

Good Health is Not the Same as a Good Life: Survey Results from Brandon, Manitoba

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Abstract The aim of this investigation was to obtain some baseline self-reported data on the health status and overall quality of life of a sample of residents of the city of Brandon, Manitoba aged 18 years or older, and to measure the impact of a set of designated health determinants, comparison standards and satisfaction with diverse domains of life on their health and quality of life. In May and June 2010, 2,500 households from the city of Brandon, Manitoba were randomly selected to receive a mailed out questionnaire and 518 useable, completed questionnaires were returned. Baseline health status data were obtained using the 8 SF-36 dimensions of health and 13 items from the United States Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Determinants of health and overall quality of life included measures of socializing activities, a Good Neighbourhood Index, Social Support Index, Community Health Index, a measure of free-time exercise levels, health-related behaviours, use of drugs, health care issues, a set of domain-specific quality of life items, a set of measures concerning criminal victimization, worries and behaviours concerning victimization and the basic postulates of Multiple Discrepancies Theory. Overall life assessment, dependent variables included Average Health, happiness, a single item measure of satisfaction with life as a whole, a single item measure of satisfaction with the overall quality of life, the Satisfaction With Life Scale, Contentment with Life Assessment Scale and a Subjective Wellbeing Index.

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Using multiple regression, we explained as much as 75% of the variance in Subjective Wellbeing scores and as little as 45% in happiness scores. Four clusters of health determinants explained from 20% (Happiness) to 44% (Average Health) of the variance in the dependent variables. Adding comparison standards and domain satisfaction scores to the set of health determinants increased our total explanatory power by only 2% points for Average Health (from 44 to 46%), but more than doubled our explanatory power for Happiness (from 20 to 45%) and for satisfaction with the overall quality of life (from 31 to 67%). As well, our explanatory power for the single item of Life Satisfaction increased from 34 to 66%, for the Satisfaction With Life Scale from 39 to 74%, for the Contentment With Life Assessment Scale from 36 to 60%, and for Subjective Wellbeing from 42 to 75%. This provided very clear evidence that self-perceived good health is not equivalent to perceived quality of life, confirming evidence reported in our earlier studies. The three most important take-home messages from this investigation are (1) in assessing the relative influence of any alleged determinants of health and the quality of life, different sets of alleged determinants will appear to be more or less influential for different dependent variables. Therefore, (2) researchers should use diverse sets of determinants and dependent variables and (3) it is a big mistake to use measures of health status as if they were measures of the perceived quality of life.

Keywords Perceived quality of life · Health status · Life satisfaction · Happiness · Satisfaction with the overall quality of life · Satisfaction with life scale · Contentment with life assessment scale · Subjective wellbeing

1 Introduction

The aim of this investigation is to obtain some baseline self-reported data on the health status and overall quality of life of a sample of residents of the city of Brandon, Manitoba (pop. approx. 42,000) aged 18 years or older, and to measure the impact of a set of designated health determinants, comparison standards and satisfaction with diverse domains or aspects of life on their health and quality of life measured with 7 different indicators. The paper begins with a description of the sampling technique, questionnaire, demographic composition of the sample and a descriptive analysis of measures of health status, health-related behaviour, health care and (domain specific and overall) quality of life. Multivariate explorations, including an overview of the variance explained and the most influential explanatory measures for 7 dependent variables, form the central analytic findings of the paper. In the conclusion, key highlights are summarized which outline the importance of the research in better understanding health and quality of life, and differentiating the two.

2 Sampling Technique, Questionnaire and Sample Demographics

In May and June 2010, 2,500 households from the city of Brandon, Manitoba were randomly selected and mailed a 16-page questionnaire that could be completed by any (one) resident in the household 18 years of age or older. The first three and a half pages contained the 36-item Medical Outcomes Study Short Form (SF-36) profile (Ware et al. 1993) and 13 items from the United States Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System (BRFSS) (CDC 2000). There are 14 items in

the BRFSS, the first of which is a general health question that is also the first question in SF-36. Seven items measuring socializing activities and social support came next, followed by 6 items forming a Community Health Index and an item measuring free-time exercise levels. This was followed by 9 questions about health-related behaviours, e.g., tobacco smoking, drinking alcoholic beverages, eating and sleeping routines, and use of over-the-counter and prescription drugs. Ten items were devoted to health care issues, e.g., rating personal and most people's health care, frequency of seeking medical and dental care in the past year, types of health problems requiring care, and distances travelled to receive care. After these, there were 3 items concerning housing needs and problems, followed by a standard set of 41 quality of life items, e.g., happiness and satisfaction with life as a whole, and satisfaction with specific domains of life like one's housing, friendships and financial security. Seven items were included concerning the fundamental postulates of Multiple Discrepancies Theory (Michalos 1985), and 11 more to craft 2 additional dependent variables, i.e., the Satisfaction with Life Scale (SWLS from Diener et al. 1985) and Contentment With Life Assessment Scale (CLAS from Lavallee et al. 2007). Ten items focused on neighbourhood issues and 13 on growth in the city over the past 10 years which were followed by two pages of items concerning crime, personal safety, worries about and behaviours concerning criminal victimization and actual victimization. The last two pages had basic demographic questions, including age, gender and education.

By the end of June we had received 518 (21%) useable, completed questionnaires. A simple random sample of this size provides sampling error margins of about plus or minus 4% points on responses, 19 times out of 20. Additional non-sampling errors may occur as a result of questions being poorly expressed or understood, respondent fatigue, mood or bias, the weather and other things that are often difficult to measure and beyond the researchers' control.

Of the 503 respondents who identified their gender, 53% (267) were females. Sixty percent (308) of those who answered the marital status question were married. The average age was 60, and the range ran from 18 to 94. Twenty-nine percent of the 482 respondents answering the question had a university degree at the bachelor's level or higher. Forty-eight percent reported their employment status as retired, 33% were employed full-time and 8% part-time. The total household income question had 399 respondents, providing an average income of \$72,978. Regarding cultural or ethnic background, 77% simply reported being Canadian and 3% reported being First Nations or Métis. Using standard measures of Body Mass Index, 4.9% of our sample would be classed as having insufficient weight, 31.4% having acceptable weight, 25.9% with some excess weight and 37.9% overweight.

According to the 2006 census for the City of Brandon, there were 31,495 residents aged 20 or older, with 16,804 (53%) women, 51% were legally married and 14% had a "university certificate, diploma or degree" (Statistics Canada 2006). Although the sample size and range is not clear, according to the Brandon Regional Health Authority (2009, pp. 4–10), about 38% of the adult population of Brandon would be classed as overweight and 21% as obese. Therefore, it is fair to say that our sample is representative of the Brandon population regarding percentages of women and men, but married people, older people and people who have some excess weight or are overweight are over-represented. Given the over-representation of older people, it may safely be assumed that any average measures of health status would be improved somewhat if younger people were appropriately represented. It may also be assumed that the average level of awareness of and attention to health status would be higher in our sample than in a more representative sample.

3 Health Status Measures

The 36-item Medical Outcomes Study Short Form (SF-36) profile is sometimes referred to as the 'gold standard' for health status measurement and its norms for several populations provide useful benchmarks for other developed countries (Ware and Sherbourne 1992; McHorney et al. 1993, 1994; Ware et al. 1993, 1994). Table 1 summarizes its basic elements.

The SF-36 scale works best as a health profile measure with eight dimensions, rather than as a single summative measure. SF-36 profile scores are designed such that 0 represents the worst and 100 represents the best state of health. Using a panel study of 3,445 patients McHorney et al. (1994), found that the internal-consistency reliability (Cronbach's alpha) for each of the eight concepts measured in the SF-36 with this panel ranged from 0.78 to 0.93, with a mean of 0.85.

Tables 2, 3, and 4 summarize the eight SF-36 profile scores for the respondents in Brandon taken all together and for males and females. The most useful comparisons that can be made with surveys like this one are usually those involving the same population at different times, and those tracking the very same people over time (longitudinal panel studies) are even better because they allow examination of changes at the level of individuals (versus aggregate changes) over time. In the absence of both kinds of comparisons for this study, we thought it would provide some context for considering results obtained from the Brandon sample if we included results obtained from other samples taken from earlier surveys. Accordingly, we included scores from samples from the Bella Coola Valley (pop. approx. 2300) and Prince George (pop. approx. 71,000), British Columbia;

Table 1 Content of the SF-36 questionnaire

Concepts	Number of items	Meaning of low scores	Meaning of high scores
Physical functioning	10	Limited a lot in performing all physical activities including bathing or dressing due to health	Performs all types of physical activities including the most vigorous without limitations due to health
Role physical	4	Problems with work or other daily activities as a result of physical health	No problems with work or other daily activities as a result of physical health
Bodily pain	2	Very severe and extremely limiting pain	No pain or limitations due to pain
General health	5	Evaluates personal health as poor and believes it is likely to get worse	Evaluates personal health as excellent
Vitality	4	Feels tired and worn out all of the time	Feels full of pep and energy all of the time
Social functioning	2	Extreme and frequent interference with normal social activities due to physical or emotional problems	Performs normal social activities without interference due to physical or emotional problems
Role emotional	3	Problems with work or other daily activities as a result of emotional problems	No problems with work or other daily activities as a result of emotional problems
Mental health	5	Feelings of nervousness and depression all of the time	Feels peaceful, happy, and calm all of the time
Reported health transition	1	Believes general health is much worse now than one year ago	Believes general health is much better now than one year ago

Source: Ware et al. (1993, pp. 3:5)

Aberdeen, Scotland (pop. approx. 210,400) and the United States. While the age range of the respondents for each of the 6 samples is fairly similar, the composition may be somewhat different.

Table 2 lists the scores for our Brandon respondent group as a whole. The scores range from 83.5 for Social Functioning to 59.3 for Vitality, with a mean of 73.9. This mean score is similar to that for Aberdeen (73.7), higher than that of the Bella Coola Valley sample (62.7) and lower than the scores for the two Prince George samples and the USA sample. The latter is the highest of the lot (76.6). Using these means of the eight scores as broad and relatively rough indicators of the health of the 6 samples listed in Table 2, the Brandon sample would rank fourth.

Because the first question in the SF-36 list of questions was used in the Brandon RHA survey, an approximate comparison can be made between our two samples. For our sample, 47.6% reported being in excellent or very good health, compared to about 61% for the Brandon RHA sample (pp. 4–4). According to Statistics Canada's National Population Health Surveys and Canadian Community Health Survey, the national figures for this question ran from 63.1% in 1994 to 59.6% in 2007 (Michalos et al. 2010). Presumably, our sample score is lower because of the over-representation of older people.

Table 3 lists the scores for males in the 5 groups for which we had data. The scores for Brandon male respondents range from 85.0 for Social Functioning to 61.9 for Vitality, with a mean of 75.0. This mean puts the sample of Brandon males in third place among the 5.

Table 4 lists the scores for females in the 5 groups. The scores for Brandon female respondents range from 82.1 for Social Functioning to 57.1 for Vitality, with a mean of 73.1. So, on average our female respondents are not as healthy as our males. The Brandon female scores put them in fourth place among the 5 samples.

Because older people are relatively over-represented in the Brandon sample, we thought it might be worthwhile to make somewhat more precise comparisons using male and female groups aged 55–64 (younger old), and 65 and older (older old). Considering the relatively small sample sizes involved, one should exercise extra caution about the figures obtained. Tables 5 and 6 display our results.

Table 2 SF-36 comparisons of country and city scores

Health dimension	Brandon 2010	Bella C. Valley 2002	P.G 1998	P.G. 1999	Aberdeen 1993	USA 1993
PF	78.5	82.3	87.2	87.7	79.2	84.2
RP	70.4	67.5	81.8	76.6	76.5	81.0
BP	68.5	54.6	60.9	72.2	76.9	75.2
GH	69.6	55.5	73.7	71.7	68.7	72.0
VT	59.3	54.0	58.4	58.4	61.2	60.9
SF	83.5	50.0	83.5	81.8	78.6	83.3
RE	82.9	75.1	80.7	78.1	75.0	81.3
MH	78.2	62.4	74.5	75.2	73.7	74.7
Average	73.9	62.7	75.1	75.2	73.7	76.6

Brandon, May 2010, N = 494, ages 18–94; Bella Coola Valley, March 2002, N = 687, ages 17–90; Prince George, November 1998, N = 719, ages 17–92; Prince George, November 1999, N = 438, ages 17–86; Aberdeen, N = 542, ages 18 and older; USA, N = 2,474, ages 18 and older

Sources: Ware et al. (1993), Garratt et al. (1993), Michalos et al. (2000), Michalos and Zumbo (2003), and Michalos et al. (2005)

Table 3 SF-36 comparisons of city and country male scores

Health dimensions	Brandon 2010	Bella C. Valley 2002	P.G. 1998	P.G. 1999	USA 1993
PF	80.9	82.4	87.1	88.3	87.2
RP	69.4	66.7	83.6	80.0	86.6
BP	68.7	53.4	61.9	74.5	76.9
GH	69.0	54.7	74.0	72.4	73.5
VT	61.9	54.1	60.2	59.6	63.6
SF	85.0	50.8	85.3	82.5	85.2
RE	84.9	76.2	81.5	78.4	83.3
MH	80.0	63.0	75.5	76.0	76.4
Average	75.0	62.7	76.1	76.5	79.1

Brandon, May 2010, N = 227, ages 20–94; Bella Coola Valley, N = 292, ages 17–90; Prince George, November 1998, N = 365, ages 17–82; Prince George, November 1999, N = 202, ages 17–86; USA, N = 1055, ages 18 and older

Source: Ware et al. (1993), Michalos et al. (2000), Michalos and Zumbo (2003), and Michalos et al. (2005)

Table 4 SF-36 comparisons of city and country female scores

Health dimensions	Brandon 2010	Bella C. Valley 2002	P.G. 1998	P.G. 1999	USA 1993
PF	76.8	82.1	87.3	87.1	81.5
RP	72.0	68.1	79.8	73.8	77.8
BP	68.2	55.5	59.7	70.2	73.6
GH	70.0	56.1	73.4	71.2	70.6
VT	57.1	54.0	56.5	57.3	58.4
SF	82.1	49.4	81.7	81.1	81.5
RE	81.8	74.3	79.8	77.8	79.5
MH	76.8	61.9	73.5	74.5	73.3
Average	73.1	62.7	74.0	74.1	74.5

Brandon, May 2010, N = 265, ages 18–93; Bella Coola Valley, N = 394, ages 17–88; Prince George, November 1998, N = 352, ages 17–92; Prince George, November 1999, N = 236, ages 20–86; USA, N = 1,412, ages 18 and older

Sources: Ware et al. (1993), Michalos et al. (2000), (2001), Michalos and Zumbo (2003), and Michalos et al. (2005)

Examining the Brandon figures for younger old males versus older old males (Table 5), one finds that the average value of the former is as expected, higher than that of the latter, namely, 81.3 versus 68.3, respectively. That is the case for the samples from Prince George in 1999 and 2005, and for the USA in 1993. The 13% point difference in average scores for the Brandon samples of younger old and older old is larger than the differences for the other 3 samples. What drives the older old figures down are the scores for Role Physical (49.4) and Vitality (59.2). In fact, the same thing happens for the 2 Prince George samples. For the USA sample, while the Vitality score is the lowest of the 8, the General Health score is second lowest.

Examining the Brandon figures for younger old females versus older old females (Table 6), one finds that the average value of the former is again as expected, higher than that of the latter, namely, 70.5 versus 67.7, respectively. The female average for younger

Table 5 Comparisons of older males' scores on the 8 health dimensions of SF-36

Dimension	Brandon 55–64 N = 67	Brandon 65 and over N = 81	PG 1999 55–64 N = 90	PG 1999 65 and over N = 189	PG 2005 55–64 N = 86	PG 2005 65 and over N = 147	USA 1993 55–64 N = 105	USA 1993 65 and over N = 293
PF	86.7	69.1	82.7	66.8	84.3	69.1	79.9	65.8
RP	83.3	49.4	74.4	55.7	79.0	57.9	76.0	59.7
BP	73.6	64.1	67.0	64.3	70.7	61.1	68.5	68.8
GH	70.8	64.5	65.8	62.2	63.3	62.8	66.6	58.6
VT	66.3	59.2	61.5	58.8	64.3	57.5	63.0	57.8
SF	91.3	81.6	82.4	79.5	85.4	83.2	83.6	79.7
RE	96.0	77.9	83.7	79.9	85.0	81.3	81.1	76.9
MH	82.1	80.5	77.9	79.0	76.9	79.2	76.9	77.4
Average	81.3	68.3	74.4	68.3	76.1	69.0	74.5	68.1

Sources: Michalos et al. (2007), and Ware et al. (1993)

Table 6 Comparisons of older females' scores on the 8 health dimensions of SF-36

Dimension	Brandon 55–64 N = 58	Brandon 65 and over N = 88	PG 1999 55–64 N = 205	PG 1999 65 and over N = 368	PG 2005 55–64 N = 179	PG 2005 65 and over N = 235	USA 1993 55–64 N = 164	USA 1993 65 and over N = 413
PF	76.5	62.2	79.0	60.4	81.2	64.9	73.1	61.9
RP	70.3	55.1	70.1	54.7	70.5	55.0	71.6	56.1
BP	63.1	63.0	64.8	56.6	66.3	57.5	66.6	63.4
GH	67.9	64.5	68.1	63.9	63.6	63.4	62.9	61.6
VT	55.5	57.5	60.3	54.1	61.3	57.5	58.1	55.5
SF	79.7	78.0	81.7	78.7	83.2	79.8	79.4	77.0
RE	75.9	82.1	82.4	78.6	81.3	80.2	79.5	73.4
MH	75.1	79.3	77.2	76.4	77.6	77.5	73.4	74.7
Average	70.5	67.7	73.0	65.4	73.1	67.0	70.6	65.5

Sources: Michalos et al. (2007), and Ware et al. (1993)

old people (70.5) is quite a bit lower than that for younger old males (81.3). For the samples from Prince George in 1999 and 2005, and the USA in 1993, the younger old average scores for females are also higher than those of the older old. The differences among the female pairs of younger old versus older old samples is not as great as the differences for the males. While the Brandon difference was 13% points for males, it was only 2.8% points for females. The largest difference occurs with the Prince George 1999 sample (7.6). The 7.6% point difference in average scores for the Prince George 1999 samples of younger old and older old is larger than the differences for the other 3 samples. What drives the female older old figures down is a bit more complicated than the male picture. For the Brandon female older old sample, the lowest scores are for Role Physical (55.1) and Vitality (57.5). For the Prince George 1999 sample and the USA samples, the lowest scores are for Vitality, followed by that for Role Physical. For the Prince George 2005 sample, Role Physical is lowest, followed by a tie between Bodily Pain and Vitality.

The question we started with concerning the relative ranking of the Brandon sample of younger old and older old compared to the 2 samples from Prince George and the USA sample has been clearly answered. The Brandon sample of male younger old people had the highest average among the 4 samples and the Brandon sample of male older old people had the second highest average. In both cases the Brandon male sample for this age group moved up from last place. The Brandon sample of female younger old people ranked 3 out of 4 and the sample of female older old people ranked first. So, in both cases there was improvement, with the female older old sample moving from fourth place to first and the younger old sample moving from fourth place to third. Probably, then, Brandon's relatively low overall ranking (Table 2) was not the result of its having over-representation of older people, because our sample of older people generally compared well with samples of older people in other studies.

Since 1993 the United States Centers for Disease Control and Prevention (CDC) have been using a set of indicators to track the population health status of residents of all 50 States (CDC 2000). The whole system is known as the Behavioral Risk Factor Surveillance System (BRFSS). There were 4 items in the original core of the system and 10 were added to it in January 1995. Table 7 lists results from 6 surveys for 3 of the original items from the BRFSS that provide good summaries of people's health from different perspectives. Specifically, the items measure the number of days in the past 30 in which respondents experienced "not good health" physically, the number of days that were mentally "not good" and the number on which "not good" physical or mental health prevented respondents from engaging in their usual activities. All of the surveys were based on mailout questionnaires to adults 18 years of age or older in Brandon and Bella Coola Valley, Quesnel (pop. approx. 10,000) and Prince George, British Columbia.

The first two columns of the table reveal that on average the Brandon sample ran second behind the Bella Coola Valley sample for "not good" physical health days, with scores of 5.0 and 6.5, respectively. Brandon (3.3) was fourth behind Bella Coola Valley (5.5), Quesnel (4.2) and Prince George 2000 (3.5) for "not good" mental health days. For limited activity days, Bella Coola Valley (4.1) was first and Brandon (3.0) second among the 6 samples.

Table 8 lists 5 other items from the CDC collection that were included in our questionnaire. The formats are the same as above, with respondents being asked to indicate the number of days in the past 30 in which they felt one way or another. The first four are negative and the last is positive. On average, the Brandon sample scores are better than the Bella Coola Valley sample scores on all 5 items. Brandon respondents felt sad on 2.9 of the

Table 7 Mean scores for physical and mental not good health days, limited activity days, general health; 6 surveys

Indicator	Brandon 2010	Bella C. Valley 2002	Quesnel May 2000	P.G. Apr. 2000	P.G. Nov. 2000	P.G. May 2001
Sample size	505	687	642	607	437	695
P. H. not good days	5.0	6.5	3.7	3.4	4.1	3.2
M. H. not good days	3.3	5.5	4.2	3.5	3.2	3.1
Limited activity days	3.0	4.1	2.8	2.1	1.5	2.2

Sources: Michalos and Zumbo (2003), Michalos and Zumbo (2000), Institute for Social Research and Evaluation surveys, 2000–2001, Michalos et al. (2005)

Table 8 Mean scores for additional five CDC items

Indicator: days in the past 30 in which you felt	Brandon 2010 (N = 497)	Bella C. Valley 2002 (N = 687)
Sad, blue or depressed	2.9	5
Worried, tense or anxious	3.7	6.7
You did not get enough sleep	7.3	9.5
Pain limited your usual activities	3.9	5
Very healthy and full of energy	17.6	16.4

Source: Michalos et al. (2005)

past 30 days, worried on 3.7 days, did not get enough sleep on 7.3 days and had their usual activities limited by pain on 3.9 days. In general, they felt “very happy and full of energy” on 17.6 of the past 30 days.

4 Health-Related Behaviour and Exposure

Tables 9, 10, and 11 review health-related behaviour and exposure issues, including some comparisons with the Bella Coola Valley survey and the 1998 Prince George survey. Table 9 lists the percentages of respondents who were tobacco smokers and/or were exposed to second-hand smoke. Eighty-four percent of the Brandon sample reported that they never smoked, compared to 66.5% of the Bella Coola Valley sample and 77.1% of the Prince George sample. In Brandon, 84.7% said they were never exposed to second-hand smoke at home, compared to 68.7% in Bella Coola Valley and 68.5% in Prince George. Thirty-seven percent of Brandon respondents reported that they were never exposed to second-hand smoke outside the home, compared to 20.4% of respondents in Bella Coola Valley and only 8.6% of the Prince George respondents. According to the Brandon RHA survey (pp. 4–9), about 25% of their sample were current smokers, compared to 15.7% of our sample.

Table 10 lists the percentages of respondents who drank alcoholic beverages with diverse frequencies and drinks per sitting. Nineteen percent of Brandon respondents reported that they never drank and 6.5% reported that they drank alcoholic beverages every day. Thirty-four percent of respondents in the Bella Coola Valley said they never drank and 5.4% drank every day, compared to 12.3% total abstainers and 5.0% daily drinkers in Prince George. Of those who drank, 80.2% of Brandon respondents reported that they drank an average of 1 or 2 drinks per sitting, compared to 63.6% of Bella Coola Valley respondents and 71.3% of Prince George respondents. At the other end of the scale, 15.4% of Bella Coola Valley respondents said that they drank 5 or more drinks per sitting on average, compared to 3.7% of Brandon respondents and 7.0% of Prince George respondents. Thus, Brandon respondents tended to be lighter drinkers in a given sitting.

Table 11 shows that on average, in their leisure time, Brandon respondents engaged in strenuous physical exercise for 15 min or more less than once per week (0.75) in the past month, moderate exercise about 2.4 times per week and mild exercise about 4.7 times per week. Bella Coola Valley respondents had more mild and strenuous exercise per week (5.5 and 1.0, respectively) and less moderate exercise (2.3 times per week).

Table 9 Smoking behaviour and exposure

Behaviour and exposure	Brandon 2010 (N = 510)	Bella C. Valley 2002 (N = 685)	P.G. 1998 (N = 352)
<i>Frequency of smoking tobacco (%)</i>			
Never	84.3	66.5	77.1
Occasionally	4.5	10.2	6
Daily	7.3	13.1	8
Hourly	3.9	10.2	8.9
<i>Frequency of exposure to second-hand smoke at home</i>			
Never	84.7	68.7	68.5
Occasionally	8.0	13.7	15.8
Daily	4.9	11.6	10.1
Hourly	2.3	6.0	5.6
<i>Frequency of exposure to second-hand smoke outside home</i>			
Never	36.7	20.4	8.6
Occasionally	57.1	64.4	74.4
Daily	5.5	12.1	15.2
Hourly	0.8	3.1	1.8

Source: Michalos et al. (2000), 2005

Table 10 Drinking alcoholic beverages behaviour

Place →	Brandon 2010 (N = 510)	Bella C. Valley 2002 (N = 677)	P.G. 1998 (N = 352)
<i>Frequency of drinking</i>			
Never	19.4	33.8	12.3
Less than once a month	18.4	17.1	22.5
Once a month	8.8	5	7.7
2–3 times a month	15.7	13	16.6
Once a week	10.0	6.4	9.4
2–3 times a week	13.3	12.4	16.1
4–6 times a week	7.8	6.9	10.5
Every day	6.5	5.4	5
<i>Average # drinks per sitting</i>			
	(N = 404)	(N = 448)	NA
1 or 2 drinks	80.2	63.6	71.3
3 or 4 drinks	16.1	21	21.7
5 or more drinks	3.7	15.4	7

‘Drink’ means one bottle or can of beer or a glass of draft, one glass of wine or a wine cooler, or one straight or mixed drink with one and a half ounces of hard liquor

Source: Michalos et al. (2000), and 2005

5 Health Care

Table 12 lists results of several questions related to respondents’ views about health care and aspects of their own care, including a column of scores from the Bella Coola Valley

Table 11 Mean number of times per week in the past month that respondents engaged in various kinds of physical activities in their leisure time for 15 min or more

Free time activities	Brandon 2010	Bella C. Valley 2002
Strenuous exercise (e.g., running, jogging, long distance cycling, singles tennis)	0.75 (N = 457)	1.0 (N = 567)
Moderate exercise (e.g., easy cycling, volleyball, easy swimming, folk dancing)	2.4 (N = 473)	2.3 (N = 585)
Mild exercise (e.g., yoga, golf, gardening, easy walking.	4.7 (N = 496)	5.5 (N = 616)

Source: Michalos et al. (2005)

Table 12 Views about and aspects of health care

Health care issue	Brandon 2010 (N = 516)	Bella C. Valley 2002 (N = 663)
Mean rating of respondents' own health care services ^a	3.5	3.4
Mean rating of health care services for most people ^a	3.3	3.3
Percent having a family physician	91.6	59.9
Number of times seen a physician in the past year	4.9	5.6
Number of times been in hospital in the past year	0.3	1.4
Distance traveled for routine medical care last time it was needed (km)	6.5	67.9
Distance traveled for specialist care last time it was needed (km)	84.3	579

^a Ratings on 5 point scale with 1 = poor, 2 = fair, 3 = average, 4 = good and 5 = excellent

Source: Michalos et al. (2005)

survey for comparison. For the Brandon sample, on a 5-point scale from 1 = poor to 5 = excellent, the mean respondent rating for their own health care services was 3.5, slightly better than their mean rating (3.3) for the health care services of most people. The Bella Coola Valley scores for the same questions were 3.4 for their own versus 3.3 for others.

In Brandon, 91.6% of respondents said they had a family physician, compared to 59.9% in the Bella Coola Valley. Nevertheless, Brandon respondents reported seeing a physician on average 4.9 times in the past year, compared to 5.6 times per year for Bella Coola Valley respondents. The former respondents had also been in hospital less often than the latter respondents, 0.3 times compared to 1.4 times per year. On average, Brandon respondents reported traveling 6.5 km the last time they needed routine medical care, compared to 67.9 km for Bella Coola Valley respondents. For specialist care, Brandon respondents traveled on average 84.3 km, compared to 579.0 km for Bella Coola Valley respondents.

Eighty-five percent of Brandon respondents had a dentist and had seen their dentist on average 1.5 times in the past year, compared to 61.4% of Bella Coola Valley respondents who had a dentist and had seen their dentist 1.6 times in the past year.

6 Quality of Life Measures

Table 13 lists results for 19 measures of the quality of people's lives, including 15 measures of specific domains or aspects of life (e.g., housing, job, family relations) and 4 overall measures (e.g., overall happiness, satisfaction with life as a whole). All of the items were formatted in 7-point scales running from 1 = very dissatisfied (or very unhappy), through 4 = evenly balanced, to 7 = very satisfied (or very happy). Besides the Brandon sample, the table includes samples from the Bella Coola Valley and Prince George in May 2001, Quesnel in May 2000 and Jasper, Alberta (pop. approx. 4,300) in July 1997. The average score for the Brandon respondents was 5.4, ranging from 4.0 for satisfaction with federal government officials to 6.4 for satisfaction with living partners. Each of the average scores for the other 4 samples are lower than the Brandon average, i.e., Quesnel and Jasper (5.2 each), Prince George (5.1) and Bella Coola Valley (5.0). While the Brandon sample had 4 scores of 6.0 or above, there was only one such score in the other 4 samples. For

Table 13 Mean satisfaction and happiness levels

How satisfied are you with	Brandon 2010	Bella C. Valley 2002	P.G. May 2001	Quesnel May 2000	Jasper July 1997
Your house, apartment	6.0	5.4	5.6	5.6	5.7
Your neighborhood	6.0	5.7	5.5	5.4	5.7
Your family relations	6.0	5.7	5.9	5.9	5.8
Your living partner	6.4	5.8	6.2	6.3	5.4
Your job	5.5	5.1	5.2	5.4	4.6
Your life as a whole	5.7	5.5	5.7	na	5.9
Your friendships	5.7	5.7	5.8	5.8	6.0
Your health	5.4	4.9	5.4	5.5	5.8
Your religion/spiritual fulfilment	5.3	5.2	5.2	5.4	4.5
Your overall standard of living	5.8	5.4	5.4	5.3	5.7
Your financial security	5.3	4.4	4.6	4.7	4.9
Your recreation activities	4.9	4.6	5.1	4.8	na
Your self-esteem	5.6	5.2	5.5	5.7	5.8
Your personal safety around home	5.7	5.8	5.6	na	na
Federal government officials	4.0	3.3	2.9	3.6	3.0
Provincial government officials	4.1	3.3	2.6	3.7	3.0
Local government officials	4.4	3.6	3.4	4.1	na
Your overall quality of life	5.8	5.5	5.7	5.5	5.9
Your overall happiness	5.8	5.5	5.8	5.6	5.8
Average	5.4	5.0	5.1	5.2	5.2
N	512	687	695	642	447

Sources: Michalos and Zumbo (2000), Zumbo and Michalos (2000), Michalos (2002), and Michalos et al. (2005)

these quality of life measures, with sample sizes of about 500, usually there must be a difference of 0.3 between any two scores to be statistically significant.

Considering only the rank ordering of only the domain satisfaction scores for the 5 samples, one finds some interesting similarities and differences at both ends of the satisfaction scales. For the samples from Brandon, Bella Coola Valley, Prince George and Quesnel, living partner satisfaction scores were ranked highest, while for the Jasper sample, it was friendship satisfaction. Curiously, the Bella Coola Valley personal safety satisfaction score was the same as the living partner satisfaction score. Family relations satisfaction scores ranked second for all 5 samples, although these scores were tied with several different scores in different samples, e.g., tied with housing and neighbourhood satisfaction scores in Brandon. At the other end of the scale, in every sample government officials at all 3 levels had the lowest satisfaction ratings, although the Brandon sample scores were higher than those for every other sample for every level of government. Local officials always fared a bit better than federal and provincial officials. Apart from government officials, which routinely serve as a sort of public punching bag in most surveys, lowest levels of satisfaction scores are reported for recreation activities in Brandon (4.9), and financial security in Bella Coola Valley (4.4), Prince George (4.6) and Quesnel (4.7). In Jasper, apart from government officials, the lowest scores are reported for religion or spiritual fulfillment (4.5).

In comparison, the Brandon Regional Health Authority (2009, pp. 1–22) reported that about 43% of their sample said that they were very satisfied with their life as a whole, while 33.9% of our sample gave that response.

7 Independent and Dependent Measures

Broadly speaking, we classified variables as independent if they belonged to the British Columbia Provincial Health Officer's (1994) list of determinants of health and dependent if they had been validated as relatively general measures of health status or overall quality of life. In some analyses in other studies we use health status indicators as predictors of overall quality of life, because the concept of the 'quality of life' is more comprehensive than the concept of 'health' (Michalos 2004). Table 14 provides an overview of how we view the most important ones. It should be noted that 3 of the items listed among the predictor variables in this table are most likely consequences rather than antecedents of ill health, namely, number of pain killers taken, number of visits to doctors, and number of times in hospital. Hours of sleep per night can be a determinant and a consequence of ill health.

Most of the measures listed in Table 14 have been explained with data presented in earlier tables, but some require additional explanations. One- and two-year test–retest reliabilities and sensitivity measures may be found for most of the domain satisfaction measures and all of the overall quality of life measures except Average Health in Michalos and Kahke (2010). Beginning with the dependent variables, we took the average of the 8 SF-36 dimension scores as a measure of Average Health. The measures of happiness, satisfaction with life as a whole and satisfaction with the overall quality of life were described earlier. Diener et al.'s (1985) 5-item Satisfaction with Life Scale (SWLS) Lavalley et al. (2007), 5-item Contentment with Life Assessment Scale (CLAS) and Michalos and Zumbo's (2000) 4-item Subjective Wellbeing (SWB) have been used and described in previous studies, e.g., Michalos (2003), Michalos et al. (2005), Michalos

Table 14 Independent and dependent variables

Independent (predictors, determinants)	Dependent variables
<i>Biological influences</i>	Average of 8 SF-36 dimensions = General Health
Age, Gender, Body mass index	Happiness
<i>Social/economic environment</i>	Satisfaction with life as a whole
Income, education level, Social support index, Good neighbourhood	Satisfaction with life scale
Index, crime worries index, community health index, frequency at religious services	Satisfaction with quality of life
	Subjective well-being index
	Contentment with life assessment scale
<i>Health behaviours</i>	
Smoking frequency, drinking frequency, drinking amount, eating breakfast, skipping meals, # pain killers taken, hrs sleep per night, frequency of moderate exercise,	
<i>Health services</i>	
Personal health care rating, most people's health care rating, # times seeing doctor, # times in hospital, # times seeing dentist, distance to doctor, distance to specialist	
<i>Comparison standards</i>	
Self status compared to wants, others of same age and gender, deserves, needs, expected 3 years ago, expect in 5 years, best ever had	
<i>Satisfaction with domains/aspects of life</i>	
Home, neighbourhood, city, quality of air, land, water, personal safety, local government, Brandon programs for recreation, police/fire protection, social programs, shops/services, religious activities, public transportation, parks, treatment by locals, feel part of community, access to health care, family, living partner, friendships, spiritual fulfillment, financial security, recreation activities, self-esteem, sense of meaning in life, life achievements, future security	

Table 15 Good neighbourhood index ($\alpha = 0.87$, $N = 451$)

Item	Item mean	Item-total correlation
I feel like I belong in my neighbourhood	5.4	0.67
I participate in neighbourhood activities	4.1	0.52
I feel comfortable reaching out to neighbours when I need help	4.7	0.59
My neighbourhood is clean	5.6	0.69
My neighbourhood is friendly	5.5	0.77
I am satisfied with the roads in my neighbourhood	4.6	0.53
I am satisfied with the sidewalks in my neighbourhood	4.6	0.48
I am satisfied with the parks/green spaces in my neighbourhood	5.0	0.55
The houses in my neighbourhood are in good condition	5.6	0.61
My neighbourhood is a good place to raise children	5.5	0.55

and Kahke (2010). Four new indexes were constructed for this investigation, and their basic features are given in Tables 15, 16, 17, and 18. Each scale was constructed by taking the average score of its constituent items.

Table 16 Crime worries index ($\alpha = 0.99$, $N = 518$)

Item: how much do you worry about the possibility that...	Item mean	Item-total correlation
A thief will break into your home while you are away	6.8	0.98
Someone will use a weapon to take something from you by force	6.5	0.94
Someone will steal a personal item (e.g., coat, purse, etc.) when you have left it somewhere unattended	8.0	0.98
A thief will break into your home while you are home	6.3	0.98
Someone will cheat or con you out of a large amount of money	5.7	0.99
Someone will assault you	6.4	0.96

Table 17 Community health index ($\alpha = 0.93$, $N = 482$)

Item: considering the city of Brandon	Item mean	Item-total correlation
Alcohol abuse is a problem here	3.5	0.82
Drug abuse is a problem here	3.6	0.85
Family violence is a problem here	3.3	0.86
Unemployment is a problem here	2.9	0.69
Sexual abuse is a problem here	3.1	0.85
Racial discrimination is a problem here	3.1	0.68

Table 18 Social support index ($\alpha = 0.77$, $N = 508$)

Item: considering the city of Brandon	Item mean	Item-total correlation
Do you have someone to confide in, or talk to about your private feelings/concerns?	1.2	0.56
Do you have someone you can really count on to help you out in a crisis situation?	1.1	0.62
Do you have someone you can really count on to give you advice when you are making important personal decisions?	1.1	0.67
Do you have someone that makes you feel loved and cared for?	1.1	0.47

Table 15 lists the 10 items of our Good Neighbourhood Index, with its Cronbach Alpha value ($\alpha = 0.87$) and item-total score correlations (averaging $r = 0.60$). Generally speaking, alpha coefficients above 0.70 are regarded as acceptable and those above 0.80 as relatively high. Alpha coefficients measure the inter-correlations (i.e., internal coherence or consistency) among the items in the set based on pairwise correlations.

Table 16 lists the 6 items of our Crime Worries Index, with its Cronbach Alpha value ($\alpha = 0.99$) and item-total score correlations (averaging $r = 0.97$).

Table 17 lists the 6 items of our Community Health Index, with its Cronbach Alpha value ($\alpha = 0.93$) and item-total score correlations (averaging $r = 0.79$).

Table 18 lists the 4 items of our Social Support Index, with its Cronbach Alpha value ($\alpha = 0.77$) and item-total score correlations (averaging $r = 0.58$).

8 Explaining Health and the Quality of Life: Multivariate Relationships

Tables 19, 20, 21, 22, 23, 24, and 25 summarize results of systematically regressing each of our 7 dependent variables (i.e., Average Health, Happiness, single item Satisfaction with Life, single item Satisfaction with the Quality of Life, and 3 indexes, SWLS, CLAS and SWB) on the set of 63 determinants listed in Table 14. Of all the potential predictors, the only ones that appear in any particular table are those that had at least one significant relationship to the dependent variable considered in that table.

The strategy of the analysis for each dependent variable was the same and the structure of each table is the same. Each of the numerical columns gives results of applying stepwise regression using the following sets of potential determinants: (1) columns 1–4 = biological, social/economic, health behaviour, health services; (2) all significant health variables from columns 1–4, (3) 7 comparison standards; (4) satisfaction in diverse domains or aspects of life (without health satisfaction), and (5) all statistically significant variables from the previous regressions indicated in the columns for all statistically significant health variables, comparison standards and satisfaction in diverse domains of life. The results in this final column may be compared to those in the column for all statistically significant health variables to estimate the relative strength of health determinants as quality-of-life determinants. We are interested in measuring:

1. the total explanatory power (R^2) of each set of determinants for each dependent variable;
2. the relative explanatory power (standardized regression coefficient or β value) of each determinant in the context of each set of predictors for each dependent variable;
3. the similarities and differences obtained in all the explanations of the measures of Average Health and the broader measures of overall quality of life.

We will comment on the results of each exhibit in turn and then provide some overview remarks in the next section.

9 Average of SF-36 Dimensions

Table 19 (column 1) shows that our 3 biological determinants explain 11% of the variation in the scores of Average Health. In the context of these determinants, respondents' age was most influential and negative ($\beta = -0.32$). Figuratively speaking, this β -value may be understood as indicating that when all predictors are standardized to have means of zero and standard deviations of one unit step, for every increase of one full unit step in respondents' age, the dependent variable (Average Health) decreases 32% of a step, with the values of the other predictors held constant (i.e., controlled).

Column 2 shows that 4 social/economic determinants could account for 18% of the variance in Average Health scores, with respondents' income most influential and positive ($\beta = 0.26$). As one might have expected, scores on the Good Neighbourhood Index ($\beta = 0.22$) and Social Support Index ($\beta = 0.14$) had a positive influence on Average Health, and scores on the Crime Worries Index had a negative influence ($\beta = -0.12$).

Three health behaviours accounted for 23% of the variance in Average Health scores (column 3), with respondents' average numbers of pain killers taken per week most influential and negative ($\beta = -0.41$).

Two health services determinants explained 13% of the variance in Average Health scores (column 4) and both influences were negative, namely, respondents' average

Table 19 Explaining average of 8 SF-36 dimensions by health determinants, comparison standards and domain satisfaction, $N = 411$

	Biological determinants	Social/economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain Sat. determinants	All significant determinants
% Variance expl.	11	18	23	13	44	28	25	46
Predictors ↓	$\beta \downarrow$	$\beta \downarrow$	$\beta \downarrow$	$\beta \downarrow$	$\beta \downarrow$	$\beta \downarrow$	$\beta \downarrow$	$\beta \downarrow$
BMI	-0.16	a	a	a	b	a	a	b
Age	-0.32	a	a	a	-0.17	a	a	-0.19
Gender	-0.11	a	a	a	b	a	a	b
Income	a	0.26	a	a	0.14	a	a	b
G. neighbourhood Index	a	0.22	a	a	0.20	a	a	b
Crime worries index	a	-0.12	a	a	-0.15	a	a	b
Social support index	a	0.14	a	a	0.18	a	a	b
Freq. moderate exercise	a	a	0.16	a	0.10	a	a	b
Hours sleep/night	a	a	0.11	a	b	a	a	b
# pain killers taken	a	a	-0.41	a	-0.34	a	a	-0.26
# times seeing doctor	a	a	a	-0.25	-0.22	a	a	-0.17
# times in hospital	a	a	a	-0.18	b	a	a	b
Self-wants	a	a	a	a	a	0.20	a	b
Self-best	a	a	a	a	a	0.34	a	0.21
Self-future	a	a	a	a	a	0.11	a	b
Recreation sat.	a	a	a	a	a	a	0.42	0.33
Self-esteem sat.	a	a	a	a	a	a	0.15	b
Life achievements sat.	a	a	a	a	a	a	0.14	b
Feel part community sat.	a	a	a	a	a	a	-0.19	b

a not in equation, *b* significance level too low to enter equation

number of times seeing a physician ($\beta = -0.25$) and being in hospital ($\beta = -0.18$) in the past year.

Using the 10 statistically significant health determinants, we found a narrower set of 8 significant predictors could account for 44% of the variance in Average Health scores. Of these 8, the most influential 2 are negative, i.e., respondents' average number of pain killers taken per week ($\beta = -0.34$) and average number of times in the past year seeing a doctor ($\beta = -0.22$), and the third most influential is positive, i.e., Good Neighbourhood Index scores ($\beta = 0.20$).

Of the 7 different comparison standards that might influence respondents' judgment of their Average Health, 3 were statistically significant (column 6). Most influential were comparisons made between respondents' current life as a whole and the best they had ever experienced ($\beta = 0.34$). The closer the gap became between their current status and the best they had ever experienced, the greater its influence. Comparisons made between their current status and what they wanted out of life ($\beta = 0.20$) were next most influential, and comparisons between their current status and what they thought they would have in the future came last ($\beta = 0.20$).

Levels of satisfaction in 4 of the 28 distinct domains of life explained 25% of the variance in Average Health scores (column 7), with respondents' satisfaction with their recreation activities most influential ($\beta = 0.42$). Given the relatively small sample size ($N = 411$), regressions involving 28 predictors would have been somewhat inaccurate. "Even when R^2 in the population is zero, the expectation of the sample R^2 is $k/(N - 1)$, where k is the number of predictors, and N is the sample size" (Pedhazur 1982, pp. 148). For our sample and number of predictors, the expectation of our sample R^2 would have been 7% though the population R^2 might be zero. To reduce the risk of such inaccuracy, we undertook several regressions with about 5 predictors at a time, deleting statistically insignificant predictors until we reached a set with only significant predictors.

Finally, using the 15 significant health determinants, comparison standards and domain satisfaction scores together, we were able to explain 46% of the variation in Average Health scores (column 8). In the final regression, there were 5 statistically significant predictors, with recreation satisfaction ($\beta = 0.33$) and average number of pain killers taken per week ($\beta = -0.26$) most influential, the first positive and the second negative. It should be noted that our exploration of the influence of 7 comparison standards and 28 domain satisfaction scores allowed us to increase our power to explain the variation in Average Health scores beyond the power of health determinants alone from 44% to only 46%. This distribution of the explanatory power of health determinants versus other kinds will be radically different for all of our overall quality of life assessment variables, indicating quite clearly that respondents distinguish having good health from having a good quality of life, all things considered.

10 Happiness

Table 20 begins with a column listing social/economic determinants because none of our biological determinants had statistically significant relations to our measure of happiness. Column (1) shows that 2 social/economic determinants explain 23% of the variation in happiness scores, with respondents' Social Support Index scores most influential ($\beta = 0.37$), followed by Good Neighbourhood Index scores ($\beta = 0.27$).

Five health behaviour determinants accounted for 12% of the variance in happiness scores (column 2), with respondents' number of hours of sleep per night most influential

Table 20 Explaining happiness by health determinants, comparison standards and domain satisfaction, $N = 491$

	Social/economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain sat. determinants	All significant determinants
% Variance expl.	23	12	5	20	40	43	45
Paedictors↓	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$
G. neighbourhood index	0.27	a	a	0.19	a	a	b
Social support ind.	0.37	a	a	0.21	a	a	0.16
Hours sleep/night	a	0.20	a	0.21	a	a	b
# Pain killers taken	a	-0.14	a	b	a	a	b
Drink frequency	a	0.17	a	0.12	a	a	b
Drink amount	a	-0.12	a	b	a	a	b
Skipping meals	a	-0.11	a	b	a	a	b
Own health care rating	a	a	0.21	0.11	a	a	b
# Times in hospital	a	a	-0.10	b	a	a	b
Self-wants	a	a	a	a	0.43	a	0.31
Self-best	a	a	a	a	0.10	a	b
Self-others	a	a	a	a	0.21	a	0.19
Living partner sat.	a	a	a	a	a	0.21	b
Financial security sat.	a	a	a	a	a	0.16	b
Meaning in life sat.	a	a	a	a	a	0.28	0.23
Life achievements sat.	a	a	a	a	a	0.19	b

a not in equation, *b* significance level too low to enter equation

($\beta = 0.20$), followed by the frequency of drinking alcoholic beverages ($\beta = 0.17$). Number of pain killers taken ($\beta = -0.14$), average amount of alcoholic drinks taken at one sitting ($\beta = -0.12$) and average number of meals skipped per week ($\beta = -0.11$) were negative as expected.

Two health services determinants explained 5% of the variance in happiness scores (column 3), with respondents' ratings of their own health care weighing in first ($\beta = 0.21$) and average number of times being in hospital in the past year second ($\beta = -0.10$). It is curious that respondents' reported happiness with life as a whole increased with increases in their health care ratings, since the latter had no influence on their Average Health assessments.

Using the 9 statistically significant health determinants, we found a narrower set of 5 significant predictors accounted for 20% of the variance in happiness scores, with respondents' Social Support Index and average number of hours of sleep per night equally influential ($\beta = 0.21$).

Three comparison standards were statistically significant (column 5). Most influential were comparisons made between respondents' current life as a whole and what they wanted out of life ($\beta = 0.43$). Comparisons made between their current status and that of others of the same sex and age in their areas were second ($\beta = 0.21$), followed by comparisons between their current status and the best they had ever experienced ($\beta = 0.10$).

Levels of satisfaction in 4 distinct domains of life explained 43% of the variance in happiness scores (column 6), with respondents' satisfaction with their sense of meaning in life most influential ($\beta = 0.28$), followed by satisfaction with their living partner ($\beta = 0.21$).

Finally, using the 12 statistically significant health determinants, comparison standards and domain satisfaction scores, we were able to explain 45% of the variation in happiness scores (column 7). In the final regression, there were 4 statistically significant predictors, with the gap between respondents' current status and what they wanted being most influential ($\beta = 0.31$), followed by their satisfaction with their sense of meaning in life ($\beta = 0.23$). As suggested earlier, the explanatory power of our predictors more than doubled from 20 to 45% as we added comparison standards and domain satisfaction scores to our set of health determinants. Besides explaining a greater amount of variance in happiness scores than in Average Health scores, none of the statistically significant predictors in the final regression equations for happiness and Average Health were the same.

11 Satisfaction with Life as a Whole

Table 21 (column 1) shows that one biological determinant explained 1% of the variation in the the single item satisfaction with life as a whole scores ($\beta = 0.11$), i.e., as we saw earlier, in our Brandon sample, male respondents had higher average scores than female respondents for the 8 SF-36 health dimensions.

Four social/economic determinants accounted for 29% of the variance in the single item satisfaction with life as a whole scores (column 2), led by the Good Neighbourhood Index ($\beta = 0.35$) and followed by the Social Support Index ($\beta = 0.30$). The Crime Worries Index had a negative impact ($\beta = -0.12$).

Four health behaviours accounted for 8% of the variance in the single item satisfaction with life as a whole scores (column 3), with respondents' frequency of drinking alcoholic beverages leading ($\beta = 0.17$), followed by their average number of hours of sleep per night ($\beta = 0.14$) and their average number of pain killers taken per week ($\beta = -0.14$).

Table 21 Explaining satisfaction with life as a whole (single item) by health determinants, comparison standards and domain satisfaction, $N = 332$

	Biological determinants	Social/economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain sat. determinants	All significant determinants
% Variance expl.	1	29	8	10	34	39	65	66
Predictors↓	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$
Gender	0.11	a	a	a	b	a	a	b
Income	a	0.11	a	a	b	a	a	b
G. neighbourhood index	a	0.35	a	a	0.25	a	a	b
Crime worries index	a	-0.12	a	a	b	a	a	b
Social support index	a	0.30	a	a	0.29	a	a	b
Hours sleep/night	a	a	0.14	a	0.12	a	a	b
# Pain killers taken	a	a	-0.14	a	-0.12	a	a	b
Drink frequency	a	a	0.17	a	0.18	a	a	b
Skipping meals	a	a	-0.12	a	b	a	a	b
Own health care rating	a	a	a	0.28	0.17	a	a	0.08
# Times seeing dentist	a	a	a	0.15	b	a	a	b
Self-wants	a	a	a	a	a	0.39	a	b
Self-best	a	a	a	a	a	0.17	a	0.16
Self-other	a	a	a	a	a	0.12	a	b
Self-progress	a	a	a	a	a	0.11	a	b
Family sat.	a	a	a	a	a	a	0.12	b
Living partner sat.	a	a	a	a	a	a	0.26	0.18
Friendships sat.	a	a	a	a	a	a	0.29	0.29
Meaning in life sat.	a	a	a	a	a	a	0.22	0.21
Life achievements sat.	a	a	a	a	a	a	0.25	0.23

a not in equation, *b* significance level too low to enter equation

Two health services determinants explained 10% of the variance in the single item satisfaction with life as a whole scores (column 4), with respondents' ratings of their own health care being most influential ($\beta = 0.28$), followed by their average numbers of times seeing a dentist in the past year ($\beta = 0.15$). No doubt the latter information will come as a pleasant surprise to dentists. Presumably, the frequency of dentists visits indicated successful prevention.

Using the 11 statistically significant health determinants, we found a narrower set of 6 significant predictors accounted for 34% of the variance in the single item satisfaction with life as a whole scores (column 5), with respondents' Social Support Index ($\beta = 0.29$) and Good Neighbourhood Index ($\beta = 0.25$) most influential.

Four comparison standards were statistically significant (column 6). Most influential were comparisons made between respondents' current life as a whole and what they wanted out of life ($\beta = 0.39$). Comparisons made between their current status and the best they had ever experienced ($\beta = 0.17$) came next at some distance.

Levels of satisfaction in 4 of the distinct domains of life explained 65% of the variance in the single item satisfaction with life as a whole scores (column 7), with respondents' satisfaction with their friendships most influential ($\beta = 0.29$), followed by satisfaction with their living partner ($\beta = 0.26$) and what they had achieved in life ($\beta = 0.25$). Part of the reason for the relatively big increase in the explanatory power of our predictors in this column lies in the fact that here we are explaining one sort of satisfaction (overall life satisfaction) by other sorts (satisfaction with specific domains and aspects of life).

Finally, using all the significant health, comparison standards and domain satisfaction determinants, we were able to explain 66% of the variation in the single item satisfaction with life as a whole scores (column 8). In that regression, 6 predictors remained statistically significant, with respondents' satisfaction with their friendships dominating the lot ($\beta = 0.29$), followed by their satisfaction with what they had achieved in life ($\beta = 0.23$) and satisfaction with their sense of meaning in life ($\beta = 0.21$).

12 Satisfaction with the Overall Quality of Life

Table 22 shows, first, that our biological determinants had no statistically significant influence on respondents' satisfaction with the overall quality of their lives. Four social/economic determinants accounted for 24% of the variance in their satisfaction with the overall quality of their lives (column 1), with respondents' Good Neighbourhood Index most influential ($\beta = 0.33$), followed by their Social Support Index ($\beta = 0.23$).

Four health behaviours accounted for 9% of the variance in respondents' scores for satisfaction with the overall quality of their lives (column 2), with respondents' average number of pain killers taken per week most influential and negative ($\beta = -0.16$), followed closely by their frequency of drinking alcoholic beverages ($\beta = 0.15$), and their average number of hours of sleep per night and average number of times per week that they eat breakfast ($\beta = 0.14$ for each variable).

Three health services determinants also explained 9% of the variance in respondents' scores for satisfaction with the overall quality of their lives (column 3). Respondents' ratings of their own health care were most influential ($\beta = 0.22$), followed negatively by their average number of times seeing a doctor in the past year ($\beta = -0.19$) and the average distance they had to travel to get routine medical care ($\beta = -0.10$).

Using the 11 statistically significant health determinants, we found that a narrower set of 7 significant predictors accounted for 31% of the variance in respondents' scores for

Table 22 Explaining satisfaction with the overall quality of life by health determinants, comparison standards and domain satisfaction, $N = 392$

	Social/ economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain sat. determinants	All significant determinants
% Variance expl.	24	9	9	31	37	60	67
Predictors↓	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$
Education	0.13	a	a	0.12	a	a	0.06
Income	0.11	a	a	b	a	a	b
G. neighbourhood index	0.33	a	a	0.25	a	a	b
Social support index	0.23	a	a	0.21	a	a	b
Hours sleep/night	a	0.14	a	b	a	a	b
# pain killers taken	a	-0.16	a	-0.14	a	a	-0.07
Drink frequency	a	0.15	a	0.14	a	a	b
Eating breakfast	a	0.14	a	0.16	a	a	b
Own health care rating	a	a	0.22	0.12	a	a	b
# Times seeing doctor	a	a	-0.19	b	a	a	b
Distance to doctor	a	a	-0.10	b	a	a	b
Self-wants	a	a	a	a	0.41	a	0.14
Self-other	a	a	a	a	0.17	a	0.14
Self-progress	a	a	a	a	0.14	a	b
Financial security Sat.	a	a	a	a	a	0.15	b
Meaning in life Sat.	a	a	a	a	a	0.30	0.34
Home sat.	a	a	a	a	a	0.18	0.14
Treatment by locals Sat.	a	a	a	a	a	0.35	0.26

a not in equation, *b* significance level too low to enter equation

satisfaction with the overall quality of their lives (column 4), with the Good Neighbourhood Index most influential ($\beta = 0.25$), followed by the Social Support Index ($\beta = 0.21$).

Three comparison standards were statistically significant in accounting for the variance in respondents' scores for satisfaction with the overall quality of their lives (column 5). Most influential were comparisons made between respondents' current life as a whole and what they wanted out of life ($\beta = 0.41$). Comparisons made between their current status and that of others of the same sex and age in their areas were a distant second ($\beta = 0.17$).

Levels of satisfaction in 4 of the distinct domains of life explained 60% of the variance in respondents' scores for satisfaction with the overall quality of their lives (column 6). Respondents' satisfaction with how local people treat them was most influential ($\beta = 0.35$), followed by satisfaction with their sense of meaning in life ($\beta = 0.30$).

Finally, using all the significant health, comparison standards and domain satisfaction determinants, we were able to explain 67% of the variation in respondents' scores for satisfaction with the overall quality of their lives (column 7), with satisfaction with their sense of meaning in life most influential ($\beta = 0.34$), followed by their satisfaction with how local people treat them ($\beta = 0.26$).

13 Satisfaction with Life Scale (SWLS)

Table 23 reveals, first, that our biological determinants did not explain any of the variation in Satisfaction With Life Scale (SWLS) scores. Four social/economic determinants accounted for 33% of the variance in SWLS scores (column 1), with respondents' Good Neighbourhood Index most influential ($\beta = 0.41$), followed by the Social Support Index ($\beta = 0.28$).

Four health behaviours accounted for 14% of the variance in SWLS scores (column 2), with respondents' average number of meals skipped per week most influential and negative ($\beta = -0.24$), followed by their average number of hours of sleep per night ($\beta = 0.19$). There was a tie between the positive influence of their frequency of drinking alcoholic beverages ($\beta = 0.13$) and the negative influence of their average number of pain killers taken per week ($\beta = -0.13$).

Two health services determinants explained 9% of the variance in SWLS scores (column 3), with respondents' ratings of their own health care being most influential positively ($\beta = 0.27$), followed negatively by the average number of times they had been in hospital in the past year ($\beta = -0.14$).

Using the 10 statistically significant health determinants, we found a narrower set of 7 significant predictors accounted for 39% of the variance in SWLS scores (column 4), with respondents' Good Neighbourhood Index most influential ($\beta = 0.33$), followed by the Social Support Index ($\beta = 0.20$).

Five comparison standards were statistically significant in accounting for 68% of the variance in respondents' SWLS scores (column 5). Most influential were comparisons made between respondents' current life as a whole and what they wanted out of life ($\beta = 0.47$). Comparisons made between their current status and the best they had ever experienced were a somewhat distant second ($\beta = 0.24$).

Levels of satisfaction in 5 of the distinct domains of life explained 56% of the variance in SWLS scores (column 6), with respondents' satisfaction with what they had achieved in life most influential ($\beta = 0.27$), followed by satisfaction with their own self-esteem ($\beta = 0.22$).

Table 23 Explaining satisfaction with life scale (SWLS) by health determinants, comparison standards and domain satisfaction, N = 329

	Social/economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain sat. determinants	All significant determinants
% Variance expl.	33	14	9	39	68	56	74
Predictors↓	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$
Income	0.16	a	a	0.12	a	a	b
G. neighbourhood index	0.41	a	a	0.33	a	a	b
Crime worries index	-0.09	a	a	b	a	a	b
Social support index	0.28	a	a	0.20	a	a	b
Hours sleep/night	a	0.19	a	0.17	a	a	b
# Pain killers taken	a	-0.13	a	b	a	a	b
Drink frequency	a	0.13	a	0.10	a	a	b
Skipping meals	a	-0.24	a	-0.16	a	a	b
Own health care rating	a	a	0.27	0.15	a	a	b
# Times in hospital	a	a	-0.14	b	a	a	b
Self-wants	a	a	a	a	0.47	a	0.30
Self-best	a	a	a	a	0.24	a	0.22
Self-other	a	a	a	a	0.14	a	0.17
Self-progress	a	a	a	a	0.12	a	b
Self-deserves	a	a	a	a	0.08	a	b
Living partner sat.	a	a	a	a	a	0.16	0.09
Self-esteem sat.	a	a	a	a	a	0.22	0.18
Life achievements sat.	a	a	a	a	a	0.27	0.12
Future security sat.	a	a	a	a	a	0.17	b
Treatment by locals sat.	a	a	a	a	a	0.13	0.09

a not in equation, *b* significance level too low to enter equation

Finally, using all the significant health, comparison standards and domain satisfaction determinants, we were able to explain 74% of the variation in SWLS scores (column 7), with comparisons made between respondents' current life as a whole and what they wanted out of life most influential ($\beta = 0.30$), followed by comparisons between their current status and the best they had ever experienced ($\beta = 0.22$), and satisfaction with their own self-esteem ($\beta = 0.18$).

14 Contentment with Life Assessment Scale (CLAS)

Table 24 reveals, first, that our biological determinants did not explain any of the variation in Contentment with Life Assessment Scale (CLAS) scores. Four social/economic determinants could account for 29% of the variance in CLAS scores (column 1), with respondents' Good Neighbourhood Index most influential ($\beta = 0.35$), followed by their Social Support Index ($\beta = 0.29$).

Three health behaviours accounted for 10% of the variance in CLAS scores (column 2), with respondents' average number of hours of sleep per night most influential positively ($\beta = 0.21$), followed by their average number of meals skipped per week negatively ($\beta = -0.18$).

Three health services determinants explained 8% of the variance in CLAS scores (column 3), led by respondents' ratings of their own health care positively ($\beta = 0.24$), followed negatively by the average number of times they had seen a doctor in the past year ($\beta = -0.11$) and been in hospital ($\beta = -0.10$).

Using the 10 statistically significant health determinants, we found that a narrower set of 9 significant predictors accounted for 36% of the variance in CLAS scores, with respondents' Good Neighbourhood Index leading the set ($\beta = 0.27$), followed somewhat closely by their Social Support Index ($\beta = 0.23$) and their number of hours of sleep per night ($\beta = 0.21$).

Five comparison standards were statistically significant in accounting for 52% of the variance in respondents' CLAS scores (column 5). Most influential were comparisons made between respondents' current life as a whole and what they wanted out of life ($\beta = 0.39$). Comparisons made between their current status and the best they had ever experienced were tied with comparisons between their current status and that of others of the same sex and age in their areas ($\beta = 0.16$).

Levels of satisfaction in 5 of the distinct domains of life explained 54% of the variance in CLAS scores (column 6), with respondents' satisfaction with what they had achieved in life most influential ($\beta = 0.30$), followed by satisfaction with their own self-esteem ($\beta = 0.23$).

Finally, using all the significant health, comparison standards and domain satisfaction determinants, we were able to explain 60% of the variation in CLAS scores (column 7). In that regression, 5 predictors remained statistically significant, with comparisons made between respondents' current life as a whole and what they wanted out of life most influential ($\beta = 0.30$), followed by comparisons made between their current status and the best they had ever experienced in the past ($\beta = 0.25$).

15 Subjective Wellbeing (SWB)

Table 25 reveals again that our biological determinants did not explain any of the variation in Subjective Wellbeing Index (SWB) scores. Five social/economic determinants

Table 24 Explaining contentment with life assessment scale (CLAS) by health determinants, comparison standards and domain satisfaction, N = 458

	Social/economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain sat. determinants	All significant determinants
% Variance expl.	29	10	8	36	52	54	60
Predictors↓	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$
Income	0.15	a	a	0.11	a	a	b
G. neighbourhood index	0.35	a	a	0.27	a	a	b
# Relig. meetings	0.12	a	a	0.12	a	a	b
Social support index	0.29	a	a	0.23	a	a	b
Hours sleep/night	a	0.21	a	0.21	a	a	b
Drink frequency	a	0.12	a	0.09	a	a	b
Skipping meals	a	-0.18	a	-0.10	a	a	b
Own health care rating	a	a	0.24	0.09	a	a	b
# times seeing doctor	a	a	-0.11	-0.10	a	a	b
# times in hospital	a	a	-0.10	b	a	a	b
Self-wants	a	a	a	a	0.39	a	0.30
Self-best	a	a	a	a	0.16	a	0.25
Self-other	a	a	a	a	0.16	a	b
Self-progress	a	a	a	a	0.13	a	b
Self-future	a	a	a	a	0.10	a	b
Living partner sat.	a	a	a	a	a	0.12	b
Friendships sat.	a	a	a	a	a	0.14	0.13
Recreation activities sat.	a	a	a	a	a	0.16	b
Self-esteem sat.	a	a	a	a	a	0.23	0.15
Life achievements sat.	a	a	a	a	a	0.30	0.18

a not in equation, b significance level too low to enter equation

Table 25 Explaining subjective wellbeing (SWB) by health determinants, comparison standards and domain satisfaction, $N = 325$

	Social/economic determinants	Health behaviour det.	Health services determinants	All health determinants	Comparison standard determinant	Domain sat. determinants	All significant determinants
% Variance expl.	35	13	10	42	53	76	75
Predictors↓	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$	$\beta\downarrow$
Income	0.18	a	a	0.12	a	a	b
G. neighbourhood index	0.39	a	a	0.31	a	a	b
Crime worries index	-0.09	a	a	b	a	a	b
# Relig. meetings	0.11	a	a	b	a	a	b
Social support index	0.30	a	a	0.25	a	a	b
Hours sleep/night	a	0.19	a	0.16	a	a	b
# pain killers taken	a	-0.17	a	-0.10	a	a	b
Drink frequency	a	0.19	a	0.16	a	a	0.08
Skiping meals	a	-0.13	a	-0.11	a	a	b
Own health care rating	a	a	0.26	0.15	a	a	b
# times seeing doctor	a	a	-0.14	b	a	a	b
# times seeing dentist	a	a	0.13	b	a	a	b
Self-wants	a	a	a	a	0.45	a	0.14
Self-best	a	a	a	a	0.11	a	0.12
Self-other	a	a	a	a	0.21	a	b
Self-progress	a	a	a	a	0.12	a	b
Family sat.	a	a	a	a	a	0.09	b
Living partner sat.	a	a	a	a	a	0.13	b
Financial security sat.	a	a	a	a	a	0.26	0.25
Meaning in life sat.	a	a	a	a	a	0.26	0.28
Life achievements sat.	a	a	a	a	a	0.13	0.14
Home sat.	a	a	a	a	a	0.13	0.18
Treatment by locals sat.	a	a	a	a	a	0.17	b

a not in equation, *b* significance level too low to enter equation

accounted for 35% of the variance in SWB scores (column 1), with respondents' Good Neighbourhood Index most influential ($\beta = 0.39$). The Social Support Index followed relatively closely ($\beta = 0.30$) compared to the third placed total household income ($\beta = 0.18$).

Four health behaviours accounted for 13% of the variance in SWB scores (column 2), with respondents' number of hours of sleep per night tied for most influential predictor with respondents' frequency of drinking alcoholic beverages ($\beta = 0.19$). Respondents' average number of pain killers taken per week had a negative influence ($\beta = -0.17$) as did their average number of meals skipped per week ($\beta = -0.13$).

Three health services determinants explained 10% of the variance in SWB scores (column 3), beginning with respondents' ratings of their own health care ($\beta = 0.26$), followed negatively by the average number of times they had seen a doctor in the past year ($\beta = -0.14$).

Using the 12 statistically significant health determinants, we found that a narrower set of 8 significant predictors accounted for 42% of the variance in SWB scores (column 4), with respondents' Good Neighbourhood Index dominating the set ($\beta = 0.31$), followed by the Social Support Index ($\beta = 0.25$). After these two predictors, there was a tie between respondents' average number of hours of sleep per night and their frequency of drinking alcoholic beverages ($\beta = 0.16$).

Four comparison standards were statistically significant in accounting for 53% of the variance in respondents' SWB scores (column 5). Most influential by a wide margin were comparisons made between respondents' current life as a whole and what they wanted out of life ($\beta = 0.45$). Comparisons made between their current status and that of others of the same sex and age in their areas came in a somewhat distant second ($\beta = 0.21$).

Levels of satisfaction in 7 of the distinct domains of life explained 76% of the variance in SWB scores (column 6), with a tie between respondents' satisfaction with their financial security and their sense of meaning in life ($\beta = 0.26$). Following these two, satisfaction with how local residents treat respondents' was most influential ($\beta = 0.17$).

Finally, using all the significant health, comparison standards and domain satisfaction determinants, we were able to explain 75% of the variation in SWB scores (column 7). In that regression, 7 predictors remained statistically significant, led by respondents' satisfaction with their sense of meaning in life ($\beta = 0.28$), followed closely by their satisfaction with their financial security ($\beta = 0.25$). The fact that we lost a percentage point of explanatory power as we moved from the penultimate to the final regression equation is probably the result of having a different set of predictors (rather than a suppressing variable) in the two equations.

16 Overview of Variance Explained and Most Influential Determinants

Table 26 lists the percent of variance explained in the scores for each of the 7 dependent variables by each cluster of health determinants, comparison standards and domain satisfaction scores. Taking all predictors together, we were able to explain as much as 75% of the variance in SWB scores and as little as 45% in happiness scores. The difference in the levels of explanation for both of these overall life assessment variables is fairly typical (Michalos 2003). The relatively large percentage of variance explained for SWB and SWLS scores (74%) is a bit unusual. Usually these figures are in the 60% range.

The four clusters of health determinants explained from 20% (Happiness) to 44% (Average Health) of the variance in the dependent variables (row 5). Adding comparison

Table 26 Percent of variance explained by health determinants, comparison standards and domain satisfaction

	8 SF-36 dim.	Happiness	Life sat.	QOL sat.	SWLS	CLAS	SWB
Biological determinants	11	0	1	0	0	0	0
Social/economic determinants	18	23	29	24	33	29	35
Health behaviour determinants	23	12	8	9	14	10	13
Health service determinants	13	5	10	9	9	8	10
All health determinants	44	20	34	31	39	36	42
Comparison standards	28	40	39	37	68	52	53
Domain satisfaction determinants	25	43	65	60	56	54	76
All significant determinants	46	45	66	67	74	60	75

standards and domain satisfaction scores to the set of health determinants increased our total explanatory power by only 2% points for Average Health (from 44 to 46%), but by 36% points for satisfaction with the overall quality of life (from 31 to 67%) and 35% points for SWLS (from 39 to 74%). In fact, the relative contribution of comparison standards and domain satisfaction scores to health determinants in terms of explanatory power for Average Health versus quality of life measured in 6 different ways provides additional clear evidence that there is more to a good life than good health. These results are quite similar to those reported in Michalos et al. (2005) and Michalos et al. (2007). To understand and appreciate the differences between good health and a good life, one must cast one's net of determinants beyond health determinants and one's net of dependent variables beyond health status measures, as argued in Michalos (2004). Unfortunately, many researchers are still using SF-36 scores to measure quality of life. See, for example, any issue of the journal *Quality of Life Research* as late as February 2010, Volume 19, Number 1.

Table 27 lists the most influential predictors of each of the 7 dependent variables from each cluster of health determinants, comparison standards and domain satisfaction scores. Examining rows across the 7 columns, some repeated entries stand out. From the first row one learns that for 5 of the 7 dependent variables (71%), biological determinants had no statistically significant impact. As one would have expected, age had a negative impact on Average Health. For 5 of 7 dependent variables, among the social/economic determinants (row 2), the Good Neighbourhood Index had the largest impact. Although we were aware of quite a bit of research indicating the importance of neighbourhoods to various aspects of the quality of people's lives (e.g., Dittmann and Goebel 2010, Sirgy and Cornwell 2002, Fernandez and Kulik 1981), because we invented the GNI and had not used it before, we were delighted to discover that it had substantial explanatory power for so many key measures of overall quality of life. Among all the health determinants (row 5), GNI was most influential for 4 of 7 (57%) of dependent variables. What is equally interesting about GNI is that it never appeared as the most influential predictor in the final regression equations for any of the dependent variables (row 8).

For 6 of 7 (86%) dependent variables, among comparison standards, the gap between what respondents have and want (self-wants gap) was most influential (row 6). This was largely expected from earlier studies (Michalos 1985, 1991a, b, 1993a, b). We did not know what to expect from this determinant in the context of all our explanatory variables (row 8), but were pleased to find that it was most influential for 3 of the 7 dependent variables.

Table 27 Most influential predictors

	General health	Hap.	Life sat.	QOL sat.	SWLS	CLAS	SWB
Biological determinants	Age	0	Gender	0	0	0	0
Social/economic det.	Income	SS	GNI	GNI	GNI	GNI	GNI
Health behaviour det.	Pain pills	Sleep	Drink	Pain pills	Meals	Sleep	Drink
Health services det.	See dr.	Own HC	Own HC	Own HC	Own HC	Own HC	Own HC
All health det.	Pain pills	Sleep/SS	SS	GNI	GNI	GNI	GNI
Comparison standards	SB	SW	SW	SW	SW	SW	SW
Domain satisfaction	Rec. sat	Life meaning	Friend sat	Local treat.	Life achieve	Life achieve	Fin.sec./life mean.
All determinants	Rec. sat.	SW	Friend sat	Life meaning	SW	SW	Life meaning

0 no significant impact, Age, gender, income total household income, GNI Good neighbourhood index, SS social support index, pain pills # pain killers taken per week, sleep # hrs sleep per night, drink frequency of drinking, meals # times skipping meals per week, see dr. # times seeing doctor past year, Own HC respondents' rating their own health care, SB comparison between self now and best ever experienced, SW comparison between self now and self wanted, Rec.Sat satisfaction with your recreation activities, life meaning satisfaction with your sense of meaning in life, Friend sat satisfaction with your friendships, local treat. satisfaction with how local people treat you, life achiev. satisfaction with what you achieve in life, Fin.Sec. satisfaction with your financial security

For 6 of 7 health services determinants, respondents' rating of their own health care were most influential (row 4). However, these ratings never appeared in the equations for all health determinants (row 5) or the final equations involving all determinants (row 8).

Besides the interesting phenomena of a few determinants displaying relatively strong explanatory power for several dependent variables, it was interesting to see the variety of most influential predictors across the 7 dependent variables. Regarding health behaviour determinants, for example, the average number of pain pills taken per week was most influential for 2 dependent variables (Average Health and satisfaction with the overall quality of life), average hours of sleep per night was most influential for 2 others (happiness and CLAS), frequency of drinking alcoholic beverages for 2 more (life satisfaction and subjective wellbeing), and skipping meals for one (SWLS).

Variety was also apparent for domain satisfaction determinants (row 7) and for the final equations (row 8). Satisfaction with recreation activities appears as most important for domain satisfaction determinants and for all determinants for Average Health. As well, satisfaction with friendships appears as most important for domain satisfaction determinants and for all determinants for life satisfaction. Beyond these cases, inspection of the other entries in rows 7 and 8 reveals considerable variety. Row 7 has 6 different most influential determinants and row 8 has 4 (like row 3).

17 Conclusion

The aim of this investigation was to obtain some baseline self-reported data on the health status and overall quality of life of a sample of residents of the city of Brandon, Manitoba

aged 18 years or older, and to measure the impact of a set of designated health determinants, comparison standards and satisfaction with diverse domains of life on their health and quality of life. In May and June 2010, 2,500 households from the city of Brandon, Manitoba were randomly selected to receive a mailed out questionnaire and 518 useable, completed questionnaires were returned. Baseline health status data were obtained using the 8 SF-36 dimensions of health and 13 items from the United States Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Determinants of health and overall quality of life included measures of socializing activities, a Good Neighbourhood Index, Social Support Index, Community Health Index, a measure of free-time exercise levels, health-related behaviours, use of drugs, health care issues, a set of domain-specific quality of life items, a set of measures concerning criminal victimization, worries and behaviours concerning victimization and the basic postulates of Multiple Discrepancies Theory (Michalos 1985). Overall life assessment, dependent variables included Average Health, happiness, a single item measure of satisfaction with life as a whole, a single item measure of satisfaction with the overall quality of life, the Satisfaction With Life Scale, Contentment with Life Assessment Scale and a Subjective Wellbeing Index.

Using stepwise multiple regression, we were able to explain as much as 75% of the variance in SWB scores and as little as 45% in happiness scores. Four clusters of health determinants explained from 20% (Happiness) to 44% (Average Health) of the variance in the dependent variables. Adding comparison standards and domain satisfaction scores to the set of health determinants increased our total explanatory power by 2% points for Average Health (from 44 to 46%), but by 36% points for satisfaction with the overall quality of life (from 31 to 67%) and 35% points for Subjective Wellbeing (from 39 to 74%).

For 5 of 7 dependent variables, biological determinants had no statistically significant impact. Among all of the health determinants, the Good Neighbourhood Index was most influential for 4 of 7 dependent variables, although this index never appeared as the most influential predictor in the final regression equations for any of the dependent variables. For 6 of 7 dependent variables, among comparison standards, the gap between what respondents have and want (self-wants gap) was most influential, and managed to be most influential in the final regression equations for 3 of the 7 dependent variables. For 6 of 7 health services determinants, respondents' rating of their own health care were most influential, but these ratings never appeared in the equations for all health determinants or the final equations involving all determinants. While a few determinants displayed relatively strong explanatory power for several dependent variables, there was considerable variety in the most influential predictors across the 7 dependent variables.

The three most important take-home messages from this investigation are (1) in assessing the relative influence of any alleged determinants of health and the quality of life, different sets of alleged determinants will appear to be more or less influential for different dependent variables. Therefore, (2) researchers should use diverse sets of determinants and dependent variables and (3) it is a big mistake to use measures of health status like SF-36 as a measure of the perceived quality of life.

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