# Short Form 36 (SF-36) Health Survey Questionnaire: normative data for Wales

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# ABSTRACT

**Background** The Short Form 36 Health Survey Questionnaire (SF-36) is used to indicate the health status of particular populations, to help with service planning and to measure the impact of clinical and social interventions. Culture-specific data are required to calculate SF-36 norm-based scores. Currently, in the UK normative sources are nearly two decades old, Anglocentric and lack data on the older population. We draw on raw data from the Welsh Health Survey (2007) to provide population norms for the eight SF-36 dimensions for Wales and its regions.

**Methods** We test the SF-36 dimensions for reliability and rating scaling assumptions and construct validity. We compare the Wales' norms to those reported in existing UK sources and examine the data between countries and by region.

**Results** The scale is reliable and has content validity. The relationships found between the SF-36 domains and a range of variables known to be related to health also demonstrate construct validity. There are differences in population health norms between England and Wales and between the regions of Wales.

**Conclusions** The results suggest that it is imperative that the accurate normative data provided in this paper is used in population studies in Wales to provide an indication of the health status of particular populations.

Keywords cost of illness, health care costs; quality of life, public health, Wales

# Background

The Short Form 36 Health Survey Questionnaire (the SF-36) was developed in the USA for use in the Rand Corporation's Health Insurance Experiment.<sup>1</sup> Subsequently the measure has been translated into 120 languages and has been used around the world to gauge the health of local populations (e.g. China, India, The Netherlands and Spain).<sup>2–5</sup> It has been reported as the most widely evaluated generic health measure accounting for 10% of all published reports before 2000.<sup>6</sup> The SF-36 is commonly used in the UK to provide an indication of the health status of particular populations, to help with service planning and to measure the impact (in terms of health gains) of clinical and social interventions.<sup>7–10</sup>

The SF-36 User Manual recommends that norm-based scores (NBS) should be used rather than 0–100 scores to simplify interpretation of the data.<sup>11</sup> General population norms can be built into the scoring algorithm so that

clinicians and researchers do not have to remember (or refer to) norms for each of the eight dimensions of the scale in order to interpret them correctly. Thus, in order to determine variations in health status and assess the effectiveness of interventions appropriate culture-specific normative data are required to calculate SF-36 NBS.

Currently in the UK the normative data that are used to establish the healthiness (or otherwise) of samples is commonly derived from one of the four sources: the Office for National Statistics (ONS) omnibus survey of Britain (1992),<sup>12</sup> the Health Survey for England,<sup>12</sup> the Oxford Healthy Life Survey General Household Survey 1992<sup>13</sup> and a survey conducted in Sheffield.<sup>14</sup> There are however

Vanessa Burholt, Professor of Gerontology Paul Nash, Research Officer limitations associated with each of these sources of normative data, which concern the Anglocentric nature of the samples and the lack of disaggregated data for the older population. Specifically, the Oxford Healthy Life Survey was confined to central England and limited to people aged between 16 and 64 years. The Sheffield survey was limited to patients from two general practitioner surgeries in the area, and to those aged between 16 and 74 years. The Health Survey for England has a greater geographic coverage than either the Oxford Healthy Life Survey or the Sheffield Survey, and included people aged 16 or more years, with no upper age limit. The British ONS Omnibus survey (1992) included adults aged 16 years and over, and had a wide coverage than all of the aforementioned studies. Despite the greater geographical coverage of The Health Survey for England, as the name suggests the study was only conducted in England and the norms cannot be assumed to apply to the devolved regions of the UK. Furthermore, because of the proportional probability sampling process used in the British ONS Omnibus Survey (1992) the final sample included only 288 individuals from the South West and Wales and 189 people living in Scotland and thus has limited generalizability to the devolved administrations.

As scores from the SF-36 are used to measure clinical outcomes, it is imperative that applicable normative data are used to judge effectiveness. In the last decade (2000-10), 40 articles published in the BMJ have used SF-36 as a outcome measure, and of these papers 23% have potentially used inappropriate norms for calculating SF-36 scores as samples were selected that extended beyond the boundaries of England (i.e. stated as UK wide), 9,15-20 encompassed England and Wales,<sup>21</sup> or were located solely within Wales.<sup>22</sup> The UK sources used for SF-36 norms are now 18 years old. SF-36 norms are likely to have changed during this period, as the health status of the populations have altered as indicated by increases in life expectancy at birth, periods of life spent in good health (healthy life expectancy) and time spent without a limiting illness or disability (disability free life expectancy).<sup>23</sup> Furthermore, there is strong evidence that health varies across the regions of the UK,<sup>23</sup> and thus SF-36 scores would be expected to differ between England, Wales and Scotland (and sub-regions) accordingly. Indeed, small-scale surveys have shown differences in SF-36 norms reported for Oxford (England), Aberdeen (Scotland) and West Glamorgan (Wales).<sup>6,13,24</sup> We may also expect the movement of populations to specific areas to contribute to the health of a population as geographical inequalities in health between areas can be greatly exacerbated through selective migration by health status.<sup>25</sup>

This paper seeks to address the lack of SF-36 normative data for Wales. Although the Welsh Health Survey (WHS, 2007) has published information on the health status of the Welsh population, the 'age standardized' SF-36 scores were not calculated using UK norms, but used US norms provided in the SF-36 User Manual.<sup>11</sup> In this paper we draw on the raw data from the WHS (2007) to provide population norms for the eight SF-36 dimensions for Wales and its regions. We test the SF-36 dimensions for reliability and rating scaling assumptions (content validity) and examine construct validity by examining statistical relationships between the domains and a range of variables known to be related to health (i.e. age, gender, social class, limiting illness, attendance at accident and emergency departments and inpatient status).<sup>12</sup> Finally we compare the Wales' norms to those reported for the British ONS Omnibus Survey (1992) and the Oxford Healthy Life Survey (1992) and we examine the Wales data by region to demonstrate area differences across the UK and within Wales.

# Methods

The paper draws on the data collected as part of the WHS (2007). However, comparisons are also made with the ONS omnibus survey of Britain (1992), and the Oxford Healthy Life Survey 1992, thus the methods and sampling for all three surveys are covered here (although the latter two are covered with brevity) (Table 1).

The WHS (2007) data were collected through a combination of methods. Letters were sent to all selected addresses explaining the purpose of the WHS and to assist recruitment. Household data were collected in face-to-face interviews and individual-level data (including the data for the SF-36) were collected from each adult aged 16 or over in the household using self-completion paper questionnaires (that were collected by the interview). This methodology differs from that used by the ONS in the Omnibus Survey where face-to-face interviews were conducted using computer aided personal interviews (CAPI) and the Oxford Healthy Life Survey General Household Survey where a postal questionnaire was used.

# Sampling

The sample for the WHS 2007 was selected from the small user version of the Post Office's postcode address file (PAF) which covers more than 99% of private households in Wales. The PAF does not include addresses for institutions (such as care homes or hospitals). For a 12 month period from January to December 2007, 13 590 addresses were

	WHS (2007)	Omnibus Survey (1992)	Oxford Healthy Life Survey (1992)
Age range	16+	16+	18-64
Geographical spread	All Wales postcode database	All G.B. postcode database	Central England GP surgeries
Sample size	13 917	2051	9332
Response rate (%)	84	78	72
Data collection technique	Face-to-face interviews for household level data and self-complete questionnaires (hand collected) for individual-level data (including SF36)	Face-to-face CAPI	Postal self-complete questionnaires
Methodological limitations	Excludes institutions from sample	Small overall sample size	Recruitment only through GP registrations
	Unequal chance of sampling due to variation in population density and exclusion of those in previous 2005/06 sample	Only 288 from the South West and Wales	Only England
			Small regional sample

 Table 1
 Main characteristics of three health surveys

randomly sampled from the PAF. Since the third year of the WHS (2005/06), addresses sampled for the survey have been added to a historical database held by the sampling agency and excluded from future WHS samples for at least 2 years. Thus, the WHS (2007) does not include any addresses sampled in the 2005/06 survey. The sample was stratified by unitary authority (UA) and in order to achieve a sample of at least 600 adults in each UA, a minimum of 540 addresses were approached in each.

The response rate for the WHS 2007 interviews (household data) was 74%, whereas the response rate for the individual self-completion questionnaire (including the SF-36 measure) was 84%.<sup>26</sup> Similar response rates were also reported for the ONS Omnibus Survey (78%)<sup>12</sup> and the Oxford Healthy Life Survey General Household Survey (72%).<sup>13</sup>

#### Measures

The SF-36 is a 36 item scale, which measures eight domains of health status: physical functioning (10 items); physical role limitations (four items); bodily pain (two items); general health perceptions (five items); energy/vitality (four items); social functioning (two items); emotional role limitations (three items) and mental health (five items). A scoring algorithm is used to convert the raw scores into the eight dimensions listed above. The scores are transformed to range from zero where the respondent has the worst possible health to 100 where the respondent is in the best possible health.

In this paper we have not imputed any missing values for the SF-36 in the WHS 2007. Imputed scores are based on the mean across each person's available item responses in each domain (for those domains with 50% or more valid scores). There has been considerable speculation regarding the impact of mean imputation on variables, with some authors suggestion that mean substitution will have a conservative bias, whereas others suggest that variation will be attenuated.<sup>27,28</sup> Although the imputation of person mean scores is recognized as a valid operation with the SF-36 measure<sup>11</sup> we felt it important to report on 'actual' scores in this paper so that the normative scores that will be used in future analysis are not differentially attenuated according to the amount of missing data that are recorded.<sup>28</sup>

The WHS (2007), ONS Omnibus Survey (1992) and the Oxford Healthy Life Survey General Household Survey used the anglicized version of the SF-36 (with the WHS 2007 also available in Welsh). However, the ONS Omnibus Survey (1992) contained different wording for one of the items included in the Mental Health Dimension. The item should ask 'How much time during the last month...' 'Have you felt calm and peaceful?' whereas the Omnibus Survey changed 'peaceful' to read 'cheerful'.

The analysis in this paper uses the basic demographic information collected in the WHS (2007) (age, gender, socio-economic status and limiting illness) as well as harnessing information about National Health Service use (i.e. attendance at accident and emergency departments and inpatient status). *T*-tests are used to compare norms for the SF-36 dimensions between the British Omnibus Survey, the Oxford Healthy Life Survey General Household Survey and the WHS. The College of Human and Health Sciences Research Committee, at Swansea University granted ethical approval for the secondary data analysis.

# Results

#### **Demographic characteristics**

Table 2 shows the socio-demographic spread of the participants for the WHS 2007 and compares this to the 1992 ONS Omnibus Survey. The samples across the three surveys are generally comparable with the following exceptions: levels of home ownership and number of chronic conditions are both greater in Wales.

 Table 2
 Socio-demographic data for WHS (WHS) 2007 and British

 Omnibus Survey 1992
 1992

	WHS		1992 Omnii Survej	2 nibus rey	
	%ª	n	%	n	
Age					
16-24	11	1584	10	204	
25-44	28	3939	36	735	
45-54	16	2243	15	302	
55-64	18	2552	15	297	
65-74	14	1968	13	281	
75+	12	1631	11	217	
Sex					
Male	46	6418	45	929	
Female	54	7499	55	1122	
Tenure					
Owner/occupier	78	10818	70	1430	
Social renting	14	1953	22	452	
Private renting/other	8	1076	8	167	
Economic status					
In employment	49	6552	50	1001	
Unemployed	1	192	5	94	
Economically inactive	50	13432	45	900	
GP contact <sup>b</sup>					
Yes	17	2403	20	420	
No	83	11373	80	1629	
Outpatient <sup>c</sup>					
Yes	21	2805	17	355	
No	80	10906	83	1694	
Inpatient <sup>d</sup>					
Yes	10	1350	13	257	
No	89	12440	87	1792	
Chronic condition					
Yes	51	6966	22	452	
No	49	6687	78	1594	

<sup>a</sup>Percentages do not always equal 100 due to rounding.

<sup>b</sup>In the last 2 weeks.

<sup>c</sup>In the last 3 months.

<sup>d</sup>In the last year.

## Rating scaling assumptions (content validity)

Table 3 illustrates the levels of non-response for each of the SF-36 domains and also reports the data by age group. The highest proportion of non-responses in each domain was recorded for those respondents aged 75–79 years. There are relatively high rates of non-response for all of those aged 65–79. Furthermore, there is fairly high non-response rate for some domains that is, physical functioning (9.4%); physical role limitations (6.6%); and emotional role limitations (6.5%). However, comparing the WHS (2007) published data (which has imputed missing values) to the data reported here, we can see that the non-response can be decreased substantially by substituting imputed mean scores for missing values. For example, although 9.4% of data are missing on the physical functioning domain this is decreased to 2.6% after imputing missing values.

Table 4 shows good internal consistency for the SF-36 domains with each realizing a Cronbach's alpha in excess of 0.8 confirming the results of previous research in the UK and US.<sup>6,13,14,29–30</sup> Each domain achieves acceptable levels of internal reliability, that is >0.7.<sup>31</sup> In particular, the internal consistency of the social functioning domain performs better in the WHS 2007 sample than demonstrated in the ONS Omnibus 1992 sample or with the original development sample in the USA.<sup>29</sup>

Table 4 shows that all domains were positively skewed, with participants tending to give more favourable responses. For all items tests of normality were rejected, however, this confirms the pattern of distribution found elsewhere.<sup>12</sup>

#### **Construct validity**

Table 5 presents the data relating to the statistical relationships between the domains and a range of variables known to be related to health (i.e. age, gender, social class, limiting illness, attendance at accident and emergency departments and inpatient status). As would be expected, and in line with previous research,<sup>12–14,29</sup> lower mean scores (representing worse health) were related to older age, being female and lower social class. Furthermore, sub-groups of people were also distinguishable by their lower health status: those who had a limiting illness, who had attended an accident and emergency department in the preceding 3 months, or who had been an inpatient in a hospital in the last year.

## **Regional differences in scores**

Table 6 demonstrates that there are differences in the SF-36 mean scores for the WHS (2007) when compared with the ONS Omnibus British Survey (1992) and the Oxford Healthy Life Survey. In a majority of cases, mean

Table 3 WHS 2007 SF36 domain non-response by age

Dimension	Total non- respons (n)	Total non- se respons (%)	Perce	ntage o	of total	non-re:	sponse	by age	group								
		()-)	16–1	920-2	4 25 – 2	2930-3	3435-3	3940-4	44 45 – 4	49 50-5	54 55-6	i9 60-6	64 65 - 6	970-7	475-7	980-8	485+
Physical functioning	1308	9.4	1.8	2.9	1.4	2.3	3.5	5.4	6.7	5.7	8.3	9	12.5	11.9	13.1	9.4	6.1
Role limitations (physical)	913	6.6	1.9	2.8	1.8	2.7	3.7	4.4	5.1	3.9	7.8	9.9	12.4	12.9	13.6	10.4	6.7
Bodily pain	526	3.8	5.3	4.9	3	3.8	4.8	6.7	5.3	4.2	7.8	6.8	10.3	9.9	10.6	9.1	7.4
General health perceptions	837	6.0	3.1	2.7	2.5	2.5	3.7	4.5	5	6.3	7.4	8.2	12.8	10.5	14.1	9.0	7.5
Energy/vitality	680	4.9	3.2	4.6	3.1	4.3	4.7	6.6	5.3	5.1	7.1	7.4	10.3	10.4	12.4	8.7	6.9
Social functioning	514	3.7	3.7	4.3	3.5	4.3	4.5	5.6	5.8	3.7	6.6	7.4	11.1	11.9	10.3	9.7	7.6
Role limitations (emotional	) 900	6.5	2.6	2.7	2.4	2.4	3.2	4.7	4.8	3.9	8.2	9	11.4	12.7	14.3	9.6	8.1
Mental health	761	5.5	3.2	3.7	3.4	3.5	4.6	6.2	5.9	4.5	7.5	8.8	11.3	10.6	12.1	8.7	6.0

 Table 4
 Internal consistency and skewness of SF36 dimensions: a comparison of Cronbach's alpha coefficients and Kolmgorov–Smirnov Z-test scores across studies

Dimension	No. of items	SF-36 Manual	Cronbac	ch's α	Kolmgor	Kolmgorov–Smirnov Z-test				of ents
			ONS 1992	WHS 2007	ONS 199	92	WHS 20	07	ONS 1992	WHS 2007
Physical functioning	10	0.93	0.93	0.96	11.75	P<0.01	29.50	P<0.001	2047	12 609
Role limitations (physical)	4	0.89	0.92	0.98	16.45	P<0.001	35.99	P<0.001	2035	13 004
Bodily pain	2	0.90	0.84	0.93	11.71	P<0.001	21.84	P<0.001	2041	13 391
General health	5	0.81	0.82	0.86	5.59	P<0.001	13.83	P<0.001	2019	13 080
Eporgy/uitality	Л	0.96	0.91	0.05	E 12	R < 0.001	11 / 7	R < 0.001	2040	12 227
Energy/vitality	4	0.60	0.01	0.65	5.15	P < 0.001	11.42	P < 0.001	2040	15 257
Social functioning	2	0.68	0.73	0.88	19.89	P < 0.001	35.65	P < 0.001	2037	13 403
Role limitations (emotional)	3	0.82	0.89	0.97	22.1	P<0.001	47.11	P<0.001	2036	13 017
Mental health	5	0.84	0.81	0.84	6.15	P<0.001	16.42	P<0.001	2040	13 156

SF-36 domain scores are lower in the WHS survey than in the other two surveys. Of particular note are the considerable differences in the scores for physical function (-11.8 and -10.6; 95% confidence interval (CI): 10.5– 13.1 and 9.2–11.3, respectively) and bodily pain (-12.4 and -11.4; CI: 10.9–13.9 and 10.7–12.2, respectively). In this respect people in Wales have considerably worse physical health and more bodily pain that those people included in either the ONS or Oxford studies. Although a majority of the mean scores for the SF-36 dimensions in Wales are lower than those in the previously cited studies, also of note is the mean score for emotional role limitation which is higher in Wales than the score observed in Central England. As the Wales score for this dimension is similar to the ONS Omnibus Survey of Britain score (-1.0) this probably reflects poor emotional Health in the Oxford sample, rather than better emotional health in Wales.

Whereas Table 6 shows difference in norms in Wales compared with Britain/England Table 7 provides the normative data for Wales and its regions, by age group (5-year age bands) and gender. Overall there is too much variation by age, gender and region to comment upon in detail, so here some general impressions are provided.

	Physical	functioning	1	Role lim	itations (ph	ysical)	Bodily p	ain		General	health perc	eptions
	Mean	(SD)	n	Mean	(SD)	n	Mean	(SD)	n	Mean	(SD)	n
Age												
16-19	92.6	(19.8)	778	94.3	(16.0)	785	86.0	(20.0)	774	77.5	(19.5)	770
20-24	92.9	(18.7)	744	93.7	(17.1)	756	84.4	(20.9)	756	75.2	(19.5)	759
25-29	91.5	(20.7)	787	91.1	(20.9)	789	80.4	(24.1)	789	74.0	(20.2)	784
30-34	91.1	(20.5)	822	91.3	(21.3)	827	80.9	(23.7)	832	73.6	(21.0)	83
35-39	90.1	(20.4)	1043	89.6	(22.6)	1055	78.6	(25.1)	1064	73.0	(20.9)	1058
40-44	88.8	(22.2)	1123	89.0	(24.3)	1153	76.2	(25.9)	1158	70.7	(22.4)	115
45-49	85.4	(24.7)	1054	84.8	(28.1)	1094	72.6	(28.0)	1113	67.8	(22.8)	1099
50-54	81.1	(27.5)	1027	81.2	(30.8)	1066	68.8	(28.1)	1080	65.5	(24.1)	1049
55-59	74.1	(31.8)	1177	75.3	(34.4)	1215	64.6	(29.8)	1245	61.9	(25.8)	1224
60-64	69.6	(32.1)	1148	70.1	(34.5)	1176	62.3	(30.3)	1230	60.9	(25.3)	119
65-69	66.2	(31.4)	879	67.7	(34.7)	929	62.0	(28.9)	988	61.3	(24.2)	93
70-74	58.5	(32.9)	771	59.9	(35.1)	808	58.1	(30.0)	874	57.6	(24.0)	838
75–79	50.8	(32.2)	593	52.7	(34.4)	641	56.3	(29.5)	709	57.8	(23.8)	64
80-84	42.0	(31.9)	384	46.0	(34.1)	412	54.0	(29.2)	459	52.8	(22.2)	432
85+	31.3	(30.5)	279	38.1	(34.9)	298	52.8	(29.6)	320	50.9	(22.8)	290
Sex												
Male	79.9	(30.0)	5890	79.4	(32.1)	6057	72.4	(28.1)	6175	66.9	(24.0)	608
Female	75.9	(31.5)	6719	77.3	(32.4)	6947	68.1	(29.4)	7216	65.6	(24.0)	699
Social class <sup>a</sup>												
1	83.2	(26.4)	4564	82.9	(28.5)	4699	74.3	(26.3)	4742	69.9	(22.1)	4658
2	78.7	(30.1)	971	79.8	(30.5)	991	69.8	(28.1)	1023	67.3	(23.0)	998
3	78.1	(30.6)	1423	78.4	(32.6)	1461	71.0	(29.4)	1518	67.9	(23.7)	1479
4	75.4	(31.9)	1741	76.4	(33.6)	1799	67.8	(29.5)	1867	64.2	(24.4)	180
5	70.8	(34.4)	3247	72.2	(35.8)	3363	65.2	(31.0)	3525	61.4	(25.6)	3430
6	64.8	(36.3)	239	68.9	(35.1)	264	65.3	(30.6)	283	59.6	(25.8)	27
Limiting illne	ess											
Yes	45.7	(32.5)	3423	43.1	(33.9)	3554	42.9	(26.5)	3785	43.0	(22.7)	3628
No	90.2	(18.9)	9024	92.0	(18.3)	9306	81.3	(21.5)	9428	75.4	(17.4)	933
Attended												
A&E <sup>b</sup>												
Yes	69.8	(36.0)	650	66.1	(38.8)	661	53.8	(31.4)	692	57.7	(26.9)	680
No	78.2	(30.5)	11 903	79.0	(31.7)	12 283	71.1	(28.5)	12 622	66.7	(23.7)	12 334
Inpatient <sup>c</sup>												
Yes	58.6	(37.3)	1186	55.0	(39.5)	1226	52.3	(31.9)	1279	51.6	(26.7)	124
No	79.8	(29.3)	11 355	80.9	(30.3)	11 704	72.1	(27.9)	12 022	67.8	(23.2)	11 762
Energy/vitality			Social fu	Social functioning			Role limitations (emotional)			Mental health		

Table 5 WHS 2007: mean	(SD) scores for the SF36	dimensions by age, sex	, social class and health variables
	(		,

No	/9.8	(29.3)	11 355	80.9	(30.3)	11 /04	/2.1	(27.9)	12 022	67.8	(23.2)	11 /62	
	Energy/\	Energy/vitality			Social functioning			itations (em	otional)	Mental I	Mental health		
	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	
Age													
16-19	69.5	(19.8)	780	90.2	(19.5)	783	94.0	(16.9)	779	78.1	(16.7)	778	
20-24	64.2	(19.4)	751	88.5	(21.1)	760	92.7	(18.9)	758	74.4	(17.9)	754	
25-29	60.6	(20.8)	784	86.1	(22.8)	787	91.5	(19.7)	783	73.7	(19.1)	779	
30-34	59.4	(19.5)	823	86.4	(23.6)	830	91.7	(20.0)	830	73.8	(17.6)	825	
35–39	58.4	(20.3)	1057	85.5	(23.0)	1066	91.5	(20.0)	1060	73.1	(18.0)	1054	
											(	Continued	

	Physical	functioning	r	Role lim	itations (ph	ysical)	Bodily p	ain		General	health perc	eptions
	Mean	(SD)	n	Mean	(SD)	n	Mean	(SD)	n	Mean	(SD)	n
40-44	58.3	(20.9)	1148	85.5	(23.3)	1164	92.2	(20.0	1151	73.8	(18.2)	1146
45-49	57.1	(21.6)	1105	81.6	(27.6)	1111	88.8	(24.4)	1098	72.1	(19.8)	1096
50-54	56.5	(22.0)	1067	80.4	(27.7)	1083	88.0	(24.6)	1067	73.2	(19.4)	1068
55-59	54.7	(23.4)	1238	76.9	(30.3)	1252	84.5	(29.1)	1212	72.2	(20.6)	1229
60-64	55.6	(23.6)	1216	76.9	(30.4)	1228	84.9	(28.0)	1185	74.1	(20.3)	1199
65–69	57.7	(22.7)	972	77.5	(22.7)	972	84.0	(28.4)	939	76.2	(18.1)	956
70-74	53.3	(23.5)	855	73.5	(30.6)	865	80.0	(31.1)	812	75.4	(18.6)	845
75–79	49.8	(22.1)	681	68.8	(32.5)	712	76.3	(32.4)	636	74.3	(18.5)	637
80-84	47.4	(23.1)	448	66.9	(32.2)	547	74.5	(35.0)	421	74.7	(18.5)	441
85+	43.9	(22.6)	312	58.6	(34.1)	320	70.9	(37.3)	286	71.6	(19.8)	313
Sex												
Male	60.3	(22.0)	6147	82.5	(27.2)	6194	88.4	(25.4)	6070	76.3	(18.2)	6109
Female	54.4	(22.3)	7090	78.2	(28.7)	7209	85.8	(26.5)	6947	72.0	(19.3)	7047
Social class <sup>a</sup>	1											
1	59.8	(20.7)	4710	84.4	(25.0)	4758	90.9	(21.0)	4710	76.6	(16.8)	4695
2	56.5	(21.8)	1023	81.8	(26.1)	1029	88.3	(23.7)	994	74.0	(18.3)	1014
3	58.6	(22.7)	1491	81.5	(27.7)	1500	88.2	(25.0)	1468	75.9	(18.6)	1493
4	56.4	(22.3)	1834	79.1	(28.7)	1872	85.4	(28.2)	1811	73.5	(18.8)	1821
5	53.9	(23.8)	3475	74.6	(31.0)	3540	81.9	(30.7)	3348	70.8	(21.0)	3436
6	51.1	(24.5)	272	70.4	(31.4)	272	79.2	(30.8)	263	65.7	(21.9)	275
Limiting illn	ess											
Yes	40.2	(21.8)	3729	55.6	31.9	3816	69.7	(35.8)	3538	64.9	(21.7)	3679
No	64.0	(18.6)	9354	90.3	18.6	9438	93.7	(16.8)	9339	77.7	(16.2)	9335
Attended A	&E <sup>b</sup>											
Yes	51.4	(24.8)	688	65.2	34.9	701	79.4	(33.8)	657	68.6	(21.6)	677
No	57.5	(22.1)	12 477	81.1	27.4	12 630	87.5	(25.4)	12 300	74.3	(18.7)	12 416
Been an												
inpatient <sup>c</sup>												
Yes	45.8	(23.6)	1268	60.7	34.2	1286	75.2	(34.9)	1211	66.9	(21.6)	1250
No	58.4	(21.8)	11 888	82.4	26.4	12 029	88.3	(24.5)	11 736	74.8	(18.4)	11 830

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<sup>a</sup>NS-SEC 5 classes: 1, managerial or professional occupations; 2, intermediate occupations; 3, small employers own account workers; 4, lower supervisory and technical occupations; 5, semi-routine and routine occupations; 6, never worked and long-term unemployed.

<sup>b</sup>In the last 3 months.

<sup>c</sup>In the last 12 months.

As noted previously health appears to deteriorate with age, as generally indicated by peak health in the early 20s (around 20-24 years) followed by decreasing mean scores with advancing age. However, there are some exceptions to this pattern. Energy and vitality, social functioning and mental health improve slightly at retirement age for both men (ages: 65-69 years) and women (ages: 60-64 years) and role limitations (emotional) improve for women only at retirement. Although the improvement drops off for men after the age of 69, the improvement in energy and vitality and mental health continues for women into the 65-69 age

group. The greater mean scores for all of these domains are most marked for men aged 65-69 years in North Wales. Furthermore, this sub-group of men also demonstrates improved mean scores for physical functioning, bodily pain and role limitations (emotional).

# Conclusions

## Main finding of this study

The comparison of the SF-36 Wales' norms to those reported for the British ONS Omnibus Survey (1992) and

	(1) British ONS Survey 1992 (ages, 16+)		(2) Oxford (Central England) Healthy Life Survey 1991– 1992 (ages, 18–64)		(3) WHS 2 (ages, 16	2007 +)	<i>Difference between 1 and 3 (95% Cl)</i>	Difference between 2 and 3
	Mean	(SD)	Mean	(SD)	Mean	(SD)		
Physical functioning	89.6	(19.3)	88.4	(17.9)	77.8	(30.0)	-11.8***	-10.6***
Role limitations (physical)	84.2	(32.7)	85.8	(29.9)	78.3	(32.3)	-5.9***	-7.5***
Bodily pain	82.5	(34.8)	81.5	(21.6)	70.1	(32.3)	-12.4***	-11.4***
General health perceptions	74.0	(21.9)	73.5	(19.9)	66.2	(24.0)	-7.8***	-7.3***
Energy and vitality	64.7	(20.8)	61.1	(19.6)	57.2	(22.3)	-7.5***	-3.9***
Social functioning	89.0	(20.8)	88.0	(19.5)	80.2	(28.1)	-8.8***	-7.8***
Role limitations (emotional)	88.0	(29.1)	82.9	(31.8)	87.0	(26.0)	-1.0	+4.1***
Mental health	76.6	(18.3)	73.8	(17.2)	74.0	(18.9)	-2.6***	+0.2

\_Table 6 Comparison of the norms for the SF-36 dimensions between the British ONS Survey [12] the Oxford Healthy Life Survey [12] and the WHS

\*\*\*P<0.001.

the Oxford Healthy Life Survey (1992) demonstrates that there are regional differences in population health norms across the UK. This supports Bhopal's<sup>32</sup> proposition that 'Populations differ by place, their characteristics and time [...]. This applies particularly to the burden of disease and risk factors, but also to causal understanding. Thus, understanding the kind of population studied is essential'. Despite the fundamental basis of good epidemiological research that like is compared with like, to date there has been no normative data for Wales available to researchers and practitioners.

#### What is already known on this topic

The tests performed on the SF-36 dimensions demonstrate that the scale is reliable and that rating scaling assumptions are sufficiently robust to ensure that it has content validity. The statistical relationships found between the SF-36 domains and a range of variables known to be related to health (i.e. age, gender, social class, limiting illness, attendance at accident and emergency departments and inpatient status) also demonstrate construct validity. This supports the findings from other studies that indicate that the SF-36 is a useful tool for measuring health status.<sup>12–14,29</sup>

## What this study adds

The examination of the WHS 2007 data by region demonstrates area differences within Wales. In particular we can see some striking differences in the health of older men in North Wales. Whilst we could relate the improved energy and vitality, mental well-being, role limitation (emotional) and social functioning at the age of 65–69 years for men and 60–64 years for women to retirement and the resulting decrease in stress, increase in leisure time and well-being that accompanies this life transition for some older people,<sup>33,34</sup> the marked increase in mean scores in North Wales for these domains plus physical functioning and bodily pain suggests that there is another mechanism at work. In this instance, we suggest that the positive variation in the health of older men in North Wales may be due to influx of healthier retirement migrants<sup>35–38</sup> that could perhaps mask the health of the native older population who are aging in place.

## Limitations of the study

There has not been a significant change in the self-reported health of the Welsh population between the WHS 2003 and WHS 2009. The SF-36 mean physical component score remained constant and the mental component score shifted from 49.8 to 49.9 over the 6 year period. We suggest that the norms provided in the paper have a minimum lifetime of 6 years. Monitoring of the WHS SF-36 raw data will capture any potential population health shifts and the need to recalculate norms.

The WHS 2007 sampling strategy has limitations. Firstly in relation to measuring the health of the nation, the exclusion of institutions (e.g. care homes, hospitals) from the sampling frame means that those people with the worst levels of health are likely to be omitted. Secondly, the chance of selection for inclusion in the sample was not equal across Wales: the probability of selecting an address varied by size and population density of the UA and, where Table 7 SF36 norms for Wales and its regions by age and sex

Mean         (5D)         Mean         (5D)         Mean         (5D)         Mean         (5D)           Pryskal functioning Mules         16-19         93.1         (21.4)         94.8         (17.8)         93.7         (20.0)         88.8         (28.3)           2D-24         94.4         (17.5)         94.6         (16.2)         94.8         (16.5)         93.3         (21.3)           2D-24         91.1         (22.4)         88.3         (25.4)         94.6         (16.6)         91.6         (22.5)           3D-3.3         91.0         (20.8)         92.4         (18.5)         08.6         (24.0)         91.3         (20.0)           40-44         05.5         (20.8)         02.4         (18.5)         08.6         (22.2)         04.6         (15.9)           45-40         87.3         (24.1)         83.6         (76.6)         69.5         (22.0)         02.8         (27.0)         60.6         (32.4)         (20.0)         (18.9)         (3.5)         63.7         (3.6)         65.6         (30.0)         73.7         (30.0)         73.9         (33.3         43.3         (30.0)         74.6         (4.30.2)         (24.1)         (33.9)         (18.2)		All Wales		South East	t Wales	Mid- and	West Wales	North Wales		
Project functioning           Males           16-19         93.1         (21.4)         94.8         (17.8)         93.7         (20.0)         88.8         (28.3)           25-29         91.1         (22.4)         88.3         (25.4)         94.6         (16.6)         91.6         (23.0)           30-34         91.1         (21.6)         92.8         (18.5)         90.5         (22.0)         88.8         (25.8)           30-34         91.0         (20.8)         92.4         (18.5)         88.6         (22.2)         93.6         (15.9)           40-44         90.5         (20.8)         82.4         (18.3)         88.6         (22.2)         90.9         (20.8)           50-54         84.2         (25.9)         83.4         (25.6)         87.2         (24.2)         82.0         (27.0)           60-64         70.4         (32.7)         68.6         (33.2)         73.0         (30.5)         69.7         (43.5)           65-69         66.8         (32.2)         42.7         (3.0)         73.7         (33.3)         46.3         (22.8)           10         75.79         53.3         (32.5)         52.2         (3.1) </th <th></th> <th>Mean</th> <th>(SD)</th> <th>Mean</th> <th>(SD)</th> <th>Mean</th> <th>(SD)</th> <th>Mean</th> <th>(SD)</th>		Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	
Male16-199.10.1494.8(17.8)9.7(20.0)8.8(28.3)20-2494.4(17.6)94.6(16.2)94.8(16.6)91.6(21.0)20-2391.1(21.6)92.8(18.5)90.5(22.0)88.8(25.8)30-3491.1(21.6)92.8(18.5)88.6(24.6)91.3(20.0)40-4490.5(20.8)90.2(21.8)88.6(22.2)9.9(20.8)50-5484.7(25.9)83.4(25.6)87.2(41.2)82.0(27.2)50-5484.7(23.0)73.1(22.1)77.6(31.3)82.0(27.8)50-5464.8(22.4)62.0(31.8)69.9(34.0)(23.1)(27.0)60-6470.4(22.7)68.6(32.1)77.6(31.2)72.8(30.0)70-7462.4(22.9)61.4(33.1)69.9(34.0)(22.1)(28.1)70-7464.7(32.7)61.4(31.1)69.9(33.0)62.7(34.1)70-7464.7(32.2)52.2(31.7)75.5(32.2)52.2(31.1)70-7491.9(19.6)91.4(20.5)91.5(18.0)91.5(19.0)70-7464.9(32.1)65.7(33.1)62.1(31.1)(32.1)(33.1)62.1(31.1)70-7464.9(32.1)65.7(35.1)(31.1)(32.	Physical function	ning								
111	Males									
P-2-494.4(17.6)94.6(16.2)94.8(16.5)93.3(7.3)25-7991.1(27.4)88.3(25.4)94.6(16.6)91.6(23.0)30-3491.0(20.8)92.4(18.5)88.6(22.0)88.3(25.9)40-4491.3(20.8)92.2(18.8)88.6(22.2)90.9(20.8)40-4487.3(24.1)83.6(25.6)87.2(24.2)82.0(28.2)55-5976.6(30.7)73.1(32.1)77.6(31.3)81.2(27.0)65.666.8(32.4)62.0(31.8)63.3(34.0)(28.2)(30.0)70-7462.4(32.9)61.4(31.1)63.3(32.4)66.2(33.1)80-8441.4(31.2)42.1(31.1)45.5(23.7)30.8(29.7)81.4(14.2)(32.9)61.4(31.1)45.5(23.7)30.8(29.7)81.4(31.2)42.1(31.1)45.5(23.7)30.8(29.7)81.4(14.1)(31.2)(31.1)45.5(23.7)30.8(16.6)82.4(14.1)(13.2)91.7(19.8)91.8(18.0)91.4(20.6)83.4(19.6)91.4(20.5)91.5(18.0)91.4(20.6)19.5(18.0)19.6(19.6)83.4(19.1)91.4(20.5)91.5(18.0)91.4(20.6)19.6<	16-19	93.1	(21.4)	94.8	(17.8)	93.7	(20.0)	88.8	(28.3)	
P9.1(2.4)8.2(2.4)9.4 (16.)9.6 (16.)9.6 (2.0)8.8 (2.8)30-3491.0(2.8)92.8(18.5)90.5(2.2.0)88.8(2.4)9.3(2.0)40-4490.5(2.8)92.4(18.5)88.6(2.2.1)93.6(15.9)45-4987.3(2.1)83.6(2.2.1)82.6(2.2.2)93.6(15.9)50-5484.2(25.9)83.4(25.6)87.2(24.2)22.0(28.2)55-597.6.6(30.7)7.1.1(2.1)7.7.6(3.1.3)81.2(27.0)60-647.0.4(32.7)68.6(32.2)7.2.0(30.5)67.2(34.0)70-7462.8(32.9)61.4(31.7)60.3(32.4)66.2(31.1)75-7955.3(32.5)52.2(31.7)75.7(32.2)72.2(44.0)70-7462.4(32.9)61.4(31.7)63.3(32.4)66.2(27.0)80-8445.7(32.9)43.2(28.7)(33.1)63.3(28.8)(28.7)(33.1)(32.9)70-7462.4(31.3)43.2(29.7)(7.1)(19.7)11.3(19.6)70-7491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)20-2291.9(19.2)92.8(14.6)92.7(19.7)91.4(20.6)20-2391.9(19.6)93.4(20.9) <t< td=""><td>20-24</td><td>94.4</td><td>(17.6)</td><td>94.6</td><td>(16.2)</td><td>94.8</td><td>(16.5)</td><td>93.3</td><td>(21.3)</td></t<>	20-24	94.4	(17.6)	94.6	(16.2)	94.8	(16.5)	93.3	(21.3)	
111	25-29	91.1	(22.4)	88.3	(25.4)	94.6	(16.6)	91.6	(23.0)	
1 40-449.00.00.2.09.2.4(18.5)8.8.6(24.0)9.1.3(20.0)45-4987.3(24.1)83.6(26.8)88.6(22.2)93.6(15.9)45-4987.3(24.1)83.6(26.8)87.2(24.2)82.0(28.2)55-597.6(30.7)7.3.1(32.1)7.7.6(31.3)81.2(27.0)60-6470.4(32.7)68.6(32.2)7.3.0(30.5)69.7(34.5)65-6968.8(32.4)6.0(31.8)6.9(34.0)7.2.8(30.0)70-7462.4(32.9)61.4(31.1)69.3(32.4)63.2(27.0)80-8446.7(32.2)47.7(31.2)49.3(33.3)46.3(22.8)85.441.4(31.3)45.2(31.3)48.5(28.7)(36.2)(19.6)85.441.4(31.3)41.2(28.7)(19.6)(19.6)(19.6)97.297.997.3(19.3)97.4(19.2)(19.6)(19.6)97.297.4(19.6)91.4(20.5)91.5(19.6)(19.6)97.497.997.3(19.3)97.8(19.7)91.0(19.6)97.497.997.4(19.6)97.4(28.6)(27.1)(19.7)91.0(19.6)97.497.997.4(19.6)97.4(29.9)85.5(25.5)87.4(29.4)(27.4) <td< td=""><td>30-34</td><td>91.1</td><td>(21.6)</td><td>92.8</td><td>(18.5)</td><td>90.5</td><td>(22.0)</td><td>88.8</td><td>(25.8)</td></td<>	30-34	91.1	(21.6)	92.8	(18.5)	90.5	(22.0)	88.8	(25.8)	
49.6.4.49.6.3(24,1)83.6(21,8)88.6.(22,2)93.6(15.9)50-5484.2(25.9)83.4(25.6)87.2(24.2)80.9(28.2)50-6484.2(25.9)83.4(25.6)87.2(24.2)81.4(27.0)60-6476.6(30.7)73.1(21.1)77.6(31.3)81.2(27.0)65-6966.8(24.4)62.0(31.8)66.9(30.5)69.7(34.5)65-7955.3(32.4)(32.9)61.4(31.1)60.3(22.4)66.2(33.1)80-8446.7(32.9)61.4(31.1)60.3(32.4)66.2(34.0)80-8446.7(32.9)44.7(31.2)49.3(33.3)46.3(28.1)80-8441.4(13.3)42.2(31.1)49.5(87.7)30.8(29.7)61-199.2(18.3)91.7(19.8)92.8(14.6)92.2(18.3)20-2491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)25-2991.9(19.2)92.0(18.3)91.2(19.7)91.0(19.6)25-2991.9(19.2)92.0(18.3)91.2(19.7)91.0(19.6)25-2991.9(19.2)92.0(18.3)87.8(25.6)87.2(23.1)40-4487.2(23.4)87.1(23.9)85.5(25.5)87.2	35-39	91.0	(20.8)	92.4	(18.5)	88.6	(24.6)	91.3	(20.0)	
487.3(24.1)83.6(26.8)89.5(22.2)90.9(20.8)55-5976.6(30.7)73.1(32.1)77.6(31.3)82.0(28.2)65-6966.8(32.4)62.0(31.8)66.9(30.0)72.8(30.0)70-7462.4(32.9)61.4(33.1)60.3(32.4)62.2(31.0)75-7955.3(32.5)52.2(31.7)57.5(32.2)57.2(34.0)85+41.4(31.3)43.2(33.1)45.3(32.8)(32.8)85+11.4(31.3)43.2(33.1)45.3(28.7)(38.8)85+11.4(31.3)43.2(33.1)45.3(28.7)(38.8)85+11.4(31.3)43.2(33.1)45.3(28.7)(38.6)(29.7)16-199.2(18.3)91.7(19.8)91.8(18.0)91.2(19.6)20-2491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)20-2491.5(19.6)90.3(20.9)90.4(19.7)91.0(19.6)35-3989.3(20.1)89.7(19.3)87.8(22.6)83.9(20.1)40-4487.2(23.4)87.1(23.9)85.5(25.6)87.2(23.4)45-4983.9(25.1)84.2(25.0)83.7(25.4)83.9(25.1)45-4583.9(25.1)84.2 <td< td=""><td>40-44</td><td>90.5</td><td>(20.8)</td><td>90.2</td><td>(21.8)</td><td>88.6</td><td>(22.2)</td><td>93.6</td><td>(15.9)</td></td<>	40-44	90.5	(20.8)	90.2	(21.8)	88.6	(22.2)	93.6	(15.9)	
5-5-48.2(25)8.4(25)7.6(24.2)8.2(28.2)5-5-97.6(30.7)7.1(31.1)7.7(31.3)81.2(27.0)60-647.04(32.7)68.6(32.1)7.0(30.5)(32.4)(30.5)70-746.2.4(32.9)61.4(31.1)60.3(32.4)66.2(31.1)75-795.5.3(22.5)5.2.2(31.7)57.5(32.2)3.6(32.8)80-844.7(32.2)4.7(31.2)49.3(33.3)46.3(28.8)80-844.67(32.2)4.7(31.2)49.3(32.8)(3.8)(29.7)70-746.9(18.3)4.7(19.8)9.8(14.6)9.5(18.8)20-249.1.5(19.6)9.1.4(20.5)9.1.5(18.0)9.1.6(19.6)20-349.1.9(19.2)9.2.0(18.3)9.1.2(19.7)9.1.9(19.6)20-349.1.9(19.6)9.1.4(20.5)9.5.5(18.0)9.1.6(19.6)35-398.9.3(20.1)8.7.1(23.9)8.5.(25.5)8.7.2(23.4)45-498.9.3(20.1)8.7.1(23.9)8.5.(25.5)8.7.2(23.4)45-498.9(20.1)8.7.1(23.9)8.5.(25.5)8.7.2(23.4)45-498.9(20.1)8.7.1(23.9)8.5.(25.5)8.7.2(23.4) <td< td=""><td>45-49</td><td>87.3</td><td>(24.1)</td><td>83.6</td><td>(26.8)</td><td>89.5</td><td>(22.2)</td><td>90.9</td><td>(20.8)</td></td<>	45-49	87.3	(24.1)	83.6	(26.8)	89.5	(22.2)	90.9	(20.8)	
\$5-5976.6(30.7)73.1(32.1)77.6(31.3)81.2(27.0)60-6470.4(32.7)68.6(33.2)73.0(30.5)69.7(34.5)65-6966.8(32.4)62.0(31.8)66.9(34.0)72.8(30.0)70-7462.4(32.9)61.4(33.1)60.3(32.4)66.2(33.1)80-8446.7(32.5)52.2(31.7)57.5(32.2)57.2(34.0)80-8446.7(32.2)44.7(31.2)43.3(32.8)46.3(22.8)80-8446.7(32.2)44.7(31.2)43.2(33.1)45.3(28.7)30.8(29.7)80-8446.7(32.2)44.7(21.2)49.3(32.8)46.3(29.7)10.8(28.7)30.8(29.7)80-8446.7(18.3)91.7(19.8)92.8(14.6)92.2(18.3)(19.6)20-2491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)20-2491.5(19.6)90.3(20.9)90.4(19.7)91.0(19.6)30-3491.0(19.6)90.3(20.9)90.4(19.7)91.0(19.6)35-3983.3(20.1)87.7(25.6)87.7(23.6)(23.1)(25.1)45-4983.9(25.1)84.2(25.0)87.7(25.4)83.9(25.1)45-571.7(32.5) <t< td=""><td>50-54</td><td>84.2</td><td>(25.9)</td><td>83.4</td><td>(25.6)</td><td>87.2</td><td>(24.2)</td><td>82.0</td><td>(28.2)</td></t<>	50-54	84.2	(25.9)	83.4	(25.6)	87.2	(24.2)	82.0	(28.2)	
60-64         70.4         (32.7)         68.6         (33.2)         73.0         (30.5)         69.7         (34.5)           70-74         62.4         (32.9)         61.4         (31.1)         66.9         (34.0)         7.2.8         (30.0)           70-74         62.4         (32.9)         61.4         (31.1)         67.5         (32.2)         62.2         (31.7)         57.5         (32.2)         7.2         (34.0)           80-84         46.7         (32.2)         44.7         (31.2)         49.3         (33.3)         46.3         (22.8)           10-5890)         (n=294)         (n=1480)         12.4         (n=1480)         12.4         (n=1480)           20-24         91.5         (19.6)         91.4         (20.5)         91.5         (18.0)         91.5         (19.6)           20-34         91.0         (19.6)         91.4         (20.5)         91.5         (18.0)         91.5         (19.6)           30-34         91.0         (19.6)         93.3         (20.9)         90.4         (19.7)         91.0         (19.6)           35-39         83.3         (20.1)         87.3         (22.9)         83.7         (25.4)	55-59	76.6	(30.7)	73.1	(32.1)	77.6	(31.3)	81.2	(27.0)	
65-6966.8(32.4)62.0(31.8)66.9(34.0)72.8(30.0)75-7955.3(32.2)61.4(31.1)60.3(32.4)66.2(31.1)75-7955.3(32.2)61.4(31.1)60.3(32.4)66.2(31.1)80-8446.7(32.2)44.7(31.2)49.3(33.3)46.3(28.7)80-8446.7(32.2)44.7(31.2)49.3(33.3)46.3(29.7)67.1075.2919.0(12.2)(13.1)48.5(28.7)(19.6)(19.6)16-1992.2(18.3)91.7(19.8)92.8(14.6)92.2(18.3)25-2491.5(19.6)91.4(20.5)91.5(19.0)(19.2)30-3491.0(19.6)90.3(20.9)90.4(19.7)91.0(19.2)30-3491.0(19.6)90.3(20.9)80.6(19.7)91.0(19.6)30-3491.0(19.6)90.3(20.9)80.6(20.1)83.9(21.1)40-4487.2(23.4)87.1(23.9)85.0(25.0)87.7(23.1)45-4983.9(25.1)84.2(25.0)83.7(25.4)83.9(25.1)55-597.7(30.5)62.4(31.4)67.1(32.3)68.8(31.4)65-6965.7(30.5)62.4(31.4)65.7(29.7)(5.7)(35.1)70-745	60-64	70.4	(32.7)	68.6	(33.2)	73.0	(30.5)	69.7	(34.5)	
70-7462.4(32.9)61.4(33.1)60.3(32.4)66.2(33.1)75-7955.3(32.5)52.2(31.7)57.5(32.2)57.2(34.0)85+41.4(31.3)43.2(31.1)48.5(33.3)46.3(32.8)85+41.4(31.3)43.2(33.1)48.5(33.3)46.3(22.7)10-1910-29(10-294)(10-294)(10-1910)(10-1910)(10-1910)70-2491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)20-2491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)30-3491.0(19.6)92.0(18.3)91.2(19.7)91.9(19.6)30-3491.0(19.6)93.7(19.3)87.8(22.6)89.3(20.1)30-3491.0(19.6)89.7(19.3)87.8(22.6)89.3(20.1)30-3491.0(19.6)89.7(19.3)87.8(22.6)89.3(20.1)30-3491.0(23.1)89.7(19.3)87.6(25.5)87.2(23.4)40-4487.2(23.4)87.1(23.9)85.5(25.5)87.2(23.4)50-5971.7(32.5)66.9(33.9)73.2(31.2)71.7(32.5)60-6468.8(31.4)66.2(31.4)67.1(23.3)64.9(34.1)65-6965.7<	65–69	66.8	(32.4)	62.0	(31.8)	66.9	(34.0)	72.8	(30.0)	
75-7955.3(32.5)52.2(31.7)57.5(32.2)57.2(34.0)80-8446.7(32.2)44.7(31.2)49.3(33.3)46.3(32.8)85.446.7(32.2)44.7(31.2)49.3(33.3)46.3(32.8)85.4(1.3).343.2(33.1)48.5(28.7)(0.8)(29.7)(0.19.10)(0.19.10)16-1992.2(18.3)91.7(19.8)92.8(14.6)92.2(18.3)20-2491.5(19.6)90.3(20.9)91.4(19.7)91.0(19.2)30-3491.0(19.6)90.3(20.9)90.4(19.7)91.0(19.6)35-3989.3(20.1)89.7(19.3)87.8(22.6)83.9(21.1)40-4487.2(23.4)87.1(23.9)85.5(25.6)87.2(23.4)45-4983.9(25.1)84.2(25.0)83.7(25.4)83.9(25.1)50-5478.4(28.6)76.1(29.9)80.6(27.0)78.4(28.6)55-5971.7(30.5)62.4(31.4)65.7(30.2)78.4(33.3)45.9(23.1)60-6468.8(31.4)62.2(31.4)67.1(32.3)68.8(31.4)65.7(33.2)68.4(31.4)65-6965.7(30.5)62.4(30.6)57.8(33.3)40.5(33.4)(35.2)(35.1)(35.2)<	70-74	62.4	(32.9)	61.4	(33.1)	60.3	(32.4)	66.2	(33.1)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	75-79	55.3	(32.5)	52.2	(31.7)	57.5	(32.2)	57.2	(34.0)	
85+         41.4         (31.3) (n = 5890)         (33.1) (n = 2494)         48.5 (n = 1910)         (28.7) (n = 1910)         30.8 (n = 1486)         (29.7) (n = 1486)           Females	80-84	46.7	(32.2)	44.7	(31.2)	49.3	(33.3)	46.3	(32.8)	
Image: constraint of the section o	85+	41.4	(31.3)	43.2	(33.1)	48.5	(28.7)	30.8	(29.7)	
Females           16-19         9.2         (18.3)         91.7         (19.8)         92.8         (14.6)         92.2         (18.3)           26-24         91.5         (19.6)         91.4         (20.5)         91.5         (18.0)         91.5         (19.6)           25-29         91.9         (19.2)         92.0         (18.3)         91.2         (19.7)         91.0         (19.6)           30-34         91.0         (19.6)         90.3         (20.9)         90.4         (19.7)         91.0         (19.6)           35-39         89.3         (20.1)         89.7         (19.3)         87.8         (22.6)         89.3         (20.1)           45-44         83.9         (25.1)         84.2         (25.0)         83.7         (25.4)         83.9         (25.1)           50-54         71.7         (32.5)         66.9         (33.9)         73.2         (31.2)         71.7         (32.5)           65-69         65.7         (30.5)         62.4         (32.1)         65.7         (30.3)         64.9         (32.4)           70-74         54.9         (32.4)         52.9         (31.6)         52.8         (33.3)         45.9			(n = 5890)		(n = 2494)		(n = 1910)		(n = 1486)	
16-19       92.2       (18.3)       91.7       (19.8)       92.8       (14.6)       92.2       (18.3)         20-24       91.5       (19.6)       91.4       (20.5)       91.5       (18.0)       91.5       (19.0)         20-24       91.9       (19.2)       92.0       (18.3)       91.2       (19.7)       91.0       (19.6)         20-34       91.0       (19.6)       90.3       (20.9)       90.4       (19.7)       91.0       (19.6)         30-34       91.0       (19.6)       93.7       (19.3)       87.8       (22.6)       89.3       (20.1)         40-44       87.2       (23.4)       87.1       (23.9)       80.5       (25.5)       87.2       (23.4)         45-49       83.9       (25.1)       84.2       (25.0)       83.7       (25.4)       83.9       (25.1)         50-59       71.7       (32.5)       66.9       (33.9)       73.2       (31.2)       71.7       (23.5)         60-64       68.8       (31.4)       66.2       (31.4)       67.1       (32.3)       68.8       (31.4)         65-69       65.7       (30.5)       62.4       (32.1)       63.8       (33.3)	Females									
20-2491.5(19.6)91.4(20.5)91.5(18.0)91.5(19.6)25-2991.9(19.2)92.0(18.3)91.2(19.7)91.9(19.2)30-3491.0(19.6)90.3(20.9)97.4(19.7)91.9(19.2)35-3983.3(20.1)89.7(19.3)87.8(22.6)89.3(23.4)40-4487.2(23.4)87.1(23.9)85.5(25.5)87.2(23.4)45-4983.9(25.1)84.2(25.0)83.7(25.4)83.9(25.1)50-5478.4(28.6)76.1(29.9)80.6(27.0)78.4(28.6)60-6468.8(31.4)66.2(31.4)67.1(32.3)68.8(31.4)65-6965.7(30.5)62.4(32.1)65.7(29.7)65.7(30.5)70-7454.9(32.4)52.9(31.6)52.8(33.3)54.9(32.4)75-7947.1(31.5)46.9(30.2)47.8(30.3)40.5(32.4)85.426.8(29.1)24.0(30.3)28.8(27.4)28.2(29.7)75-7947.7(30.0)7.5(31.0)7.5(30.8)7.6(30.6)85.426.8(29.1)24.0(30.3)28.8(27.4)28.2(29.7)7616.2(30.9)7.5(31.0)7.5(30.8)7.6(30.6)85.426.	16-19	92.2	(18.3)	91.7	(19.8)	92.8	(14.6)	92.2	(18.3)	
25-2991.9(19.2)92.0(18.3)91.2(19.7)91.9(19.2)30-3491.0(19.6)90.3(20.9)90.4(19.7)91.0(19.6)35-3989.3(20.1)89.7(19.3)87.8(22.6)89.3(20.1)40-4487.2(23.4)87.1(23.9)85.5(25.5)87.2(23.4)50-5478.4(28.6)76.1(29.9)80.6(27.0)78.4(28.6)50-5478.4(28.6)76.1(29.9)80.6(27.0)78.4(28.6)50-5471.7(32.5)66.9(31.4)67.1(32.3)68.8(31.4)65-6965.7(30.5)62.4(31.4)67.1(32.3)68.8(31.4)70-7454.9(32.4)52.9(31.6)52.8(33.3)54.9(32.4)75-7947.1(31.5)46.9(30.2)47.8(31.9)46.6(33.4)80-8438.4(31.2)37.5(30.8)37.8(30.3)40.5(33.2)85+26.8(29.1)24.0(30.3)28.8(27.4)28.2(29.7)10-747.8(30.0)7.5(30.8)7.5(30.8)7.5(30.8)(31.9)85+26.8(29.1)24.0(30.3)28.8(27.4)28.2(29.7)10-1(1-2019)(1-2019)(1-2019)(1-2018)(1-216)(1-216)80-2 <t< td=""><td>20-24</td><td>91.5</td><td>(19.6)</td><td>91.4</td><td>(20.5)</td><td>91.5</td><td>(18.0)</td><td>91.5</td><td>(19.6)</td></t<>	20-24	91.5	(19.6)	91.4	(20.5)	91.5	(18.0)	91.5	(19.6)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	25-29	91.9	(19.2)	92.0	(18.3)	91.2	(19.7)	91.9	(19.2)	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	30-34	91.0	(19.6)	90.3	(20.9)	90.4	(19.7)	91.0	(19.6)	
40-44         87.2         (23.4)         87.1         (23.9)         85.5         (25.5)         87.2         (23.4)           45-49         83.9         (25.1)         84.2         (25.0)         83.7         (25.4)         83.9         (25.1)           50-54         78.4         (28.6)         76.1         (29.9)         80.6         (27.0)         78.4         (28.6)           55-59         71.7         (32.5)         66.9         (33.9)         73.2         (31.2)         71.7         (32.5)           60-64         68.8         (31.4)         66.2         (31.4)         67.1         (32.3)         68.8         (31.4)           65-69         65.7         (30.5)         62.4         (32.1)         65.7         (29.7)         (55.7         (30.5)           70-74         54.9         (32.4)         52.9         (30.2)         47.8         (31.9)         46.6         (33.4)           80-84         38.4         (31.2)         37.5         (30.8)         37.8         (30.3)         40.5         (32.2)           85+         26.8         (29.1)         24.0         (30.0)         75.5         (31.9)         77.5         (30.8)         78.6	35-39	89.3	(20.1)	89.7	(19.3)	87.8	(22.6)	89.3	(20.1)	
45-49         83.9         (25.1)         84.2         (25.0)         83.7         (25.4)         83.9         (25.1)           50-54         78.4         (28.6)         76.1         (29.9)         80.6         (27.0)         78.4         (28.6)           55-59         71.7         (32.5)         66.9         (33.9)         73.2         (31.2)         71.7         (32.5)           60-64         68.8         (31.4)         66.2         (31.4)         67.1         (32.3)         68.8         (31.4)           65-69         65.7         (30.5)         62.4         (32.1)         65.7         (29.7)         (35.7)         (30.5)           70-74         54.9         (32.4)         52.9         (31.6)         52.8         (33.3)         54.9         (32.4)           80-84         38.4         (31.2)         37.5         (30.8)         78.8         (30.3)         40.5         (33.2)           85+         26.8         (30.0)         77.5         (31.0)         78.8         (30.8)         78.6         (30.6)           70tal         77.8         (30.0)         77.5         (31.0)         75.5         (30.8)         (77.1)         (31.8)         (32.8)	40-44	87.2	(23.4)	87.1	(23.9)	85.5	(25.5)	87.2	(23.4)	
50-54         78.4         (28.6)         76.1         (29.9)         80.6         (27.0)         78.4         (28.6)           55-59         71.7         (32.5)         66.9         (33.9)         73.2         (31.2)         71.7         (32.5)           60-64         68.8         (31.4)         66.2         (31.4)         67.1         (32.3)         68.8         (31.4)           65-69         65.7         (30.5)         62.4         (32.1)         65.7         (30.5)         (30.4)           70-74         54.9         (32.4)         52.9         (31.6)         52.8         (33.3)         54.9         (32.4)           75-79         47.1         (31.5)         46.9         (30.2)         47.8         (31.9)         46.6         (33.4)           80-84         38.4         (31.2)         37.5         (30.8)         37.8         (30.3)         40.5         (33.2)           85+         26.8         (30.0)         77.5         (30.10)         77.5         (30.8)         78.6         (76.7)         (9.14)         (30.6)           701         77.8         (30.0)         77.5         (31.0)         77.5         (30.8)         78.6         (77.9) <td>45-49</td> <td>83.9</td> <td>(25.1)</td> <td>84.2</td> <td>(25.0)</td> <td>83.7</td> <td>(25.4)</td> <td>83.9</td> <td>(25.1)</td>	45-49	83.9	(25.1)	84.2	(25.0)	83.7	(25.4)	83.9	(25.1)	
55-59         71.7         (32.5)         66.9         (33.9)         73.2         (31.2)         71.7         (32.5)           60-64         68.8         (31.4)         66.2         (31.4)         67.1         (32.3)         68.8         (31.4)           65-69         65.7         (30.5)         62.4         (32.1)         65.7         (29.7)         65.7         (30.5)           70-74         54.9         (32.4)         52.9         (31.6)         52.8         (33.3)         54.9         (32.4)           75-79         47.1         (31.5)         46.9         (30.2)         47.8         (31.9)         46.6         (33.4)           80-84         38.4         (31.2)         37.5         (30.8)         37.8         (30.3)         40.5         (32.7)           85+         26.8         (29.1)         24.0         (30.3)         28.8         (27.4)         28.2         (29.7)           701         77.8         (30.0)         77.5         (31.0)         75.5         (30.8)         78.6         (30.6)         (7.9)         (30.6)         (7.9)         (7.9)         (7.9)         (7.9)         (7.9)         (7.9)         (7.9)         (7.9)         (7.9) </td <td>50-54</td> <td>78.4</td> <td>(28.6)</td> <td>76.1</td> <td>(29.9)</td> <td>80.6</td> <td>(27.0)</td> <td>78.4</td> <td>(28.6)</td>	50-54	78.4	(28.6)	76.1	(29.9)	80.6	(27.0)	78.4	(28.6)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	55-59	71.7	(32.5)	66.9	(33.9)	73.2	(31.2)	71.7	(32.5)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	60-64	68.8	(31.4)	66.2	(31.4)	67.1	(32.3)	68.8	(31.4)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	65–69	65.7	(30.5)	62.4	(32.1)	65.7	(29.7)	65.7	(30.5)	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	70-74	54.9	(32.4)	52.9	(31.6)	52.8	(33.3)	54.9	(32.4)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	75-79	47.1	(31.5)	46.9	(30.2)	47.8	(31.9)	46.6	(33.4)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	80-84	38.4	(31.2)	37.5	(30.8)	37.8	(30.3)	40.5	(33.2)	
Total77.8(30.0) (n = 12609) $(n = 2894)$ (n = 2158) $(n = 2158)$ (n = 2158) $(n = 1667)$ (n = 1667)Total77.8(30.0) (n = 12609)77.5(31.0) (n = 5488)77.5(30.8) (n = 4068)78.6(30.6) (n = 3153)Males16-1994.3(16.0)95.3(13.7)94.8(12.7)91.4(23.0)20-2494.3(16.8)94.8(17.5)93.4(16.9)94.7(15.3)25-2990.5(22.2)88.2(24.4)93.6(17.7)90.3(23.1)30-3493.2(19.4)93.8(17.1)93.2(19.5)92.0(23.0)35-3990.6(22.2)92.7(18.2)85.8(28.2)92.5(20.0)40-4490.4(22.7)91.2(21.7)86.8(27.5)93.5(16.1)45-4986.7(27.3)83.3(30.0)87.9(26.0)91.1(22.6)50-5483.2(30.5)81.2(31.8)87.4(26.6)81.9(32.0)	85+	26.8	(29.1)	24.0	(30.3)	28.8	(27.4)	28.2	(29.7)	
Total77.8(30.0) (n = 12609)77.5(31.0) (n = 5488)77.5(30.8) (n = 4068)78.6(30.6) (n = 3153)Role limitations (physical) MalesMales16-1994.3(16.0)95.3(13.7)94.8(12.7)91.4(23.0)20-2494.3(16.8)94.8(17.5)93.4(16.9)94.7(15.3)25-2990.5(22.2)88.2(24.4)93.6(17.7)90.3(23.1)30-3493.2(19.4)93.8(17.1)93.2(19.5)92.0(23.0)35-3990.6(22.2)92.7(18.2)85.8(28.2)92.5(20.0)40-4490.4(22.7)91.2(21.7)86.8(27.5)93.5(16.1)45-4986.7(27.3)83.3(30.0)87.9(26.0)91.1(22.6)50-5483.2(30.5)81.2(31.8)87.4(26.6)81.9(32.0)			(n = 6719)		(n = 2894)		(n = 2158)		(n = 1667)	
Note $(n = 12609)$ $(n = 5488)$ $(n = 4068)$ $(n = 3153)$ Role limitations (physical)Males16-1994.3(16.0)95.3(13.7)94.8(12.7)91.4(23.0) $20-24$ 94.3(16.8)94.8(17.5)93.4(16.9)94.7(15.3) $25-29$ 90.5(22.2)88.2(24.4)93.6(17.7)90.3(23.1) $30-34$ 93.2(19.4)93.8(17.1)93.2(19.5)92.0(23.0) $35-39$ 90.6(22.2)92.7(18.2)85.8(28.2)92.5(20.0) $40-44$ 90.4(22.7)91.2(21.7)86.8(27.5)93.5(16.1) $45-49$ 86.7(27.3)83.3(30.0)87.9(26.0)91.1(22.6) $50-54$ 83.2(30.5)81.2(31.8)87.4(26.6)81.9(32.0)	Total	77.8	(30.0)	77.5	(31.0)	77.5	(30.8)	78.6	(30.6)	
Role limitations (physical)         Males       16-19       94.3       (16.0)       95.3       (13.7)       94.8       (12.7)       91.4       (23.0)         20-24       94.3       (16.8)       94.8       (17.5)       93.4       (16.9)       94.7       (15.3)         25-29       90.5       (22.2)       88.2       (24.4)       93.6       (17.7)       90.3       (23.1)         30-34       93.2       (19.4)       93.8       (17.1)       93.2       (19.5)       92.0       (23.0)         35-39       90.6       (22.2)       92.7       (18.2)       85.8       (28.2)       92.5       (20.0)         40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)			(n = 12609)		(n = 5488)		(n = 4068)		(n = 3153)	
Males         16-19       94.3       (16.0)       95.3       (13.7)       94.8       (12.7)       91.4       (23.0)         20-24       94.3       (16.8)       94.8       (17.5)       93.4       (16.9)       94.7       (15.3)         25-29       90.5       (22.2)       88.2       (24.4)       93.6       (17.7)       90.3       (23.1)         30-34       93.2       (19.4)       93.8       (17.1)       93.2       (19.5)       92.0       (23.0)         35-39       90.6       (22.2)       92.7       (18.2)       85.8       (28.2)       92.5       (20.0)         40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	Role limitations	(physical)					<b>x</b>		(	
16-19 $94.3$ $(16.0)$ $95.3$ $(13.7)$ $94.8$ $(12.7)$ $91.4$ $(23.0)$ $20-24$ $94.3$ $(16.8)$ $94.8$ $(17.5)$ $93.4$ $(16.9)$ $94.7$ $(15.3)$ $25-29$ $90.5$ $(22.2)$ $88.2$ $(24.4)$ $93.6$ $(17.7)$ $90.3$ $(23.1)$ $30-34$ $93.2$ $(19.4)$ $93.8$ $(17.1)$ $93.2$ $(19.5)$ $92.0$ $(23.0)$ $35-39$ $90.6$ $(22.2)$ $92.7$ $(18.2)$ $85.8$ $(28.2)$ $92.5$ $(20.0)$ $40-44$ $90.4$ $(22.7)$ $91.2$ $(21.7)$ $86.8$ $(27.5)$ $93.5$ $(16.1)$ $45-49$ $86.7$ $(27.3)$ $83.3$ $(30.0)$ $87.9$ $(26.0)$ $91.1$ $(22.6)$ $50-54$ $83.2$ $(30.5)$ $81.2$ $(31.8)$ $87.4$ $(26.6)$ $81.9$ $(32.0)$	Males	(l. <b>)</b> /								
20-24       94.3       (16.8)       94.8       (17.5)       93.4       (16.9)       94.7       (15.3)         25-29       90.5       (22.2)       88.2       (24.4)       93.6       (17.7)       90.3       (23.1)         30-34       93.2       (19.4)       93.8       (17.1)       93.2       (19.5)       92.0       (23.0)         35-39       90.6       (22.2)       92.7       (18.2)       85.8       (28.2)       92.5       (20.0)         40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	16-19	94.3	(16.0)	95.3	(13.7)	94.8	(12.7)	91.4	(23.0)	
25-29       90.5       (22.2)       88.2       (24.4)       93.6       (17.7)       90.3       (23.1)         30-34       93.2       (19.4)       93.8       (17.1)       93.2       (19.5)       92.0       (23.0)         35-39       90.6       (22.2)       92.7       (18.2)       85.8       (28.2)       92.5       (20.0)         40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	20-24	94.3	(16.8)	94.8	(17.5)	93.4	(16.9)	94.7	(15.3)	
30-34       93.2       (19.4)       93.8       (17.1)       93.2       (19.5)       92.0       (23.0)         35-39       90.6       (22.2)       92.7       (18.2)       85.8       (28.2)       92.5       (20.0)         40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	25-29	90.5	(22.2)	88.2	(24.4)	93.6	(17.7)	90.3	(23.1)	
35-39       90.6       (22.2)       92.7       (18.2)       85.8       (28.2)       92.5       (20.0)         40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	30-34	93.2	(19.4)	93.8	(17.1)	93.2	(19.5)	92.0	(23.0)	
40-44       90.4       (22.7)       91.2       (21.7)       86.8       (27.5)       93.5       (16.1)         45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	35-39	90.6	(22.2)	92.7	(18.2)	85.8	(28.2)	92.5	(20.0)	
45-49       86.7       (27.3)       83.3       (30.0)       87.9       (26.0)       91.1       (22.6)         50-54       83.2       (30.5)       81.2       (31.8)       87.4       (26.6)       81.9       (32.0)	40-44	90.4	(22.2)	91.7	(21.7)	86.8	(27.5)	93.5	(16.1)	
50-54     83.2     (30.5)     81.2     (31.8)     87.4     (26.6)     81.9     (32.0)	45_49	86.7	(27.3)	83.3	(30.0)	87.9	(26.0)	91.1	(22.6)	
	50-54	83.2	(30.5)	81.2	(31.8)	87.4	(26.6)	81.9	(32.0)	
	JU-J4	05.2	(30.3)	01.2	(31.0)	07.4	(20.0)	01.5	(32.0)	

	All Wales		South East	t Wales	Mid- and	West Wales	North Wa	les
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
55-59	77.6	(34.2)	76.3	(34.6)	77.4	(35.1)	79.7	(32.6)
60-64	69.0	(36.2)	67.4	(36.3)	72.3	(34.2)	67.0	(38.3)
65-69	67.1	(35.2)	61.4	(34.5)	68.0	(36.1)	72.9	(34.0)
70-74	61.0	(35.9)	60.5	(36.6)	57.5	(34.9)	65.9	(35.6)
75–79	46.7	(32.5)	48.3	(34.0)	56.5	(32.7)	53.5	(36.8)
80-84	47.6	(33.5)	46.7	(32.5)	48.8	(34.9)	47.3	(33.8)
85+	42.3	(35.3)	45.8	(38.4)	41.1	(30.2)	39.5	(39.1)
		(n = 6057)		(n = 2560)		(n = 1972)		(n = 1525)
Females								
16-19	94.4	(16.1)	93.7	(17.2)	93.9	(16.6)	96.8	(12.5)
20-24	93.2	(17.4)	92.5	(18.8)	92.4	(17.5)	96.1	(12.8)
25-29	91.7	(19.8)	90.9	(21.3)	91.4	(19.1)	93.6	(17.4)
30-34	85.6	(22.8)	87.8	(25.0)	88.8	(23.5)	94.6	(15.5)
35-39	88.7	(22.9)	88.2	(22.1)	88.2	(25.2)	90.1	(21.8)
40-44	87.8	(25.7)	88.4	(25.3)	85.8	(28.0)	89.4	(23.0)
45-49	83.3	(28.7)	83.8	(28.4)	82.6	(29.9)	83.6	(27.8)
50-54	79.6	(31.0)	77.9	(32.7)	80.6	(29.3)	81.2	(30.4)
55-59	73.3	(34.4)	69.5	(36.5)	73.2	(33.8)	79.1	(31.3)
60-64	73.3	(32.8)	67.0	(34.7)	70.3	(32.4)	78.2	(29.4)
65-69	68.3	(34.3)	63.3	(37.5)	70.5	(30.9)	71.9	(23.4)
70 74	58.8	(34.3)	55 5	(37.3)	61.0	(33.8)	61.1	(35.7)
75 79	52.0	(34.4)	51.7	(32.7)	54.0	(34.3)	54.5	(36.8)
75-79	JJ.Z	(34.5)	JI.7 45 D	(35.0)	19.0	(34.3)	J4.J	(30.8)
80-64 85 J	44.0	(34.0)	45.5	(30.4)	40.5	(33.9)	30.3	(32.2)
+69	50.1	(54.0)	51.7	(55.9)	44.5	(0.55)	50.4	(5.5)
Tatal	70.2	(1 = 0.007)	77.0	(11 = 2694)	70.1	(11 = 2255)	70.4	(11 = 1710)
IOLAI	/8.3	(32.3)	77.9	(31.9)	78.1	(31.9)	79.4	(32.2)
Redily pain		(n = 13004)		(n = 5558)		(n = 4205)		(n = 3241)
Bodily pain								
IVIAIES	00.1	(10.7)	00.0	(10.1)	07.0	(17 4)	06.4	(21.0)
16-19	88.1	(18.7)	89.8	(18.1)	87.0	(17.4)	86.4	(21.6)
20-24	85.9	(20.1)	86.7	(21.3)	83.9	(17.9)	87.5	(21.0)
25-29	81.0	(23.8)	/8.6	(25.1)	82.1	(22.4)	84.0	(22.9)
30-34	83.3	(22.5)	83.3	(21.1)	83.1	(23.6)	83.7	(24.0)
35-39	80.0	(24.6)	81.4	(21.8)	/6.0	(28.1)	82.2	(24.5)
40-44	77.8	(24.4)	78.1	(23.9)	76.9	(25.9)	78.4	(23.0)
45-49	76.3	(26.7)	74.6	(27.0)	75.7	(27.6)	80.2	(24.7)
50-54	72.1	(27.2)	70.9	(26.7)	74.0	(26.2)	72.2	(29.3)
55-59	66.9	(29.4)	64.3	(30.3)	68.0	(28.3)	69.7	(29.1)
60-64	63.0	(30.7)	61.5	(31.6)	64.3	(29.3)	63.5	(31.0)
65-69	63.4	(28.9)	61.6	(28.0)	62.4	(31.0)	67.0	(26.9)
70-74	61.7	(29.3)	60.7	(28.5)	60.3	(29.9)	65.1	(29.6)
75-79	58.4	(29.5)	55.8	(30.1)	61.2	(28.3)	58.9	(29.9)
80-84	58.9	(29.0)	57.0	(28.2)	58.7	(30.6)	62.4	(28.2)
85+	56.2	(27.9)	60.0	(26.4)	57.0	(29.9)	49.5	(26.8)
		( <i>n</i> = 6175)		( <i>n</i> = 2613)		( <i>n</i> = 2012)		( <i>n</i> = 1550)
-								Cantinuad

	All Wales		South East Wales		Mid- and West Wales		North Wales	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Females								
16–19	84.2	(21.0)	83.7	(21.7)	85.2	(20.4)	83.8	(20.2)
20-24	83.0	(21.5)	83.4	(22.3)	79.5	(21.4)	87.2	(18.8)
25-29	79.8	(24.4)	79.5	(25.0)	78.5	(24.7)	81.9	(23.0)
30-34	78.7	(24.4)	78.8	(24.2)	76.8	(26.8)	81.0	(21.4)
35-39	77.4	(25.6)	76.7	(25.0)	75.9	(27.2)	80.6	(24.5)
40-44	74.7	(27.3)	74.1	(26.9)	73.9	(29.1)	77.0	(25.5)
45-49	69.6	(28.7)	69.1	(28.2)	68.8	(29.6)	71.7	(28.7)
50-54	66.2	(28.5)	65.3	(29.1)	66.4	(28.3)	67.3	(27.9)
55-59	62.6	(30.1)	57.0	(31.0)	63.6	(29.6)	69.9	(27.8)
60-64	61.7	(29.9)	59.0	(30.3)	60.3	(29.9)	67.5	(28.8)
65-69	60.8	(28.9)	59.6	(30.0)	61.9	(28.5)	60.9	(27.8)
70-74	54.9	(30.2)	51.6	(29.0)	57.1	(30.7)	57.3	(31.2)
75–79	54.5	(29.5)	54.7	(30.3)	53.5	(28.6)	55.5	(29.6)
80-84	50.4	(28.8)	46.7	(29.2)	50.3	(27.2)	56.2	(30.0)
85+	51.3	(30.3)	51.8	(32.3)	53.1	(27.4)	47.6	(31.0)
		(n = 7216)		(n = 3112)		(n = 2336)		(n = 1768)
Total	70.1	(28.9)	69.7	(29.1)	69.4	(28.9)	71.7	(28.5)
		(n = 13391)		(n = 5725)		(n = 4348)		(n = 3318)
General health p	erceptions	(		(		(11 13 13)		( 5516)
Males								
16-19	81.9	(17.8)	82.6	(16.3)	80.2	(19.1)	83.0	(18.2)
20-24	77.5	(18.5)	78.4	(17.2)	76.9	(201)	76.6	(18.7)
25-29	74.8	(20.0)	73.7	(21.0)	74.3	(18.9)	77.1	(19.6)
30-34	73.8	(20.8)	74.0	(21.2)	72.6	(21.7)	74 7	(19.2)
35-39	73.8	(21.0)	75.2	(19.4)	71.4	(23.9)	74 3	(20.2)
40-44	72.0	(22.2)	71.2	(22.6)	70.9	(23.0)	74.8	(20.2)
45-49	68.7	(22.2)	66.1	(22.5)	69.4	(22.9)	72.6	(20.4)
50-54	65.7	(23.5)	63.8	(23.9)	69.7	(22.1)	64 5	(23.9)
55-59	61.9	(25.9)	59.0	(27.4)	64 3	(25 5)	63.3	(23.4)
60-64	59.4	(25.5)	57.9	(26.4)	60.7	(24.9)	60.0	(25.1)
65-69	60.4	(24.1)	55.0	(23.4)	61 7	(24.3)	65.8	(23.3)
70-74	58.2	(24.2)	56.4	(24 5)	56.4	(24 5)	63.2	(23.0)
75-79	55.1	(24.4)	51.6	(24.9)	55.9	(23.9)	59.4	(23.9)
80-84	53.6	(22.5)	50.6	(22.0)	58.8	(22.9)	50.6	(21.8)
85+	53.2	(21.2)	54.7	(19.5)	54.6	(22.2)	49.2	(22.5)
		(n = 6083)		(n = 2567)		(n = 1990)		(n = 1526)
Females								<b>x</b>
16-19	73.6	(20.2)	73.6	(20.5)	73.2	(21.0)	74.2	(18.3)
20-24	73.1	(20.2)	73.0	(20.8)	70.1	(21.1)	77.6	(16.3)
25-29	73.4	(20.5)	70.8	(21.3)	75.2	(19.8)	76.1	(19.1)
30-34	73.4	(21.2)	73.3	(21.5)	71.3	(23.6)	76.3	(16.7)
35-39	72.3	(20.7)	71.8	(21.2)	71.9	(21.5)	73.6	(18,9)
40-44	69.6	(22.6)	67.8	(22.6)	70.1	(23.2)	72.2	(21.8)
45-49	67.0	(23.3)	67.1	(23.7)	67.2	(23.1)	66.6	(22,7)
50-54	65.3	(24.7)	63.9	(25.7)	66.1	(23.1)	66.7	(25,0)

	All Wales		South East Wales		Mid- and West Wales		North Wales	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
55-59	65.2	(25.1)	59.3	(26.3)	61.3	(26.6)	66.5	(23.2)
60-64	62.2	(25.1)	58.1	(24.6)	62.9	(24.3)	67.4	(22.7)
65-69	62.1	(24.2)	59.8	(25.7)	63.0	(23.2)	63.9	(23.7)
70-74	57.1	(23.8)	54.4	(24.1)	57.5	(23.5)	60.2	(23.6)
75–79	54.5	(23.2)	51.0	(24.4)	56.1	(21.1)	58.1	(23.5)
80-84	52.1	(22.0)	50.7	(23.5)	52.8	(22.0)	53.2	(20.1)
85+	49.7	(23.6)	47.2	(23.9)	52.0	(22.6)	50.7	(24.3)
		( <i>n</i> = 6997)		( <i>n</i> = 3024)		( <i>n</i> = 2245)		(n = 1728)
Total	66.2	(24.0)	65.1	(24.6)	66.2	(23.9)	68.0	(22.9)
		( <i>n</i> = 13 080)		( <i>n</i> = 5591)		( <i>n</i> = 4235)		( <i>n</i> = 3254)
Energy and vital Males	ity							
16–19	74.0	(18.1)	74.7	(17.2)	72.8	(18.9)	74.6	(18.6)
20-24	68.0	(18.4)	68.1	(19.0)	68.2	(17.3)	67.5	(18.9)
25–29	65.6	(20.1)	62.7	(20.7)	67.0	(20.6)	69.0	(17.7)
30-34	62.8	(19.3)	61.4	(19.1)	63.2	(20.4)	65.2	(18.3)
35-39	61.7	(19.9)	62.4	(19.3)	60.6	(21.6)	62.0	(19.2)
40-44	62.0	(20.2)	60.8	(21.2)	62.4	(20.1)	63.7	(18.5)
45-49	60.5	(20.6)	58.2	(20.1)	60.9	(22.2)	64.1	(18.6)
50-54	59.3	(21.8)	58.1	(22.2)	62.1	(20.1)	58.3	(22.6)
55-59	56.5	(23.4)	55.6	(23.9)	57.2	(23.6)	56.9	(22.4)
60-64	56.1	(23.9)	54.8	(23.8)	56.9	(23.8)	56.9	(24.3)
65–69	59.8	(21.9)	55.9	(20.0)	59.4	(23.7)	65.4	(20.3)
70-74	57.0	(23.3)	54.1	(24.5)	55.7	(22.7)	62.7	(21.4)
75–79	52.4	(22.0)	47.7	(22.0)	56.3	(20.5)	54.6	(22.7)
80-84	51.2	(22.2)	49.6	(22.7)	53.9	(23.4)	49.8	(19.8)
85+	48.5	(22.6)	51.3	(23.7)	49.7	(20.7)	42.8	(23.5)
		( <i>n</i> = 6147)		( <i>n</i> = 2595)		( <i>n</i> = 2006)		( <i>n</i> = 1546)
Females								
16–19	65.2	(20.4)	63.7	(21.3)	67.7	(21.1)	64.7	(17.0)
20-24	60.7	(19.7)	60.4	(20.4)	59.6	(19.9)	62.9	(18.0)
25-29	56.4	(20.5)	55.5	(20.3)	56.6	(20.6)	57.8	(20.9)
30-34	56.4	(19.2)	55.2	(19.3)	57.4	(21.0)	57/8	(16.4)
35-39	55.8	(20.1)	55.3	(20.8)	56.3	(20.1)	55.9	(19.0)
40-44	54.9	(21.0)	54.2	(19.8)	54.1	(22.2)	57.2	(21.4)
45-49	54.3	(22.0)	53.3	(22.0)	56.8	(21.4)	53.2	(22.6)
50-54	54.2	(22.0)	54.2	(22.0)	55.2	(21.1)	53.0	(23.3)
55-59	53.0	(23.4)	50.7	(23.1)	53.0	(24.1)	56.4	(22.4)
60-64	55.1	(23.2)	51.8	(23.6)	55.6	(23.7)	59.1	(21.5)
65–69	55.8	(23.3)	52.2	(23.5)	57.2	(22.8)	58.9	(23.2)
70-74	49.9	(23.2)	47.5	(22.5)	49.4	(24.0)	53.4	(23.2)
75–79	47.6	(22.0)	46.4	(21.8)	48.7	(20.9)	48.1	(24.1)
80-84	44.3	(23.4)	43.6	(22.7)	44.5	(24.1)	45.0	(23.7)
85+	41.7	(22.3)	38.9	(22.8)	42.4	(22.3)	44.9	(21.5)
		( <i>n</i> = 7090)		( <i>n</i> = 3045)		( <i>n</i> = 2289)		( <i>n</i> = 1756)
Total	57.2	(22.3)	55.9	(22.3)	57.7	(22.6)	58.6	(21.9)
		( <i>n</i> = 13237)		( <i>n</i> = 5640)		( <i>n</i> = 4965)		( <i>n</i> = 3302)
								Continued

	All Wales		South East Wales		Mid- and West Wales		North Wales	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Social functionin	ıg							
Males								
16–19	92.7	(16.7)	94.1	(14.0)	93.4	(14.9)	88.8	(22.7)
20-24	91.0	(18.3)	91.3	(17.8)	91.1	(18.1)	90.2	(19.6)
25-29	88.0	(22.2)	86.5	(22.8)	87.0	(23.5)	91.8	(18.7)
30-34	89.9	(21.3)	89.4	(21.6)	89.2	(20.9)	91.3	(21.5)
35-39	88.0	(22.7)	89.2	(21.3)	86.8	(22.8)	86.9	(25.1)
40-44	88.2	(21.5)	87.2	(21.8)	88.8	(22.8)	89.4	(19.3)
45-49	85.2	(25.7)	81.9	(28.3)	85.7	(26.1)	90.4	(18.2)
50-54	82.7	(27.6)	81.9	(26.8)	83.8	(27.9)	83.2	(28.9)
55-59	78.7	(30.0)	76.2	(31.7)	79.9	(29.2)	81.1	(27.9)
60-64	76.4	(30.7)	74.6	(31.7)	79.2	(28.5)	75.6	(31.9)
65-69	78.4	(29.7)	76.1	(29.6)	77.7	(31.0)	82.3	(27.5)
70-74	75.6	(29.8)	74.2	(31.1)	74.7	(30.1)	78.9	(27.4)
75–79	70.3	(32.6)	67.9	(32.7)	73.7	(31.3)	69.7	(33.8)
80-84	69.6	(31.0)	66.1	(30.2)	73.9	(31.9)	69.3	(30.9)
85+	65.0	(30.8)	66.2	(32.7)	69.2	(29.2)	57.6	(30.3)
		( <i>n</i> = 6194)		(n = 2622)		( <i>n</i> = 2022)		( <i>n</i> = 1550)
Females								
16-19	87.9	(21.6)	87.6	(22.3)	87.6	(21.9)	88.7	(19.8)
20-24	86.2	(23.1)	85.0	(24.7)	85.0	(23.4)	90.7	(17.9)
25-29	84.5	(23.2)	85.3	(23.1)	82.4	(24.8)	85.6	(21.6)
30-34	83.3	(25.0)	82.1	(25.1)	82.5	(27.1)	86.9	(21.8)
35-39	83.5	(23.1)	82.9	(23.5)	82.4	(23.4)	86.0	(22.0)
40-44	83.1	(24.6)	83.1	(24.8)	81.3	(26.7)	85.7	(21.3)
45-49	78.7	(28.8)	77.4	(29.3)	80.5	(28.6)	76.2	(27.8)
50-54	78.5	(27.7)	76.8	(28.7)	80.2	(27.0)	79.0	(27.0)
55-59	75.3	(30.5)	72.7	(31.9)	76.0	(30.0)	78.5	(28.7)
60-64	77.3	(30.1)	73.5	(32.2)	77.6	(29.5)	82.5	(27.2)
65-69	76.8	(29.0)	73.4	(30.3)	78.5	(28.3)	79.0	(28.1)
70-74	71.7	(31.2)	68.8	(31.2)	70.4	(32.8)	76.5	(29.3)
75-79	67.6	(32.4)	67.3	(31.6)	69.5	(32.5)	65.4	(33.9)
80-84	64.9	(33.0)	60.5	(34.1)	68.0	(29.6)	67.0	(35.7)
85+	55.6	(35.2)	53.0	(37.0)	59.7	(33.6)	53.5	(34.7)
		( <i>n</i> = 7209)		( <i>n</i> = 3111)		( <i>n</i> = 2325)		( <i>n</i> = 1773)
Total	80.2	(28.1)	79.2	(28.6)	80.4	(27.9)	81.6	(27.3)
		( <i>n</i> = 13 403)		( <i>n</i> = 5733)		(n = 4347)		(n = 3323)
Role limitations (	(emotional)							
Males								
16-19	95.2	(15.6)	96.1	(12.7)	95.1	(16.3)	93.5	(19.4)
20-24	94.1	(17.3)	95.6	(15.9)	94.4	(15.40	91.0	(21.4)
25-29	96.1	(16.3)	91.1	(20.2)	91.5	(20.9)	96.1	(16.3)
30-34	96.5	(13.4)	92.4	(19.6)	92.4	(19.1)	93.1	(18.2)
35-39	93.1	(20.6)	93.6	(17.6)	95.3	(14.7)	92.6	(20.2)
40-44	93.7	(18.2)	94.0	(18.0)	92.4	(19.7)	96.0	(13.2)
								Continued

	All Wales		South East Wales		Mid- and West Wales		North Wales	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
45-49	90.8	(22.8)	88.1	(25.2)	91.8	(21.4)	94.6	(19.5)
50-54	89.4	(24.6)	88.3	(25.7)	91.9	(20.9)	88.6	(26.5
55-59	87.1	(27.4)	85.3	(29.5)	87.4	(26.8)	89.3	(24.6)
60-64	84.5	(29.5)	79.8	(32.6)	89.9	(23.4)	84.6	(30.9)
65–69	84.3	(29.0)	83.1	(28.2)	83.0	(30.9)	87.8	(27.2)
70-74	82.1	(30.5)	81.0	(31.1)	82.3	(29.6)	83.7	(31.1)
75–79	75.0	(33.3)	72.9	(34.2)	77.8	(31.0)	75.0	(34.5)
80-84	76.2	(34.5)	76.1	(35.7)	78.4	(32.1)	73.3	(36.5)
85+	70.9	(36.3)	67.6	(38.8)	78.7	(30.2)	65.4	(39.5)
		(n = 6070)		( <i>n</i> = 2566)		( <i>n</i> = 1977)		( <i>n</i> = 1527)
Females								
16-19	93.0	(17.9)	93.2	(18.0)	92.2	(19.2)	93.5	(16.0)
20-24	91.4	(20.2)	90.4	(22.2)	90.5	(19.7)	95.0	(14.8)
25–29	90.6	(19.9)	90.6	(20.6)	91.3	(19.3)	89.9	(19.2)
30-34	90.1	(21.8)	88.8	(22.8)	90.3	(20.5)	90.3	(21.3)
35-39	89.4	(21.3)	87.6	(23.0)	89.9	(20.9)	92.4	(18.2)
40-44	90.8	(21.5)	90.9	(21.2)	88.6	(24.0)	93.5	(18.0)
45-49	87.0	(25.6)	87.2	(25.2)	86.9	(25.8)	86.8	(26.2)
50-54	86.9	(24.6)	85.4	(26.4)	88.6	(23.1)	87.3	(23.2)
55-59	82.1	(30.5)	79.6	(32.8)	83.9	(29.3)	83.6	(28.3)
60-64	85.3	(26.3)	82.0	(29.5)	86.2	(25.6)	88.9	(21.7)
65–69	83.8	(27.9)	80.6	(30.2)	85.5	(25.8)	85.7	(27.3)
70-74	78.1	(31.4)	75.7	(31.2)	78.2	(32.6)	80.9	(30.7)
75–79	77.3	(31.6)	80.5	(29.4)	76.5	(30.9)	72.8	(35.7)
80-84	73.1	(35.3)	69.8	(35.4)	71.6	(37.1)	80.2	(31.9)
85+	70.9	(38.0)	71.1	(36.5)	74.8	(37.0)	64.6	(41.8)
		(n = 6947)		(n = 3000)		(n = 2238)		(n = 1709)
Total	87.0	(26.0)	86.2	(26.6)	87.4	(25.4)	87.9	(25.7)
		$(n = 13\ 017)$		(n = 5566)		(n = 4215)		(n = 3236)
Mental health								
Males								
16–19	81.2	(15.1)	80.6	(14.8)	81.1	(14.7)	82.3	(16.4)
20-24	76.2	(16.9)	75.8	(17.7)	77.6	(15.2)	74.9	(17.7)
25-29	76.0	(19.1)	74.3	(18.8)	75.3	(20.5)	79.8	(17.4)
30-34	76.4	(16.8)	73.9	(16.7)	77.7	(17.3)	79.6	(16.0)
35-39	75.6	(17.7)	75.9	(16.6)	75.6	(17.3)	75.4	(20.2)
40-44	76.3	(17.8)	75.9	(19.1)	76.1	(17.8)	77.3	(15.1)
45-49	74.8	(18.6)	71.9	(20.1)	75.5	(17.8)	79.2	(15.6)
50-54	75.6	(19.0)	75.2	(18.5)	76.9	(19.4)	74.7	(19.4)
55-59	74.1	(19.7)	73.4	(19.7)	75.0	(20.4)	74.2	(18.9)
60-64	75.1	(20.1)	72.1	(21.6)	76.9	(18.1)	76.9	(20.1)
65-69	78.2	(17.6)	75.9	(17.7)	77.8	(18.1)	81.8	(16.3)
70-74	79.1	(16.2)	77.8	(16.9)	78.4	(16.6)	82.0	(14.5)
75-79	75.8	(18.7)	72.8	(20.2)	76.4	(16.9)	79.3	(17.90
80-84	77.9	(17.0)	76.6	(16.8)	79.4	(16.6)	77.8	(17.8)
85+	75.0	(17.1)	74.2	(15.8)	78.0	(13.6)	71.9	(22.6)
00	. 5.0	(n = 6109)		(n = 2579)	70.0	(n = 1995)		(n = 1535)
								Continued

	All Wales		South East Wales		Mid- and West Wales		North Wales	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Females								
16-19	75.2	(17.6)	73.2	(19.5)	76.6	(17.2)	77.3	(13.3)
20-24	72.8	(18.7)	72.6	(19.4)	72.9	(18.5)	73.2	(17.2)
25-29	71.8	(19.0)	71.6	(18.0)	71.2	(20.3)	73.2	(19.3)
30-34	71.5	(18.0)	70.7	(18.3)	73.0	(17.5)	71.3	(18.0)
35-39	71.1	(18.1)	70.0	(19.0)	72.4	(17.9)	71.5	(16.5)
40-44	71.6	(18.3)	70.1	(18.4)	71.8	(18.8)	73.8	(17.5)
45-49	70.0	(20.5)	70.0	(20.8)	70.7	(20.9)	68.0	(19.4)
50-54	71.4	(19.5)	71.7	(19.3)	70.2	(20.3)	72.4	(18.7)
55-59	70.3	(21.3)	68.1	(22.7)	72.0	(20.1)	71.5	(20.3)
60-64	73.1	(20.3)	70.8	(20.3)	73.6	(20.9)	76.0	(19.3)
65-69	74.5	(18.3)	71.2	(19.1)	75.5	(17.7)	77.8	(17.4)
70-74	71.9	(19.9)	69.5	(19.1)	73.4	(20.1)	73.6	(20.4)
75-79	73.0	(18.3)	72.7	(18.6)	73.4	(17.0)	72.6	(19.5)
80-84	72.2	(19.2)	69.5	(18.8)	73.2	(19.8)	74.8	(18.7)
85+	70.0	(20.8)	66.9	(20.9)	72.9	(18.1)	70.3	(23.9)
		( <i>n</i> = 7047)		( <i>n</i> = 3040)		( <i>n</i> = 2281)		( <i>n</i> = 1726)
Total	74.0	(18.9)	72.6	(19.2)	74.7	(18.7)	75.4	(18.5)
		( <i>n</i> = 13 156)		( <i>n</i> = 5619)		( <i>n</i> = 4276)		( <i>n</i> = 3261)

addresses contained four or more households (e.g. houses converted to flats), three households were selected for inclusion in the survey. Finally, the method of administration (self-completion) is likely to have had an impact on the ratings, that is, resulting in lower scores than those obtained through interviewer-administration.<sup>39,40</sup>

Despite the sampling limitations we conclude that it is imperative that the normative data provided in this paper are used in population studies in Wales to provide an indication of the health status of particular populations, and to measure the impact (in terms of health gains) of clinical and social interventions. The explanation for the better health of a sub-population, explored above, serves to illustrate that it is only by having normative data at this level of disaggregation that we can begin to understand the intricacies concerning the health of the Welsh population.

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