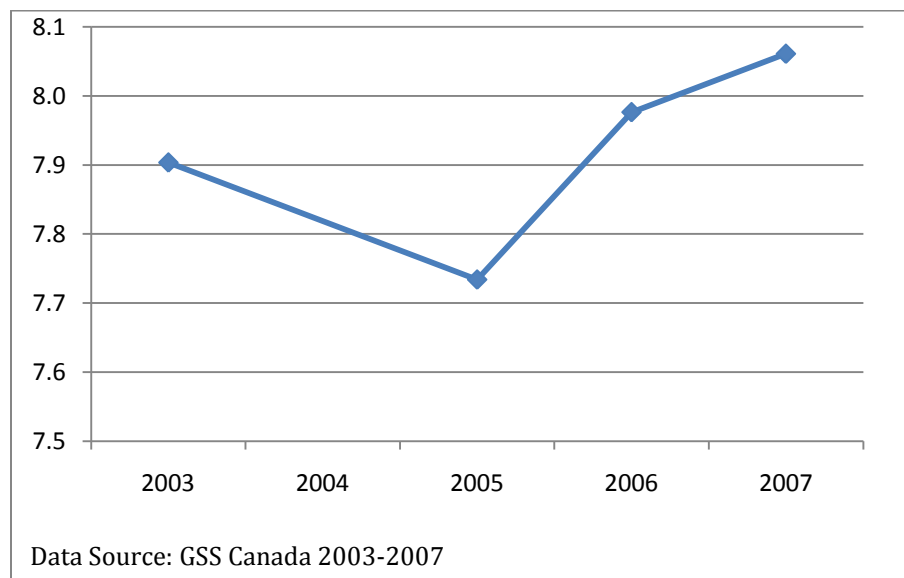
The consistent scale of the life satisfaction question used in the CCHS provides a consistent time series on happiness in Canada for the 2003-2008 period (Chart 1a). It appears that there has not been much variation in happiness over this period. In 2008, 91.4 per cent of Canadians aged 12 or older reported that they were satisfied or very satisfied with life, almost identical to the 91.2 per cent in 2003.

Chart 1a: Percentage satisfied or very satisfied with life, household population aged 12 and older, Canada, 2003 to 2008



The level of average life satisfaction from the GSS is also high, at 8.1 in 2007 on a scale of 1 to 10. It was up from 7.9 in 2003 and had increased in both 2006 and 2007.

Chart 2: Average Life Satisfaction on a 10 point scale, household population aged 15 and older, Canada, 2003 to 2007



Hill (2002) studied happiness in Canada since World War II and found that there was a small but positive trend like most of the other developed countries. Using data from 25 surveys from 1946 to 1998, he found that this trend amounted to 0.4 on a scale of 0-10 between 1946 to 1998. This can be interpreted as an increase in happiness by 1 point on a 0-10 point scale by 40% of the population. It must be noted that his analysis makes use of a large number of surveys on Canada, most of which have different wording and

scales on the life satisfaction and happiness. However, he does state that changes in the wording of the question are much less of an issue than changes in the choices of those questions. For instance, the surveys are comparable if the question changes from “how are happy are you..” to “how satisfied are you..” but not when the choices for the answer or the scale changes. Therefore, some sort of meaning can be derived from his analysis, which is summed up by Chart 3 below. His findings show that post 1985, life satisfaction in Canada has hovered around 8 on a scale of 1-10. This is largely consistent with cross-sectional data collected over the past decade from global surveys like the Gallup World Poll and the World Values Survey.⁹

Chart 3: Trend of Happiness in Canada



Source: Hill (2002), pp. 116

C. Life Satisfaction at Different Levels of Geography

This sub-section will present a cross-sectional analysis of life satisfaction in Canada at three levels of geography – provincial, CMA, and Health Region. Two methods have been used to present the statistics. The first method looks at the average life satisfaction utilising the full scale of survey responses. The second method on the other hand, looks at the variation of satisfaction of the percentage of the population that is satisfied and very satisfied. While this method provides the degree of disparity only amongst the proportion of the population with relatively high subjective well-being, it also provides an interesting comparison with the first method.

i. Provinces

Chart 4 shows on a scale of 1-5 the average life satisfaction by province. In 2007-2008, Prince Edward Island had the highest level of happiness at 4.33, followed by Quebec (4.30) and Alberta (4.30). The lowest average life satisfaction was found in Ontario (4.23), followed by British Columbia (4.24) and Manitoba (4.25). One is struck by the small range of 0.10 between happiest province, Prince Edward Island

⁹ The average life satisfaction for Canada from the World Values Survey is 7.84 (Wave 1, 1981-1984), 7.88 (Wave 2, 1994-1994) and 7.80 (Wave 4, 1999-2004). In his empirical work, Hill (2002) used the first two waves of the World Values Survey.

and the least happy province, Ontario. The change of axis in Chart 5 gives an impression of a greater variation. The standard deviation between the average values of the provinces is only 0.03, which means that variation is extremely small.

Chart 4: Average Life Satisfaction Level of the Canadian Provinces on a scale of 1 to 5, 2007-2008

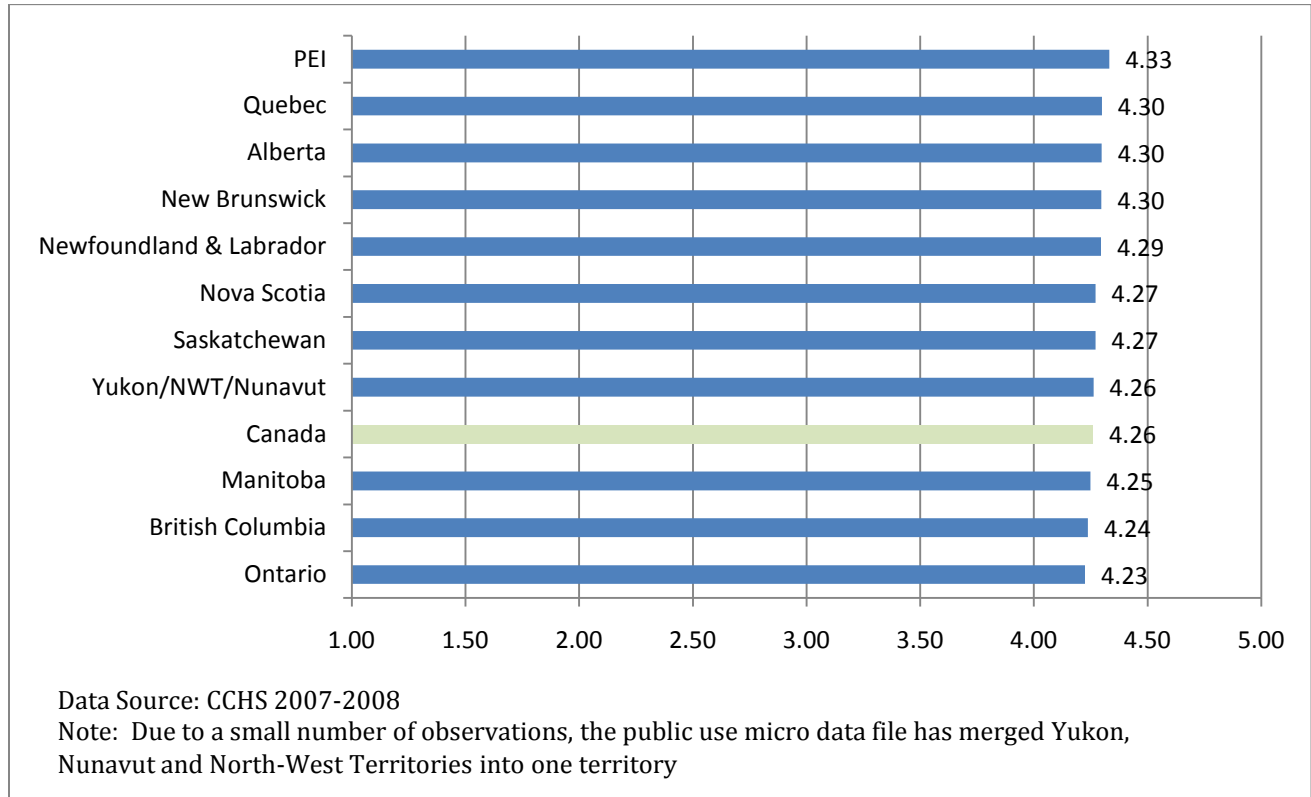
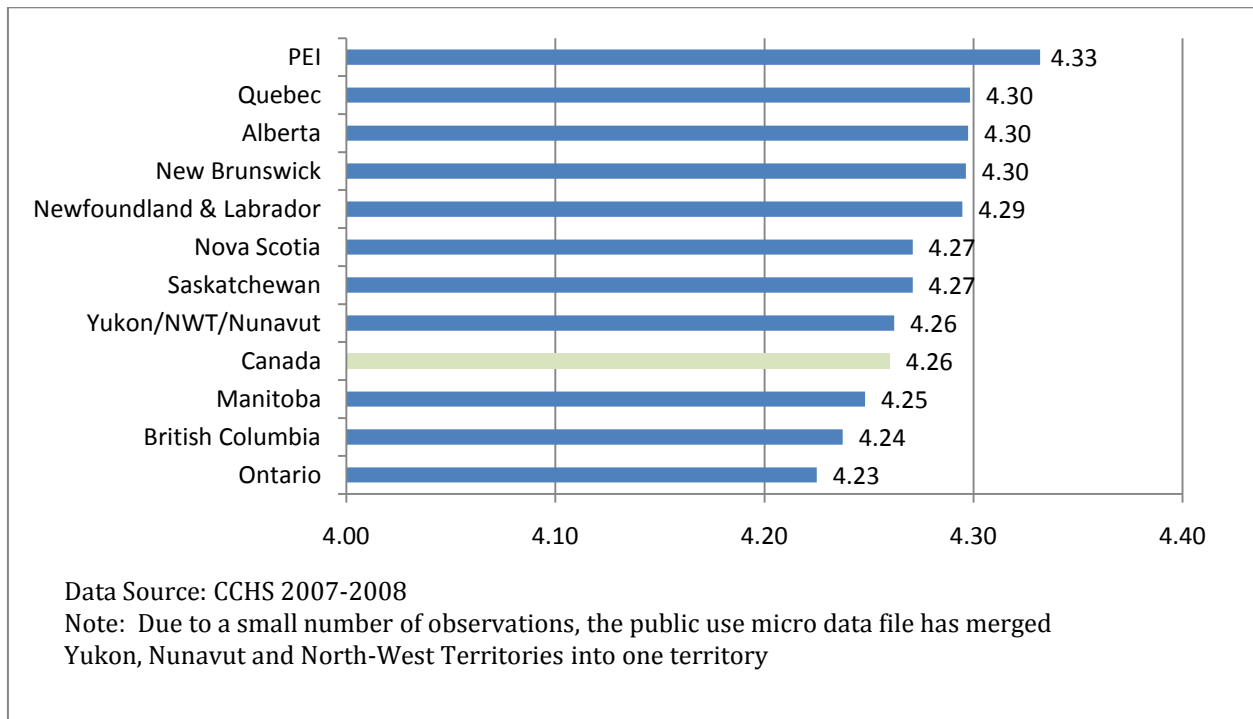


Chart 5: Average Life Satisfaction Level of the Canadian Provinces on a scale of 1 to 5, 2007-2008



We used an alternative method that ranks the life satisfaction of the provinces according to the percentage of the population that was ‘satisfied’ and ‘very satisfied’. Chart 6 shows again a small variation in happiness across the provinces, with a range of 3.9 percentage points between the top and bottom ranked province.

This method also sees considerable change in rankings at the top compared to the bottom. Prince Edward Island (94.08 per cent) is still the top ranked province, but is now followed by Newfoundland and Labrador (93.44 per cent, previously fifth) and New Brunswick (93.28 per cent, previously fourth). Quebec (92.13) drops from second place to sixth place in the happiness leagues with this change in metric. At the bottom, Ontario still ranks the lowest (90.18 per cent) and British Columbia (90.57 per cent), which still retains its second last position. Nova Scotia, previously sixth last (91.70 per cent) is now third last.

When compared with the weighted measure for the whole Canadian population (91.13 per cent), only the bottom two provinces of Ontario and British Columbia fare worse. Chart 7 presents the same ranking with a change in scales and gives an impression of a greater amount of variation than actually exists because of a change in the values for the axis.

Chart 6: Percentage 'Satisfied' and 'Very Satisfied' with life in Canada's Provinces, 2007-2008

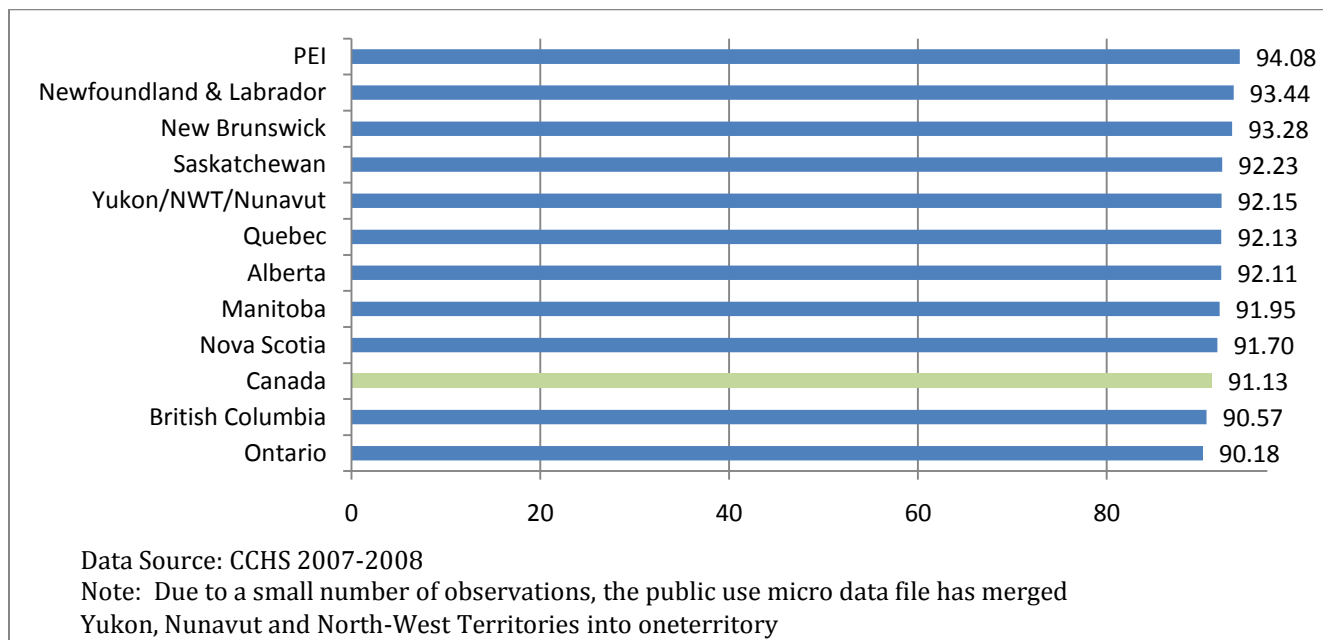
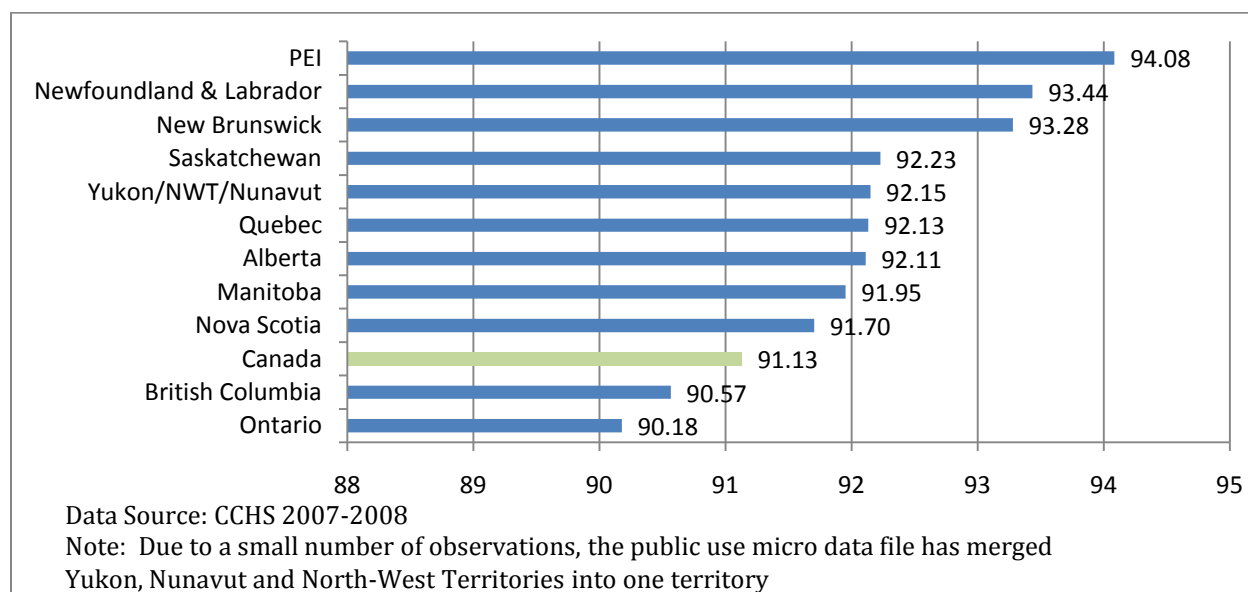


Chart 7: Percentage 'Satisfied' and 'Very Satisfied' with life in Canada's Provinces, 2007-2008



ii. CMAs

Charts 8 and 9 present average happiness ratings for 33 CMAs. The three happiest CMAs using this approach are Brantford (4.36), Quebec (4.35), and Calgary (4.33). The least happy CMAs are Toronto (4.16), Vancouver (4.18) and Windsor (4.21). Two of these CMAs, Toronto and Windsor fall in the least satisfied province (Ontario) while Vancouver falls in the province (British Columbia) that is second from bottom on the list of most satisfied provinces. The range between the most happy and least happy CMAs is relatively small, 0.2 on a scale of 1 to 5 or 5 per cent.

Chart 8: Average Life Satisfaction Level of the Canada's 33 Census Metropolitan Areas (CMAs) on a scale of 1 to 5, 2007-2008

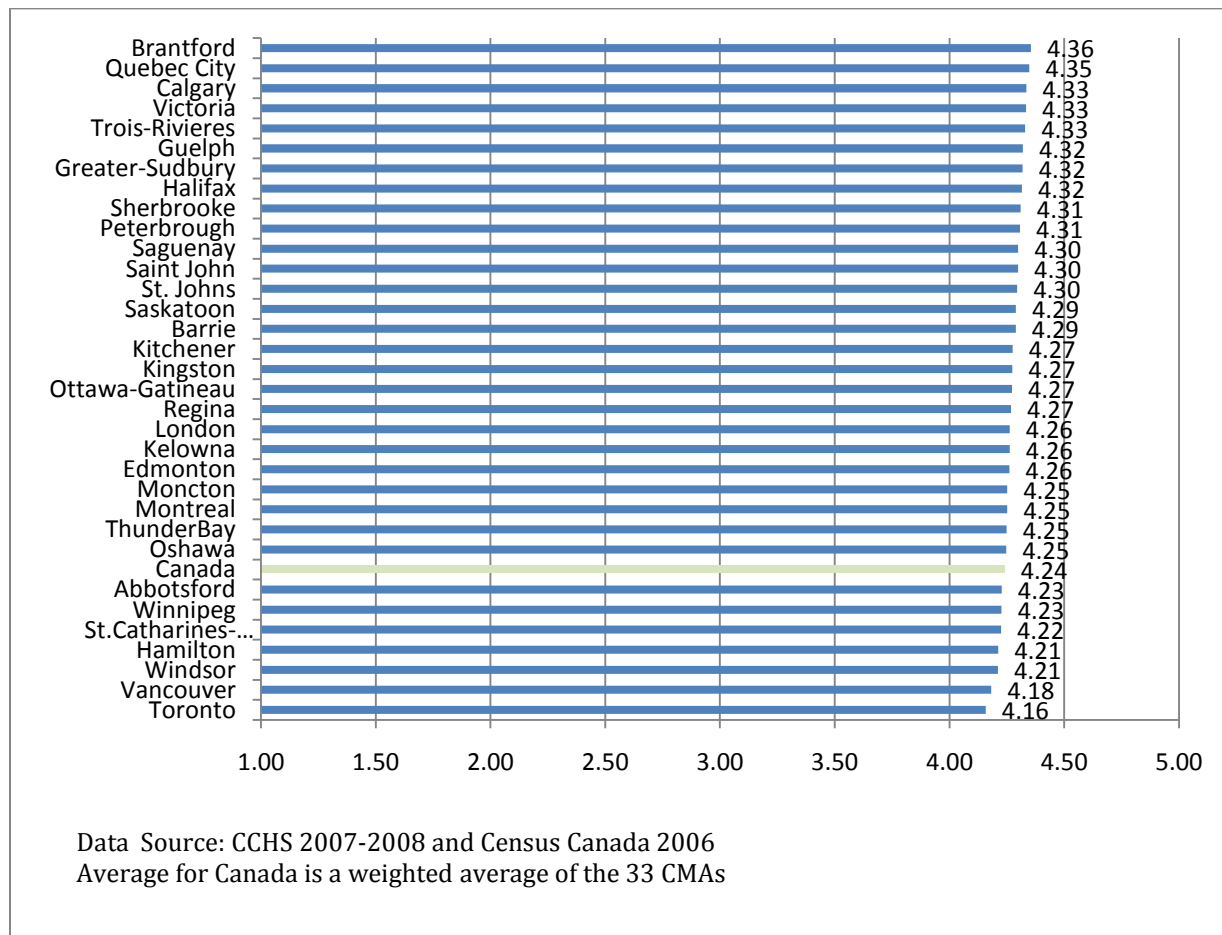
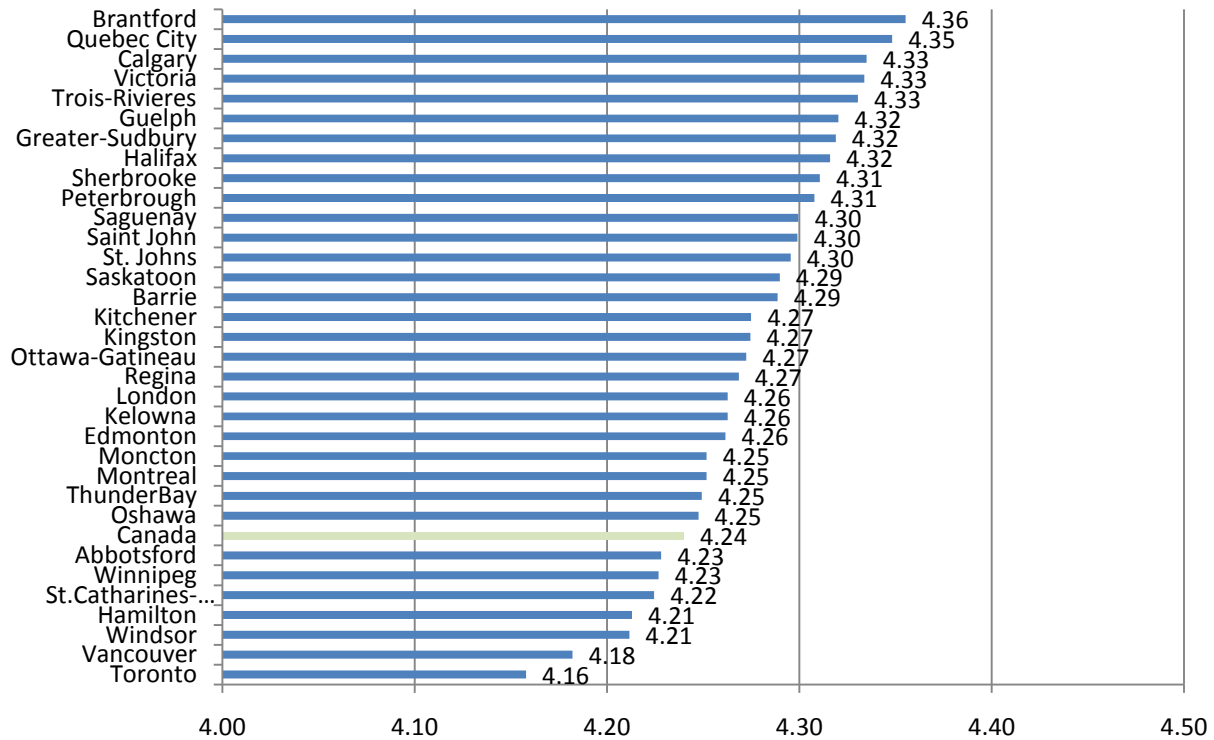
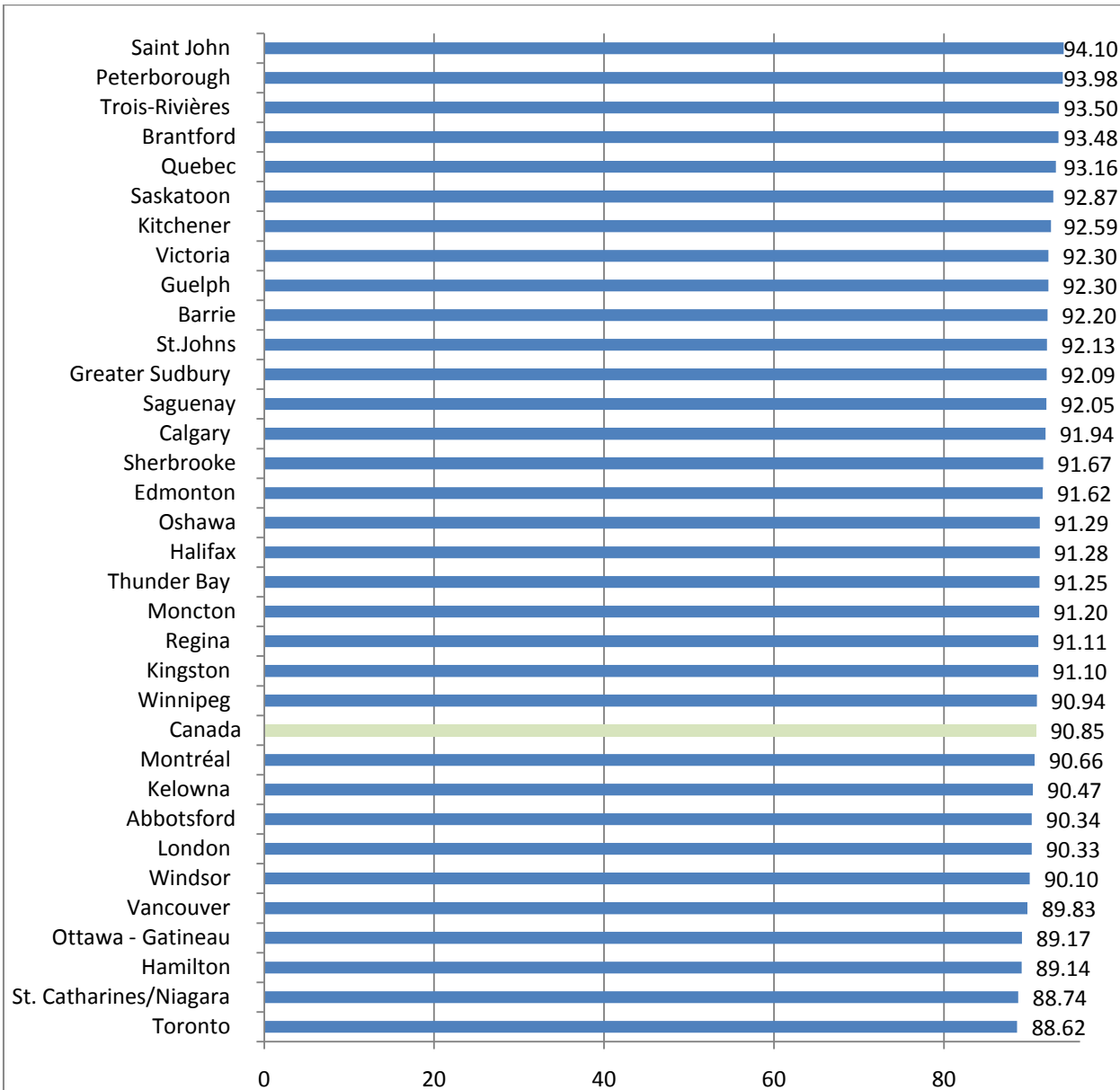


Chart 9: Average Life Satisfaction Level of the Canada's 33 Census Metropolitan Areas (CMAs) on a scale of 1 to 5, 2007-2008



Data Source: CCHS 2007-2008 and Census Canada 2006
 Average for Canada is a weighted average of the 33 CMAs

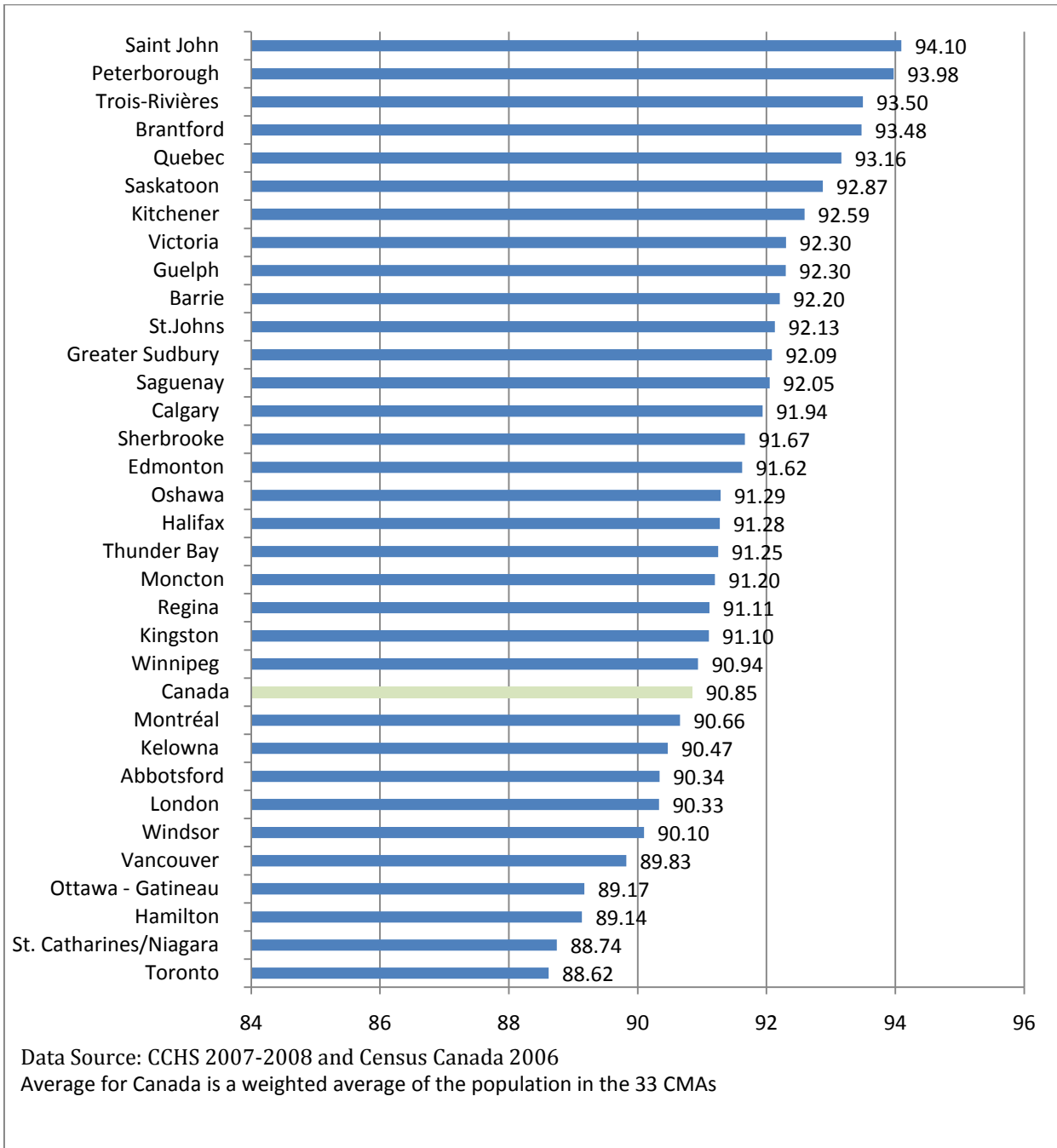
Chart 10: Percentage 'Satisfied' and 'Very Satisfied' with life in Canada's 33 Census Metropolitan Areas (CMAs), 2007-2008



Data Source: CCHS 2007-2008 and Census Canada 2006

Average for Canada is a weighted average of the population in the 33 CMAs

Chart 11: Percentage 'Satisfied' and 'Very Satisfied' with life in Canada's 33 Census Metropolitan Areas (CMAs), 2007-2008



To look at the variation at the top, we ranked the CMAs based on the percentage of the population that chose the top two categories of the life satisfaction question: 'satisfied' and 'very satisfied'. The results from this ranking criterion compared to the one that was based on average life satisfaction in Chart 10 and 11 are different especially with regards to top ranked CMAs. Saint John (94.10 per cent, previously ranked 12th), Peterborough (93.98 per cent, previously ranked 10th) and Trois-Rivières (93.50 per cent, previously ranked fifth) are now ranked the highest. Brantford, previously ranked number one, now become fifth.

The comparisons at the bottom are relatively similar: Toronto (88.62 per cent, previously ranked last), St. Cath/Niagara (88.74 per cent, previously ranked fifth from bottom) and Hamilton (89.14 per cent,

previously ranked fourth from bottom). All three of these CMAs fall in the bottom ranked province – Ontario. Vancouver, previously ranked second last, rises to fifth last.

The difference between the happiest CMA, Saint John and the least happy CMA, Toronto is 5.48 percentage points. Given the scale from 0 to 100 for this metric, this is equivalent to 5.48 per cent. Similar to the ordering based on average life satisfaction, the ranking of CMAs based on percentage of satisfied and very satisfied is characterized by very low variation with a standard deviation of 1.44 per cent.

Table 2: Average Life Satisfaction and Percentage Satisfied and Very Satisfied by Canada's Census Metropolitan Area (CMA) Population

CMA	Population	Average Life Satisfaction	Percentage Satisfied and Very Satisfied
Average for CMA Grouping		4.24	90.31
Toronto (5,113,149)	x > 1,000,000	4.16	88.62
Montreal (3,635,571)		4.25	90.66
Vancouver (2,116,581)		4.18	89.83
Ottawa-Gatineau (1,130,761)		4.27	89.17
Calgary (1,079,310)		4.33	91.94
Edmonton (1,034,945)		4.26	91.62
Average for CMA Grouping		4.26	91.23
Quebec (715,515)	450,000 < x < 1,000,000	4.35	93.16
Winnipeg (694,668)		4.23	90.94
Hamilton (692,911)		4.21	89.14
London (457,720)		4.26	90.33
Kitchener (451,235)		4.27	92.59
Average for CMA Grouping		4.27	91.10
St.Cathrines-Niagara (390,317)	200,000 < x < 450,000	4.22	88.74
Halifax (372,858)		4.32	91.28
Oshawa (330,594)		4.25	91.29
Victoria (330,088)		4.33	92.30
Windsor (323,342)		4.21	90.10
Saskatoon (233,923)		4.29	92.87
Average for CMA Grouping		4.29	91.78
Regina (194,971)	160,000 < x < 200,000	4.27	91.11
Sherbrooke (186,952)		4.31	91.67
St.Johns (181,113)		4.30	92.13
Barrie (177,061)		4.29	92.20
Average for CMA Grouping		4.29	91.59
Kelowna (162,276)	130,000 < x < 160,000	4.26	90.47
Abbotsford (159,020)		4.23	90.34
Greater Sudbury (158,258)		4.32	92.09
Kingston (152,358)		4.27	91.10
Saguenay (151,643)		4.30	92.05
Trois-Rivieres (141,529)		4.33	93.50
Average for CMA Grouping		4.30	92.72
Guelph (127,009)	100,000 < x < 130,000	4.32	92.30
Moncton (126,424)		4.25	91.20
Brantford (124,607)		4.36	93.48
Thunder Bay (122,907)		4.25	91.25
Saint John (122,389)		4.30	94.10
Peterborough (116,570)		4.31	93.98

Data Source: CCHS and Canada Census Profiles 2006

() contain population level in 2006

While we will look at socio-economic indicators in the following sections, a quick glance at both the rankings suggests that the more populated centers are the relatively less happy ones. To analyze this, we divided CMA population into six discrete (but unequal) categories. Table 2 shows that the lowest group, containing a population between 100,000 and 130,000 has an average life satisfaction of 4.30 and 92.72 per cent satisfied and highly satisfied individuals while the highest group with a population of over 1,000,000 has an average life satisfaction of 4.24 and 90.31 per cent satisfied and highly satisfied individuals. The second lowest group with a population of 130,000 and 160,000 is compared with the second highest group with a population of 450,000 to 720,000, and we see that the less populated group fares better: 4.29 vs. 4.27 and 91.59 per cent vs. 91.23 per cent. These statistics must be interpreted with caution as the groupings do not contain an equal number of CMAs nor are they demarcated with a common criterion based on a fixed population range.

iii. Health Regions

As illustrated in Chart 12, the distribution of average life satisfaction among the 102 Health Regions of Canada is relatively even with very few outliers (with only two health regions above 4.38). (Data for all health regions can be found in Appendix V). Renfrew County and District Health Unit, Ontario (4.40), Oxford County Health Unit, Ontario (4.39) and Région des Laurentides, Quebec (4.38) were found to be the happiest Health Regions. The City of Toronto Health Unit, Ontario (4.11), Peel Regional Health Unit, Ontario (4.14) and Vancouver Health Service Delivery Area, British Columbia (4.16) were found to be the least happy health regions. The most apparent difference between these health regions is that the least happy are the large urban centres while the happiest are relatively non-urban areas. The range in average life satisfaction between the most happy and least happy health region is 0.29 points on a maximum range of 4, equivalent to 7.3 per cent.

Chart 12: Distribution of Health Regions by Average Life Satisfaction on a scale of 1 to 5, 2007-2008

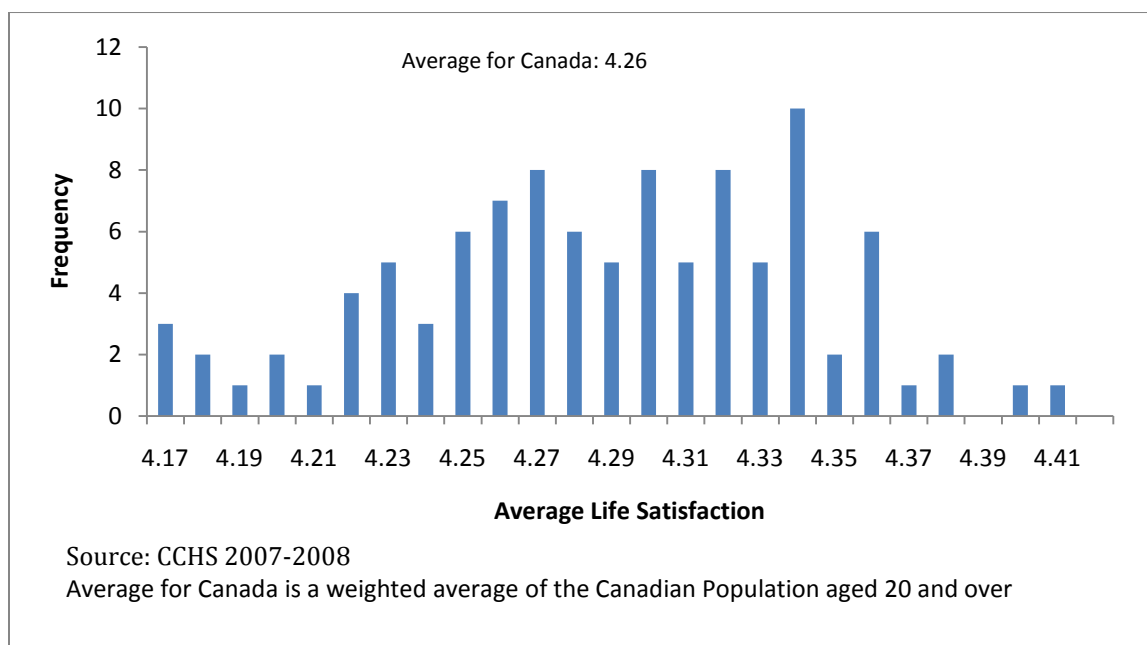
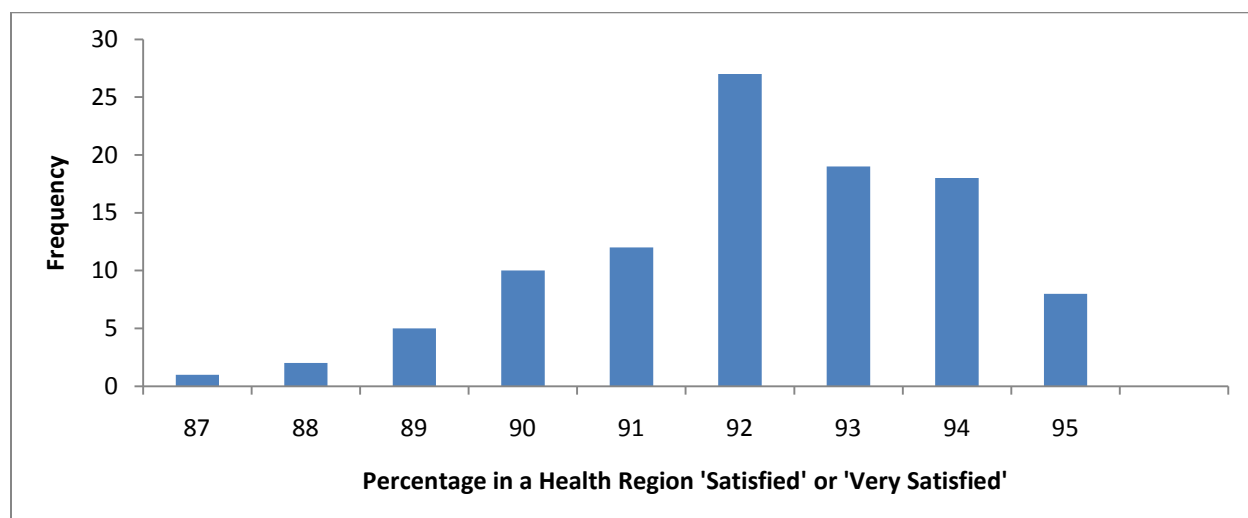


Chart 13: Distribution of Health Regions by the Percentage of the Population 'Satisfied' and 'Very Satisfied', 2007-2008



The distribution of Health Region using the percentage 'satisfied' and 'very satisfied' is similar to the one that was obtained using the average life satisfaction approach. The variation is very low (1.74 per cent) and the only visible outlier is the City of Toronto, Health Unit (86.81 per cent). At the bottom, City of Toronto is followed by Vancouver Health Service Delivery Area (88.14 per cent) and Région de Montréal, Quebec (88.17 per cent). At the top, Région de la Côte-Nord, Quebec (95.48 per cent) ranks first, followed by Région de la Chaudière-Appalaches, Quebec (95.34 per cent) and Western-Labrador-Grenfell Regional Integrated Health Authority, Newfoundland and Labrador (95.31 per cent).

D. Life Satisfaction by Different Demographic and Situational Characteristics

In addition to geographical variation, happiness varies by the situation and personal characteristics of the individual, including marital status, age, sex, income, health, education and social connections. To study the average satisfaction, we divide these characteristics into two main categories. The first category consists of situational variables which include health, mental health, level of physical activity and difficulty with activities. The second category consists of individual characteristics such as income, student status, visible minority status, immigrant status, age, sex, employment status, education and language spoken at home.

i. Situational Variables

Health affects all three aspects of an individual's well-being: social, mental and physical. As expected, data from CCHS shows that average life satisfaction is higher for a person in self reported good health. Table 3 and Chart 14 show that average life satisfaction is 3.23 for those in poor health, 3.83 for those in fair health, 4.11 for those in good health, 4.38 for those in very good health and 4.56 for those in excellent health. The difference between those in excellent health and those in poor health is 1.32 points.

The results are similar for self reported mental health (Table 3 and Chart 15). Those in poor mental health have very low average life satisfaction (2.65) and those in excellent mental health have high average

life satisfaction (4.57). The difference between those in poor mental health and in excellent mental health is 1.92 points and is mainly driven by the average score on poor mental health.

Table 3: Average Life Satisfaction at different levels of Perceived Health and Mental Health Status in Canada, 2007-2008

	Mental Health		Health	
	Average Life Satisfaction	% of Population	Average Life Satisfaction	% of Population
Poor (Lowest)	2.65	1.01	3.23	3.22
Fair	3.38	4.05	3.83	9.06
Good	3.95	20.85	4.11	29.75
Very Good	4.27	35.33	4.38	36.74
Excellent (Highest)	4.57	38.76	4.56	21.24
<i>Difference between Highest and Lowest</i>	1.92		1.33	

Chart 14: Life Satisfaction by Self Perceived Health Status in Canada, 2007-2008

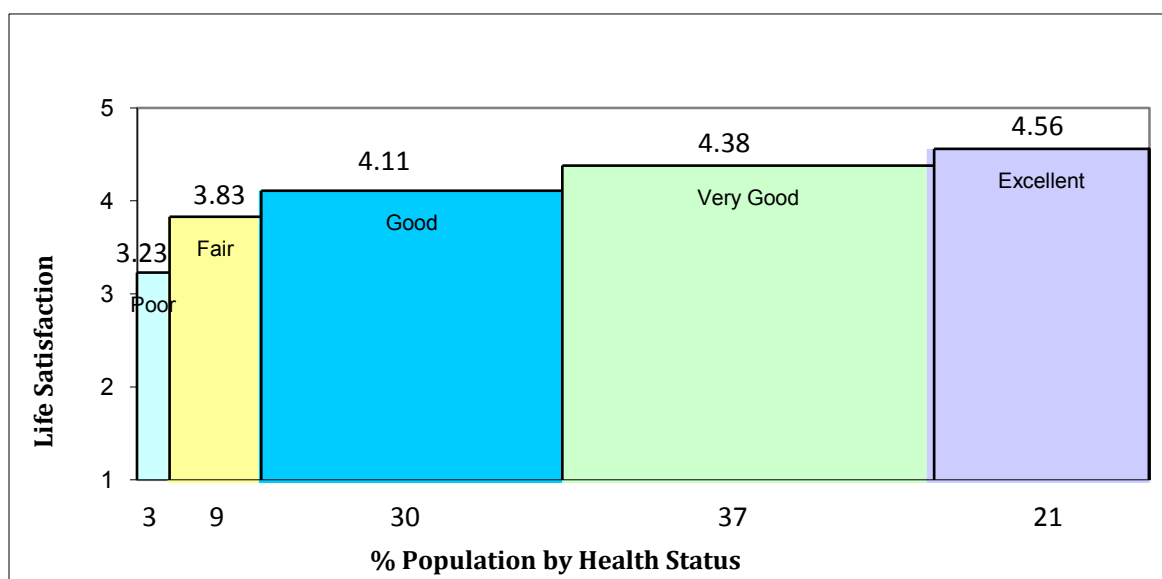
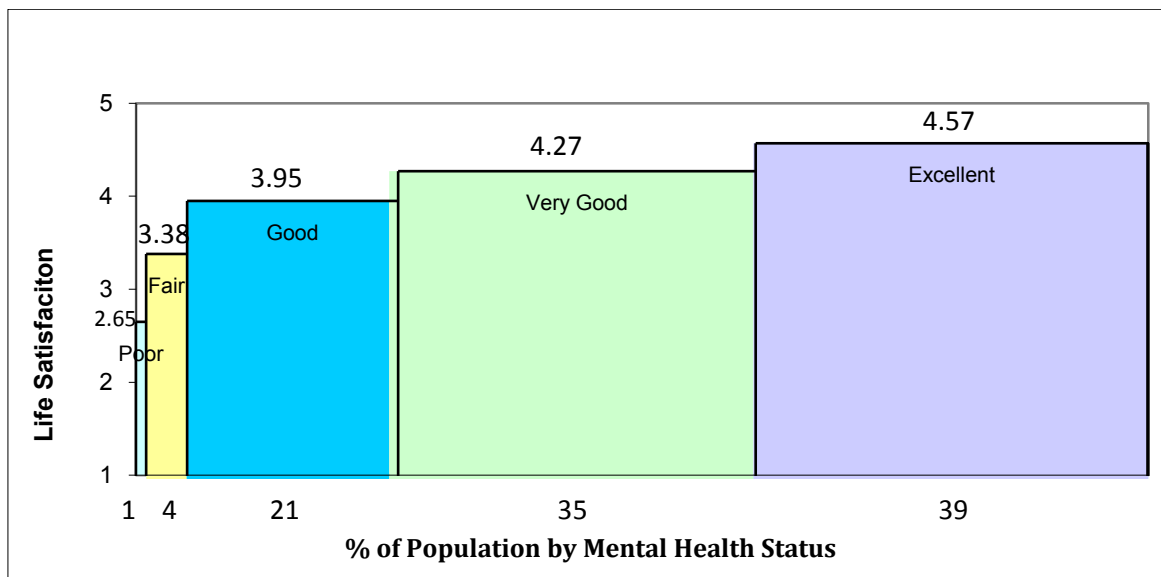


Chart 15 : Life Satisfaction by Self Perceived Mental Health Status in Canada, 2007-2008



The pattern for self perceived stress is similar to that of health. The higher the average stress in an individual's daily life the lower his average life satisfaction. On a scale of 1-5, individuals who are extremely stressed in their daily routines had an average life satisfaction of 3.67 while individuals who did not feel any stress had an average life satisfaction of 4.52 (Table 4 and Chart 16).

Table 4: Average Life Satisfaction at different levels of Stress in Canada, 2007-2008

Stress	Average Life Satisfaction	% of Population
Not at all (Lowest)	4.52	11.89
Not very	4.41	23.73
A bit	4.25	41.46
Quite a bit	4.05	19.16
Extremely (Highest)	3.67	3.76
<i>Difference between Highest and Lowest</i>	0.85	

Chart 16: Life Satisfaction by Self Perceived Mental Health Status in Canada, 2007-2008

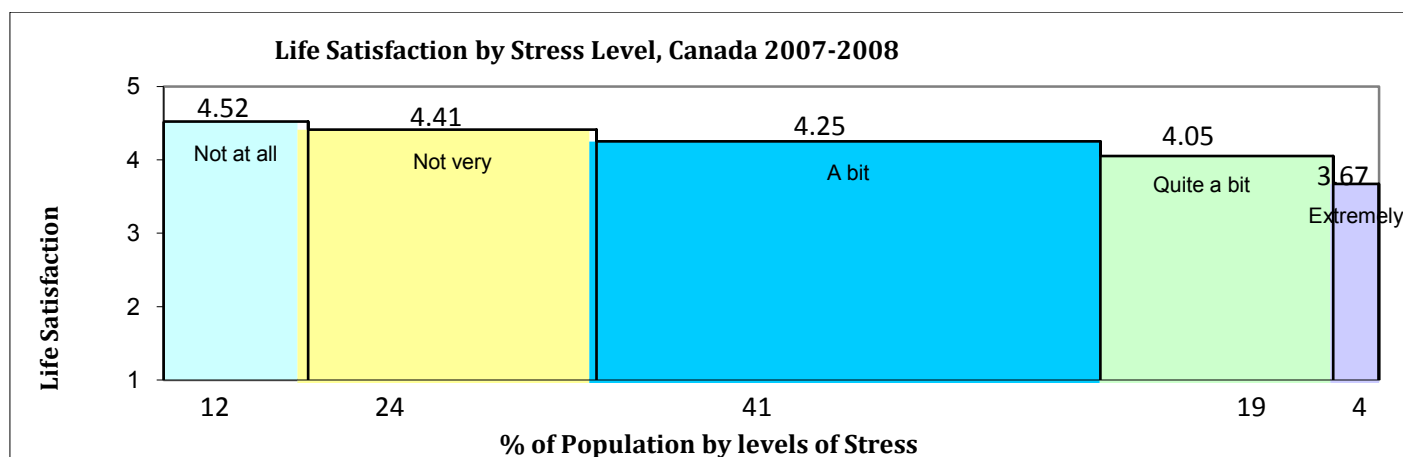


Table 5 and Chart 17 show that a higher sense of belonging to the local community results in higher average life satisfaction. Average life satisfaction increases from 3.93 for those with very weak sense of belonging to 4.16 for somewhat weak, 4.31 for somewhat strong and 4.47 for very strong sense.

Table 5: Average Life Satisfaction by Sense of Belonging to the Local Community, 2007-2008

Sense of Belonging to the Local Community	Average Life Satisfaction	% of Population
Very weak	3.93	10.24
Somewhat weak	4.16	26.37
Somewhat strong	4.31	46.12
Very Strong	4.47	17.28
<i>Difference between very weak and very strong sense of belonging</i>	0.54	

Chart 17: Life Satisfaction by Sense of Belonging to the Local Community in Canada, 2007-2008

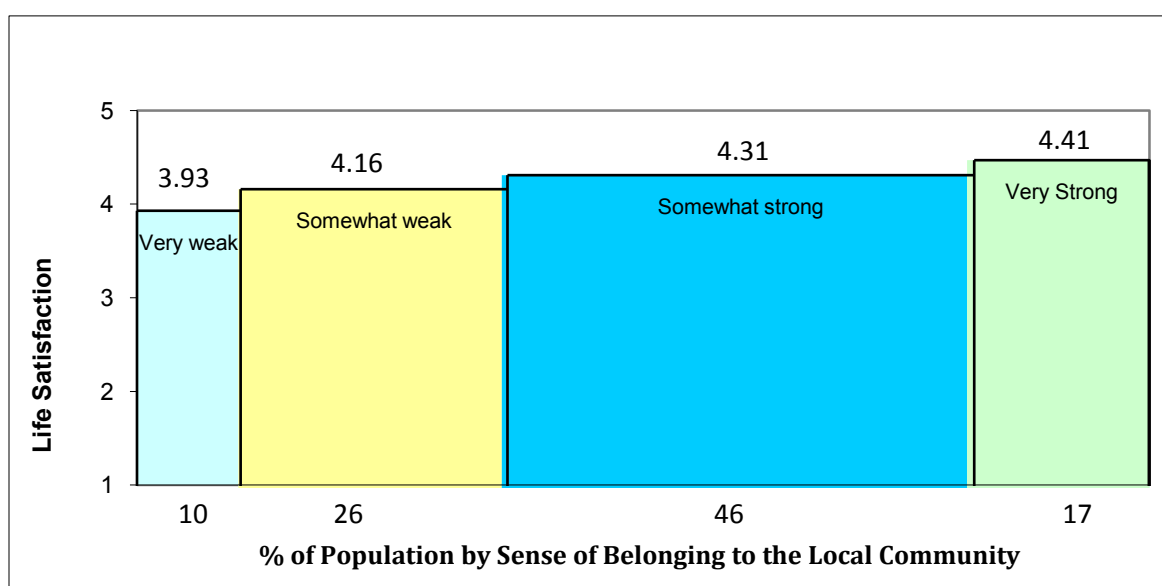


Table 6 and Chart 18 show the average life satisfaction across three different levels of physical activity. This concept is based primarily on the leisure physical activity index and has been adopted in the CCHS as a survey question with three possible answers; inactive, somewhat active and active. As expected, the level of physical activity has a positive relationship with average life satisfaction with the score being 4.16 for inactive, 4.33 for somewhat active and 4.40 for active individuals.

Table 6: Average Life Satisfaction by Level of Physical Activity in Canada, 2007-2008

Level of Physical Activity	Average Life Satisfaction	% of Population
Inactive	4.16	23.14
Somewhat Active	4.33	24.74
Active	4.40	52.12
<i>Difference between Inactive and Active</i>	0.24	

Chart 18: Life Satisfaction by Level of Physical Activity in Canada, 2007-2008

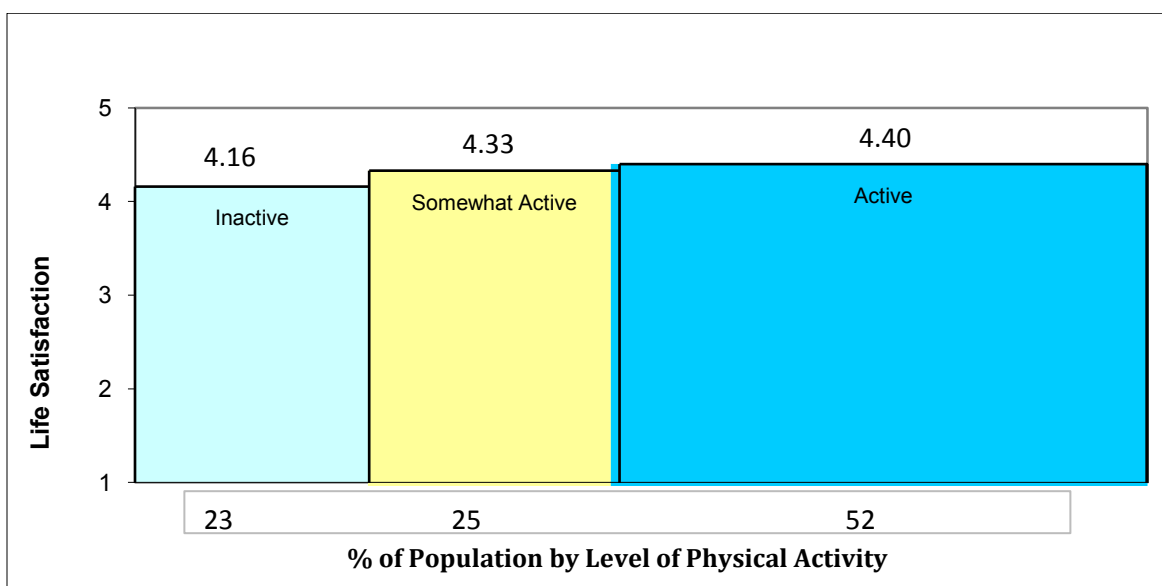
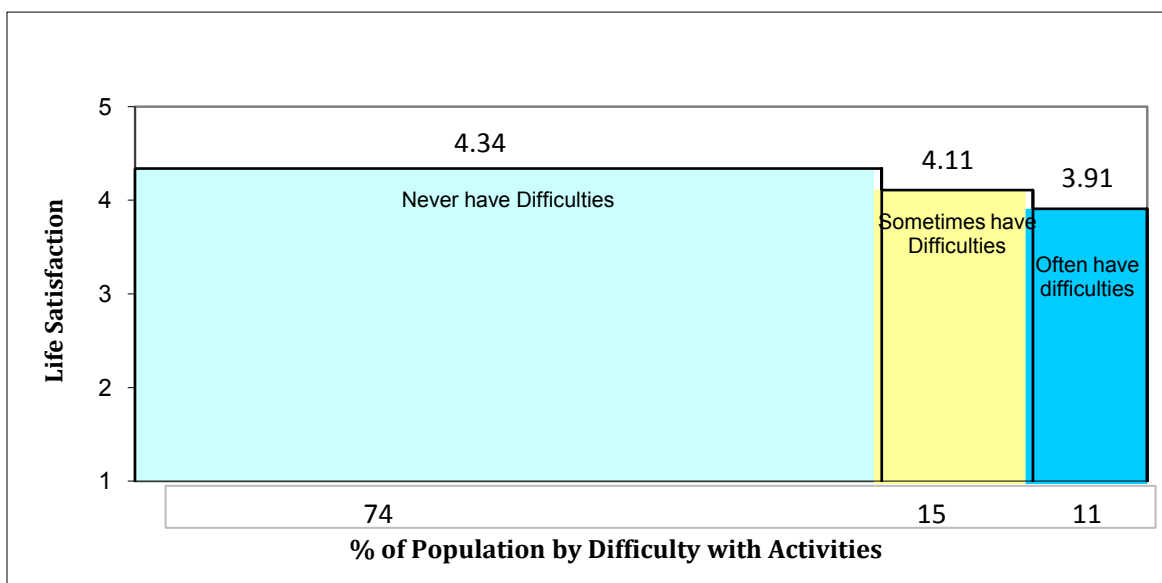


Table 7 and Chart 19 show average life satisfaction is lower for people who have difficulty with activities such as learning, hearing, seeing, walking, climbing stairs or bending. The average life satisfaction is 4.34 for people who have never had any difficulty with such activities, 4.11 for people who have sometime had difficulties and 3.91 for those who often have difficulties.

Table 7: Average Life Satisfaction by Difficulty with Activities in Canada, 2007-2008

Difficulty with Activities	Average Life Satisfaction	% of Population
Never have Difficulties	4.34	73.79
Sometimes have Difficulties	4.11	14.94
Often have difficulties	3.91	11.28
<i>Difference between Never have Difficulties and Often have difficulties</i>	0.43	

Chart 19: Average Life Satisfaction by Difficulty with Activities in Canada, 2007-2008



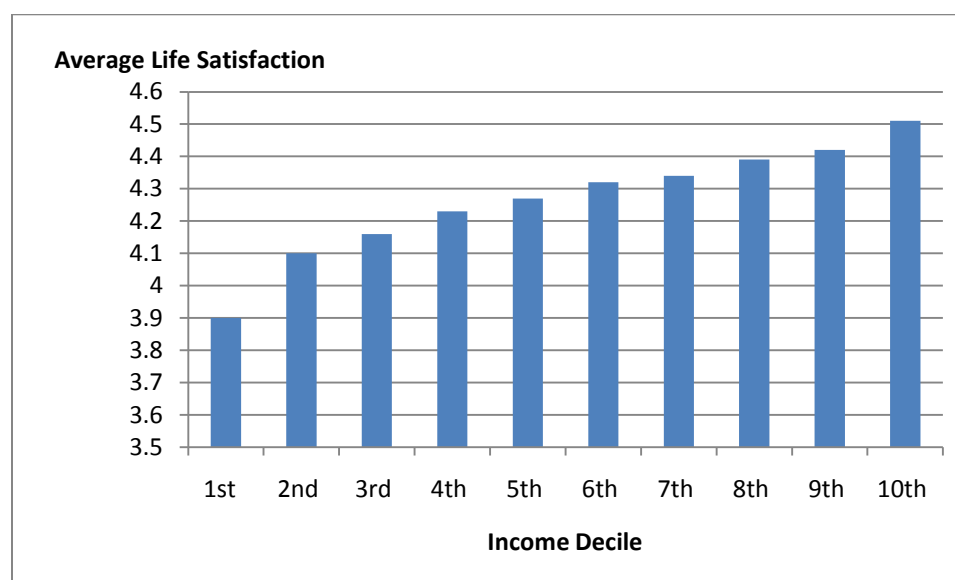
ii. Individual Characteristics

The income measures in the CCHS 2007-2008 are expressed in terms of household income deciles. Table 8 and Chart 20 show a positive monotonic relationship between this income measure and subjective well-being. Those in the lowest income decile have an average life satisfaction of 3.90 while those in the top decile have a life satisfaction of 4.51. It must be noted that the gap between fifth and the bottom income decile (0.37) is greater than the gap between the median income decile and the top income decile (0.24). Therefore, the marginal effects of income on life satisfaction are relatively larger for the low income groups.

Table 8: Average Life Satisfaction by Household Income Deciles of Canada, 2007-2008

Household Income	Average Life Satisfaction
1 st Decile (Lowest)	3.90
2 nd Decile	4.10
3 rd Decile	4.16
4 th Decile	4.23
5 th Decile	4.27
6 th Decile	4.32
7 th Decile	4.34
8 th Decile	4.39
9 th Decile	4.42
10 th Decile (Highest)	4.51
<i>Difference between Highest and Lowest</i>	0.61

Chart 20: Life Satisfaction by Income Deciles, Canada 2007-2008



We find that students are slightly happier than non-students, 4.28 versus 4.26 (Table 9). Individuals are categorized as students if they are enrolled part-time or full-time in a school, college or a university.

Table 9: Average Life Satisfaction by Student Status in Canada, 2007-2008

Student Status	Average Life Satisfaction	% of Population
Student	4.28	8.00
Non-Student	4.26	92.00
<i>Difference between Not a student and Student</i>	0.02	

The CCHS also has a question on the immigration status of an individual. Individuals are termed immigrants if they were not born in Canada. They are termed recent immigrants if they migrated within the last nine years, and are classified as non-recent immigrants if they migrated to Canada more than nine years ago at the time of the survey. The data from CCHS shows that those born in Canada are markedly happier than those born outside (Table 10). Non-immigrants have an average life satisfaction of 4.30 compared to 4.11 for recent immigrants and 4.14 for non-recent Immigrants.

Table 10: Average Life Satisfaction by Immigration Status in Canada, 2007-2008

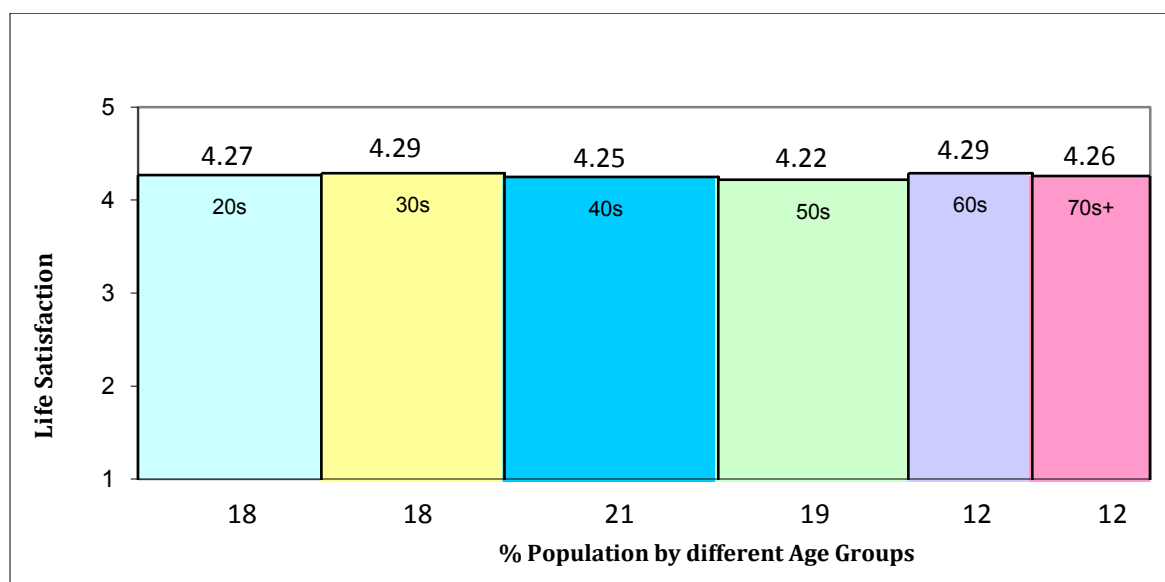
Immigration Status	Average Life Satisfaction	% of Population
Non-Immigrants	4.30	85.00
Non-Recent Immigrants	4.14	3.00
Recent Immigrants	4.11	12.00
<i>Difference between Recent Immigrants and Non-Immigrants</i>	0.19	

In the CCHS, age is measured by decade. From Table 11 and Chart 21 it can be seen that average life satisfaction increases from 4.27 in the 20s to 4.29 in the 30s. It then declines with individuals in their 40s to 4.25 before reaching a global minimum of 4.22 in the 50s. It then increases to 4.29 for individuals in their 60s before declining slightly to 4.26 for individuals in their 70s. Therefore, individuals in the 30s are the happiest and the individuals in the 50s are the least happy of all the age categories. But the differences are small.

Table 11: Average Life Satisfaction by Age Categories in Canada, 2007-2008

Age Category	Average Life Satisfaction	% of Population
20s	4.27	18.12
30s (Joint highest)	4.29	18.09
40s	4.25	21.13
50s (Lowest)	4.22	18.78
60s (Joint highest)	4.29	12.25
70s and above	4.26	11.63
<i>Difference between the 30s and the 50s</i>	0.07	

Chart 21: Average Life Satisfaction by Age Categories in Canada, 2007-2008



Visible minorities are found to be less happy than those who belong to the majority. The average life satisfaction of those in the visible minorities is 4.10 compared to 4.29 for the majority (Table 12).

Table 12: Average Life Satisfaction by Visible Minority Status in Canada, 2007-2008

Visible Minority Status	Average Life Satisfaction	% of Population
Majority	4.29	81.62
Visible Minority	4.10	18.38
<i>Difference between Majority and Visible Minority</i>	0.19	

Education was found to have a positive relationship with well-being although the relationship is not perfectly linear. Table 13 and Chart 22 show that average life satisfaction is 4.11 for individuals with less than secondary education, 4.24 for individuals with secondary schooling, and 4.22 for individuals with some post-secondary schooling and 4.31 for persons with post-secondary schooling.

Table 13: Average Life Satisfaction by Highest Educational Attainment in Canada, 2007-2008

Highest Educational Attainment	Average Life Satisfaction	% of Population
Less than Secondary	4.11	15.79
Secondary School Graduate	4.24	16.26
Some Post-Secondary	4.22	7.93
Post-Secondary	4.31	60.02
<i>Difference between Less than Secondary and Post-Secondary</i>	0.20	

Chart 22: Average Life Satisfaction by Highest Educational Attainment in Canada, 2007-2008

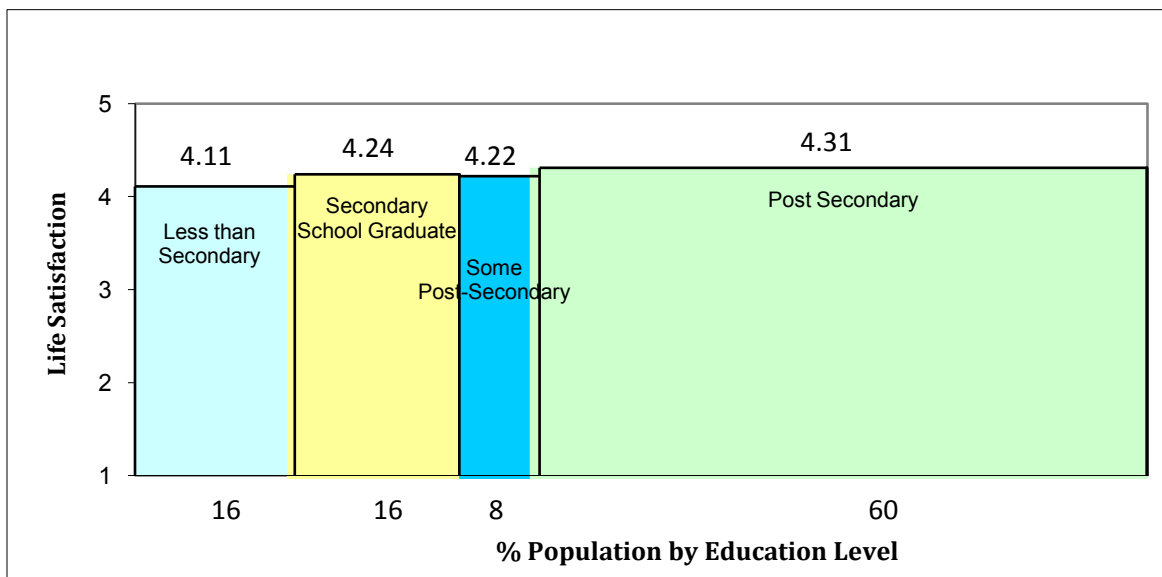
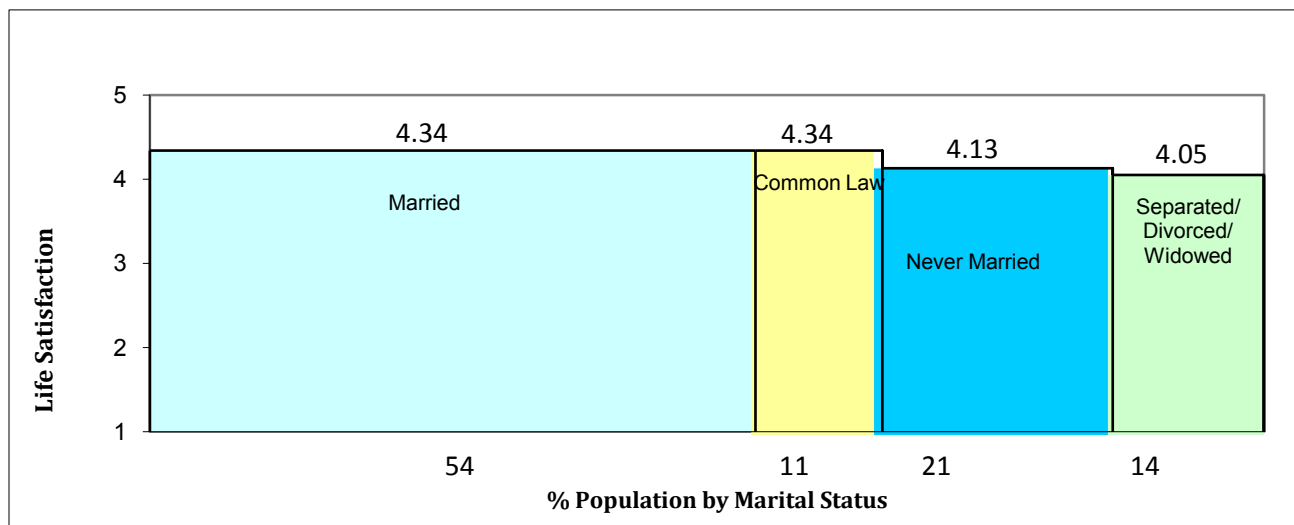


Table 14 and Chart 23 show that individuals who are married or in a common law relationship are happier than individuals who have never married or are separated, divorced or widowed. The average life satisfaction of those who are married or in a common law relationship is 4.34 compared to 4.05 for those who are separated, widowed or divorced and 4.13 for those who have never married.

Table 14: Average Life Satisfaction by Marital Status in Canada, 2007-2008

Marital Status	Average Life Satisfaction	% of Population
Married	4.34	54.36
Common Law	4.34	11.39
Never married	4.13	20.68
Separated/Divorced/Widowed	4.05	13.57
<i>Difference between Married and Separated/Divorced/Widowed</i>	0.29	

Chart 23: Average Life Satisfaction by Marital Status in Canada, 2007-2008



We find Francophones (4.32) and Anglophones (4.27) to be happier than Allophones (4.06) as shown in Table 11 and Chart 24. This is not surprising as familiarity with the official language provides great advantages in social networking as well as labour market opportunities.

Table 15: Average Life Satisfaction by Language Spoken at Home in Canada, 2007-2008

Language Spoken at Home	Average Life Satisfaction	% of Population
Francophones	4.32	21.18
Anglophones	4.27	66.22
Allophones	4.06	12.00
<i>Difference between Francophones and Allophones</i>	0.26	

Chart 24: Average Life Satisfaction by Language Spoken at Home in Canada, 2007-2008

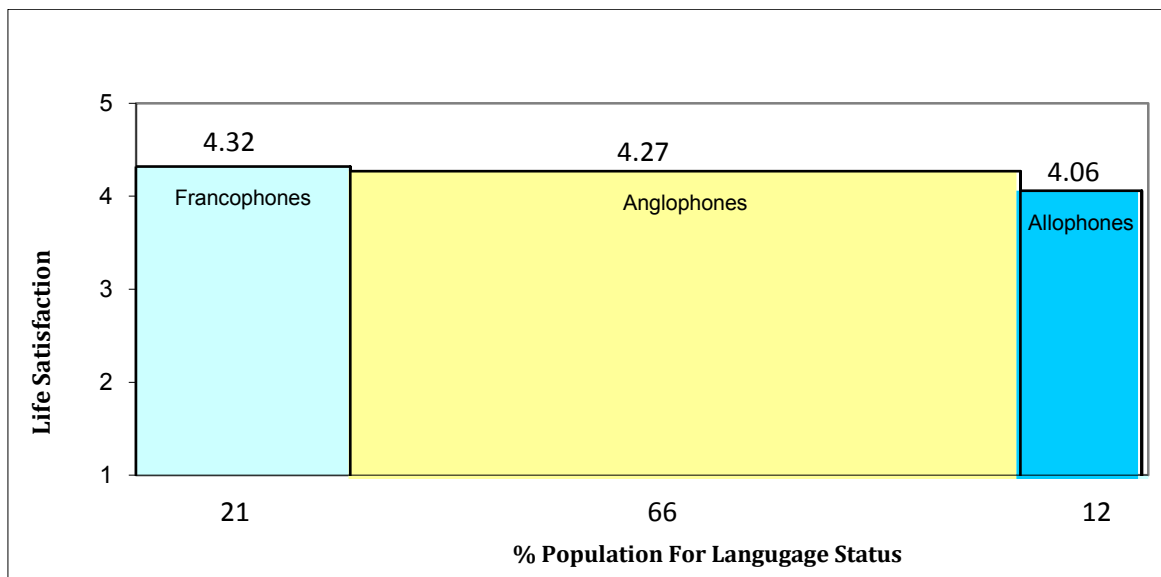


Table 16 shows that employed individuals are happier than those who are not employed. This is not surprising since loss of employment is seen by most as stigma and causes one to lose self-respect. However, the statistics from this table must be interpreted with caution as the 'not employed' variable includes both the unemployed as well as those not in the labour forces due to the limitations of the public use microdata file. Employment status also includes a category for those who are disabled and are permanently unable to work. Their average life satisfaction is considerably lower at 3.63 when compared to those who are employed (4.30) and not employed (4.21)

Table 16: Average Life Satisfaction by Employment Status in Canada, 2007-2008

Employment Status	Average Life Satisfaction	% of Population
Employed	4.30	72.07
Not Employed (unemployed and out of labour force)	4.21	24.98
Disabled	3.63	2.94
<i>Difference between Employed & Unable to Work</i>	0.67	

Average life satisfaction of males is 4.25 compared 4.26 for females (Table 17). The difference between the happiness of the two sexes is quite small but there are other factors like health that might play an important role between the relationship of an individual's sex and life satisfaction. This relationship will be examined closely when such factors are accounted in the analysis in the following section.

Table 17: Average Life Satisfaction by Sex in Canada, 2007-2008

Sex	Average Life Satisfaction	% of Population
Female	4.26	49.04
Male	4.25	50.96
<i>Difference between Male and Female</i>	0.01	

Table 18 gives the differences in average life satisfaction within the different categories for variables discussed in this section. Among the situational variables, the greatest difference is found in mental health (1.92) followed by health (1.32), stress (0.85), sense of belonging to the local community (0.54), difficulty with activities (0.42) and level of physical activity (0.24). The greatest disparity in average life satisfaction within individual characteristics is found in employment status (0.67), and household income (0.61), followed by marital status (0.29), language spoken at home (0.28), educational attainment (0.20), immigration status (0.19) and visible minority status (0.19). Age (0.07), student status (0.02) and sex (0.01) have negligible differences.

The ranking of these characteristics or factors is done without accounting for other variables that may mitigate or enhance the impact on subjective well-being. The following section will explore the strength of the association of these variables with well-being using a framework based on a regression analysis that will enable such factors to be taken into account.

Table 18: Differences in Average Life Satisfaction by certain demographics and situational characteristics, Canada 2007-2008

Variable	Category with the highest average on Life Satisfaction	Category with the lowest average on Life Satisfaction	Difference between highest and lowest average
Situational Variables			
Mental Health	Excellent Mental Health	Poor Mental Health	1.92
Health	Excellent Health	Poor Health	1.32
Stress	Not at all	Extremely	0.85
Sense of Belonging to the local community	Very strong	Very weak	0.54
Difficulty with Activities	Never	Often	0.42
Level of Physical Activity	Completely Inactive	Highly Active	0.24
Individual Characteristics			
Household Income	1st Decile	10th Decile	0.61
Employment Status	Employed	Unable to Work	0.67
Marital Status	Married	Never Married	0.29
Language Spoken at Home	Francophones	Allophones	0.28
Highest Educational Attainment	Post-Secondary Graduate	Less than Secondary	0.20
Immigration Status	Non-Immigrants	Recent Immigrants	0.19
Visible Minority Status	Majority	Visible Minority	0.19
Age	30s/60s	50s	0.07
Student Status	Student	Non-Student	0.02
Sex	Female	Male	0.01

Data Source: CCHS 2007-2008

IV. Regression Analysis

This section of the report will discuss the methodological framework for the regression analysis estimated using the CCHS dataset and the choice of key variables. It will then presents results from two sets of regressions: Equation 1 that uses only individual variables and Equation 2 that uses individual and health region variables. In addition, this section will also explore results that have been derived from the regression analysis in the form of marginal effects and predicted life satisfaction.

A. Methodological Framework for the Regression Analysis

The regression analysis follows the econometric techniques that Helliwell (2003) has used in his paper to explain international and interpersonal differences in well-being using the World Values Survey. The idea behind his framework is as follows; subjective well-being is caused by both individual factors (e.g. individual temperament, income, health) and societal factors (societal levels of corruption, inequality, average income). This approach is well suited for our study as we have two sets of regressors: individual level and societal level. Building on Helliwell's methodology, we seek to discover the simultaneous identification of individual-level and societal-level determinants of well-being, except in our case we define societal-level as not the national level, but at the health region and the CMA level. We have therefore divided our analysis into three sets of equations: 1) individual well-being explained by individual variables 2) individual well-being being explained by individual and societal variables and 3) average well-being of a geographical unit explained by societal variables.¹⁰

The reason we want to consider several geographical dimensions of society is twofold. First, in the abstract it is hard to know what is the size of the geographic unit which primarily affects subjective well-being. Thus we will experiment by using two geographical levels in Canada. Second, as the size of our unit for society increases (from health region to CMA) the range of societal level variables available increases because of greater data availability.

The two-level analysis, using individual and societal determinants allows us to differentiate the effects at the individual and societal level. Societal variables (discussed in the following section) are either averages of individual variables from the CCHS or drawn from other sources.. An example of an average of an individual variable is average health of a geographical unit. It is known that healthier people are happier, but does the average level of health society play a role as well in the form of a spillover effect? Does just being around healthy people make people happier? By regressing individual subjective well-being on both individual health and average health in their health region we can analyze if there is a societal effect of health on subjective well-being.

Helliwell (2003) primarily used ordinary least squares (OLS), but also used an ordered probit model, which is appropriate since the dependent variable, life satisfaction is an ordinal categorical variable. Mathematically this would be represented as:

$$z_{ij} = f(\alpha, \beta X_i + \gamma Y_{ij})$$

¹⁰ The results from this analysis along with a discussion can be found in Appendix III F. This section will primarily focus on individual well-being and its determinants at the individual and societal level.

With z_{ij} being the individual life satisfaction, X_i being a vector of community level variables, and Y_{ij} being a vector of individual variables, α is a vector of the cut-points for life satisfaction levels, β is vector of the coefficients on community level variables, and γ is a vector of the coefficients on individual level variables. If we use an OLS regression, we would assume to distance from “neither satisfied nor dissatisfied” (3) to “satisfied” (4) is the same as the distance from “satisfied” (4) to “very satisfied” (5). However, the order probit makes no assumption as the cut-points determine the distance between the ordinal categories.

B. Key Variables

Subjective well-being is the main dependent variable for our regression analysis and it is measured using the life satisfaction question which asks, “How satisfied are you with your life in general?” and rates its answers on a 5 point scale, with the following possible answers: very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, or very dissatisfied. Due to the limited number of responses on income, the number of observations for the regression analysis is smaller compared to the total sample size. After accounting for the attrition, the total sample size is 83,466 from 102 health regions. The independent variables have been divided into two categories: individual variables and societal variables. The individual variables are further divided into ordinal variables and dummy variables. The summary of the data can be found in Appendix Table 2.

All the variables that were used as ordinal in our analysis have been used with the scheme provided by the CCHS. Health and mental health were used as ordinal variables using the scheme: 1-poor, 2-fair, 3-good, 4-very good and 5-excellent. Stress was also used with the same scheme with the orders for the best and worst outcome reversed: 1- not at all (stressful), 2- not very, 3- a bit, 4- quite a bit, 5- extremely (stressful). For the ‘sense of belonging variable’ the best outcome was 1-very weak and the worst was 4-very strong. We also used actual household income as an ordinal variable as only discrete measures were provided by the CCHS in the form of household income deciles.

The dummy variables in this analysis are control variables that are related to individual characteristics and demographics such as age, sex, immigration status, visible minority status, marital status, language and labour force status. These individual characteristics are used as control variables so that their association with well-being could be accounted for when the relationship between well-being and the aforementioned ordinal variables is studied.

For age, a categorical variable was used as a regressor because exact age was not given in the public use microdata. Age group 20-29 was the base case in our regressions with 6 indicator variables, five for the next 10 year age groups plus one for those aged 80 and older.

Immigration status was used as an independent variable with non-immigrants as the base case. The indicator variables were non-recent immigrants, individuals who had migrated to Canada more than nine years ago and recent immigrants, individuals who had migrated to Canada less than nine years ago.

We also used visible minority status as a regressor with non-visible minority being the base case. For the sex variable, females were used as the base case and males were the indicator variable.

Education of the individual was used as an independent variable. This variable corresponds to the highest level of education attained and has four levels. The base case is did not graduate from secondary school and the other three indicator variables are graduated from secondary school, attended post-secondary, and graduated from post-secondary.

Marital status of the respondent was used as a regressor with the base case of ‘never been married’. Three indicator variables were used, one for married, one for in a common-law relationship, and one for persons divorced, separated, or widowed.

Language spoken at home was used as a regressor with Anglophone as the base case, and indicator variables for Francophones and Allophones, individuals who never speak either English or French at home.

Employment status was used as an independent variable with employed as the base case with indicator variables for ‘not working’ and the permanently disabled. Unfortunately, the public use microdata file for the CCHS does not contain a variable on whether the respondent is unemployed; therefore, we had to use the ‘not working’ variable to represent the individuals out the labour force as well as those who were unemployed.

Student status was also a regressor with non-student as the base case and student as the indicator variables. The student variable represents individuals who are either studying full-time or part-time in a school, college and university.

Two additional categories related to the level of physical activity and difficulties with activities were added as controls in the form of dummy variables. Level of physical activity was used as regressor with ‘physically inactive’ as the base case with two indicator variables, one for ‘somewhat inactive’ and the other for ‘physically active’. Difficulty with activities is related to problems with hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities?” with possible answers of ‘sometimes’, ‘often’ or ‘never’. We chose ‘never’ as the base case and used indicator variables for ‘sometimes have difficulties’ and one for ‘often have difficulties’.

The societal variables at the health region level were proportion of individuals who were: students, graduates of the post-secondary level, non-recent immigrants, married, francophones, and males, physically active and never had difficulty with activities. For ordinal variables representing individual characteristics, we used averages for the population in a health region. These variables were average perceived health, average perceived mental health, average stress, average level of belonging to the local community and average age. The societal variables at the CMA level were the corresponding proportions and averages for these same variables.

We calculated a measure of income inequality for each health region by using the variance of individuals’ income that was measured by CCHS in income deciles. Aside from income inequality, we also calculated the logarithm of health region population sizes from the CCHS. The corresponding measure at the CMA level is the income variance of the individuals’ in the CMA.

We used the 2006 Canadian Census Population and its community profiles to derive at both the CMA and health region level four variables: population density (persons per square kilometer), median household income, the unemployment rate, and a score of ethnic fractionalization.¹¹

¹¹ This was calculated using the number of non-visible minorities plus 12 categories of visible minorities (Chinese, South Asian, Black, Filipino, Latin American, Southeast Asian, Arab, West Asian, Korean, Japanese, visible minority not included elsewhere, and multiple visible minority). Then using these thirteen categories we calculated a a Herfindahl-type index that represents the probability than any two randomly drawn people from the health region will be from the same ethnic group. We calculated this from the ethnic subpopulation shares using the formula $1 - \sum_1^N s_i^2$ with s_i being the share of the ethnic group i (in the health region).

B. Regression Results

i. Ordered Probit Regression of Life Satisfaction of the Canadian Population

a. Equation 1 and 2

In Equation 1, we used subjective well-being as the dependent variable and all the individual variables discussed in the previous section as independent variables. In Equation 2, we tested for the “societal” impact on subjective well-being and aimed to explore where these variables could add more robustness to our original model. Equation 2 therefore contains individual as well as health region variables. The results for both the models can be found in Appendix Table 3 in Appendix III. They show that all the positive situational characteristics – health, mental health, sense of belonging to the local community, level of physical activity are positively associated with well-being. The negative situational characteristics like difficulty with activities and stress level are negatively associated with well-being as expected. The variables representing these situational characteristics are highly significant in both sets of Equations. Therefore good health, physically active lifestyle and high sense of belonging are positive determinants of happiness while pressure, strain or anxiety in domestic and work related routine and frequent difficulties with activities such as learning, hearing, seeing, walking, climbing stairs or bending are negative determinants of well-being.

The results for personal characteristics and demographics are also close to expectations. Married individuals and those in a common-law relationship are happier than those who have never been married. Their variables are highly significant (at 1 per cent) while the one representing those who are divorced separated and widowed was insignificant. These results are consistent for both sets of Equations. This is in line with findings of empirical studies in the literature that have successfully pinned down the causal relationship between marriage and happiness. Even though there is a cause to believe that habituation can set in following marriage which can cause relative happiness to decline, a married individual is still happier than someone who is divorced, separated, widowed or has never married.

The analysis for both equations shows that income is positively related to well-being and the coefficient of the income variable is highly significant. The role of income has been much debated in the well-being literature. There is also a great deal of contention over the role of income beyond a certain threshold, after which marginal effects of income on happiness start to decrease.

For age groups, people from 30-50 years are found to be less happy while the individuals in their 70s are happier than those in their 20s (the base case variable). Categorical variables for individuals in their 30s and 50s are statistically significant at 1 per cent. For those in their 30s and the 70s, the statistical significance is at 5 per cent. These results are consistent in both Equations except the statistical significance for those in their 70s declines from 5 per cent to 10 per cent in Equation 2. Variables for individuals in their 60s are statistically insignificant.

Visible minorities and Immigrants are less satisfied than the majority and Non-Immigrants respectively in both Equation 1 and Equation 2. Their categorical variables are statistically significant.

The categorical variables for language spoken at home are highly significant at 1 per cent for Equation 1. Francophones are happier and more satisfied while Allophones are less happy and satisfied than

Anglophones. The variable for Francophone is insignificant in Equation 2 and we suspect that this is due to multicollinearity which we have tested and will discuss in the following sub-section.

Students were found to be more happy than non-students and the variable representing them is highly significant (at 1 per cent) in both equations.

The societal determinants of subjective well-being were income inequality (weakly significant at 10 per cent), median household income (weakly significant at 10 per cent), proportion of non-recent immigrants (statistically significant at 5 per cent), proportion of post-secondary graduates (statistically significant at 5 per cent), proportion of individuals who are married (weakly significant at 10 per cent), proportion of individuals who are physically active and the proportion of the individuals with no difficulties (highly significant at 1 per cent). All other societal variables were statistically insignificant.¹²

ii. Average Effects: Equation 1 and 2

The coefficients in ordered probit regressions are z-values that cannot be interpreted in a meaningful way. The degree of association between subjective well-being and its key determinants is not possible to estimate with a z-value. Therefore, we tried to understand the coefficients in terms of the marginal effects for both Equation 1 and Equation 2. This will also help us interpret the impact of each explanatory variable on the change in the probability for every level of satisfaction. In terms of computation, marginal effects are calculated keeping each variable at its average level.

An average effect or a net effect is calculated aggregating all marginal effects for each variable and multiplying it by a weight. The weights are assigned according to the scale used in the life satisfaction question. The weighting scheme is: 1-Very Dissatisfied, 2- Dissatisfied, 3- Neither Satisfied Nor Dissatisfied, 4- Satisfied and 5 is Very Satisfied. (See results in Appendix Table 5 and Appendix Table 6 in Appendix III)

The results show that the association of the ordinal variables with well-being does not change when health region variables are added to the model except sense of belonging to the local community. On average, a unit increase in self reported health, self reported mental health and household income increases the probability of being satisfied (where satisfied is going up by a level on a scale of 1-5) by 11 per cent, 21 per cent and 2 per cent respectively while an increase in stress level decreases the probability of being satisfied by 10 per cent. An increase in sense of belonging increases the probability of being satisfied by 8 per cent and 9 per cent for Equations 1 and Equation 2 respectively.

A student has 4 per cent chance of being happier than a non-student in Equation 1. This probability increases to 6 per cent in Equation 2.

¹² We also checked for the 'societal impact' with variables representing information collected at the CMA level in Equation 3 (results in Appendix III B). Aside from proportion of physically active individuals (statistically significant at 10 per cent), all other societal variables were statistically insignificant. One possible reason why CMA variables have no impact on subjective well-being could be due to the fact that there is very little variation at the CMA level as the standard deviation of life satisfaction is 0.04 (on a scale of 1-5). Even with a very high mean score, the variation at top end of the life satisfaction scale is very low as the standard deviation for individuals who were satisfied or very satisfied was only 1.44 per cent.

The probabilities of recent immigrants and non-recent immigrants being less happy than non-immigrants are 15 per cent and 7 per cent respectively. The probability increases for recent immigrants to 12 per cent and decreases for non-recent immigrants to 5 per cent in Equation 2. Visible minorities have a greater chance of being less happy than the majority – 6 per cent and 4 per cent for Equation 1 and Equation 2 respectively.

Being married increases the probability of being more satisfied with life than an individual who has never married by 19 per cent. The probability increases to 20 per cent in Equation 2. A person in a common law relationship also has greater chances of being happier (14 per cent both Equation 1 and Equation 2).

Francophones have a probability (3 per cent) of being more satisfied with life than Anglophones while Allophones have a probability (8 per cent) being less happy than Anglophones. The probability decreases to 2 per cent for Francophones and 6 per cent for Allophones in Equation 2.

For age, the individuals in their 30s, 40s and 50s have a probability of being less satisfied than those in their 20s. The probability for all three age groups decreases in Equation 2: 3 per cent vs. 5 per cent, 7 per cent vs. 2 per cent and 4 per cent vs. 6 per cent respectively. For those in their 70s, the probability of being more satisfied than for someone in their 20 increases from 2 per cent to 3 per cent in Equation 2.

Males are generally less satisfied than females with a probability of 7 per cent and 6 per cent for Equation 1 and Equation 2 respectively.

For level of physical activity, individuals who are somewhat active and active are more satisfied than individuals who are inactive with a probability of 5 per cent and 6 per cent respectively. This result is consistent in Equation 2. For individuals who sometimes have difficulties along with those who often have difficulties are generally found to be less satisfied with probabilities of 8 per cent and 4 per cent respectively. The magnitude decreases for those who sometimes have difficulties (6 per cent) and increases for those often have difficulties (4 per cent).

The average effects for health region variables are negligible. The only significant impact is caused by inequality, where a standard deviation increase in the household income decile causes the probability of being satisfied to decrease by 1 per cent.

iii. Predicted Probabilities and Expected Life Satisfaction: Equation 1

In order to further understand the results of the ordered probit regression, we explored the size of the effect of the independent variables by creating predicted distributions of life satisfaction. In this method, we varied one variable while keeping all other variables at a constant level. For example, an individual with poor health and average attributes in all other independent variables has a 0.20 per cent probability of being very dissatisfied, 2.95 per cent of being dissatisfied, 9.40 per cent of being neither satisfied nor dissatisfied, 71.64 per cent satisfied, and 15.81 per cent very satisfied with their life. This is different than just looking at the raw percentages of life satisfaction of individuals with poor health. This method controls for the other variables in our regression, while looking at the effect of health on life satisfaction, given average levels of the other variables. In comparison if we just look at the raw distribution of those who self report their health as poor, of these people, 1.08 per cent described themselves as very dissatisfied with their lives, 7.96 per cent as dissatisfied, 14.14 per cent as neither satisfied nor dissatisfied, 60.3 per cent as satisfied, and 16.51 per cent as very satisfied. There reason for the discrepancy is that people who report their health as only fair, have characteristics that are different in ways from the average population which leads to lower SWB, e.g. they tend to be poorer.

We arrived at the “Expected Value” of Life Satisfaction” by using the same weighting scheme used to compute average effects in the previous section. Each predicted probability was then multiplied with a weight. The weighting scheme is 1-Very Dissatisfied, 2- Dissatisfied, 3- Neither Satisfied Nor Dissatisfied, 4- Satisfied and 5 is Very Satisfied. For ordinal variables, a difference was computed between the highest and the lowest category in the expected values and contrasted with the difference in actual means of life satisfaction. For dummy variables, a difference was calculated between the highest and the lowest probabilities of a categorical variable and then compared with the difference in actual means. For this analysis we have chosen to concentrate on the individual variables as the health region variables did not show any concrete association with well-being. Expected probabilities at each satisfaction level and its “Expected Value” of Life Satisfaction for each category of a variable can be found in Appendix Table 7 in Appendix III.

In all of our regressions, both health in general and mental health were found to be highly statistically significant coefficients (p-value less than 0.1 per cent). Self-assessed mental health has the widest marginal effect at mean levels in other variables, given average levels in other variables, then the expected value of life satisfaction is only 3.54 for those with poor mental health, 3.83 for those with fair mental health, 4.07 for those with good, 4.30 for those with very good, and 4.51 for those who self-assessed their mental health as excellent (Table 19). The actual average life satisfaction is 2.65 for those with poor mental health, and 4.57 with excellent mental health. When the differences in expected life satisfaction (0.97) and actual life satisfaction (1.92) are compared, we find that there is 50.5 per cent variation in subjective well-being between individuals in poor and excellent mental health can directly be attributed to mental health assuming all other variables are held constant at their average levels.

Table 19: Expected Average Life Satisfaction by Mental Health, Canada 2007-2008

Mental Health	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Poor	2.65	3.54	0.89	
Fair	3.38	3.83	0.45	
Good	3.95	4.07	0.12	
Very Good	4.27	4.3	0.03	
Excellent	4.57	4.51	-0.06	
<i>Difference between Poor and Excellent Mental Health</i>	1.92	0.97		50.5 per cent

The second widest variation in life satisfaction is due to self-assessed health (Table 20). Assuming all other variables are at average levels for the overall population, the expected value of life satisfaction of those who report poor health is 4.00, 4.12 for fair health, 4.24 for good health, 4.35 for very good health, and 4.46 for excellent health. The actual observed average satisfaction for those with poor health is 3.23 and 4.56 for those with excellent health, meaning only 34.5 per cent (0.46 out of 1.32) of the difference in life satisfaction between people with poor and excellent health is directly attributed to health.

Table 20: Expected Average Life Satisfaction by Health, Canada 2007-2008

Health	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Poor	3.23	4.00	0.77	
Fair	3.83	4.12	0.29	
Good	4.11	4.24	0.13	
Very Good	4.38	4.35	-0.03	
Excellent	4.56	4.46	-0.1	
<i>Difference between Poor and Excellent Health</i>	1.32	0.46		34.5 per cent

The variable which has the next widest impact is stress (Table 21), which was found to be highly statistically significant in all our regressions. Again, assuming all other variables are at the averages for the population, those who say their average day is not at all stressful will have an expected value of life satisfaction of 4.48, those whose average day is not very stressful 4.38, a bit stressful 4.28, quite a bit stressful 4.18, and those who say their average day is extremely stressful will have an expected value of life satisfaction at 4.08 given average levels in other variables. The observed average satisfaction for those who are not at all stressed is 4.52 and 3.67 for those who are extremely stressed. Thus, 47.1 per cent (0.40 out of 0.85) of the difference in average satisfaction between these groups is directly attributed to stress.

Table 21: Expected Average Life Satisfaction by Mental Stress, Canada 2007-2008

Stress	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Not at all	4.52	4.48	-0.04	
Not very	4.41	4.38	-0.03	
A bit	4.25	4.28	0.03	
Quite a bit	4.05	4.18	0.13	
Extremely	3.67	4.08	0.41	
<i>Difference between Not at all and Extremely Stressed</i>	0.85	0.40		47.1 per cent

The next variable with the widest variation in predicted well-being is sense of belonging to local community (Table 22). Sense of belonging to the local community was found to be highly statistically significant in all our regressions. Given average levels in all other variables, those who report a very weak sense of belonging to the local community have an expected value of life satisfaction of 4.15, a somewhat weak sense 4.24, a somewhat strong sense 4.33, and those who report a very strong sense of belonging to the local community have an expected value of life satisfaction of 4.41. The observed average life satisfaction for those who have a very weak sense of belonging to the local community is 3.93, and 4.47 for those who report a very strong sense of belonging; meaning 48.1 per cent (0.26 out of 0.54) of this difference is attributed directly to their difference in their sense of belonging.

Table 22: Expected Average Life Satisfaction by Sense of Belonging to the Local Community, Canada 2007-2008

Sense of Belonging to the Local Community	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Very weak	3.93	4.15	0.22	
Somewhat weak	4.16	4.24	0.08	
Somewhat strong	4.31	4.33	0.02	
Very Strong	4.47	4.41	-0.06	
<i>Difference between very weak and very strong sense of belonging</i>	0.54	0.26		48.1 per cent

Household income, adjusted for both household and community size, is also closely associated with subjective well-being (Table 23). It was found to be highly statistically variable in all our regressions. Given average levels in all the other variables average life satisfaction monotonically increases with income deciles from a low of an expected value of life satisfaction 4.20 for the lowest decile to a high of 4.40 for the highest decile. The observed average life satisfaction by household income deciles also increased monotonically with the lowest decile having an average of 3.90 and the highest having an average of 4.51.

Thus, only 32.6 per cent (0.20 out of 0.61) of the difference in life satisfaction between the top and bottom deciles is due directly to household income.

The expected value for life satisfactions for persons in the bottom decile is 0.30 points greater than the actual value (4.20 versus 3.90). It is this difference that explains most of the reduction in the gap in happiness between the top and bottom deciles once controls are run. It suggests that the low actual happiness values observed for the very poor reflect more than just low income and include such influences as poor health and a low sense of belonging.

Table 23: Expected Average Life Satisfaction by Household Income, Canada 2007-2008

Household Income	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
1 st Decile	3.90	4.20	0.30	
2 nd Decile	4.10	4.22	0.12	
3 rd Decile	4.16	4.25	0.09	
4 th Decile	4.23	4.27	0.04	
5 th Decile	4.27	4.29	0.02	
6 th Decile	4.32	4.31	-0.01	
7 th Decile	4.34	4.34	0	
8 th Decile	4.39	4.36	-0.03	
9 th Decile	4.42	4.38	-0.04	
10 th Decile	4.51	4.40	-0.11	
<i>Difference between top and bottom income decile</i>	0.61	0.20		32.8 per cent

Marital status also has a large impact subjective well-being (Table 24). The dummy variables for married and common-law were found to be statistically significant in all our regressions. Because the dummy variable for separated/widowed/divorced was insignificant in all our regressions we cannot infer any differences between the base case (never married) and separated, widowed or divorced. Assuming average levels in the non-marital status variables, we find married individuals have an expected value of life satisfaction of 4.34; persons in a common-law relationship have a similar value with an expected value of life satisfaction of 4.34, while individuals who have never married have an expected life satisfaction of 4.13, the lowest out of any category. The observed average life satisfaction for married persons is 4.34 and 4.13 for never married and 90.9 per cent of this variation (.20 out of 0.22) can directly be tied to their marital status.

Table 24: Expected Average Life Satisfaction by Marital Status, Canada 2007-2008

Marital Status	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) – (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Married	4.34	4.39	0.05	
Common Law	4.34	4.34	0.00	
Separated/Divorced/Widowed*	4.05	4.20	0.15	
Never married	4.13	4.19	0.06	
<i>Difference between Married and Never Married</i>	0.22	0.20		90.9 per cent

* indicates that coefficient of the variable is statistically insignificant.

Dummy variables for sometimes having difficulties with activities and often having difficulties with activities were both found to be statistically significant in all regressions. Consistent with the literature and inconsistent with most people's perceptions the difference in subjective well-being directly from physical difficulties is small. Controlling for other factors including health, a representative person has an expected value of life satisfaction of 4.32 if he or she reports to having no difficulties with daily activities, those who report have some difficulties with daily activities have an expected value of life satisfaction of 4.28, and those who often have difficulties with daily activities have an expected value of life satisfaction of 4.26. Those who report never having difficulties with the daily activities were observed to have an average life satisfaction of 4.34 compared to an average life satisfaction of 3.91 for those who often had difficulties with their daily activities. Only 14.3 per cent (0.06 out of 0.42) of the difference in life satisfaction between those with no difficulties and those who often have difficulties can be directly attributed to their difficulties in daily activities.

Table 25: Expected Average Life Satisfaction by Difficulties with Activities, Canada 2007-2008

Difficulty with Activities	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) – (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Often Difficulties	4.34	4.26	-0.08	
Sometimes Difficulties	4.11	4.28	0.17	
Never difficulties	3.91	4.32	0.41	
<i>Difference Often and Never Difficulties</i>	0.42	0.06		14.3 per cent

All our regressions found a strong statistically significant negative effect of being physically inactive on life satisfaction. According to our regression if an individual is not physically active but has average characteristics in all other variables then have an expected value of life satisfaction of 4.28, his life satisfaction is 4.33 if he is somewhat active and 4.34 if he is highly active. The observed average satisfaction for those who are not physically active is 4.16 and 4.40 for those who are physically active.

Only 25 per cent of the observation difference in life satisfaction between those not physically active and those somewhat physically active can be directly tied to their level of physical activity.

Table 26: Expected Average Life Satisfaction by Physical Activity, Canada 2007-2008

Physical Activity	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Inactive	4.16	4.28	0.12	
Somewhat Active	4.33	4.33	0.00	
Active	4.4	4.34	-0.06	
<i>Difference between Inactive and Active</i>	0.24	0.06		25.0 per cent

We found statistically significant effects of language spoken (Table 27). Speaking French at home was found to have a somewhat statistically significant impact on subjective well-being compared to the base case of speaking English at home. Speaking neither English nor French at home was found to have a strong statistically significant impact compared to the base case of speaking English at home. Given average levels of all other variables we found an Anglophone would have an expected value of life satisfaction of 4.30, a francophone 4.33, and an allophone 4.24. The actual distribution is Anglophones have an average life satisfaction of 4.27, Francophones 4.32, and Allophones 4.06, meaning 28.6 per cent (0.06 out of 0.21) of the difference in average life satisfaction between Francophones and Allophones is directly due to the difference in language spoken at home.

Table 27: Expected Average Life Satisfaction by Language Spoken at Home, Canada 2007-2008

Language Spoken at Home	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Anglophone	4.27	4.30	0.03	
Francophone*	4.32	4.33	0.01	
Allophone	4.06	4.24	0.18	
<i>Difference between Anglophone and Allophone</i>	0.21	0.06		28.6 per cent

* indicates that the coefficient of the variable was statistically insignificant.

In all the regressions, we found a strong statistically significant impact of being a student compared to the base case of not being a non-student. The expected value of a non-student with all other characteristics average is 4.30 compared to 4.36 for a non-student (Table 28). When we looked at the actual distribution of average life satisfaction across student status we found virtually no difference, with students

having an average life satisfaction of 4.28 compared to 4.26 for a non-student. The differences between the two statuses are too low for any kind of inferences to be drawn.

Table 28: Expected Average Life Satisfaction by Student Status, Canada 2007-2008

Student Status	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Not a student	4.26	4.30	0.04	
Student	4.28	4.36	0.08	
<i>Difference between student and non-student</i>	0.02	0.06		-

Given average characteristics of the overall population a female is expect to have a life satisfaction of 4.33 and a male, 4.27 (Table 29). However in the actual distribution there is very little difference between the two sexes with females having an average life satisfaction of 4.26 and males, 4.25. Similar to the case of student status, the differences in are very low and no inferences are drawn on the variation in average life satisfaction.

Table 29: Expected Average Life Satisfaction by Sex, Canada 2007-2008

Sex	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Female	4.26	4.33	0.07	
Male	4.25	4.27	0.02	
<i>Difference between Male and Female</i>	0.01	0.06		-

Another variable we found to be statistically significant in all our regressions were immigration status. Holding all other variables as representative of the average individual in the overall population, non-immigrants have an expect value of life satisfaction of 4.32, non-recent immigrants (immigrated to Canada more than nine years ago) have an expect value of life satisfaction of 4.26 while recent immigrants have an expected life satisfaction of 4.19 (Table 20). The actual average for non-immigrants is 4.30 and 4.11 for recent immigrants. 68.4 per cent (0.13 out of 0.19) of this difference in average life satisfaction is directly attributed to the difference in immigration status.

Table 30: Expected Average Life Satisfaction by Immigration Status, Canada 2007-2008

Immigration Status	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) – (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Non-Immigrants	4.30	4.32	0.02	
Non-Recent Immigrants	4.14	4.26	0.12	
Recent Immigrants	4.11	4.19	0.08	
<i>Difference between Non-Immigrant and Recent Immigrants</i>	0.19	0.13		68.4 per cent

We also found a statistically significant effect of visible minority status in all regressions. Assuming all other attributes were at the mean levels of the overall population someone who is non-visible minority has an expected life satisfaction of 4.31 whereas a visible minority has an expected life satisfaction of 4.27 (Table 31). This difference, however, is much less than the actual difference in life satisfaction, accounting for only 21.2 per cent (0.04 out of 0.19) of the difference as the actual average of non-visible minorities is 4.29 and 4.10 for visible minorities.

Table 31: Expected Average Life Satisfaction by Visible Minority Status, Canada 2007-2008

Visible Minority Status	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) – (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Majority	4.29	4.31	0.02	
Visible Minority	4.10	4.27	0.17	
<i>Difference between visible and non-visible minorities</i>	0.19	0.04		21.1 per cent

In all our regressions an indicator variables for ages 30-39, 40-49, 50-59, 71-79 were found to be somewhat statistically significant. The indicator variable for those aged 80 and older was found to be highly statistically significant in all regressions. None of our regressions for the indicator variable for those in their 60s to be statistically significant, indicating we cannot draw any inferences in subjective well-being from the base case (20s) and people in their 60s. Controlling for all other variables, the expected value of life satisfaction declined from a local maxima of 4.33 for people in their 20s to a minimum of 4.28 in their 50s and then increased to a maximum of 4.37 for those in their 70s (Table 32). However the actual distribution of average life satisfaction is different. Although there is still a local maximum in the 20s decreasing to a local minimum in their 50s, after which average life satisfaction increases to another local maximum in 60s and then continues to decline in the 70s and 80s. This is likely due worse health and lower income of the elderly.

Table 32: Expected Average Life Satisfaction by Age, Canada 2007-2008

Age Category	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
20s	4.27	4.33	0.06	
30s	4.29	4.31	0.02	
40s	4.25	4.3	0.05	
50s	4.22	4.28	0.06	
60s*	4.29	4.31	0.02	
70s	4.26	4.37	0.11	
<i>Difference between 30s and 70s</i>	0.03	0.06	0.03	-

* indicates that the coefficient of the variable is statistically insignificant

Employment status was found to have a statistically insignificant relationship with subjective well-being. Assuming all other characteristics are at the overall mean someone employed has an expected life satisfaction of 4.31 compared to 4.33 for someone who is disabled and 4.30 for someone who is not employed (Table 33). The actual average life satisfaction for people who are employed is 4.30, 4.21 for those not employed and 3.63 for those unable to work. It is not clear why, once all other factors are controlled for, the disabled are actually happier than the non-disabled.

Table 33: Expected Average Life Satisfaction by Employment Status, Canada 2007-2008

Employment Status	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
Employed	4.30	4.31	0.01	
Not Employed*	4.21	4.30	0.09	
Unable to Work*	3.63	4.33	-0.61	
<i>Difference between Unable to Work and Not Employed</i>	0.67	-0.03		-

* indicates that the coefficient of the variable is statistically insignificant

We also did not find any statistically significant direct effect of individual education on subjective well-being. Those who did not graduate high school have an average life satisfaction of 4.31, those highest level of education is graduated post-secondary or attended post-secondary have an average life satisfaction of 4.30, and those who have graduate post-secondary have an average life satisfaction of 4.31 (Table 34). This means that differences in happiness between persons with different levels of educational attainment

reflect almost entirely other factors, such as income. Education alone has minimal direct effect on happiness.

Table 34: Expected Average Life Satisfaction by Highest Educational Attainment, Canada 2007-2008

Highest Educational Attainment	Actual Value (1)	Expected Mean (2)	Difference between actual and expected mean (2) - (1)	Difference in average life satisfaction explained by variable (3)=(2/1)
No High School Graduation	4.11	4.31	0.20	
High School Graduation	4.24	4.30	0.06	
Went to Post Secondary	4.22	4.30	0.08	
Post Secondary Graduation	4.31	4.31	0.00	
<i>Difference between No HS</i>	0.20	0.01		5.0

* indicates that the coefficient of the variable is statistically insignificant

Table 35 below summarizes the differences in the average expected life satisfaction of all individual level variables. Based on the results in this table, we observe the greatest differences in expected life satisfaction are found in mental health, health, stress, sense of belonging to the local community, household income and marital status. The variation in expected life satisfaction as a percentage of actual life satisfaction (column 3) does not give the same ordering. Differences in expected life satisfaction in marital status accounts for the highest variation (90.9 per cent) followed by mental health (50.5 per cent), sense of belonging (48.1 per cent), stress (47.1 per cent) and health (34.5 per cent) and household income (32.8 per cent).

Table 35: Difference in Distribution of Life Satisfaction directly explained by individual level variables

	Difference in Actual Averages (1)	Direct Effect (Expected Value) (2)	% Direct Effect (3) = (2)/(1)	Indirect Effect (4) = (1) - (2)	% Indirect Effect (5) = (4)/(1)
Mental Health	1.92	0.97	50.5	0.95	49.5
Health	1.32	0.46	34.5	0.86	65.2
Stress	0.85	0.40	47.1	0.45	52.9
Sense of Belonging to the Local Community	0.54	0.26	48.1	0.28	51.9
Household Income	0.61	0.20	32.8	0.41	67.2
Marital Status	0.22	0.20	90.9	0.02	9.1
Immigration Status	0.19	0.13	68.4	0.06	31.6
Difficulty with activities	0.42	0.06	14.3	0.36	85.7
Physical Activity	0.24	0.06	25.0	0.18	75.0
Language Spoken at Home	0.21	0.06	28.6	0.15	71.4
Student Status	0.02	0.06	-	-0.04	-200.0
Sex	0.01	0.06	-	-0.05	-500.0
Visible Minority Status	0.19	0.04	21.1	0.15	78.9
Age Category	-0.01	0.03	-	-0.04	400.0
Educational Attainment*	0.20	0.01	5.0	0.19	95.0
Employment Status*	0.58	-0.03	-	0.61	105.2

* indicates that the coefficients of the categorical variable was insignificant.

V. Explaining Geographical Variation in Happiness in Canada

The regression analysis in the previous section based on happiness data for 83,000 Canadians identified the variables that were the most important determinants of subjective well-being, namely health, mental health, stress, sense of well-being and income. In this section, we will seek to exploit this information to explain geographical variation in life satisfaction in Canada across provinces, CMAs, and health regions, based on values for these variables in the geographical units at the different levels of geography.

The average level of happiness in a geographical unit reflects the average level of happiness of the population. As seen, this happiness is positively related to the state of mental health, overall health, sense of belonging to the community, and income and negatively related to stress, among other factors. Consequently, differences in these population characteristics or states over space can be the source of geographical variation in happiness. For example, a strong sense of belonging to the community in Atlantic Canada could in principle explain higher average happiness in Atlantic Canada. The challenge is how to quantify the relative importance of the difference factors that can in principle explain geographical variations in happiness in order to weight the observed geographical variation in the determinants or drivers of happiness. To do this, the paper makes use of the coefficients of these variables to derive weights for the five variables. These weights are mental health (0.40), followed by health (0.21), stress (0.18), sense of belonging (0.16), and household income (0.04).

Equation 2 in Appendix III gives the following coefficients: mental health (0.455), health (0.236), stress level (-0.208), sense of belonging to the local community (0.180), and household income (0.047). The absolute value of these coefficients was summed and then normalized or rescaled to add to unity to produce the weights. The choice of these variables was made on two criteria. First, the variables were statistically significant at the highest level (1 per cent). Second, and more important, these five variables had the greatest degree of expected variation in happiness among the categories of the variables, as shown in the second column of Table 35. The relative size of the direct effect of these variables on happiness (mental health (0.97), health (0.46), stress (0.40), sense of belonging (0.54), and household income (0.20)) corresponds closely to the relative size of the coefficients and weights. Other variables of course affect happiness, but their direct effect is less. The most important of these variables are marital status (0.20) and immigration status (0.13), followed by difficulties with activities (0.06), physical activity (0.06), language spoken at home (0.06), student status (0.06) and sex (0.06). A more complete analysis of geographical variation of happiness in Canada would include these factors. As this is an exploratory analysis, a decision was made to focus on the most important determinants of happiness. Future work may include these other factors.

In addition to the weights of the five drivers of happiness chosen for this study, geographical variations in average happiness will be affected by the geographical variation in the observed values of the drivers. For example, if the average mental health of geographical units exhibit little variation across space, even though within the geographical unit it manifests large differences among individuals, then mental health contributes little to explanation of geographical variation.

Geographic variation in the drivers of happiness can be gauged by the variance or standard deviation and the range of the averages for the variables for the units at a particular geographical level. Table 36 provides these estimates for the standard deviation and ranges of the five variables at the

provincial, CMA, and health region level. The key observation that emerges is that the sense of belonging to the local community exhibits much more variation across space in Canada than the other variations. For example, for the 102 units at the health region level, the range of the values for sense of belonging was 0.95 points on a scale of 1 to 5, double that of the other variables: mental health (0.42), stress (0.45), health (0.47), and income (0.50). The same pattern was found at the CMA and provincial levels. At the health region and CMA level (but not the provincial level), income also had a significant degree of geographical variation. But the low weight assigned to income dampens this factor's ability to explain geographical variation in happiness.

Table 366: Variation in Life Satisfaction and Determinants at the Provincial, CMA, and Health Region Level

Provincial Level					
	Rescaled Coefficients (1)	Std Dev of the Mean Values (2)	Min Average Value (3)	Max Average Value (4)	Range (5) = (4) - (3)
Life Satisfaction		0.03	4.23	4.33	0.11
Perceived Health	0.21	0.07	3.50	3.71	0.21
Perceived Mental Health	0.40	0.07	3.95	4.16	0.21
Stress Level	-0.18	0.08	2.55	2.82	0.28
Sense of Belonging to local community	0.16	0.18	3.22	3.78	0.56
Household Income (Deciles)	0.04	0.01	2.75	2.79	0.03
CMA level					
	Rescaled Coefficients (1)	Std Dev of the Mean Values (2)	Min Average Value (3)	Max Average Value (4)	Range (5) = (4) - (3)
Life Satisfaction		0.05	4.16	4.36	0.20
Perceived Health	0.21	0.08	3.47	3.79	0.32
Perceived Mental Health	0.40	0.08	3.85	4.25	0.40
Stress Level	-0.18	0.08	2.57	2.90	0.33
Sense of Belonging to local community	0.16	0.13	3.16	3.71	0.54
Household Income (Deciles)	0.04	0.20	2.50	3.00	0.50
Health Region level					
	Rescaled Coefficients (1)	Std Dev of the Mean Values (2)	Min Average Value (3)	Max Average Value (4)	Range (5) = (4) - (3)
Life Satisfaction		0.06	4.12	4.41	0.29

Perceived Health	0.21	0.10	3.34	3.81	0.47
Perceived Mental Health	0.40	0.08	3.83	4.25	0.42
Stress Level	-0.18	0.09	2.48	2.94	0.45
Sense of Belonging to local community	0.16	0.19	3.04	4.00	0.95
Household Income (Deciles)	0.04	0.21	2.50	3.00	0.50

A. Provinces

As shown in Chart 4 earlier in the paper, at the provincial level, average happiness in Canada varied from a high of 4.33 in Prince Edward Island to a low of 4.23 in Ontario and 4.24 in British Columbia. The Canadian average was 4.26. Table 37 applies the framework developed above to explain the 0.07 point higher average happiness in Prince Edward Island relative to the national average (data for all provinces in Appendix Tables 8-18 in Appendix IV). The table shows that both health and mental health are below average in the province, which in principle should reduce happiness in the province relative to the national average. On the other hand, the stress level is below average, which raises happiness, and even more important, the sense of belonging is well above average, boosting happiness. The net effect is that 0.04 points of the Prince Edward Island's 0.07 point greater happiness relative to the national average can be explained by the five variables included in this framework, with the high sense of belonging to the community being the most important factor.

Table 37: Explaining Variation in Life Satisfaction for Prince Edward Island

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for PEI (3)	Standardized Average for PEI (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.33	4.33	0.07		
Perceived Health (1-5)	3.64	3.64	3.60	3.60	-0.04	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	4.05	4.05	-0.02	0.40	-0.01
Stress Level (1-5)	2.79	2.79	2.68	2.68	-0.11	-0.18	0.02
Sense of Belonging to local community (1-4)	2.70	3.38	2.87	3.59	0.21	0.16	0.03
Household Income (Deciles) (1-10)	5.55	2.78	5.56	2.78	0.00	0.04	0.00
Total Variation Explained							0.04

Note: Figures in Total Variation (Column 7) have been rounded to the second decimal place.

Table 38 applies the same framework to explain the -0.02 point gap in happiness between British Columbia and the national average. Below average stress and above average sense of belonging boost happiness in British Columbia relative to the national average. But the province's below average level of mental health, combined with the high weight given this variable in the determination of overall happiness, reduces average happiness in the province.

Table 38: Explaining Variation in Life Satisfaction for British Columbia

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for BC (3)	Standardized Average BC for (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.24	4.24	-0.02		
Perceived Health (1-5)	3.64	3.64	3.62	3.62	-0.01	0.21	0.00
Perceived Mental Health (1-5)	4.07	4.07	3.97	3.97	-0.09	0.40	-0.04
Stress Level (1-5)	2.79	2.79	2.76	2.76	-0.03	-0.18	0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.77	3.46	0.08	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.57	2.79	0.01	0.04	0.00
Total Variation Explained							-0.02

Error! Reference source not found. gives the contributions of the five determinants of happiness examined in this study to variation in life satisfaction for all provinces and territories. Each column shows the variance explained by one of the five determinants of life satisfaction while the total in the bottom row indicates the total variation that is explained collectively by these five factors. The last column sums of the absolute values of the contributions each determinant of life satisfaction for all the provinces.

The most important of the five factors in explaining the deviations of average happiness in a province from the national average is sense of belonging, followed closely by mental health. Stress and health are next in importance, but only have about one half the explanatory power of sense of belonging and mental health. Perhaps surprisingly, differences in household income across provinces appears to explain none of the variation in happiness, likely due to the low weight of this variable.

The four Atlantic provinces enjoy above average levels of life satisfaction (Table 40). As Table 39 shows, this situation is related to the below average lower stress levels and even more important, the above average sense of belonging in all of these provinces.

Table 39: Provincial Variation in Life Satisfaction Explained by Five Happiness Determinants

	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC	YKW/NWT	<u>Absolute Total</u>
Perceived Health	0.00	-0.01	-0.02	-0.03	0.01	0.00	-0.01	-0.02	0.01	0.00	-0.01	0.14
Perceived Mental Health	0.03	-0.01	-0.03	-0.04	0.04	0.00	-0.02	-0.03	0.00	-0.04	-0.05	0.29
Stress Level	0.04	0.02	0.02	0.02	0.00	-0.01	0.01	0.01	0.00	0.01	0.02	0.16
Sense of Belonging	0.07	0.03	0.02	0.02	-0.03	0.01	0.01	0.02	-0.01	0.01	0.06	0.30
Household Income	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
Total	0.14	0.04	-0.01	-0.03	0.02	-0.01	-0.01	-0.01	0.00	-0.02	0.03	

Table 40 summarizes the results in terms of the explanatory power of the five drivers of happiness to explain the provincial variation. One half of the variation is explained for Prince Edward Island and

Quebec, the two happiest provinces. All or almost all the variation is accounted for in British Columbia and Manitoba, two of the three least happy provinces.

Table 40: Provincial Geographical Variation in Life Satisfaction Accounted for by Health, Mental Health, Stress, Belonging, and Income

	Variation in Life Satisfaction at Different Levels of Geography		
	Difference between the National and the Provincial Life Satisfaction (1)	Variation Explained by Health, Mental Health, Stress, Belonging and Income (2)	% Variation Explained (3) = (2)/(1)
<u>Provinces</u>			
Prince Edward Island	0.072	0.037	51.87
Quebec	0.038	0.022	57.99
Alberta	0.037	0.002	5.19
New Brunswick	0.036	-0.033	-90.73
Newfoundland and Labrador	0.034	0.138	400.63
Nova Scotia	0.011	-0.014	-130.57
Saskatchewan	0.011	-0.014	-132.16
Yukon/NWT/Nunavut	0.002	0.028	1577.05
Manitoba	-0.012	-0.014	119.38
British Columbia	-0.023	-0.021	92.34
Ontario	-0.035	-0.008	22.25

B. CMAs

As shown in Chart 8 earlier in the paper, at the CMA, average happiness in Canada in 2007-08 varied from a high of 4.36 in Brantford (4.35 in Quebec City) to a low of 4.16 in Toronto 94.18 in Vancouver. The Canadian average was 4.26. Table 41 applies the framework developed above to explain the 0.11 point higher average happiness in Quebec City relative to the national average. (data for the fifth happiness and least happy CMAs are found in Appendix Tables 19-28 in Appendix IV). The table shows that both health and mental health are above average in the city, which in principle should increase happiness in the city relative to the national average. On the other hand, the sense of belonging, perhaps surprisingly given the homogeneous linguistic and ethnic mix of the population, is below average, which lowers happiness. The net effect is that 0.06 points, or more than half of the Quebec City's 0.11 point greater happiness relative to the national average can be explained by the five variables included in this framework, with the high sense of mental health being the most important factor.

Table 41: Explaining Variation in Life Satisfaction for Quebec City

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Quebec City (3)	Standardized Average for Quebec City (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.35	4.35	0.11		
Perceived Health (1-5)	3.65	3.65	3.75	3.75	0.10	0.21	0.02
Perceived Mental Health (1-5)	4.08	4.08	4.25	4.25	0.17	0.40	0.07
Stress Level (1-5)	2.81	2.81	2.80	2.80	-0.01	-0.18	0.00
Sense of Belonging to local community (1-4)	2.68	3.34	2.53	3.16	-0.18	0.16	-0.03
Household Income (Deciles) (1-10)	5.53	2.76	5.44	2.72	-0.04	0.04	0.00
Total Variation Explained							0.06

Table 41a applies the same framework to explain the -0.06 point gap in happiness between Vancouver, the second unhappiness CMA, and the national average. As was the case for British Columbia, mental health is well below and it is this factor that accounts for most of the negative happiness gap (-0.05 points). There is some offset from the city's above average sense of belonging..

Table 41a: Explaining Variation in Life Satisfaction for Vancouver

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Vancouver (3)	Standardized Average for Vancouver (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.18	4.18	-0.06		
Perceived Health (1-5)	3.65	3.65	3.63	3.63	-0.02	0.21	0.00
Perceived Mental Health (1-5)	4.08	4.08	3.96	3.96	-0.11	0.40	-0.05

Stress Level (1-5)	2.81	2.81	2.78	2.78	-0.03	-0.18	0.00
Sense of Belonging to local community (1-4)	2.68	3.34	2.75	3.44	0.10	0.16	0.02
Household Income (Deciles) (1-10)	5.53	2.76	5.54	2.77	0.00	0.04	0.00
Total Variation Explained							-0.03

Error! Reference source not found. gives the contributions of the five determinants of happiness examined in this study to variation in life satisfaction for the five happiest and least happy CMAs. Each column shows the variance explained by one of the five determinants of life satisfaction while the total in the bottom row indicates the total variation that is explained collectively by these five factors. The bottom of the table sums of the absolute values of the contributions each determinant of life satisfaction for all the provinces.

The most important of the five factors in explaining the deviations of average happiness at the CMA level from the national average is mental health, followed by sense of belonging. Health was next in importance, followed by stress. Again, differences in household income across provinces appears to explain very little of the variation in happiness, likely due to the low weight of this variable.

Table 42: CMA Variation in Life Satisfaction Explained by Five Happiness Determinants

Top Ranked CMAs by Life Satisfaction					
	Toronto	Vancouver	Hamilton	Windsor	St.Catharines-Niagara
Perceived Health	-0.01	0.00	-0.01	-0.03	-0.02
Perceived Mental Health	0.00	-0.05	-0.01	0.00	-0.01
Stress Level	-0.01	0.00	0.00	0.00	0.01
Sense of Belonging	-0.01	0.02	0.02	0.02	0.01
Household Income	0.00	0.00	0.00	0.00	0.00
Total	-0.03	-0.03	0.00	-0.01	-0.01

Top Ranked CMAs by Life Satisfaction					
	Brantford	Quebec	Trois-Rivieres	Victoria	Calgary
Perceived Health	0.00	0.02	0.00	0.02	0.03
Perceived Mental Health	-0.01	0.07	0.06	-0.01	0.02
Stress Level	-0.01	0.00	0.01	0.02	0.00
Sense of Belonging	0.01	-0.03	-0.01	0.01	-0.02
Household Income	0.00	0.00	0.00	0.00	0.00
Total	-0.01	0.06	0.06	0.04	0.03

Absolute Total of the Top and Bottom Ranked CMAs					
Perceived Health	0.14				
Perceived Mental Health	0.23				
Stress Level	0.06				
Sense of Belonging	0.16				
Household Income	0.01				

Table 43 summarizes the results in terms of the explanatory power of the five drivers of happiness to explain the CMA variation. For the most satisfied CMAs, the variation in subjective well-being is well explained for (62.78 per cent), Quebec City (55.42 per cent), Trois-Rivieres and to some extent for Victoria (35.56 per cent) and Calgary (27.27 per cent). All four have above average health and with the exception of Victoria, all of them also have below average sense of belonging and above average mental health. Stress levels are for Quebec and Trois-Rivieres are well below average while those of Victoria and Calgary are closer to the CMA average.

St Catharines-Niagara (56.51 per cent), Vancouver (52.29 per cent), Windsor (35.60 per cent) and Toronto (23.30 per cent) are the lowest ranked CMAs by life satisfaction whose variation can be attributed to its most important determinants. Apart from Toronto whose mental health is closer to the CMA average, all these CMAs have below average health and mental health. Another notable and common characteristic amongst these three CMAs compared to Toronto is the high sense of belonging to the local community and

relatively low stress level. Income levels in these CMAs are average and do not feature prominently as an important factor.

Table 43: CMA Variation in Life Satisfaction Accounted for by Health, Mental Health, Stress, Belonging, and Income

	Variation in Life Satisfaction at Different Levels of Geography		
	Difference between National and Provincial Life Satisfaction (1)	Variation Explained by Health, Mental Health, Stress, Belonging and Income (2)	% Variation Explained (3) = (2)/(1)
<u>Most Satisfied CMAs</u>			
Brantford	0.115	-0.013	-10.89
Quebec	0.108	0.060	55.42
Trois-Rivieres	0.090	0.057	62.78
Victoria	0.094	0.033	35.56
Calgary	0.095	0.026	27.27
<u>Least Satisfied CMAs</u>			
Toronto	-0.082	-0.019	23.30
Vancouver	-0.058	-0.030	52.29
Hamilton	-0.027	0.005	-18.43
Windsor	-0.029	-0.010	35.60
St.Cathrines-Niagara	-0.016	-0.009	56.51

C. Health Regions

As noted earlier in the paper and documented in Appendix V, at the health region level, average happiness in Canada varied from a high of 4.40 in Renfrew County and 4.39 in Oxford County to a low of 4.11 in the City of Toronto, 4.14 in Peel Regional Health Unit, and 4.14 in Vancouver Health Services Delivery Area. The Canadian average was 4.26. Table 44 applies the framework developed above to explain the 0.13 point higher average happiness in Oxford County relative to the national average (data for the five happiest and least happy health regions are found in Appendix Tables 29-38 in Appendix IV). The table shows that a very strong sense of belonging and below average stress explain why residents of Oxford County are much happier than average.

Table 44: Explaining Variation in Life Satisfaction for Oxford County

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Oxford County (3)	Standardized Average for Oxford County (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.39	4.39	0.13		
Perceived Health (1-5)	3.64	3.64	3.69	3.69	0.05	0.21	0.01
Perceived Mental Health (1-5)	4.07	4.07	4.03	4.03	-0.04	0.40	-0.02
Stress Level (1-5)	2.79	2.79	2.65	2.65	-0.14	-0.18	0.03
Sense of Belonging to local community (1-4)	2.70	3.38	3.12	3.90	0.53	0.16	0.08
Household Income (Deciles) (1-10)	5.55	2.78	6.02	3.01	0.23	0.04	0.01
Total Variation Explained							0.11

Table 45 applies the framework to explain the -0.12 point gap in happiness between the City of Toronto and the national average. The major factor, explaining one quarter of the gap is the higher stress level in Toronto. Below average health and mental health also contributed to the gap.

Table 45: Explaining Variation in Life Satisfaction for City of Toronto

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Toronto (3)	Standardized Average for Toronto (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.14	4.14	-0.12		
Perceived Health (1-5)	3.64	3.64	3.59	3.59	-0.05	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	4.03	4.03	-0.04	0.40	-0.01
Stress Level (1-5)	2.79	2.79	2.94	2.94	0.15	-0.18	-0.03
Sense of Belonging to local community (1-4)	2.70	3.38	2.73	3.41	0.04	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.20	2.60	-0.18	0.04	-0.01
Total Variation Explained							-0.05

Error! Reference source not found.6 gives the contributions of the five determinants of happiness examined in this study to variation in life satisfaction for the five happiest and least happy health regions. Each column shows the variance explained by one of the five determinants of life satisfaction while the total in the bottom row indicates the total variation that is explained collectively by these five factors. The bottom of the table sums of the absolute values of the contributions each determinant of life satisfaction for all ten health regions.

The most important of the five factors in explaining the deviations of average happiness at the top and bottom health regions in terms of happiness sense of belonging, followed by mental health. Stress was third in importance followed by health. In contrast to the results at the provincial and CMA levels,

household income was found to play some, albeit small, role in explaining differences in happiness between health regions and the national average.

Table 376: Health Region Variation in Life Satisfaction Explained by Five Happiness Determinants

Top Ranked HRs by Life Satisfaction					
	Toronto	Peel HU	Vancouver	Fraser South	Richmond
Perceived Health	-0.01	-0.01	0.01	-0.01	-0.02
Perceived Mental Health	0.00	-0.01	-0.05	-0.05	-0.04
Stress Level	0.00	-0.03	0.01	0.00	0.02
Sense of Belonging to local community	-0.02	0.01	0.00	0.01	0.03
Household Income (Deciles)	0.00	-0.01	0.00	-0.01	-0.01
Total	-0.03	-0.05	-0.03	-0.05	-0.02
Top Ranked HRs by Life Satisfaction					
	Renfrew	Oxford County	Région des Laurentides	Région de la Gaspésie - Îles-de-la-Madeleine	Région de la Côte-Nord
Perceived Health	-0.02	0.01	0.02	-0.02	0.00
Perceived Mental Health	-0.05	-0.02	0.05	0.01	0.07
Stress Level	0.02	0.03	-0.02	0.05	0.04
Sense of Belonging to local community	0.06	0.08	-0.05	0.09	0.06
Household Income (Deciles)	0.00	0.01	0.00	-0.01	0.01
Total	0.00	0.11	-0.01	0.11	0.17
Absolute Total of the Top and Bottom Ranked HRs					
Perceived Health	0.14				
Perceived Mental Health	0.34				
Stress Level	0.20				
Sense of Belonging to local community	0.41				
Household Income (Deciles)	0.06				

Table 47 summarizes the results in terms of the explanatory power of the five drivers of happiness to explain the CMA variation. For the highest ranked health regions by life satisfaction, the strongest correlates of life satisfaction are only able to explain the variation in Région de la Gaspésie - Îles-de-la-Madeleine (100.21 per cent), Région de la Côte-Nord (150.26 per cent) and Oxford County (86.87 per cent). The first two regions are in the province of Quebec that ranks among the top provinces by life satisfaction scores and although the variation in the latter is significantly over explained, a discussion is still merited due to the similarity between the two regions. The positive features of Région de la Gaspésie - Îles-de-la-Madeleine are its high sense of belonging, below average stress levels and its above average mental health. These are offset by poor health and below average household income. These features are also common in Région de la Côte-Nord with the exception of household income that was found to be above the national

average. Oxford County on the other hand, has above average health, sense of belonging, household income that is offset by below average stress levels and mental health.

The variation in subjective well-being is explained to some degree for each of the five bottom ranked health regions in contrast to their high ranking counterparts. The important determinants explain the most variation in Fraser South (62.35 per cent) followed by Peel Health Unit (44.79 per cent), Vancouver (31.83 per cent), Richmond (22.13 per cent) and City of Toronto (19.30 per cent). The common characteristics among these CMAs are relatively low health and mental health except for Vancouver that has above average health and Toronto, whose mental health is close to the national average. Income levels in Toronto and Vancouver are closer to the average while they are relatively low for the other three. Toronto and Vancouver also have a below average sense of belonging although magnitude of the difference is much greater in the former. Stress levels were noted to be relatively higher in Toronto and Peel Health Unit.

Table 47: Health Region Variation in Life Satisfaction Accounted for by Health, Mental Health, Stress, Belonging, and Income

Variation in Life Satisfaction at Different Levels of Geography			
	Difference between the National and the Provincial Life Satisfaction (1)	Variation Explained by Health, Mental Health, Stress, Belonging and Income (2)	% Variation Explained (3) = (2)/(1)
<u>Satisfied Health Regions</u>			
Renfrew	0.140	0.001	0.51
Oxford	0.130	0.114	87.68
Région des Laurentides	0.116	-0.006	-5.11
Région de la Gaspésie - Îles-de-la-Madeleine	0.106	0.106	100.21
Région de la Côte-Nord	0.113	0.170	150.26
<u>Least Satisfied Health Regions</u>			
City of Toronto	-0.150	-0.029	19.30
Peel Health Unit	-0.120	-0.054	44.79
Vancouver HSDA	-0.100	-0.032	31.83
Fraser South	-0.082	-0.051	62.35
Richmond	-0.082	-0.018	22.13

VI. Conclusion

This paper has presented a preliminary analysis and results of the factors explaining geographic variation of happiness in Canada at the provincial, CMA, and health region level. After a detailed description of the landscape of happiness in Canada in 2007-08 based on the CCHS, the paper identifies through regression analysis five key determinants of happiness. It then develops weights for these five factors and applies these weights to the geographic variation in the five variables. A sense of belonging appears as the most important factor in explaining geographical variation in Canada, followed by mental health.

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Appendix I: What Makes people Happy? A Review

This appendix will discuss determinants of happiness that have featured prominently in the literature: marriage, financial situation, employment, education, health, and inequity. In some cases, entire studies have been devoted to exploring the relationship between some of these factors and subjective well-being. The discussion in each sub-section will make note of the type of relationship with each factor, the major findings and the type of analysis that was carried out.

A. Marriage

In the tradition of Becker (1981), marriage provides a basic safety net against adverse life experiences and allows for gains from economies of scale and specialization within the family. Marriage allows for spouses to combine their human capital and advance in the labour market. This is reflected in married people earning higher incomes than single people, *ceteris paribus* (Chun and Lee, 2001). While economists like Becker have focused on economic gains, psychologists and sociologists have stressed the increase in emotional support and relational gratification as an important benefit of marriage contributing to increased well-being.

Empirical studies have shown that compared to single people, married people have better physical and psychological health (Burman and Margolin 1992, and Ross *et al.* 1990). Using data from the U.S. General Social Survey, Layard (2005) shows that a single person is less happy than a married person by 4.5 point on the happiness scale of 10 to 100.¹³ Widowers and the unmarried also suffer from lower well-being than the married, but the group most affected are the separated. A separated person is eight points lower on the happiness scale as compared to a married person.¹⁴

Appendix Table 1: Happiness by Martial Status, United States General Social Survey - Appendix

Family Relationships	Fall in Happiness Points (Scale 10-100) Versus Married
Divorced	5
Separated	8
Widowed	4
Never Married	4.5
Cohabiting	2
Source: Layard (2005:64)	

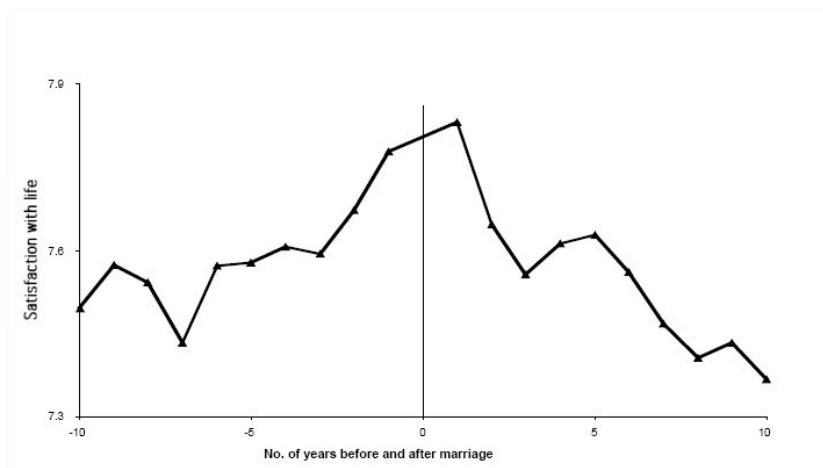
Frey and Stutzer (2003), using the German Socio-Economic Panel, have shown that happiness profile of married people follows a particular trend after controlling for sex and basic demographic characteristics. Appendix Figure 1 shows that the level of happiness starts to increase as the time of marriage comes nearer, and it peaks around the year of the marriage. After the peak period, there is reason to believe that adaptation sets in and the level of happiness keeps decreasing with time until it falls back to

¹³ The scale is actually 1-10, but for simplicity, all units were multiplied by 10 so it ranges from 10-100.

¹⁴ Also see Stack and Eshleman (1998)

its baseline level. This notion is supported by some psychologists who believe that marital transitions cause short term change in well-being (Johnson and Wu 2002).

Appendix Figure 1: Life Satisfaction and Marriage



Source: Frey and Stutzer (2003), pp. 32

Guven *et al.* (2009) also used panel data to study happiness and marital status in Australia. They found that if spouses did not experience similar levels of life satisfaction during their marriage years, they were more likely to get a divorce. The probability of a divorce would increase if the happiness gap grew over time. In particular, if the wife were unhappier than the husband, the marriage was more likely to end in a break up because most divorces were instigated by women. The authors also controlled for other variables such as children, income and age. Despite these controls, the association between an increasing happiness gap and the risk of divorce continued to persist. The paper concluded that public policy, especially policies that affect the division of labour inside households, should avoid giving spouses incentives that lead to diverging levels of happiness – namely, individual income and employment have been shown to be among the main determinants of happiness.

Helliwell (2003), using data from the World Values Survey, investigated which individual and national-level characteristics affect individual life satisfaction. Not surprisingly, married individuals were the happiest while the divorced and separated were the least happy. In October 2009, the Gallup Healthways Well-Being Index of the United States showed that married people seem to be most satisfied, ahead of single people, the widowed, those in common-law relationships, the divorced and those who are separated.

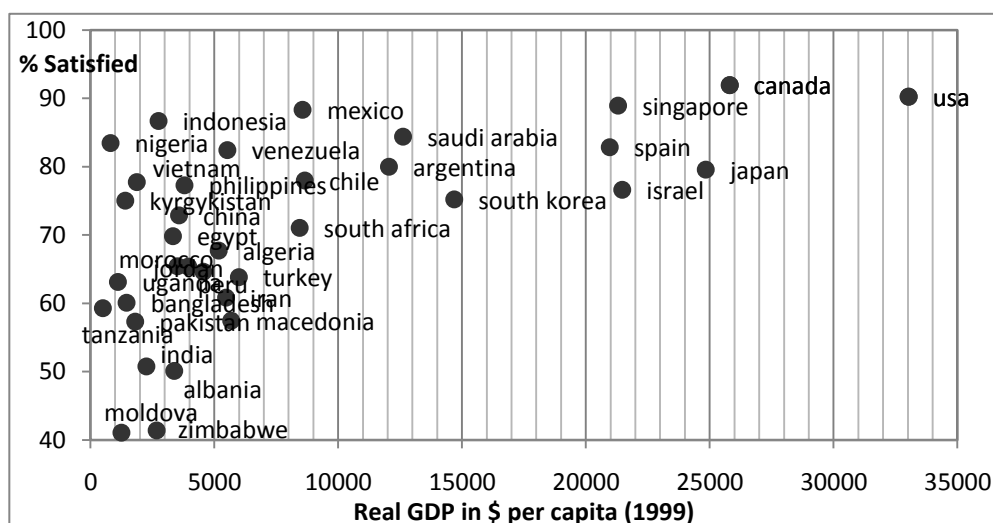
B. Financial Situation

An individual's economic status is an important factor in determining his or her well-being. Economic status depends not only on one's current income stream in comparison with the reference group but also on expectations of future earnings. Traditionally, researchers have focused on the role of current income in absolute terms. Studies have shown that individuals who have a higher relative income have higher subjective well-being, although the magnitude is often described to be small. (Diener *et al.* 1999).

The case of former East Germany showed that the living standards of those in work have soared since 1990, but their level of happiness has plummeted. Instead of comparing their incomes with their old reference group, the Soviet Bloc, they now make comparisons with the new reference group with higher average income, the West Germans (Layard, 2005). Economic comparisons in the form of the reference income approach are closely related to Brickman and Campbell's (1971) concept of a 'hedonic treadmill'. Individuals' objectives and goals are closely related to his environment. These goals and objectives are revised as the environment around him evolves. Helliwell and Barrington-Leigh (2008) studied the reference income approach locally. By analyzing data at different geographical levels in Canada, they found income comparison effects were stronger and dominated empathy, consistent with the findings of Kingdon and Knight (2007) who studied South African regions.

Besides laying emphasis on reference income, researchers have also made note of a certain income threshold that corresponds to a level sufficient to fulfill basic needs (Helliwell, 2003). Beyond this threshold, additional income is not associated with extra happiness. This can be seen from the right-hand side of Appendix Figure 2. For countries that have a GDP per capita of above \$10,000, happiness does not rise as steeply as it does for countries below that level.

Appendix Figure 2: Cross Country Comparisons: Income and Happiness



Sources: World Development Indicators Database and World Values Survey.

Note: The percentage satisfied shown in the graph is obtained by taking the average of "quite" or "very happy" and per cent satisfied above level 6 in the World Values Survey. Layard (2005) has performed a similar analysis by merging two waves of the World Values Survey for a larger pool of countries.

Inglehart *et al.* (2008) used the five waves of the World Values Survey to test the link between life satisfaction and income for 46 countries for which time series data was available. They were able to show a smooth and a positive relationship. This relationship was also shown by Helliwell *et al.* (2009), Deaton (2008) and Wolfers and Stevenson (2008) who used the European Social Survey (23 countries) and Gallup World Poll (130 countries) respectively, with the latter survey having a more representative sample of the world's population. The reason leading Layard (2005), Easterlin (1995) and Bjornskov (2008) to doubt the relationship between happiness and rising incomes is that they used the World Values Survey, which includes few poor countries, most of them in eastern Europe or parts of the former Soviet Union (among

them Moldova, Ukraine, Armenia, Belarus, Russia, Bulgaria, Latvia, Estonia, Azerbaijan, Bosnia and Herzegovina, Macedonia, Romania, Estonia, and Slovakia). The respondents in these countries were found to be exceptionally dissatisfied and they established a cluster of countries well below the relationship between life satisfaction and income which should otherwise hold in a balanced sample. The World Values Survey in its earlier waves also surveyed people from urban parts of India, China, Ghana and Nigeria to establish some sort of balance in the sample which was tilted towards OECD countries. People from these countries had higher life satisfaction. Therefore, the sample of poor countries comprised of a mixture of satisfied people from the urban parts of some poor countries and dissatisfied respondents from poor countries in Eastern Europe failed to show any clear trend (Deaton, 2008).

C. Unemployment

Work not only provides income, but it helps sustains social relationships. Loss of employment is seen by most as a stigma and causes one to lose self-respect. This factor is also related to one's financial situation. The lack of employment will in most cases lead to a loss of income and decrease in well-being. Using the World Values Survey, Helliwell (2003) shows that unemployment lowers subjective well-being by as much as a one-unit drop on the five-point health scale.

Loss of employment causes a decrease in well-being, part of which can only be attributed to lower income. The German Socio Economic Panel has shown that for a person, the pain of unemployment is greater than the pain of losing income.¹⁵ Moving between employment and being out of the labour force involves a smaller change in happiness than moving between work and unemployment. According to some researchers, unemployment causes persistent misery and despair which causes people to report a lower well-being even after being unemployed for a lengthy duration. Clark (2006) used data from three European Panels to show that there is no 'habituation' to unemployment and that it hurts as much after one or two years of unemployment as it does at the beginning. Helliwell (2003), however, believes that the constant reported loss in well-being is mostly to the habituation affects in the form of debt and despair that builds up after long-standing unemployment. And that it is important to disentangle the habituation affects which would provide a more accurate affect of the unemployment on well-being and satisfaction.

D. Health

Health contributes towards all three measures of an individuals' well-being; social, mental, and physical. The indicators of health in the form of life expectancy, fertility and infant mortality are central measures of the quality of life. Hayes and Ross (1986) cite several studies indicating a high correlation between health and psychological well-being. This positive association has been confirmed by Helliwell (2003) and Bjornskov *et al.* (2006). Using the World Values Survey, Helliwell showed that a one-point improvement in health, on the five point scale, is associated with a 0.61 point increase in subjective well-being and given the means and scales of the variables, a 1 per cent increase in average reported health status is associated with just over 1 per cent increase in subjective well-being. His analysis yielded similar results when the analysis was extended to cross country comparisons.

¹⁵ Winkleman and Winkleman (1998). The causal affect of unemployed is higher than out of labour force for all the different models used with variations in demographic variables.

It must be noted that healthy people do have a tendency to overstate the loss in well-being from deterioration in their actual health (Layard, 2005). Therefore, there is cause to believe that there would be a significant difference between measuring the impact of a self-assessed change in health status and an actual change in health status on well-being. It has also been found that individuals whose personalities are inherently more optimistic are more likely to give positive assessments of their health status and their subjective well-being. Scheier *et al.* (1989) performed an experiment on optimism on 51 patients before and after a coronary artery bypass surgery where they found that post-surgery optimistic patients showing positive signs in the form of quicker recovery and positive emotional response to family and hospital staff.

Clinical research examined SWB from a different angle: how an individual's SWB affects their physical wellness. Davidson *et al.* (2010) used the Canadian Nova Scotia Health Survey to study the increased "positive affect" of people (such as joy, happiness, excitement, enthusiasm and contentment) on the effect of ten-year incidence of coronary health disease. The results indicated that positive affect, through a variety of mechanisms such as better sleeping habits and giving up smoking, could actually defend against coronary heart disease. This conclusion suggested that preventive strategies for the disease may be enhanced not only by reducing depressive symptoms in individuals but also by increasing their positive affect.

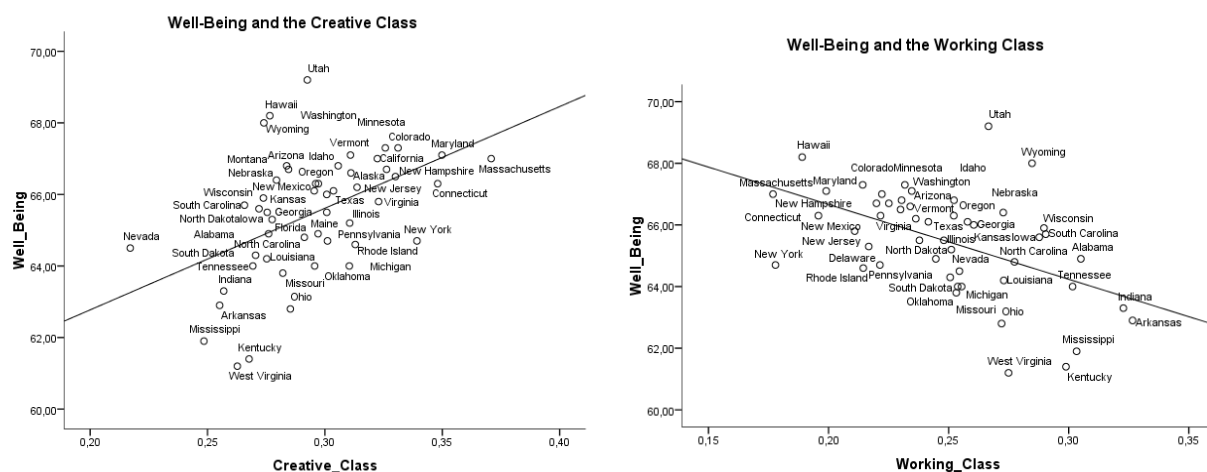
E. Education

Education has been found to be the strongest systematic determinant of individual participation in a variety of social activities, and social connections have been linked to increased health and well-being (Putnam, 2000). The results which have been obtained are quite surprising in relation to what theorists have proposed.

Helliwell (2003:24) found that individual partial effects of different levels of education did not have a large and significant impact on life satisfaction. After community variables were added to his analysis, once again, national educational attainment did not have an impact on well-being. The individual well-being benefits of education on life satisfaction are mitigated by other factors such as health, perceived trust, and higher incomes; and for community-level variables, benefits of education appear to flow through positive effects on the creation and maintenance of human and social capital like national trust and quality of government. Using the data from the same survey with a larger pool of countries, Bjørnskov *et al.* (2006) found the variable of primary education to be significant only for people outside low income groups. Their results also showed that secondary schooling did not contribute to well-being for any income or age group. Satisfaction and returns to education depends also on the quality of education received and there is significant variance in education quality in the World Values sample of countries.

Along with the international evidence on well-being noted above, there has been considerable research on U.S. states. Specifically, Florida *et al.* (2009) examined the relationship between well-being and several economic and social measures including education across states. They found that more advanced a society is, the happier the citizens of that state. This analysis revealed some intriguing conclusions (Appendix Figure 3). The correlation between well-being and the Creative Class, defined as individuals part of creative professions such as business, finance, and law, comparatively small but positive ($r = .49$). In contrast, the correlation between well-being and working class occupations (construction and extraction, installation, maintenance and repair, production, transportation and material moving occupations) was negative ($r = -.50$) (Florida, Mellandar, and Rentfrow, 2008:15). The occupational Creative Class had a larger percentage of people with a Bachelors degree or higher than the Working Class. Partial correlations were also run to make sure all the results were statistically significant.

Appendix Figure 3 : Well-Being and Florida's Classes



Source: Florida *et al.* (2008)

F. Inequality

Inequality has also been studied as a determining well-being. The actual degree of income inequality and related redistributive government policies might well affect personal socio-economic positions as well as the perceived fairness of the allocation of resources of society. First, the degree of income inequality affects the relative income position of individuals and might thus influence their well-being. Helliwell (2002) assessed inequality by adding the Gini coefficient for each national economy as a regressor of life satisfaction.¹⁶ Bjornskov *et al.* (2008) using the same data set and methodology studied a larger pool of countries. Their results were similar to Helliwell's where the inequality variable was statistically insignificant.

Individuals are also concerned about their income position in relation to their peer or reference group for happiness. But the direction of this relationship is ambiguous. People in low income groups might be negatively influenced by inequality if the affect of envy and status is strong. Yet greater income inequality could also entail greater opportunities. Unequal but dynamic societies might allow for upward economic mobility which might be less likely in more equal societies. The well-being of people in higher income brackets and those in favourable position in relation to their reference group is also indeterminate as it is also dependent on two opposing affects: the feeling of being in a good social position versus the fear of being deprived by the income groups below them (Alesina *et al.*, 2003).

¹⁶ There were, however, some well-being effects of income inequality in an indirect manner where personal and national income averages were added to the regression equation, a negative effect on well-being was observed. The observation was based on the decile position of the individual.

Appendix II: Data Summary

Appendix Table 2: Data Summary

	Min	Max	Mean	Std. Dev.
Individual Variables				
<u>Ordinal Variables</u>				
Life Satisfaction	1	5	4.25	0.74
Perceived Health	1	5	3.54	1.04
Perceived Mental Health	1	5	4.01	0.93
Stress Level	1	5	2.68	1.02
Sense of Belonging to local community	1	4	2.80	0.86
Household Income (Deciles)	1	10	5.42	2.89
<u>Dummy Variables</u>				
<u>Student Status</u>				
Not a Student	0	1	0.93	0.26
Student	0	1	0.05	0.22
<u>Immigration Status</u>				
Non-Immigrants	0	1	0.83	0.38
Recent Immigrants	0	1	0.03	0.16
Non-Recent Immigrants	0	1	0.12	0.33
<u>Age Group</u>				
20s	0	1	0.13	0.33
30s	0	1	0.16	0.37
40s	0	1	0.17	0.37
50s	0	1	0.19	0.39
60s	0	1	0.16	0.37
70s	0	1	0.12	0.32
80+	0	1	0.07	0.25
<u>Visible Minority Status</u>				
Majority	0	1	0.85	0.36
Visible Minority	0	1	0.12	0.32
<u>Education</u>				
Less than Secondary	0	1	0.20	0.40
Secondary School Graduate	0	1	0.16	0.36
Some Post-Secondary	0	1	0.07	0.25
Post-Secondary	0	1	0.54	0.50
<u>Marital Status</u>				
Never been married	0	1	0.20	0.40

Married	0	1	0.49	0.50
Common-Law	0	1	0.09	0.29
	Min	Max	Mean	Std. Dev.
Divorced/Separated/Widowed	0	1	0.22	0.42
<u>Language</u>				
Anglophone	0	1	0.73	0.45
Francophone	0	1	0.19	0.39
Allophone	0	1	0.06	0.24
<u>Working Status</u>				
Employed	0	1	0.66	0.47
Not Employed	0	1	0.30	0.46
Unable to Work	0	1	0.04	0.19
<u>Sex</u>				
Females	0	1	0.55	0.50
Males	0	1	0.45	0.50
<u>Level of Physical Activity</u>				
Inactive	0	1	0.22	0.42
Somewhat Active	0	1	0.24	0.43
Active	0	1	0.51	0.50
<u>Difficulty with Activities</u>				
Never	0	1	0.68	0.47
Sometimes Difficulties	0	1	0.17	0.38
Often	0	1	0.15	0.35
Health Region Level Variables				
Household Income Inequality†	3.98	9.02	7.81	0.61
Ethnic Fractionalization†	0.01	0.68	0.17	0.20
Population Density of Health Region†	-1.20	8.41	3.35	2
Median Household Income†	37921	104447	53558	10409
Unemployment Rate†	3.60	25.40	7.35	3.61
Proportion of Students**	1.91	13.61	6.63	2.46
Proportion of Non-Recent Immigrants**	0.00	51.58	12.05	11.17
Proportion of Post Secondary Graduates**	38.97	70.92	55.72	5.73
Proportion of Married**	37.34	71.31	55.24	8.41
Proportion of Francophones**	0.00	98.24	18.91	33.84
Proportion of Males**	47.27	55.38	49.23	1.05
Proportion of Physically Active Individuals**	13.28	37.45	22.72	4.24
Proportion of Individuals who have never had Difficulty with Activities**	56.53	84.69	71.65	6.42
Average Health	2.34	2.81	2.61	0.09
Average Mental Health	2.83	3.25	3.05	0.08
Average Stress	2.48	2.94	2.76	0.09
Average Sense of Belonging	2.43	3.20	2.77	0.16

Average Age	3.54	4.77	4.32	0.20
Total Observations: 116569				
Missing responses are not excluded				
† Denotes a variable derived from the 2006 Census of Population. All other variables are from the 2007/2008 Canadian Community Health Survey				
**Denotes a Health Region Variable in terms of percentage.				
Perceived Mental Health and Perceived Health have five categories:				
1-poor, 2-fair, 3- good, 4-very good, 5- excellent				
Stress has five categories :				
1-not at all, 2-not very, 3- a bit, 4-quite a bit, 5-extremely				
Sense of Belonging to the local Community has four categories:				
1-weak, 2-somewhat weak, 3-somewhat strong, 4-strong				
Income Deciles: "This derived variable is a distribution of Canadians in deciles (ten categories including approximately the same percentage of residents for each province) based on their value for [INCEDADR, i.e..]the adjusted ratio of their total household income to the low income cut-off corresponding to their household and community size. It provides, for each respondent, a relative measure of their household income to the household incomes of all other respondents." (From the CCHS documentation)				
Average Age: This variable is derived by taking the mean of the categorical variable - age. Each category or level denotes a 10 year age group. For instance, 2 indicates that the average age of the health region is in the 20s, 3 indicates an average age in the 30s and so forth.				

Appendix III: Regression Results

A. Equation 1 and Equation 2

Appendix Table 3: Ordered Probit Regression of Life Satisfaction of individuals in 101 Health Regions of Canada, 2007-2008

	Equation 1: Only Individual Level Variables		Equation 2: Individual and Health Region Variables	
	Coefficient	S.E	Coefficient	S.E
Pseudo R ²	0.1912		0.1921	
<u>Individual Variables</u>				
<i><u>Ordinal Variables</u></i>				
Perceived Health	0.237***	0.009	0.236***	0.009
Perceived Mental Health	0.452***	0.010	0.455***	0.010
Stress Level	-0.208***	0.008	-0.208***	0.008
Sense of Belonging to local community	0.178***	0.009	0.180***	0.009
Household Income (Deciles)	0.047***	0.003	0.047***	0.003
<i><u>Dummy Variables</u></i>				
<u>Student Status</u>				
Not a Student				
Student	0.116***	0.030	0.119***	0.031
<u>Immigration Status</u>				
Non-Immigrants				
Recent Immigrants	-0.271***	0.045	-0.257***	0.045
Non-Recent Immigrant	-0.129***	0.026	-0.113***	0.027
<u>Age Group</u>				
20s				
30s	-0.053**	0.025	-0.052**	0.025
40s	-0.081***	0.025	-0.079***	0.025
50s	-0.122***	0.027	-0.122***	0.027
60s	-0.042	0.029	-0.044	0.029
70s	0.077**	0.038	0.073*	0.038
<u>Visible Minority Status</u>				
Visible Majority				
Visible Minority	-0.094***	0.025	-0.084***	0.025
<u>Education</u>				
Less than Secondary				
Secondary School Graduate	-0.009	0.025	-0.010	0.025

	Equation 1: Only Individual Level Variables		Equation 2: Individual and Health Region Variables	
Some Post-Secondary	-0.017	0.034	-0.020	0.034
Post-Secondary	0.013	0.022	0.011	0.022
<u>Marital Status</u>				
Never been married				
	Coefficient	S.E	Coefficient	S.E
Married	0.421***	0.020	0.418***	0.020
Common-Law	0.313***	0.025	0.309***	0.025
Divorced/Separated/Widowed	0.021	0.026	0.018	0.026
<u>Language</u>				
Anglophone				
Francophone	0.087***	0.018	0.050	0.034
Allophone	-0.129***	0.037	-0.123***	0.037
<u>Working Status</u>				
Employed				
Not Employed	-0.013	0.020	-0.010	0.020
Disabled	0.046	0.053	0.051	0.053
<u>Sex</u>				
Females				
Males	-0.127***	0.014	-0.127***	0.014
<u>Level of Physical Activity</u>				
Inactive				
Somewhat Active	0.115***	0.017	0.111***	0.017
Active	0.143***	0.018	0.135***	0.018
<u>Difficulty with Activities</u>				
Never				
Sometimes Difficulties	-0.132***	0.027	-0.132***	0.027
Often	-0.075***	0.020	-0.075***	0.020
<u>Health Region Variables</u>				
Household Income Inequality			-0.027*	0.016
Ethnic Fractionalization				
Population Density of Health Region			0.001	0.007
Median Household Income			-0.000*	0.000
Unemployment Rate			-0.003	0.003
Proportion of Students			-0.006	0.006
Proportion of Non-Recent Immigrants			-0.003**	0.002

Proportion of Post Secondary Graduates	0.004**	0.002
Proportion of Married	0.003*	0.002
Proportion of Francophones		
Proportion of Males	-0.017	0.012
Proportion of Physically Active Individuals	0.008***	0.003
Proportion of Individuals who never have difficulty with activities	0.007***	0.003
Average Health	-0.119	0.162
Average Mental Health	-0.183	0.156
Average Stress	0.113	0.120
Average Sense of Belonging	-0.124	0.083
Average Age	-0.016	0.079

Data Source CCHS 2007-2008

Note: *** p<0.01, ** p<0.05, * p<0.1 denote significances at the 1, 5 and 10 per cent level respectively. Boldface indicates base case variable.

B. Equation 3

Appendix Table 4: Ordered Probit Regression of Life Satisfaction of individuals in 33 CMAs of Canada, 2007-2008

Equation 3 (with individual and CMA variables)	
	Coefficient S.E
Pseudo R ²	0.193
<u>CMA level Variables</u>	
Household Income Inequality	0.001 0.033
Population Density of Health Region	0.000 0.000
Median Household Income	-0.000 0.000
Unemployment Rate	-0.012 0.014
Proportion of Students	-0.008 0.009
Proportion of Non-Recent Immigrants	-0.005 0.003
Proportion of Post Secondary Graduates	-0.001 0.004
Proportion of Married	0.002 0.005
Proportion of Males	-0.023 0.018
Proportion of Physically Active Individuals	0.009* 0.006
Proportion of Individuals who never have difficulty with activities	0.007 0.004
Average Health	-0.185 0.430
Average Mental Health	-0.106 0.297
Average Stress	0.265 0.177
Average Sense of Belonging	-0.132 0.224
Average Age	-0.181 0.149
Data Source CCHS 2007-2008	
Note: *** p<0.01, ** p<0.05, * p<0.1 denote significances at the 1, 5 and 10 per cent level respectively. Boldface indicates base case variable.	

C. Average Effects: Equation 1

Appendix Table 5: Ordered Probit Results of Regression 1 - Average Effects

	$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		Average Effect
<u>Individual Variables</u>											
<u>Ordinal Variables</u>											
Perceived Health	-0.0002	**	-0.0043	**	-0.0169	**	-0.0673	**	0.0873	**	0.11
Perceived Mental Health	-0.0006	**	-0.0092	**	-0.0323	**	-0.1233	**	0.1634	**	0.21
Stress Level	0.0002	**	0.0037	**	0.0123	**	0.0594	**	-0.0769	**	-0.10
Sense of Belonging	-0.0002	**	-0.0032	**	-0.0129	**	-0.0511	**	0.0660	**	0.08
Household Income (Deciles)	0.0000	**	-0.0008	**	-0.0035	**	-0.0136	**	0.0175	**	0.02
<u>Dummy Variables</u>											
<u>Student Status</u>											
Not a Student											-
Student	-0.0001	**	-0.0018	**	-0.0102	**	-0.0350	**	0.0438	**	0.04
<u>Immigration Status</u>											
Non-Immigrants											-
Recent Immigrants	0.0004	**	0.0063	**	0.0128	**	0.0679	**	-0.0955	**	-0.15
Non-Recent Immigrants	0.0001	**	0.0025	**	0.0051	**	0.0357	**	-0.0473	**	-0.07
<u>Age Group</u>											
20s											-
30s	0.0000	*	0.0010	*	0.0003	*	0.0151	*	-0.0196	*	-0.03
40s	0.0001	**	0.0015	**	0.0020	**	0.0228	**	-0.0298	**	-0.05
50s	0.0001	**	0.0023	**	0.0045		0.0340	**	-0.0447	**	-0.07
60s	0.0000		0.0008		-0.0011		0.0120		-0.0156		-0.03

										Average Effect
		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$
70s		-0.0001	*	-0.0012	*	-0.0091		-0.0231	*	0.0291
										*
<u>Visible Minority Status</u>										
Visible Majority										
Visible Minority		0.0001	**	0.0018	**	0.0029	**	0.0264	**	-0.0346
										**
<u>Education</u>										
Less than Secondary										
Secondary School Graduate		0.0000		0.0002		-0.0026		0.0027		-0.0035
Some Post-Secondary		0.0000		0.0003		-0.0033		0.0048		-0.0062
Post-Secondary		0.0000		-0.0002		-0.0036		-0.0038		0.0049
<u>Marital Status</u>										
Never been married										
Married		-0.0004	**	-0.0080	**	-0.0313	**	-0.1178	**	0.1545
Common-Law		-0.0002	**	-0.0042	**	-0.0191	**	-0.0992	**	0.1204
Divorced/Separated/Widowed		0.0000		-0.0004		-0.0046		-0.0062		0.0079
<u>Language</u>										
Anglophone										
Francophone		-0.0001	**	-0.0014	**	-0.0075	**	-0.0256	**	0.0325
Allophone		0.0001	**	0.0026	**	0.0036	**	0.0355	**	-0.0472
<u>Working Status</u>										
Employed										
Not Employed		0.0000		0.0002		-0.0017		0.0037		-0.0047
Unable to Work		0.0000		-0.0008		-0.0091		-0.0136		0.0173

Sex**Females**

Males

Level of Physical Activity**Inactive**

Somewhat Active

Active

Difficulty with Activities**Never**

Sometimes Difficulties

Often

	$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		Average Effect
Males	0.0001	**	0.0022	**	0.0063	**	0.0367	**	-0.0472	**	-0.07
Somewhat Active	-0.0001	**	-0.0019	**	-0.0091	**	-0.0341	**	0.0431	**	0.05
Active	-0.0001	**	-0.0023	**	-0.0108	**	-0.0427	**	0.0538	**	0.06
Sometimes Difficulties	0.0001	**	0.0026	**	0.0052	**	0.0360	**	-0.0480	**	-0.08
Often	0.0001	**	0.0014	**	0.0023	**	0.0212	**	-0.0277	**	-0.04

Data Source: CCHS 2007-2008

Marginal Effects are based on varying one variable and keeping all others at the overall average levels.

*, **, + denote significances at the 1, 5 and 10 percent level respectively.

D. Average Effects: Equation 2

Appendix Table 6: Ordered Probit Results of Regression 2 - Average Effects

	$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		Average Effect
<u>Individual Variables</u>											
<u>Ordinal Variables</u>											
Perceived Health	-0.0002	**	-0.0043	**	-0.0154	**	-0.06730	**	0.0872	**	0.11
Perceived Mental Health	-0.0005	**	-0.0092	**	-0.0305	**	-0.12400	**	0.1642	**	0.21
Stress Level	0.0002	**	0.0037	**	0.0135	**	0.05939	**	-0.0768	**	-0.10
Sense of Belonging to local community	-0.0002	**	-0.0032	**	-0.0117	**	-0.05167	**	0.0667	**	0.09
Household Income (Deciles)	0.0000	**	-0.0008	**	-0.0030	**	-0.01366	**	0.0176	**	0.02
<u>Dummy Variables</u>											
<u>Student Status</u>											
Not a Student											
Student	-0.0001	**	-0.0018	**	-0.0071	**	-0.03609	**	0.0451	**	0.06
<u>Immigration Status</u>											
Non-Immigrants											
Recent Immigrants	0.0003	**	0.0059	**	0.0197	**	0.06506	**	-0.0909	**	-0.12
Non-Recent Immigrant	0.0001	**	0.0021	**	0.0077	**	0.03146	**	-0.0415	**	-0.05
<u>Age Group</u>											
20s											
30s	0.0000	*	0.0009	*	0.0035	*	0.01494	*	-0.0194	*	-0.02
40s	0.0001	**	0.0014	**	0.0053	**	0.02237	**	-0.0291	**	-0.04

	Average Effect										
	$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		$\partial \text{Pr}(y=1)/\partial x$		Average Effect
50s	0.0001	**	0.0023	**	0.0083	**	0.03409	**	-0.0449	**	-0.06
60s	0.0000		0.0008		0.0029		0.01265		-0.0164		-0.02
70s	-0.0001	*	-0.0012	*	-0.0044	*	-0.02167	*	0.0273	*	0.03
Visible Majority											
Visible Minority	0.0001	**	0.0016	**	0.0057	**	0.02374	**	-0.0310	**	-0.04
<u>Education</u>											
Less than Secondary											
Secondary School Graduate	0.0000		0.0002		0.0007		0.00300		-0.0039		0.00
Some Post-Secondary	0.0000		0.0004		0.0013		0.00576		-0.0074		-0.01
Post-Secondary	0.0000		-0.0002		-0.0007		-0.00319		0.0041		0.01
<u>Marital Status</u>											
Never been married											
Married	-0.0004	**	-0.0078	**	-0.0280	**	-0.11701	**	0.1532	**	0.20
Common-Law	-0.0002	**	-0.0041	**	-0.0166	**	-0.09790	**	0.1188	**	0.14
Divorced/Separated/Widowed	0.0000		-0.0003		-0.0011		-0.00526		0.0067		0.01
<u>Language</u>											
Anglophone											
Francophone	0.0000		-0.0008		-0.0031		-0.01462		0.0186		0.02
Allophone	0.0001	**	0.0024	**	0.0086	**	0.03388	**	-0.0449	**	-0.06
<u>Working Status</u>											
Employed											
Not Employed	0.0000		0.0002		0.0006		0.00284		-0.0037		0.00
Disabled	0.0000		-0.0008		-0.0032		-0.01525		0.0193		0.02
<u>Sex</u>											

	$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		$\partial \Pr(y=1)/\partial x$		Average Effect
Females											
Males	0.0001	**	0.0022	**	0.0082	**	0.03668	**	-0.0471	**	-0.06
<u>Level of Physical Activity</u>											
Inactive											
Somewhat Active	-0.0001	**	-0.0018	**	-0.0068	**	-0.03286	**	0.0416	**	0.05
Active	-0.0001	**	-0.0021	**	-0.0082	**	-0.04037	**	0.0508	**	0.06
<u>Difficulty with Physical Activities</u>											
Never											
Sometimes	0.0001	**	0.0026	**	0.0092	**	0.03602	**	-0.0480	**	-0.06
Often	0.0001	**	0.0014	**	0.0050	**	0.02103	**	-0.0275	**	-0.04
<u>Health Region Variables</u>											
Household Income Inequality	0.0000	+	0.0005	+	0.0017	+	0.00776	+	-0.0100	+	-0.01
Log Population Health Region	0.0000		0.0000		-0.0001		-0.00033		0.0004		
Median Household Income	0.0000	+	0.0000	+	0.0000	+	0.00000	+	0.0000	+	0.00
Unemployment Rate	0.0000		0.0000		0.0002		0.00078		-0.0010		
Proportion of Students	0.0000		0.0001		0.0004		0.00186		-0.0024		
Proportion of Non-Recent Immigrants	0.0000	*	0.0001	*	0.0002	*	0.00098	*	-0.0013	*	0.00
Proportion of Post Secondary Graduates	0.0000	*	-0.0001	*	-0.0003	*	-0.00125	*	0.0016	*	0.00
Proportion of Married	0.0000	+	-0.0001	+	-0.0002	+	-0.00098	+	0.0013	+	0.00
Proportion of Males	0.0000		0.0003		0.0011		0.00499		-0.0064		
Proportion of Physically Active Individuals	0.0000	**	-0.0001	**	-0.0005	**	-0.00240	**	0.0031	**	0.00
Proportion of Never Individuals with no Difficulty with Physical activities	0.0000	**	-0.0001	**	-0.0004	**	-0.00198	**	0.0025	**	0.00
Average Health	0.0001		0.0021		0.0077		0.03444		-0.0443		
Average Mental Health	0.0002		0.0032		0.0118		0.05290		-0.0680		
Average Stress	-0.0001		-0.0020		-0.0073		-0.03285		0.0422		
Average Sense of Belonging	0.0001		0.0021		0.0080		0.03591		-0.0461		
Average Age	0.0000		0.0003		0.0010		0.00472		-0.0061		

Data Source: CCHS 2007-2008. Marginal Effects are based on varying one variable and keeping all others at the overall average levels.

E. Ordered Probit Results of Equation 1 – Expected Life Satisfaction

Appendix Table 7: Ordered Probit Results of Equation 1 - Predicted Probabilities

	Very Dissatisfied (1)	Dissatisfied (2)	Neither Satisfied Nor Dissatisfied (3)	Satisfied (4)	Very Satisfied (5)	Expected Value of Life Satisfaction (6)	Actual Life Satisfaction (7)
Health							
Poor	0.0020	0.0295	0.094	0.7164	0.1581	4.00	3.23
Fair	0.0009	0.0172	0.0651	0.695	0.2219	4.12	3.83
Good	0.0004	0.0095	0.0427	0.6492	0.2982	4.24	4.11
Very Good	0.0002	0.005	0.0266	0.5837	0.3847	4.35	4.38
Excellent	0.0001	0.0025	0.0156	0.5045	0.4773	4.46	4.56
<i>Difference</i>						0.46	1.32
Mental Health							
Poor	0.01720	0.11940	0.21360	0.61110	0.03880	3.54	2.65
Fair	0.00510	0.05540	0.14010	0.70440	0.09500	3.83	3.38
Good	0.00120	0.02120	0.07530	0.70620	0.19600	4.07	3.95
Very Good	0.00030	0.00670	0.03320	0.61570	0.34410	4.30	4.27
Excellent	0.00000	0.00170	0.01200	0.46500	0.52130	4.51	4.57
<i>Difference</i>						0.97	1.92
Stress							
Not at all	0.0001	0.0021	0.0141	0.4888	0.4949	4.48	4.52
Not very	0.0001	0.004	0.0227	0.5604	0.4128	4.38	4.41
A bit	0.0003	0.0072	0.035	0.6231	0.3343	4.28	4.25
Quite a bit	0.0006	0.0124	0.0519	0.6725	0.2625	4.18	4.05
Extremely	0.0012	0.0206	0.0738	0.7048	0.1995	4.08	3.67
<i>Difference</i>						0.40	0.85
Sense of Belonging to the Local Community							
Very weak	0.0007	0.0145	0.0578	0.6838	0.2432	4.15	3.93
Somewhat weak	0.0004	0.0091	0.0416	0.6459	0.3029	4.24	4.16
Somewhat strong	0.0002	0.0056	0.0290	0.5967	0.3685	4.33	4.31
Very Strong	0.0001	0.0033	0.0196	0.5388	0.4382	4.41	4.47
<i>Difference</i>						0.26	0.54
Household Income							
1 st Decile	0.0005	0.0114	0.0487	0.6652	0.2743	4.20	3.90
2 nd Decile	0.0004	0.0101	0.0446	0.6547	0.2902	4.22	4.10
3 rd Decile	0.0004	0.0089	0.0408	0.6434	0.3066	4.25	4.16
4 th Decile	0.0003	0.0078	0.0372	0.6313	0.3233	4.27	4.23
5 th Decile	0.0003	0.0069	0.0339	0.6185	0.3404	4.29	4.27
6 th Decile	0.0002	0.006	0.0308	0.605	0.3579	4.31	4.32

	Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied	Expected Value of Life Satisfaction	Actual Life Satisfaction
7 th Decile	0.0002	0.0053	0.0279	0.591	0.3756	4.34	4.34
8 th Decile	0.0002	0.0046	0.0253	0.5763	0.3937	4.36	4.39
9 th Decile	0.0001	0.004	0.0228	0.5611	0.4119	4.38	4.42
10 th Decile	0.0001	0.0035	0.0205	0.5455	0.4304	4.40	4.51
<i>Difference</i>						0.20	0.61
Student Status							
Not a student	0.0002	0.0064	0.0322	0.6115	0.3495	4.30	4.26
Student	0.0002	0.0046	0.0251	0.5755	0.3946	4.36	4.28
<i>Difference</i>						0.06	0.02
Immigration Status							
Non-Immigrants	0.0002	0.006	0.0305	0.6038	0.3595	4.32	4.30
Recent Immigrants	0.0005	0.0119	0.0502	0.6687	0.2686	4.19	4.11
Non-Recent Immigrants	0.0003	0.0081	0.0383	0.6352	0.318	4.26	4.14
<i>Difference</i>						-0.05	-0.16
Age Category							
20s	0.0002	0.0054	0.0283	0.593	0.373	4.33	4.27
30s	0.0002	0.0063	0.0315	0.6085	0.3535	4.31	4.29
40s	0.0003	0.0067	0.0333	0.6161	0.3437	4.30	4.25
50s	0.0003	0.0076	0.0363	0.6279	0.3279	4.28	4.22
60s*	0.0002	0.0061	0.031	0.6061	0.3565	4.31	4.29
70s	0.0001	0.0044	0.0243	0.5703	0.4009	4.37	4.26
<i>Difference</i>						0.03	-0.01
Visible Minority Status							
Majority	0.0002	0.0061	0.0312	0.6067	0.3558	4.31	4.29
Visible Minority	0.0003	0.0077	0.0368	0.6299	0.3253	4.27	4.10
<i>Difference</i>						-0.04	-0.19
Educational Attainment							
No HS Grad	0.0002	0.0064	0.032	0.6106	0.3508	4.31	4.11
HS Grad*	0.0002	0.0066	0.0327	0.6135	0.347	4.30	4.24
Went to PS*	0.0003	0.0067	0.0333	0.6161	0.3436	4.30	4.22
PS Grad*	0.0002	0.0062	0.0313	0.6073	0.355	4.31	4.31
<i>Difference</i>						0.01	0.20
Marital Status							
Married	0.0001	0.0039	0.0222	0.557	0.4167	4.39	4.34
Common Law	0.0002	0.0053	0.028	0.5916	0.3749	4.34	4.34
Separated/Divorced/Widowed*	0.0005	0.0117	0.0496	0.6673	0.2709	4.20	4.05
Never married	0.0006	0.0122	0.0512	0.671	0.265	4.19	4.13
<i>Difference</i>						-0.20	-0.22

Language Spoken at Home

	Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied	Expected Value of Life Satisfaction	Actual Life Satisfaction
Anglophone	0.0002	0.0064	0.0321	0.6111	0.3501	4.30	4.27
Francophone	0.0002	0.0055	0.0285	0.5942	0.3716	4.33	4.32
Allophone	0.0004	0.0089	0.0409	0.6437	0.3062	4.25	4.06
<i>Difference</i>						-0.06	-0.21

Employment Status

Employed	0.0002	0.0063	0.0317	0.6092	0.3525	4.31	4.30
Not Employed*	0.0002	0.0065	0.0324	0.612	0.3489	4.30	4.21
Unable to Work*	0.0002	0.0054	0.0285	0.594	0.3719	4.33	3.63
<i>Difference</i>						-0.03	0.58

Sex

Female	0.0002	0.0054	0.0281	0.5921	0.3742	4.33	4.26
Male	0.0003	0.0076	0.0364	0.6285	0.3272	4.27	4.25
<i>Difference</i>						0.06	0.01

Physical Activity

Inactive	0.0003	0.0075	0.036	0.6267	0.3296	4.28	4.16
Somewhat Active	0.0002	0.0055	0.0287	0.595	0.3706	4.33	4.33
Active	0.0002	0.0051	0.0273	0.5875	0.3799	4.34	4.40
<i>Difference</i>						0.06	0.24

Difficulty with Activities

Never Difficulties	0.0002	0.0058	0.03	0.6015	0.3624	4.26	4.34
Sometimes Difficulties	0.0003	0.0072	0.035	0.6228	0.3348	4.28	4.11
Often difficulties	0.0003	0.0084	0.0391	0.638	0.3142	4.32	3.91
<i>Difference</i>						0.06	0.42

F. OLS Regression of Life Satisfaction at the Societal Level

We also explored life satisfaction within two difference geographic dimensions: Health Region and CMA level. The results from Equation 1 and Equation 2 showed that societal variables do have very significant association with subjective well-being. Undertaking this analysis will help us determine whether these societal variables play any kind of a role in life satisfaction of the society as whole. We used two proxies for the life satisfaction of the society. Both these methods were also used to discuss and explore the landscape that was existent in Canada with regards to the regional variation in life satisfaction in the previous section. The first method was using the average life satisfaction approach, and the second method was to explore the variation at the top by using the percentage of individuals in the society that were 'satisfied' or 'very satisfied'. The results from the two methods provide a useful comparison between the determinants of life satisfaction that are important for the whole population and those that are essential for the more satisfied individuals in society.

The regressions were estimated using an Ordinary Least Squares (OLS) approach and are subject to the usual caveats that apply to this approach. Moreover, the sample size for the analysis at the Health Region (101) and CMA (33) are very small and therefore, the results of this section should be interpreted with caution.

i. OLS Regression of Life Satisfaction at Health Region Level

Table 38: OLS Regression of Life Satisfaction at Health Region Level

	Average Life Satisfaction of Health Region (1)			% Satisfied and Very Satisfied at the Health Region Level (2)	
	Coefficient	Standard Error		Coefficient	Standard Error
Inequality	-0.014*	0.007	Inequality	-0.006***	0.002
Median Household Income±	0.000	0.000	Median Household Income±	-0.000**	0.000
Unemployment Rate±	-0.002	0.001	Unemployment Rate±	-0.000	0.000
Log Population Density±	-0.000	0.003	Log Population Density±	-0.001	0.001
Ethnic Fractionalization±	-0.282***	0.047	Ethnic Fractionalization±	-0.044**	0.022
Average Health	0.061	0.074	Average Health	-0.005	0.029
Average Mental Health	0.142*	0.074	Average Mental Health	0.058**	0.027
Average Stress	-0.098*	0.054	Average Stress	-0.015	0.021
Average Age	-0.010	0.037	Average Age	-0.011	0.012
Proportion who never have difficulty	0.003***	0.001	Proportion who never have difficulty	0.001*	0.001
Proportion of Active Individuals	0.400**	0.156	Proportion of Active Individuals	0.015	0.044
Proportion of Students	-0.001	0.002	Proportion of Students	-0.001	0.001
Proportion of Post-Secondary Graduates	0.000	0.001	Proportion of Post-Secondary Graduates	-0.000	0.000
Proportion of Married	0.001	0.001	Proportion of Married	0.001***	0.000
Proportion of Males	-0.015**	0.006	Proportion of Males	-0.003	0.002
_cons	4.459***	0.443	_cons	0.942***	0.166
Number of observations	101		Number of observations	101	
R2	0.710		R2	0.566	
Adjusted R2	0.659		Adjusted R2	0.489	
F statistic	27.385		F statistic	10.607	

Data Source: CCHS 2007-2008

± indicates data take from the Canada Census Profiles 2006

***, ** and * indicate significance at 1, 5 and 10% respectively.

Table 38 shows results for both approaches when health region life satisfaction is regressed on some societal variables. The average life satisfaction approach shows that coefficients on inequality, ethnic fractionalization, average mental health, proportion of active individuals and proportion of males were statistically significant. Whereas, using the percentage satisfied and very satisfied approach, only coefficients on inequality, ethnic fractionalization, household income, average mental health and proportion of married individuals are statistically significant.

For inequality, a standard deviation increase in household income would cause average life satisfaction to go down by 0.01. This coefficient is weakly significant similar to the case where it was an explanatory variable for subjective well-being. This coefficient is weakly significant at the 10 per cent level. This is contrasted with the results from the second approach where the relationship between percentage satisfied and very satisfied is highly significant at 1 per cent, and a standard deviation increase in household income would cause 0.6 per cent decrease in health region satisfaction.

Median household income is statistically insignificant using the average life satisfaction approach, but the percentage satisfied approach sees it as statistically significant at 5 per cent. However, the magnitude of its association with health region satisfaction is negligible similar to its relationship with subjective well-being.

Ethnic Fractionalization, although showed no statistical significance when used as an explanatory variable for subjective well-being, is highly significant in both the average life satisfaction approach (at 1 per cent level) and percentage satisfied approach (at 5 per cent). The relationship with well-being, although negative, appears to be quite strong: a unit increase in the index of ethnic fractionalization causes average satisfaction to go down by 0.2 and percentage of satisfied individuals in society to decrease by 4 per cent. This shows that individuals in Canada have a preference towards living in areas that are more homogenous. Based on the results in the previous section that discussed the geographical variation in well-being, it can be assumed that these areas are less small urban centres as opposed to urban centres that have a large populace.

Average mental health is also statistically significant in both sets of regressions (10 per cent with the first method and 5 per cent with the second method). Like ethnic fractionalization, it shows a strong association with health region satisfaction. A unit increase in mental health of the health region is associated with a 0.14 increase in average life satisfaction and 5.9 per cent increase in the percentage of satisfied individuals in society. It can therefore be concluded that the more mentally healthy regions are also the more happy ones.

Proportion of individuals who never have difficulty is also shows a statistically significant relationship with health region satisfaction just like it did for subjective well-being (1 per cent for the first method and 10 per cent for the second method). The magnitude of the relationship, however, is weak with a unit increase being associated with a 0.003 increase in average health region satisfaction and 0.1 per cent increase in the satisfied individuals in a society.

Proportion of physically active individuals, proportion of males and stress are two variables that are statistically significant (at 5 per cent) only using the average life satisfaction approach. A health region, on average is happier by 0.40 on the life satisfaction scale for a percentage increase in active individuals in society. A unit increase in average stress level at the health region causes average life satisfaction to go down by 0.098. Males are less happy than females at the individual level and this is also evident at the societal level as a percentage increase in the proportion of males in society will lower its satisfaction by 0.15.

Proportion of married individuals is statistically significant (at 1 per cent level) only using the second method (of percentage satisfied). A percentage increase in the proportion of married individuals increases the satisfied individuals in a health region by 0.1 per cent.

ii. OLS Regression of Life Satisfaction at CMA level

Table 39: OLS Regression of Life Satisfaction at CMA Level

	Average Life Satisfaction of CMA (1)			% Satisfied and Very Satisfied at the CMA Level (2)	
	Coefficient	Standard Error		Coefficient	Standard Error
Inequality	-0.004	0.016	Inequality	-0.012**	0.005
Median Household Income±	-0.000	0.000	Median Household Income±	-0.000	0.000
Unemployment Rate±	-0.003	0.006	Unemployment Rate±	0.001	0.003
Log Population Density±	-0.000	0.000	Log Population Density±	-0.000	0.000
Ethnic Fractionalization±	-0.256***	0.053	Ethnic Fractionalization±	-0.051**	0.023
Average Health	0.286**	0.127	Average Health	0.069	0.082
Average Mental Health	0.052	0.154	Average Mental Health	0.045	0.096
Average Stress	0.103	0.136	Average Stress	0.040	0.051
Average Age	-0.032	0.068	Average Age	-0.005	0.021
Proportion who never have difficulty	0.002	0.002	Proportion who never have difficulty	0.000	0.001
Proportion of Active Individuals	0.002	0.002	Proportion of Active Individuals	-0.000	0.001
Proportion of Married	0.002	0.002	Proportion of Married	0.002	0.001
Proportion of Males	-0.000	0.008	Proportion of Males	0.001	0.003
_cons	3.101***	0.751	_cons	0.531**	0.244
Number of observations	33		Number of observations	33	
R2	0.800		R2	0.582	
Adjusted R2	0.662		Adjusted R2	0.296	
F statistic	22.032		F statistic	3.978	

Data Source: CCHS 2007-2008
± indicates data take from the Canada Census Profiles 2006
***, ** and * indicate significance at 1, 5 and 10% respectively.

The same approaches are applied to explore the variation in life satisfaction at the CMA level. Using the first method of average life satisfaction, we find only two variables whose variables are statistically significant. The first one is ethnic fractionalization (significant at 1 per cent level), that is inversely related to well-being at the CMA level: a unit increase in the index of ethnic fractionalization is associated with a 0.26 decrease in average life satisfaction. The other variable is average health (significant at 5% level) and the results show that a unit increase in average health causes average life satisfaction to go down by 0.29.

Going by the percentage satisfied approach, we find that only inequality and ethnic fractionalization have a statistically significant relationship with well-being at the CMA level. For inequality, a standard deviation increase household income is related with a 1 per cent increase in percentage satisfied or highly satisfied. Inequality is therefore strongly associated with CMA life satisfaction than it is with Health Region satisfaction. A unit increase in index on ethnic fractionalization is associated with 5 per cent decrease in the percentage of satisfied individuals in a CMA.

It must be noted that the variation at the CMA level in average life satisfaction and percentage of satisfied and highly satisfied individuals is very low. For average life satisfaction, the standard deviation is 0.04, and for percentage of satisfied individuals is 1.44 per cent. The statistical insignificance of most of the explanatory variables can be attributed to this low variation at the CMA level along with a small sample size.

Appendix IV: Explaining Variation in Life Satisfaction across different levels of geography

Note: The averages on household income and sense of belonging have been standardized to a scale of 1-5.
The figures for total variation (column 7) have been rounded to the second decimal place.

A. Provinces

Appendix Table 8: Explaining Variation in Life Satisfaction in Newfoundland & Labrador

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for NFLD & LAB (3)	Standardized Average for NFLD & LAB (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.29	4.29	0.03		
Perceived Health (1-5)	3.64	3.64	3.63	3.63	-0.01	0.21	0.00
Perceived Mental Health (1-5)	4.07	4.07	4.14	4.14	0.07	0.40	0.03
Stress Level (1-5)	2.79	2.79	2.55	2.55	-0.24	-0.18	0.04
Sense of Belonging to local community (1-4)	2.70	3.38	3.05	3.81	0.43	0.16	0.07
Household Income (Deciles) (1-10)	5.55	2.78	5.53	2.76	-0.01	0.04	0.00
Total Variation Explained							0.14

Appendix Table 9: Explaining Variation in Life Satisfaction in Prince Edward Island

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for PEI (3)	Standardized Average for PEI (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.33	4.33	0.07		
Perceived Health (1-5)	3.64	3.64	3.60	3.60	-0.04	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	4.05	4.05	-0.02	0.40	-0.01
Stress Level (1-5)	2.79	2.79	2.68	2.68	-0.11	-0.18	0.02
Sense of Belonging to local community (1-4)	2.70	3.38	2.87	3.59	0.21	0.16	0.03
Household Income (Deciles) (1- 10)	5.55	2.78	5.56	2.78	0.00	0.04	0.00
Total Variation Explained							0.04

Appendix Table 10 : Explaining Variation in Life Satisfaction in Nova Scotia

	Average for Canada	Standardized Average Across Provinces (2)	Average for NS (3)	Standardized Average for NS (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.27	4.27	0.01		
Perceived Health (1-5)	3.64	3.64	3.52	3.52	-0.12	0.21	-0.02
Perceived Mental Health (1-5)	4.07	4.07	3.99	3.99	-0.08	0.40	-0.03
Stress Level (1-5)	2.79	2.79	2.68	2.68	-0.11	-0.18	0.02
Sense of Belonging to local community (1-4)	2.70	3.38	2.83	3.54	0.15	0.16	0.02
Household Income (Deciles) (1- 10)	5.55	2.78	5.51	2.75	-0.02	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 11: Explaining Variation in Life Satisfaction in New Brunswick

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for NB (3)	Standardized Average for NB (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.30	4.30	0.04		
Perceived Health (1-5)	3.64	3.64	3.50	3.50	-0.14	0.21	-0.03
Perceived Mental Health (1-5)	4.07	4.07	3.96	3.96	-0.10	0.40	-0.04
Stress Level (1-5)	2.79	2.79	2.68	2.68	-0.12	-0.18	0.02
Sense of Belonging to local community (1-4)	2.70	3.38	2.79	3.49	0.11	0.16	0.02
Household Income (Deciles) (1- 10)	5.55	2.78	5.56	2.78	0.00	0.04	0.00
Total Variation Explained							-0.03

Appendix Table 12: Explaining Variation in Life Satisfaction in Quebec

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for QC (3)	Standardized Average for QC (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.30	4.30	0.04		
Perceived Health (1-5)	3.64	3.64	3.69	3.69	0.06	0.21	0.01
Perceived Mental Health (1-5)	4.07	4.07	4.16	4.16	0.10	0.40	0.04

Stress Level (1-5)	2.79	2.79	2.81	2.81	0.02	-0.18	0.00
Sense of Belonging to local community (1-4)	2.70	3.38	2.58	3.22	-0.16	0.16	-0.03
Household Income (Deciles) (1-10)	5.55	2.78	5.52	2.76	-0.02	0.04	0.00
Total Variation Explained							0.02

Appendix Table 13: Explaining Variation in Life Satisfaction in Ontario

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for ON (3)	Standardized Average for ON (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.23	4.23	-0.04		
Perceived Health (1-5)	3.64	3.64	3.62	3.62	-0.02	0.21	0.00
Perceived Mental Health (1-5)	4.07	4.07	4.06	4.06	-0.01	0.40	0.00
Stress Level (1-5)	2.79	2.79	2.82	2.82	0.03	-0.18	-0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.73	3.41	0.03	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.56	2.78	0.01	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 14: Explaining Variation in Life Satisfaction in Manitoba

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for MB (3)	Standardized Average for MB (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.25	4.25	-0.01		
Perceived Health (1-5)	3.64	3.64	3.58	3.58	-0.06	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	4.01	4.01	-0.06	0.40	-0.02
Stress Level (1-5)	2.79	2.79	2.74	2.74	-0.06	-0.18	0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.76	3.45	0.07	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.58	2.79	0.01	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 15 : Explaining Variation in Life Satisfaction in Saskatchewan

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for SK (3)	Standardized Average for SK (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.27	4.27	0.01		
Perceived Health (1-5)	3.64	3.64	3.55	3.55	-0.09	0.21	-0.02
Perceived Mental Health (1-5)	4.07	4.07	4.00	4.00	-0.07	0.40	-0.03
Stress Level (1-5)	2.79	2.79	2.75	2.75	-0.04	-0.18	0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.83	3.53	0.15	0.16	0.02
Household Income (Deciles) (1- 10)	5.55	2.78	5.57	2.79	0.01	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 16 : Explaining Variation in Life Satisfaction in Alberta

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for AB (3)	Standardized Average for AB (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.30	4.30	0.04		
Perceived Health (1-5)	3.64	3.64	3.71	3.71	0.07	0.21	0.01
Perceived Mental Health (1-5)	4.07	4.07	4.07	4.07	0.01	0.40	0.00
Stress Level (1-5)	2.79	2.79	2.80	2.80	0.01	-0.18	0.00
Sense of Belonging to local community (1-4)	2.70	3.38	2.64	3.30	-0.08	0.16	-0.01
Household Income (Deciles) (1- 10)	5.55	2.78	5.55	2.77	0.00	0.04	0.00
Total Variation Explained							0.00

Appendix Table 17 : Explaining Variation in Life Satisfaction in Yukon/NWT/Nunavut

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for YK/NWT/NUNA (3)	Standardized Average YK/NWT/NUNA for (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.26	4.26	0.00		
Perceived Health (1-5)	3.64	3.64	3.57	3.57	-0.07	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	3.95	3.95	-0.11	0.40	-0.05

Stress Level (1-5)	2.79	2.79	2.66	2.66	-0.13	-0.18	0.02
Sense of Belonging to local community (1-4)	2.70	3.38	3.03	3.78	0.40	0.16	0.06
Household Income (Deciles) (1-10)	5.55	2.78	-	-	-	0.04	-
Total Variation Explained							0.03

Appendix Table 18 : Explaining Variation in Life Satisfaction in British Columbia

	Average for Canada (1)	Standardized Average Across Provinces (2)	Average for BC (3)	Standardized Average BC for (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.24	4.24	-0.02		
Perceived Health (1-5)	3.64	3.64	3.62	3.62	-0.01	0.21	0.00
Perceived Mental Health (1-5)	4.07	4.07	3.97	3.97	-0.09	0.40	-0.04
Stress Level (1-5)	2.79	2.79	2.76	2.76	-0.03	-0.18	0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.77	3.46	0.08	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.57	2.79	0.01	0.04	0.00
Total Variation Explained							-0.02

B. CMAs

i. Top 5 CMAs by Life Satisfaction

Appendix Table 19 : Explaining Variation in Life Satisfaction in Brantford

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Brantford (3)	Standardized Average for Brantford (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.24	4.24	4.36	4.36	0.11		
Perceived Health (1-5)	3.65	3.65	3.63	3.63	-0.02	0.21	0.00
Perceived Mental Health (1-5)	4.08	4.08	4.06	4.06	-0.02	0.40	-0.01
Stress Level (1-5)	2.81	2.81	2.86	2.86	0.05	-0.18	-0.01
Sense of Belonging to local community (1-4)	2.68	3.34	2.71	3.39	0.05	0.16	0.01
Household Income (Deciles) (1-10)	5.53	2.76	5.59	2.79	0.03	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 20 : Explaining Variation in Life Satisfaction in Quebec City

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Quebec City (3)	Standardized Average for Quebec City (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.24	4.24	4.35	4.35	0.11		
Perceived Health (1-5)	3.65	3.65	3.75	3.75	0.10	0.21	0.02
Perceived Mental Health (1-5)	4.08	4.08	4.25	4.25	0.17	0.40	0.07
Stress Level (1-5)	2.81	2.81	2.80	2.80	-0.01	-0.18	0.00
Sense of Belonging to local community (1-4)	2.68	3.34	2.53	3.16	-0.18	0.16	-0.03
Household Income (Deciles) (1- 10)	5.53	2.76	5.44	2.72	-0.04	0.04	0.00
Total Variation Explained							0.06

Appendix Table 21 : Explaining Variation in Life Satisfaction in Trois-Rivieres

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Trois- Rivieres (3)	Standardized Average for Trois-Rivieres (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.24	4.24	4.33	4.33	0.09		
Perceived Health (1-5)	3.65	3.65	3.67	3.67	0.02	0.21	0.00
Perceived Mental Health (1-5)	4.08	4.08	4.22	4.22	0.14	0.40	0.06
Stress Level (1-5)	2.81	2.81	2.76	2.76	-0.05	-0.18	0.01
Sense of Belonging to local community (1-4)	2.68	3.34	2.61	3.27	-0.08	0.16	-0.01
Household Income (Deciles) (1- 10)	5.53	2.76	5.50	2.75	-0.01	0.04	0.00
Total Variation Explained							0.06

Appendix Table 22: Explaining Variation in Life Satisfaction in Victoria

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Victoria (3)	Standardized Average for Victoria (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.24	4.24	4.33	4.33	0.09		
Perceived Health (1-5)	3.65	3.65	3.74	3.74	0.09	0.21	0.02
Perceived Mental Health (1-5)	4.08	4.08	4.05	4.05	-0.03	0.40	-0.01
Stress Level (1-5)	2.81	2.81	2.72	2.72	-0.09	-0.18	0.02
Sense of Belonging to local community (1-4)	2.68	3.34	2.73	3.41	0.07	0.16	0.01
Household Income (Deciles) (1- 10)	5.53	2.76	5.53	2.77	0.00	0.04	0.00
Total Variation Explained							0.03

Appendix Table 23: Explaining Variation in Life Satisfaction in Calgary

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Calgary (3)	Standardized Average for Calgary (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.33	4.33	0.09		
Perceived Health (1-5)	3.65	3.65	3.79	3.79	0.13	0.21	0.03
Perceived Mental Health (1-5)	4.08	4.08	4.13	4.13	0.05	0.40	0.02
Stress Level (1-5)	2.81	2.81	2.82	2.82	0.01	-0.18	0.00
Sense of Belonging to local community (1-4)	2.68	3.34	2.57	3.21	-0.13	0.16	-0.02
Household Income (Deciles) (1- 10)	5.53	2.76	5.53	2.77	0.00	0.04	0.00
Total Variation Explained							0.03

ii. Bottom 5 CMAs by Life Satisfaction

Appendix Table 24 : Explaining Variation in Life Satisfaction in Toronto

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Toronto (3)	Standardized Average for Toronto (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.16	4.16	-0.08		
Perceived Health (1-5)	3.65	3.65	3.63	3.63	-0.03	0.21	-0.01
Perceived Mental Health (1-5)	4.08	4.08	4.08	4.08	0.00	0.40	0.00
Stress Level (1-5)	2.81	2.81	2.86	2.86	0.05	-0.18	-0.01
Sense of Belonging to local community (1-4)	2.68	3.34	2.65	3.31	-0.03	0.16	-0.01
Household Income (Deciles) (1- 10)	5.53	2.76	5.56	2.78	0.01	0.04	0.00
Total Variation Explained							-0.02

Appendix Table 25 : Explaining Variation in Life Satisfaction in Vancouver

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Vancouver (3)	Standardized Average for Vancouver (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.18	4.18	-0.06		
Perceived Health (1-5)	3.65	3.65	3.63	3.63	-0.02	0.21	0.00
Perceived Mental Health (1-5)	4.08	4.08	3.96	3.96	-0.11	0.40	-0.05
Stress Level (1-5)	2.81	2.81	2.78	2.78	-0.03	-0.18	0.00

Sense of Belonging to local community (1-4)	2.68	3.34	2.75	3.44	0.10	0.16	0.02
Household Income (Deciles) (1-10)	5.53	2.76	5.54	2.77	0.00	0.04	0.00
Total Variation Explained							-0.03

Appendix Table 26 : Explaining Variation in Life Satisfaction in Hamilton

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Hamilton (3)	Standardized Average for Hamilton (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.21	4.21	-0.03		
Perceived Health (1-5)	3.65	3.65	3.60	3.60	-0.05	0.21	-0.01
Perceived Mental Health (1-5)	4.08	4.08	4.05	4.05	-0.03	0.40	-0.01
Stress Level (1-5)	2.81	2.81	2.80	2.80	-0.01	-0.18	0.00
Sense of Belonging to local community (1-4)	2.68	3.34	2.80	3.50	0.15	0.16	0.02
Household Income (Deciles) (1-10)	5.53	2.76	5.51	2.76	-0.01	0.04	0.00
Total Variation Explained							0.01

Appendix Table 27 : Explaining Variation in Life Satisfaction in Windsor

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for Windsor (3)	Standardized Average for Windsor (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.24	4.24	4.21	4.21	-0.03		
Perceived Health (1-5)	3.65	3.65	3.53	3.53	-0.13	0.21	-0.03
Perceived Mental Health (1-5)	4.08	4.08	4.07	4.07	-0.01	0.40	0.00
Stress Level (1-5)	2.81	2.81	2.81	2.81	0.00	-0.18	0.00
Sense of Belonging to local community (1-4)	2.68	3.34	2.77	3.46	0.12	0.16	0.02
Household Income (Deciles) (1-10)	5.53	2.76	5.58	2.79	0.03	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 28 : Explaining Variation in Life Satisfaction in St Catharines-Niagara

	Average across CMAs (1)	Standardized Average Across CMAs (2)	Average for St.Catharines- Niagara (3)	Standardized Average for St.Catharines- Niagara (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.24	4.24	4.22	4.22	-0.02		
Perceived Health (1-5)	3.65	3.65	3.56	3.56	-0.10	0.21	-0.02
Perceived Mental Health (1-5)	4.08	4.08	4.06	4.06	-0.02	0.40	-0.01
Stress Level (1-5)	2.81	2.81	2.78	2.78	-0.03	-0.18	0.01
Sense of Belonging to local community (1-4)	2.68	3.34	2.75	3.43	0.09	0.16	0.01
Household Income (Deciles) (1- 10)	5.53	2.76	5.53	2.76	0.00	0.04	0.00
Total Variation Explained							-0.01

C. Health Regions

i. Top 5 Health Regions by Life Satisfaction

Appendix Table 29 : Explaining Variation in Life Satisfaction in Renfrew

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Renfrew (3)	Standardized Average for Renfrew (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.40	4.40	0.14		
Perceived Health (1-5)	3.64	3.64	3.53	3.53	-0.11	0.21	-0.02
Perceived Mental Health (1-5)	4.07	4.07	3.96	3.96	-0.11	0.40	-0.05
Stress Level (1-5)	2.79	2.79	2.70	2.70	-0.09	-0.18	0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.99	3.73	0.36	0.16	0.06
Household Income (Deciles) (1- 10)	5.55	2.78	5.39	2.70	-0.08	0.04	-0.00
Total Variation Explained							0.00

Appendix Table 30: Explaining Variation in Life Satisfaction in Oxford County

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Oxford County (3)	Standardized Average for Oxford County (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.39	4.39	0.13		
Perceived Health (1-5)	3.64	3.64	3.69	3.69	0.05	0.21	0.01
Perceived Mental Health (1-5)	4.07	4.07	4.03	4.03	-0.04	0.40	-0.02
Stress Level (1-5)	2.79	2.79	2.65	2.65	-0.14	-0.18	0.03

Sense of Belonging to local community (1-4)	2.70	3.38	3.12	3.90	0.53	0.16	0.08
Household Income (Deciles) (1-10)	5.55	2.78	6.02	3.01	0.23	0.04	0.01
Total Variation Explained							0.11

Appendix Table 31 : Explaining Variation in Life Satisfaction in Région des Laurentides

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Région des Laurentides (3)	Standardized Average for Région des Laurentides (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.38	4.38	0.12		
Perceived Health (1-5)	3.64	3.64	3.75	3.75	0.11	0.21	0.02
Perceived Mental Health (1-5)	4.07	4.07	4.19	4.19	0.12	0.40	0.05
Stress Level (1-5)	2.79	2.79	2.92	2.92	0.13	-0.18	-0.02
Sense of Belonging to local community (1-4)	2.70	3.38	2.43	3.04	-0.33	0.16	-0.05
Household Income (Deciles) (1-10)	5.55	2.78	5.56	2.78	0.01	0.04	0.00
Total Variation Explained							-0.01

Appendix Table 32 : Explaining Variation in Life Satisfaction in Région de la Gaspésie - Îles-de-la-Madeleine

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Région de la Gaspésie - Îles-de-la-Madeleine (3)	Standardized Average for Région de la Gaspésie - Îles-de-la-Madeleine (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.37	4.37	0.11		
Perceived Health (1-5)	3.64	3.64	3.54	3.54	-0.10	0.21	-0.02
Perceived Mental Health (1-5)	4.07	4.07	4.09	4.09	0.02	0.40	0.01
Stress Level (1-5)	2.79	2.79	2.54	2.54	-0.25	-0.18	0.05
Sense of Belonging to local community (1-4)	2.70	3.38	3.13	3.91	0.54	0.16	0.09
Household Income (Deciles) (1-10)	5.55	2.78	4.96	2.48	-0.30	0.04	-0.01
Total Variation Explained							0.11

Appendix Table 33 : Explaining Variation in Life Satisfaction in Région de la Côte-Nord

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Région de la Côte-Nord (3)	Standardized Average for Région de la Côte-Nord (4)	Difference in Standardized Averages (5) = (4) - (2)	Rescaled Coefficients (6)	(7) = (6) * (5)
Life Satisfaction (1-5)	4.26	4.26	4.37	4.37	0.11		
Perceived Health (1-5)	3.64	3.64	3.63	3.63	-0.01	0.21	0.00

Perceived Mental Health (1-5)	4.07	4.07	4.24	4.24	0.17	0.40	0.07
Stress Level (1-5)	2.79	2.79	2.58	2.58	-0.21	-0.18	0.04
Sense of Belonging to local community (1-4)	2.70	3.38	3.00	3.75	0.37	0.16	0.06
Household Income (Deciles) (1-10)	5.55	2.78	5.89	2.95	0.17	0.04	0.01
Total Variation Explained							0.17

ii. Bottom 5 Health Regions by Life Satisfaction

Appendix Table 34 : Explaining Variation in Life Satisfaction in City of Toronto

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Toronto (3)	Standardized Average for Toronto (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.14	4.14	-0.12		
Perceived Health (1-5)	3.64	3.64	3.59	3.59	-0.05	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	4.03	4.03	-0.04	0.40	-0.01
Stress Level (1-5)	2.79	2.79	2.94	2.94	0.15	-0.18	-0.03
Sense of Belonging to local community (1-4)	2.70	3.38	2.73	3.41	0.04	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.20	2.60	-0.18	0.04	-0.01
Total Variation Explained							-0.05

Appendix Table 35: Explaining Variation in Life Satisfaction in Peel Health Region

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Peel Health Region (3)	Standardized Average for Peel Health Region (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.14	4.14	-0.12		
Perceived Health (1-5)	3.64	3.64	3.59	3.59	-0.05	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	4.03	4.03	-0.04	0.40	-0.01
Stress Level (1-5)	2.79	2.79	2.94	2.94	0.15	-0.18	-0.03
Sense of Belonging to local community (1-4)	2.70	3.38	2.73	3.41	0.04	0.16	0.01
Household Income (Deciles) (1-10)	5.55	2.78	5.20	2.60	-0.18	0.04	-0.01
Total Variation Explained							-0.05

Appendix Table 36: Explaining Variation in Life Satisfaction in Vancouver Health Service Delivery Area (HSDA)

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Vancouver (3)	Standardized Average for Vancouver (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.16	4.16	-0.10		
Perceived Health (1-5)	3.64	3.64	3.69	3.69	0.05	0.21	0.01
Perceived Mental Health (1-5)	4.07	4.07	3.95	3.95	-0.12	0.40	-0.05
Stress Level (1-5)	2.79	2.79	2.75	2.75	-0.04	-0.18	0.01
Sense of Belonging to local community (1-4)	2.70	3.38	2.69	3.37	-0.01	0.16	0.00
Household Income (Deciles) (1- 10)	5.55	2.78	5.55	2.78	0.00	0.04	0.00
Total Variation Explained							-0.03

Appendix Table 37 : Explaining Variation in Life Satisfaction in Fraser South

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Fraser South (3)	Standardized Average for Fraser South (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.18	4.18	-0.08		
Perceived Health (1-5)	3.64	3.64	3.59	3.59	-0.05	0.21	-0.01
Perceived Mental Health (1-5)	4.07	4.07	3.95	3.95	-0.12	0.40	-0.05
Stress Level (1-5)	2.79	2.79	2.79	2.79	0.00	-0.18	0.00
Sense of Belonging to local community (1-4)	2.70	3.38	2.76	3.46	0.08	0.16	0.01
Household Income (Deciles) (1- 10)	5.55	2.78	5.23	2.61	-0.16	0.04	-0.01
Total Variation Explained							-0.05

Appendix Table 38 : Explaining Variation in Life Satisfaction in Richmond

	Average across Canada (1)	Standardized Average Across Canada (2)	Average for Richmond (3)	Standardized Average for Richmond (4)	Difference in Standardized Averages (5) =(4)-(2)	Rescaled Coefficients (6)	(7) =(6)*(5)
Life Satisfaction (1-5)	4.26	4.26	4.18	4.18	-0.08		
Perceived Health (1-5)	3.64	3.64	3.56	3.56	-0.08	0.21	-0.02
Perceived Mental Health (1-5)	4.07	4.07	3.98	3.98	-0.09	0.40	-0.04
Stress Level (1-5)	2.79	2.79	2.70	2.70	-0.09	-0.18	0.02
Sense of Belonging to local community (1-4)	2.70	3.38	2.85	3.56	0.19	0.16	0.03
Household Income (Deciles) (1- 10)	5.55	2.78	5.09	2.55	-0.23	0.04	-0.01
Total Variation Explained							-0.02

Appendix V: Life Satisfaction by 102 Health Regions of Canada, 2007-2008

Appendix Table 39: Life Satisfaction by 102 Health Regions of Canada, 2007-2008

	Percent Satisfied or Very Satisfied in a Health Region	Average Life Satisfaction
Canada	91.13	4.26
Newfoundland and Labrador		
Eastern Regional IHA, NWF & LBDR	92.13	4.30
Central Regional IHA, NWF & LBDR	95.25	4.30
Western-Labrador-Grenfell Regional IHA, NWF & LBDR	95.31	4.29
Prince Edward Island (consolidated)	94.08	4.33
Nova Scotia		
Zone 1, NS	92.67	4.21
Zone 2, NS	90.74	4.23
Zone 3, NS	92.06	4.23
Zone 4, NS	92.33	4.25
Zone 5, NS	91.99	4.25
Zone 6, NS	91.28	4.32
New Brunswick		
Region 1, NB	91.20	4.25
Region 2, NB	94.10	4.30
Region 3, NB	93.74	4.34
Region 4 & 5, NB	92.60	4.29
Region 6 & 7, NB	95.20	4.32
Quebec		
Région du Bas-Saint-Laurent, QC	93.89	4.32
Région du Saguenay - Lac-Saint-Jean, QC	92.05	4.30
Région de la Capitale-Nationale, QC	93.16	4.35
Région de la Mauricie et du Centre-du-Québec, QC	93.50	4.33
Région de l'Estrie, QC	91.67	4.31
Région de Montréal, QC	88.17	4.19
Région de l'Outaouais, QC	93.46	4.36
Région de l'Abitibi-Témiscamingue, QC	91.11	4.26
Région de la Côte-Nord, QC	95.48	4.37
Région de la Gaspésie - Îles-de-la-Madeleine, QC	94.32	4.37
Région de la Chaudière-Appalaches, QC	95.34	4.35
Région de Laval, QC	93.51	4.32
Région de Lanaudière, QC	93.62	4.35
Région des Laurentides, QC	94.23	4.38
Région de la Montérégie, QC	93.36	4.32

Ontario		
District of Algoma HU, ON	92.91	4.34
Brant County HU, ON	93.48	4.36
Durham RHU, ON	91.29	4.25
Elgin-St. Thomas HU, ON	94.91	4.30
Grey Bruce HU, ON	92.32	4.23
Haldimand-Norfolk HU, ON	89.77	4.24
Haliburton, Kawartha, Pine Ridge District HU, ON	93.52	4.35
Halton RHU, ON	92.12	4.34
City of Hamilton HU, ON	89.00	4.21
Hastings and Prince Edward Counties HU, ON	91.96	4.27
Huron County HU, ON	93.98	4.36
Chatham-Kent HU, ON	91.59	4.22
Kingston, Frontenac and Lennox and Addington HU, ON	91.10	4.27
Lambton HU, ON	92.06	4.32
Leeds, Grenville and Lanark District HU, ON	93.19	4.34
Middlesex-London HU, ON	90.33	4.26
Niagara Regional Area HU, ON	88.74	4.22
North Bay Parry Sound District HU, ON	94.05	4.32
Northwestern HU, ON	91.07	4.26
City of Ottawa HU, ON	89.17	4.27
Oxford County HU, ON	93.69	4.39
Peel RHU, ON	90.38	4.14
Peterborough County-City HU, ON	93.98	4.31
Porcupine HU, ON	91.70	4.25
Renfrew County and District HU, ON	94.34	4.40
Eastern ON HU, ON	93.15	4.29
Simcoe Muskoka District HU, ON	92.20	4.29
Sudbury and District HU, ON	92.09	4.32
Thunder Bay District HU, ON	91.25	4.25
Waterloo HU, ON	92.59	4.27
Wellington-Dufferin-Guelph HU, ON	92.30	4.32
Windsor-Essex County HU, ON	90.10	4.21
York RHU, ON	89.69	4.19
City of Toronto HU, ON	86.81	4.11
Manitoba		
Winnipeg RHA, MB	90.94	4.23
Brandon & Assiniboine RHA, MB	93.51	4.32
North & South Eastman RHA, MB	93.55	4.27
Interlake RHA, MB	92.10	4.27
Central RHA, MB	94.93	4.28
Parkland-Norman-Burntwood/Churchill RHA, MB	92.89	4.26
Saskatchewan		
Sun Country-Five Hills-Cypress RHA, SK	93.53	4.28

Regina Qu'Appelle RHA, SK	91.11	4.27
Sunrise- Kelsey Trail RHA, SK	90.47	4.19
Saskatoon RHA, SK	92.87	4.29
Heartland-Prairie North RHA, SK	93.30	4.29
Prince Albert-Mamawetan/Keewatin/Athabasca Parkland RHA, SK	91.48	4.25
Alberta		
Chinook RHA, AB	93.28	4.33
Palliser Health Region, AB	92.20	4.25
Calgary Health Region, AB	91.94	4.33
David Thompson RHA, AB	93.07	4.30
East Central Health, AB	93.94	4.30
Capital Health, AB	91.62	4.26
Aspen RHA, AB	92.17	4.24
Peace Country Health, AB	92.62	4.30
Northern Lights Health Region, AB	91.86	4.28
British Columbia		
East Kootenay HSDA, BC	93.14	4.36
Kootenay-Boundary HSDA, BC	91.58	4.34
Okanagan HSDA, BC	90.47	4.26
Thompson/Cariboo HSDA, BC	90.36	4.25
Fraser East HSDA, BC	90.34	4.23
Fraser North HSDA, BC	91.77	4.22
Fraser South HSDA, BC	89.07	4.18
Richmond HSDA, BC	92.35	4.18
Vancouver HSDA, BC	88.14	4.16
North Shore/Coast Garibaldi HSDA, BC	92.63	4.33
South Vancouver Island HSDA, BC	92.30	4.33
Central Vancouver Island HSDA, BC	90.70	4.31
North Vancouver Island HSDA, BC	91.82	4.32
Northwest HSDA, BC	89.84	4.22
Northern Interior HSDA, BC	89.07	4.22
Northeast HSDA, BC	94.77	4.30
Yukon/NWT/Nunawit	92.15	4.26