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Preliminary Estimates of Good Life Time (GLT) in Canada Using the General Social Survey

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Abstract

There has been a recent resurgence of interest in measures of social progress and well-being that go beyond the conventional System of National Accounts measures, especially GDP and GDP per capita. In this context, Wolfson and Rowe (2010) have proposed Good Life Time (GLT) as an alternative / complement to traditional economic measures. GLT is based on a generalization of life expectancy and a person is said to be in GLT if they have adequate amounts of health, money, and the time to enjoy them. In this study, we develop a simple approach using public microdata from the 1992, 1998, 2005, and 2010 General Social Surveys. We conclude that issues related to high item non-response rates and lack of time series consistency in many of the key questionnaire items, especially in the money and health domains, likely overwhelm any time series trends obtained in this manner. Microsimulation or synthetic matching are therefore the recommended methods to obtain time series trends of GLT.

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Executive Summary

Informative measures of national outcomes are essential for the development of policy. There are several well-developed indicators for specific outcomes, such as GDP and life expectancy. However, these measures fall short if the goal is to evaluate comprehensively well-being. GDP fails to capture other aspects of economic well-being, such as health, leisure time, and the environment. Similarly, life expectancy fails to control for quality of life. More complete measures of economic and social performance are needed.

Wolfson and Rowe (2010) have proposed Good Life Time (GLT) as a new indicator of aggregate well-being. GLT combines the domains of money, time use, and health status into a single coherent and principled statistical framework. An individual is said to be “in GLT” if that individual simultaneously exceeds minimum thresholds in terms of selected measures of income, health status, and leisure time. The proportion of the population deemed to be in GLT serves as a useful indicator of population well-being. However, this measure can be problematic for comparing well-being over time, as it is somewhat dependent upon the population’s age composition. This difficulty can be overcome by using Sullivan’s method (Sullivan, 1971) to calculate the total number of years an individual would expect to spend in the GLT state in the remainder of his or her life based upon age-specific mortality rates and age-specific proportions of the population in GLT. In this way, GLT represents a variant of health-adjusted life expectancy (HALE), and in turn a generalization of the very widely used indicator, life expectancy.

This report applies the GLT framework to repeated cross-sectional data from the 1992, 1998, 2005, and 2010 General Social Surveys (GSS). The GSS was chosen as a survey that asked questions about the respondent’s health, money, and time. The specific measures of adequate health, money, and time used are: whether the person self-reports that a long-term condition limited the amount or kinds of activity that the person could perform (health); having at least two-thirds of median equivalent household income (money); and answering “yes” to five or fewer of ten questions about whether or not an individual is “time stressed” (time). Using these thresholds, this report estimates that 59.2 per cent of men 15 years or older in Canada in 2010 were in a state of GLT, compared to 47.6 per cent of women. Alternative measures of determining the thresholds for each of the domains are also considered.

However, the results obtained in this report are illustrative due to high item non-response rates, especially in the income domain, and lack of time series consistency in many of the key

questionnaire items. These issues limit the validity of the results and the ability to generalize them to the Canadian population. More sophisticated techniques, such as synthetic matching and microsimulation, and the more detailed microdata from Statistics Canada's Research Data Centres could be used to produce superior estimates. The methodology could also be extended to account for other aspects of well-being, such as educational attainment or accumulated wealth.

Preliminary Estimates of Good Life Time (GLT) in Canada Using the General Social Survey¹

Introduction

Performance indicators serve a very useful purpose in society. If constructed properly, they can quantify population characteristics, identify areas for improvement, and provide goals for policymakers. However, the standard national-level indicators leave much to be desired. While gross domestic product (GDP) and related measures are useful for economic and market analysis, they do not reflect what people consider to be most important when evaluating their quality of life. Similarly, health measures based solely on mortality rates, for example life expectancy, do not take into account the health status of the living.

This has been highlighted by the Organisation for Economic Co-operation and Development (OECD)'s project on Measuring the Progress of Societies and the report by The Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2009). In this context, Wolfson and Rowe (2010) have proposed Good Life Time (GLT) as an alternative / complement to traditional economic measures. GLT is an integrated statistical framework and summary index to assess and reflect social progress (Wolfson and Rowe, 2010). GLT differs from GDP in that it uses time instead of money as the basic numeraire. Conceptually, it is built upon life expectancy and its underlying life table, and generalizes this idea. In doing so, the GLT indicator combines the life domains of money, time use, and health status into a single coherent and principled statistical framework.²

One way to generate GLT index estimates is to use a microsimulation model to conduct a cohort analysis (e.g. tracking those born between 1965 and 1970 over time). A simpler method is first to estimate GLT for age and sex groups for a cycle of the General Social Survey (GSS), which asks respondents about their health, time use, and income. Respondents therefore form a cross-section, or snapshot, of the population at a point in time. This cross-sectional snapshot is then further assembled with life table data using the Sullivan method (Sullivan, 1971) to obtain a GLT estimate. Finally, this process can be repeated for different cycles of the GSS to form a time series of GLT estimates.

¹ This report was written by Kar-Fai Gee and Michael Wolfson. At the time that the report was written, Kar-Fai Gee was an economist at the Centre for the Study of Living Standards. Michael Wolfson is a Professor with the University of Ottawa's School of Epidemiology, Public Health and Preventive Medicine and [Canada Research Chair in Population Health Modelling/Populomics](#). The authors would like to thank Andrew Sharpe and Matthew Calver from the CSLS for comments. Email: michael.wolfson@uottawa.ca

² This report will focus on generating estimates of GLT using the GSS and not on the theoretical validity of the underlying framework. For further discussion of the GLT indicator itself, see *Good Life Time (GLT): Health, Income, and the Time to Enjoy Them, New Indicators of Social Progress* (Wolfson and Rowe, 2010).

This study applies the Wolfson-Rowe (2010) framework to public use microdata from the 1992, 1998, 2005 and 2010 GSS. Based on these data, an indicator can be calculated based on whether the individual had adequate health, money, and enough time to enjoy them. The data in the GSS also allow for more probing analysis of the different aspects of GLT, such as which correlates (e.g. sex, age, level of education) are the most influential in determining if a person was in the GLT state.

I. Data Sources and Definitions

This section opens with a brief description of the General Social Survey (GSS). It then considers how to assess whether a person has adequate money, health, and the time to enjoy them based upon their responses to GSS questions.³

A. General Social Survey

A requirement when constructing estimates of the GLT is measures on all three dimensions: time use, money, and health – because one of the key questions is whether individuals, when they are in an adequate state on one of these dimensions, are also in adequate states on the others. An individual is not in a GLT state, for example, if they have high income, but they are in poor health or time crunched. Therefore, when using a single data source, it is imperative that data on all three elements are present. The main source for time use data in Canada is the GSS, while the Canadian Community Health Survey (CCHS) and the Survey of Labour and Income Dynamics (SLID) are the best resources for health and income data respectively. However, the latter two surveys do not contain information on time use, while the GSS provides some limited measures of income and health. Consequently, the GSS was chosen as the data source for this exercise.

The GSS is an annual telephone survey administered by Statistics Canada that collects data on social trends from the civilian, non-institutionalized population age 15 years or older and living in the ten Canadian provinces. Until 1998, the target sample was approximately 10,000 individuals, though in subsequent cycles, Statistics Canada increased the sample size to 25,000. Interviewers ask respondents a standard set of socio-demographic questions used for classification along with a more specific series of questions on a given topic.

The topic in the 1992 (Cycle 7), 1998 (Cycle 12), 2005 (Cycle 19), and 2010 (Cycle 24) GSS was time use. Some of these questions were quantitative and addressed the duration spent on an activity or the number of times that the respondent performed the activity (e.g. “Last week,

³ Following Statistics Canada guidelines, all percentages will be rounded to one decimal place. Similarly, data quality indicators are based on the coefficient of variation (CV): A - Excellent (CV between 0% and 2%); B - Very good (CV between 2% and 4%); C - Good (CV between 4% and 8%); D - Acceptable (CV between 8% and 16%); E - Use with caution (CV greater than or equal to 16%). A value of ‘...’ is shown if there is insufficient sample size (less than 15) or if the CV for the variable is larger than 33.4 per cent.

how many hours did you spend providing unpaid care or assistance to one or more seniors living outside your household?”). Others were more subjective and qualitative in nature (e.g. “How often do you feel rushed? Would you say it is: every day/a few times a week/about once a week/about once a month/less than once a month?”).

Certain questions have been added or removed between cycles. For example, the 2010 GSS had a much more disaggregated set of activities than the 1992 GSS. Some questions are also worded differently between cycles, which can influence comparability of results between surveys (e.g. “Compared to other people your age, how would you describe your state of health?” versus “In general, would you say your health is: ...”). Therefore, when analyzing data between cycles, it is important to consider not only the responses to each question, but also the questions themselves. This necessarily influences comparability of results between years when constructing time series of GLT.

B. Critical Values for Life Domains

An individual is said to be in the GLT state if that individual simultaneously possesses an adequate amount of money, health, and time. An individual is deemed to have a sufficient amount of money if his or her income exceeds some specified threshold. Similarly, whether or not an individual is considered to have a sufficient level of health (or time) is determined by whether or not that individual exceeds some cut-off level of health (or time). If an individual has adequate money, adequate health, and adequate time at the same time, then that individual is in the GLT state. Deficiency in one or more of these three domains means that the individual is not in the GLT state.

An important step in this analysis is determining the levels in each of the three life domains to be considered “adequate”. Inevitably, this is a somewhat arbitrary matter of judgment. Still, in certain instances, the literature can provide commonly used cut-off limits. This is particularly true for the money domain, as the poverty line is a widely-used social indicator. The following sections describe the threshold values used in this study and discuss any assumptions used in the methodology.⁴

i. Money Domain

A straightforward approach to setting a threshold for the adequacy of household income is with reference to widely used poverty (more precisely, low income) lines. This is also the approach used in this paper.⁵ Unfortunately, the household income measures in the GSS are limited when compared to other surveys, such as the SLID. Respondents to the SLID are given the opportunity to link their household income to their tax data, which is an option that many

⁴ The data presented in this sub-section will treat item non-respondents as though they have the same distribution of responses as the rest of the population.

⁵ The before-tax version of the LIM is referred to as the GSS does not have data on after-tax household income.

people exercise. In contrast, household income in the GSS is reported in the public-use microdata files in terms of income brackets (Table 1).

There is a long history of defining low income or poverty lines and there is no clear consensus. For example, Statistics Canada’s low income measure (LIM) is half of the median “equivalent household income” – household income adjusted for the number of people living in the household.⁶ One method of determining this threshold would be to calculate the equivalent household income for every person in the survey and then determine the median. However, this would require inputting an income value for each income bracket and might be imprecise, especially given the high non-response rate for this question (Appendix Table 1). To avoid this problem, this report uses before-tax LIMs in current dollars from Statistics Canada (2011b).

Table 1: Household Income Variable by GSS Cycle

Question: What is your best estimate of your total household income, received by all household members, from all sources, before taxes and deductions, during the year ending...?			
1992 GSS	1998 GSS	2005 GSS	2010 GSS
No income or loss	No income or loss	No income or loss	No income or loss
Less than \$5,000	Less than \$5,000	Less than \$5,000	Less than \$5,000
\$5,000 to \$9,999	\$5,000 to \$9,999	\$5,000 to \$9,999	\$5,000 to \$9,999
\$10,000 to \$14,999	\$10,000 to \$14,999	\$10,000 to \$14,999	\$10,000 to \$14,999
\$15,000 to \$19,999	\$15,000 to \$19,999	\$15,000 to \$19,999	\$15,000 to \$19,999
\$20,000 to \$29,999	\$20,000 to \$29,999	\$20,000 to \$29,999	\$20,000 to \$29,999
\$30,000 to \$39,999	\$30,000 to \$39,999	\$30,000 to \$39,999	\$30,000 to \$39,999
\$40,000 to \$49,999	\$40,000 to \$49,999	\$40,000 to \$49,999	\$40,000 to \$49,999
\$50,000 to \$59,999	\$50,000 to \$59,999	\$50,000 to \$59,999	\$50,000 to \$59,999
\$60,000 to \$79,999	\$60,000 to \$79,999	\$60,000 to \$79,999	\$60,000 to \$79,999
\$80,000 or more	\$80,000 to \$99,999	\$80,000 to \$99,999	\$80,000 to \$99,999
	\$100,000 or more	\$100,000 or more	\$100,000 to \$149,999
			\$150,000 or more

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Note: In the 1992 GSS, the household size was capped at 7 (i.e. the top category was ‘seven persons or more’). In the 1998 GSS, the largest household size was 8, while it was 6 in the 2005 and 2010 GSS.

In this case, the required measure is that of very modest but adequate income rather than low income. Therefore, the adequacy criteria for the money domain was set somewhat higher than the LIMs, specifically whether the respondent was in a household that was over two-thirds the median equivalent household income (rather than the half median equivalent household income threshold used in the LIMs). Table 2 presents the threshold household income brackets based on this value. If a person with a given household size reported household income in that income bracket or higher, they were considered to have adequate income.

⁶ More precisely, the equivalent household income of a person is defined as the household income divided by the square root of the household size.

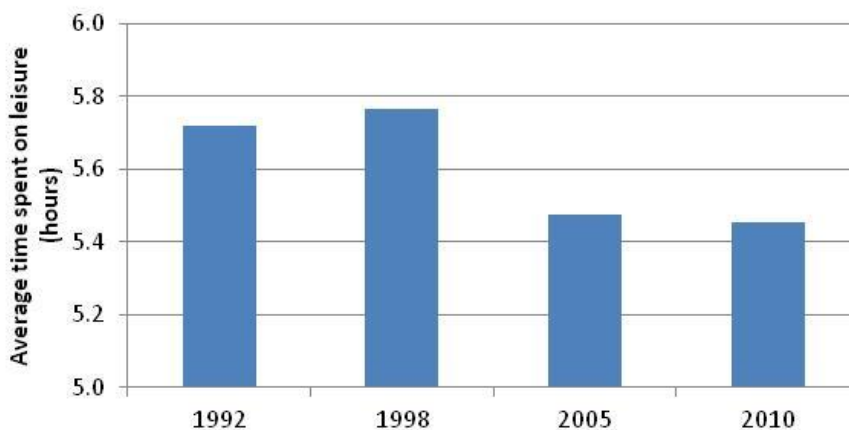
Table 2: Income Threshold Based on 2/3 Median Equivalent Household Income in Current Dollars by Year

Household size	Year			
	1992 GSS	1998 GSS	2005 GSS	2010 GSS
1	\$15,000 to \$19,999	\$20,000 to \$29,999	\$20,000 to \$29,999	\$30,000 to \$39,999
2	\$20,000 to \$29,999	\$30,000 to \$39,999	\$40,000 to \$49,999	\$40,000 to \$49,999
3	\$30,000 to \$39,999	\$30,000 to \$39,999	\$40,000 to \$49,999	\$50,000 to \$59,999
4	\$30,000 to \$39,999	\$40,000 to \$49,999	\$50,000 to \$59,999	\$60,000 to \$79,999
5	\$40,000 to \$49,999	\$40,000 to \$49,999	\$60,000 to \$79,999	\$60,000 to \$79,999
6	\$40,000 to \$49,999	\$50,000 to \$59,999	\$60,000 to \$79,999	\$60,000 to \$79,999
7	\$50,000 to \$59,999	\$50,000 to \$59,999	...	...
8	...	\$50,000 to \$59,999	...	...

Note: In the 1992 GSS, the household size was capped at 7 (i.e. the top category was ‘seven persons or more’). In the 1998 GSS, the largest household size was 8, while it fell to 6 in the 2005 and 2010 GSS. Based on before-tax LIMs in current dollars from Statistics Canada (2011b), multiplying the median equivalent household income by two-thirds, and then multiplying the resulting figure by the square root of the household size.

ii. Time Domain

In the time domain, the basic concept of GLT is having sufficient time to enjoy both good health and adequate income. In general, enough time can be defined either in terms of leisure time or discretionary time. For example, the simplest measure of enough time could be whether a person has a certain amount of *actual leisure time*, such as time spent socializing (e.g. restaurant meals), passive leisure (e.g. reading a book), active leisure (e.g. playing tennis), or other entertainment activities (e.g. watching a baseball game). Using this definition, the average time spent on these activities was between five and six hours per day (including weekends) for all four years, though average actual leisure time was slightly higher in 1992 (5.7 hours) and 1998 (5.8 hours) than in 2005 (5.5 hours) and 2010 (5.5 hours) (Chart 1).

Chart 1: Average Leisure Time per day for People Aged 15 and Older

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

However, this quantitative measure is based upon the notion that certain activities are considered to be enjoyable and others, such as paid or unpaid work, are not enjoyable. The distinction between these two categories turns out not to be that clear. In the 2005 GSS, respondents were asked to rate their enjoyment for a number of selected activities and on average, paid work was ranked higher than many other activities that are commonly thought to be leisure, such as watching a movie (Table 3). This was especially true for those 65 years of age and older, where paid work was actually rated the highest of all the activities for which the question was asked.⁷

Therefore, using time use data and objective metrics may be misleading. In the case of having adequate money, more objective measures may be used because there is a set of basic necessities and the costs associated with these goods and services are roughly the same for everyone. However, this is not necessarily true for how an individual spends their discretionary time. For example, people may require different amounts of sleep or a person may choose to work instead of watching a football game because it brings them more enjoyment. Limiting the leisure activities to a certain set may confuse the notion of enough time to enjoy life, with individual preferences among the activities.

Table 3: Enjoyment of Activities in the 2005 GSS

Activity	15-24	25-34	35-44	45-54	55-64	65+	All
Cleaning the house	2.3	2.5	2.5	2.5	2.7	2.9	2.6
Grocery shopping	2.8	2.9	2.8	2.8	2.9	3.2	2.9
Repairs and maintenance	2.7	3.0	3.0	3.1	3.1	3.3	3.0
Clubs and social organizations	3.2	3.1	3.1	2.9	2.9	3.2	3.1
Commuting to/from work	3.0	3.0	3.1	3.2	3.3	3.7	3.1
Shopping (other than grocery)	3.6	3.3	3.1	2.9	2.9	3.1	3.1
Volunteering	3.0	3.2	3.3	3.3	3.3	3.6	3.3
Watching television	3.5	3.4	3.3	3.3	3.3	3.6	3.4
Cooking	3.2	3.5	3.4	3.4	3.5	3.5	3.4
Social events	3.8	3.7	3.6	3.4	3.3	3.4	3.6
Driving children	3.8	3.8	3.6	3.5	3.7	...	3.6
Movies, plays, sports events	4.2	4.0	3.8	3.6	3.3	3.0	3.7
Paid work	3.6	3.7	3.8	3.9	4.0	4.3	3.8
Dining at restaurants	4.1	4.2	4.0	3.9	3.8	3.7	4.0
Supper at home	4.0	4.2	4.2	4.2	4.2	4.3	4.2

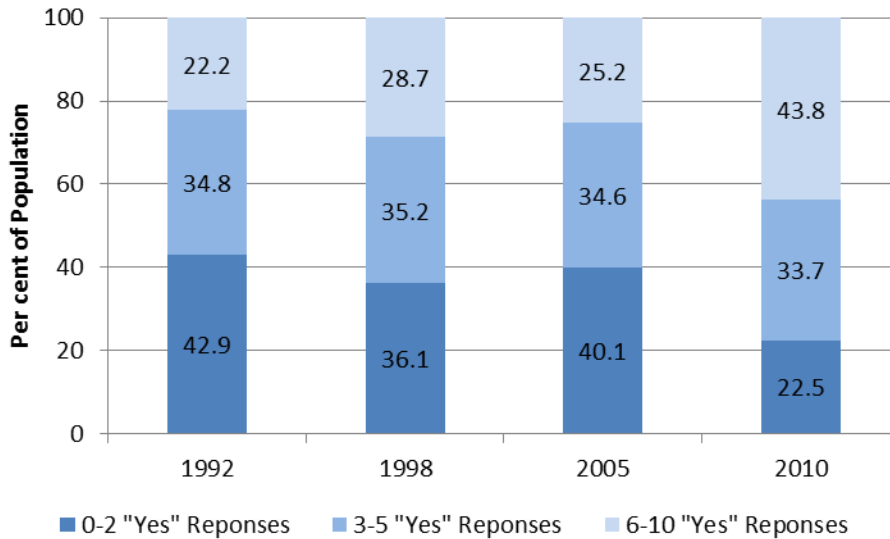
Source: Statistics Canada, General Social Survey (2005).

Note: The number represents the average based upon a five-point scale where 1 was “dislike a great deal” and 5 was “enjoy a great deal”.

⁷ A number of shortcomings of this analysis are noted in Wolfson and Rowe (2010). The authors note that the enjoyment levels represent the average level of enjoyment for each activity and not their marginal enjoyment from performing an extra 10 minutes of that activity. Furthermore, the enjoyment attached to paid work may be due primarily to social aspects rather than the work itself.

An alternative is the time perception questions in the GSS, which are more subjective in nature and reflect an individual's opinion of their time situation. In all four GSS years, respondents were asked ten time stress questions in random order.⁸ The time stress questions are phrased such that answering "Yes" indicates that a person had time stress in the area covered by the question. Therefore, the more time stress questions that were answered "Yes", the higher the time stress of the respondent. Chart 2 illustrates the distribution of "Yes" responses for all four GSS. Respondents in 1998 and 2005 had higher time stress than respondents in 1992 and 2010.

Chart 2: Distribution of "Yes" Responses to the Ten Time Stress Questions



Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Note: Only includes those who answered "Yes" or "No" to all ten time stress questions. A higher number of "Yes" responses indicates a higher level of time stress.

We have assumed that these time stress questions provide a more accurate reflection of the time domain because, as discussed previously, the notion of enjoyable activities can vary between people. Furthermore, it is more inclusive in the sense that it takes into account the individual's perception of their situation on average, rather than only their situation on the day that they were interviewed. In 2010, the average number of "Yes" answers to the time stress questions, when rounded to two decimal places, was the same for people interviewed on a

⁸ Each of these questions could be answered by Yes/No/Not stated. These ten questions were:

"Do you plan to slow down in the coming year?"

"Do you consider yourself a workaholic?"

"When you need more time, do you tend to cut back on your sleep?"

"At the end of the day, do you often feel that you have not accomplished what you had set out to do?"

"Do you worry that you don't spend enough time with your family or friends?"

"Do you feel that you're constantly under stress trying to accomplish more than you can handle?"

"Do you feel trapped in a daily routine?"

"Do you feel that you just don't have time for fun any more?"

"Do you often feel under stress when you don't have enough time?"

"Would you like to spend more time alone?"

weekday or on a weekend (3.16). In contrast, in the 2010 GSS, people who were interviewed during the weekend had an average of 7.1 hours of actual leisure time per day compared to 4.8 hours for people who were interviewed during the weekdays.

In light of these issues, the number of “Yes” responses to the time stress questions has been used as the criterion for the time domain. A Statistics Canada publication using the GSS and the time perception questions divides people into three categories: Those with low time stress (0-2 responses as yes), medium time stress (3-5 responses as yes), and high time stress (6-10 responses as yes) (Hurst, 2008). Therefore, the threshold used in this paper is five or fewer “Yes” responses to the ten time stress questions. However, a brief analysis using an actual leisure time threshold will be presented at the end of the paper.

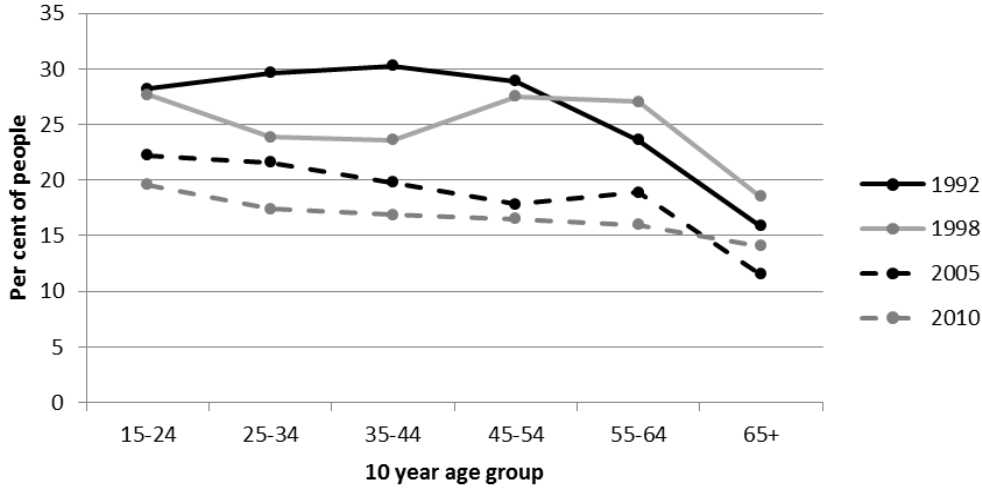
iii. Health Domain

As discussed by Wolfson and Rowe (2010), the preferred metric of health status is the McMaster “Health Utility Index” (HUI). The HUI captures an individual’s capacity to function and is based on eight health sub-domains: vision, hearing, communicating, mobility, dexterity, pain, emotion, and cognition. However, the GSS does not contain the necessary variables to calculate the HUI. Instead, the GSS has two health variables: a self-reported health status measure that is a five-category question (poor/fair/good/very good/excellent), and questions related to whether the respondent is “limited in the amount or kind of activity he/she can do at home, at work, at school or in other activities because of a physical condition or mental condition or health problem”.

The self-reported health question is identified by Wolfson and Rowe (2010) as being an alternative to the HUI. However, the question was phrased differently in the 1992 and 1998 GSS when compared to the 2005 and 2010 GSS. In the 1992 and 1998 GSS, the question was “Compared to other people your age, how would you describe your health? Would you say it is...”, while in the 2005 and 2010 GSS, the question was “In general, would you say your health is...”. The effect of the change in question is seen clearly in the proportion of people who responded “Excellent” (Chart 3). In particular, the relationship between the proportion of people who responded “Excellent” and their age group is different in the earlier GSS than in the later GSS. This pattern would tend to be relatively consistent in all four survey years if the questions were comparable.⁹

⁹ Potential weaknesses of the self-reported health status question are reporting bias (e.g. cultural differences or age differences) and that it is too subjective. For example, an Australian survey identified that 28 per cent of respondents, when asked a five-point self-reported health status question twice, changed their answer the second time (Crossley and Kennedy, 2000). Similarly, Aboriginal people in Australia reported better self-reported health on average than the general Australian population despite having worse health indicators (Murry *et al.*, 2011). An advantage of the self-reported health status variable is that it does not only consider specific health issues. Therefore, responses tend to provide a better overall perspective of health status than other, more specific measures.

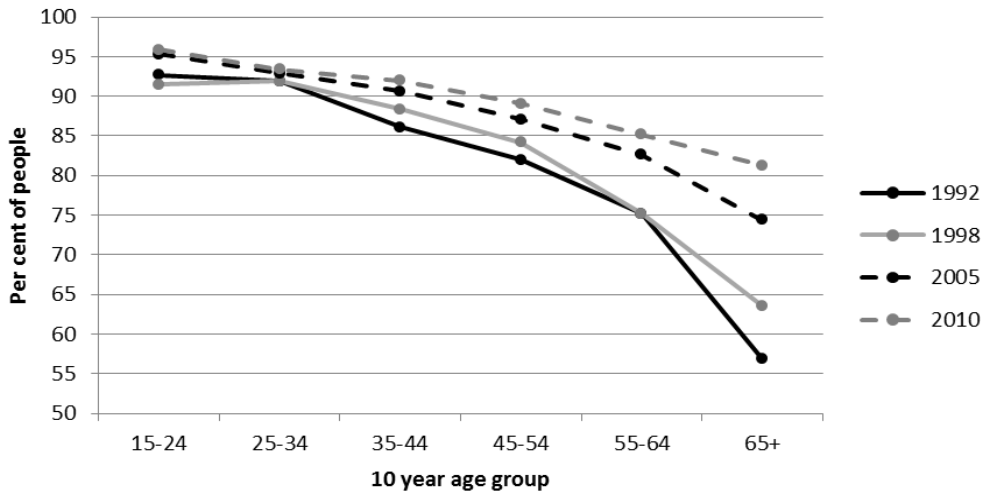
Chart 3: Percentage of People Who Reported "Excellent" as Their Self-Reported Health Status



Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010).

An alternative is to estimate health status by whether a long-term condition limited the amount or kinds of activity a person could perform. However, there are issues with the long-term disability questions as well. More specifically, the respondents were asked only a single question in the 1992 and 1998 GSS, while in the two subsequent time use GSS, the question was split into three (in 2005) and four (in 2010). A derived variable was therefore constructed for the 2005 and 2010 GSS (Chart 4). The change in the questions asked in each GSS, as well as the definition of the derived variable, is presented on Table 4.

Chart 4: Proportion of People Without Activity Limitation



Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Note: Activity limitation variable in 2005 and 2010 based on whether the respondent responded “No” or “Sometimes” to all questions. Variable in 2005 and 2010 derived using the definition provided in Table 4.

Table 4: Self-Reported Activity Limitations by GSS Cycle

Year	Variable	Details
1992 GSS	Question Potential responses Adequacy condition	Are you limited in the amount or kind of activity you can do at home, at work or at school because of a long-term physical condition or health problem? Yes / No No
1998 GSS	Questions Potential responses Adequacy condition	Are you limited in the amount or kind of activity you can do at home, at work or at school because of a long-term physical or mental condition or health problem? Yes / No No
2005 GSS	Questions Potential responses Adequacy condition	Does a physical condition or mental condition or health problem reduce the amount or the kind of activity you can do: ... in other activities, for example, transportation or leisure? Does a physical condition or mental condition or health problem reduce the amount or the kind of activity you can do: ... at home? Does a physical condition or mental condition or health problem reduce the amount or the kind of activity you can do: ... at work or at school? Yes, sometimes / Yes, often / No (for all three questions) “Yes, sometimes” or “No” for all three questions
2010 GSS	Questions Potential responses Adequacy condition	Are your daily activities at home, work, school or any other area limited by: ... a physical condition? Are your daily activities at home, work, school or any other area limited by: ... a psychological, emotional or mental health condition? Are your daily activities at home, work, school or any other area limited by: ... learning difficulties? Are your daily activities at home, work, school or any other area limited by: ... any other health condition? No / Sometimes / Often or always (for all four questions) “Sometimes” or “No” for all four questions

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

This variable is more comparable across surveys than the self-reported health question.¹⁰ Furthermore, it is more objective in nature, which is consistent with the recommendation of the HUI, which is quasi-objective in nature. Consequently, this study determines health adequacy by the self-reported activity limitation question. This was also the approach taken by Eurostat (2010) to account for potential reporting bias. While the self-reported health question will not be used in this paper, an alternative is presented at the end using the variable.

¹⁰ It is unlikely that the percentage of people aged 65 and over with long-term activity disability has actually decreased by 25 percentage points from 1992 to 2010 in reality. Unfortunately, other derivations of health status based on the self-reported activity limitation questions had similar flaws.

C. Item Non-Response

A source of non-sampling error is item non-response. While item non-response is reasonably low for the derived health or time variables (Appendix Table 2 and Appendix Table 3 in Appendix A), this is not the case for the household income, where item non-response was particularly high (Appendix Table 1 in Appendix A).

A method of adjusting for item non-response is to impute values that are missing. This technique uses the correlation between variables in the dataset (e.g. age, sex, marital status, household income), in order to estimate values that are missing. In doing so, it uses all available information to construct a full dataset without missing values. However, time constraints did not permit the construction of an accurate imputation model.

By far the simplest method is listwise deletion, where respondents' records are deleted if they had non-response to any of the three domains. Table 5 summarizes this approach and its implications for the overall GLT index.

Table 5: Ways of Measuring GLT

		1992 GSS	1998 GSS	2005 GSS	2010 GSS
Definition for coding GLT	In GLT	Adequate in all of the three domains			
	Not in GLT	Those who are not coded as "In GLT" or "Non Response" (i.e. respondents to all three domains and inadequate in at least one domain)			
	Non Response	Non response in at least one of the three domains			
Non-response for the overall GLT index (% of respondents)		23.3	32.1	27.3	21.6

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Therefore, listwise deletion excludes a fairly large percentage of the available information, up to one-third of all respondents in 1998. Inferences based on the respondents to the GLT can be extended to the general population if the data were missing completely at random. In this case, it would be expected that the GLT respondents are reasonably representative of the general population. A brief examination of the GLT respondent population along various cross-sections is presented in Table 6. Overall, it seems that this population is skewed away from youth and those aged 65 and older; and females in all four survey years. Geographic representation was much better in 2005 and 2010 than in 1992 and 1998. In 1992 and 1998, Quebec and Ontario were over-represented and under-represented among GLT respondents respectively.

Despite the potential issues outlined above, listwise deletion is the most practical method, and therefore the one used in this report to account for item non-response. However, it is

important to recognize that the results generated through this approach may be biased and are likely not entirely representative of the Canadian population.

Table 6: Composition of the GLT Respondents Compared to the Whole Dataset Reflecting Non-Response

Group	Subpopulation	Per cent representation in the sample (percentage point difference from the whole population)			
		1992	1998	2005	2010
Age group	15-24	13.5 (-4.2)	13.0 (-3.7)	13.8 (-2.9)	12.2 (-3.8)
	25-34	24.1 (+2.0)	21.7 (+2.7)	18.7 (+2.0)	18.2 (+1.4)
	35-44	22.5 (+2.0)	24.8 (+3.1)	21.8 (+2.5)	18.7 (+1.7)
	45-54	15.8 (1.4)	18.9 (+2.0)	20.5 (+1.8)	20.9 (+1.8)
	55-64	11.1 (-0.1)	10.8 (-0.2)	13.5 (+0.2)	15.7 (+0.7)
	65+	12.9 (-1.1)	10.8 (-3.9)	11.6 (-3.5)	14.3 (-1.8)
Sex	Male	50.4 (+1.5)	51.2 (+2.0)	51.5 (+2.2)	51.3 (+2.0)
	Female	49.6 (-1.5)	48.8 (-2.0)	48.5 (-2.2)	48.7 (-2.0)
Province	Newfoundland and Labrador	2.2 (+0.1)	2.1 (+0.3)	1.6 (0.0)	1.6 (+0.1)
	Prince Edward Island	0.4 (0.0)	0.5 (+0.1)	0.4 (0.0)	0.5 (0.0)
	Nova Scotia	3.4 (0.0)	3.6 (+0.5)	3.1 (+0.1)	3.0 (+0.2)
	New Brunswick	2.7 (0.0)	2.6 (+0.1)	2.2 (-0.1)	2.3 (0.0)
	Quebec	28.7 (+3.1)	28.2 (+3.4)	23.9 (0.0)	23.1 (-0.2)
	Ontario	33.8 (-3.4)	34.8 (-3.1)	39.0 (+0.2)	39.3 (+0.5)
	Manitoba	3.6 (-0.4)	3.4 (-0.3)	3.6 (+0.1)	3.5 (0.0)
	Saskatchewan	3.4 (0.0)	3.1 (-0.1)	3.0 (0.0)	3.0 (0.0)
	Alberta	8.9 (-0.2)	9.1 (-0.2)	10.1 (+0.1)	10.3 (-0.3)
	British Columbia	13.0 (0.8)	12.6 (-0.6)	13.1 (-0.3)	13.4 (-0.3)

Source: Appendix A.

Note: Numbers in the parenthesis denote the per cent representation in the sample minus the per cent representation in the whole dataset. A positive number indicates that the given subpopulation represents a larger proportion of the sample than in the whole dataset, and vice versa for a negative number.

II. Analysis

This section presents the results of the analysis using the methodology outlined in the previous section. It opens with a discussion of the basic results and then uses Sullivan's method to account for differences in composition of the population. An examination of the most important covariates of GLT using regression analysis then follows. The section concludes with some alternatives in the GSS for each domain, as well as an examination of how the results in this paper differ from other measures of well-being in Canada.

The focus of this section is on illustrating how the GLT framework can be applied to a time series of repeated cross sectional surveys. Not much emphasis will be placed on examining the time series trends revealed in this analysis due to limited data quality and lack of consistency in questionnaires, especially in the money and health domains. These issues likely overwhelm any trends across time in Canadians' well-being obtained in this manner. All values in this section pertain to the subpopulation of people who were not coded as being non-respondents as defined in the previous section.

A. Results

Chart 5 illustrates the adequacy patterns for each of the three dimensions by ten year age group, using the definitions outlined in the previous section. In general, the results for all four survey years are fairly similar. Further, the patterns shown in Chart 5 by sex are as one might expect. The percentage of people with adequate time decreased until the 25-34 or 35-44 year age group, at which point it begins to rise. Almost the opposite trend was observed in the money domain, where the percentage of people with adequate money rose with age until the 45-54 age group, after which it begins to decline. Finally, while health status in the general population is fairly high in Canada, it too declines with age. These patterns were the same in all four survey years.

The opposing trends in money and time are consistent with expectations. People who had full-time employment would have less discretionary time to spend on other activities, which tends to add to time stress. On the other hand, all else equal, working fewer hours results in lower income even though the person would likely experience less time stress. Due to the opposing trends in money and time, GLT as measured by the intersection of people with adequate time, money, and health is fairly low – around 40 per cent for men and 30 per cent for women.

Chart 5: Adequacy in each domain by sex and age group

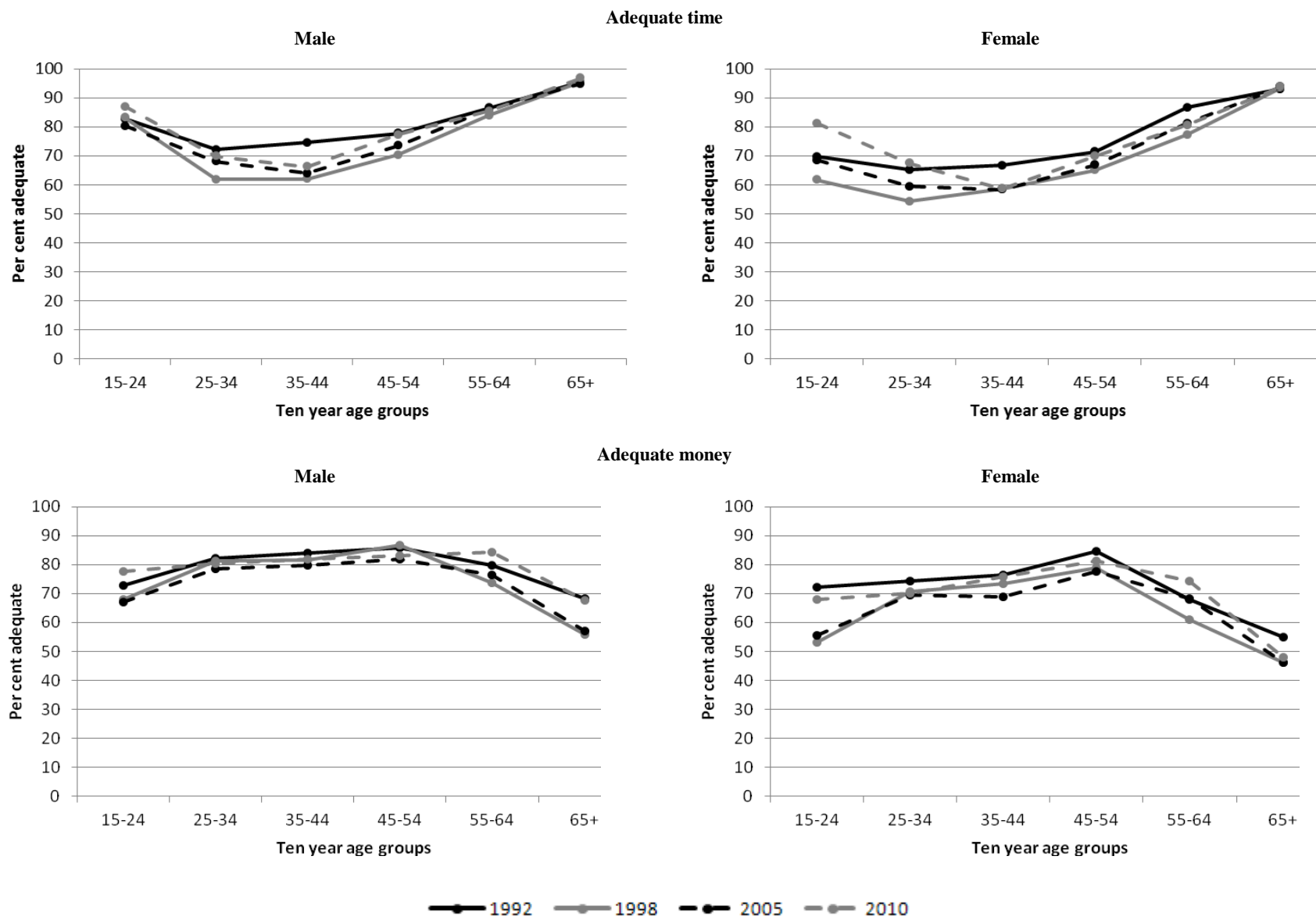
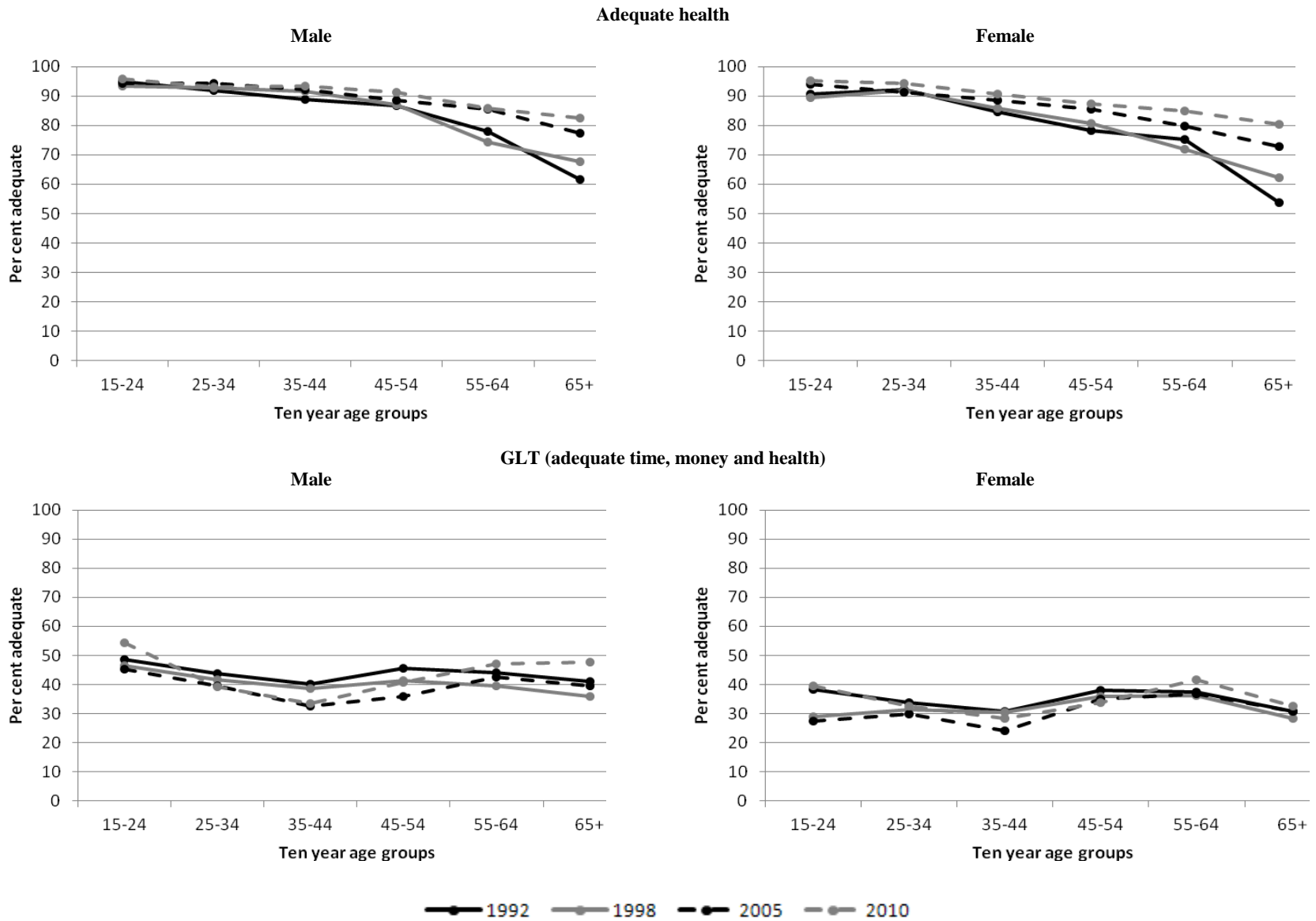


Chart 5: Adequacy in each domain by sex and age group (continued)



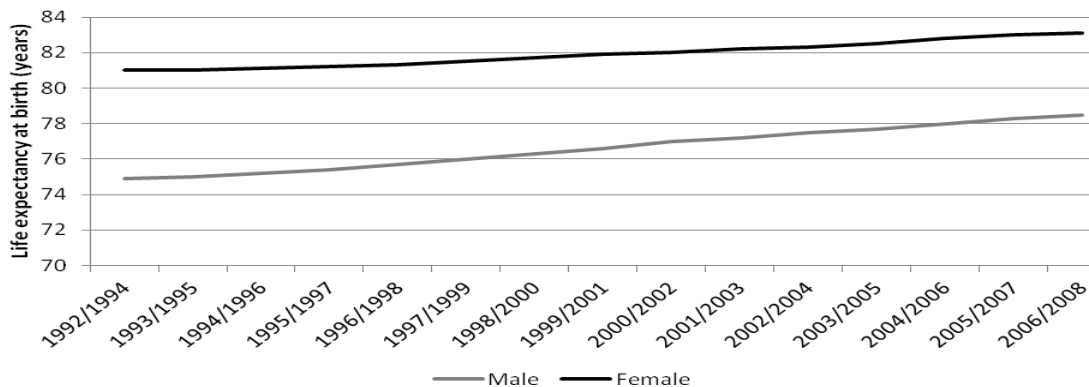
It is interesting to note that the proportion of women with adequate time, money, or health is lower than that of men. In the money domain, this is not surprising first because, women have historically had lower incomes than men. Second, even though the criterion for the money domain is based upon household income rather than individual income, total household income is dependent upon individual income, and an important proportion of women live on their own.

On the other hand, it may appear surprising that a somewhat lower proportion of women have adequate health, given that women have higher life expectancy than men (Chart 6). However, women report more illness and make greater use of health care services in virtually all age groups, results which are consistent with the findings in the Canadian Community Health Survey (CCHS), where the proportion of men with participation or activity limitations was slightly lower than those of women (Table 7). Furthermore, the proportion of men with a high score on the McMaster HUI was slightly higher than that of women.

These results highlight the fundamental weakness of focusing national health indicators solely on mortality rates, which take no account of health status among the living. In this case, an index based on life expectancy would imply that women are faring better than men, while those based on health status among the living imply that men are faring better than women.

The simplest way of presenting the GLT summary index is to calculate the percentage of the overall population in each time-money-health adequacy category. Table 8 illustrates the results using this approach. There are eight possible categories representing all possible combinations of two states (adequate and inadequate) along three dimensions (leisure time, money, and health). These states can be described by a sequence of three letters: “t” for leisure time, “m” for money, and “h” for health. An uppercase letter represents an adequate level in the domain, while a lowercase letter represents an inadequate level. For example, TMh represents a state in which an individual has adequate leisure time, adequate money, and inadequate health.

Chart 6: Life Expectancy at Birth in Canada by Gender, 1992/94-2006/08



Source: Statistics Canada, CANSIM table 102-0512.

Note: Life expectancy based upon three years of mortality data.

Table 7: Proportion of People Aged 12 or Older with Health Characteristics from the CCHS

Variable	CCHS year	Male	Female
Participation and activity limitation, sometimes or often	2007/2008	28.8	31.6
	2009/2010	26.2	29.7
Functional health, good to full (based on HUI)	2009/2010	82.8	80.1

Source: Statistics Canada, CANSIM table 105-0502.

For men in all of the GSS cycles and for women in the 1992 and 1998 GSS, the domain that is the most influential in “preventing” GLT≡TMH is time (as seen by comparing the per cent of people with TMH versus tMH), followed by money (as seen by comparing the per cent of people with TMH versus TmH). This was reversed for women in the 2005 and 2010 GSS. Furthermore, the domain with the highest proportion of adequacy is health, while the money and time domains have similar and lower proportions at adequate levels.

Table 8: Per cent of People with Different Variants of GLT, Ages 15 and Older

State	Male				Female			
	1992	1998	2005	2010	1992	1998	2005	2010
TMH	55.6 ^A	48.7 ^B	52.3 ^A	59.2 ^A	44.8 ^B	37.9 ^B	40.8 ^A	47.6 ^B
TmH	12.4 ^C	13.8 ^C	15.7 ^B	13.3 ^C	14.3 ^C	15.7 ^C	18.9 ^B	18.4 ^B
TMh	7.9 ^C	6.0 ^D	4.5 ^C	3.9 ^D	8.4 ^C	5.6 ^D	4.7 ^C	4.1 ^D
Tmh	3.9 ^D	3.8 ^D	3.2 ^C	2.8 ^D	5.9 ^D	5.7 ^D	4.3 ^C	3.7 ^D
tMH	15.0 ^C	19.9 ^C	16.2 ^B	14.8 ^C	16.8 ^C	20.1 ^C	17.8 ^B	17.1 ^C
tmH	3.0 ^D	4.3 ^D	5.2 ^C	3.2 ^D	5.0 ^D	9.0 ^C	8.7 ^C	5.7 ^C
tMh	1.7 ^E	2.6 ^D	2.0 ^D	1.9 ^D	2.7 ^D	3.5 ^D	3.1 ^D	2.1 ^D
tmh	0.6 ^E	0.9 ^E	0.9 ^D	0.9 ^D	2.0 ^D	2.5 ^D	1.8 ^D	1.4 ^D
Adequate time	79.7 ^A	72.3 ^A	75.8 ^A	79.2 ^A	73.4 ^A	65.0 ^A	68.6 ^A	73.7 ^A
Adequate money	80.2 ^A	77.1 ^A	75.0 ^A	79.7 ^A	72.7 ^A	67.0 ^A	66.4 ^A	70.8 ^A
Adequate health	86.0 ^A	86.7 ^A	89.5 ^A	90.5 ^A	81.0 ^A	82.6 ^A	86.2 ^A	88.7 ^A
GLT≡TMH	55.6 ^A	48.7 ^B	52.3 ^A	59.2 ^A	44.8 ^B	37.9 ^B	40.8 ^A	47.6 ^B

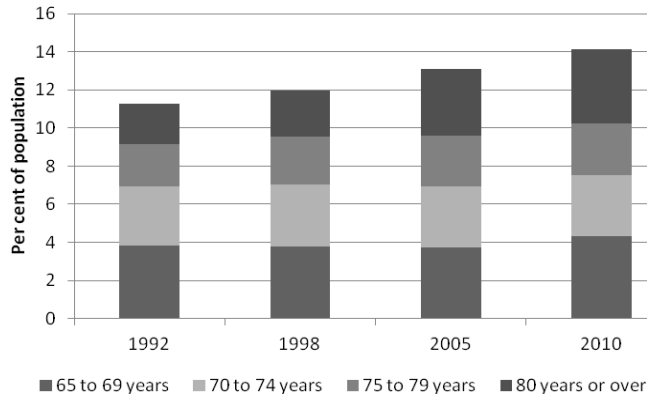
Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Legend: T – Adequate leisure; t – Inadequate leisure; M – Adequate money; m – Inadequate money; H – Adequate health; h – Inadequate health

As previously observed in Chart 5, there are trends in each domain according to the respondent’s age. Furthermore, it is well-known that the age structure of the population is changing and that Canada as a whole is getting older (Chart 7). Therefore, trends in the GLT of

the whole population may be simply an artifact of the change in the population composition rather than changes in the well-being of Canadians.

Chart 7: Proportion of Population 65 Years or Older



Median age (years)	
1992	33.6
1998	36.0
2005	38.6
2010	39.7

Source: Population data from CANSIM table 051-0001

One method of adjusting for this is to apply Sullivan's method. In doing so, the current status of the population can be presented in a manner that takes into account life expectancy, but is independent of fluctuations in age structure such as those associated with the baby boom. The Sullivan method approach is also suggested by Wolfson and Rowe (2010).

Estimates generated by the Sullivan method are based on how many total years an individual would spend in a given GLT state in the remainder of his or her life. In this way, the GLT represents a trivariate version of health-adjusted life expectancy (HALE). However, instead of inputting disease or disability trends, it uses the prevalence of people with enough money, health, and time to enjoy them for a given gender or age group.

Table 9 illustrates the results using ten-age year groups for the underlying unabridged life tables for numerical stability.¹¹ Interestingly, applying Sullivan's method increases the relative influence of money in preventing GLT≡TMH. Here, the money domain is more influential in "preventing" GLT≡TMH than time, especially for women. Furthermore, people spend more of their lives with adequate health when compared to the other domains, followed by adequate time and then money.

When comparing the two sexes, in all four survey years, men were estimated to spend more of their remaining life with adequate money when compared to women. On the other hand,

¹¹ Results here use 1995-1997 unabridged life tables (for the 1992 and 1998 GSS results) and the 2000-2002 unabridged life tables (for the 2005 and 2010 GSS results) from Statistics Canada. Ideally, these would be calculated using unabridged life tables specific to each year. However, attempts to apply the Jagger *et al.* (2006) methodology using population data from CANSIM table 051-0001 and mortality data from CANSIM table 102-0504 to construct abridged life tables result in upwards biased life expectancy estimates.

when compared to men, women were estimated to spend a larger proportion of their remaining life with adequate time or health.

Table 9: Years of Remaining Life that a Person 25 Years Old Will Spend in a Given State

State	Male				Female			
	1992	1998	2005	2010	1992	1998	2005	2010
TMH	27.8	24.0	27.0	30.6	24.1	21.1	23.3	26.1
TmH	6.0	7.7	9.1	7.5	8.7	10.4	12.3	12.5
TMh	5.7	4.2	3.2	2.6	6.7	4.5	3.6	2.7
Tmh	3.0	3.3	2.4	2.0	5.4	5.7	4.3	3.1
tMH	6.7	8.9	7.6	7.3	7.2	8.7	8.1	8.5
tmH	1.2	1.7	2.3	1.5	2.0	3.3	3.7	2.8
tMh	0.8	1.3	1.0	1.0	1.4	1.8	1.5	1.1
tmh	0.4	0.5	0.4	0.5	1.4	1.5	1.1	0.9
Adequate time	42.5	39.2	41.7	42.7	44.9	41.6	43.4	44.5
Adequate money	41.1	38.4	38.8	41.5	39.5	36.1	36.4	38.4
Adequate health	41.6	42.2	46.0	47.0	42.1	43.4	47.3	49.9
GLT≡TMH	27.8	24.0	27.0	30.6	24.1	21.1	23.3	26.1

Source: 1995-1997 and 2000-2002 unabridged life tables from Statistics Canada.

Note: 1992 and 1998 GSS results calculated using the 1995-1997 unabridged life tables. 2005 and 2010 GSS results calculated using the 2000-2002 unabridged life tables.

B. Correlates of GLT

It is also of interest to examine which other factors are the most important correlates of GLT. This has been assessed using a logit regression directly with the microdata from each survey wave with $GLT \equiv TMH$ as a dichotomous dependent variable and the variables of interest as the independent variables. Due to difficulties in constructing a consistent time series of GLT, the regressions have only been conducted for the 2010 GSS. Inferring trends over time from the coefficients of individual year regressions might be misleading due to the high non-response rates and the lack of consistency in the health threshold. It would therefore be difficult to separate this effect from the true evolution of the GLT index over time in Canada.

The variables used in this analysis were chosen based on their availability in most public-use microdata files and whether they would be expected to influence at least one of the time, money, or health domains. Certain variables would be expected to influence an individual domain a certain way; for example, having no hours of employment is likely correlated with inadequate income. On the other hand, people with no employment have much less time stress.

Performing a regression can help determine which of these opposing forces is stronger in the context of the overall index. The variables considered are as follows:¹²

- Age group: 15-24 (reference group); 25-34; 35-44; 45-54; 55-64; 65+.
- Rural/Urban indicator according to CMA/CA or non-CMA/CA region: Urban (reference group); Rural; Provinces not divided into CMA and non-CMA regions in the dataset (Atlantic region and Manitoba).
- Labour force status: Full-time work (reference group); part-time work; student; no hours of employment.
- Marital status: Single and never married (reference group); Married/Living in common-law; Widowed/Separated/Divorced.
- Highest level of education attained: Some secondary/elementary/no schooling (reference group); High school diploma; Some post-secondary; College diploma; University degree.
- Number of single children under the age of 14.
- Number of household members earning income in the household other than the respondent.
- Immigrant status: Born in Canada (reference group); non-immigrant.

Appendix C reports the results of these regressions. Significant positive correlates of GLT (related to a higher chance of being in GLT) for both males and females were:

- Educational attainment (more education is better).
- Number of household members earning income other than the respondent.

On the other hand, the variables that were significant negative influence on GLT (related to a lower chance of being in GLT) for both males and females were:

- Living in Atlantic provinces/Manitoba (as opposed to CMA regions).
- Being an immigrant.
- Having no hours of employment (as opposed to having full-time work).
- Number of young, single children in the household.

¹² Other variables could be included in the regression model depending on the purpose of the analysis. For example, if the GLT estimates were comparable between years, all observations could be pooled with survey year dummies and consistently defined classification variables as the independent variables.

Some of these are in line with expectations. For example, all else equal, increasing the number of household members earning income would also increase household income. Similarly, children in the household generally represent a net financial and time cost to the household.¹³ The results also indicate that the effect of education and hours of employment on income is stronger than its effect on time use.

However, the results of the regression analysis were not entirely the same for both male and female respondents. One of the main differences was that being a student was a significant negative correlate of GLT for women when compared to full-time work. Furthermore, being divorced/widowed/separated was a significant negative correlate for women when compared to never having been married. These characteristics were not statistically significant for men.

C. Sensitivity Analysis

The choice of adequacy criterion can have a large influence on the overall results of the GLT analysis. There are a number of different definitions that are possible for each domain. Table 10 outlines some feasible alternatives, keeping in mind some of the issues mentioned in the first section of the report. The bolded values represent the definitions used in the main body of the paper.

This is not intended to be an exhaustive list. A number of possibilities also exist within each alternative, such as varying the number of “Yes” responses to the time stress questions, the number of hours for leisure required in order to be adequate, or the set of activities considered to be leisure. Level differences between the different adequacy thresholds are particularly sensitive to such choices.

What is perhaps more interesting is that even using alternative criteria, the proportion of remaining life spent with adequate money is lower for women than for men, but the effect is reversed when considering the time and health domains. This mirrors the pattern seen in Table 9. Furthermore, the evolution of the GLT index over the four GSS also varies between different alternatives of the same domain. All of the alternatives display different patterns over time when compared to the definitions used in the main body of the paper.

It is also possible to examine how the overall index varies with the different alternatives. Table 11 outlines three alternatives based on using the alternative for time adequacy (GLT1), alternative for money adequacy (GLT2), and alternative for health adequacy (GLT3).

Table 12 outlines the results of performing Sullivan’s method on each version of the GLT. The evolution of the GLT summary index varies depending on how it is specified. In the base GLT, GLT1, and GLT3, people were estimated to spend more years with GLT in 1998 and 2005 than

¹³ This is not to say that children do not bring other benefits to society or those raising and living with them. However, when looking only at the narrower domains of an individual’s time, money, and health, young children tend to have a negative impact.

in 1992 and 2010. However, in GLT2, the proportion of their remaining life spent with GLT increases over time.

Table 10: Years of Remaining Life that a Person 25 Years Old Will Spend in a Given State
(Bold numbers represent the results obtained using the definitions in the main body of the paper)

Gender	Domain	Alternative Adequacy Criteria	1992	1998	2005	2010
Male	Time domain	<ul style="list-style-type: none"> • 5 or more “Yes” responses to time stress questions 	42.5	39.2	41.7	42.7
		<ul style="list-style-type: none"> • 6 or more hours of actual leisure time if interviewed during the weekend; 4 or more hours of actual leisure time if interviewed during a weekday. 	33.5	32.9	30.9	30.8
	Money domain	<ul style="list-style-type: none"> • Based on Statistics Canada LIMs and household size 	41.1	38.4	38.8	41.5
		<ul style="list-style-type: none"> • Based on household income distribution by household size in the GSS.¹⁴ 	33.5	37.4	38.5	38.1
	Health domain	<ul style="list-style-type: none"> • Long-term activity limitation. 	41.6	42.2	46.0	47.0
		<ul style="list-style-type: none"> • Good/Very good/Excellent responses to the self-reported health status question. 	44.4	45.1	45.1	44.6
Female	Time domain	<ul style="list-style-type: none"> • 5 or more “Yes” responses to time stress questions 	44.9	41.6	43.4	44.5
		<ul style="list-style-type: none"> • 6 or more hours of actual leisure time if interviewed during the weekend; 4 or more hours of actual leisure time if interviewed during a weekday. 	35.8	36.1	33.1	32.3
	Money domain	<ul style="list-style-type: none"> • Based on Statistics Canada LIMs and household size 	39.5	36.1	36.4	38.4
		<ul style="list-style-type: none"> • Based on household income distribution by household size in the GSS 	28.9	34.7	35.8	35.2
	Health domain	<ul style="list-style-type: none"> • Long-term activity limitation 	42.1	43.4	47.3	49.9
		<ul style="list-style-type: none"> • Good/Very good/Excellent responses to the self-reported health status question 	47.6	47.8	47.3	48.2

¹⁴ In 1992, household size of 1 and over \$20,000 household income; household size of 2 and over \$30,000 household income; household size of 3 or more and over \$40,000. Same definitions for 1998. In 2005, household size of 1 and over \$20,000 household income; household size of 2 and over \$40,000 household income; household size of 3 or more and over \$50,000. In 2010, household size of 1 and over \$30,000 household income; household size of 2 and over \$50,000 household income; household size of 3 or more and over \$60,000.

Table 11: Alternative GLT Definitions

Domain	Definition used in the paper (Base GLT)	Alternate time criterion (GLT1)	Alternate money criterion (GLT2)	Alternate health criterion (GLT3)
Time	5 or more “Yes” responses to time stress questions	6 or more hours of actual leisure time if interviewed during the weekend; 4 or more hours of actual leisure time if interviewed during the weekday	5 or more “Yes” responses to time stress questions	5 or more “Yes” responses to time stress questions
Money	Based on Statistics Canada LIMs and household size	Based on Statistics Canada LIMs and household size	Based on household income distribution by household size in the GSS	Based on Statistics Canada LIMs and household size
Health	Long-term activity limitation	Long-term activity limitation	Long-term activity limitation	Good/Very good/Excellent responses to the self-reported health status question

Table 12: Years of Remaining Life that a Person 25 Years Old Will Spend in GLT Years Under Different Definitions of GLT

Version	Male				Female			
	1992	1998	2005	2010	1992	1998	2005	2010
Base GLT	27.8	24.0	27.0	30.6	24.1	21.1	23.3	26.1
GLT1 (time)	20.5	18.7	18.6	20.6	17.7	16.7	16.3	17.4
GLT2 (money)	23.4	23.5	26.8	28.1	18.0	20.2	23.1	23.7
GLT3 (health)	30.3	25.7	27.1	29.7	27.8	22.9	23.5	25.9

Conclusion

This study applies a simple methodology for calculating the Wolfson-Rowe Good Life Time (GLT) summary index using repeated cross-sectional General Social Survey (GSS) time use surveys rather than more complex microsimulation. It first discusses the basic framework of the GLT and then considers how to use the variables in the GSS to determine adequacy in each of the GLT's domains: time, money, and health. Using feasible definitions for each of the GLT components, the GLT is considered from three different perspectives: The percentage of people in the eight different states (adequate or not adequate in each of the three domains); the number of years that a person 25 years old is likely to spend in each state using Sullivan's method for generalizing life table calculations of life expectancy; and a brief examination of important correlates of GLT at the individual level using a logistic regression. The paper then concludes with sensitivity analysis using alternative definitions for each of the GLT components.

Most of the results obtained in this paper are meant to be illustrative, given the issues brought forward in the first section of the paper. High item non-response rates, especially in the household income variable, and lack of time series consistency in many of the key questionnaire items, seriously limit the validity of the results and the ability to generalize them to the Canadian population. As the GSS is the only survey jointly including measures of time use, money income, and health status, a proper time series of GLT in Canada would likely need to be constructed using the two other methods mentioned in Wolfson and Rowe (2010): synthetic matching and microsimulation.

Synthetic matching and microsimulation are significantly more technical and costly than the methodology applied in this paper but provide more accurate and reliable estimates. Synthetic matching is a well-developed methodology for combining data from three separate surveys. In this context, data from the Survey of Labour and Income Dynamics could be used for the money domain; data from the Canadian Community Health Survey could be used for the health domain; and data from the GSS could be used for the time domain. Microsimulation simulates the lives of each individual in a representative sample of the population, allowing for estimates of the number of years that they can be expected to have each component of the GSS.

There are a number of further areas of research that are possible within the GLT framework using the GSS. One way of potentially improving the quality of the results obtained through regression would step beyond the public-use microdata files and conduct the analysis at the Statistics Canada Research Data Centres, where access to the raw survey data is possible. The more detailed variables there would also facilitate constructing an imputation model to mitigate some of the high non-response rates observed in this survey. Finally, having access to the more detailed classification variables in the raw microdata would allow for more accurate adequacy variables that can take into account a number of other factors than those considered in this study.

Extending the GLT concept to include other variables could also be of interest. An application mentioned in Wolfson and Rowe (2010) includes taking into account educational attainment or literacy rates. It would also be relevant to include measures of wealth, rather than only household income. This would take into account people who have accumulated enough wealth over the course of their lifetime to live comfortably, despite not having an adequate annual income.

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Appendix A: Distribution of Variables Used in GLT

Appendix Table 1: Distribution of People in Household Income Brackets, by Household Size (%)

Year	Household size	Household Income Bracket								Non-response	Median income bracket
		< \$20,000	\$20,000 - \$29,999	\$30,000 - \$39,999	\$40,000 - \$49,999	\$50,000 - \$59,999	\$60,000 - \$79,999	> \$80,000			
1992	1	46.8 ^C	20.2 ^C	14.4 ^D	8.3 ^D	5.1 ^E	3.3 ^E	1.9 ^E		15.0	\$20,000 - \$29,999
	2	18.1 ^C	20.3 ^C	16.6 ^C	14.7 ^C	10.3 ^C	11.0 ^C	9.1 ^D		22.3	\$30,000 - \$39,999
	3	11.8 ^D	11.6 ^D	15.7 ^C	15.3 ^C	16.8 ^C	14.7 ^D	14.1 ^D		26.0	\$40,000 - \$49,999
	4	7.5 ^D	9.7 ^D	17.1 ^C	14.5 ^C	16.3 ^C	18.5 ^C	16.5 ^C		25.1	\$50,000 - \$59,999
	5	7.7 ^E	12.5 ^D	14.7 ^D	17.4 ^D	16.6 ^D	14.1 ^D	17.1 ^D		28.3	\$40,000 - \$49,999
	6	9.0 ^E	11.0 ^E	12.8 ^E	15.2 ^E	18.3 ^E	13.4 ^E	20.2 ^E		28.2	\$50,000 - \$59,999
	7+	...	...	...	...	...	...	...		35.4	\$40,000 - \$49,999
	Total	17.4^B	15.2^B	15.9^B	14.0^B	13.0^B	12.8^B	11.7^C		22.7	\$40,000 - \$49,999
Year	Household size	< \$20,000	\$20,000 - \$29,999	\$30,000 - \$39,999	\$40,000 - \$49,999	\$50,000 - \$59,999	\$60,000 - \$79,999	\$80,000 - \$99,999	> \$100,000	Non-response	Median income bracket
1998	1	39.6 ^C	18.3 ^D	14.8 ^D	10.2 ^D	7.2 ^D	5.8 ^E	2.3 ^E	1.7 ^E	35.7	\$20,000 - \$29,999
	2	15.2 ^C	14.4 ^C	14.3 ^C	13.4 ^C	13 ^C	13.1 ^C	7.0 ^D	9.8 ^C	30.7	\$40,000 - \$49,999
	3	10 ^D	9.4 ^D	14.4 ^D	13.3 ^D	13.4 ^D	17.6 ^C	11.7 ^D	10.2 ^D	28.1	\$50,000 - \$59,999
	4	6.7 ^D	5.5 ^D	11.6 ^D	13.8 ^D	15.3 ^C	20.0 ^C	10.7 ^D	16.3 ^C	30.3	\$50,000 - \$59,999
	5	4.8 ^E	9.3 ^D	10.0 ^D	14.5 ^D	13.2 ^D	15.6 ^D	11.2 ^D	21.4 ^D	35.7	\$50,000 - \$59,999
	6	...	...	19.3 ^E	13.5 ^E	21.1 ^E	...	...	12.3 ^E	36.2	\$40,000 - \$49,999
	7	...	...	...	...	...	...	...	...	51.0	\$40,000 - \$49,999
	8+	...	...	...	...	...	...	...	...	50.0	\$40,000 - \$49,999
Total	11.4^C	13.6^B	13.1^B	13.0^B	14.6^B	8.5^B	11.3^C	11.4^C	32.1	\$40,000 - \$49,999	

Year	Household size	Household Income Bracket									Non-response	Median income bracket
		< \$20,000	\$20,000 - \$29,999	\$30,000 - \$39,999	\$40,000 - \$49,999	\$50,000 - \$59,999	\$60,000 - \$79,999	\$80,000 - \$99,999	> \$100,000			
2005	1	31.8 ^C	17.3 ^C	15 ^C	11.4 ^C	8.9 ^D	9.1 ^D	2.7 ^E	3.7 ^D		28.5	\$30,000 - \$39,999
	2	8.7 ^C	10.5 ^C	12.7 ^C	11.5 ^C	12.3 ^C	16.4 ^B	11.7 ^C	16.2 ^B		25.8	\$50,000 - \$59,999
	3	6.6 ^D	5.3 ^D	10 ^C	9.8 ^C	11.0 ^C	19.0 ^C	13.1 ^C	25.2 ^B		24.6	\$60,000 - \$79,999
	4	4.8 ^D	3.9 ^D	7.0 ^D	8.9 ^C	10.7 ^C	18.0 ^C	17.0 ^C	29.7 ^B		24.2	\$60,000 - \$79,999
	5	5.0 ^D	5.4 ^D	10.1 ^D	10.1 ^D	11.3 ^D	15.8 ^D	14.6 ^D	27.7 ^C		27.0	\$60,000 - \$79,999
	6+	4.4 ^E	4.5 ^E	7.9 ^E	7.5 ^E	15.5 ^D	17.0 ^D	13.2 ^D	30.0 ^D		29.6	\$60,000 - \$79,999
	Total	10.0^B	8.3^B	10.9^A	10.3^B	11.3^A	16.3^A	12.2^A	20.6^B		26.3	\$50,000 - \$59,999
Year	Household size	< \$20,000	\$20,000 - \$29,999	\$30,000 - \$39,999	\$40,000 - \$49,999	\$50,000 - \$59,999	\$60,000 - \$79,999	\$80,000 - \$99,999	\$100,000 - \$149,999	> \$150,000	Non-response	Median income bracket
2010	1	26.4 ^C	16.9 ^C	15.3 ^D	10.7 ^D	8.7 ^D	11.1 ^D	4.8 ^D	4.8 ^D	1.3 ^E	19.4	\$30,000 - \$39,999
	2	4.6 ^D	7.0 ^C	9.5 ^C	10.4 ^C	9.6 ^C	18.5 ^C	13.6 ^C	16.9 ^C	10.0 ^C	21.5	\$60,000 - \$79,999
	3	4.8 ^D	4.9 ^D	5.5 ^D	6.7 ^D	8.7 ^D	15.5 ^C	14.0 ^C	25.0 ^C	14.7 ^C	21.8	\$80,000 - \$99,999
	4	2.2 ^E	3.8 ^D	4.2 ^D	6.4 ^D	7.4 ^D	13.9 ^C	14.6 ^C	26.9 ^C	20.6 ^C	19.6	\$80,000 - \$99,999
	5	4.4 ^E	2.6 ^E	5.3 ^E	6.5 ^D	5.8 ^D	12.2 ^D	13.8 ^D	25.2 ^C	24.1 ^C	23.1	\$80,000 - \$99,999
	6+	1.8...	1.1...	4.3 ^E	8.2 ^E	3.1...	22.5 ^D	15.0 ^D	24.2 ^D	19.6 ^D	35.7	\$80,000 - \$99,999
	Total	6.4^A	6.4^A	7.6^B	8.4^B	8.3^B	15.6^B	13.0^A	20.3^B	13.9^B	21.2	\$60,000 - \$79,999

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Appendix Table 2: Distribution of Responses to the Long-Term Disability Variable by Age Group and Sex (%)

Year	Male				Female			
	Age	Are you limited in the amount or kind of activity you can do at home, at work or at school because of a long-term physical condition or health problem?		Non-response	Age	Are you limited in the amount or kind of activity you can do at home, at work or at school because of a long-term physical condition or health problem?		Non-response
		Limited	Not Limited			Limited	Not Limited	
1992	15-24	5.5 ^E	94.5 ^A	0.9	15-24	9.1 ^D	90.9 ^A	1.5
	25-34	7.9 ^D	92.1 ^A	1.4	25-34	8.2 ^D	91.8 ^A	2.0
	35-44	11.8 ^D	88.2 ^A	1.7	35-44	15.9 ^D	84.1 ^A	2.5
	45-54	13.7 ^D	86.3 ^A	0.8	45-54	22.4 ^D	77.6 ^B	1.7
	55-64	23.5 ^D	76.5 ^B	2.0	55-64	26.0 ^D	74.0 ^B	2.0
	65+	39.0 ^C	61.0 ^C	5.1	65+	46.1 ^C	53.9 ^C	2.7
	Total	14.5^C	85.5^A	1.8	Total	19.8^B	80.2^A	2.1
1998	15-24	5.9 ^E	94.1 ^A	4.0	15-24	11.2 ^D	88.8 ^A	4.0
	25-34	7.5 ^D	92.5 ^A	6.1	25-34	8.8 ^D	91.2 ^A	6.4
	35-44	8.4 ^D	91.6 ^A	7.3	35-44	14.9 ^D	85.1 ^A	7.3
	45-54	13.2 ^D	86.8 ^A	6.3	45-54	18.4 ^D	81.6 ^A	6.4
	55-64	24.4 ^D	75.6 ^B	9.0	55-64	25.1 ^D	74.9 ^B	8.3
	65+	33.9 ^C	66.1 ^B	13.8	65+	38.3 ^C	61.7 ^B	12.5
	Total	13.4^C	86.6^A	7.6	Total	18.4^B	81.6^A	7.7
2005	15-24	4.5 ^D	95.5 ^A	0.3	15-24	5.0 ^D	95.0 ^A	0.3
	25-34	6.2 ^D	93.8 ^A	0.7	25-34	8.1 ^D	91.9 ^A	0.9
	35-44	7.9 ^D	92.1 ^A	0.7	35-44	10.9 ^D	89.1 ^A	0.9
	45-54	11.5 ^C	88.5 ^A	1.1	45-54	14.4 ^C	85.6 ^A	1.3
	55-64	15.0 ^D	85.0 ^A	1.6	55-64	19.7 ^C	80.3 ^A	3.6
	65+	22.6 ^C	77.4 ^A	5.0	65+	28.1 ^C	71.9 ^A	7.7
	Total	10.6^B	89.4^A	1.6	Total	14.0^B	86.0^A	2.6
2010	15-24	3.5 ^E	96.5 ^A	1.9	15-24	4.8 ^E	95.2 ^A	1.4
	25-34	7.1 ^D	92.9 ^A	1.8	25-34	6.1 ^D	93.9 ^A	2.2
	35-44	6.8 ^D	93.2 ^A	1.6	35-44	9.3 ^D	90.7 ^A	1.5
	45-54	9.3 ^D	90.7 ^A	1.2	45-54	12.4 ^D	87.6 ^A	2.1
	55-64	14.9 ^D	85.1 ^A	1.9	55-64	14.7 ^D	85.3 ^A	1.4
	65+	17.8 ^D	82.2 ^A	2.9	65+	19.4 ^C	80.6 ^A	3.0
	Total	9.6^C	90.4^A	1.9	Total	11.2^C	88.8^A	2.1

Both sexes				
Year	Age	Are you limited in the amount or kind of activity you can do at home, at work or at school because of a long-term physical condition or health problem?		Non-response
		Limited	Not Limited	
1992	15-24	7.3 ^D	92.7 ^A	1.2
	25-34	8.1 ^D	91.9 ^A	1.7
	35-44	13.9 ^C	86.1 ^A	2.1
	45-54	18.0 ^C	82.0 ^A	1.3
	55-64	24.8 ^C	75.2 ^B	2.0
	65+	43.1 ^C	56.9 ^B	3.5
	Total	17.2^A	82.8^A	2.0
1998	Age	Are you limited in the amount or kind of activity you can do at home, at work or at school because of a long-term physical or mental condition or health problem?		Non-response
		Limited	Not Limited	
	15-24	8.5 ^D	91.5 ^A	4.0
	25-34	8.1 ^D	91.9 ^A	6.3
	35-44	11.6 ^C	88.4 ^A	7.3
	45-54	15.8 ^C	84.2 ^A	6.4
	55-64	24.8 ^C	75.2 ^B	8.6
	65+	36.4 ^C	63.6 ^B	13.0
Total	15.9^A	84.1^A	7.7	
2005	Age	Derived variable (see Table 5)		Non-response
		Limited	Not Limited	
	15-24	4.7 ^D	95.3 ^A	0.3
	25-34	7.1 ^C	92.9 ^A	0.8
	35-44	9.4 ^C	90.6 ^A	0.8
	45-54	12.9 ^C	87.1 ^A	1.2
	55-64	17.4 ^C	82.6 ^A	2.7
65+	25.6 ^B	74.4 ^A	6.6	
Total	12.3^A	87.7^A	2.2	
2010	Age	Derived variable (see Table 5)		Non-response
		Limited	Not Limited	
	15-24	4.1 ^D	95.9 ^A	1.7
	25-34	6.6 ^D	93.4 ^A	2.0
	35-44	8.0 ^D	92.0 ^A	1.5
	45-54	10.9 ^C	89.1 ^A	1.7
	55-64	14.8 ^C	85.2 ^A	1.6
65+	18.7 ^C	81.3 ^A	3.0	
Total	10.4^A	89.6^A	2.0	

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Appendix Table 3: Distribution of Responses to Time Stress Questions

Year	Male					Female				
	Age group	0-2 "Yes" responses	3-5 "Yes" responses	6-10 "Yes" responses	Non-response	Age group	0-2 "Yes" responses	3-5 "Yes" responses	6-10 "Yes" responses	Non-response
1992	15-24	41.9 ^C	43.6 ^C	14.5 ^D	0.7	15-24	30.7 ^C	42.1 ^C	27.2 ^C	0.9
	25-34	33.7 ^C	40.0 ^C	26.3 ^C	1.5	25-34	29.3 ^C	36.9 ^C	33.8 ^C	1.1
	35-44	38.1 ^C	37.5 ^C	24.4 ^C	1.2	35-44	31.6 ^C	35.3 ^C	33.1 ^C	1.9
	45-54	38.5 ^C	38.1 ^C	23.4 ^D	1.4	45-54	39.8 ^C	31.5 ^C	28.7 ^C	1.0
	55-64	58.5 ^C	29.4 ^D	12.1 ^D	2.0	55-64	49.5 ^C	37.9 ^C	12.6 ^D	1.4
	65+	83.2 ^B	13.0 ^D	3.8 ^E	6.6	65+	74.8 ^B	19.3 ^D	5.9 ^E	5.3
	Total	45.3^B	35.6^B	19.1^B	1.9	Total	40.7^B	34.2^B	25.2^B	2.0
1998	15-24	37 ^C	44.5 ^C	18.5 ^D	2.5	15-24	24.4 ^C	39.6 ^C	36.0 ^C	2.0
	25-34	25.3 ^C	38.8 ^C	35.9 ^C	4.6	25-34	17.1 ^D	37.5 ^C	45.4 ^C	5.0
	35-44	24.8 ^C	39.8 ^C	35.4 ^C	5.0	35-44	22.8 ^C	36.7 ^C	40.5 ^C	5.1
	45-54	34.1 ^C	37.9 ^C	27.9 ^C	4.8	45-54	35.0 ^C	30.6 ^C	34.4 ^C	4.2
	55-64	56.9 ^C	28.7 ^D	14.4 ^D	7.2	55-64	46.1 ^C	32.8 ^C	21.0 ^D	7.2
	65+	76.8 ^B	19.3 ^D	3.8 ^E	11.1	65+	70.0 ^B	24.1 ^C	6.0 ^E	9.6
	Total	38.4^B	36.5^B	25.1^B	5.6	Total	34.0^B	33.9^B	32.1^B	5.7
2005	15-24	37.2 ^B	44.5 ^B	18.4 ^C	0.1	15-24	29.2 ^C	42.5 ^B	28.2 ^C	0.2
	25-34	27.5 ^C	42.1 ^B	30.3 ^C	0.8	25-34	19.7 ^C	40.4 ^B	39.9 ^B	0.3
	35-44	27.7 ^C	38.4 ^B	33.8 ^B	0.5	35-44	24.2 ^C	35.3 ^B	40.5 ^B	0.4
	45-54	39.7 ^B	34.7 ^B	25.5 ^C	0.6	45-54	33.3 ^C	35.1 ^B	31.7 ^C	0.4
	55-64	55.3 ^B	30.9 ^C	13.8 ^D	0.4	55-64	52.1 ^B	28.9 ^C	19.0 ^C	0.3
	65+	78.6 ^A	17.5 ^C	3.9 ^E	0.7	65+	74.9 ^A	19.4 ^C	5.7 ^D	0.6
	Total	42.3^A	35.5^A	22.2^B	0.5	Total	38.1^A	33.8^A	28.2^A	0.4
2010	15-24	44.4 ^C	41.6 ^C	14.0 ^D	0.9	15-24	32.7 ^C	48.6 ^B	18.6 ^C	0.9
	25-34	34.8 ^C	34.8 ^C	30.4 ^C	0.8	25-34	28.7 ^C	40.0 ^C	31.3 ^C	1.5
	35-44	30.5 ^C	36.1 ^C	33.5 ^C	0.9	35-44	22.7 ^C	35.8 ^C	41.5 ^C	1.0
	45-54	38.4 ^C	37.7 ^C	23.9 ^C	0.8	45-54	35.7 ^C	33.8 ^C	30.5 ^C	1.6
	55-64	59.1 ^B	26.9 ^C	14.0 ^D	1.3	55-64	53 ^B	28.3 ^C	18.7 ^D	0.9
	65+	81.3 ^A	15.4 ^D	3.3 ^E	1.3	65+	72.4 ^B	22.4 ^C	5.2 ^D	1.3
	Total	46.8^A	32.7^B	20.5^B	1.0	Total	40.9^A	34.6^B	24.4^B	1.2

Year	Both Genders				
	Age group	0-2 "Yes" responses	3-5 "Yes" responses	6-10 "Yes" responses	Non-response
1992	15-24	36.4 ^C	42.8 ^B	20.8 ^C	0.8
	25-34	31.5 ^C	38.5 ^B	30.0 ^C	1.3
	35-44	34.9 ^B	36.4 ^B	28.8 ^C	1.6
	45-54	39.1 ^C	34.8 ^C	26.1 ^C	1.2
	55-64	53.9 ^B	33.7 ^C	12.4 ^D	1.7
	65+	78.3 ^A	16.7 ^D	5.0 ^D	5.7
	Total	42.9^A	34.8^A	22.2^A	2.0
1998	15-24	30.9 ^C	42.1 ^B	27.0 ^C	2.3
	25-34	21.2 ^C	38.2 ^B	40.6 ^B	4.8
	35-44	23.8 ^C	38.2 ^B	37.9 ^B	5.1
	45-54	34.6 ^C	34.3 ^C	31.2 ^C	4.5
	55-64	51.4 ^B	30.8 ^C	17.8 ^D	7.2
	65+	72.9 ^B	22.0 ^C	5.1 ^D	10.1
	Total	36.1^A	35.2^A	28.7^A	5.7
2005	15-24	33.3 ^B	43.5 ^B	23.2 ^B	0.1
	25-34	23.6 ^B	41.3 ^B	35.1 ^B	0.5
	35-44	26.0 ^B	36.9 ^B	37.2 ^B	0.5
	45-54	36.5 ^B	34.9 ^B	28.6 ^B	0.5
	55-64	53.7 ^B	29.9 ^B	16.4 ^C	0.3
	65+	76.5 ^A	18.5 ^C	4.9 ^D	0.7
	Total	40.1^A	34.6^A	25.2^A	0.4
2010	15-24	38.7 ^B	45.0 ^B	16.3 ^C	0.9
	25-34	31.7 ^B	37.4 ^B	30.8 ^B	1.2
	35-44	26.6 ^C	35.9 ^B	37.5 ^B	1.0
	45-54	37.0 ^B	35.8 ^B	27.2 ^B	1.2
	55-64	56.0 ^B	27.6 ^C	16.4 ^C	1.1
	65+	76.4 ^A	19.2 ^C	4.3 ^D	1.3
	Total	43.8^A	33.7^A	22.5^A	1.1

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010).

Note: Only includes those who answered "Yes" or "No" to all ten time stress questions. A higher number of "Yes" responses indicates a higher level of time stress.

Appendix B: Distribution of Alternative Variables for the GLT

Appendix Table 4: Distribution of Responses to the Self-Reported Health Question

Male							
Year	Age	Compared to other people your age, how describe health?					Non-response
		Poor	Fair	Good	Very Good	Excellent	
1992	15-24	...	5.1 ^E	25.6 ^C	37.2 ^C	31.6 ^C	0.9
	25-34	1.9 ^E	7.2 ^D	25.3 ^C	37.2 ^C	28.4 ^C	1.3
	35-44	2.1 ^E	6.8 ^D	25 ^C	35.9 ^C	30.3 ^C	1.7
	45-54	3.1 ^E	8.9 ^D	31.3 ^C	23.7 ^D	33.0 ^C	0.8
	55-64	4.2 ^E	11.5 ^D	32.0 ^D	25.5 ^D	26.8 ^D	1.5
	65+	6.4 ^E	16.0 ^D	31.1 ^D	27.6 ^D	18.9 ^D	4.9
	Total	2.7^D	8.5^C	27.6^B	32.5^B	28.8^B	1.7
1998	Age	Compared to other people your age, how would you describe your state of health?					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	...	5.8 ^E	19.6 ^D	38.3 ^C	35.0 ^C	4.0
	25-34	2.9 ^E	8.5 ^D	29.2 ^C	35.2 ^C	24.2 ^C	6.1
	35-44	2.4 ^E	8.7 ^D	26.9 ^C	38.9 ^C	23.1 ^C	7.4
	45-54	3.0 ^E	8.1 ^D	24.7 ^C	33.4 ^C	30.7 ^C	6.4
	55-64	2.8 ^E	12.1 ^D	25.4 ^D	31.2 ^D	28.6 ^D	9.0
	65+	4.1 ^E	11.5 ^D	30.0 ^C	33.6 ^C	20.8 ^D	14.5
Total	2.6^D	8.7^C	25.9^B	35.6^B	27.1^B	7.7	
2005	Age	In general, would you say your health is:					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	...	6.7 ^D	31.1 ^C	36.0 ^C	25.4 ^C	0.1
	25-34	1.1 ^E	8.0 ^D	30.6 ^C	37.9 ^B	22.4 ^C	0.7
	35-44	1.8 ^E	8.7 ^D	31.2 ^C	37.4 ^B	20.9 ^C	0.8
	45-54	3.8 ^D	10.3 ^D	31.9 ^C	36.8 ^B	17.2 ^C	0.7
	55-64	4.0 ^E	13.4 ^D	32.7 ^C	30.9 ^C	19.0 ^C	0.7
	65+	5.4 ^D	15.6 ^C	37.0 ^C	28.6 ^C	13.4 ^D	0.8
Total	2.7^C	10.1^B	32.2^A	35.0^A	20.0^B	0.6	
2010	Age	In general, would you say your health is:					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	...	9.9 ^D	30.5 ^C	34.8 ^C	23.7 ^C	1.0
	25-34	2.6 ^E	8.8 ^D	34.3 ^C	35.0 ^C	19.3 ^C	1.3
	35-44	1.7 ^E	11.3 ^D	34.0 ^C	35.2 ^C	17.8 ^C	1.6
	45-54	3.1 ^E	11.6 ^D	35.8 ^C	33.7 ^C	15.8 ^C	0.9
	55-64	4.3 ^E	12.7 ^D	33.1 ^C	34.0 ^C	15.9 ^D	1.5
	65+	4.6 ^E	16.8 ^D	34.8 ^C	30.5 ^C	13.2 ^D	2.5
Total	2.8^D	11.7^C	33.8^B	33.9^B	17.7^B	1.5	

Female							
Year	Age	Compared to other people your age, how describe health?					Non-response
		Poor	Fair	Good	Very Good	Excellent	
1992	15-24	...	7.6 ^D	27.8 ^C	39.0 ^C	24.7 ^C	1.3
	25-34	1.4 ^E	5.5 ^E	28.1 ^C	34.1 ^C	30.9 ^C	1.9
	35-44	2.6 ^E	6.7 ^D	25.5 ^C	34.9 ^C	30.3 ^C	2.2
	45-54	2.6 ^E	12.7 ^D	30.3 ^C	29.6 ^C	24.7 ^D	1.7
	55-64	5.8 ^E	12.4 ^D	34.9 ^C	26.3 ^D	20.6 ^D	2.0
	65+	7.8 ^E	21.4 ^D	28.6 ^C	28.5 ^C	13.6 ^D	2.6
	Total	3.2^D	10.4^C	28.7^B	32.7^B	25.0^B	2.0
1998	Age	Compared to other people your age, how would you describe your state of health?					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	...	8.5 ^D	30.0 ^C	40.0 ^C	19.9 ^D	4.0
	25-34	2.0 ^E	8.7 ^D	28.4 ^C	37.3 ^C	23.6 ^C	6.3
	35-44	3.2 ^E	9.8 ^D	26.5 ^C	36.3 ^C	24.1 ^C	7.4
	45-54	4.4 ^E	10.2 ^D	26.5 ^C	34.6 ^C	24.3 ^C	6.6
	55-64	5.8 ^E	13.3 ^D	25.3 ^D	30.0 ^D	25.6 ^D	8.3
	65+	5.3 ^E	15.6 ^D	31.8 ^C	30.5 ^C	16.8 ^D	12.6
Total	3.5^D	10.7^C	28.1^B	35.3^B	22.3^B	7.8	
2005	Age	In general, would you say your health is:					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	0.9 ^E	6.8 ^D	34.6 ^C	38.8 ^B	18.9 ^C	0.2
	25-34	1.6 ^E	9.4 ^D	31.8 ^C	36.6 ^C	20.7 ^C	0.5
	35-44	2.6 ^E	10.5 ^D	32.1 ^C	36.2 ^B	18.6 ^C	0.6
	45-54	4.1 ^D	11.4 ^C	31.8 ^C	34.3 ^B	18.4 ^C	0.8
	55-64	5.0 ^D	13.8 ^D	30.6 ^C	31.9 ^C	18.7 ^C	0.6
	65+	5.6 ^D	21.2 ^C	35.5 ^C	27.7 ^C	10.1 ^D	1.2
Total	3.2^C	12.1^B	32.8^A	34.3^A	17.6^B	0.7	
2010	Age	In general, would you say your health is:					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	...	11.9 ^D	34.4 ^C	37.2 ^C	15.3 ^D	0.9
	25-34	1.5 ^E	9.8 ^D	34.2 ^C	39.0 ^C	15.6 ^D	1.8
	35-44	2.8 ^E	11.1 ^D	29.8 ^C	40.3 ^C	16.0 ^D	1.3
	45-54	4.1 ^E	13.4 ^D	31.9 ^C	33.4 ^C	17.1 ^C	1.9
	55-64	5.2 ^E	15.2 ^D	30.2 ^C	33.4 ^C	16 ^D	1.1
	65+	5.0 ^D	16.4 ^D	34.3 ^C	29.5 ^C	14.8 ^D	1.8
Total	3.3^D	13.0^B	32.5^B	35.4^B	15.8^B	1.5	

Both sexes							
Year	Age	Compared to other people your age, how describe health?					Non-response
		Poor	Fair	Good	Very Good	Excellent	
1992	15-24	...	6.3 ^D	26.7 ^C	38.1 ^B	28.2 ^C	1.1
	25-34	1.6 ^E	6.4 ^D	26.7 ^C	35.6 ^B	29.6 ^C	1.6
	35-44	2.4 ^E	6.7 ^D	25.2 ^C	35.4 ^B	30.3 ^C	2.0
	45-54	2.9 ^E	10.8 ^D	30.8 ^C	26.7 ^C	28.9 ^C	1.3
	55-64	5.0 ^E	12.0 ^D	33.5 ^C	25.9 ^C	23.6 ^C	1.8
	65+	7.2 ^D	19.1 ^C	29.6 ^C	28.1 ^C	15.9 ^D	3.4
	Total	2.9^C	9.5^B	28.2^A	32.6^A	26.8^A	1.9
1998	Age	Compared to other people your age, how would you describe your state of health?					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	1.5 ^E	7.1 ^D	24.6 ^C	39.1 ^B	27.7 ^C	4.0
	25-34	2.5 ^E	8.6 ^D	28.8 ^C	36.2 ^B	23.9 ^C	6.2
	35-44	2.8 ^E	9.3 ^D	26.7 ^C	37.6 ^B	23.6 ^C	7.4
	45-54	3.7 ^D	9.2 ^D	25.6 ^C	34.0 ^C	27.5 ^C	6.5
	55-64	4.3 ^E	12.7 ^D	25.3 ^C	30.6 ^C	27.0 ^C	8.6
65+	4.8 ^D	13.9 ^D	31.0 ^C	31.8 ^C	18.5 ^C	13.3	
Total	3.1^C	9.7^A	27.0^B	35.4^A	24.7^B	7.7	
2005	Age	In general, would you say your health is:					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	0.8 ^E	6.8 ^C	32.8 ^B	37.4 ^B	22.2 ^B	0.1
	25-34	1.3 ^E	8.7 ^C	31.2 ^B	37.2 ^B	21.6 ^C	0.6
	35-44	2.2 ^D	9.6 ^C	31.6 ^B	36.8 ^B	19.8 ^C	0.7
	45-54	4.0 ^D	10.9 ^C	31.8 ^B	35.5 ^B	17.8 ^C	0.7
	55-64	4.5 ^D	13.6 ^C	31.7 ^B	31.4 ^B	18.9 ^C	0.6
65+	5.5 ^D	18.7 ^C	36.2 ^B	28.1 ^B	11.5 ^C	1.0	
Total	3.0^C	11.1^A	32.5^A	34.7^A	18.8^A	0.7	
2010	Age	In general, would you say your health is:					Non-response
		Poor	Fair	Good	Very Good	Excellent	
	15-24	1.1 ^E	10.9 ^C	32.4 ^B	36.0 ^B	19.6 ^C	0.9
	25-34	2.1 ^E	9.3 ^D	34.2 ^B	37.0 ^B	17.4 ^C	1.6
	35-44	2.3 ^E	11.2 ^C	31.9 ^B	37.7 ^B	16.9 ^C	1.4
	45-54	3.6 ^D	12.5 ^C	33.8 ^B	33.6 ^B	16.5 ^C	1.5
	55-64	4.7 ^D	14.0 ^C	31.7 ^C	33.7 ^B	16.0 ^C	1.3
65+	4.8 ^D	16.6 ^C	34.6 ^B	30.0 ^C	14.1 ^C	2.1	
Total	3.1^C	12.4^B	33.1^A	34.7^A	16.7^A	1.5	

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Appendix Table 5: Distribution of Average Actual Leisure Time (%)

Male									
Year	Age	Actual leisure time (hours)							Average leisure time (hours)
		0.00 to 2.00	2.01 to 4.00	4.01 to 6.00	6.01 to 8.00	8.01 to 10.00	10.01 to 12.00	> 12.00	
1992	15-24	12.2 ^D	17.3 ^D	20.0 ^D	16.1 ^D	13.8 ^D	9.1 ^D	11.5 ^D	6.6
	25-34	19.4 ^C	21.2 ^C	22.2 ^C	13.9 ^D	9.4 ^D	6.5 ^D	7.4 ^D	5.5
	35-44	23.3 ^C	26.7 ^C	22.2 ^C	11.6 ^D	6.6 ^D	4.7 ^E	4.8 ^E	4.8
	45-54	15.1 ^D	24 ^D	23.9 ^D	15.2 ^D	10 ^D	6.1 ^E	5.7 ^E	5.5
	55-64	12.5 ^D	16.2 ^D	22.0 ^D	17.4 ^D	12.5 ^D	9.6 ^E	9.8 ^E	6.6
	65+	3.9 ^E	8.6 ^E	15.7 ^D	22.1 ^D	18.1 ^D	19.9 ^D	11.7 ^D	8.1
	Total	15.6^C	20.0^B	21.2^B	15.4^C	11.1^C	8.5^C	8.2^C	6.0
1998	15-24	11.7 ^D	15.2 ^D	17.4 ^D	18.2 ^D	13.7 ^D	12.5 ^D	11.3 ^D	6.9
	25-34	23.5 ^C	22.3 ^C	18.9 ^D	13.4 ^D	9.5 ^D	6.7 ^D	5.6 ^E	5.2
	35-44	23.4 ^C	27.0 ^C	19.7 ^C	12.0 ^D	7.2 ^D	5.4 ^D	5.3 ^D	4.8
	45-54	16.6 ^D	26.5 ^C	24.9 ^C	13.0 ^D	9.1 ^D	6.0 ^E	4.0 ^E	5.2
	55-64	10.4 ^D	17.9 ^D	19.9 ^D	17.1 ^D	12.2 ^D	12 ^D	10.6 ^D	6.7
	65+	...	8.9 ^D	17.6 ^D	22.8 ^D	21.2 ^D	15.9 ^D	11.9 ^D	8.2
	Total	16.0^B	20.6^B	19.8^B	15.5^C	11.5^C	9.1^C	7.6^C	6.0
2005	15-24	13.6 ^C	17.4 ^C	20.2 ^C	15.8 ^C	11 ^D	11.7 ^D	10.3 ^D	6.5
	25-34	25.0 ^C	25.3 ^C	16.8 ^C	11.1 ^D	8.0 ^D	5.9 ^D	7.9 ^D	5.1
	35-44	28.9 ^C	29.8 ^C	17.6 ^C	8.4 ^D	5.6 ^D	5.3 ^D	4.5 ^D	4.4
	45-54	24.3 ^C	26.7 ^C	18.8 ^C	10.8 ^D	7.3 ^D	5.6 ^D	6.6 ^D	5.0
	55-64	15.1 ^D	20.9 ^C	20.3 ^C	14.7 ^D	11.8 ^D	9.3 ^D	7.8 ^D	6.1
	65-74	5.9 ^D	9.7 ^D	15.8 ^C	21.1 ^C	20.0 ^C	15.8 ^C	11.7 ^D	7.8
	Total	19.7^B	22.3^B	18.3^B	13.2^B	10.1^B	8.5^B	7.9^B	5.7
2010	15-24	14.5 ^D	15.8 ^D	20.5 ^C	14.4 ^D	13.5 ^D	10.1 ^D	11.2 ^D	6.5
	25-34	22.1 ^C	24.2 ^C	16.5 ^D	13.1 ^D	9.7 ^D	7.5 ^D	6.9 ^D	5.3
	35-44	27.3 ^C	29.7 ^C	17.7 ^C	10.7 ^D	7.1 ^D	2.7 ^E	4.8 ^E	4.4
	45-54	24.5 ^C	24.4 ^C	22.2 ^C	10.5 ^D	7.5 ^D	5.2 ^D	5.8 ^D	4.9
	55-64	15.1 ^D	21.8 ^C	17.5 ^D	16.1 ^D	13.0 ^D	8.2 ^D	8.4 ^D	6.1
	65+	5.6 ^D	11.5 ^D	16.9 ^D	19.2 ^D	18.5 ^D	16.4 ^D	11.9 ^D	7.8
	Total	18.7^B	21.5^B	18.7^B	13.8^B	11.3^C	8.1^B	8.0^B	5.8

Female									
Year	Age	Actual leisure time (hours)							Average leisure time (hours)
		0.00 to 2.00	2.01 to 4.00	4.01 to 6.00	6.01 to 8.00	8.01 to 10.00	10.01 to 12.00	> 12.00	
1992	15-24	15.6 ^D	25.2 ^C	21.1 ^D	14.3 ^D	12.5 ^D	6.1 ^E	5.3 ^E	5.5
	25-34	24.5 ^C	28 ^C	19.6 ^C	14.0 ^D	7.5 ^D	4.4 ^E	2.1 ^E	4.5
	35-44	26.4 ^C	29.5 ^C	19.4 ^D	12.6 ^D	5.5 ^E	4.7 ^E	1.8 ^E	4.3
	45-54	18.2 ^D	24.9 ^D	19.9 ^D	16.2 ^D	11.2 ^D	5.8 ^E	3.8 ^E	5.3
	55-64	9.7 ^E	16.7 ^D	22.6 ^D	17.9 ^D	18.2 ^D	7.3 ^E	7.6 ^E	6.5
	65+	3.9 ^E	7.7 ^D	20.7 ^D	27.6 ^C	20.5 ^D	13.3 ^D	6.4 ^E	7.5
	Total	17.6^B	22.9^B	20.4^B	16.6^C	11.7^C	6.7^C	4.1^C	5.5
1998	15-24	15.1 ^D	22.2 ^C	19.6 ^D	18.3 ^D	11.4 ^D	7.1 ^D	6.3 ^E	5.8
	25-34	26.1 ^C	26.1 ^C	16.6 ^D	13.9 ^D	9.1 ^D	4.3 ^E	3.9 ^E	4.7
	35-44	23.9 ^C	29.3 ^C	19.5 ^C	13.8 ^D	6.1 ^D	4.8 ^E	2.7 ^E	4.5
	45-54	17.9 ^D	25.9 ^C	24.5 ^C	14.9 ^D	7.5 ^D	5.6 ^E	3.7 ^E	5.0
	55-64	8.6 ^E	17.6 ^D	27.3 ^D	17.9 ^D	13.0 ^D	8.8 ^E	6.8 ^E	6.4
	65+	2.8 ^E	9.6 ^D	17.4 ^D	25.9 ^C	21.9 ^C	14.1 ^D	8.3 ^D	7.7
	Total	16.8^B	22.5^B	20.3^B	17.2^B	11.1^C	7.2^C	5.0^C	5.6
2005	15-24	19.1 ^C	23.1 ^C	20.7 ^C	13.2 ^C	11.8 ^D	6.7 ^D	5.3 ^D	5.4
	25-34	28.8 ^C	27.1 ^C	17.5 ^C	11.5 ^D	7.8 ^D	4.1 ^D	3.2 ^E	4.4
	35-44	31.4 ^C	27.6 ^C	17.6 ^C	10.7 ^D	6.7 ^D	3.4 ^D	2.5 ^E	4.1
	45-54	24.6 ^C	26.6 ^C	19.1 ^C	13.9 ^C	8.7 ^D	4.1 ^D	3.0 ^E	4.7
	55-64	15.4 ^C	19.3 ^C	21.3 ^C	17.2 ^C	12.8 ^D	8.3 ^D	5.7 ^D	5.9
	65-74	5.3 ^D	10.6 ^D	17.8 ^C	25.5 ^C	18.5 ^C	12.8 ^C	9.4 ^D	7.5
	Total	21.3^B	22.7^B	18.9^B	15.1^B	10.8^B	6.4^C	4.7^C	5.3
2010	15-24	22.4 ^C	19.1 ^C	22.6 ^C	12.1 ^D	11.8 ^D	7.3 ^D	4.8 ^E	5.3
	25-34	29.0 ^C	26.0 ^C	17.0 ^D	13.3 ^D	8.1 ^D	3.9 ^E	2.7 ^E	4.4
	35-44	34.4 ^C	26.4 ^C	18.0 ^C	10.7 ^D	5.3 ^D	3.3 ^E	1.7 ^E	3.8
	45-54	25.2 ^C	27.0 ^C	19.7 ^C	12.8 ^D	8.9 ^D	3.2 ^E	3.2 ^E	4.6
	55-64	15.3 ^D	21.8 ^C	21.8 ^C	15.4 ^D	12.1 ^D	8.2 ^D	5.3 ^E	5.7
	65+	6.9 ^D	12.2 ^D	19.7 ^C	22.7 ^C	19.2 ^C	11.9 ^D	7.4 ^D	7.1
	Total	22.2^B	22.2^B	19.7^B	14.5^B	10.9^C	6.2^C	4.2^C	5.2

Both sexes									
Year	Age	Actual leisure time (hours)							Average leisure time (hours)
		0.00 to 2.00	2.01 to 4.00	4.01 to 6.00	6.01 to 8.00	8.01 to 10.00	10.01 to 12.00	> 12.00	
1992	15-24	13.9 ^C	21.2 ^C	20.5 ^C	15.2 ^C	13.2 ^C	7.6 ^D	8.5 ^D	6.1
	25-34	21.9 ^C	24.6 ^C	20.9 ^C	14.0 ^C	8.5 ^D	5.4 ^D	4.8 ^D	5.0
	35-44	24.9 ^C	28.1 ^C	20.8 ^C	12.1 ^C	6.1 ^D	4.7 ^D	3.3 ^D	4.5
	45-54	16.6 ^C	24.5 ^C	21.9 ^C	15.7 ^C	10.6 ^D	5.9 ^D	4.7 ^D	5.4
	55-64	11.1 ^D	16.4 ^D	22.3 ^C	17.7 ^D	15.4 ^D	8.4 ^D	8.6 ^D	6.5
	65+	3.9 ^E	8.1 ^D	18.6 ^C	25.3 ^C	19.5 ^C	16.1 ^C	8.7 ^D	7.7
	Total	16.6^A	21.5^A	20.8^A	16.0^A	11.4^A	7.6^B	6.1^A	5.7
1998	15-24	13.4 ^C	18.6 ^C	18.5 ^C	18.3 ^C	12.6 ^C	9.9 ^D	8.8 ^D	6.4
	25-34	24.8 ^C	24.2 ^C	17.8 ^C	13.6 ^C	9.3 ^D	5.5 ^D	4.8 ^D	4.9
	35-44	23.7 ^C	28.1 ^C	19.6 ^C	12.9 ^C	6.7 ^D	5.1 ^D	4.0 ^D	4.6
	45-54	17.2 ^C	26.2 ^C	24.7 ^C	13.9 ^C	8.3 ^D	5.8 ^D	3.9 ^D	5.1
	55-64	9.5 ^D	17.7 ^C	23.7 ^C	17.5 ^C	12.6 ^D	10.4 ^D	8.6 ^D	6.6
	65+	2.3 ^E	9.3 ^D	17.5 ^C	24.6 ^C	21.6 ^C	14.9 ^C	9.8 ^D	7.9
	Total	16.4^A	21.6^B	20.1^A	16.3^A	11.3^A	8.1^B	6.3^B	5.8
2005	15-24	16.3 ^C	20.2 ^C	20.5 ^C	14.5 ^C	11.4 ^C	9.2 ^C	7.9 ^C	6.0
	25-34	26.9 ^B	26.2 ^B	17.1 ^C	11.3 ^C	7.9 ^C	5.0 ^D	5.6 ^D	4.8
	35-44	30.2 ^B	28.7 ^B	17.6 ^C	9.5 ^C	6.1 ^C	4.4 ^D	3.5 ^D	4.3
	45-54	24.4 ^B	26.6 ^B	19.0 ^C	12.4 ^C	8.0 ^C	4.8 ^D	4.8 ^D	4.8
	55-64	15.3 ^C	20.1 ^C	20.8 ^C	15.9 ^C	12.3 ^C	8.8 ^C	6.7 ^D	6.0
	65-74	5.6 ^D	10.2 ^C	16.9 ^C	23.5 ^C	19.2 ^C	14.2 ^C	10.4 ^C	7.6
	Total	20.5^A	22.5^A	18.6^A	14.2^A	10.5^A	7.4^B	6.3^B	5.5
2010	15-24	18.3 ^C	17.4 ^C	21.6 ^C	13.3 ^C	12.7 ^C	8.7 ^D	8.1 ^D	5.9
	25-34	25.5 ^C	25.1 ^C	16.7 ^C	13.2 ^C	8.9 ^D	5.7 ^D	4.8 ^D	4.9
	35-44	30.9 ^B	28.1 ^C	17.9 ^C	10.7 ^C	6.2 ^D	3.0 ^D	3.3 ^D	4.1
	45-54	24.9 ^C	25.7 ^C	20.9 ^C	11.7 ^C	8.2 ^D	4.2 ^D	4.5 ^D	4.7
	55-64	15.2 ^C	21.8 ^C	19.7 ^C	15.8 ^C	12.5 ^C	8.2 ^D	6.8 ^D	5.9
	65+	6.3 ^D	11.9 ^C	18.4 ^C	21.1 ^C	18.9 ^C	13.9 ^C	9.4 ^D	7.4
	Total	20.5^A	21.9^A	19.2^A	14.2^B	11.1^B	7.1^A	6.1^B	5.5

Source: Statistics Canada, General Social Survey (1992, 1998, 2005, and 2010)

Appendix C: Regression Results

Appendix Table 6: Correlates of Good Life Time

		Male	Female
Number of Observations		5,339	6,529
10 year age group (reference group is 15-24)	25-34	-0.466** (0.199)	-0.167 (0.18)
	35-44	-0.417* (0.217)	-0.176 (0.18)
	45-54	-0.099 (0.206)	-0.156 (0.182)
	55-64	0.301 (0.215)	0.212 (0.198)
	65+	0.389* (0.229)	0.145 (0.203)
Urban/rural indicator (reference group is urban)	Rural	-0.097 (0.104)	-0.008 (0.092)
	Other (provinces not divided into urban/rural in the dataset)	-0.308*** (0.083)	-0.247*** (0.079)
Marital status (reference group is never married)	Married/Living common-law	0.071 (0.129)	0.2* (0.113)
	Divorced/Widowed/Separated	-0.169 (0.153)	-0.354*** (0.122)
Educational attainment (reference group is less than secondary)	University degree	0.954*** (0.128)	1.308*** (0.137)
	College diploma	0.464*** (0.118)	0.907*** (0.126)
	Some post-secondary	0.279** (0.133)	0.803*** (0.147)
	High school graduate	0.306** (0.137)	0.54*** (0.138)
Labour Force Status (reference group is full-time work)	Part-time work	-0.034 (0.173)	-0.092 (0.119)
	Student	-0.149 (0.205)	-0.42** (0.204)
	No hours of employment	-0.838*** (0.104)	-0.322*** (0.086)
Number of children		-0.154*** (0.055)	-0.329*** (0.05)
Number of household earners		0.370*** (0.067)	0.459*** (0.06)
Immigrant		-0.642*** (0.101)	-0.529*** (0.095)

Note: *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.1$