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Using health state utility values from the general population to approximate baselines in decision analytic models when condition specific data are not available

Running head: EQ-5D scores with/without prevalent conditions

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ABSTRACT

Decision analytic models in healthcare require baseline health related quality of life (HRQoL) data to accurately assess the benefits of interventions. The use of inappropriate baselines such as assuming the value of perfect health (EQ-5D = 1) for not having a condition may overestimate the benefits of some treatment and thus distort policy decisions informed by cost per QALY thresholds.

The primary objective was to determine if data from the general population are appropriate for baseline health state utility values (HSUVs) when condition specific data are not available.

Methods: Data from four consecutive Health Surveys for England were pooled. Self-reported health status and EQ-5D data were extracted and used to generate mean HSUVs for cohorts with or without prevalent health conditions. These were compared with mean HSUVs from all respondents irrespective of health status.

Results: Over 45% of respondents (n=41,174) reported at least one health condition and almost 20% reported at least two. Our results suggest that data from the general population could be used to approximate baseline HSUVs in some analyses but not all. In particular, HSUVs from the general population would not be an appropriate baseline for cohorts who have just one health condition. In these instances, if condition specific data are not available, data from respondents who report they do not have a prevalent health condition may be more appropriate. Exploratory analyses suggest the decrement on HRQoL may not be constant across ages for all conditions and these relationships may be condition specific. Additional research is required to validate our findings.

INTRODUCTION

Agencies such as the National Institute for Health and Clinical Excellence (NICE) produce national guidance on the provision of new health technologies and their recommendations are informed by reviews of clinical and economic evidence. To facilitate consistent reimbursement recommendations across all disease areas interventions are appraised using a decision rule based on the incremental cost per quality adjusted life year (QALY). The cost per QALY results are estimated using decision analytic models which describe the clinical pathway of health conditions or systems mathematically.

Analytic models frequently compare the benefits of treatments that have the potential to alleviate a health condition or avoid a clinical event. Conditions and events are described by health states in the models and the health related quality of life (HRQoL) or health state utility values (HSUV) associated with these are generally obtained from clinical trials or observational studies. The baseline HRQoL used to represent the HSUVs for individuals without these conditions or events is equally relevant as these data are used to assess the HRQoL gain in alleviating or avoiding the condition or event. Ideally the baseline HSUVs would be derived from people without specific condition(s) using the definitions of health states in the model. However, these data are rarely available and a baseline of full health is commonly assumed.[1] As the average person still has other health problems, this assumption overestimates the benefits of treatment[2,3] and it has been suggested that on average, a treatment will increase HRQoL to the same level as persons without the condition.[4] The baseline HSUVs used in decision models has important consequences as these data could distort a policy decision based on a cost per QALY threshold thus undermining efficient resource allocation.[5]

When condition specific baseline data are not available, one solution has been to use age-adjusted HSUVs obtained from the general population (irrespective of health condition).[1,2] These data will include individuals with the condition of interest hence an element of double

counting is inevitable. However, unless the prevalence of the health condition is high or the affect on HRQoL is substantial, intuitively one would expect the HRQoL of the average person without a particular health condition to be similar to the HRQoL of the average person of a similar age in the general population. Researchers have shown that in cardiovascular disease (CVD) the cost per QALY results are of a similar magnitude when estimated using either a baseline from the general population or a baseline from respondents with no history of CVD.[5]

The primary objective of the current study is to determine if this finding generalises to other conditions and thus if data from the general population are appropriate as baseline HSUVs in decision models. Specifically, we compare the HRQoL for subgroups who have a particular prevalent health condition (irrespective of other conditions) with a) the HRQoL from similar aged subgroups who do not have the condition (irrespective of other health conditions) and b) the HRQoL from similar aged subgroups irrespective of health status (i.e. the general population). As a secondary analysis, we compare the HRQoL for subgroups who have just one particular prevalent health condition with a) the HRQoL from similar aged subgroups who do not have any condition and b) the HRQoL from similar aged subgroups irrespective of health status (i.e. the general population).

METHODS

Data: We used HRQoL data and information on health status collected in the Health Survey for England (HSE).[6] The HSE is an annual survey conducted on randomly selected samples of the population living in private households in England.[HSE] The current study pools data collected during the 2003, 2004, 2005 and 2006 surveys. Information on health status was obtained from responses to the following question: " Do you have any long-standing illness, disability or infirmity? By long-standing I mean anything that has troubled you over a period of time, or that is likely to affect you over a period of time?" Details were obtained for a

maximum of six types of long-standing illnesses per person and responses were coded into 39 different health conditions. Two additional codes: "unclassifiable" and "complaint no longer present" were treated as no condition in our analyses.

HRQoL information was collected using the widely used generic questionnaire, the EQ-5D.[7] The EQ-5D contains five attributes of health status including: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each attribute is measured by a question with three possible responses: no problem, some problem, or severe problem. The combination of all possible responses leads to 243 (3^5) distinct health states. A random sample of the UK general public valued a sample of these health states using time trade-off techniques.[7] The resulting algorithm, which was used to calculate HSUVs for the current study, produces a range of -0.59 to 1, whereby 1 represents perfect health, 0 represents death and negative values represent health states considered to be worse than death.

Analysis:

Generally patients in decision analytic models are defined to match the demographic characteristics of patients who would receive the intervention under evaluation in clinical practice. Consequently, a typical patient will have concurrent health conditions and for older aged cohorts, a substantial proportion of patients will have additional prevalent health conditions. However, the effectiveness and HRQoL evidence used to assess the benefits of treatments may be derived from studies using strict recruitment criteria and patients with comorbidities can be excluded from these. As the baseline needs to reflect the definitions and data used in the model, we perform a series of analyses as described below.

i) The primary analyses test whether data from the general population can be used as the baseline HRQoL when data from cohorts with a specific health condition (irrespective of other health conditions) are used to assess the benefits of treatment. We compare mean EQ-5D scores for these subgroups with mean EQ-5D scores from a) respondents of a similar age

who did not have the specific health condition and b) respondents of a similar age irrespective of health status (i.e. the general population).

ii) The secondary analyses test whether data from the general population can be used as the baseline HRQoL when data from cohorts with a single health condition are used to assess the benefits of treatment. We compare mean EQ-5D scores for these subgroups with mean EQ-5D scores from a) respondents of a similar age who do not have any health condition and b) respondents of a similar age irrespective of health status (i.e. the general population).

iii) Exploratory analyses were also performed to test a) if the decrements on HRQoL for cohorts with a specific health condition (irrespective of other health conditions) are comparable to the decrements for cohorts with the single specific health condition (and no other condition) and b) if the decrements on HRQoL are constant across age.

All analyses were performed in STATA (v 11). Using the minimal important difference for the EQ-5D (0.074) as a benchmark,[8] and assuming a SD of 0.20 in EQ-5D scores, we used subgroups of greater than 64 (256) respondents for having the power to detect a mean difference of 0.10 (0.05) with 80% power and 5% two-sided significance. The analyses were weighted using the individual level self-administered questionnaire weights.[6] Statistical significance for the weighted mean EQ-5D scores was assessed using the 95% confidence intervals (CI) of the mean whereby if the CIs do not overlap there is a statistically significant difference between the groups.[9]

RESULTS

Of the 41,174 respondents who completed the EQ-5D questionnaire, 44.5% (18302/41174) were male, and the mean age was 48.6 (SD: 18.5) years for males and 48.5 (SD: 19.0) years for females. 54.5% (22449/41174) reported they did not have a history of a health condition, 26.1% (10762/41174) reported just one condition and 19.3% (7963/41174) reported at least two conditions. The most prevalent condition (Table A1 appendix) was

"arthritis/rheumatism/fibrositis" at 10.1% (4145/41174) of the sample followed by "hypertension/high blood pressure" at 7.7% (3172/41174). Prevalence of comorbid health conditions varied by primary health condition and by age. The proportion of respondents with more than one health condition ranged from 84.2% (123/146) of respondents with "other bladder problems/incontinence" to 54.0% (1325/2452) of respondents with "asthma". For respondents (n=4,212) aged 40 years or younger who reported at least one health condition, just 22.2% had at least one other condition while 57.4% of respondents (n=1,638) aged over 80 years who reported at least one health condition had at least one other condition.

The mean EQ-5D for all respondents (n=41,174) was 0.868 (range:-0.594 to 1). Respondents (22,449) who reported no health condition had a mean EQ-5D of 0.949 (range: -0.371 to 1) while respondents who reported one, or more than one health condition had mean EQ-5D scores of 0.821 (range: -0.594 to 1) and 0.654 (range: -0.594 to 1) respectively.

i) Primary analyses: With the exception of respondents who had a history of "hayfever" (n=416), all mean EQ-5D scores for respondents who reported they had a specific health condition irrespective of whether they had other health conditions too (Table 1) were lower than the mean EQ-5D scores for the subgroups who either did not have the condition or the subgroups irrespective of health status. Four of the 39 subgroups had less than 64 respondents hence were not assessed in terms of significant differences in mean scores. As the confidence intervals of the mean EQ-5D scores did not overlap for 29/35 pairs when comparing with subgroups without the condition and 27/35 pairs when comparing with subgroups irrespective of health condition, the differences were significant at the $p < 0.05$ level. Comparing the mean EQ-5D scores for respondents not affected by a condition with the corresponding mean scores for respondents irrespective of health condition, the confidence intervals of the paired mean scores overlapped.

INSERT TABLE 1: Mean EQ-5D scores for respondents subgrouped by health condition

These data can be used to assess the average absolute or relative effect on HRQoL compared to the average person of a similar age who does not have the named condition, or the average person of a similar age irrespective of health status. The condition "complaints of the teeth/mouth or tongue" produced the largest average decrement on HRQoL compared to the subgroup who did not have the condition (absolute = 0.345, relative = 39%) and the subgroup from the general population (absolute = 0.344, relative = 39%). The condition "a history of stroke" produced the second largest average decrement on HRQoL compared to the subgroup who did not have the condition (absolute = 0.287, relative = 35%) and the subgroup from the general population (absolute = 0.282, relative = 34%). When compared to subgroups without the health condition, and when compared to subgroups irrespective of health status, 31/39 of the differences in mean EQ-5D scores were greater than the minimal important difference (|0.074|) for the EQ-5D.[8]

ii) Secondary analyses: For the subgroups who reported they had a single specific health condition, compared to subgroups of a similar age who reported no health condition, with the exception of respondents who had a history of "hayfever" (n=186), and respondents who had a history of "poor hearing/deafness" (n=146) all mean EQ-5D scores were lower for the subgroups with the condition (Table 2). 10 of the 39 subgroups had less than 64 respondents hence were not assessed in terms of significant differences in mean scores. Of the remaining 29 pairs, compared to subgroups who reported no condition, as the confidence intervals of the mean EQ-5D scores did not overlap for 22 comparisons the differences were significant at the $p < 0.05$ level. When comparing the mean EQ-5D scores for subgroups with a single health condition with subgroups of a similar age irrespective of health status (i.e. general population), of the 29 subgroups involving more than 64 respondents, the mean scores were greater for 13 of the subgroups with a single condition. As the CIs for the mean EQ-5D

scores did not overlap for 8 of the 13 pairs, these differences were statistically significant ($p < 0.05$). For the remaining 16/29 subgroups with mean EQ-5D scores smaller than those of similar aged subgroups irrespective of health status, the CIs of the mean EQ-5D scores did not overlap for 5/16 comparisons ($p < 0.05$).

INSERT TABLE 2: Mean EQ-5D scores for respondents with a single health condition

These data can be used to assess the average absolute or relative effect on HRQoL for a single condition in isolation compared to the average person of a similar age who does not have any condition, or the average person of a similar age irrespective of health status. The condition "complaints of the teeth/mouth or tongue" produced the largest average decrement on HRQoL compared to the subgroup who had no condition (absolute = 0.290, relative = 30%) and the subgroup from the general population (absolute = 0.245, relative = 27%). The condition "a history of stroke" produced the second largest average decrement on HRQoL compared to the subgroup who had no condition (absolute = 0.254, relative = 27%) and the subgroup from the general population (absolute = 0.106, relative = 13%). When compared to subgroups without a health condition, 20/39 of the differences in mean EQ-5D scores were greater than the minimal important difference (|0.074|) for the EQ-5D while just 12/39 of the differences were greater than the MID when comparing to the subgroups irrespective of health status.[8]

iii) Exploratory analyses

a) Comparing average decrements on HRQoL for cohorts with a specific health condition (irrespective of other health conditions) with average decrements for corresponding cohorts with just the single specific health condition. In 14 of the 39 conditions, the average decrements on HRQoL were more than halved for the subgroups with just the one health

condition (versus subgroups with no condition) compared to the average decrements on HRQoL for the subgroups with the same condition irrespective of other conditions (versus subgroups without the specific condition irrespective of other conditions) . For example the average relative decrement was 2% for respondents (n=1127) with just "asthma" when compared to respondents of a similar age without any health condition versus an average relative decrement of 10% for respondents (n=2452) with "asthma" and any other health condition when compared to respondents of a similar age without asthma. These data suggest comorbidities impose an additional decrement on HRQoL and the implication of this should be considered on an individual basis when calculating decrements attributed to the alleviation of conditions or avoidance of clinical events in economic models.

b) Comparing decrements on HRQoL across age groups

Using the full dataset, HRQoL decreased by age (Figure 1) in general irrespective of the number of health conditions. The rate of decrease in HRQoL by age was greatest in respondents aged over 65 years. Comparing the mean EQ-5D scores for the youngest and oldest aged cohorts subgrouped by health status, the reduction in HRQoL was greatest for respondents with at least one health condition.

INSERT FIGURE 1: Mean EQ-5D scores stratified by age and number of health conditions

Potential trends in decrements in HRQoL by age for the individual health conditions were assessed visually by plotting mean EQ-5D scores for age and health condition stratified subgroups together with the average absolute and relative decrements (Figure 2, Figure 3 & Figure 4 supplied in the appendix). Due to small numbers in the age stratified data, these exploratory analyses were performed for the most prevalent health conditions only and the data were compared to respondents who did not have the relevant condition. For the cohort (n=2484) with " back problems/slipped disc/spine/neck" plus any other health condition, the average relative decrement on HRQoL compared to respondents without the condition

increased by age up to the age of 80 years (Figure 2a). This trend was also visible in the cohort (n=1106) with just " back problems/slipped disc/spine/neck" (Figure 2b) when compared to respondents with no health condition. The age stratified average absolute decrements (range 0.19 to 0.29) were similar for the cohorts with or without comorbid health conditions. Compared to the respondents without the condition, as the CIs for the mean EQ-5D scores did not cross, all the age stratified decrements were statistically significant at the 95% level.

INSERT FIGURE 2: Mean EQ-5D scores and decrements on HRQoL for respondents with "back problems/slipped disc/spine/neck"

Conversely, for the cohort (n= 3172) with "hypertension/high blood pressure/blood" plus any other condition the relative decrement on HRQoL compared to respondents without the condition decreased by age with the largest effects observed in respondents younger than 60 years (Figure 3a). The average effect on HRQoL was much smaller across all age groups for the cohort with just "hypertension/high blood pressure/blood" (n=974) compared to the average effect on HRQoL for the cohort with "hypertension/high blood pressure/blood" and any other health condition (Figure 3b).

For the cohort (n=4145) with "arthritis/rheumatism/fibrositis" plus any other health condition, the average relative decrement on HRQoL compared to subgroups without the condition decreased slightly by age for respondents aged over 40 years (Figure 4). Conversely, for the cohort (n=1358) with just "arthritis/rheumatism/fibrositis" and no other condition, compared to respondents with no health condition, the average relative decrement on HRQoL increased by age. When comparing the mean EQ-5D scores from cohorts with just "arthritis/rheumatism/fibrositis" with the mean EQ-5D scores for cohorts with "arthritis/rheumatism/fibrositis" plus any other condition the confidence intervals of the mean EQ-5D scores did not overlap for the cohorts aged between 40 years and 70 years only. All

age and condition specific mean EQ-5D scores used in the analyses which are not discussed in the article are provided in the online appendix.

DISCUSSION

This study provides EQ-5D scores obtained from non institutionalised residents in England stratified by self-reported history of prevalent health condition(s) and age (where sample sizes permit). Our results suggest that data from the general population irrespective of health status could be used in place of condition specific data to represent the HSUVs associated with not having a particular health condition in some analyses but not all. In particular, our analyses show that HSUVs from the general population would not be appropriate for cohorts who have just one health condition. In these instances, if the condition specific data are not available, age stratified mean HSUVs from respondents who report they have none of the prevalent health conditions could be used.

Not surprisingly, the average decrement on HRQoL compared to the condition specific baseline was generally smaller for respondents with a single health condition compared to respondents with the same health condition plus any comorbidities. For several conditions the decrement was more than halved. The majority of analytic models use cohorts defined to match those in the clinical studies used to represent the effectiveness of treatment. Therefore the data from cohorts with comorbidities are potentially more relevant as few clinical data are derived from patients who do not have any of the prevalent conditions, particularly in older aged cohorts. However, some clinical studies do impose strict exclusion criteria relating to comorbidities. Consequently the clinical and HRQoL evidence and the cohort definitions used in economic models should be considered carefully when selecting the baseline HSUV used to estimate the benefits of treatments.

Our exploratory analyses suggest the decrement on HRQoL associated with health conditions are not constant across age. Some conditions showed an increasing trend and others showed a decreasing trend. This may be due to the prevalence of comorbidities and additional research in this area would be beneficial. In particular research in health conditions which have a substantial effect on HRQoL and cohorts subgrouped by severity of condition would be interesting.

The mean EQ-5D score for individuals reporting no health condition is comparable to the average (EQ-5D = 0.952) obtained from individuals with no condition in the US Medical Expenditure Panel Survey (n=40,846).[10] While we found a strong trend for HSUVs to decrease by age irrespective of health status, we observed a levelling or increase in mean HRQoL in the age groups 65 to 70 years. This has also been reported in data collected using several different preference-based measures in the US.[11] Comparing our results generated using the UK EQ-5D algorithm, with the US EQ-5D values for non institutionalised US respondents (n=3,816) in the US based National Health Measurement Study, there is a much larger variation in age related mean EQ-5D scores in our dataset. The US mean scores ranged from approximately 0.89 for both males and females aged between 35 and 44 years to approximately 0.85 (0.82) for males (females) aged between 75 and 89 years. Using the data from all respondents irrespective of health status, the mean EQ-5D scores are 0.915 and 0.650 for the subgroups aged 30 to 35 years and 80 to 85 years respectively in our data. However, our results are comparable with those reported in a larger study using data (n=22,523) from the US Medical Expenditure Panel Survey (2001): mean UK EQ-5D scores 0.897 (0.864) for males (females) aged 30-39 years and 0.711 (0.622) for males (females) aged 80-89 years.[12]

There are limitations with the data used in this study. In particular the health conditions are self-reported and no information was collected that could be used to determine either the duration of the health condition or the severity of the condition. There was a great deal of

individual variation for respondents reporting the same health condition and this could be partly attributable to the wide range in severity of and duration of condition included within a single subgroup. The coded conditions are not exhaustive and it is probable that some respondents had health conditions which are not included in the analyses. As the conditions that are not identified are not prevalent this is unlikely to affect our main findings. The surveys did not sample from people in nursing homes or other institutions who are likely to have lower HRQoL on average than those residing in their own home. This is more likely to have an effect on the HSUVs for the older aged cohorts and it could be that the actual average EQ-5D scores for these subgroups are lower than we report. This may have an impact on the age related trends in the decrements for the different health conditions and additional research in this area would be interesting.

Some of the mean HSUVs for subgroups with a particular condition are lower than the corresponding values for subgroups without the condition or those from respondents irrespective of health status which initially appears counter intuitive. For the analyses conducted on subgroups with just one health condition, one possible explanation for higher HSUVs for the respondents with a condition is that the average person in the general population will in fact have a lower HSUV as the combined decrements on HRQoL for the prevalent conditions could be larger than the decrement for the single condition.

Decision analytic models of health care interventions require a baseline HRQoL profile to accurately calculate the benefits of treatment. These data would ideally be derived from respondents who do not have the exact definition of the health condition(s) being modelled. When these data are not available, the current study provides a number of age and health condition stratified HSUVs that can be used to assess the benefits of treatment compared to the average person who does not have the condition. Our results suggest age adjusted HSUV from the general population could be used as the baseline when modelling the benefits of treatment for individuals with comorbidities. However, these data are not appropriate when

modelling interventions in patients with a single health condition. Our findings require validation in additional datasets and additional research examining subgroups of patients with precisely defined health conditions would be beneficial.

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Table 1: Primary analyses, comparing mean EQ-5D scores for respondents subgrouped by health condition (plus any other health condition), respondents of a similar age without the health condition, and respondents of a similar age irrespective of health status

		Respondents affected by the health condition (and any other health condition)			Respondents of a similar age not affected by the health condition			Respondents of a similar age irrespective of health status (i.e. general population)		
	Mean Age	n	Mean EQ-5D	95% CI of the mean	n	Mean EQ-5D	95% CI of the mean	n	Mean EQ-5D	95% CI of the mean
Cancer (neoplasm) including lumps, mass masses, tumours and growths and benign (nonmalignant) lumps and cysts	60.9	820	0.697	(0.657, 0.736)	560	0.798	(0.755, 0.839)*	574	0.795	(0.754, 0.836)‡
Diabetes including hyperglycemia	60.4	1772	0.714	(0.695, 0.731)	592	0.845	(0.823, 0.866)†	628	0.841	(0.819, 0.862)‡
Other endocrine/metabolic diseases	56.4	1566	0.771	(0.747, 0.793)	655	0.830	(0.797, 0.861)†	696	0.821	(0.790, 0.852)
Mental illness/anxiety/depression/nerves	45.5	1332	0.606	(0.585, 0.626)	645	0.878	(0.861, 0.894)†	682	0.856	(0.836, 0.876)‡
Mental handicap	31.7	31*	0.654	(0.524, 0.783)	691	0.916	(0.901, 0.929)	692	0.916	(0.901, 0.929)
Epilepsy/fits/convulsions	43.2	267	0.715	(0.671, 0.758)	703	0.896	(0.880, 0.910)†	709	0.894	(0.878, 0.909)‡
Migraine/headaches	44.0	393	0.777	(0.745, 0.808)	704	0.888	(0.871, 0.904)†	714	0.885	(0.868, 0.902)‡

Other problems of nervous system	52.3	926	0.584	(0.552, 0.615)	607	0.846	(0.825, 0.865)†	631	0.834	(0.813, 0.854)‡
Cataract/poor eye sight/blindness	62.8	543	0.700	(0.669, 0.731)	530	0.814	(0.786, 0.841)†	538	0.812	(0.785, 0.839)‡
Other eye complaints	61.2	470	0.741	(0.683, 0.797)	567	0.794	(0.752, 0.835)	574	0.795	(0.754, 0.836)
Poor hearing/deafness	61.2	586	0.768	(0.742, 0.794)	567	0.795	(0.753, 0.835)†	574	0.795	(0.754, 0.836)
Tinnitus/noises in the ear	61.0	125	0.749	(0.684, 0.812)	572	0.795	(0.753, 0.835)	574	0.795	(0.754, 0.836)
Meniere's disease/ear complaints causing balance problems	60.9	154	0.704	(0.649, 0.759)	572	0.795	(0.754, 0.836)	574	0.795	(0.754, 0.836)
Other ear complaints	42.8	81	0.879	(0.826, 0.932)	708	0.894	(0.878, 0.909)	709	0.894	(0.878, 0.909)
Stroke/cerebral haemorrhage/cerebral thrombosis	67.8	360	0.541	(0.488, 0.593)	589	0.828	(0.804, 0.851)†	603	0.822	(0.798, 0.846)‡
Heart attack/angina	68.5	929	0.628	(0.602, 0.653)	569	0.826	(0.802, 0.850)†	603	0.822	(0.798, 0.846)‡
Hypertension/high blood pressure	62.3	3172	0.777	(0.765, 0.788)	451	0.812	(0.787, 0.835)	522	0.811	(0.788, 0.832)
Other heart problems	64.0	1349	0.672	(0.649, 0.694)	496	0.802	(0.771, 0.831)†	528	0.795	(0.765, 0.824)‡
Piles/haemorrhoids including varicose veins in anus	47.9	24*	0.778	(0.644, 0.911)	645	0.857	(0.832, 0.882)	647	0.858	(0.832, 0.882)
Varicose veins/phlebitis in lower	59.0	102	0.794	(0.730, 0.857)	665	0.804	(0.780, 0.828)	668	0.804	(0.780, 0.827)

extremities										
Other blood vessels/embolic	59.8	476	0.644	(0.611, 0.676)	619	0.846	(0.824, 0.866)†	628	0.841	(0.819, 0.862)‡
Bronchitis/emphysema	65.2	336	0.584	(0.541, 0.625)	565	0.835	(0.809, 0.860)†	577	0.828	(0.801, 0.853)‡
Asthma	44.2	2452	0.797	(0.779, 0.814)	674	0.890	(0.873, 0.907)†	714	0.885	(0.868, 0.902)‡
Hayfever	36.9	416	0.920	(0.904, 0.935)	790	0.910	(0.893, 0.925)	803	0.910	(0.894, 0.925)
Other respiratory complaints	56.1	686	0.697	(0.671, 0.723)	676	0.824	(0.791, 0.855)†	696	0.821	(0.790, 0.852)‡
Stomach ulcer/abdominal hernia/rupture	59.3	619	0.688	(0.654, 0.720)	650	0.806	(0.781, 0.830)†	668	0.804	(0.780, 0.827)‡
Other digestive complaints (stomach, liver, pancreas, bile ducts, small intestine duodenum, jejunum and ileum)	51.6	666	0.734	(0.707, 0.760)	620	0.836	(0.815, 0.856)†	631	0.834	(0.813, 0.854)‡
Complaints of bowel/colon (large intestine, caecum, bowel, colon, rectum)	52.5	925	0.698	(0.665, 0.731)	609	0.832	(0.808, 0.855)†	625	0.829	(0.805, 0.852)‡
Complaints of teeth/mouth/tongue	46.8	30*	0.550	(0.346, 0.753)	651	0.895	(0.878, 0.910)	652	0.894	(0.878, 0.910)
Kidney complaints	52.7	297	0.657	(0.609, 0.703)	621	0.833	(0.809, 0.855)†	625	0.829	(0.805, 0.852)‡
Urinary tract infection	59.5	36*	0.705	(0.546, 0.862)	668	0.804	(0.780, 0.827)	668	0.804	(0.780, 0.827)
Other bladder problems/incontinence	61.1	146	0.619	(0.557, 0.679)	571	0.796	(0.755, 0.837)†	574	0.795	(0.754, 0.836)‡

Reproductive system disorders	50.1	545	0.782	(0.757, 0.806)	662	0.865	(0.846, 0.884)†	668	0.866	(0.847, 0.885)‡
Arthritis/rheumatism/fibrositis	62.9	4145	0.597	(0.584, 0.609)	436	0.862	(0.836, 0.888)†	538	0.812	(0.785, 0.839)‡
Back problems/slipped disc/spine/neck	50.0	2484	0.649	(0.632, 0.666)	615	0.888	(0.870, 0.905)†	668	0.866	(0.847, 0.885)‡
Other problems of bones/joints/muscles	54.9	2526	0.642	(0.628, 0.656)	627	0.854	(0.833, 0.874)†	696	0.821	(0.790, 0.852)‡
Infectious and parasitic disease	44.5	79	0.676	(0.605, 0.746)	735	0.879	(0.863, 0.895)†	736	0.879	(0.863, 0.895)‡
Disorders of blood and blood forming or organs and immunity disorders	53.7	334	0.728	(0.692, 0.764)	646	0.833	(0.812, 0.853)†	647	0.833	(0.812, 0.854)‡
Skin complaints	45.9	684	0.773	(0.733, 0.812)	675	0.855	(0.834, 0.875)†	682	0.856	(0.836, 0.876)‡

* Four subgroups with less than the sample size (64 respondents) for assessing significance were not compared for difference in mean EQ-5D scores

All CIs for mean EQ-5D overlap ($p>0.05$) when comparing: respondents not affected by the condition versus irrespective of health status

† CIs for mean EQ-5D do not overlap ($p<0.05$) when comparing: respondents with the condition versus respondents not affected by the condition

‡ CIs for mean EQ-5D do not overlap ($p<0.05$) when comparing: respondents with the condition versus respondents irrespective of health status

Table 2: Secondary analyses, comparing mean EQ-5D score for respondents with a single health condition, respondents of a similar age with no health condition, and respondents of a similar age irrespective of health condition

		Respondents affected by the one health condition (and no other health condition)			Respondents of a similar age with no health condition			Respondents of a similar age irrespective of health status (i.e. general population)		
	Mean Age	n	Mean EQ-5D	95% CI of the mean	n	Mean EQ-5D	95% CI of the mean	n	Mean EQ-5D	95% CI of the mean
Cancer (neoplasm) including lumps, mass masses, tumours and growths and benign (nonmalignant) lumps and cysts	55.0	282	0.836	(0.801, 0.871)	315	0.952	(0.937, 0.965)†	670	0.835	(0.813, 0.856)
Diabetes including hyperglycemia	55.2	537	0.898	(0.883, 0.912)	315	0.952	(0.937, 0.965)†	670	0.835	(0.813, 0.856)‡
Other endocrine/metabolic diseases	48.3	422	0.924	(0.909, 0.937)	369	0.948	(0.934, 0.960)	647	0.858	(0.832, 0.882)‡
Mental illness/anxiety/depression/nerves	40.6	541	0.709	(0.685, 0.733)	535	0.955	(0.946, 0.964)†	826	0.877	(0.856, 0.897)‡
Mental handicap	26.0	11*	0.776	(0.594, 0.957)	399	0.965	(0.954, 0.976)	527	0.940	(0.927, 0.952)
Epilepsy/fits/convulsions	38.5	102	0.873	(0.837, 0.908)	500	0.953	(0.943, 0.962)†	794	0.903	(0.889, 0.916)
Migraine/headaches	40.3	132	0.912	(0.880, 0.943)	573	0.955	(0.945, 0.965)†	850	0.907	(0.893, 0.921)

Other problems of nervous system	48.2	336	0.695	(0.663, 0.726)	369	0.948	(0.934, 0.960)†	647	0.858	(0.832, 0.882)‡
Cataract/poor eye sight/blindness	53.3	97	0.926	(0.897, 0.954)	302	0.936	(0.923, 0.949)	625	0.829	(0.805, 0.852)‡
Other eye complaints	49.1	95	0.894	(0.857, 0.930)	349	0.946	(0.933, 0.959)†	645	0.843	(0.802, 0.884)
Poor hearing/deafness	51.7	146	0.937	(0.914, 0.959)	315	0.931	(0.916, 0.944)	631	0.834	(0.813, 0.854)‡
Tinnitus/noises in the ear	59.2	21*	0.903	(0.816, 0.990)	273	0.923	(0.905, 0.940)	668	0.804	(0.780, 0.827)
Meniere's disease/ear complaints causing balance problems	54.3	40*	0.893	(0.826, 0.960)	319	0.930	(0.913, 0.946)	647	0.833	(0.812, 0.854)
Other ear complaints	36.1	33*	0.926	(0.869, 0.982)	532	0.956	(0.947, 0.965)	780	0.909	(0.895, 0.923)
Stroke/cerebral haemorrhage/cerebral thrombosis	65.8	102	0.684	(0.587, 0.780)	216	0.938	(0.917, 0.958)†	644	0.790	(0.763, 0.817)
Heart attack/angina	67.0	200	0.804	(0.768, 0.840)	193	0.935	(0.914, 0.955)†	617	0.815	(0.791, 0.839)
Hypertension/high blood pressure	59.8	974	0.916	(0.903, 0.928)	286	0.936	(0.918, 0.953)	628	0.841	(0.819, 0.862)‡
Other heart problems	58.2	366	0.822	(0.781, 0.862)	288	0.938	(0.921, 0.953)†	637	0.829	(0.808, 0.849)
Piles/haemorrhoids including varicose veins in anus	48.2	8*	0.931	(0.822, 1.038)	369	0.948	(0.934, 0.960)	647	0.858	(0.832, 0.882)
Varicose veins/phlebitis in lower	49.0	36*	0.847	(0.790, 0.903)	349	0.946	(0.933, 0.959)	645	0.843	(0.802, 0.884)

extremities										
Other blood vessels/embolic	51.8	104	0.807	(0.760, 0.852)	315	0.931	(0.916, 0.944)†	631	0.834	(0.813, 0.854)
Bronchitis/emphysema	65.0	83	0.789	(0.744, 0.834)	200	0.956	(0.939, 0.973)†	577	0.828	(0.801, 0.853)
Asthma	37.6	1127	0.931	(0.922, 0.939)	500	0.953	(0.943, 0.962)†	794	0.903	(0.889, 0.916)‡
Hayfever	35.8	186	0.961	(0.947, 0.975)	532	0.956	(0.947, 0.965)	780	0.909	(0.895, 0.923)‡
Other respiratory complaints	47.9	156	0.818	(0.778, 0.858)	369	0.948	(0.934, 0.960)†	647	0.858	(0.832, 0.882)
Stomach ulcer/abdominal hernia/rupture	52.5	124	0.891	(0.863, 0.918)	302	0.936	(0.923, 0.949)†	625	0.829	(0.805, 0.852)‡
Other digestive complaints (stomach, liver, pancreas, bile ducts, small intestine duodenum, jejunum and ileum)	43.9	184	0.875	(0.845, 0.903)	424	0.959	(0.949, 0.967)†	714	0.885	(0.868, 0.902)
Complaints of bowel/colon (large intestine, caecum, bowel, colon, rectum)	44.2	282	0.878	(0.854, 0.901)	424	0.959	(0.949, 0.967)†	714	0.885	(0.868, 0.902)
Complaints of teeth/mouth/tongue	34.4	11*	0.667	(0.410, 0.924)	531	0.957	(0.947, 0.966)	763	0.912	(0.898, 0.926)
Kidney complaints	44.8	81	0.845	(0.799, 0.889)	461	0.952	(0.942, 0.960)†	736	0.879	(0.863, 0.895)
Urinary tract infection	43.8	7*	0.934	(0.822, 1.046)	424	0.959	(0.949, 0.967)	714	0.885	(0.868, 0.902)
Other bladder problems/incontinence	50.5	23*	0.891	(0.829, 0.952)	371	0.947	(0.932, 0.961)	668	0.866	(0.847, 0.885)

Reproductive system disorders	41.6	174	0.882	(0.855, 0.909)	494	0.943	(0.930, 0.956)†	761	0.877	(0.846, 0.908)
Arthritis/rheumatism/fibrositis	60.1	1358	0.685	(0.662, 0.706)	286	0.936	(0.918, 0.953)†	628	0.841	(0.819, 0.862)‡
Back problems/slipped disc/spine/neck	45.5	1106	0.745	(0.727, 0.761)	461	0.952	(0.942, 0.960)†	736	0.879	(0.863, 0.895)‡
Other problems of bones/joints/muscles	48.9	942	0.731	(0.709, 0.753)	349	0.946	(0.933, 0.959)†	645	0.843	(0.802, 0.884)‡
Infectious and parasitic disease	40.8	33*	0.762	(0.698, 0.824)	535	0.955	(0.946, 0.964)	826	0.877	(0.856, 0.897)
Disorders of blood and blood forming or organs and immunity disorders	39.7	90	0.876	(0.835, 0.915)	573	0.955	(0.945, 0.965)†	850	0.907	(0.893, 0.921)
Skin complaints	38.4	210	0.916	(0.892, 0.939)	500	0.953	(0.943, 0.962)†	794	0.903	(0.889, 0.916)

* Ten subgroups with less than the sample size (64 respondents) for assessing significance were not compared for difference in mean EQ-5D scores

All CIs for mean EQ-5D do not overlap ($p<0.05$) when comparing: respondents with no health condition versus respondents irrespective of health status

† CIs for mean EQ-5D do not overlap ($p<0.05$) when comparing: respondents with the condition versus respondents with no health condition

‡ CIs for mean EQ-5D do not overlap ($p<0.05$) when comparing: respondents with the condition versus respondents irrespective of health status

Figure 1: Mean EQ-5D scores stratified by age and number of health conditions

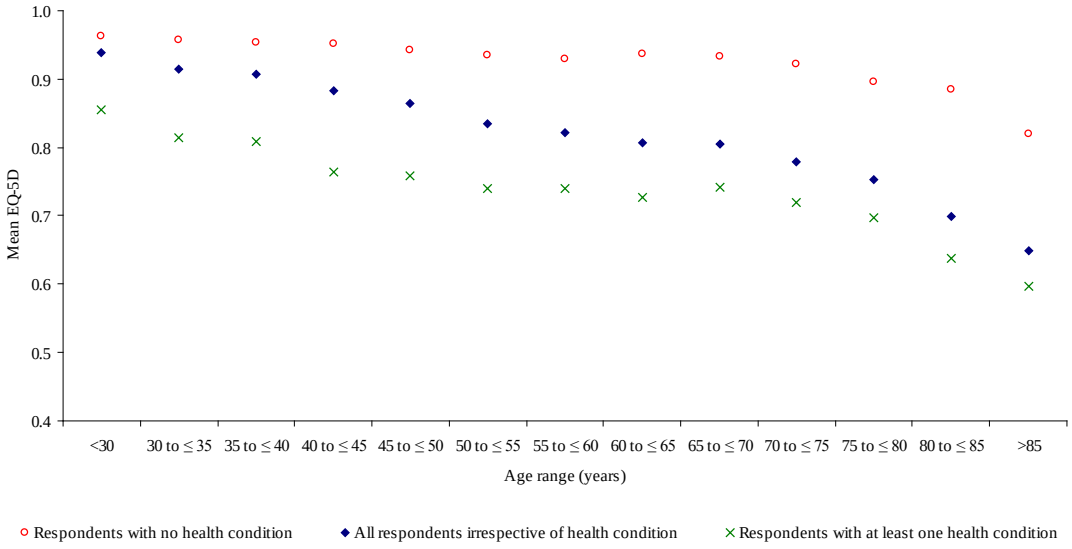


Figure 2: Mean EQ-5D scores and average decrements on HRQoL for respondents with “back problems/slipped disc/spine/neck”

Figure 2a: Respondents with “back problems/slipped disc/spine/neck” and any other health condition compared to respondents without “back problems/slipped disc/spine/neck”

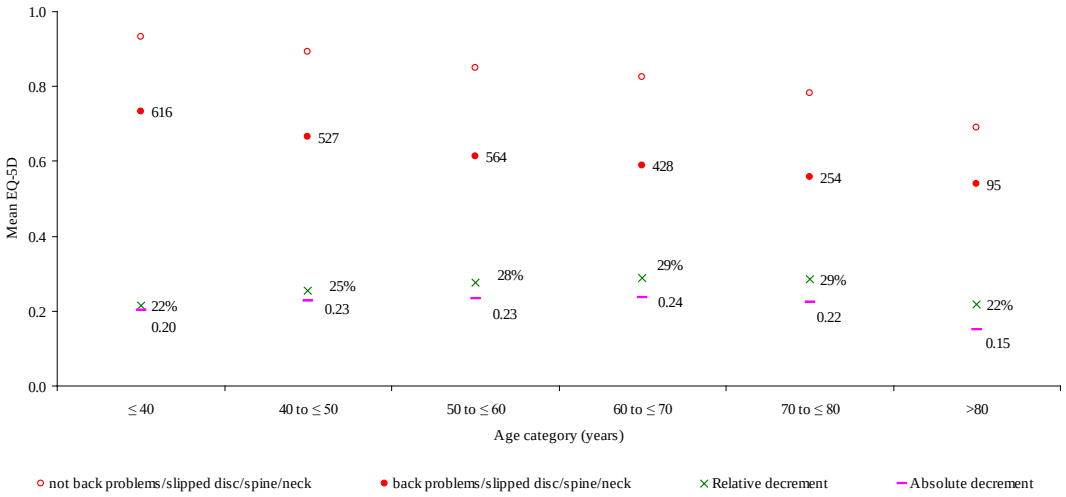
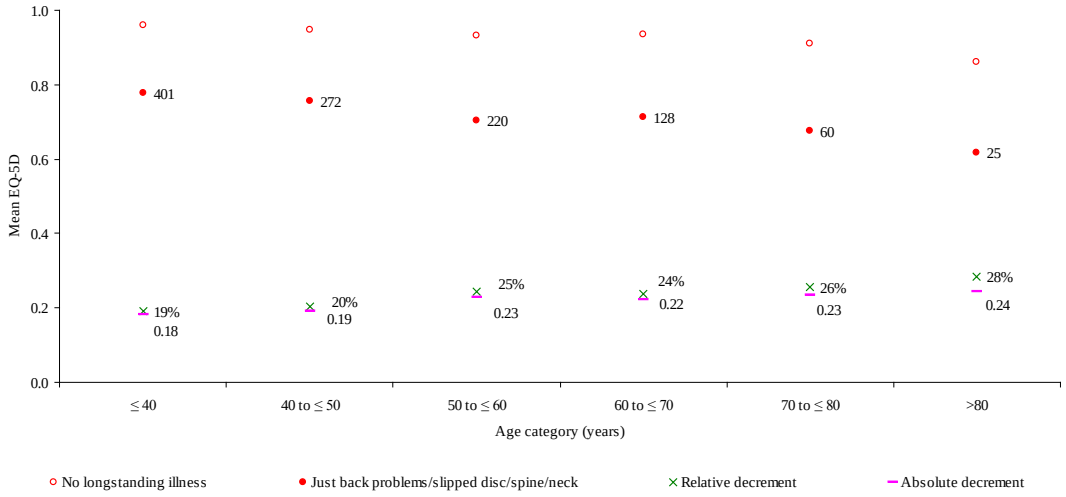


Figure 2b: Respondents with just “back problems/slipped disc/spine/neck” and no other health condition compared to respondents with no condition



(the number of cases are shown next to data points for respondents who have the condition)

APPENDIX

Table A1: Frequencies of the health conditions

	Respondents affected by the health condition (and any other health condition)			Respondents affected by just the one health condition			
	n	mean age	Se of the mean	n	~	mean age	Se of the mean
No health condition	22449	39.9	(39.6, 40.1)				
Cancer (neoplasm) including lumps, mass masses, tumours and growths and benign (nonmalignant) lumps and cysts	820	60.9	(59.3, 62.3)	282	34%	55.0	(52.5, 57.4)
Diabetes including hyperglycemia	1772	60.4	(59.6, 61.1)	537	30%	55.2	(53.7, 56.6)
Other endocrine/metabolic diseases	1566	56.4	(55.4, 57.2)	422	27%	48.3	(46.7, 49.8)
Mental illness/anxiety/depression/nerves	1332	45.5	(44.6, 46.4)	541	41%	40.6	(39.2, 41.9)
Mental handicap	31	31.7	(26.9, 36.4)	11	35%	26.0	(19.5, 32.4)
Epilepsy/fits/convulsions	267	43.2	(41.1, 45.2)	102	38%	38.5	(35.8, 41.1)
Migraine/headaches	393	44.0	(42.2, 45.8)	132	34%	40.3	(36.9, 43.6)
Other problems of nervous system	926	52.3	(51.0, 53.4)	336	36%	48.2	(46.0, 50.3)

Cataract/poor eye sight/blindness	543	62.8	(60.5, 65.0)	97	18%	53.3	(48.0, 58.6)
Other eye complaints	470	61.2	(58.7, 63.5)	95	20%	49.1	(44.5, 53.5)
Poor hearing/deafness	586	61.2	(59.3, 63.0)	146	25%	51.7	(48.2, 55.1)
Tinnitus/noises in the ear	125	61.0	(58.3, 63.7)	21	17%	59.2	(50.3, 68.1)
Meniere's disease/ear complaints causing balance problems	154	60.9	(58.1, 63.5)	40	26%	54.3	(49.9, 58.6)
Other ear complaints	81	42.8	(35.7, 49.8)	33	41%	36.1	(25.4, 46.7)
Stroke/cerebral haemorrhage/cerebral thrombosis	360	67.8	(66.3, 69.2)	102	28%	65.8	(63.1, 68.5)
Heart attack/angina	929	68.5	(67.5, 69.4)	200	22%	67.0	(65.0, 68.8)
Hypertension/high blood pressure	3172	62.3	(61.8, 62.8)	974	31%	59.8	(58.8, 60.7)
Other heart problems	1349	64.0	(62.9, 65.0)	366	27%	58.2	(56.0, 60.4)
Piles/haemorrhoids including varicose veins in anus	24	47.9	(42.2, 53.5)	8	33%	48.2	(39.7, 56.5)
Varicose veins/phlebitis in lower extremities	102	59.0	(55.5, 62.4)	36	35%	49.0	(43.0, 54.9)

Other blood vessels/embolic	476	59.8	(58.1, 61.4)	104	22%	51.8	(48.2, 55.3)
Bronchitis/emphysema	336	65.2	(63.5, 66.8)	83	25%	65.0	(61.3, 68.6)
Asthma	2452	44.2	(43.4, 45.0)	1127	46%	37.6	(36.5, 38.6)
Hayfever	416	36.9	(35.3, 38.4)	186	45%	35.8	(33.7, 37.7)
Other respiratory complaints	686	56.1	(54.4, 57.7)	156	23%	47.9	(44.1, 51.6)
Stomach ulcer/abdominal hernia/rupture	619	59.3	(57.7, 60.7)	124	20%	52.5	(49.7, 55.2)
Other digestive complaints (stomach, liver, pancreas, bile ducts, small intestine duodenum, jejunum and ileum)	666	51.6	(50.1, 53.0)	184	28%	43.9	(41.1, 46.6)
Complaints of bowel/colon (large intestine, caecum, bowel, colon, rectum)	925	52.5	(51.2, 53.8)	282	30%	44.2	(41.8, 46.5)
Complaints of teeth/mouth/tongue	30	46.8	(39.9, 53.7)	11	37%	34.4	(22.3, 46.3)
Kidney complaints	297	52.7	(50.3, 54.9)	81	27%	44.8	(40.0, 49.5)
Urinary tract infection	36	59.5	(53.9, 64.9)	7	19%	43.8	(30.0, 57.5)
Other bladder problems/incontinence	146	61.1	(57.7, 64.3)	23	16%	50.5	(41.1, 59.8)
Reproductive system disorders	545	50.1	(48.2, 51.8)	174	32%	41.6	(38.7, 44.4)

Arthritis/rheumatism/fibrositis	4145	62.9	(62.3, 63.5)	1358	33%	60.1	(58.8, 61.2)
Back problems/slipped disc/spine/neck	2484	50.0	(49.2, 50.7)	1106	45%	45.5	(44.4, 46.5)
Other problems of bones/joints/muscles	2526	54.9	(54.0, 55.8)	942	37%	48.9	(47.5, 50.2)
Infectious and parasitic disease	79	44.5	(40.4, 48.5)	33	42%	40.8	(35.2, 46.3)
Disorders of blood and blood forming or organs and immunity disorders	334	53.7	(49.9, 57.4)	90	27%	39.7	(36.1, 43.2)
Skin complaints	684	45.9	(44.0, 47.8)	210	31%	38.4	(36.3, 40.4)

~ proportion of respondents affected by the health condition who reported at least one other condition

Table A2: Additional age/health condition stratified mean EQ-5D scores for prevalent health conditions

Age Band (years)	n	mean	95% CI of mean	n	mean	95% CI of mean	n	mean	95% CI of mean	n	mean	95% CI of mean
	History of health condition* General population irrespective of health status (n = 41147)			No history of health condition No Health condition (n=22449)			History of health condition Arthritis/rheumatism/fibrositis (n=4145)			No history of health condition		
<30	8083	0.9383	(0.935,0.941)	6269	0.9633	(0.960,0.965)	45	0.6865	(0.587,0.785)	8038	0.9396	(0.936,0.942)
30 to ≤ 35	3608	0.9145	(0.907,0.921)	2555	0.9564	(0.951,0.961)	62	0.6526	(0.470,0.834)	3546	0.9196	(0.913,0.925)
35 to ≤ 40	4020	0.9069	(0.900,0.913)	2675	0.9544	(0.950,0.958)	88	0.6712	(0.575,0.766)	3932	0.9121	(0.906,0.918)
40 to ≤ 45	3746	0.8824	(0.872,0.891)	2376	0.9513	(0.946,0.956)	154	0.6485	(0.595,0.701)	3592	0.8919	(0.882,0.901)
45 to ≤ 50	3294	0.8639	(0.852,0.875)	1892	0.9430	(0.936,0.949)	214	0.5859	(0.535,0.635)	3080	0.8824	(0.871,0.893)
50 to ≤ 55	3156	0.8344	(0.824,0.843)	1555	0.9345	(0.927,0.941)	384	0.5975	(0.558,0.636)	2772	0.8679	(0.859,0.876)
55 to ≤ 60	3285	0.8222	(0.811,0.833)	1400	0.9296	(0.914,0.944)	482	0.5996	(0.567,0.631)	2803	0.8585	(0.847,0.869)
60 to ≤ 65	2739	0.8072	(0.793,0.821)	1017	0.9373	(0.928,0.946)	514	0.5902	(0.552,0.627)	2225	0.8546	(0.841,0.867)
65 to ≤ 70	2993	0.8041	(0.790,0.817)	992	0.9331	(0.921,0.944)	621	0.6024	(0.565,0.639)	2372	0.8560	(0.844,0.866)
70 to ≤ 75	2501	0.7790	(0.766,0.791)	741	0.9219	(0.909,0.934)	580	0.6045	(0.575,0.633)	1921	0.8293	(0.816,0.841)

75 to ≤ 80	1895	0.7533	(0.739,0.767)	522	0.8965	(0.881,0.911)	472	0.5864	(0.555,0.617)	1423	0.8066	(0.792,0.820)
80 to ≤ 85	1199	0.6985	(0.677,0.719)	301	0.8844	(0.866,0.902)	319	0.5509	(0.513,0.588)	880	0.7518	(0.727,0.775)
>85	655	0.6497	(0.624,0.675)	154	0.8191	(0.784,0.853)	210	0.5198	(0.462,0.577)	445	0.7090	(0.682,0.735)
	Hypertension/high blood pressure/blood (n = 3172)						Other problems of bones/joints/muscles (n=2526)					
<30	20	0.8062	(0.709,0.902)	8063	0.9386	(0.935,0.941)	202	0.7626	(0.726,0.799)	7881	0.9428	(0.939,0.945)
30 to ≤ 35	26	0.8154	(0.710,0.919)	3582	0.9153	(0.907,0.922)	136	0.7438	(0.700,0.786)	3472	0.9218	(0.914,0.929)
35 to ≤ 40	79	0.8641	(0.810,0.917)	3941	0.9077	(0.901,0.913)	142	0.685	(0.634,0.735)	3878	0.9146	(0.908,0.920)
40 to ≤ 45	108	0.7745	(0.701,0.847)	3638	0.8854	(0.875,0.894)	185	0.6794	(0.631,0.726)	3561	0.8925	(0.883,0.902)
45 to ≤ 50	200	0.8032	(0.759,0.847)	3094	0.8676	(0.855,0.879)	185	0.6407	(0.586,0.695)	3109	0.8774	(0.865,0.888)
50 to ≤ 55	306	0.7666	(0.727,0.805)	2850	0.8414	(0.831,0.851)	210	0.6021	(0.558,0.645)	2946	0.8502	(0.840,0.859)
55 to ≤ 60	416	0.778	(0.747,0.808)	2869	0.8284	(0.816,0.840)	229	0.6426	(0.601,0.683)	3056	0.8354	(0.824,0.846)
60 to ≤ 65	426	0.8089	(0.777,0.840)	2313	0.8069	(0.791,0.822)	226	0.5847	(0.536,0.632)	2513	0.8255	(0.811,0.839)
65 to ≤ 70	573	0.7849	(0.761,0.808)	2420	0.8084	(0.792,0.823)	267	0.5962	(0.530,0.662)	2726	0.8253	(0.813,0.836)
70 to ≤ 75	453	0.7749	(0.746,0.803)	2048	0.7799	(0.765,0.794)	265	0.605	(0.561,0.648)	2236	0.7988	(0.786,0.811)
75 to ≤ 80	296	0.7417	(0.709,0.773)	1599	0.7554	(0.739,0.770)	212	0.6125	(0.569,0.655)	1683	0.7719	(0.757,0.786)
80 to ≤ 85	194	0.6867	(0.633,0.740)	1005	0.7009	(0.678,0.723)	169	0.548	(0.495,0.600)	1030	0.7254	(0.704,0.746)

>85	75	0.6853	(0.617,0.753)	580	0.6456	(0.618,0.672)	98	0.5498	(0.484,0.615)	557	0.6704	(0.642,0.698)
	Back problems/slipped disc/spine/neck (n=2484)						Asthma (n=2452)					
<30	218	0.7623	(0.728,0.795)	7865	0.9432	(0.940,0.946)	531	0.9024	(0.886,0.918)	7552	0.9408	(0.937,0.944)
30 to ≤ 35	152	0.7035	(0.657,0.749)	3456	0.9241	(0.916,0.931)	211	0.8658	(0.832,0.898)	3397	0.9174	(0.909,0.924)
35 to ≤ 40	246	0.7193	(0.675,0.763)	3774	0.9184	(0.912,0.924)	240	0.8531	(0.817,0.889)	3780	0.9102	(0.903,0.916)
40 to ≤ 45	258	0.6573	(0.583,0.731)	3488	0.8993	(0.891,0.906)	199	0.7676	(0.670,0.864)	3547	0.8893	(0.881,0.897)
45 to ≤ 50	269	0.6728	(0.632,0.713)	3025	0.8813	(0.869,0.892)	196	0.7073	(0.591,0.823)	3098	0.874	(0.865,0.882)
50 to ≤ 55	267	0.6152	(0.565,0.665)	2889	0.8538	(0.844,0.862)	185	0.7591	(0.701,0.817)	2971	0.8392	(0.829,0.848)
55 to ≤ 60	297	0.6139	(0.571,0.655)	2988	0.8433	(0.832,0.854)	200	0.7604	(0.707,0.812)	3085	0.8262	(0.814,0.837)
60 to ≤ 65	248	0.5586	(0.488,0.628)	2491	0.8329	(0.821,0.844)	164	0.6229	(0.558,0.686)	2575	0.818	(0.804,0.831)
65 to ≤ 70	180	0.6378	(0.592,0.683)	2813	0.8155	(0.801,0.829)	174	0.7122	(0.661,0.763)	2819	0.8092	(0.795,0.823)
70 to ≤ 75	155	0.565	(0.501,0.628)	2346	0.7941	(0.781,0.806)	152	0.6909	(0.629,0.751)	2349	0.7851	(0.772,0.797)
75 to ≤ 80	99	0.5456	(0.470,0.620)	1796	0.7645	(0.750,0.778)	120	0.7168	(0.659,0.773)	1775	0.7559	(0.741,0.770)
80 to ≤ 85	66	0.549	(0.465,0.632)	1133	0.7074	(0.686,0.728)	56	0.6936	(0.594,0.792)	1143	0.6987	(0.677,0.719)
>85	29	0.5142	(0.374,0.654)	626	0.6553	(0.629,0.681)	24	0.7018	(0.624,0.778)	631	0.6474	(0.621,0.673)
	Diabetes. incl. hyperglycemia (n=1772)						Other endocrine/metabolic (n=1566)					

<30	43	0.8595	(0.773,0.945)	8040	0.9386	(0.935,0.941)	59	0.8551	(0.809,0.900)	8024	0.9389	(0.935,0.942)
30 to ≤ 35	41	0.7271	(0.579,0.874)	3567	0.9165	(0.909,0.923)	45	0.8214	(0.736,0.906)	3563	0.9156	(0.908,0.923)
35 to ≤ 40	59	0.8312	(0.765,0.896)	3961	0.9079	(0.901,0.914)	80	0.8718	(0.814,0.928)	3940	0.9076	(0.901,0.913)
40 to ≤ 45	85	0.7321	(0.651,0.812)	3661	0.8858	(0.876,0.895)	109	0.7923	(0.734,0.850)	3637	0.8851	(0.875,0.894)
45 to ≤ 50	118	0.7611	(0.697,0.824)	3176	0.8675	(0.855,0.879)	119	0.7085	(0.543,0.873)	3175	0.8706	(0.861,0.879)
50 to ≤ 55	142	0.703	(0.644,0.761)	3014	0.8409	(0.831,0.850)	140	0.7876	(0.729,0.845)	3016	0.8368	(0.827,0.846)
55 to ≤ 60	173	0.7199	(0.669,0.770)	3112	0.8277	(0.816,0.838)	198	0.7589	(0.713,0.804)	3087	0.826	(0.814,0.837)
60 to ≤ 65	245	0.656	(0.593,0.718)	2494	0.8216	(0.808,0.834)	198	0.7905	(0.747,0.833)	2541	0.8085	(0.793,0.823)
65 to ≤ 70	303	0.7254	(0.685,0.765)	2690	0.8124	(0.798,0.826)	233	0.7942	(0.758,0.830)	2760	0.8048	(0.790,0.818)
70 to ≤ 75	279	0.7114	(0.673,0.749)	2222	0.7878	(0.774,0.801)	175	0.7487	(0.699,0.798)	2326	0.7813	(0.768,0.794)
75 to ≤ 80	167	0.6555	(0.604,0.706)	1728	0.763	(0.748,0.777)	109	0.7125	(0.651,0.773)	1786	0.7555	(0.741,0.769)
80 to ≤ 85	83	0.6977	(0.638,0.756)	1116	0.6985	(0.676,0.720)	75	0.599	(0.524,0.673)	1124	0.7043	(0.682,0.725)
>85	34	0.6214	(0.507,0.734)	621	0.651	(0.624,0.677)	26	0.5316	(0.388,0.674)	629	0.6543	(0.628,0.680)
	Other heart problems (n=1349)						Mental illness/anxiety/depression/nerves (n=1332)					
<30	43	0.8201	(0.747,0.892)	8040	0.9389	(0.935,0.942)	188	0.6835	(0.639,0.727)	7895	0.944	(0.940,0.947)
30 to ≤ 35	16	0.8645	(0.781,0.947)	3592	0.9148	(0.907,0.922)	132	0.627	(0.559,0.694)	3476	0.9243	(0.917,0.931)

35 to ≤ 40	28	0.8147	(0.741,0.888)	3992	0.9075	(0.901,0.913)	159	0.6232	(0.573,0.672)	3861	0.9176	(0.911,0.923)
40 to ≤ 45	43	0.628	(0.431,0.824)	3703	0.8855	(0.876,0.894)	171	0.6167	(0.564,0.669)	3575	0.8955	(0.886,0.904)
45 to ≤ 50	51	0.7086	(0.641,0.775)	3243	0.8664	(0.854,0.877)	136	0.5356	(0.463,0.607)	3158	0.8782	(0.867,0.889)
50 to ≤ 55	67	0.6759	(0.589,0.762)	3089	0.8376	(0.828,0.847)	142	0.563	(0.503,0.622)	3014	0.8458	(0.836,0.855)
55 to ≤ 60	112	0.686	(0.626,0.745)	3173	0.8269	(0.815,0.837)	147	0.5901	(0.511,0.668)	3138	0.8342	(0.823,0.844)
60 to ≤ 65	159	0.6234	(0.531,0.714)	2580	0.8189	(0.805,0.832)	78	0.5522	(0.476,0.627)	2661	0.8143	(0.800,0.828)
65 to ≤ 70	209	0.6866	(0.626,0.747)	2784	0.8132	(0.799,0.827)	57	0.6398	(0.534,0.745)	2936	0.8068	(0.793,0.820)
70 to ≤ 75	225	0.6719	(0.625,0.718)	2276	0.7892	(0.776,0.802)	48	0.5862	(0.471,0.700)	2453	0.783	(0.770,0.795)
75 to ≤ 80	186	0.6885	(0.643,0.733)	1709	0.7602	(0.745,0.774)	29	0.5762	(0.423,0.728)	1866	0.7561	(0.742,0.770)
80 to ≤ 85	127	0.6137	(0.555,0.672)	1072	0.707	(0.684,0.729)	28	0.5333	(0.384,0.682)	1171	0.7021	(0.681,0.723)
>85	83	0.5171	(0.441,0.592)	572	0.6692	(0.642,0.695)	17	0.5524	(0.361,0.743)	638	0.6523	(0.626,0.677)
	Heart attack/angina (n=929)						Other problems of nervous system (n=926)					
<30	1	0.088	na	8082	0.9384	(0.935,0.941)	67	0.735	(0.669,0.800)	8016	0.94	(0.936,0.943)
30 to ≤ 35	2	0.4244	(-3.59,4.442)	3606	0.9148	(0.907,0.922)	36	0.7242	(0.609,0.838)	3572	0.9163	(0.908,0.923)
35 to ≤ 40	6	0.7015	(0.352,1.050)	4014	0.9072	(0.900,0.913)	77	0.6408	(0.564,0.717)	3943	0.9119	(0.905,0.918)
40 to ≤ 45	10	0.5502	(0.250,0.850)	3736	0.8834	(0.873,0.892)	92	0.5847	(0.512,0.656)	3654	0.8893	(0.879,0.898)

45 to ≤ 50	23	0.5502	(0.250,0.850)	3271	0.8664	(0.855,0.877)	86	0.5043	(0.320,0.688)	3208	0.8748	(0.865,0.883)
50 to ≤ 55	51	0.6643	(0.514,0.814)	3105	0.8374	(0.827,0.846)	107	0.4949	(0.417,0.571)	3049	0.845	(0.835,0.854)
55 to ≤ 60	103	0.5863	(0.520,0.652)	3182	0.8291	(0.818,0.840)	117	0.6003	(0.537,0.663)	3168	0.8295	(0.818,0.840)
60 to ≤ 65	112	0.6167	(0.544,0.688)	2627	0.8147	(0.800,0.828)	73	0.5558	(0.471,0.639)	2666	0.814	(0.800,0.827)
65 to ≤ 70	143	0.6687	(0.611,0.726)	2850	0.811	(0.797,0.824)	86	0.6128	(0.538,0.687)	2907	0.8091	(0.795,0.822)
70 to ≤ 75	157	0.6501	(0.594,0.705)	2344	0.7875	(0.774,0.800)	71	0.5527	(0.463,0.641)	2430	0.7851	(0.772,0.797)
75 to ≤ 80	167	0.6523	(0.598,0.706)	1728	0.7628	(0.748,0.777)	51	0.5092	(0.395,0.623)	1844	0.76	(0.746,0.773)
80 to ≤ 85	95	0.621	(0.557,0.684)	1104	0.7058	(0.683,0.727)	41	0.5189	(0.410,0.627)	1158	0.7051	(0.683,0.726)
>85	59	0.6122	(0.523,0.700)	596	0.653	(0.626,0.679)	22	0.5806	(0.416,0.744)	633	0.6519	(0.626,0.677)
	Complaints of bowel/colon (n=925)						Cancer (n=820)					
<30	79	0.876	(0.840,0.911)	8004	0.9389	(0.935,0.942)	27	0.7952	(0.669,0.921)	8056	0.9387	(0.935,0.941)
30 to ≤ 35	58	0.7895	(0.709,0.869)	3550	0.9163	(0.908,0.923)	21	0.8435	(0.713,0.973)	3587	0.9149	(0.907,0.922)
35 to ≤ 40	71	0.7871	(0.704,0.869)	3949	0.9091	(0.902,0.915)	32	0.8461	(0.744,0.948)	3988	0.9074	(0.901,0.913)
40 to ≤ 45	65	0.5958	(0.357,0.834)	3681	0.8878	(0.879,0.895)	33	0.7186	(0.617,0.819)	3713	0.8842	(0.874,0.893)
45 to ≤ 50	64	0.6706	(0.575,0.765)	3230	0.8678	(0.856,0.879)	43	0.5728	(0.171,0.974)	3251	0.868	(0.858,0.877)
50 to ≤ 55	85	0.7138	(0.627,0.800)	3071	0.8379	(0.828,0.847)	49	0.7283	(0.591,0.865)	3107	0.8361	(0.826,0.845)

55 to ≤ 60	106	0.6808	(0.593,0.768)	3179	0.8273	(0.816,0.838)	89	0.6724	(0.600,0.744)	3196	0.8262	(0.815,0.837)
60 to ≤ 65	85	0.5847	(0.493,0.675)	2654	0.8138	(0.799,0.827)	84	0.6737	(0.607,0.739)	2655	0.8113	(0.797,0.825)
65 to ≤ 70	100	0.7257	(0.658,0.793)	2893	0.8063	(0.792,0.819)	133	0.7297	(0.652,0.807)	2860	0.8078	(0.794,0.821)
70 to ≤ 75	89	0.6455	(0.575,0.716)	2412	0.7841	(0.771,0.796)	109	0.6819	(0.609,0.754)	2392	0.7831	(0.770,0.795)
75 to ≤ 80	65	0.6319	(0.529,0.734)	1830	0.7577	(0.743,0.771)	122	0.6599	(0.595,0.724)	1773	0.76	(0.745,0.774)
80 to ≤ 85	38	0.5881	(0.457,0.719)	1161	0.7019	(0.680,0.723)	47	0.6627	(0.567,0.758)	1152	0.6998	(0.678,0.721)
>85	20	0.4607	(0.294,0.626)	635	0.6546	(0.628,0.680)	31	0.5643	(0.439,0.689)	624	0.654	(0.628,0.679)

Figure 3: Mean EQ-5D scores and decrements on HRQoL for cohorts with "hypertension/high blood pressure/blood"

Figure 3a: Respondents with "hypertension/high blood pressure/blood" and any other health condition compared to respondents without "hypertension/high blood pressure/blood "

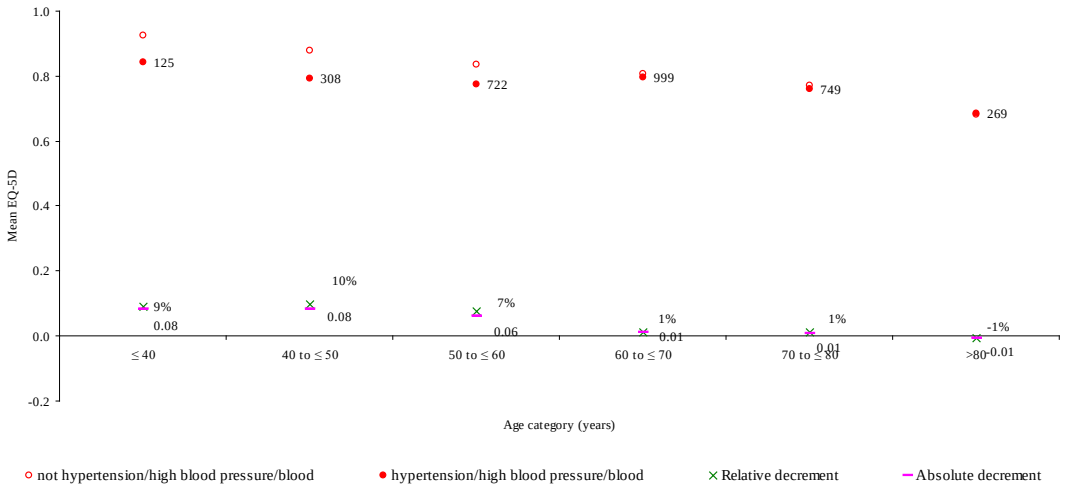
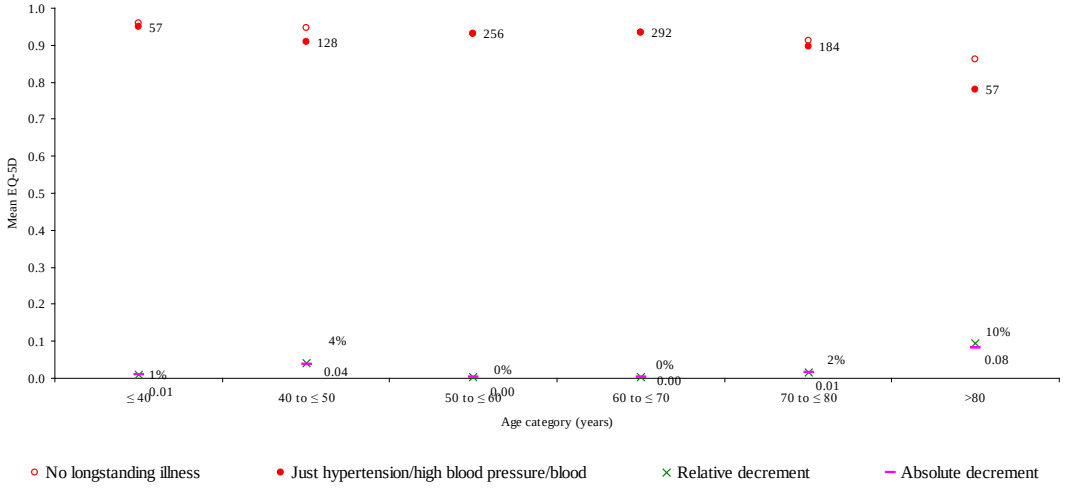


Figure 3b: Respondents with just "hypertension/high blood pressure/blood"and no other health condition compared to respondents with no condition



(the number of cases are shown next to data points for respondents who have the condition)

Figure 4: Mean EQ-5D scores and decrements on HRQoL for cohorts with "arthritis/rheumatism/fibrositis"

Figure 4a: Respondents with "arthritis/rheumatism/fibrositis" and any other health condition compared to respondents without "arthritis/rheumatism/fibrositis"

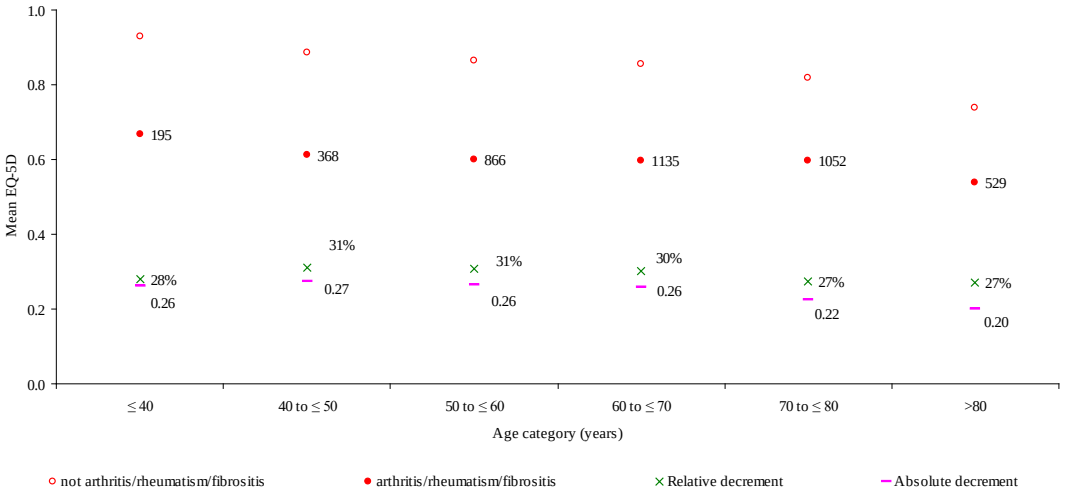
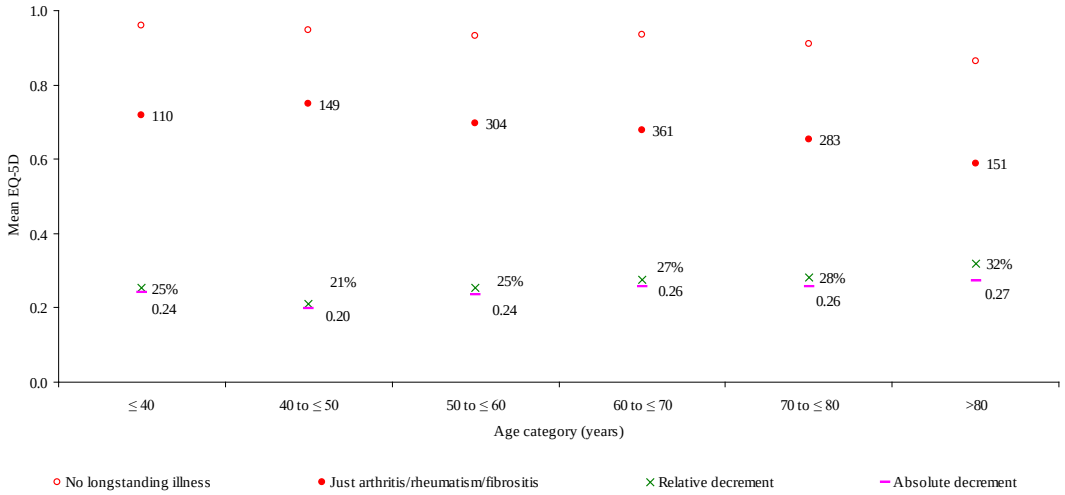


Figure 4b: Respondents with just "arthritis/rheumatism/fibrositis" and no other health condition compared to respondents with no condition



(the number of cases are shown next to data points for respondents who have the condition)