The SoFIE-Health study: Are the results comparable to the New Zealand population?

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Aims: To determine the comparability of the health status of adults in the longitudinal Survey of Families Income and Employment (SoFIE) population with the nationally representative New Zealand Health Survey 2006/07 (NZHS) and whether the results were consistent by ethnicity.

Methods: Overall health status was measured by self-rated health (SRH), health related quality of life (SF-36) and psychological distress (Kessler-10). Age standardised means or prevalence and confidence intervals were computed and compared between surveys. The ratio of age standardised prevalence of very good/excellent SRH and high/very high K-10 scores to the respective total population scores was calculated, within ethnic and New Zealand area deprivation groups.

Results: In general the demographic characteristics of SoFIE and the NZHS samples were similar. Most of the mean scores for the eight domains were higher in SoFIE than in the NZHS, with large differences in the bodily pain and general health domains. The proportion of SoFIE respondents reporting excellent health status was almost twice that of the NZHS sample. However, there were no differences between the samples in the scores of psychological distress. Relative differences of very good/excellent SRH and high/very high psychological distress between ethnic and area deprivation groups were similar in the two samples.

Discussion: We have shown that the overall subjective health status of SoFIE participants was higher than that of NZHS respondents. However, patterns of relative differences between ethnic groups were similar. The two surveys may not be completely comparable, possibly due to survey design, sample attrition and non-response.

Longitudinal studies of selected populations have become increasingly common in population health research[1-6]. The most recent in New Zealand (NZ) is the Survey of Families, Income and Employment (SoFIE) run by Statistics NZ (2002-2010) which consisted of a large sample of adults (N>22,000) at baseline [7].Longitudinal studies commonly use measures of self-rated health status and/or health related quality of life that enquire about personal health, using single- and multi-item scales.

The single item self-rated health measure "in general would you say your health is Excellent, Very Good, Good, Fair or Poor?" is a subjective indicator of general health, which encompasses both mental and physical health status.[1] Responses to this question are a powerful predictor of future health care use and mortality, independent of other medical, lifestyle and psychosocial risk factors.[8-10] However, there has been much debate in recent literature about the interpretation of this measure of self-rated in particular populations and its utility in assessing inequalities in health.[6, 11-12] This is because measures of self-rated health have been shown to be sensitive to study designs and to be interpreted differently in different contexts by diverse groups.[6, 11-12]

Multi-item scales that measure health-related quality of life (HRQL) typically include dimensions of mental and physical health. Most conceptualisations of HRQL emphasise the effects of disease on physical, cognitive, psychological/emotional, social (relationship), and role (daily tasks associated with work, home-making and leisure) functioning. Measures of HRQL are often used to measure the effects of chronic illness and tracking it in different populations can identify subgroups with poor physical or mental health and help guide policies or interventions aimed at improving health.

The Medical Outcomes Study Short Form 36 questionnaire (SF-36) is one of the most widely used questionnaires for measuring HRQL, and measures different aspects of self-reported physical and mental health status in adults[13-14]. The SF-36 has been shown to be reliable and valid for most New Zealanders.[15-16] The Kessler-10 (K-10) is a population screening instrument for non-specific psychological distress and serious mental disorder.[17-18] A strong association has been found between a high K-10 score and having a mental disorder (depression or anxiety) in both the previous month and the previous 12 months.[19-21] The K-10 and SF-36 are commonly used in population-based cross-sectional surveys within NZ such as the New Zealand Health Surveys (NZHS) 1996/97, 2002/03 and 2006/07,[22-24] National Nutrition Survey,[25] New Zealand Mental Health Survey,[20] as well as longitudinal life-course studies such as the Dunedin Multidisciplinary Health and Development Study.[26]

Benchmarking longitudinal studies to NZ population health data is important for determining the reliability and consistency of population health estimates and investigations of inequalities in health. The 2006/07 NZHS found persistent disparities across a range of risk factors and health outcomes for Māori and Pacific peoples compared to the total population.[24, 27] These disparities remained despite substantive recent improvements to access to health care and reduction in relative and absolute inequalities in mortality[27] and the fact that reducing inequalities in health has been a major policy concern in New Zealand.[28]

A recent comparison of the health status of the young adults in the Dunedin Multidisciplinary Health and Development Study to those of similar age in the 1996/97 NZHS showed that most measures of self-reported health status (SF-36) and health outcomes (such as body mass index and hospital admissions) were similar.[26] However, by necessity, that analysis was restricted to people aged[25-26] and ethnic comparisons were not possible due to small numbers. The aim of this paper is to establish the generalisability of the SoFIE results to the NZ population. This will be done by comparing the health status of adults (aged 15 years and older) in the SoFIE population with the nationally representative 2006/07 NZHS and investigate whether the results are consistent by ethnicity, which is particularly important in light of the inequalities described above.

Methods
SoFIE-Health
SoFIE was a household panel longitudinal survey with a fixed duration of eight years conducted by Statistics NZ (2002-2010).[7] The population covered by SoFIE was the usually resident population of New Zealand living in private dwellings (excluding people living in institutions or in establishments such as boarding houses, rest homes, hotels, motels or hostels). The initial SoFIE sample comprised approximately 11,500 responding private households (response rate of 77%) and 22,000 adults sampled within them, on a representative basis from rural and urban areas throughout New Zealand to minimise sampling error. In Wave 2 there were just over 20,000 (91%) responding adult original sample members (OSMs) and in Wave 3 there were over 18,200 responding OSM adults (90% of Wave 2 responders, 83% of Wave 1 responders).[7] The data used in the current analysis were taken from the Wave 3 interview conducted from October 2004 to September 2005 (SoFIE data Version 4) (at the time of analysis for this paper only Waves 1 to 3 data were available).

In SoFIE face to face interviews were conducted annually to collect information on income levels, sources and changes; and on the major influences on income such as employment and education experiences, household and family status and changes, demographic factors and the single item self-rated health status. In Waves 2, 4, 6 and 8 information on assets and liabilities was collected to monitor net worth and savings. An extensive battery of health questions, collecting information on health related quality of life, psychological distress, co-morbidities (e.g. stroke, diabetes, injury), lifestyle factors (smoking and alcohol consumption) perceived stress and primary care usage, were asked in Waves 3, 5 and 7 – giving rise to the SoFIE-Health sub-study.

New Zealand Health Survey 2006/07
The 2006/07 NZHS was carried out from October 2006 to November 2007, collecting information on over 17,000 New Zealanders (4921 children aged from birth to 14 years and 12,488 adults aged 15 years and over).[24] The survey included the usually resident population who live in permanent private dwellings, that is, approximately 94% of the usually resident population. The survey design used multi-stage, stratified sampling, with a probability-proportionate-to-size selection of the sample and over-sampling of Māori, Pacific and Asian ethnic groups. A total of 12,874 households were sampled from throughout New Zealand. The final response rate for the adult sample (15 years and over) was 67.9%, with good participation by Māori and Pacific peoples (response rates of 67.5% and 70.2% respectively).[29] Interviews were conducted in participants' homes and included measures of self-reported physical and mental health status, risk and protective behaviours for health outcomes such as tobacco use and alcohol consumption, and the use of health care services. The raw 2006/07 NZHS data was not available to the researchers at the time of this analysis, so comparisons were made with published data.

Health measures
The health measures used in this analysis were those common to both SoFIE-Health and the 2006/07 NZHS.

Self-reported health status (SRH)
The general self-rated health summary question was used to measure overall self-rated health, i.e. "in general would you say your health is: Excellent, Very Good, Good, Fair, Poor."

Short-Form 36 (SF-36)
The SF-36 (version 2) was used to assess different dimensions of HRQL.[30] This is scored in eight domains of health status: general health perceptions (GH), physical functioning (PF), role limitations due to physical functioning (RP), bodily pain (BP), general mental health (MH), role limitations due to emotional problems (RE), vitality (VT), and social functioning (SF). Each is scored from 0 (worst score) to 100 (best score) and domain scores are presented as means. The SF-36 is both valid and reliable in the general New Zealand population, although it is not clear if it is as reliable in ethnic minority populations in NZ.[15]

The Kessler-10
The K-10 was used to measure non-specific psychological distress.[17-18] This scale was developed as a population mental health screening tool to measure level of current anxiety and depressive symptoms. It consists of ten questions about negative emotional states a person may have experienced in the four weeks prior to the interview. The scores were grouped into four common groupings: low (10-15), moderate (16-21), high (22-29), and very high (30+).[19] Very high scores have been shown to have a high association with the presence of depression or anxiety.[19 21]

Statistical Analysis

Comparisons were made between the SoFIE-Health respondents and participants of NZHS 06/07 aged 15 years and older. For all measures, either means (e.g. SF-36 domain scores) or prevalence (e.g. proportion of the population reporting excellent SRH) are presented together with 95% confidence intervals (CIs). For this paper, means and prevalences were age standardised to the World Health Organization (WHO) world population age distribution using the direct method.[31] The results were considered to be different between the SoFIE-Health and NZHS 06/07 surveys if the 95% CIs did not overlap.

Longitudinal survey weights were applied to the SoFIE-Health data based on each respondent's probability of being selected and adjusted for attrition by age and sex, thus providing estimates consistent with the original eligible population at the beginning of SoFIE (1 October 2002). All SoFIE-Health numbers presented in this paper are randomly rounded to the nearest multiple of five, with a minimum value of 10, as per Statistics New Zealand protocol. All results of the 2006/07 NZHS were weighted to represent New Zealand's estimated resident population living in permanent private dwellings at 31 June 2007. Calibrated weights were calculated using population counts from the 2006 Census (adjusted to mid-2007), in categories of age, gender, District Health Board area and ethnic group.[29]

For this analysis, ethnicity was grouped to the following total ethnic groups: European/Other, Māori, Pacific, and Asian. The 'Other' ethnic group (comprising mainly Middle-Eastern, Latin-American and African ethnicities and those who reported 'New Zealander') has been combined with 'European' to avoid small number problems. Age was grouped into six bands: 15–24, 25–34, 35–44, 45–54, 55–64, 65+ years. The NZ Deprivation (NZDep2001) index is a neighbourhood-level deprivation score and was grouped into quintiles.[32]

Due to limitations in access to the raw data for the NZ Health Survey we assumed that if the confidence intervals for the health measures did not overlap there was a difference in health between surveys. For comparisons of SF-36 scores for the eight domains of health a 5 point difference in SF-36 scores between the two surveys was assumed to represent a clinically relevant difference.[14]

Results

Table 1 describes the sample size and demographic characteristics of the weighted SoFIE and 2006/07 NZHS populations. The distributions of the study populations were relatively similar across age and sex groups. There were slightly more people in the European/Other group and slightly higher proportions of respondents living in less deprived areas (as measured by the NZDep2001) in SoFIE than in the 2006/07 NZHS. This is likely to be due to oversampling of Māori, Pacific and Asian groups in the 2006/07 NZHS and possibly greater attrition of lower socioeconomic groups in SoFIE. Overall the demographic characteristics of SoFIE and the 2006/07 NZHS respondents were similar.

Table 1 Description of the sample size and demographics of the SoFIE and 2006/07 NZ Health Survey populations.

	SoFIE		NZHS	
	N*	%	N*	%
Total	2926900		3120700	
Sex				
Men	1413800	48.3	1497600	48.0
Women	1513100	51.7	1623100	52.0
Age group				
15-24	484500	16.6	553300	17.7
25-34	477100	16.3	507800	16.3
35-44	594700	20.3	609500	19.5
45-54	523800	17.9	556000	17.8
55-64	396200	13.5	418100	13.4
65+	450800	15.4	476100	15.3
Ethnicity				
European / Other	2490800	85.1	2551600	81.8
Māori	276700	9.5	355400	11.4
Pacific	134700	4.6	164700	5.3
Asian	177300	6.1	279000	8.9
NZ Dep 2001				
Quintile 1	688000	23.5	674200	21.6
Quintile 2	616600	21.1	608800	19.5
Quintile 3	541100	18.5	644800	20.7
Quintile 4	584200	20.0	639700	20.5
Quintile 5	493800	16.9	553300	17.7

* N= number, rounded to the nearest hundred.

Table 2 presents age standardised mean scores of the eight SF-36 domains of health. There were differences in mean SF-36 scores between the SoFIE and 2006/07 NZHS samples i.e. mean scores were typically higher in the SoFIE sample than in the 2006/07 NZHS. The mean scores for the bodily pain and general health domains were higher in the SoFIE sample with over a 5 point difference compared to the 2006/07 NZHS. The only domain where the mean score was higher in the 2006/07 NZHS than in the SoFIE population was the role limitations due to emotional problems domain. The patterns in differences of SF-36 scores were similar for males and females across the eight domains of health.

Table 3 presents the age standardised prevalence of SRH status and level of psychological distress for the SoFIE and 2006/07 NZHS samples. The proportion of SoFIE respondents reporting excellent health status was almost twice that of the NZHS, for males and females separately and combined. Accordingly, the proportion of SoFIE respondents reporting very good, good or fair/poor health was lower than the proportion of 2006/07 NZHS respondents who did so. No differences between samples were observed for the levels of psychological distress (K-10).

Table 2 Age standardised mean SF36 scores for the eight health domains, for SoFIE participants and 2006/07 NZ Health Survey respondents, by sex and overall.

	Total			Male			Female		
	SoFIE	NZHS		SoFIE	NZHS		SoFIE	NZHS	
PF	89.4 (88.9-89.8)	87.5 (87.1-87.9)		91.1 (90.6-91.6)	89.8 (89.4-90.3)		87.7 (87.2-88.3)	85.4 (84.8-86.0)	
RP	86.0 (85.5-86.6)	86.8 (86.3-87.2)		87.6 (86.9-88.2)	88.2 (87.6-88.8)		84.6 (83.9-85.2)	85.5 (84.8-86.1)	
BP	83.3 (82.7-83.8)	75.8 (75.3-76.4)	**	84.3 (83.6-85.0)	76.8 (76.0-77.6)	**	82.3 (81.7-83.0)	74.9 (74.1-75.7)	**
GH	80.1 (79.6-80.6)	74.7 (74.2-75.3)	**	80.7 (80.1-81.3)	74.5 (73.8-75.3)	**	79.5 (78.9-80.1)	74.9 (74.2-75.6)	*
VT	65.4 (64.8-65.9)	64.0 (63.5-64.4)		67.9 (67.2-68.5)	66.0 (65.3-66.6)		63.0 (62.4-63.7)	62.1 (61.6-62.7)	
SF	90.7 (90.2-91.3)	88.5 (88.0-89.0)		92.2 (91.6-92.8)	89.8 (89.1-90.5)		89.3 (88.7-90.0)	87.3 (86.5-88.0)	
RE	92.6 (92.1-93.0)	93.6 (93.3-93.9)		93.8 (93.2-94.3)	94.6 (94.1-95.1)		91.4 (90.8-92.0)	92.6 (92.2-93.1)	
MH	83.3 (82.8-83.7)	81.9 (81.5-82.2)		84.5 (84.0-85.0)	82.8 (82.3-83.3)		82.1 (81.5-82.6)	81.0 (80.5-81.5)	

PF = physical functioning
RP = role limitations due to physical functioning
BP = bodily pain
GH = general health
VT = vitality
SF = social functioning
RE = role limitations due to emotional problems
MH = mental health
* 3.0-4.9 point difference,
** 5+ point difference where confidence intervals do not overlap

Table 3 Age standardised prevalence (95% confidence intervals) of self-reported health status and level of psychological distress (Kessler-10), for SoFIE participants and 2006/07 NZ Health Survey respondents, by sex and overall.

	SoFIE	NZHS	
Total	Self-Rated Health		
Excellent	38.6 (37.5-39.7)	19.9 (19.1-20.6)	**
V Good	33.7 (32.8-34.6)	41.4 (40.1-42.6)	**
Good	20.0 (19.2-20.7)	29.0 (27.8-30.2)	**
Fair/Poor	7.7 (7.3-8.1)	9.8 (9.1-10.5)	*
Male			
Excellent	39.7 (38.2-41.0)	18.9 (17.6-20.1)	**
V Good	32.7 (31.3-34.0)	40.8 (39.0-42.6)	**
Good	19.8 (18.7-20.8)	30.5 (28.8-32.1)	**
Fair/Poor	7.8 (7.2-8.4)	9.9 (8.9-10.9)	*
Female			
Excellent	37.5 (36.2-38.8)	20.8 (19.5-22.0)	**
V Good	34.7 (33.5-35.9)	41.9 (40.3-43.5)	**
Good	20.2 (19.3-21.2)	27.6 (26.1-29.2)	**
Fair/Poor	7.6 (7.0-8.2)	9.7 (8.8-10.6)	*
	SoFIE	NZHS	
Total	K-10		
Low	78.3 (77.5-79.1)	77.8 (76.8-78.8)	
Mod	15.1 (14.4-15.8)	15.4 (14.6-16.2)	
High	5.0 (4.6-5.4)	5.0 (4.5-5.5)	
Very high	1.5 (1.3-1.7)	1.7 (1.5-2.0)	
Male			
Low	80.5 (79.4-81.5)	80.5 (79.1-81.9)	
Mod	14.2 (13.3-15.2)	13.7 (12.5-15.0)	
High	4.3 (3.8-4.9)	4.3 (3.6-5.1)	
Very high	1.0 (0.7-1.2)	1.4 (1.0-1.8)	
Female			
Low	76.3 (75.3-77.4)	75.3 (73.9-76.8)	
Mod	16.0 (15.0-16.9)	17.0 (15.6-18.3)	
High	5.7 (5.1-6.3)	5.7 (4.9 - 6.4)	
Very high	2.0 (1.6-2.3)	2.0 (1.6-2.4)	

* 1.0-4.9 percentage point difference
** 5+ percentage point difference

Table 4 Age standardised prevalence (95% confidence intervals) of very good to excellent self-reported health status and high to very high levels of psychological distress (K-10), for SoFIE participants and 2006/07 NZ Health Survey respondents, by ethnic group and NZDep, including the ratio of subgroup prevalence to the total population score.

	SoFIE		NZHS	
	Prevalence (95% CI)	ratio	Prevalence (95% CI)	ratio
Self-Rated Health (Ex + VG)				
Total population	70.5 (69.6-71.3)		61.2 (59.8 - 62.6)	
Ethnic Group				
NZ/European	73.2 (72.3-74.1)	1.04	63.3 (61.7 - 65.0)	1.03
Māori	65.1 (62.6-67.7)	0.92	51.0 (48.3 - 53.7)	0.83
Pacific	69.2 (65.6-72.9)	0.98	50.2 (46.4 - 54.1)	0.82
Asian	62.1 (58.2-66.0)	0.88	54.0 (50.6 - 57.4)	0.88
NZ Deprivation				
1 (least)	76.7 (75.0-78.3)	1.09	69.4 (67.0 - 71.9)	1.13
2	73.7 (72.1-75.3)	1.05	66.2 (63.6 - 68.7)	1.08
3	69.8 (67.9-71.7)	0.99	61.5 (58.7 - 64.3)	1.00
4	67.4 (65.6-69.2)	0.96	56.8 (54.2 - 59.4)	0.93
5 (most)	61.7 (59.6-63.9)	0.88	51.4 (48.5 - 54.4)	0.84
K-10 (High + Very High)				
Total population	6.3 (5.8-6.7)		6.8 (6.1 - 7.4)	
Ethnic Group				
NZ/European	6.0 (5.5-6.4)	0.95	6.1 (5.4 - 6.8)	0.90
Māori	10.5 (8.6-12.3)	1.67	10.8 (9.5 - 12.1)	1.59
Pacific	9.9 (7.4-12.3)	1.57	12.9 (10.2 - 15.6)	1.90
Asian	7.9 (5.6-10.3)	1.25	7.7 (5.8 - 9.6)	1.13
NZ Deprivation				
1 (least)	3.4 (2.7-4.1)	0.54	3.6 (2.6 - 4.6)	0.53
2	5.2 (4.3-6.0)	0.83	5.0 (3.7 - 6.3)	0.74
3	7.1 (5.9-8.2)	1.13	4.8 (3.8 - 5.9)	0.71
4	7.9 (6.8-9.0)	1.25	9.0 (7.3 - 10.8)	1.32
5 (most)	10.2 (8.8-11.6)	1.62	11.9 (10.2 - 13.5)	1.83

Table 4 presents the age standardised prevalence of very good and excellent SRH status and high to very high levels of psychological distress (K-10), by total ethnic group and NZ Deprivation quintile. Ratios were calculated by comparing the subgroup prevalence to the prevalence of the total population. After age standardisation, Māori, Pacific and Asian respondents typically had lower prevalence of very good and excellent health status than the general population on both surveys. Māori, Pacific and Asian respondents also had higher prevalence of high and very high levels of psychological distress compared to the total population, on both surveys. The results by NZ Deprivation were similar between the two surveys. Overall, whilst the prevalence of SRH may have varied between SoFIE and 2006/07 NZHS data, the pattern of relative differences between social groups was similar.

Discussion

This comparison of the health status of SoFIE respondents with the sample population in the most recent 2006/07 NZHS showed that SoFIE respondents tended to rate their health and health related quality of life better than participants of the 2006/07 NZHS. However, despite this there was no difference in the distribution of psychological distress between the two surveys. The relative ratio of rates to the overall average was similar between the two surveys, for social groups, ethnicity and area deprivation. So although health status was better in the SoFIE population, the patterns of differences among respondents in SoFIE and the 2006/07 NZHS were similar.

Such inconsistencies in survey health data have been reported elsewhere. A recent publication from the US comparing trends in self-rated health across four nationally representative surveys observed strong inconsistencies in the rates of self-rated health between the populations, particularly among certain population sub-groups.[6] There are a number of possible explanations for the differences in the overall health of the populations from these two 'nationally representative' surveys used in the current analysis.

Sampling Methods

The target population for both surveys was the usually resident population of NZ who live in private dwellings. However, there were differences in the sampling methods. In SoFIE a random sample was created using a three-stage stratified cluster approach. Firstly, primary sampling units (PSUs) were assigned to strata according to region, urban/rural, high/low Māori population density and other socio-economic variables derived from the 1996 census. NZ is divided into approximately 19,000 PSUs containing on average around 70 dwellings; SoFIE sampled 1,500 PSUs. The 2006/07 NZHS also used an area-based framework for sample selection, which consisted of over 32,000 meshblocks, of which 1385 were sampled. The 2006/07 NZHS also used a three-step cluster selection sample process.[29] However, the 2006/07 NZHS 'boosted' the sample of Māori, Pacific and Asian participants in order to get large enough counts in sub-groups to enable reliable estimates. However, any differences in the results by ethnicity due to sampling should have been corrected by using the sampling weights.

Attrition/Non-response

The 2006/07 NZHS had an overall response rate of 68%. As SoFIE is a longitudinal survey, attrition (loss to follow up, death, refusal to be re-interviewed) is an ongoing problem. By Wave 3 of the survey a response rate of 83% of the original Wave 1 population was achieved. Taking this into account, with the initial 77% household response rate, the overall response rate in Wave 3 was 64%. (Response rates in SoFIE are relatively high when compared with similar international longitudinal panel studies.[33]) However, it is possible that the SoFIE population surveyed in Wave 3 were in better health than the general NZ population because people with poor health status at the start of the survey were more likely to drop out (or die) by Wave 3.[34] Therefore good health status may be a stronger determinant of retention in a longitudinal survey than it is of participation in a one-off cross-sectional survey. A longitudinal survey in the Netherlands (NEMESIS) found that psychopathology had a weak-to-moderate effect on attrition and is more strongly related to failure to locate respondents than to refusal.[35]

Different annual base populations

Both surveys used survey weighting estimation with calibrated weights to calculate estimates of population totals, averages and proportions, to reflect the probability of each respondent being sampled and taking into account non-response.

However, the weighting of the surveys was to different benchmark years, with SoFIE weighted to the eligible (estimated resident) population in 2002 and the 2006/07 NZHS weighted to the estimated 2007 resident population, using 2006 census data. The recent 2006/07 NZHS looked at trends in health status over three NZ health surveys (1996/97, 2002/03 and 2006/07) and found relatively stable rates of self-rated health across the 10 years. When the SF-36 results from SoFIE were compared to the older 2002/03 NZHS the confidence intervals for four domains overlapped in both males and females (PF, VT, SF and MH). Therefore the different calibrated year of the surveys may be part of the explanation for differences in subjective health status between the studies. This is similar to what was found in the US.[6]

Survey Mode

Both surveys interviewed participants in their own homes using Blaise Computer Assisted Personal Interview (CAPI) software, using showcards where appropriate. However, the order of the questions asked in the two surveys was different. In the SoFIE survey the SF-36 and K-10 questions were not all asked in consecutive order as per the original questionnaire designs. This may have affected how individuals responded to some of the questions.

Survey Structure

The different purpose and structure of the surveys could also have led to differential response bias. Participants of the 2006/07 NZHS may have responded differently (to those in SoFIE) as they were informed that the survey was focussed on health outcomes. Also, the SF-36 was asked near the end of the 2006/07 NZHS questionnaire after questions about chronic health conditions and health service usage. In SoFIE, the SF-36 questions were placed towards the beginning of the health module. The health module in SoFIE was asked as part the third wave of the survey, and at the end of a long interview, so it is possible that the SoFIE respondents were exhibiting survey fatigue and behaviour training through repeated exposure to the survey. However, Poulton showed that there was little evidence that the repeated assessments over the years in the Dunedin Study had significantly altered the Study members' health, either in terms of responses to questionnaires or on other measures of health such as body mass index and smoking[26].

Conclusion

We have shown that the overall subjective health-status of SoFIE participants was slightly better than that reported by participants in the 2006/07 NZHS. However, patterns of differences between ethnic groups were similar between the surveys. There are a number of possible reasons for the differences in health status, with the most likely being survey design and attrition or non-response. That is, health status might be a stronger determinant of attrition in longitudinal studies than it is in one-off cross-sectional surveys – even within strata of socio-demographic factors.

Statistics New Zealand Security Statement

Access to the data used in this study was provided by Statistics New Zealand in a secure environment designed to give effect to the confidentiality provisions of the Statistics Act, 1975. The results in this study and any errors contained therein are those of the author, not Statistics New Zealand.

References

1. **Singh-Manoux A, Martikainen P, Ferrie J, Zins M, Marmot M, Goldberg M.** What does self rated health measure? Results from the British Whitehall II and French Gazel cohort studies. J Epidemiol Community Health 2006;60(4):364-72.

2. **Hennessy CH, Moriarty DG, Zack MM, P.A. S, R. B.** Measuring health-related quality of life for public health surveillance. Public Health Reports 1994;109(5):665-72.

3. **Marmot M, Brunner E.** Cohort Profile: The Whitehall II study. Int. J. Epidemiol. 2005;34(2):251-56.

4. **Contoyannis P, Jones AM, Rice N.** The dynamics of health in the British Household Panel Survey. Journal of Applied Econometrics 2004;19(4):473-503.

5. **Wooden M, Freidin S, Watson N.** The Household, Income and Labour Dynamics in Australia (HILDA)Survey: Wave 1. Australian Economic Review 2002;35(3):339-48.

6. **Salomon JA, Nordhagen S, Oza S, Murray CJL.** Are Americans Feeling Less Healthy? The Puzzle of Trends in Self-rated Health. Am. J. Epidemiol. 2009:kwp144.

7. **Carter KN, Cronin M, Blakely T, Hayward M, Richardson K.** Cohort profile: Survey of Families, Income and Employment (SoFIE) and Health Extension (SoFIE-Health). Int. J. Epidemiol. 2009;Published online May 28:dyp215.

8. **Mackenbach JP, Simon JG, Looman CWN, Joung IMA.** Self-assessed health and mortality: could psychosocial factors explain the association? Int. J. Epidemiol. 2002;31(6):1162-68.

9. **Idler EL, Benyamini Y.** Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies. Journal of Health and Social Behavior 1997;38(1):21-37.

10. **Miilunpalo S, Vuori I, Oja P, Pasanen M, Urponen H.** Self-rated health status as a health measure: The predictive value of self-reported health status on the use of physician services and on mortality in the working-age population. Journal of Clinical Epidemiology 1997;50(5):517-28.

11. **Subramanian SV, Ertel K.** Is the use of self-rated health measures to assess health inequalities misleading? Int. J. Epidemiol. 2008;37(:):1436-40.

12. **Subramanian SV, Ertel K.** Author's Response: Self-rated health may be adequate for broad assessments of social inequalities in health. Int. J. Epidemiol. 2009;38(1):319-20.

13. **Ware JE.** SF-36 Health Survey Update. SPINE 2000;25(24):3130-39.

14. **Ware JE, Kosinki MA, Gandek B.** SF-36 Health Survey: Manual and Interpretation Guide. Lincoln RI: Quality Metric Incorporated, 2005.

15. **Scott KM, Sarfati D, Tobias MI, Haslett SJ.** A challenge to the cross-cultural validity of the SF-36 health survey: factor structure in Maori, Pacific and New Zealand European ethnic groups. Soc Sci Med 2000;51(11):1655-64. 4: Scott KM et al. SF-36 health survey reliabili...[PMID: 10462864]Related Articles, Links.

16. **Scott KM, Tobias MI, Sarfati D, Haslett SJ.** SF-36 health survey reliability, validity and norms for New Zealand. Aust N Z J Public Health 1999;23(4):401-6.

17. **Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, et al.** Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol Med 2002;32(6):959-76.

18. **Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al.** Screening for serious mental illness in the general population. Arch Gen Psychiatry 2003;60(2):184-9.

19. **Andrews G, Slade T.** Interpreting scores on the Kessler Psychological Distress Scale (K10). Aust NZ J Public Health 2001;25(6):494-97.

20. **Oakley Browne MA, Wells JE, Scott KM.** Te Rau Hinengaro: The New Zealand Mental Health Survey. Wellington: Ministry of Health, 2006.

21. **Oakley Browne MA, Wells JE, Scott KM, McGee MA.** The Kessler Psychological Distress Scale in Te Rau Hinengaro: the New Zealand Mental Health Survey. Australian and New Zealand Journal of Psychiatry 2010;44(4):314-22.

22. **Ministry of Health.** Taking the Pulse The 1996/97 New Zealand Health Survey. Wellington: Ministry of Health, 1999.

23. **Ministry of Health.** A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey. Wellington: Ministry of Health, 2004.

24. **Ministry of Health.** A Portrait of Health. Key Results of the 2006/07 New Zealand Health Survey. Wellington: Ministry of Health, 2008.

25. **Russell DG, Parnell WR, Wilson NC.** NZ Food: NZ People. Key results of the 1997 National Nutrition Survey. Wellington: Ministry of Health, 1999.

26. **Poulton R, Hancox R, Milne B, Baxter J, Scott K, Wilson N.** The Dunedin Multidisciplinary Health and Development Study: are its findings consistent with the overall New Zealand population? NZ Med J 2006;119(1235).

27. **Blakely T, Tobias M, Atkinson J, Yeh L-C, Huang K.** Tracking disparity: trends in ethnic and socioeconomic inequalities in mortality, 1981-2004. Wellington: Ministry of Health, 2007.

28. **Ministry of Health.** Reducing Inequalities in Health. Wellington: Ministry of Health, 2002.

29. **Ministry of Health.** Methodology Report for the 2006/07 New Zealand Health Survey. Wellington: Ministry of Health, 2008.

30. **Ware JE, Snow KK, Kosinki MA, Gandek MS.** SF-36 Health Survey Manual and Interpretation Guide. Lincoln RI: Quality Metric Incorporated, 2000.

31. **Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M.** Age Standardization of Rates: A New WHO Standard. Geneva: World Health Organization, 2003.

32. **Salmond C, Crampton P.** NZ Dep 2001 Index of Deprivation. Wellington: Department of Public Health, University of Otago, 2002.

33. **Headey B, Warren D.** Families, Incomes and Jobs, Volume 3: A Statistical Report on Waves 1 to 5 of the HILDA Survey. Melbourne: Melbourne Institute of Applied Economic and Social Research, The University of Melbourne, 2008.

34. **Carter K, Hayward M, Richardson K.** SoFIE-Health Baseline Report: Study Design and Associations of Social Factors and Health in Waves 1 to 3. SoFIE-Health Report 2. Wellington: University of Otago, Wellington, 2008.

35. **de Graaf R, Bijl RV, Smit F, Ravelli A, Vollebergh WAM.** Psychiatric and Sociodemographic Predictors of Attrition in a Longitudinal Study The Netherlands Mental Health Survey and Incidence Study (NEMESIS). Am. J. Epidemiol. 2000;152(11):1039-47