



Self reported overall health status: Implications for intervention strategies

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Research

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Abstract

Background

Data collected using the South Australian chronic disease and risk factor surveillance system were analysed in order to monitor changes in the prevalence of overall health status over time.

Methods

The South Australian Monitoring and Surveillance System (SAMSS) has been conducted monthly since 2002. This representative, population, chronic disease and risk factor, telephone-based surveillance system includes a single question determining the prevalence of overall health status (SF1) and a wide range of demographics, social, chronic conditions and risk factor indicators.

Results

Between 2006 and 2008, 83.2% of respondents reported 'Excellent, Very Good or Good' health and 16.8% reported 'Fair or Poor' health. There was a statistically significant trend in the age sex standardised prevalence of those reporting 'Very Good', 'Good' or 'Poor' health from 2002 to 2008. The SF1 identifies 'Fair or Poor' health in the case of those with chronic conditions and health risk factors, and 'Excellent, Very Good or Good' health in the absence of chronic conditions. A wide range of social, demographic variables, with those of a lower socio-economic status in particular, statistically significantly more likely to report a lower overall health status

Conclusion

The SF1 can be used to measure general health as part of telephone surveys and surveillance systems.

Key words

SF1; socio-economic status; overall health status; prevalence; health-related quality of life

Background

Increasingly, a single question asking respondents to rate their general health is being used in health surveys as an indication of overall health status. If a comprehensive coverage of health status is not required, a single question has great advantages, such as decreased cost and ease of interpretation [1]. The most common general health question has been adapted from the first question of the Short Form 36 (SF36) [2] and is commonly referred to as the SF1. The general health question is the first question of the suite of Short Form questionnaires, and as a single question has been used in a wide variety of other health and wellbeing questionnaires to examine health related quality of life.

Responses to the SF1 can be used as a general indicator of self-reported health and wellbeing [3], and the SF1 has been found to be a strong indicator of future health care use and mortality [4]. SF1 provides subjective information about health status and presents an alternative measure to that derived solely from the prevalence data regarding illness, death or service use [5]. It has often been used internationally in surveys to assess the general health of the population [6]; those who experience various chronic conditions, such as diabetes, asthma and cancer; and patients undergoing specific treatments [7-12].

At the national level, the SF1 has been used in the 1989 Australian Health Survey and the 1995, 2001, 2004-05 and 2007-08 National Health Surveys [13]. These results have been reported in the Australia's Health report series [14], as well as in the Social Health Atlas of Australia in 1999 [5]. The Australian Bureau of Statistics (ABS) has compiled a report concerning characteristics of people reporting good or better health, in which the content validity of the SF1 as a measure of health status was explored [3]. It was stated that although the SF1 is a measure of perceived rather than actual health, research has indicated that self-assessed health status is a predictor of mortality and morbidity.

While self-assessed health status may not always be a measure of the respondents 'true' health status, it does reveal something about the respondent's perception of his or her own health at a given point in time [3]. Monitoring self-assessed health within Australia may also help to develop an understanding about the perceptions of the proportion of people who report good or better health, yet also present as high risk drinkers, current smokers, have a sedentary lifestyle or who are classified as being overweight or obese. Research shows that



overall health status indicates an individual's own sense of their condition [15]. Thus if an individual's or population's own rating of their health is at odds with their actual health or risk factors, opportunities for targeted health promotion programmes are presented. Of interest is the relationship of poor overall health status and health equity issues [16]. Confirming the relationship between ill-health and inequality within the Australian context should lead researchers and public health practitioners towards further inquiry into the causal nature of these relationships as well as inquiry into determining the most appropriate range of locally relevant intervention strategies.

The aim of the present research was to analyse data collected by the South Australian Monitoring and Surveillance System (SAMSS) to firstly, assess changes in the prevalence of self-reported health status over time and secondly, to determine the relationship between the SF1 and a range of relevant chronic conditions, health related risk factors, demographic variables, socioeconomic and other health indicators.

Method

The SF1 has been used in SAMSS, a telephone-based chronic disease and risk factor surveillance system, since 2002 [17-18]. All households in South Australia, with a number listed in the Electronic White Pages (EWP) were eligible for selection in the sample. Data collected using face-to-face surveys in South Australia [19-20] estimate that 70% of households in South Australia currently have a listed telephone number. Approximately, 600 completed interviews are conducted on a random selection people (of all ages) each month and the interviews are conducted in English. A monthly sample of 600 (n=7200 interviews each year) was deemed to be sufficient, based on sample size calculations, to adequately demonstrate the prevalence of most adult (age 18 years and over) health conditions or risk factors with a ±3% error. Within each household, the person who had their birthday last is selected for interview. Overall, the response rate for SAMSS from June 2002 until December 2008 has generally ranged between 65% to 70% each month.

A letter introducing SAMSS and informing people of the purpose of the survey is sent to the household of each selected telephone number. The Computer Assisted Telephone Interview (CATI) system is used to conduct the interviews. At least ten call backs are made to the telephone number selected to interview household members. Replacement interviews for persons who could not be contacted or interviewed are not permitted.

Sample weights are calculated each month to compensate for differential non-response and sample frame under coverage. The data are weighted each month by probability of selection in the household (the number of people in the household and the number of listings in the White Pages), age, sex and area of residence (metropolitan Adelaide and rural South Australia) to reflect the structure of the population in South Australia to the latest Census or Estimated Residential Population (ERP) [21]. The weighting formula for each month is:

$$w_{h,i} = d_{h,i} \times \frac{N_h}{\sum_{i=1}^{n_h} d_{h,i}} \times \frac{n}{N}$$

Where h is stratum (10 year age groups, sex and area of residence), $w_{h,i}$ is the weighting value for respondent i in stratum h; $d_{h,i}$ is the household size of people (0+ years) over for respondent i in stratum h; N_h is the population size of stratum h, n_h is the sample size in stratum h; N is the total population size; and n is the total sample size.

The SF1 question is asked as follows: "In general, would you say your health is: *Excellent, Very Good, Good, Fair or Poor?*" For the purpose of continuity, answers to the SF1 question were dichotomised ('Excellent, Very Good or Good', and 'Fair or Poor') in a manner similar to other previous analyses [3, 22-23].

The Socioeconomic Index for Areas (SEIFA), Index of Relative Social Disadvantage (IRSD), created from Census data, is an area level indicator of socioeconomic status [24] and is used as a measure of inequality.

Data are presented for respondents aged 18 years and over. The Statistical Package for the Social Sciences (SPSS version 15.0) for Windows [25] and STATA V9.2 [26] were used for chi-square tests and logistic regression analyses and Epi Info Version [27] to determine chi-square tests for trends. Trends in prevalence over time were examined between July 2002 and December 2008, for each of the five categories of the SF1. Direct age-sex standardised (to the 2003 Estimated Residential population) method was applied to the SF1 prevalence estimates over time to control for the effects of the age and sex profile changing over time. The weighting values were applied to the data prior to all analyses undertaken in SPSS and STATA using standard weighting options. Univariate and multivariate analyses were conducted of the aggregated data collected between 2006 and 2008. Adjusted standardised residuals were obtained in SPSS and were used to test deviations from expected values separately in each cell. Overall significance was examined using Chi-square tests.

The 'Excellent, Very Good or Good' and 'Fair or Poor' categories were examined in association with the self reported chronic conditions: diabetes, asthma, cardiovascular disease (CVD), chronic obstructive pulmonary disease (COPD), osteoporosis, arthritis, and having a disability (a self reported limitation in activities because of an impairment or health problem). Risk factors such body mass index (BMI, as defined by the World Health Organization) [28], sufficient physical activity (150 minutes of walking moderate or vigorous activity with vigorous weighted by a factor of two to account for the greater intensity) [29], long term risky or high risk levels of alcohol consumption [30], smoking status, current high blood pressure, high cholesterol and health service use, number of days off work and days of limited activity due to health were also examined. All



variables significant at $p < 0.25$ at a univariate level were included in the logistic regression models [31]. Due to collinearity of individual chronic diseases, the different types of health services and the number of days off work and days of limited activity at work, a combined variable for number of chronic conditions, number of health services and days off work/limited activity at work were included in the logistic regression analysis.

Results

Figure 1 reports the prevalence within each category of the SF1 for each year. Overall, there were no statistical differences in the proportions of respondents reporting each category of health status between 2002 and 2008 ($\chi^2_{\text{trend}} = 0.333$, $p = 0.56$). When standardised to the 2003 South Australian ERP [20] there was a statistically significant change over time for the proportion of respondents reporting 'Very Good' ($\chi^2_{\text{trend}} = 5.466$, $p = 0.019$), 'Good' ($\chi^2_{\text{trend}} = 9.491$, $p = 0.002$) and 'Poor' health ($\chi^2_{\text{trend}} = 4.083$, $p = 0.043$) (Figure 2).

The proportion of the South Australian population aged 18 years and over reporting each category of SF1 response from 2006 to 2008, overall and by sex, is outlined in Table 1 with statistically significant differences between males and females highlighted ($\chi^2 = 14.73$, $df = 4$, $p = 0.005$). Table 2 highlights the differences by age group with younger groups more likely to report more favourable health status and older groups, especially those aged 55 years and over, more likely to report a 'Fair' or 'Poor' status.

Table 3 shows the demographic characteristics associated at a univariate level with those respondents reporting a 'Fair or Poor' status.

Table 4 shows associations between those reporting 'Fair or Poor' health and self reported chronic conditions, the number of chronic conditions and health related risk factors. There was a statistically significant association between all self reported chronic conditions and risk factors (Table 4) and those reporting 'Fair or Poor' health.

A number of questions were asked to establish days off work and health service use factors associated with respondents reporting a 'Fair or Poor' health status. Respondents were also asked a range of questions to determine how many days off work they had taken in the past four weeks, how often they had used specific health services and the number of health services they had used. All of these factors were statistically significantly associated with respondents reporting a 'Fair' or 'Poor' status (Table 5).

Results of the multivariate analysis of characteristics associated with reporting 'Fair or Poor' health are presented in Table 6. Respondents born in a country other than Australia, the UK or Ireland, who were unable to work, those with an education level up to secondary level, had an annual household income up to \$40,000, were living in the middle or lowest SEIFA quintile, with one or more health condition, classified as overweight or obese, classified as being at risk or high-risk of harm from alcohol in the long-term, not undertaking a sufficient level of physical activity to confer a

health benefit, an ex- or current smoker, those with current high blood pressure, those unable to work and/or carry out usual activities at least one day in the past month, and those who had used one or more health services in the past month were statistically significantly more likely to report a 'Fair or Poor' health status ($\chi^2 = 3989.35$, $p < 0.001$).

Discussion

Responses to the overall health status question (SF1) in the South Australian chronic disease and risk factor surveillance system demonstrate that reporting a 'Fair' or 'Poor' health status is associated with a wide range of demographic characteristics, chronic health conditions, health related risk factors, economic factors and health service use. While many of these associations are to be expected (older persons, those with chronic diseases) others are congruent with the social gradient of health literature and health equity literature [32-36].

The nature and type of these relationships and their causal direction can be complex and multidimensional. For example, several of the behaviours/risk factors identified in this study (obesity, physical activity and smoking) are themselves associated with socio-economic status, which leads to a presumption that the underlying causal dynamics of health status is greatly influenced by socio-economic factors. These include: access to meaningful and rewarding employment; sufficient income to enable participation in the economic and cultural life of a community; adequate shelter and housing; educational opportunities to allow for ongoing personal development; living in a culturally normative milieu which militates against discriminatory practices based on race, gender, sexuality culture or religious orientation; social support and connectedness; and sufficient access to transport and communication [32, 34]. The relative absence of any combination of these underlying factors can also have an impact on overall health status and on self-reported health and well-being.

Perhaps unsurprisingly, the number of chronic health conditions, current conditions such as high blood pressure, health service use and those who had days off or activities limited due to health were statistically significantly associated with 'Fair' or 'Poor' health status. Gross annual income, education, employment and SEIFA were all significant variables in the multivariate analysis, indicating those of lower socioeconomic status were more likely to report 'Fair' or 'Poor' health. It was also not surprising that physical activity, obesity and smoking – all primary health risk factors in today's society – also played a role. Country of birth may impact on reporting of a 'Fair' or 'Poor' health status due to difficulties accessing health care among this group, a different interpretation of the question or a different understanding of health messages, particularly if English is a second language.

The direction of causality must be made clear and clearly understood prior to any intervention strategy as this will be a key determining factor in the design and



development of interventions. The key question being: *does poor health status cause lower socio-economic status or does lower socio-economic status cause poor health status?* At face value this seems a false dichotomy as it could be argued that it is a far more interactive relationship. Whilst that may be a valid position, there is sufficient evidence to indicate that the greater strength in the causal relationship runs in the direction of socio-economic determinants leading to poorer health status [22, 35, 37-38]. This is not to suggest that this issue is uncontested. Whilst there are studies which have produced conflicting results [39-41], there is considerable evidence that income inequality is strongly associated with poorer health status [35, 42-44].

Even having answered this question on the direction of causality, practitioners and planners are still faced with the challenge of: at what level and by which methods to intervene in this complex web of causal relationships. Results presented also indicate that the age and sex standardised proportion of those reporting 'Poor' health status has changed significantly between 2002 and 2008. However, while there is a temptation to design intervention strategies which can appear to have an immediate effect on a specific set of observable behaviours or measurable conditions, such an approach may miss the underlying causal context and lead to interventions of marginal impact. It is also at times difficult to make valid estimates of population impact of such interventions [45].

As public health interventions become more sophisticated and multi-pronged the necessity for effective and easily applied summary measures grows. The SF1 offers itself as an easy to administer rapid means by which to measure changes in health status at the population level. Whilst controlling for other confounders it is possible that this simple measure can be utilised and understood by experienced researchers, early career investigators as well as practitioners, policy makers and decision makers who may not be familiar with other more complex instruments.

Conclusion

The SF1 is statistically significantly associated with health and risk factors and this has been shown using SAMSS data. This indicates that, in general, the SF1 identifies 'Fair or Poor' health in the case of those with chronic conditions and health risk factors, and 'Excellent, Very Good or Good' health in the absence of chronic conditions. There is also a strong association with socio-economic determinants which have been identified as leading to poorer health status.

The SF1 can be used as an acceptable measuring tool in telephone surveys and it is demonstrating its utility as an ongoing assessment measure. It should be considered for incorporation into the design and development of multi-layered multi-pronged public/population health intervention strategies.

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PEER REVIEW

Not commissioned; Externally peer reviewed

CONFLICTS OF INTEREST

None

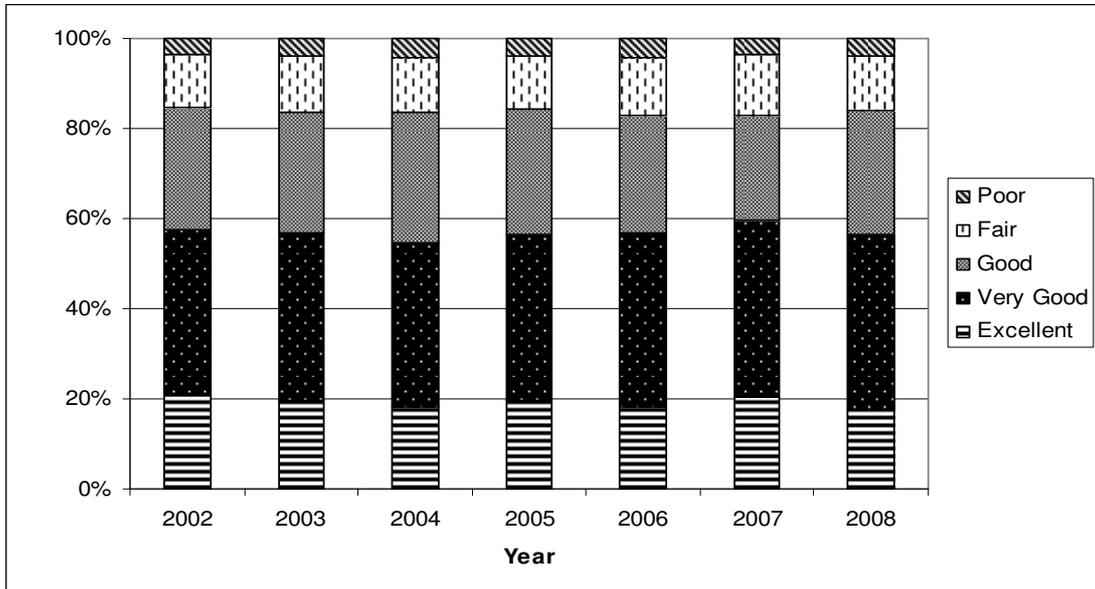


Figure 1: Prevalence within each category of SF1 by year, South Australians aged 18 years and over

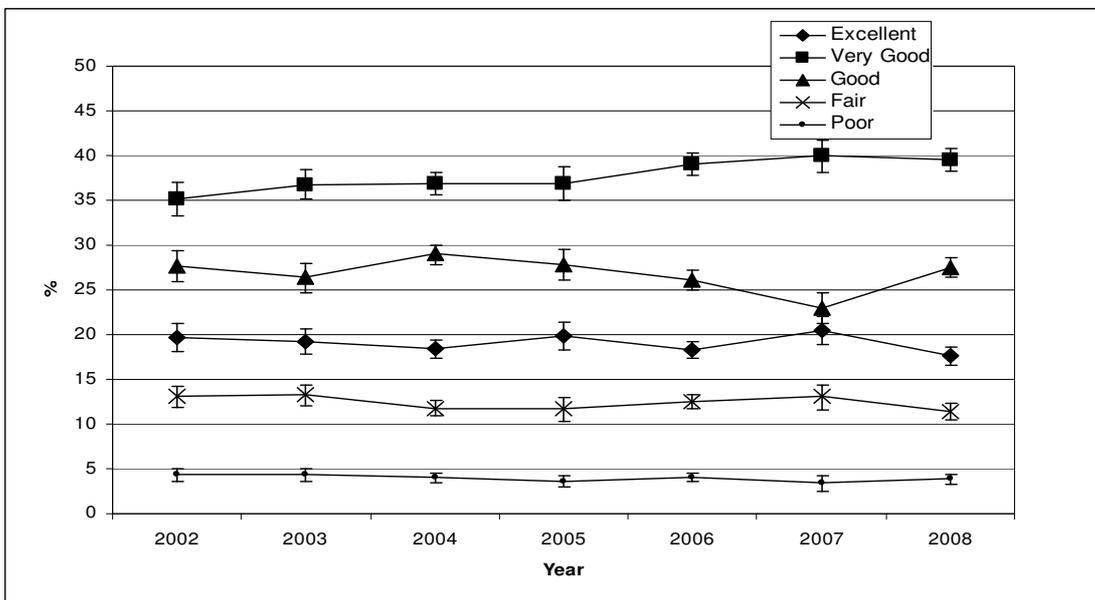


Figure 2: Age-sex standardised prevalence of SF1 over time, South Australians aged 18 years and over



Table 1: Individual SF1 responses by sex, South Australian population, 18 years and over, SAMSS 2006-2008

SF1 response	n	%	95% CI	
Excellent				
Overall	3055	18.6	(18.0 - 19.2)	
Male	1430	17.7	(16.9 - 18.6)	↓
Female	1624	19.3	(18.5 - 20.2)	↑
Very Good				
Overall	6424	39.0	(38.3 - 39.8)	
Male	3123	38.7	(37.7 - 39.8)	
Female	3301	39.3	(38.2 - 40.3)	
Good				
Overall	4224	25.7	(25.0 - 26.3)	
Male	2150	26.7	(25.7 - 27.6)	↑
Female	2074	24.7	(23.8 - 25.6)	↓
Fair				
Overall	2106	12.8	(12.3 - 13.3)	
Male	1053	13.1	(12.3 - 13.8)	
Female	1053	12.5	(11.8 - 13.3)	
Poor				
Overall	656	4.0	(3.7 - 4.3)	
Male	305	3.8	(3.4 - 4.2)	
Female	352	4.2	(3.8 - 4.6)	
Overall total	16465	100.0		

↑↓ Statistically significantly higher or lower between male and female (χ^2 test = 14.73, p<0.05).



Table 2: Individual SF1 responses by age group, South Australian population, 18 years and over, SAMSS 2006-2008

SF1 response	n	%	95% CI	
Excellent				
18 to 24 years	392	21.5	(19.7 - 23.5)	↑
25 to 34 years	714	25.6	(24.0 - 27.3)	↑
35 to 44 years	644	20.4	(19.0 - 21.9)	↑
45 to 54 years	579	19.0	(17.7 - 20.5)	
55 to 64 years	401	16.6	(15.2 - 18.2)	↓
65 to 74 years	189	11.6	(10.1 - 13.2)	↓
75 years and over	137	8.4	(7.2 - 9.9)	↓
Very Good				
18 to 24 years	829	45.5	(43.2 - 47.8)	↑
25 to 34 years	1171	42.0	(40.2 - 43.9)	↑
35 to 44 years	1397	44.3	(42.6 - 46.0)	↑
45 to 54 years	1192	39.2	(37.5 - 41.0)	
55 to 64 years	861	35.7	(33.8 - 37.6)	↓
65 to 74 years	533	32.8	(30.5 - 35.1)	↓
75 years and over	441	27.1	(25.0 - 29.4)	↓
Good				
18 to 24 years	453	24.9	(22.9 - 26.9)	
25 to 34 years	644	23.1	(21.6 - 24.7)	↓
35 to 44 years	716	22.7	(21.3 - 24.2)	↓
45 to 54 years	800	26.3	(24.8 - 27.9)	
55 to 64 years	648	26.9	(25.1 - 28.7)	
65 to 74 years	477	29.3	(27.2 - 31.6)	↑
75 years and over	486	29.9	(27.7 - 32.1)	↑
Fair				
18 to 24 years	122	6.7	(5.6 - 7.9)	↓
25 to 34 years	214	7.7	(6.7 - 8.7)	↓
35 to 44 years	317	10.1	(9.1 - 11.2)	↓
45 to 54 years	355	11.7	(10.6 - 12.9)	↓
55 to 64 years	362	15.0	(13.7 - 16.5)	↑
65 to 74 years	326	20.0	(18.1 - 22.0)	↑
75 years and over	409	25.2	(23.1 - 27.3)	↑
Poor				
18 to 24 years	25	1.4	(1.0 - 2.0)	↓
25 to 34 years	43	1.5	(1.2 - 2.1)	↓
35 to 44 years	79	2.5	(2.0 - 3.1)	↓
45 to 54 years	113	3.7	(3.1 - 4.5)	
55 to 64 years	141	5.8	(5.0 - 6.8)	↑
65 to 74 years	102	6.3	(5.2 - 7.6)	↑
75 years and over	153	9.4	(8.1 - 10.9)	↑
TOTAL	16465	100.0		

↑↓ Statistically significantly higher or lower than between age groups (χ^2 test = 1050.81, $p < 0.05$).

**Table 3: Univariate analysis of demographic characteristics associated with fair/poor health, 18 years and over, 2006-2008**

	n	%	OR	(95% OR)	p value
Sex					
Male	1358/8061	16.8	1.00		
Female	1405/8404	16.7	0.99	(0.91 - 1.08)	0.829
Age					
18 to 24 years	147/1822	8.1	1.00		
25 to 34 years	257/2785	9.2	1.15	(0.93 - 1.43)	0.185
35 to 44 years	396/3154	12.6	1.63	(1.34 - 1.99)	<0.001
45 to 54 years	469/3039	15.4	2.07	(1.70 - 2.52)	<0.001
55 to 64 years	503/2412	20.9	2.99	(2.46 - 3.64)	<0.001
65 to 74 years	428/1627	26.3	4.05	(3.31 - 4.96)	<0.001
75 years and over	562/1626	34.6	6.00	(4.93 - 7.31)	<0.001
Country of birth*					
Australia	2043/12986	15.7	1.00		
UK/Ireland	318/1608	19.8	1.32	(1.16 - 1.51)	<0.001
Other	397/1851	21.5	1.46	(1.30 - 1.65)	<0.001
ATSI status					
No/don't know	2724/16294	16.7	1.00		
Yes	38/171	22.0	1.41	(0.98 - 2.02)	0.066
Employment					
Employed (self/wages/salary)	1033/10171	10.2	1.00		
Unemployed	75/407	18.4	1.99	(1.54 - 2.58)	<0.001
Home duties	206/1155	17.8	1.92	(1.63 - 2.26)	<0.001
Student	52/734	7.1	0.68	(0.51 - 0.91)	0.009
Retired	1038/3466	30.0	3.78	(3.43 - 4.17)	<0.001
Unable to work/other	357/531	67.3	18.20	(15.02 - 22.07)	<0.001
Education*					
Degree or higher	341/3645	9.4	1.00		
Trade/Certificate/Diploma	658/4261	15.4	1.77	(1.54 - 2.03)	<0.001
No schooling up to secondary	1753/8527	20.6	2.51	(2.22 - 2.83)	<0.001
Household income					
More than \$80,000	363/4660	7.8	1.00		
\$60,001-80,000	252/2297	11.0	1.46	(1.23 - 1.72)	<0.001
\$40,001-60,000	314/2276	13.8	1.90	(1.61 - 2.22)	<0.001
\$20,001-40,000	693/2681	25.9	4.13	(3.60 - 4.74)	<0.001
up to \$20,000	701/1923	36.5	6.79	(5.90 - 7.83)	<0.001
Not stated	439/2628	16.7	2.37	(2.05 - 2.75)	<0.001

*Not stated category not reported

**Table 3: Univariate analysis of demographic characteristics associated with fair/poor health, 18 years and over, 2006-2008 (cont)**

	n	%	OR	(95% OR)	p value
SEIFA quintile*					
Highest	463/3790	12.2	1.00		
High	492/3426	14.4	1.21	(1.05 - 1.38)	0.007
Middle	640/3398	18.8	1.67	(1.47 - 1.90)	<0.001
Low	597/3255	18.3	1.61	(1.42 - 1.84)	<0.001
Lowest	570/2548	22.3	2.07	(1.81 - 2.37)	<0.001
Marital Status*					
Never married	406/3138	12.9	1.00		
Widowed	337/1027	32.9	3.30	(2.79 - 3.90)	<0.001
Separated/Divorced	288/1135	25.4	2.29	(1.93 - 2.71)	<0.001
Married/De facto	1728/11153	15.5	1.24	(1.10 - 1.39)	<0.001

*Not stated category not reported

Table 4: Univariate analysis of chronic conditions and risk factors associated with fair/poor health, 18 years+, 2006-2008

	n	%	OR	(95% OR)	p value
HEALTH CONDITIONS					
Diabetes					
No/Don't know	2265/15272	14.8	1.00		
Yes	497/1193	41.7	4.10	(3.63 - 4.64)	<0.001
Current asthma					
No/Don't Know	2201/14342	15.3	1.00		
Yes	562/2123	26.5	1.99	(1.78 - 2.21)	<0.001
COPD					
No/Don't Know	2451/15641	15.7	1.00		
Yes	312/824	37.8	3.27	(2.82 - 3.79)	<0.001
Cardiovascular disease					
No	2140/15153	14.1	1.00		
Yes	623/1313	47.4	5.49	(4.88 - 6.17)	<0.001
Arthritis					
No	1566/12915	12.1	1.00		
Yes	1196/3550	33.7	3.68	(3.37 - 4.02)	<0.001
Osteoporosis					
No/Don't Know	2466/15756	15.7	1.00		
Yes	296/709	41.8	3.87	(3.31 - 4.51)	<0.001
Disability					
No/Don't know	1201/13089	9.2	1.00		
Yes	1561/3376	46.2	8.51	(7.78 - 9.31)	<0.001
Number of health conditions					
0	507/8753	5.8	1.00		
1	728/4307	16.9	3.31	(2.94 - 3.73)	<0.001
2	705/2024	34.9	8.71	(7.66 - 9.90)	<0.001
3	506/938	53.9	19.01	(16.26 - 22.23)	<0.001
4 to 7 conditions	317/443	71.7	41.19	(32.88 - 51.60)	<0.001

**Table 4: Univariate analysis of chronic conditions and risk factors associated with fair/poor health, 18 years+, 2006-2008 (cont)**

	n	%	OR	(95% OR)	p value
HEALTH RELATED RISK FACTORS					
BMI*					
Normal (18.5 to 24.9)	787/6362	12.4			
Underweight (up to 18.5)	53/320	16.6	1.41	(1.04 - 1.91)	0.026
Overweight (25 to 29.9)	859/5573	15.4	1.29	(1.16 - 1.43)	<0.001
Obese (30 and over)	828/3181	26.0	2.50	(2.24 - 2.78)	<0.001
Alcohol - Long term risk*					
Non-drinker/Low risk	2592/15668	16.5	1.00		
Risky/High-risk	139/661	21.1	1.35	(1.11 - 1.63)	0.002
Physical activity*					
Sufficient activity	864/8395	10.3	1.00		
Activity but not sufficient	943/4843	19.5	2.11	(1.91 - 2.33)	<0.001
No activity	883/2876	30.7	3.86	(3.48 - 4.30)	<0.001
Smoking status					
Non-smoker	977/7414	13.2	1.00		
Ex-smoker	1127/6258	18.0	1.45	(1.32 - 1.59)	<0.001
Smoker	659/2793	23.6	2.03	(1.82 - 2.27)	<0.001
Current high blood pressure					
No/Don't know	1699/13281	12.8	1.00		
Yes	1064/3184	33.4	3.42	(3.13 - 3.74)	<0.001
Current high cholesterol					
No/Don't know	1985/14024	14.2	1.00		
Yes	778/2442	31.9	2.83	(2.57 - 3.13)	<0.001

*Not stated category not reported



Table 5: Univariate analysis days off work and health service use associated with fair or poor health, 18 years+, 2006-2008

	n	%	OR	(95% OR)	p value
DAYS OFF OR LIMITED BECAUSE OF HEALTH IN THE LAST 4 WEEKS					
Days unable to work					
	1887/1376				
None	6	13.7			
At least one in past month	874/2697	32.4	3.02	(2.75 - 3.32)	<0.001
Unable to carry out activities due to health					
	1542/1280				
None	4	12.0			
At least once in past month	1220/3657	33.4	3.66	(3.35 - 3.99)	<0.001
Had days off and/or days limited from usual activities because of health					
	1280/1170				
No days off or limited	1	10.9			
Days off	261/1102	23.7	2.53	(2.17 - 2.94)	<0.001
Days limited	607/2062	29.4	3.39	(3.04 - 3.79)	<0.001
Days off and limited	613/1594	38.4	5.08	(4.52 - 5.71)	<0.001
HEALTH SERVICE USE					
Used a GP					
	1115/1043				
None	4	10.7			
At least once in last four weeks	1647/6031	27.3	3.14	(2.89 - 3.42)	<0.001
Used hospital accident and emergency dept					
	2611/1602				
None	6	16.3			
At least once in last four weeks	151/439	34.5	2.70	(2.21 - 3.30)	<0.001
Admitted to hospital					
	2600/1600				
None	3	16.2			
At least once in last four weeks	162/462	35.1	2.79	(2.29 - 3.39)	<0.001
Used a hospital clinic					
	2319/1532				
None	1	15.1			
At least once in last four weeks	444/1144	38.8	3.55	(3.13 - 4.03)	<0.001
Used a specialist					
	2290/1489				
None	3	15.4			
At least once in last four weeks	473/1572	30.1	2.37	(2.11 - 2.66)	<0.001
Number of health services used					
0	921/9551	9.6			
1	1127/4942	22.8	2.77	(2.52 - 3.04)	<0.001
2	479/1404	34.1	4.85	(4.26 - 5.52)	<0.001
3 to 5 health services	236/569	41.5	6.64	(5.55 - 7.95)	<0.001

**Table 6: Multivariate analysis of characteristics associated fair or poor health, 18 years and over, 2006-2008**

	OR	(95% CI)	p value
Country of birth			
Australia	1.00		
UK/Ireland	0.98	(0.84 - 1.15)	0.828
Other	1.48	(1.28 - 1.72)	<0.001
Employment			
Employed (self/wages/salary)	1.00		
Unemployed	1.22	(0.90 - 1.64)	0.202
Home duties	1.10	(0.90 - 1.33)	0.348
Student	0.80	(0.58 - 1.10)	0.172
Retired	1.15	(0.99 - 1.34)	0.068
Unable to work/other	3.44	(2.73 - 4.34)	<0.001
Education			
Degree or higher	1.00		
Trade/Certificate/Diploma	1.16	(0.99 - 1.37)	0.074
No schooling up to secondary	1.34	(1.15 - 1.55)	<0.001
Not stated	3.19	(1.32 - 7.72)	0.010
Household income			
More than \$80,000	1.00		
\$60,001-80,000	1.16	(0.96 - 1.40)	0.121
\$40,001-60,000	1.19	(1.00 - 1.43)	0.054
\$20,001-40,000	1.45	(1.21 - 1.72)	<0.001
up to \$20,000	1.59	(1.31 - 1.94)	<0.001
Not stated	1.36	(1.14 - 1.63)	0.001
SEIFA quintile			
Highest	1.00		
High	1.03	(0.88 - 1.21)	0.711
Middle	1.17	(1.01 - 1.37)	0.043
Low	1.05	(0.90 - 1.23)	0.549
Lowest	1.19	(1.01 - 1.41)	0.035
Not stated	0.30	(0.07 - 1.29)	0.106
Number of health conditions			
0	1.00		
1	2.26	(1.98 - 2.57)	<0.001
2	4.00	(3.45 - 4.63)	<0.001
3	7.45	(6.21 - 8.93)	<0.001
4 to 6 conditions	12.34	(9.56 - 15.94)	<0.001



Table 6: Multivariate analysis of characteristics associated fair or poor health, 18 years and over, 2006-2008 (cont)

	OR	(95% CI)	p value
BMI			
Normal (18.5 to 24.9)	1.00		
Underweight (up to 18.5)	1.26	(0.88 - 1.80)	0.205
Overweight (25 to 29.9)	1.18	(1.04 - 1.33)	0.008
Obese (30 and over)	1.62	(1.42 - 1.85)	<0.001
Not stated	1.45	(1.20 - 1.77)	<0.001
Alcohol - Long term risk			
Non-drinker/Low risk	1.00		
Risky/High-risk	1.42	(1.13 - 1.79)	0.003
Not stated	1.28	(0.78 - 2.09)	0.335
Physical activity			
Sufficient activity	1.00		
Activity but not sufficient	1.42	(1.26 - 1.59)	<0.001
No activity	1.95	(1.72 - 2.21)	<0.001
Not stated	1.49	(1.09 - 2.04)	0.014
Smoking status			
Non-smoker	1.00		
Ex-smoker	1.14	(1.02 - 1.28)	0.020
Smoker	1.97	(1.72 - 2.26)	<0.001
Current high blood pressure			
No/Don't know	1.00		
Yes	1.48	(1.32 - 1.66)	<0.001
Had days off and/or days limited from usual activities because of health			
No days off or limited	1.00		
Days off	1.64	(1.36 - 1.96)	<0.001
Days limited	2.08	(1.82 - 2.38)	<0.001
Days off and limited	2.70	(2.34 - 3.13)	<0.001
Number of health services used			
0	1.00		
1	1.45	(1.30 - 1.63)	<0.001
2	1.69	(1.44 - 1.98)	<0.001
3 to 5 health services	1.91	(1.53 - 2.38)	<0.001