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# Catalogues of EQ-5D-3L Health-Related Quality of Life Scores for 199 Chronic Conditions and Health Risks for Use in the UK and the USA

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## Abstract

**Background** Health-related quality of life (HRQoL) measures are essential in economic evaluation, but sometimes primary sources are unavailable, and information from secondary sources is required. Existing HRQoL UK/US catalogues are based on earlier diagnosis classification systems, amongst other issues. A recently published Danish catalogue merged EQ-5D-3L data from national health surveys with national registers containing patient information on ICD-10 diagnoses, healthcare activities and socio-demographics.

**Aims** To provide (1) UK/US EQ-5D-3L-based HRQoL utility population catalogues for 199 chronic conditions on the basis of ICD-10 codes and health risks and (2) regression models controlling for age, sex, comorbidities and health risks to enable predictions in other populations.

**Methods** UK and US EQ-5D-3L value sets were applied to the EQ-5D-3L responses of the Danish dataset and modelled using adjusted limited dependent variable mixture models (ALDVMMs).

**Results** Unadjusted mean utilities, percentiles and adjusted disutilities based on two ALDVMMs with different control variables were provided for both countries. Diseases from groups M, G, and F consistently had the smallest utilities and the largest negative disutilities: fibromyalgia (M797), sclerosis (G35), rheumatism (M790), dorsalgia (M54), cerebral palsy (G80-G83), post-traumatic stress disorder (F431), dementia (F00-2), and depression (F32, etc.). Risk factors, including stress, loneliness, and BMI30+, were also associated with lower HRQoL.

**Conclusions** This study provides comprehensive catalogues of UK/US EQ-5D-3L HRQoL utilities. Results are relevant in cost-effectiveness analysis, for NICE submissions, and for comparing and identifying facets of disease burden.

## 1 Introduction

Economic evaluations are routinely used in appraisals of health technologies, such as those used by the National Institute for Health and Care Excellence (NICE) in England or the Institute for Clinical and Economic Review (ICER) in the USA [1, 2]. These economic evaluations often measure benefits through the quality-adjusted life-year (QALY). The QALY combines quality and length of life considerations in a single measure [3, 4], and is usually based on generic patient-reported outcome measures such as EQ-5D. The

EQ-5D is considered the most widely used generic health utility measure in the world [4], and it is the preferred health benefit measure of NICE for its technology appraisals [1]. It is applied in numerous research and clinical practice settings, such as cost-utility analysis (CUA), clinical trials, patient surveillance or monitoring, and population health measurement [5–8].

The EQ-5D instrument describes health using five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. There are currently two instrument versions: the original EQ-5D version, now named EQ-5D-3L [9], and the newer EQ5D-5L version [10]. Both include the same five health dimensions but differ in the number of levels of severity. In EQ-5D-3L, each dimension has three possible levels (no problems, some problems, extreme problems), and it can describe 243 unique health states [9, 11–13]. EQ-5D-5L incorporates two additional levels in each dimension to improve the sensitivity of the original three-level version. Separate studies have estimated country-specific utility value sets

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### Key Points for Decision-Makers

Two main types of catalogues are supplied for both the UK and the USA: 1. unadjusted sample mean utilities for 199 chronic conditions and health risks and 2. corresponding regression models for the USA and UK that can be used to make utility predictions in other populations.

Results indicate that health-related quality of life (HRQoL) varies across disease groups but is lowest for renal disease, mental and behavioural disorders, some cancers, blood diseases, digestive system diseases, and nervous system diseases.

Health risks and lifestyle factors, including loneliness, perceived stress, and high BMIs, are associated significantly with low HRQoL after controlling for chronic diseases.

for the health states described by both instruments on the basis of general population values [11–15]. Utility values are anchored at an upper value of one equivalent to perfect health and zero for states considered equivalent to being ‘dead’. Negative values representing health states considered worse than dead are also possible [16]. NICE currently recommends using the three-level (3L) version in the UK [17]. However, mapping algorithms (crosswalks) exist to convert EQ-5D-3L to EQ-5D-5L values [18–20] which will allow for the translation of the EQ-5D-3L values in this catalogue to EQ-5D-5L utilities once the new UK EQ-5D-5L value set is released and additional countries, such as the USA, are included.

The importance of ensuring comparability across economic evaluation studies of technologies and over time has been stressed by health economists and organisations such as the Panel on Cost-Effectiveness in Health and Medicine (PCEHM) and NICE [17, 21–24]. The PCEHM recommended ‘the collection of a national catalogue of preference weights that could be used by CEA researchers without the burden of primary data collection’ given the large variability in the literature of utility values associated with different medical conditions [24, 25]. In response, Sullivan et al. (2006, 2011) published two separate EQ-5D-3L catalogues for the USA and the UK [24, 26–28], both based on regression estimation using representative US samples of the Medical Expenditure Panel Survey (MEPS). They included 157 mostly self-reported chronic conditions classified

according to the International Classification of Diseases, Ninth Revision (ICD-9). The US catalogue was based on pooled 2000–2002 MEPS data and used the US utility value set [12]. The UK catalogue included an additional year of the MEPS dataset (2000–2003) and used the UK EQ-5D-3L value set [11]. The statistical models included gender, age, income, ethnicity, education, the number of comorbidities and the primarily self-reported chronic conditions but did not incorporate health risks. A number of less comprehensive catalogues are also available. For example, Finland (2006) [29] and Korean (2009) catalogues cover fewer than 30 conditions [30]. In 2019, a systematic review of 207 studies collated EQ-5D-3L estimates among fifteen ICD-10 disease groups [31]. However, the included studies used value sets for different countries (some failed to report the specific value set used) and even different versions of EQ-5D. These issues, coupled with heterogeneity in the quality of the studies, limit the practical usefulness of the estimates found in the review. Recently, a Danish study published a catalogue of Danish EQ-5D-3L preference scores for 199 chronic conditions based on newer, improved methodology, including the use of ICD-10-based conditions and regression models appropriate for EQ-5D [32, 33].

The current study is based on and broadly replicates the most recent Danish study, but applies the UK and US EQ-5D-3L value sets to convert the responses to the EQ-5D-3L instrument into utility scores to enable the use of these data in the UK and the USA. The objectives are: (1) to create population-level off-the-shelf catalogues of UK and US EQ-5D-3L preference-based scores for 199 ICD-10 defined chronic conditions to improve on existing UK and US catalogues and (2) to provide two separate statistical models to allow researchers to predict utilities in their own population of interest for any combination of chronic disease. This first catalogue supplies unadjusted, national sample population estimates of UK and US norm-based mean utilities for the 199 chronic conditions, socioeconomic covariates, and health risks. A second catalogue is also provided as a reference, and it presents UK and US regression-based utility estimates and marginal effects for the same 199 chronic diseases, socioeconomic covariates and health risks, adjusting for the sample composition allowing for direct comparisons across chronic diseases for the same representative individual. To construct this second catalogue, two alternative EQ-5D-3L model specifications are estimated, one with a core set of covariates and the second one including additional health risks and socioeconomic controls. To supplement the second catalogue, we also provide a Stata do file and a user guide in the online supplementary materials to enable health professionals to estimate EQ-5D-3L in their specific settings and populations. In combination with previous publications and details on the prevalence [34], multimorbidity associations [35], socioeconomic differences [36], and health

risks disparities [37] of the same 199 chronic conditions, these estimates can provide valuable information for future resource allocation in the UK and the USA.

In common with the recently published Danish catalogue [32], there are several important differences with earlier studies. First, most previous studies rely partly on self-reported health conditions, which raises questions about accuracy [38–41]. Second, we use the newer ICD-10 classification system and include 199 ICD-10-based chronic conditions. Third, behavioural risk factors such as smoking, body mass index (BMI), stress and social networks have been suggested as potentially necessary controls [42]. These are missing from existing catalogues but are found important in explaining EQ-5D-3L in the Danish catalogue. Fourth, acknowledging the biases caused by model misspecification and the now well-documented idiosyncrasies of the distribution of EQ-5D, we use the adjusted limited dependent variable mixture model (ALDVMM) to model EQ-5D [43–48]. Using traditional linear models, preceding catalogues have been mainly developed to provide population-based utility estimates of individual chronic conditions and cannot be directly transferred to the populations of interest in economic evaluations where decrements in utility from developing a new chronic condition in these less healthy populations would not be expected to mirror the decrements observed in a healthier population. This has led to research into possible ways of combining utilities for individual chronic diseases estimated on separate disease-specific samples (multiplicative, additive and minimum estimators are a few common choices) [49–52]. However, the ALDVMM, a nonlinear model reflecting the characteristics of EQ-5D utility data, allows utility decrements to be dependent on the combinations of comorbidities and other covariates in the model, enabling researchers to estimate realistic, real-world multi-morbid health states of their specific interest.

## 2 Methods

### 2.1 Data

Following Sullivan et al. [28], we use the responses from a large representative sample from a single country (Denmark) and derive the associated utility values using each country's value sets. This is in line with patient reporting from multinational clinical trials where the same value set is used across data from all countries and mapping studies of EQ-5D, which often apply utility value sets that differ from the country's data collection when, for example, country-specific population data are not accessible for researchers. The dataset combines three national health survey samples with seven national registers containing patient-level information on diagnoses, healthcare activity

and socio-demographics using a civil registration number that uniquely identifies Danish citizens [33].

A brief summary of the data is presented below. Full details of the methodology, samples, variables, weighting and data handling, and content of all registers can be found in these references [32, 33, 53–55]. Details on variable names can also be found in the online Supplementary Material 1 (Appendix 1). Responses to the five items of the EQ-5D-3L questionnaire were included in three of the Danish National Public Health Survey (NPHS) samples [53, 56–58], and 55,616 unique responses were obtained using the last two consecutive waves (2010 and 2013), which incorporated the EQ5D-3L questionnaire [53]. Details on dataset and respondent characteristics can be found in Table 1 of an earlier publication [32] and in the online Supplementary Material 1 (Appendix 2) in the current study. The survey data based on randomly assigned nationals comprised self-reported data on HRQoL, health behaviours (e.g. lifestyle factors), BMI, education, stress, loneliness, etc. Data from the surveys were combined with patient-level register data on diagnoses, healthcare activity, and socio-demographics from seven national registers based on the unique civil registration number [34, 54, 55, 57, 59, 60]. The registers contained information from somatic [61] and psychiatric hospital contacts [62], primary healthcare [63], prescribed medicines [64], gender, age, and ethnicity,<sup>1</sup> and residence place [65]. The aim was to derive each respondent's ICD-10-based doctor-reported diagnosis, medicine and other relevant variables from identifying chronic conditions. A medical review team identified and grouped the chronic conditions from ICD-10 codes, and definitions, algorithms and methodology identifying the chronic conditions were clinically validated separately [54, 55]. EQ-5D-3L responses were converted to utility values using Dolan's (1997), and Shaw et al. (2005) value sets for EQ-5D-3L for the UK and USA, respectively [11, 12].

### 2.2 Statistical analysis

We first compute sample means, medians and interquartile ranges for each country and the corresponding standard errors of EQ-5D-3L for the 199 chronic conditions and other socio-economic and health risk variables. These statistics are thus not adjusted for the potentially different sample composition of the chronic conditions groups but provide estimates of the population values instead.

<sup>1</sup> The ethnicity variable defined as Danish, western or non-western used Danish standard programming based on register variables agreed on in the joint collaboration regarding the national health profiles between the five Danish regions and the National Institute of Public health (Christensen et al. [53]).

a) Histogram of the UK EQ-5D-3L distribution, National Health Profiles 2010/2013.  $n=55,616$ .

b) Histogram of the US EQ-5D-3L distribution, National Health Profiles 2010/2013.  $n=55,616$ .

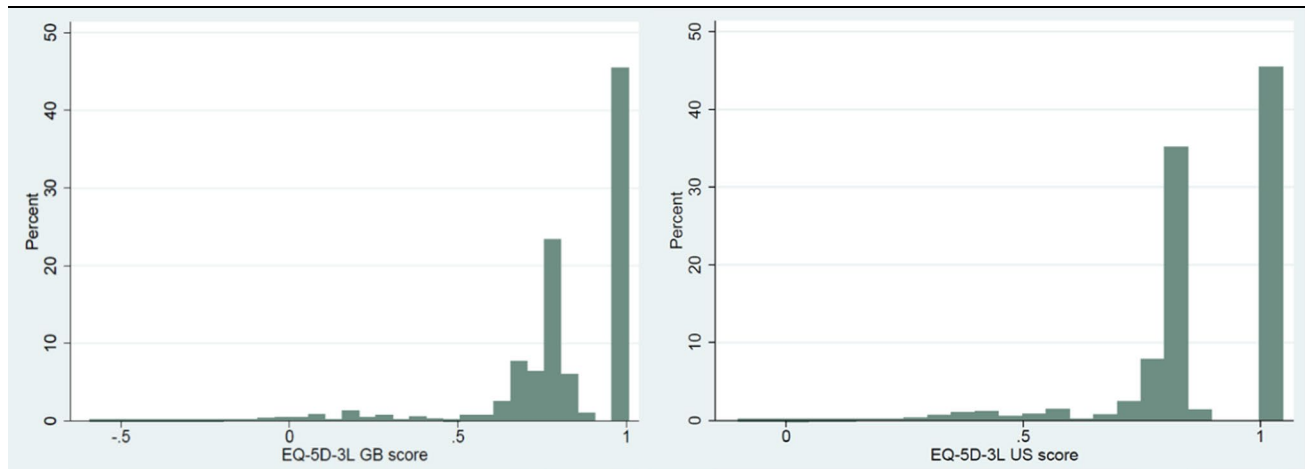


Fig. 1 Histograms of EQ-5D-3L using the UK and US value sets

Subsequently, we conduct regression analyses controlling for several variables, as detailed below. Utilities originating from measures such as the EQ-5D have specific characteristics that challenge statistical regression modelling. The values are bounded between the minimum value, which differs by country, and the value of one (or full health). The data distribution is often multimodal and highly skewed, with a large group of observations around one, followed by a gap to the first possible utility value below full health [44, 45]. The minimum values in the UK and US EQ-5D-3L utility scores are  $-0.594$  and  $-0.102$ , and the highest utility scores below one are  $0.883$  and  $0.86$ , respectively. Figure 1 shows histograms of the distributions of EQ-5D-3L using the UK and US value sets. There are a large number of individuals in full health. In both cases, the distributions present two rough additional modes and skewness.

The ALDVMM was developed to model the UK EQ-5D-3L value set utility scores. It has been shown to offer several advantages and perform better than standard models, which do not take into account the characteristics of utility data when modelling not only EQ-5D-3L, but other generic preference-based measures such as EQ-5D-5L, SF-6D and HUI3 as well [43–48, 66]. The ALDVMM is a very flexible semi-parametric model which uses mixtures of Tobit-like components and can accommodate all the idiosyncrasies of the EQ-5D-3L distribution, such as the upper and lower boundaries, the mass of observations at full health, the gap between full health and the next feasible value in the value set, and can approximate the skewness and multimodality often present in this type of data.

Estimating mixture models is challenging, but even more so for extensive models such as the current study. They require a comprehensive search procedure to identify the global maximum because the likelihood is not globally concave. At the same time, the number of components in the mixture is unknown and requires selection as well. This involves estimating models with an increasingly higher number of components and using graphical methods and standard fit statistics to select the optimal model [66]. We used the community-contributed Stata ALDVMM command available for free download and published in the Stata Journal [44, 45].

Two separate ALDVMM regression models were estimated as follows for each of the UK and US EQ-5D-3L models:

- **Base model:** EQ-5D-3L as a function of the 199 chronic conditions, sex, age, samples (to adjust for regional differences) and the number of comorbidities. This model is helpful for economic evaluations in which the extra controls included in the full model below are not available or required.
- **Full model:** includes additional controls to adjust for common health risks and socioeconomic variables. The added variables are: family equalised income (£ and \$), education (no education or training, students/training, short, middle bachelor equivalent, or higher education such as a master's degree or higher, ethnicity origin (Danish, western or non-western), partnership status (partner or not), home living children (yes/no), social

network (often feeling lonely or not), perceived stress (Cohen's Perceived Stress Scale, 20% most stressed or not), BMI groups (< 18.5; 18.5–25; > 25 < 30; ≥ 30 < 35; ≥ 35), daily smoking (yes/no), alcohol intake greater national recommendations (yes/no), nationally recommended exercise and fruit intake (yes/no), SF-12 self-reported general health [67] ('excellent'; 'very good'; 'good'; 'fair'; 'poor'; 'missing'), and self-reported long-term illness or disability ('none'; 'yes'). See the online Supplementary Material 1 (Appendix 1) for model variable notations and details on model specifications.

Quadratic terms for family-equalised income and age were included in all estimated models where the levels of those variables were included.<sup>2</sup> Non-response and population weights standardising by age, sex and education were used when calculating EQ-5D-3L sample statistics. The estimated ALDVMMs did not use weights but incorporated controls for variables comparable to those used in the weighting procedure.

After model estimation, marginal effects (ME) for the chronic conditions and other variables included in the model were also calculated. The structure of linear regression models implies that the expected decrease in EQ-5D-3L due to developing a chronic condition (the ME) is the same for every individual regardless of, for example, how many other chronic conditions the individual has. This ME is simply the coefficient of the chronic condition in the linear regression model. However, in nonlinear models, such as the ALDVMM, the ME is a function of that specific health condition and all the other covariates incorporated in the model, such as the presence of other chronic conditions, age, sex, etc. In this case, the decrease in EQ-5D due to a new chronic condition will be different for individuals with no previous chronic conditions and those with other chronic conditions already present. A user-written program was developed to handle the links between the 199 chronic conditions variables and the variable accounting for the number of comorbidities.

Preliminary data management of registers and surveys was conducted in SAS9.4 in a secure server at Statistics Denmark research server facilities following legal regulations. Data analysis was carried out in STATA15 using the same secure research servers. Online supplemental materials are provided, including documentation and Stata programs to facilitate the use of the estimated models by analysts to calculate predictions. The parameter estimates and the (co)

variance matrices of the models are also made available to allow the use of probabilistic sensitivity analysis within economic evaluations [68].

## 3 Results

### 3.1 Sample-based estimates of the EQ-5D-3L

Table 1 provides a one-page overview of the UK and US EQ-5D-3L sample mean scores for the overall sample and sex and age intervals for 20 chronic disease groups, overweight and commonly prescribed medicines. The overall sample means of EQ-5D-3L utility scores are 0.829 and 0.869 for the UK and USA, respectively. These differences reflect the differences in the EQ-5D-3L countries' value sets. Among the seven highest prevalent disease groups (E, G, H, I, J; M, F), chronic diseases within the respiratory system [J; scores 0.776 (UK); 0.831 (USA)], endocrine disorders [E; scores 0.742 (UK); 0.807 (USA)], diseases in the circulatory system [I; scores 0.741 (UK); 0.807 (USA)] and diseases of the eye and adnexa [H; scores 0.736 (UK); 0.803 (USA)] had the highest HRQoL sample mean scores. Furthermore, highly prevalent diseases of the musculoskeletal system [M; scores 0.705 (UK); 0.782 (USA)], diseases of the nervous system [G; scores 0.697 (UK); 0.775 (USA)] and mental conditions [F; scores 0.651 (UK); 0.742 (USA)] had the lowest EQ-5D-3L sample mean scores. Finally, less prevalent disease groups such as genitourinary conditions [N; scores 0.625 (UK); 0.725 (USA)], benign neoplasm and diseases of the blood [group D; scores 0.687 (UK); 0.768 (USA)], and diseases in the digestive system [group K; scores 0.692 (UK); 0.773 (USA)] showed even lower HRQoL scores. In all cases, utilities based on the US value set were higher than those based on the UK value set. Although the differences in utilities between the UK and the USA were not constant, the ranking according to utilities was preserved across these broad disease groups. The sample of men appeared to have higher mean scores than the sample of women in most cases, and utilities tended to decrease with age in both the UK and US samples.

Table 2 presents a more disaggregated level of information and includes the sample mean EQ-5D-3L utility estimates and percentiles, mean age and number of chronic conditions (NCC) of all 199 chronic conditions and socioeconomic and health risk variables for the UK and USA, respectively. The ten diseases with the lowest mean EQ-5D-3L scores are systemic sclerosis [M34; scores 0.362; 0.533 (USA)], fibromyalgia [M797; scores 0.369; 0.558 (USA)], unspecified rheumatism [M790; scores 0.390; 0.575 (USA)], dementia [F00, G30 etc.; scores 0.415 (UK); 0.572 (USA)], systemic atrophies [G10–G14, G30–G32; scores 0.475 (UK); 0.618 (USA)], post-traumatic stress

<sup>2</sup> A third model including similar covariates to Sullivan et al.'s work [26, 28] was also estimated. This model is not discussed here as the fit was similar to the base model, but can be provided by the authors on request.

**Table 1** Overview of EQ-5D-3L UK and US sample utility scores, mean age and mean number of chronic conditions (NCC) across overall disease groups, prescribed medicine, gender and age

Name	ICD-10 or medication code	Population frequencies and means <sup>a</sup>			Sample EQ-5D-3L UK mean scores						Sample EQ-5D-3L US mean scores					
		<i>n</i>	Age mean	NCC mean	All	Men	Women	Age 16–44	Age 45–74	Age 75+	All	Men	Women	Age 16–44	Age 45–74	Age 75+
B—viral hepatitis and human immunodeficiency virus (HIV) disease	B18, B20–B24	31	43.5	2.9	0.726	0.714	0.738	0.713	0.740	n/a	0.799	0.789	0.808	0.793	0.805	n/a
C—malignant neoplasms	C00–C99; D32–D33; D35.2–D35.4; D42–D44	2947	64.7	5.3	0.736	0.752	0.724	0.814	0.754	0.659	0.803	0.814	0.794	0.856	0.816	0.749
D—in situ, benign and neoplasms of uncertain or unknown behaviour and diseases of the blood and blood-forming organs, etc.	D00–D09; D55–D59; D60–D67; D80–D89	1254	59.2	6.0	0.687	0.662	0.701	0.812	0.697	0.530	0.768	0.814	0.794	0.856	0.775	0.658
E—endocrine, nutritional and metabolic diseases	E00–E14; E20–E29; E31–35; E70–E78; E84–E85; E88–E89	12,412	63.5	4.9	0.742	0.762	0.725	0.788	0.757	0.674	0.807	0.821	0.795	0.839	0.818	0.759
G—Diseases of the nervous system	G00–G14; G20–G32; G35–G37; G40–47; G50–64; G70–73; G80–G83; G90–G99	6698	55.1	4.8	0.697	0.708	0.690	0.752	0.694	0.586	0.775	0.783	0.771	0.813	0.774	0.697

Table 1 (continued)

Name	ICD-10 or medication code	Population frequencies and means <sup>a</sup>			Sample EQ-5D-3L UK mean scores						Sample EQ-5D-3L US mean scores					
		<i>n</i>	Age mean	NCC mean	All	Men	Women	Age 16–44	Age 45–74	Age 75+	All	Men	Women	Age 16–44	Age 45–74	Age 75+
H—diseases of the eye and adnexa and diseases of the ear and mastoid process	H02–H06; H17–H18; H25–H28; H31–H32; H34–H36; H40–55; H57; H80, H810; H93, H90–H93	6309	65.8	5.2	0.736	0.767	0.705	0.819	0.765	0.659	0.803	0.824	0.781	0.861	0.823	0.749
I—diseases of the circulatory system	I05–I06; I10–28; I30–33; I36–141; I44–I52; I60–I88; I90–I94; I96–I99	16,990	62.9	4.6	0.741	0.760	0.726	0.798	0.756	0.668	0.807	0.820	0.796	0.847	0.817	0.755
J—diseases of the respiratory system	J30.1; J40–J47; J60–J84; J95, J97–J99	14,087	51.5	4.0	0.776	0.803	0.757	0.845	0.753	0.641	0.831	0.851	0.818	0.880	0.815	0.736
K—Diseases of the digestive system	K25–K27; K40, K43, K50–52; K58–K59; K71–K77; K86–K87	4462	56.8	5.2	0.692	0.721	0.669	0.780	0.692	0.558	0.773	0.792	0.756	0.833	0.772	0.678
L—diseases of the skin and subcutaneous tissue	L40	722	56.0	4.3	0.749	0.769	0.730	0.832	0.733	0.647	0.813	0.827	0.799	0.869	0.804	0.738
M—diseases of the musculoskeletal system and connective tissue	M01–M25; M30–M36; M40–M54; M60.1–M99	13,163	57.0	4.4	0.705	0.732	0.683	0.754	0.704	0.630	0.782	0.801	0.767	0.817	0.782	0.729



**Table 1** (continued)

Name	ICD-10 or medication code	Population frequencies and means <sup>a</sup>			Sample EQ-5D-3L UK mean scores						Sample EQ-5D-3L US mean scores					
		n	Age mean	NCC mean	All	Men	Women	Age 16–44	Age 45–74	Age 75+	All	Men	Women	Age 16–44	Age 45–74	Age 75+
N—diseases of the genitourinary system	N18	224	66.3	8.1	0.625	0.656	0.579	0.616	0.653	0.592	0.725	0.746	0.695	0.727	0.744	0.700
Q—congenital malformations, deformations and chromosomal abnormalities	Q00–Q56; Q60–Q99	1323	44.1	3.7	0.782	0.807	0.764	0.833	0.730	0.651	0.836	0.854	0.823	0.872	0.799	0.742
F—mental and behavioural disorders	F00–99	6106	50.7	4.6	0.651	0.665	0.642	0.711	0.636	0.504	0.742	0.750	0.736	0.782	0.733	0.639
Diagnosed overweight, admitted	E66 (doctor diagnosed)	2761	46.2	3.6	0.726	0.683	0.737	0.780	0.671	0.601	0.797	0.769	0.805	0.835	0.760	0.707
Having no chronic conditions	–	18,136	37.7	0.0	0.908	0.914	0.900	0.913	0.900	0.828	0.926	0.931	0.920	0.930	0.920	0.868
Having one or more chronic conditions	–	37,480	53.2	3.2	0.783	0.803	0.767	0.827	0.777	0.687	0.836	0.850	0.824	0.867	0.832	0.768
Depression medicine <sup>b</sup>	ATC: N06A	5835	52.5	4.5	0.620 (0.0049)	0.620	0.620	0.663	0.618	0.507	0.720 (0.0033)	0.720	0.720	0.749	0.720	0.641
Antipsychotic medicine <sup>b</sup>	ATC: N05A	1127	53.2	5.5	0.559 (0.0123)	0.576	0.546	0.576	0.575	0.445	0.678 (0.0081)	0.688	0.671	0.690	0.689	0.598
Indication prescribed anxiety medicine <sup>b</sup>	All prescriptions with indication codes 163 or 371 (for anxiety)	1035	49.3	4.4	0.607 (0.0115)	0.614	0.604	0.634	0.613	0.458	0.711 (0.0075)	0.714	0.709	0.728	0.717	0.609

Table 1 (continued)

Name	ICD-10 or medication code	Population frequencies and means <sup>a</sup>		Sample EQ-5D-3L UK mean scores					Sample EQ-5D-3L US mean scores						
		n	Age mean	All	Men	Women	Age 16–44	Age 45–74	Age 75+	All	Men	Women	Age 16–44	Age 45–74	Age 75+
Heart failure medication <sup>b</sup>	ATC: C01AA05, C03, C07 or C09A w.indo code 430	58	69.6	8.0	0.607 (0.0296)	0.631	0.571	n/a	0.603	0.593	0.707 (0.0276)	n/a	0.699	0.699	0.699
Ischemic heart medication <sup>b</sup>	ATC: C01A, C01B, C01D, C01E	2035	72.0	6.8	0.637 (0.0080)	0.668	0.604	0.704	0.673	0.591	0.734 (0.0055)	0.778	0.759	0.701	0.701
<b>All population</b>		<b>55,616</b>	<b>47.6</b>	<b>2.1</b>	<b>0.829</b>	<b>0.849</b>	<b>0.809</b>	<b>0.873</b>	<b>0.807</b>	<b>0.694</b>	<b>0.869</b>	<b>0.901</b>	<b>0.854</b>	<b>0.773</b>	<b>0.773</b>

n/a not available, all means weighted, n is not weighted. All population estimates in bold

<sup>a</sup>Estimates adapted from Hvidberg et al. [69]

<sup>b</sup>Two-year inclusion times. Standard error (SE) in brackets included only for medicine variables as they are not provided in any other tables

disorder [F431; scores 0.482 (UK); 0.627 (USA)], cerebral palsy [G80–G83; scores 0.512 (UK); 0.646 (USA)], other inflammatory spondylopathies [M46; scores 0.522 (UK); 0.661 (USA)], dorsalgia [M54; scores 0.528 (UK); 0.662 (USA)], and spondylosis [M47; scores 0.538 (UK); 0.666 (USA)]. Furthermore, Table 2 presents that mean EQ-5D-3L scores are lower for groups with a higher number of comorbidities [0.908 versus 0.558 (UK); 0.926 versus 0.680 (USA) for 7+ conditions], lower in older age groups [from 0.891 to 0.694 (UK); 0.914 to 0.773 (USA)], lower for the lower educational groups excluding students [ranging from 0.75 to 0.898 (UK); 0.814 to 0.919 (USA)], average HRQoL is lower for women than men [0.809 versus 0.849 (UK); 0.854 versus 0.883 (USA)] and non-western immigrants [0.832 versus 0.758 (UK); 0.871 versus 0.819 (USA)]. Larger differences are found within health risk and lifestyle factors such as loneliness [0.630 versus 0.841 (UK); 0.728 versus 0.877 (USA)], high perceived stress [0.638 versus 0.881 (UK); 0.732 versus 0.906 (USA)], non-exercise [0.690 versus 0.858 (UK); 0.771 versus 0.889 (US)], BMI (normal weight 0.855 (UK); 0.887 (USA) versus BMI 35+ 0.707 (UK); 0.783 (USA)], daily smokers [0.774 versus 0.841 (UK); 0.830 versus 0.878 (USA)], but less so for those reporting excessive alcohol intake [0.813 versus 0.835 (UK); 0.857 versus 0.873 (USA)] and fruit intake below recommendations [0.829 versus 0.847 (UK); 0.869 versus 0.882 (USA)]. These averages do not consider potential differences in the composition of the groups; therefore, part of the differences between groups might be explained by the presence/absence of other comorbidities, health risks, etc. Below we present estimates that adjust for these potential differences.

### 3.2 Model-based adjusted estimates of the base and full model

Even though the underlying EQ-5D-3L response data are the same for both models and the distributions of the UK and USA, EQ-5D-3L (Fig. 1) show some similarities in terms of skewness and the number of modes, and the use of different value sets translates into some differences in the overall distribution, making it important to carry out the estimation procedure separately for the UK and the USA. Extensive searches were carried out for both countries' ALDVMMs. A three-component model was chosen for the UK on the basis of sample fit measures, information criteria (AIC and BIC) and graphical methods. A two-component model was selected using the same methodological procedure for the USA. Searches for a third component did not yield any model that improved fit over the two-component models. Table 3 presents measures of fit and information criteria for the selected models for the UK and USA, respectively. Including the additional covariates in the model substantially

improves the measures of fit. However, even the basic model, including all 199 chronic conditions and controlling for age and sex, shows a relatively good fit to the data (see Figs. 2 and 3 for plots of the cumulative distribution of EQ-5D-3L implied by the models versus the data). The online Supplementary Materials 2 and 3 provides the full set of parameter estimates of the selected models as Stata and Excel file downloads.

The parameters of nonlinear models cannot be interpreted directly in the same way as the parameters of linear models. In nonlinear models, the effect of the conditioning variable depends on the value of the other variables in the model. For example, in our case, the disutility of a chronic condition will generally be different for a person who has no other chronic conditions and a person who already has some other chronic conditions. To interpret and compare the models and conditions meaningfully, we calculate the MEs for two representative 50-year-old individuals, male and female, with no chronic conditions. We set the rest of the variables to the mean sample values for continuous variables and the mode for discrete variables. The MEs for age are calculated by varying the age of the same individuals while maintaining the rest of the characteristics. Tables 4 and 5 present the predictions and marginal effects for the base and the full UK models. Tables 6 and 7 present the same information for the US models.

Chronic conditions from groups M, G and F have some of the largest estimated disutilities in the base UK model. Some examples of large disutilities are (ICD-10 code and ME for male/female in brackets): fibromyalgia (M797; ME  $-0.1999/-0.1900$ ), sclerosis (G35;  $-0.1379/-0.1273$ ), rheumatism, unspecified (M790; ME  $-0.1336/-0.1236$ ), dorsalgia (M54; ME  $-0.1041/-0.0954$ ), cerebral palsy (G80–G83; ME  $-0.1034/-0.0945$ ), post-traumatic stress disorder (F431  $-0.0919/-0.0837$ ), HIV (B20–24; ME  $-0.0833/-0.0772$ ), other intervertebral disc disorders (M51; ME  $-0.0829/-0.0754$ ), diseases of myoneural junction and muscle (G70–G73; ME  $-0.081/-0.0742$ ), dementia (F00–2, G30–32; ME  $-0.0806/-0.0744$ ), spinal osteochondrosis (M42; ME  $-0.0804/-0.0733$ ) and depression (F32, F33, F34.1, F06.32; ME  $-0.0787/-0.0716$ ). When controlling for additional variables in the full model, the disutilities of the chronic conditions tend to decrease in size, probably due to the inclusion of the SF-12 question, which will be correlated to some extent with the presence of chronic conditions. One exception is fibromyalgia, where the disutility appears to be higher than in the base model ( $-0.1999/-0.1900$ ); however, the sample has very few individuals with this chronic condition, and it is atypical to have fibromyalgia

on its own; the median number of chronic conditions in these individuals is eight.

The disutilities of chronic conditions estimated using the US base model are generally smaller than in the UK model, reflecting the differences in the US/UK value sets. The largest disutilities correspond to chronic viral hepatitis (B18; ME  $-0.1024/-0.1040$ ), sclerosis (G35; ME  $-0.0842/-0.0816$ ), post-traumatic stress disorder (F431; ME  $-0.0739/-0.0717$ ), dorsalgia (M54; ME  $-0.0716/-0.0695$ ) and rheumatism (M790; ME  $-0.0671/-0.0650$ ). Chronic diseases of group M show relatively higher marginal disutilities in the US model.

Both base models include age as a covariate for adjustment, and the full UK and US models also include other socioeconomic, lifestyle and health risk variables. For all four models, an increase in age is associated with a decrease in utility. The decrease per year is relatively small after controlling for chronic conditions and other covariates, and the rate of decrease increases with age. For example, in the base UK model, males with no chronic conditions at age 20 are estimated to have an average utility of 0.9121 (0.9270 for females); at age 80, the average utility declines to 0.8719 (0.8920 for females), with a difference of 0.0402 (0.0350 for females). In the US base model, the corresponding average disutility for that group is 0.0246 (0.0231 for females). This decrease is much smaller at younger ages, with an increase of 1 year expected to decrease utility for males by 0.0003 at age 20 but by a much larger 0.0037 at age 80.

We found relatively large decreases in marginal utilities within the single SF-12 general health question, stress, self-reported long-standing illness, high BMI and loneliness. The largest single disutilities were found for the SF-12 question of poor general health (UK  $-0.2369/-0.2260$  for males/females; USA  $-0.1650/-0.1606$  for male/females) followed by perceived stress (UK  $-0.0595/-0.0535$  for males/females; USA  $-0.0708/-0.0692$  for males/females), self-reported long-standing illness or injury (UK around  $-0.073$  for both sexes; USA around  $-0.020$  both sexes), BMI > 35 (UK  $-0.0129/-0.0113$  for males/females; USA  $-0.0296/-0.0283$  for males/females) and a sense of feeling loneliness often (UK  $-0.0152/-0.0136$  for males/females; USA  $-0.0231/-0.0220$  for males/females). Finally, higher education showed a relatively high positive difference relative to the baseline of no education (UK 0.0252/0.0244 for males/females) but less for the US models (0.0165/0.0155 for males/females).

Finally, estimates of socioeconomic disparities provide potential health improvements and have become increasingly important to public health assessments, interventions, researchers, healthcare decision-makers, and the industry

**Table 2** Sample EQ-5D-3L mean scores, percentiles, *n*, mean number chronic conditions and percentiles for the 199+ chronic conditions, socioeconomic variables, and health risks for the UK and US

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
	<b>B—viral hepatitis and human immunodeficiency virus (HIV) disease</b>	<b>B18, B20–B24</b>	<b>31</b>	<b>43.5</b>	<b>2.9</b>	<b>0.2938</b>	<b>0.726</b>	<b>0.0668</b>	<b>0.656</b>	<b>0.727</b>	<b>1</b>	<b>0.799</b>	<b>0.0448</b>	<b>0.748</b>	<b>0.810</b>	<b>1</b>
1	Chronic viral hepatitis	B18	17	44.7	2.9	0.5118	0.755	0.0443	0.689	0.725	1	0.820	0.0324	0.767	0.800	1
2	Human immunodeficiency virus (HIV) disease	B20–24	14	42.4	2.8	0.3139	0.696	0.1274	0.620	0.883	1	0.778	0.0843	0.706	0.860	1
	<b>C—malignant neoplasms</b>	<b>C00–C99; D32–D33; D35.2–D35.4; D42–D44</b>	<b>2947</b>	<b>64.7</b>	<b>5.3</b>	<b>0.0699</b>	<b>0.736</b>	<b>0.0058</b>	<b>0.689</b>	<b>0.796</b>	<b>1</b>	<b>0.803</b>	<b>0.0040</b>	<b>0.767</b>	<b>0.827</b>	<b>1</b>
3	Malignant neoplasms of other and unspecified localisations	C00–C14; C30–C33; C37–C42; C45–C49; C69; C73–74; C754–C759	248	61.2	6.0	0.2729	0.727	0.0217	0.689	0.796	1	0.796	0.0148	0.767	0.827	1
4	Malignant neoplasms of digestive organs	C15–C17; C22–C26	64	68.4	5.5	0.4174	0.607	0.0497	0.383	0.689	0.796	0.711	0.0351	0.576	0.767	0.827
5	Malignant neoplasm of colon	C18	262	71.3	5.8	0.2398	0.720	0.0175	0.623	0.760	1	0.790	0.0123	0.706	0.816	1
6	Malignant neoplasms of rectosigmoid junction, rectum, anus and anal canal	C19–C21	174	70.6	5.8	0.2662	0.739	0.0247	0.689	0.796	1	0.806	0.0170	0.767	0.827	1

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
7	Malignant neoplasm of bronchus and lung	C34	159	67.9	7.1	0.3313	0.613	0.0313	0.516	0.691	0.796	0.719	0.0211	0.594	0.777	0.827
8	Malignant melanoma of skin	C43	220	58.4	4.5	0.2171	0.812	0.0165	0.727	0.796	1	0.855	0.0116	0.810	0.827	1
9	Other malignant neoplasms of skin	C44	122	71.5	6.4	0.3756	0.737	0.0280	0.691	0.796	1	0.805	0.0190	0.777	0.827	1
1	Malignant neoplasm of breast	C50	681	64.5	4.9	0.1391	0.715	0.0118	0.689	0.760	0.848	0.786	0.0080	0.767	0.816	0.844
11	Malignant neoplasms of female genital organs	C51–C52; C56–C58	113	63.1	5.2	0.3169	0.718	0.0311	0.689	0.760	1	0.795	0.0208	0.767	0.816	1
12	Malignant neoplasm of cervix uteri, corpus uteri and part unspecified	C53–C55	140	62.6	5.0	0.3140	0.742	0.0252	0.691	0.796	1	0.809	0.0171	0.777	0.827	1
13	Malignant tumour of the male genitalia	C60, C62–C63	54	46.3	3.0	0.3342	0.831	0.0311	0.725	1	1	0.873	0.0223	0.800	1	1
14	Malignant neoplasm of prostate	C61	440	72.4	5.6	0.1775	0.754	0.0142	0.691	0.796	1	0.815	0.0098	0.777	0.827	1
15	Malignant neoplasms of urinary tract	C64–C68	166	71.5	5.9	0.2721	0.705	0.0282	0.620	0.760	1	0.783	0.0194	0.706	0.816	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
16	Brain cancer <sup>a</sup>	C71, C75.1–C75.3, D33.0–D33.2, D35.2–D35.4, D43.0–D43.2, D44.3–D44.5 (brain), C70, D32, D42 (brain membrane), C72, D33.3–D33.9, D43.3–D43.9 (cranial nerve, spinal cord)	202	54.4	5.8	0.2964	0.758	0.0238	0.689	0.796	1	0.819	0.0166	0.767	0.827	1
17	Malignant neoplasms of ill-defined, secondary and unspecified sites, and of independent (primary) multiple sites	C76–C80, C97	326	64.0	5.9	0.1953	0.709	0.0166	0.639	0.760	0.814	0.782	0.0115	0.706	0.816	0.843
18	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	C81–C96	213	62.3	5.7	0.2828	0.719	0.0203	0.620	0.796	0.883	0.788	0.0137	0.706	0.827	0.860

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
	<b>D—in situ, benign and neoplasms of uncertain or unknown behaviour and diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism</b>	<b>D00–D09; D55–D59; D60–D67; D80–D89</b>	<b>1254</b>	<b>59.2</b>	<b>6.0</b>	<b>0.1270</b>	<b>0.687</b>	<b>0.0102</b>	<b>0.620</b>	<b>0.760</b>	<b>1</b>	<b>0.768</b>	<b>0.0070</b>	<b>0.706</b>	<b>0.816</b>	<b>1</b>
19	In situ neoplasms	D00–D09	289	55.3	4.3	0.2018	0.784	0.0154	0.691	0.796	1	0.835	0.0108	0.777	0.827	1
20	Haemolytic anaemias	D55–D59	20	52.6	6.4	1.0464	0.770	0.0564	0.760	0.796	0.883	0.822	0.0381	0.816	0.827	0.860
21	Aplastic and other anaemias	D60–D63	167	64.6	7.7	0.3523	0.581	0.0311	0.293	0.691	0.796	0.697	0.0213	0.527	0.777	0.827
22	Other anaemias	D64	463	67.3	7.5	0.2227	0.593	0.0187	0.364	0.691	0.796	0.702	0.0129	0.576	0.777	0.827
23	Coagulation defects, purpura and other haemorrhagic conditions	D65–D69	216	50.9	5.4	0.2931	0.737	0.0250	0.689	0.796	1	0.803	0.0172	0.767	0.827	1
24	Other diseases of blood and blood-forming organs	D70–D77	81	56.0	5.9	0.4067	0.708	0.0276	0.620	0.691	0.796	0.782	0.0199	0.706	0.777	0.827
25	Certain disorders involving the immune mechanism	D80–D89	102	50.2	5.4	0.3896	0.729	0.0339	0.689	0.796	1	0.800	0.0228	0.767	0.827	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			n	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
	<b>E—endocrine, nutritional and metabolic diseases</b>	<b>E00–E14; E20–E29; E31–35; E70–E78; E84–E85; E88–E89</b>	<b>12,412</b>	<b>63.5</b>	<b>4.9</b>	<b>0.0308</b>	<b>0.742</b>	<b>0.0029</b>	<b>0.691</b>	<b>0.796</b>	<b>1</b>	<b>0.807</b>	<b>0.0020</b>	<b>0.777</b>	<b>0.827</b>	<b>1</b>
26	Diseases of the thyroid <sup>a</sup>	E00–E04, E06, E07	1515	60.1	4.9	0.0936	0.739	0.0083	0.689	0.796	1	0.805	0.0057	0.767	0.827	1
27	Thyrotoxicosis <sup>a</sup>	E05	714	61.0	4.6	0.1182	0.725	0.0135	0.689	0.796	1	0.795	0.0093	0.767	0.827	1
28	Diabetes type 1 <sup>a</sup>	E10	284	45.1	4.4	0.2139	0.769	0.0190	0.689	0.796	1	0.826	0.0130	0.767	0.827	1
29	Diabetes type 2 <sup>a</sup>	E11	3253	65.6	5.8	0.0626	0.701	0.0061	0.620	0.760	0.883	0.779	0.0042	0.706	0.816	0.860
30	Diabetes others <sup>a</sup>	E12–E14	18	59.5	5.4	0.8595	0.664	0.0699	0.516	0.691	0.883	0.755	0.0458	0.594	0.777	0.860
31	Disorders of other endocrine glands	E20–E35, except E30	252	44.9	5.0	0.2608	0.690	0.0223	0.620	0.760	0.883	0.770	0.0151	0.706	0.816	0.860
32	Metabolic disorders	E70–E77; E79–E83; E85, E88–E89;	224	56.8	6.2	0.3054	0.681	0.0234	0.620	0.760	0.848	0.766	0.0158	0.706	0.816	0.844
33	Disturbances in lipoprotein circulation and other lipids <sup>a</sup>	E78	9685	65.8	5.2	0.0351	0.743	0.0032	0.691	0.796	1	0.808	0.0022	0.777	0.827	1
34	Cystic fibrosis <sup>a</sup>	E84	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	<b>G—diseases of the nervous system</b>	<b>G00–G14; G20–G32; G35–G37; G40–47; G50–64; G70–73; G80–G83; G90–G99</b>	<b>6698</b>	<b>55.1</b>	<b>4.8</b>	<b>0.0473</b>	<b>0.697</b>	<b>0.0045</b>	<b>0.620</b>	<b>0.760</b>	<b>0.883</b>	<b>0.775</b>	<b>0.0031</b>	<b>0.706</b>	<b>0.816</b>	<b>0.860</b>
35	Inflammatory diseases of the central nervous system	G00–G09	66	52.0	5.0	0.5228	0.690	0.0451	0.516	0.760	1	0.766	0.0313	0.594	0.816	1



**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
36	Systemic atrophies primarily affecting the central nervous system and other degenerative diseases	G10–G14, G30–G32	70	69.6	6.4	0.5117	0.475	0.0518	0.258	0.587	0.796	0.618	0.0352	0.498	0.687	0.827
37	Parkinson's disease <sup>a</sup>	G20, G21, G22, F02.3	611	62.8	6.6	0.1637	0.584	0.0162	0.362	0.691	0.796	0.697	0.0110	0.550	0.777	0.827
38	Extrapyramidal and movement disorders	G23–G26	107	60.1	7.0	0.4221	0.636	0.0328	0.585	0.725	0.796	0.733	0.0226	0.677	0.800	0.827
39	Sclerosis	G35	155	49.1	4.4	0.2975	0.584	0.0310	0.516	0.691	0.796	0.689	0.0225	0.594	0.777	0.827
40	Demyelinating diseases of the central nervous system	G36–G37	62	49.0	4.5	0.3909	0.628	0.0470	0.620	0.727	0.796	0.721	0.0330	0.706	0.810	0.827
41	Epilepsy <sup>a</sup>	G40–G41	585	51.9	5.8	0.1776	0.647	0.0160	0.587	0.725	0.85	0.742	0.0110	0.687	0.800	0.854
42	Migraine <sup>a</sup>	G43	2042	49.2	4.0	0.0743	0.736	0.0074	0.689	0.796	1	0.804	0.0050	0.767	0.827	1
43	Other headache syndromes	G44	143	44.8	5.1	0.3383	0.640	0.0339	0.587	0.725	0.848	0.740	0.0227	0.687	0.800	0.844
44	Transient cerebral ischaemic attacks and related syndromes and vascular syndromes of brain in cerebrovascular diseases	G45–G46	623	68.0	6.6	0.1690	0.689	0.0149	0.620	0.760	1	0.771	0.0101	0.706	0.816	1
45	Sleep disorders	G47	453	53.7	5.2	0.1967	0.727	0.0155	0.689	0.796	1	0.795	0.0106	0.767	0.827	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
46	Disorders of trigeminal nerve and facial nerve disorders	G50–G51	207	56.3	5.2	0.2405	0.706	0.0273	0.689	0.760	1	0.783	0.0185	0.767	0.816	1
47	Disorders of other cranial nerves, cranial nerve disorders in diseases classified elsewhere, nerve root and plexus disorders and nerve root and plexus compressions in diseases classified elsewhere	G52–G55	109	59.1	5.6	0.4117	0.616	0.0420	0.433	0.691	0.796	0.724	0.0285	0.593	0.777	0.827
48	Mononeuropathies of upper limb	G56	1460	57.4	5.0	0.1029	0.715	0.0088	0.689	0.796	0.883	0.789	0.0060	0.767	0.827	0.860
49	Mononeuropathies of lower limb, other mononeuropathies and mononeuropathy in diseases classified elsewhere	G57–G59	193	56.9	4.9	0.2683	0.685	0.0257	0.620	0.727	0.85	0.768	0.0178	0.706	0.810	0.854

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
50	Polyneuropathies and other disorders of the peripheral nervous system	G60–G64	296	61.5	6.4	0.2665	0.596	0.0235	0.516	0.691	0.796	0.706	0.0161	0.594	0.777	0.827
51	Diseases of myoneural junction and muscle	G70–G73	56	50.9	4.8	0.3841	0.600	0.0490	0.383	0.692	0.796	0.711	0.0329	0.574	0.781	0.827
52	Cerebral palsy and other paralytic syndromes	G80–G83	113	47.9	5.0	0.2800	0.512	0.0404	0.159	0.691	0.796	0.646	0.0282	0.446	0.775	0.827
53	Other disorders of the nervous system	G90–G99	257	53.8	5.7	0.2311	0.652	0.0230	0.585	0.727	0.814	0.745	0.0158	0.677	0.810	0.843
	<b>H—diseases of the eye and adnexa and diseases of the ear and mastoid process</b>	<b>H02–H06; H17–H18; H25–H28; H31–H32; H34–H36; H40–55; H57; H80,H810; H93, H90-H93</b>	<b>6309</b>	<b>65.8</b>	<b>5.2</b>	<b>0.0468</b>	<b>0.736</b>	<b>0.0043</b>	<b>0.689</b>	<b>0.796</b>	<b>1</b>	<b>0.803</b>	<b>0.0030</b>	<b>0.767</b>	<b>0.827</b>	<b>1</b>
54	Disorders of eyelid, lacrimal system and orbit	H02–H06	257	62.3	5.5	0.2078	0.745	0.0191	0.689	0.796	1	0.808	0.0133	0.767	0.827	1
55	Corneal scars and opacities	H17	34	60.6	5.8	0.7866	0.751	0.0608	0.691	0.760	1	0.819	0.0414	0.777	0.816	1
56	Other disorders of cornea	H18	132	60.1	5.1	0.3893	0.760	0.0311	0.689	0.796	1	0.820	0.0218	0.767	0.827	1
57	Diseases of the eye lens (cataracts)	H25–H28	928	73.5	6.1	0.1210	0.713	0.0110	0.620	0.760	1	0.786	0.0076	0.706	0.816	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
58	Disorders of the choroid and retina	H31–H32	36	59.1	6.5	1.1796	0.666	0.1063	0.689	0.796	1	0.751	0.0752	0.767	0.827	1
59	Retinal vascular occlusions	H34	115	73.2	6.4	0.3273	0.719	0.0350	0.691	0.796	1	0.788	0.0248	0.775	0.827	1
60	Other retinal disorders	H35	749	72.0	6.2	0.1601	0.691	0.0144	0.620	0.760	1	0.773	0.0100	0.706	0.814	1
61	Retinal disorders in diseases classified elsewhere	H36	175	58.5	7.1	0.3437	0.695	0.0317	0.689	0.760	0.848	0.772	0.0221	0.767	0.816	0.844
62	Glaucoma <sup>c</sup>	H40–H42	858	70.8	5.4	0.1259	0.732	0.0106	0.689	0.796	1	0.801	0.0074	0.767	0.827	1
63	Disorders of the vitreous body and globe	H43–H45	136	56.7	5.4	0.4032	0.676	0.0357	0.620	0.727	0.812	0.760	0.0251	0.706	0.810	0.833
64	Disorders of optic nerve and visual pathways	H46–H48	74	53.1	5.7	0.3592	0.657	0.0499	0.556	0.727	0.883	0.746	0.0340	0.626	0.810	0.860
65	Disorders of ocular muscles, binocular movement, accommodation and refraction	H49–H52	294	43.9	3.4	0.1717	0.837	0.0139	0.760	0.848	1	0.873	0.0099	0.816	0.844	1
66	Visual disturbances	H53	360	55.8	5.9	0.2253	0.716	0.0188	0.656	0.796	1	0.789	0.0129	0.761	0.827	1
67	Blindness and partial sight	H54	58	60.9	5.8	0.4786	0.676	0.0533	0.364	0.796	1	0.764	0.0369	0.576	0.827	1
68	Nystagmus and other irregular eye movements and other disorders of eye and adnexa	H55, H57	80	54.9	4.8	0.3937	0.755	0.0354	0.689	0.796	1	0.819	0.0251	0.767	0.827	1
69	Otosclerosis	H80	161	61.5	4.9	0.2926	0.803	0.0211	0.725	0.814	1	0.848	0.0148	0.800	0.843	1

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			n	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
70	Ménière's disease <sup>a</sup>	H810	143	66.4	6.2	0.3259	0.718	0.0257	0.689	0.796	0.85	0.787	0.0178	0.767	0.827	0.854
71	Other diseases of the inner ear	H83	882	68.3	6.0	0.1175	0.747	0.0110	0.691	0.796	1	0.811	0.0075	0.777	0.827	1
72	Conductive and sensorineural hearing loss	H90	566	64.5	6.0	0.1722	0.742	0.0142	0.691	0.796	1	0.807	0.0097	0.777	0.827	1
73	Other hearing loss and other disorders of ear, not elsewhere classified	H910, H912, H913, H918, H930, H932, H933	114	61.5	6.1	0.3573	0.714	0.0301	0.689	0.796	1	0.788	0.0206	0.767	0.827	1
74	Presbycusis (age-related hearing loss)	H911	1477	79.3	6.4	0.0956	0.697	0.0089	0.620	0.760	0.883	0.775	0.0061	0.706	0.816	0.860
75	Hearing loss, unspecified	H919	1149	66.7	6.0	0.1060	0.731	0.0105	0.689	0.796	1	0.800	0.0071	0.767	0.827	1
76	Tinnitus	H931	769	63.6	5.8	0.1303	0.734	0.0121	0.691	0.796	1	0.801	0.0082	0.777	0.827	1
77	Other specified disorders of ear	H938	350	66.6	5.9	0.2202	0.734	0.0178	0.689	0.796	1	0.801	0.0123	0.767	0.827	1
	<b>I—diseases of the circulatory system</b>	<b>I05–I06; I10–28; I30–33; I36–141; I44–152; I60–188; I90–194; I96–199</b>	<b>16,990</b>	<b>62.9</b>	<b>4.6</b>	<b>0.0260</b>	<b>0.741</b>	<b>0.0025</b>	<b>0.691</b>	<b>0.796</b>	<b>1</b>	<b>0.807</b>	<b>0.0017</b>	<b>0.775</b>	<b>0.827</b>	<b>1</b>
78	Aortic and mitral valve disease <sup>a</sup>	I05, I06, I34, I35	426	72.3	7.5	0.1964	0.684	0.0149	0.620	0.727	0.848	0.764	0.0102	0.706	0.810	0.844
79	Hypertensive diseases <sup>a</sup>	I10–I15	14,504	64.8	4.8	0.0285	0.732	0.0027	0.689	0.796	1	0.801	0.0019	0.767	0.827	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
80	Heart failure <sup>a</sup>	I11.0, I13.0, I13.2, I42.0, I42.6, I42.7, I42.9, I50.0, I50.1, I50.9	369	72.4	8.4	0.2128	0.603	0.0193	0.433	0.691	0.814	0.709	0.0133	0.593	0.777	0.843
80A	Ischaemic heart diseases	I20–I25	2017	67.9	7.5	0.0906	0.660	0.0083	0.620	0.725	0.814	0.750	0.0057	0.706	0.800	0.843
81	Angina pectoris	I20	1253	66.3	7.3	0.1144	0.667	0.0100	0.620	0.727	0.796	0.755	0.0068	0.706	0.800	0.827
82	Acute myocardial infarction and subsequent myocardial infarction	I21–I22	494	68.0	7.9	0.1866	0.682	0.0165	0.620	0.760	1	0.766	0.0113	0.706	0.816	1
83	AMI complex/other	I23–I24	28	67.8	8.6	0.6266	0.603	0.0717	0.364	0.691	0.796	0.714	0.0465	0.576	0.777	0.827
84	Chronic ischaemic heart disease	I25	1234	69.7	8.3	0.1145	0.648	0.0106	0.587	0.691	0.796	0.742	0.0072	0.687	0.777	0.827
85	Pulmonary heart disease and diseases of pulmonary circulation	I26–I28	154	67.9	7.3	0.3405	0.604	0.0305	0.516	0.691	0.796	0.709	0.0206	0.594	0.777	0.827
86	Acute pericarditis	I30	53	53.8	4.9	0.4336	0.836	0.0338	0.725	0.814	1	0.876	0.0237	0.800	0.843	1
87	Other forms of heart disease	I31–I43, except I34–I35 and I42	85	58.8	7.2	0.4830	0.714	0.0294	0.623	0.760	0.883	0.786	0.0196	0.742	0.816	0.860
88	Atrioventricular and left bundle-branch block	I44	178	71.0	7.0	0.3626	0.721	0.0310	0.639	0.796	1	0.791	0.0212	0.706	0.827	1
89	Other conduction disorders	I45–46	129	62.7	6.4	0.3714	0.756	0.0223	0.689	0.796	1	0.814	0.0159	0.767	0.827	1
90	Paroxysmal tachycardia	I47	593	63.4	6.4	0.1655	0.720	0.0128	0.689	0.760	1	0.793	0.0087	0.767	0.816	1

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
91	Atrial fibrillation and flutter	I48	1480	71.9	6.9	0.1032	0.689	0.0091	0.620	0.727	0.727	0.770	0.0063	0.706	0.810	0.860
92	Other cardiac arrhythmias	I49	423	67.3	6.9	0.2076	0.709	0.0173	0.689	0.760	0.848	0.783	0.0117	0.767	0.816	0.844
93	Complications and ill-defined descriptions of heart disease and other heart disorders in diseases classified elsewhere	I51–52	50	71.1	8.9	0.5591	0.586	0.0449	0.516	0.689	0.76	0.697	0.0304	0.594	0.767	0.816
94	Stroke	I60, I61, I63–I64, Z501 (rehabilitation)	812	68.6	7.0	0.1344	0.641	0.0124	0.516	0.710	0.848	0.733	0.0086	0.594	0.777	0.844
95	Cerebrovascular diseases	I62, I65–I68	180	63.8	7.4	0.2833	0.604	0.0283	0.433	0.710	0.796	0.708	0.0188	0.593	0.777	0.827
96	Sequelae of cerebrovascular disease	I69	513	70.0	8.3	0.1842	0.555	0.0168	0.260	0.689	0.796	0.675	0.0116	0.508	0.767	0.827
97	Atherosclerosis	I70	397	71.2	8.6	0.2239	0.563	0.0203	0.260	0.691	0.796	0.682	0.0140	0.508	0.777	0.827
98	Aortic aneurysm and aortic dissection	I71	121	70.7	7.5	0.3367	0.699	0.0236	0.620	0.710	0.796	0.777	0.0161	0.706	0.777	0.827
99	Diseases of arteries, arterioles and capillaries	I72, I74, I77–I79	142	61.2	6.6	0.3864	0.731	0.0254	0.691	0.796	1	0.801	0.0175	0.777	0.827	1
100	Other peripheral vascular diseases	I73	391	68.3	7.7	0.2142	0.615	0.0188	0.585	0.691	0.796	0.721	0.0126	0.677	0.777	0.827
101	Phlebitis, thrombosis of the portal vein and others	I80–I82	439	60.9	5.8	0.1940	0.706	0.0164	0.656	0.760	0.883	0.782	0.0111	0.748	0.816	0.860

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
102	Varicose veins of lower extremities	I83	494	55.2	3.7	0.1448	0.811	0.0136	0.727	0.796	1	0.855	0.0096	0.810	0.827	1
103	Haemorrhoids <sup>a</sup>	I84	1048	50.7	4.0	0.1059	0.760	0.0099	0.691	0.796	1	0.819	0.0069	0.777	0.827	1
104	Oesophageal varices (chronic), varicose veins of other sites, other disorders of veins, nonspecific lymphadenitis, other noninfective disorders of lymphatic vessels and lymph nodes and other and unspecified disorders of the circulatory system	I85–I99, except I89 and I95	145	50.0	4.8	0.3354	0.746	0.0236	0.656	0.796	1	0.808	0.0165	0.748	0.827	1
	<b>J—diseases of the respiratory system</b>	<b>J30.1; J40–J47; J60–J84; J95, J97–J99</b>	<b>14,087</b>	<b>51.5</b>	<b>4.0</b>	<b>0.0288</b>	<b>0.776</b>	<b>0.0026</b>	<b>0.691</b>	<b>0.796</b>	<b>1</b>	<b>0.831</b>	<b>0.0018</b>	<b>0.777</b>	<b>0.827</b>	<b>1</b>
105	Respiratory allergy <sup>a</sup>	J30, except J30.0	9792	50.2	3.8	0.0337	0.788	0.0030	0.725	0.796	1	0.840	0.0021	0.800	0.827	1
105A	Chronic lower respiratory diseases <sup>a</sup>	J40–J43, J47	5046	55.0	5.2	0.0522	0.740	0.0046	0.689	0.796	1	0.807	0.0032	0.767	0.827	1



**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			n	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
106	Bronchitis, not specified as acute or chronic, simple and mucopurulent chronic bronchitis and unspecified chronic bronchitis	J40-J42	182	67.3	8.9	0.3503	0.569	0.0343	0.364	0.691	0.796	0.686	0.0236	0.576	0.777	0.827
107	Emphysema	J43	76	62.9	7.6	0.4699	0.622	0.0405	0.312	0.691	0.812	0.728	0.0267	0.525	0.777	0.833
108	Chronic obstructive lung disease (COPD) <sup>a</sup>	J44, J96, J13–J18	2435	61.3	6.4	0.0851	0.680	0.0076	0.620	0.760	0.848	0.763	0.0052	0.706	0.816	0.844
109	Asthma, status asthmaticus <sup>a</sup>	J45–J46	4107	52.3	5.3	0.0583	0.736	0.0053	0.689	0.796	1	0.803	0.0037	0.767	0.827	1
110	Bronchiectasis	J47	52	58.6	6.8	0.6295	0.694	0.0602	0.362	0.796	1	0.780	0.0405	0.566	0.827	1
111	Other diseases of the respiratory system	J60–J84; J95, J97–J99	217	62.2	7.1	0.2852	0.617	0.0271	0.364	0.725	0.812	0.720	0.0185	0.576	0.794	0.833
	<b>K—diseases of the digestive system</b>	<b>K25–K27; K40, K43, K50–52; K58–K59; K71–K77; K86–K87</b>	<b>4462</b>	<b>56.8</b>	<b>5.2</b>	<b>0.0602</b>	<b>0.692</b>	<b>0.0053</b>	<b>0.620</b>	<b>0.760</b>	<b>0.883</b>	<b>0.773</b>	<b>0.0036</b>	<b>0.706</b>	<b>0.816</b>	<b>0.860</b>
112	Ulcers <sup>a</sup>	K25–K27	2245	59.6	5.8	0.0893	0.644	0.0078	0.587	0.725	0.796	0.739	0.0053	0.687	0.800	0.827
113	Inguinal hernia	K40	480	58.1	4.0	0.1605	0.812	0.0124	0.725	0.796	1	0.857	0.0086	0.800	0.827	1
114	Ventral hernia	K43	134	60.4	5.7	0.3646	0.690	0.0280	0.587	0.760	0.848	0.774	0.0191	0.687	0.816	0.844
115	Crohn's disease	K50	212	47.2	4.6	0.2653	0.715	0.0252	0.620	0.796	1	0.787	0.0177	0.706	0.827	1
116	Ulcerative colitis	K51	371	50.9	4.7	0.2182	0.731	0.0194	0.689	0.796	1	0.800	0.0133	0.767	0.827	1
117	Other noninfective gastroenteritis and colitis	K52	209	61.8	6.9	0.3066	0.627	0.0270	0.552	0.691	0.796	0.726	0.0180	0.671	0.777	0.827

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
118	Irritable bowel syndrome (IBS)	K58	566	49.3	5.1	0.1826	0.722	0.0136	0.689	0.796	1	0.793	0.0093	0.767	0.827	1
119	Other functional intestinal disorders	K59	542	58.8	6.3	0.1840	0.635	0.0175	0.587	0.725	0.796	0.731	0.0120	0.687	0.800	0.827
120	Diseases of liver, biliary tract and pancreas	K71–K77; K86–K87	274	57.3	6.0	0.2602	0.671	0.0193	0.620	0.725	0.796	0.758	0.0131	0.706	0.800	0.827
	<b>L—diseases of the skin and subcutaneous tissue</b>	<b>L40</b>	<b>722</b>	<b>56.0</b>	<b>4.3</b>	<b>0.1248</b>	<b>0.749</b>	<b>0.0119</b>	<b>0.691</b>	<b>0.796</b>	<b>1</b>	<b>0.813</b>	<b>0.0082</b>	<b>0.777</b>	<b>0.827</b>	<b>1</b>
121	Psoriasis <sup>a</sup>	L40	722	56.0	4.3	0.1248	0.749	0.0119	0.691	0.796	1	0.813	0.0082	0.777	0.827	1
	<b>M—diseases of the musculoskeletal system and connective tissue</b>	<b>M01–M25; M30–M36; M40–M54; M60.1–M99</b>	<b>13,163</b>	<b>57.0</b>	<b>4.4</b>	<b>0.0311</b>	<b>0.705</b>	<b>0.0029</b>	<b>0.689</b>	<b>0.760</b>	<b>0.85</b>	<b>0.782</b>	<b>0.0020</b>	<b>0.767</b>	<b>0.816</b>	<b>0.854</b>
122	Infectious arthropathies	M01–M03	101	47.6	4.7	0.4562	0.737	0.0350	0.689	0.796	0	0.804	0.0244	0.767	0.827	1
122A	Inflammatory polyarthropathies and ankylosing spondylitis <sup>a</sup>	M05–M14, M45	2008	60.3	5.7	0.0909	0.666	0.0075	0.620	0.727	0.796	0.755	0.0051	0.706	0.810	0.827
123	Rheumatoid arthritis <sup>a</sup>	M05, M06, M07.1, M07.2, M07.3, M08, M09	919	56.8	5.7	0.1351	0.646	0.0115	0.587	0.725	0.796	0.741	0.0079	0.687	0.800	0.827
124	Inflammatory polyarthropathies—except rheumatoid arthritis <sup>a</sup>	M074–M079, M10–M14, M45	1478	61.3	5.9	0.1062	0.662	0.0090	0.620	0.727	0.796	0.752	0.0061	0.706	0.810	0.827
125	Polyarthrosis (arthrosis)	M15	169	67.5	7.4	0.3209	0.543	0.0301	0.228	0.691	0.796	0.672	0.0200	0.463	0.777	0.827

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			n	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
126	Coxarthrosis (arthrosis of hip)	M16	1458	70.7	5.8	0.0968	0.663	0.0083	0.620	0.692	0.796	0.752	0.0056	0.706	0.777	0.827
127	Gonarthrosis (arthrosis of knee)	M17	2590	63.3	5.2	0.0730	0.688	0.0065	0.620	0.727	0.796	0.771	0.0044	0.706	0.810	0.827
128	Arthrosis of first carpometacarpal joint and other arthrosis	M18–M19	1036	61.2	5.7	0.1309	0.673	0.0101	0.620	0.727	0.727	0.760	0.0069	0.706	0.810	0.827
129	Acquired deformities of fingers and toes	M20	616	56.1	5.0	0.1511	0.735	0.0126	0.689	0.796	1	0.803	0.0086	0.767	0.827	1
130	Other acquired deformities of limbs	M21	275	52.5	5.5	0.2333	0.702	0.0227	0.689	0.760	0.883	0.782	0.0151	0.767	0.816	0.860
131	Disorders of patella (knee-cap)	M22	496	36.0	3.3	0.1242	0.749	0.0154	0.691	0.796	1	0.813	0.0104	0.777	0.827	1
132	Internal derangement of knee	M230, M231, M233, M235, M236, M238	128	44.5	4.0	0.2667	0.715	0.0244	0.691	0.796	0.796	0.790	0.0163	0.777	0.827	0.827
133	Derangement of meniscus due to old tear or injury	M232	497	48.3	3.8	0.1510	0.775	0.0131	0.691	0.796	1	0.832	0.0090	0.777	0.827	1
134	Internal derangement of knee, unspecified	M239	382	44.3	3.3	0.1495	0.790	0.0126	0.725	0.796	1	0.842	0.0087	0.800	0.827	1
135	Other specific joint derangements	M24, except M240–M241	58	40.3	3.7	0.4177	0.720	0.0411	0.620	0.760	1	0.795	0.0285	0.706	0.816	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
136	Other joint disorders, not elsewhere classified	M25	193	48.6	4.6	0.2656	0.673	0.0253	0.620	0.760	0.796	0.759	0.0169	0.706	0.816	0.827
137	Systemic connective tissue disorders	M30–M36, except M32, M34	463	61.5	6.4	0.1995	0.633	0.0181	0.516	0.727	0.796	0.734	0.0122	0.594	0.810	0.827
138	Systemic lupus erythematosus	M32	45	51.5	7.2	0.5933	0.603	0.0595	0.516	0.691	0.796	0.710	0.0411	0.594	0.777	0.827
139	Dermatopolymyositis	M33	15	60.0	7.1	0.9106	0.667	0.0917	0.620	0.760	0.85	0.753	0.0617	0.706	0.816	0.854
140	Systemic sclerosis	M34	13	62.4	8.9	2.9138	0.362	0.2482	-0.319	0.620	0.796	0.533	0.1746	0.053	0.706	0.827
141	Kyphosis, lordosis	M40	54	53.2	5.3	0.6530	0.632	0.0504	0.620	0.691	0.796	0.736	0.0341	0.706	0.777	0.827
142	Scoliosis	M41	164	40.8	4.3	0.3292	0.671	0.0307	0.620	0.760	1	0.759	0.0214	0.706	0.816	1
143	Spinal osteochondrosis	M42	69	47.7	4.7	0.4656	0.593	0.0550	0.364	0.691	0.796	0.711	0.0368	0.576	0.777	0.827
144	Other deforming dorsopathies	M43	275	56.8	5.8	0.2341	0.577	0.0228	0.260	0.691	0.796	0.697	0.0151	0.463	0.777	0.827
145	Other inflammatory spondylopathies	M46	62	53.5	6.7	0.5913	0.522	0.0540	0.159	0.620	0.796	0.661	0.0352	0.446	0.706	0.827
146	Spondylosis	M47	924	63.3	6.5	0.1451	0.538	0.0123	0.189	0.689	0.76	0.669	0.0082	0.446	0.767	0.816
147	Other spondylopathies and spondylopathies in diseases classified elsewhere	M48, M49	483	67.7	7.5	0.2112	0.539	0.0167	0.208	0.689	0.76	0.668	0.0111	0.457	0.767	0.816
148	Cervical disc disorders	M50	131	50.8	4.7	0.2913	0.613	0.0291	0.362	0.691	0.796	0.723	0.0193	0.566	0.777	0.827
149	Other intervertebral disc disorders	M51	501	51.3	5.0	0.1734	0.557	0.0165	0.228	0.691	0.796	0.683	0.0109	0.463	0.777	0.827

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			n	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
150	Other dorsopathies, not elsewhere classified	M53	92	49.4	4.9	0.3938	0.575	0.0394	0.264	0.691	0.76	0.693	0.0268	0.467	0.777	0.816
151	Dorsalgia	M54	621	50.6	5.3	0.1649	0.528	0.0159	0.197	0.689	0.76	0.662	0.0105	0.446	0.767	0.816
152	Soft tissue disorders	M60–M63, except M60.0	133	48.2	5.2	0.3852	0.663	0.0333	0.656	0.760	0.796	0.753	0.0224	0.748	0.816	0.827
153	Synovitis and tenosynovitis	M65	270	50.8	4.4	0.2146	0.738	0.0200	0.691	0.760	1	0.803	0.0141	0.777	0.816	1
154	Disorders of synovium and tendon	M66–68	238	43.6	3.8	0.2025	0.742	0.0215	0.691	0.796	1	0.811	0.0145	0.777	0.827	1
155	Soft tissue disorders related to use, overuse and pressure	M70	175	53.2	5.2	0.3170	0.665	0.0272	0.620	0.727	0.796	0.758	0.0184	0.706	0.810	0.827
156	Fibroblastic disorders	M72	521	62.1	4.6	0.1432	0.761	0.0140	0.691	0.796	1	0.822	0.0097	0.777	0.827	1
157	Shoulder lesions	M75	899	52.3	4.3	0.1174	0.696	0.0116	0.689	0.760	0.796	0.776	0.0078	0.767	0.816	0.827
158	Enthesopathies of lower limb, excluding foot	M76	111	43.9	3.4	0.2444	0.718	0.0297	0.656	0.760	0.85	0.794	0.0196	0.761	0.816	0.854
159	Other enthesopathies	M77	156	47.7	4.1	0.2912	0.669	0.0276	0.620	0.727	0.796	0.760	0.0184	0.706	0.810	0.827
160	Rheumatism, unspecified	M790	113	53.3	6.4	0.3457	0.390	0.0382	0.088	0.362	0.691	0.575	0.0250	0.397	0.566	0.777
161	Myalgia	M791	107	53.6	5.6	0.4644	0.632	0.0326	0.516	0.760	0.796	0.731	0.0217	0.594	0.816	0.827
162	Other soft tissue disorders, not elsewhere classified	M792–M794; M798–M799	81	53.0	5.4	0.4018	0.571	0.0439	0.255	0.691	0.796	0.691	0.0292	0.506	0.777	0.827
163	Other soft tissue disorders, not elsewhere classified: pain in limb	M796	250	50.8	5.1	0.2466	0.653	0.0237	0.620	0.760	0.796	0.747	0.0157	0.706	0.816	0.827

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
164	Fibromyalgia	M797	36	48.4	7.8	0.6511	0.369	0.0620	0.055	0.364	0.691	0.558	0.0397	0.360	0.576	0.777
165	Osteoporosis <sup>a</sup>	M80–M81	1817	71.8	6.1	0.0907	0.648	0.0085	0.620	0.725	0.796	0.742	0.0058	0.704	0.800	0.827
166	Osteoporosis in diseases classified elsewhere	M82	16	61.4	9.9	1.1443	0.541	0.1106	0.053	0.691	0.796	0.666	0.0786	0.368	0.777	0.827
167	Adult osteomalacia and other disorders of bone density and structure	M83, M85, except M833	582	62.6	5.4	0.1485	0.709	0.0132	0.656	0.760	0.848	0.784	0.0091	0.748	0.816	0.844
168	Disorders of continuity of bone	M84	29	44.5	5.0	0.8657	0.633	0.0748	0.195	0.760	1	0.736	0.0497	0.457	0.816	1
169	Other osteopathies	M86–M90	160	56.7	5.6	0.3518	0.647	0.0314	0.620	0.760	0.796	0.744	0.0212	0.706	0.816	0.827
170	Other disorders of the musculoskeletal system and connective tissue	M95–M99	253	52.2	5.3	0.2724	0.679	0.0212	0.620	0.760	0.848	0.764	0.0142	0.706	0.816	0.844
	<b>N—diseases of the genitourinary system</b>	<b>N18</b>	<b>224</b>	<b>66.3</b>	<b>8.1</b>	<b>0.2867</b>	<b>0.625</b>	<b>0.0237</b>	<b>0.516</b>	<b>0.691</b>	<b>0.814</b>	<b>0.725</b>	<b>0.0161</b>	<b>0.594</b>	<b>0.777</b>	<b>0.843</b>
171	Chronic renal failure (CRF) <sup>a</sup>	N18	224	66.3	8.1	0.2867	0.625	0.0237	0.516	0.691	0.814	0.725	0.0161	0.594	0.777	0.843
	<b>Q—congenital malformations, deformations and chromosomal abnormalities</b>	<b>Q00–Q56; Q60–Q99</b>	<b>1323</b>	<b>44.1</b>	<b>3.7</b>	<b>0.0881</b>	<b>0.782</b>	<b>0.0087</b>	<b>0.691</b>	<b>0.796</b>	<b>1</b>	<b>0.836</b>	<b>0.0060</b>	<b>0.777</b>	<b>0.827</b>	<b>1</b>

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
172	Congenital malformations: of the nervous, circulatory, respiratory system; cleft palate and cleft lip, urinary tract, bones and muscles, other and chromosomal abnormalities not elsewhere classified	Q00–Q07; Q20–Q37; Q60–Q99	863	43.6	3.9	0.1138	0.757	0.0118	0.691	0.796	1	0.819	0.0081	0.777	0.827	1
173	Congenital malformations of eye, ear, face and neck	Q10–Q18	205	37.9	2.8	0.1329	0.847	0.0144	0.796	0.848	1	0.879	0.0103	0.825	0.844	1
174	Other congenital malformations of the digestive system	Q38–Q45	80	57.3	4.8	0.4178	0.779	0.0312	0.691	0.796	1	0.833	0.0223	0.777	0.827	1
175	Congenital malformations of the sexual organs	Q50–Q56	198	47.2	3.3	0.2240	0.816	0.0176	0.725	0.812	1	0.858	0.0126	0.800	0.833	1
	<b>F—mental and behavioural disorders</b>	<b>F00–99</b>	<b>6106</b>	<b>50.7</b>	<b>4.6</b>	<b>0.0453</b>	<b>0.651</b>	<b>0.0047</b>	<b>0.620</b>	<b>0.725</b>	<b>0.848</b>	<b>0.742</b>	<b>0.0031</b>	<b>0.706</b>	<b>0.800</b>	<b>0.844</b>
176	Dementia <sup>a</sup>	F00, G30, F01, F02.0, F03.9, G31.8B, G31.8E, G31.9, G31.0B	179	80.9	6.9	0.2702	0.415	0.0305	0.159	0.516	0.691	0.572	0.0210	0.399	0.594	0.777

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
177	Organic, including symptomatic, mental disorders	F04–F09	160	60.1	6.8	0.3135	0.604	0.0316	0.516	0.691	0.796	0.707	0.0214	0.594	0.777	0.827
178	Mental and behavioural disorders due to use of alcohol	F10	382	47.5	5.4	0.2005	0.638	0.0182	0.516	0.691	0.812	0.735	0.0123	0.594	0.777	0.833
179	Mental and behavioural disorders due to psychoactive substance use	F11–F19	368	48.0	5.1	0.1795	0.664	0.0190	0.620	0.743	0.848	0.753	0.0129	0.706	0.810	0.844
180	Schizophrenia <sup>a</sup>	F20	143	44.7	5.6	0.2907	0.608	0.0330	0.331	0.725	0.812	0.714	0.0216	0.512	0.794	0.833
181	Schizotypal and delusional disorders	F21–F29	193	48.2	6.7	0.2960	0.637	0.0265	0.378	0.725	0.848	0.733	0.0174	0.550	0.800	0.844
182	Bipolar affective disorder <sup>a</sup>	F30–F31	132	52.8	6.5	0.3870	0.597	0.0341	0.378	0.689	0.812	0.700	0.0222	0.550	0.767	0.833
183	Depression <sup>a</sup>	F32, F33, F34.1, F06.32	4619	52.5	4.9	0.0535	0.631	0.0055	0.516	0.725	0.848	0.727	0.0037	0.610	0.800	0.844
184	Mood (affective) disorders	F340, F348–F349, F38–F39	44	48.5	7.4	0.6371	0.596	0.0614	0.378	0.621	0.812	0.698	0.0426	0.550	0.732	0.833
185	Phobic anxiety disorders	F40	78	36.8	4.7	0.3321	0.550	0.0391	0.255	0.689	0.76	0.677	0.0250	0.506	0.767	0.816
186	Other anxiety disorders	F41	226	43.5	5.9	0.2747	0.568	0.0247	0.258	0.689	0.812	0.686	0.0162	0.506	0.767	0.833
187	Obsessive compulsive disorder (OCD) <sup>a</sup>	F42	70	34.2	5.1	0.4303	0.685	0.0342	0.620	0.725	0.848	0.763	0.0230	0.706	0.800	0.844
188	Post-traumatic stress disorder	F431	73	45.4	5.1	0.3710	0.482	0.0468	0.197	0.620	0.725	0.627	0.0313	0.467	0.706	0.800



**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
189	Reactions to severe stress and adjustment disorders	F432–F439	386	39.7	5.1	0.1663	0.640	0.0184	0.516	0.725	0.848	0.735	0.0121	0.594	0.800	0.844
190	Dissociative (conversion) disorders, somatoform disorders and other neurotic disorders	F44, F45, F48	170	49.2	6.4	0.3434	0.576	0.0309	0.293	0.689	0.796	0.692	0.0207	0.527	0.767	0.827
191	Eating disorders	F50	54	27.5	4.5	0.4739	0.683	0.0436	0.656	0.812	0.848	0.761	0.0291	0.761	0.833	0.844
192	Behavioural syndromes associated with physiological disturbances and physical factors	F51–F59	58	41.9	4.6	0.4904	0.698	0.0519	0.689	0.760	1	0.780	0.0355	0.767	0.816	1
193	Emotionally unstable personality disorder	F603	112	39.3	6.1	0.3266	0.596	0.0309	0.320	0.689	0.796	0.705	0.0204	0.506	0.767	0.827
194	Specific personality disorders	F602, F604–F609	363	43.1	5.6	0.1860	0.586	0.0201	0.291	0.689	0.812	0.698	0.0132	0.512	0.767	0.833
195	Disorders of adult personality and behaviour	F61–F69	119	43.9	6.1	0.3491	0.592	0.0333	0.293	0.689	0.812	0.702	0.0214	0.527	0.767	0.833
196	Mental retardation	F70–F79	44	38.8	5.4	0.7177	0.694	0.0507	0.585	0.796	1	0.768	0.0355	0.677	0.827	1
197	Disorders of psychological development	F80–F89	44	24.1	3.7	0.3364	0.685	0.0581	0.689	0.760	0.848	0.766	0.0389	0.767	0.816	0.844
198	Hyperkinetic disorders (ADHD) <sup>a</sup>	F90	193	31.7	4.0	0.2147	0.694	0.0214	0.620	0.760	0.848	0.770	0.0142	0.706	0.816	0.844

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
199	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	F91–F99	244	38.4	5.7	0.2425	0.622	0.0255	0.309	0.725	0.848	0.724	0.0170	0.517	0.794	0.844
	<b>Extra conditions</b>															
	Ischaemic heart diseases broad	I05–I06; I11–I13; I20–I28; I30–I52	4221	67.5	6.5	0.0600	0.693	0.0054	0.620	0.760	0.883	0.773	0.0037	0.706	0.816	0.860
	Arthritis	M01–M03; M5–M9; M7–M14; M15–M20; M45	612	61.9	5.1	0.0460	0.695	0.0040	0.623	0.760	0.814	0.775	0.0027	0.742	0.816	0.833
	Arthrosis	M15–M19	4589	64.2	5.2	0.0555	0.684	0.0048	0.62	0.727	0.796	0.767	0.0033	0.706	0.810	0.827
	Back conditions	M32–34; M41–M43; M46–49; M50–51; M53–M54	2620	55.4	5.3	0.0819	0.589	0.0074	0.364	0.691	0.796	0.704	0.0049	0.576	0.777	0.827
	Overweight, clinical diagnosed (BMI > 35)	E66	2761	46.2	3.6	0.0712	0.726	0.0067	0.689	0.796	1	0.797	0.0046	0.767	0.827	1
	Endometriosis	N80	428	44.7	2.7	0.1504	0.726	0.0164	0.689	0.796	1	0.798	0.0110	0.767	0.827	1
	<b>NCCs</b>															
	Having no chronic conditions		18,136	37.7	0.0	n/a	0.908	0.0014	0.796	1	1	0.926	0.0010	0.827	1	1
	Having 1 chronic condition		11,303	44.4	1.0	n/a	0.868	0.0020	0.796	1	1	0.895	0.0014	0.827	1	1
	Comorbidity: 2 conditions		7657	50.1	2.0	n/a	0.826	0.0029	0.760	0.796	1	0.866	0.0021	0.816	0.827	1
	Comorbidity: 3 conditions		5698	54.6	3.0	n/a	0.792	0.0037	0.725	0.796	1	0.842	0.0026	0.800	0.827	1

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
	Comorbidity: 4 conditions		3959	58.7	4.0	n/a	0.752	0.0045	0.691	0.796	1	0.813	0.0031	0.777	0.827	1
	Comorbidity: 5 conditions		2805	61.8	5.0	n/a	0.708	0.0061	0.656	0.760	0.848	0.783	0.0042	0.761	0.816	0.844
	Comorbidity: 6 conditions		1915	63.8	6.0	n/a	0.679	0.0079	0.620	0.727	0.796	0.762	0.0054	0.706	0.810	0.827
	Comorbidity: 7 or more conditions		4143	67.1	9.0	0.0406	0.558	0.0061	0.293	0.689	0.796	0.680	0.0041	0.517	0.767	0.827
	One or more chronic conditions		37,480	53.2	3.2	0.0150	0.783	0.0015	0.691	0.796	1	0.836	0.0011	0.777	0.827	1
	<b>Gender</b>															
	Women		29,268	48.2	2.3	0.0152	0.809	0.0017	0.725	0.796	1	0.854	0.0012	0.800	0.827	1
	Men		26,348	47.0	1.8	0.0167	0.849	0.0016	0.796	1	1	0.883	0.0011	0.827	1	1
	<b>Age</b>															
	Age 16–24 years		5993	19.9	0.6	0.0169	0.891	0.0028	0.796	1	1	0.914	0.0020	0.827	1	1
	Age 25–34 years		5388	29.7	1.0	0.0220	0.882	0.0028	0.796	1	1	0.906	0.0020	0.827	1	1
	Age 35–44 years		8516	39.8	1.3	0.0220	0.852	0.0027	0.796	1	1	0.886	0.0019	0.827	1	1
	Age 45–54 years		1657	49.6	1.9	0.0248	0.813	0.0028	0.725	0.725	1	0.857	0.0019	0.800	0.827	1
	Age 55–64 years		11,198	59.8	2.6	0.0282	0.805	0.0027	0.725	0.796	1	0.852	0.0019	0.800	0.827	1
	Age 65–74 years		8840	69.1	3.6	0.0360	0.803	0.0028	0.725	0.796	1	0.850	0.0020	0.800	0.827	1
	Age 75+ years		5024	81.3	4.9	0.0518	0.694	0.0048	0.620	0.760	0.883	0.773	0.0033	0.706	0.816	0.860
	<b>Education</b>															
	No education/training		14,603	58.2	3.1	0.0287	0.750	0.0027	0.691	0.796	1	0.814	0.0019	0.777	0.827	1
	Students or in training		4968	21.8	0.7	0.0212	0.892	0.0028	0.796	1	1	0.914	0.0021	0.827	1	1
	Short education		24,455	48.7	2.0	0.0172	0.834	0.0017	0.760	0.848	1	0.873	0.0012	0.816	0.844	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
	Middle education (e.g. bachelor's degree)		8315	47.5	1.8	0.0273	0.866	0.0024	0.796	1	1	0.895	0.0017	0.827	1	1
	High education (master's degree or higher)		3028	45.0	1.4	0.0382	0.898	0.0035	0.796	1	1	0.919	0.0026	0.827	1	1
	Missing		247	56.8	2.5	0.2225	0.670	0.0244	0.587	0.727	0.85	0.752	0.0172	0.687	0.810	0.854
	<b>Ethnicity</b>															
	Danish		53,268	48.1	2.1	0.0124	0.832	0.0011	0.760	0.848	1	0.871	0.0008	0.816	0.844	1
	Other Western		1144	44.0	1.4	0.0728	0.815	0.0084	0.725	0.848	1	0.857	0.0059	0.800	0.844	1
	Non-Western		1204	38.4	1.5	0.0699	0.758	0.0100	0.691	0.796	1	0.819	0.0070	0.777	0.827	1
	<b>Family equalised income</b>															
	< £20,000		5066	41.0	1.8	0.0392	0.798	0.0045	0.725	0.848	1	0.872	0.0038	0.816	0.844	1
	£20,000–39,999		26,123	50.5	2.5	0.0197	0.799	0.0018	0.725	0.796	1	0.830	0.0015	0.777	0.827	1
	£40,000–59,999		17,368	45.1	1.6	0.0171	0.868	0.0015	0.796	1	1	0.889	0.0011	0.827	1	1
	£60,000–79,999		4961	48.4	1.6	0.0301	0.884	0.0026	0.796	1	1	0.902	0.0015	0.827	1	1
	£80,000+		2098	51.0	1.6	0.0472	0.887	0.0040	0.796	1	1	0.910	0.0021	0.827	1	1
	<b>Family equalised income quartiles</b>															
	1st quartile		14,248	50.5	2.7	0.0294	0.770	0.0028	0.691	0.796	1	0.827	0.0020	0.777	0.827	1
	2nd quartile		14,244	47.4	2.1	0.0240	0.818	0.0023	0.727	0.848	1	0.861	0.0016	0.810	0.844	1
	3rd quartile		14,247	44.3	1.6	0.0196	0.860	0.0018	0.796	1	1	0.891	0.0013	0.827	1	1
	4th quartile		14,247	47.6	1.6	0.0183	0.879	0.0016	0.796	1	1	0.905	0.0012	0.827	1	1
	<b>Socio-economic position</b>															
	Retired, age		12,408	74.9	4.3	0.0325	0.750	0.0028	0.691	0.796	0	0.812	0.0020	0.777	0.827	1
	Retirement, free		2414	63.1	2.7	0.0545	0.839	0.0042	0.760	0.796	1	0.874	0.0030	0.816	0.827	1
	Early retirement, health reasons		2227	52.1	4.7	0.0778	0.547	0.0079	0.255	0.689	0.76	0.674	0.0053	0.506	0.767	0.816
	Seek leave and other leave		507	39.1	2.6	0.1343	0.654	0.0167	0.516	0.760	0.848	0.747	0.0112	0.594	0.816	0.844
	Unemployed, social benefits longer term		555	37.3	2.8	0.1199	0.547	0.0168	0.195	0.689	0.796	0.676	0.0111	0.467	0.767	0.827

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
	Unemployed minimum 6 months, ordinary		673	43.3	1.6	0.0872	0.838	0.0091	0.725	0.848	1	0.874	0.0065	0.800	0.844	1
	In training or education		3472	19.8	0.5	0.0198	0.899	0.0036	0.796	1	1	0.919	0.0026	0.827	1	1
	Employed		32,262	42.2	1.3	0.0100	0.878	0.0011	0.796	1	1	0.904	0.0008	0.827	1	1
	Others not in workforce		1098	36.1	1.4	0.0661	0.795	0.0090	0.725	0.848	1	0.845	0.0063	0.800	0.844	1
	<b>Partnership</b>															
	Having a partner		28,055	50.1	2.1	0.0172	0.829	0.0016	0.760	0.848	1	0.869	0.0011	0.816	0.844	1
	Not married/not in a relationship		27,561	45.3	2.0	0.0171	0.828	0.0016	0.760	0.848	1	0.868	0.0012	0.816	0.844	1
	<b>Children home</b>															
	No children home		41,004	51.7	2.4	0.0155	0.815	0.0014	0.725	0.812	1	0.859	0.0010	0.800	0.833	1
	Having children living home under 15 years		13,959	37.1	1.2	0.0156	0.867	0.0020	0.796	1	1	0.896	0.0014	0.827	1	1
	Missing		653	41.3	2.0	0.1136	0.762	0.0157	0.691	0.796	1	0.820	0.0108	0.777	0.827	1
	<b>Social network – loneliness</b>															
	Not lonely or seldom lonely		52,523	47.3	2.0	0.0119	0.841	0.0011	0.760	0.848	1	0.877	0.0008	0.816	0.844	1
	Often lonely, self-reported		2407	49.0	3.2	0.0778	0.630	0.0081	0.516	0.725	0.848	0.728	0.0055	0.594	0.800	0.844
	Missing		686	59.3	3.5	0.1301	0.769	0.0121	0.691	0.796	1	0.828	0.0085	0.777	0.827	1
	<b>Stress – Cohen’s Perceived Stress Scale</b>															
	80% least stressed		43,466	47.1	1.8	0.0119	0.881	0.0009	0.796	1	1	0.906	0.0007	0.827	1	1
	20% most stressed (cut point 18)		9851	47.0	3.0	0.0357	0.638	0.0036	0.587	0.725	0.814	0.732	0.0024	0.687	0.800	0.843
	Missing		2299	57.8	3.0	0.0686	0.763	0.0073	0.691	0.796	1	0.823	0.0051	0.777	0.827	1

Table 2 (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
<b>Body mass index (kg/m<sup>2</sup>), self-reported</b>																
	BMI < 18.5		1193	39.9	1.9	0.0827	0.783	0.0098	0.725	0.848	1	0.836	0.0069	0.800	0.844	1
	BMI > 18.5 < 25		25,087	44.4	1.7	0.0159	0.855	0.0016	0.796	1	1	0.887	0.0011	0.827	1	1
	BMI > 25 < 30		19,387	50.6	2.2	0.0206	0.831	0.0019	0.760	0.848	1	0.870	0.0013	0.816	0.844	1
	BMI ≥ 30 < 35		6317	50.3	2.7	0.0410	0.780	0.0038	0.691	0.796	1	0.834	0.0026	0.777	0.827	1
	BMI ≥ 35		2015	47.9	3.2	0.0816	0.707	0.0078	0.656	0.760	0.883	0.783	0.0053	0.761	0.816	0.860
	Missing		1617	58.5	3.2	0.0859	0.747	0.0087	0.689	0.796	1	0.811	0.0060	0.767	0.827	1
<b>Daily smoker</b>																
	Do not smoke daily		45,779	47.3	2.0	0.0131	0.841	0.0012	0.760	0.848	1	0.878	0.0009	0.816	0.844	1
	Smoking daily		8968	47.6	2.2	0.0314	0.774	0.0033	0.691	0.796	1	0.830	0.0023	0.777	0.827	1
	Missing		869	59.7	3.4	0.1119	0.749	0.0110	0.691	0.796	1	0.813	0.0077	0.777	0.827	1
<b>Alcohol intake</b>																
	Do not exceed National Board of Health's recommendations		46,937	47.4	2.0	0.0129	0.835	0.0012	0.760	0.848	1	0.873	0.0009	0.816	0.844	1
	Exceed recommendations with more than 7 drinks a week/woman or 14 drinks a week/man		4274	43.9	1.9	0.0418	0.813	0.0045	0.725	0.848	1	0.857	0.0031	0.800	0.844	1
	Missing		4405	52.7	2.9	0.0508	0.781	0.0048	0.691	0.796	1	0.835	0.0033	0.777	0.827	1
<b>Exercise</b>																
	Exercise at least 4 h a week		45,913	46.2	1.8	0.0117	0.858	0.0010	0.796	1	1	0.889	0.0008	0.827	1	1
	Do not exercise during the week		8457	52.4	3.1	0.0404	0.690	0.0041	0.620	0.760	1	0.771	0.0028	0.706	0.816	1
	Missing		1246	62.3	3.6	0.1009	0.735	0.0104	0.689	0.796	1	0.802	0.0073	0.767	0.827	1

**Table 2** (continued)

No	Name of chronic condition or variable	ICD-10 code	Population frequencies and means <sup>A</sup>				UK EQ-5D-3L unadjusted sample utilities					US EQ-5D-3L unadjusted sample utilities				
			<i>n</i>	Mean age	Mean NCC	NCC SE	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%	EQ-5D utility	EQ-5D SE	EQ-5D 25%	EQ-5D 50%	EQ-5D 75%
<b>Fruit intake</b>																
	Do not meet National Board of Health's recommendations		50,958	47.3	2.0	0.0126	0.829	0.0012	0.760	0.848	1	0.869	0.0008	0.816	0.844	1
	5 or more portions of fruit a day as recommended		3486	47.0	2.0	0.0449	0.847	0.0043	0.760	1	1	0.882	0.0030	0.816	1	1
	Missing		1172	58.8	3.3	0.0947	0.770	0.0092	0.691	0.796	1	0.827	0.0064	0.777	0.827	1
<b>SF-12 General Health (self-reported)</b>																
	Excellent		6231	37.9	0.7	0.0174	0.972	0.0013	1	1	1	0.976	0.0010	1	1	1
	Very good		20,840	42.7	1.2	0.0121	0.924	0.0010	0.796	1	1	0.936	0.0008	0.827	1	1
	Good		21,183	51.8	2.3	0.0188	0.817	0.0014	0.727	0.796	1	0.856	0.0010	0.800	0.827	1
	Fair		6846	56.7	4.4	0.0468	0.554	0.0039	0.364	0.689	0.725	0.676	0.0025	0.574	0.767	0.800
	Poor		1341	56.8	5.8	0.1182	0.210	0.0101	-0.016	0.157	0.516	0.448	0.0068	0.307	0.420	0.594
	Missing		547	60.7	3.3	0.1644	0.749	0.0217	0.691	0.796	1	0.812	0.0147	0.777	0.827	1
<b>Long-term illness or disability (self-reported)</b>																
	No long-term illness		36,747	44.4	1.2	0.0098	0.905	0.0009	0.796	1	1	0.923	0.0007	0.827	1	1
	Long term illness		18,488	52.6	3.6	0.0262	0.676	0.0025	0.620	0.743	0.796	0.760	0.0017	0.706	0.810	0.827
	Missing		1753	63.5	3.6	0.0890	0.754	0.0087	0.691	0.796	1	0.816	0.0060	0.777	0.827	1
<b>Samples</b>																
	NDR sample		40,816	47.6	2.1	0.0144	0.826	0.0014	0.760	0.848	1	0.867	0.0010	0.816	0.844	1
	DK sample		14,800	47.6	2.0	0.0225	0.835	0.0020	0.760	0.848	1	0.873	0.0014	0.816	0.844	1
	<b>All population</b>	<b>-</b>	<b>55,616</b>	<b>47.6</b>	<b>2.1</b>	<b>0.0121</b>	<b>0.829</b>	<b>0.0012</b>	<b>0.760</b>	<b>0.848</b>	<b>1</b>	<b>0.869</b>	<b>0.0008</b>	<b>0.816</b>	<b>0.844</b>	<b>1</b>

Note: *n* = 55,616 in all models. All NCC means and unadjusted EQ-5D estimates are weighted. Frequencies (*n*) are not weighted. Conditions no. marked with 'A' are overlapping other conditions, usually due to complex register definition [54]. Bold text signifies aggregated disease groups, health variables and total population estimates  
*ICD-10* International Classification of Diseases version 10, *n/a* not available<sup>A</sup>Estimates adapted from Hvidberg et al. [69]

<sup>a</sup>Complex defined conditions

**Table 3** Summary measures of fit for the UK and US base and full ALDVMMs

	AIC	BIC	Mean absolute error	Root mean squared error
<b>UK base model</b>				
1 component	31,698.45	33,590.81	0.1394863	0.18995961
2 components	17,218.26	21,092.24	0.1399875	0.19214219
3 components	10,982.12	16,855.58	0.13895	0.18989694
<b>UK full model</b>				
1 component	30,691.11	32,663.8	0.1379652	0.18803380
2 components	3018.952	7544.548	0.114237	0.1504211
3 components	-12,349.21	-5458.163	0.1063071	0.14735358
<b>US base model</b>				
1 component	-815.7213	1076.639	0.1045412	0.13479988
2 components	-26,770.45	-22,887.54	0.1043856	0.13512545
<b>US full model</b>				
1 component	-9718.437	-7567.216	0.0954433	0.12264923
2 components	-42,413.68	-37,888.08	0.0872551	0.10835724

[36, 70–72]. Hence, Appendices 3 and 4 in the online Supplementary Material 1 present easily available, off-the-shelf health inequality UK and US EQ-5D-3L average sample scores based on subgroups of educational, income, socioeconomic, age, gender, BMI groups across the 199+ chronic conditions and covariates.

### 3.3 Using the two types of catalogues

The sections above provide two separate catalogues that may be of interest. The first one provides population-based estimates of utility; the second one provides utility estimates adjusted for covariates for a representative individual so that comparisons across chronic conditions adjusted for other covariates can be made for UK and US EQ-5D-3L norms. Catalogue one, the population estimates, are useful when interest lies in EQ-5D-3L in the general population. The estimated regressions used to construct catalogue two may be used to calculate utility estimates in samples other than the general population sample used here, for example, when using it to appraise interventions with different age and sex distributions or lower baseline health than the general population. For this purpose, a technical guide on how to use the model estimates to predict EQ-5D-3L scores has been provided in the online Supplementary Material 2, along with Stata data and programming files to do so.<sup>3</sup>

<sup>3</sup> Furthermore, a simplified example of how to use the estimates has been provided in an earlier publication using the Danish value set in the results section [32].

## 4 Discussion

EQ-5D is one of the most widely used measures of benefit for CEA. However, EQ-5D is not always collected in trials, and when it is, different populations, methodologies and value sets make comparisons across trials difficult. Utility catalogues of chronic diseases which use a standardised methodology can help to ensure meaningful comparisons can be made. This paper presents newer, standardised catalogues of mean-based EQ-5D-3L preference scores for 199 doctor-reported chronic conditions in the UK and the USA. Two versions of the catalogues are included, one based on a model controlling for chronic conditions, age and sex, and a second, more comprehensive one, which controls for additional socioeconomic, lifestyle and health risk variables. The study provides evidence of the association between different chronic conditions, health risks and lifestyle factors with HRQoL and their differences. This may be useful for benchmarking, and comparisons, including identifying what factors, such as conditions and/or health risks, are associated with the lowest HRQoL, of interest for policy- and decision-makers, health professionals, and researchers. The catalogue may also be of use to inform evidence in Public Health interventions designed to reduce the prevalence of some chronic conditions.

This study has several methodological strengths. First, it uses registry records to determine chronic conditions instead of self-reported data. Second, it includes 199 chronic conditions on the basis of the newer ICD-10 classification. Third, we use statistical models developed specifically to model the characteristics of generic preference-based measures such as EQ-5D-3L.



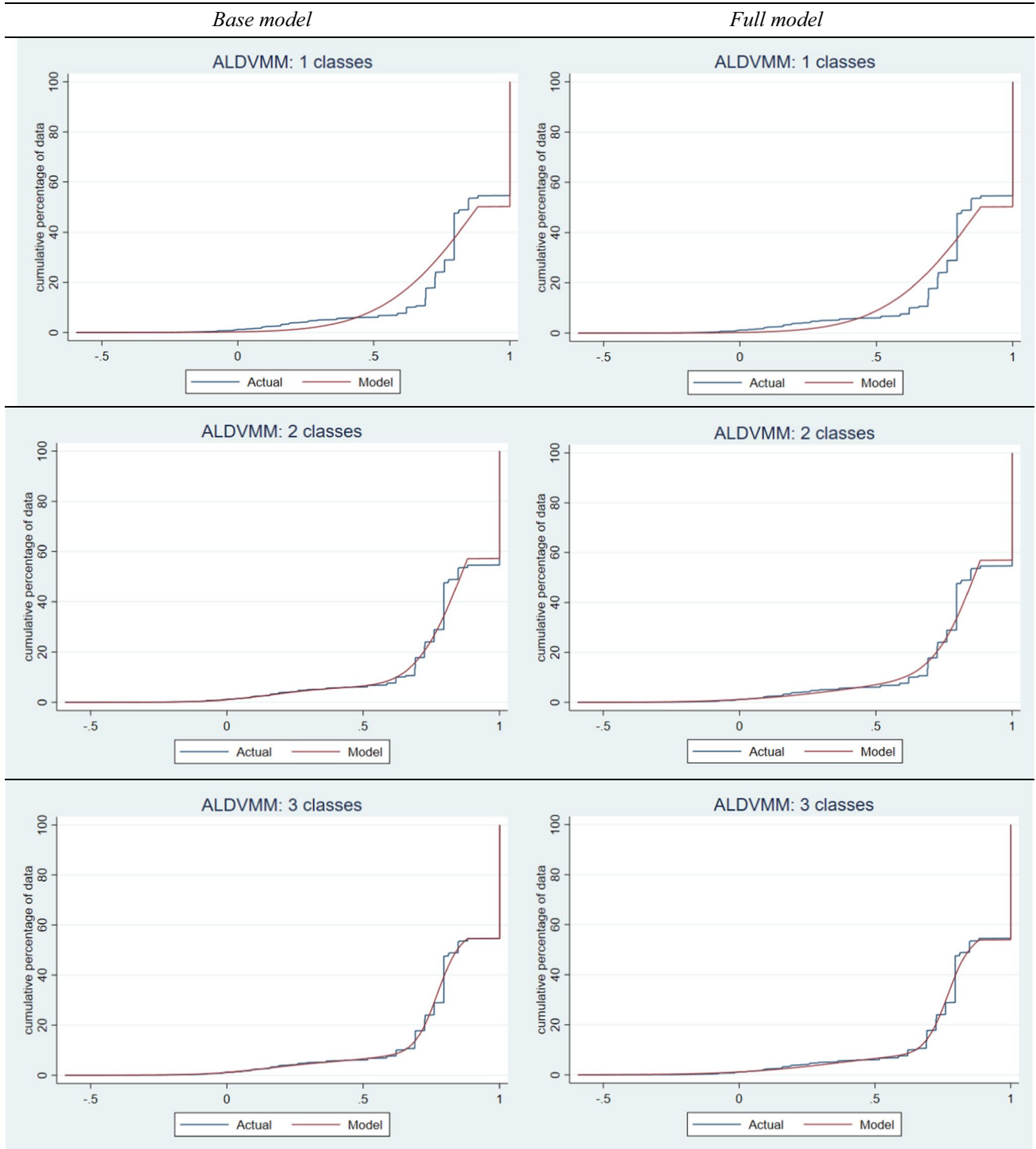


Fig. 2 Cumulative percentage plots of UK models

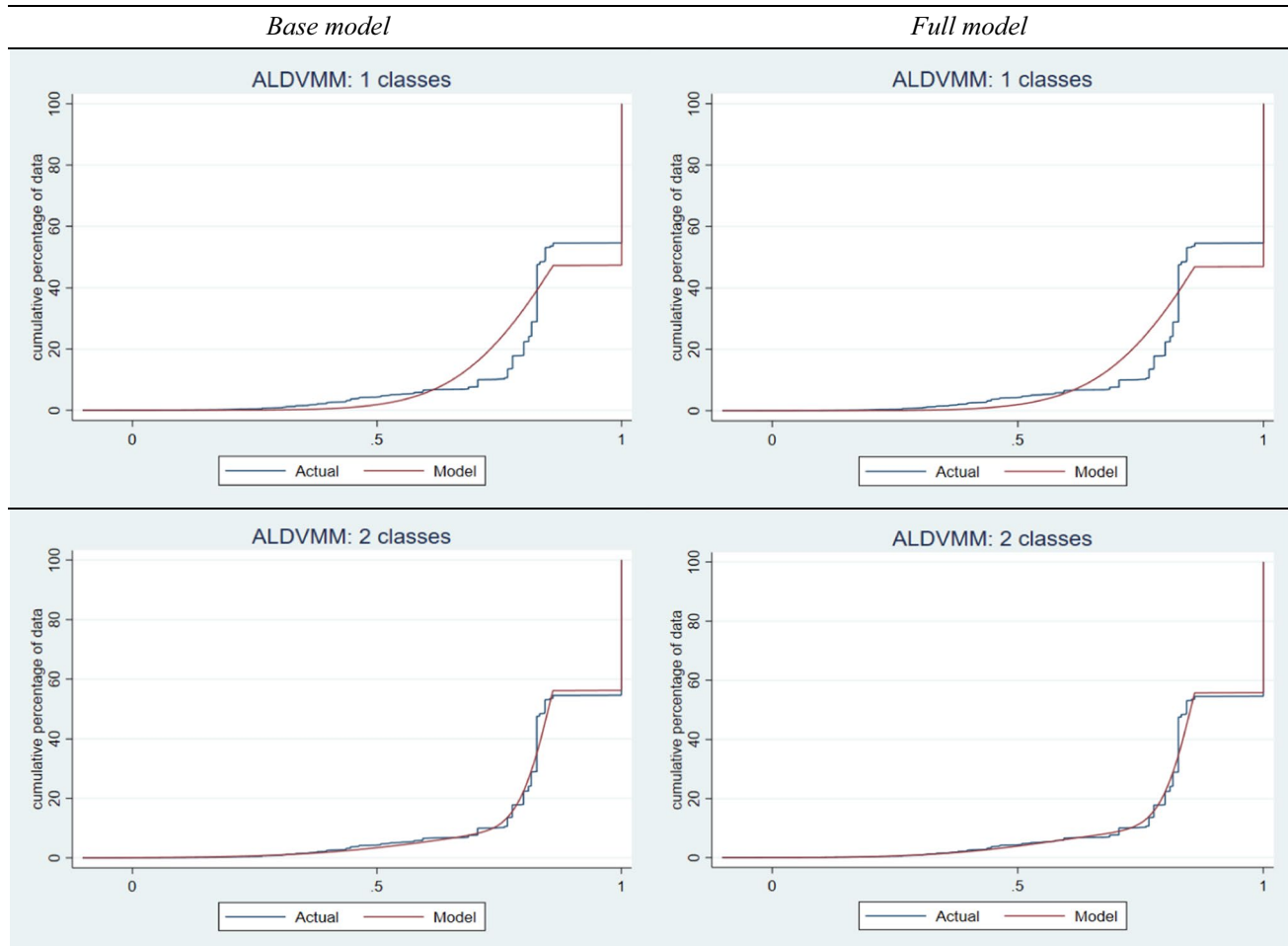


Fig. 3 Cumulative percentage plots of US models

The study also has some limitations. Despite the large number of chronic conditions and other controls included in the models, heterogeneity within the chronic conditions can be large. Being able to control for other chronic conditions goes some way in alleviating this problem, as the estimates can be tailored to different populations, but when using the estimates in economic evaluations, analysts would need to make additional assumptions regarding the impact of new treatments in the long run.

We use a Danish data sample to estimate HRQoL models for the UK and USA by applying the respective value sets to the EQ-5D-3L instrument data. As earlier pointed out by Sullivan and colleagues (2011), this is not an ideal approach [28] but a practical one. Despite efforts to produce EQ-5D-3L versions that are comparable across countries, there still remains the possibility that

the dimension descriptors are interpreted slightly differently in different countries, leading to differences in both the distribution of responses to the individual dimensions and the value sets. Furthermore, as confirmed in the current study, issues such as country differences in health risks, for example, BMI, may impact HRQoL. Differences in BMI across the USA and Europe are well documented. For instance, WHO estimated the mean BMI in Denmark to be 25.3 in 2016, while both the UK and US estimates are larger, 27.1 and 28.9 for the UK and the USA, respectively [73]. Other research also finds similar patterns in BMI, with the UK slightly closer to the Danish population than the USA [74].

Another factor that may contribute to differences might be educational attainment. Educational levels in the USA are the highest and closest to the Danish population,

**Table 4** ALDVMM predictions and marginal effects of representative 50-year-olds by sex: UK base model—chronic conditions and age

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	No conditions	0.8958	0.0016	0.000				0.9098	0.0015	0.000			
1	Chronic viral hepatitis	0.8228	0.0218	0.000	- 0.0730	0.0218	0.001	0.8412	0.0185	0.000	- 0.0686	0.0185	0.000
2	Human immunodeficiency virus (HIV) disease	0.8125	0.0316	0.000	- 0.0833	0.0316	0.009	0.8326	0.0287	0.000	- 0.0772	0.0287	0.007
3	Malignant neoplasms of other and unspecified localizations	0.8734	0.0063	0.000	- 0.0224	0.0063	0.000	0.8879	0.0056	0.000	- 0.0218	0.0055	0.000
4	Malignant neoplasms of digestive organs	0.8190	0.0117	0.000	- 0.0768	0.0117	0.000	0.8409	0.0104	0.000	- 0.0689	0.0104	0.000
5	Malignant neoplasm of colon	0.8729	0.0063	0.000	- 0.0229	0.0064	0.000	0.8875	0.0058	0.000	- 0.0223	0.0058	0.000
6	Malignant neoplasms of rectosigmoid junction, rectum, anus and anal canal	0.8807	0.0076	0.000	- 0.0151	0.0076	0.046	0.8943	0.0070	0.000	- 0.0154	0.0070	0.027
7	Malignant neoplasm of bronchus and lung	0.8622	0.0081	0.000	- 0.0335	0.0081	0.000	0.8785	0.0071	0.000	- 0.0313	0.0072	0.000
8	Malignant melanoma of skin	0.8796	0.0052	0.000	- 0.0162	0.0052	0.002	0.8934	0.0046	0.000	- 0.0163	0.0046	0.000
9	Other malignant neoplasms of skin	0.8832	0.0048	0.000	- 0.0126	0.0048	0.009	0.8964	0.0045	0.000	- 0.0133	0.0044	0.003
10	Malignant neoplasm of breast	0.8639	0.0036	0.000	- 0.0319	0.0037	0.000	0.8796	0.0034	0.000	- 0.0302	0.0033	0.000
11	Malignant neoplasms of female genital organs	0.8638	0.0063	0.000	- 0.0320	0.0063	0.000	0.8785	0.0058	0.000	- 0.0312	0.0058	0.000
12	Malignant neoplasm of cervix uteri, corpus uteri and part unspecified	0.8684	0.0069	0.000	- 0.0274	0.0069	0.000	0.8840	0.0062	0.000	- 0.0258	0.0062	0.000
13	Malignant tumour of the male genitalia	0.8649	0.0089	0.000	- 0.0309	0.0090	0.001	0.8790	0.0079	0.000	- 0.0308	0.0079	0.000
14	Malignant neoplasm of prostate	0.8714	0.0048	0.000	- 0.0244	0.0048	0.000	0.8865	0.0043	0.000	- 0.0232	0.0043	0.000
15	Malignant neoplasms of urinary tract	0.8672	0.0065	0.000	- 0.0286	0.0064	0.000	0.8826	0.0058	0.000	- 0.0272	0.0058	0.000
16	Brain cancer <sup>a</sup>	0.8771	0.0067	0.000	- 0.0187	0.0067	0.006	0.8915	0.0061	0.000	- 0.0183	0.0061	0.003

Table 4 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
17	Malignant neoplasms of ill-defined, secondary and unspecified sites, and of independent (primary) multiple sites	0.8560	0.0070	0.000	-0.0398	0.0071	0.000	0.8732	0.0061	0.000	-0.0365	0.0061	0.000
18	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	0.8727	0.0074	0.000	-0.0231	0.0074	0.002	0.8880	0.0067	0.000	-0.0218	0.0066	0.001
19	In situ neoplasms	0.8763	0.0043	0.000	-0.0195	0.0044	0.000	0.8905	0.0039	0.000	-0.0193	0.0039	0.000
20	Haemolytic anaemias	0.9133	0.0198	0.000	0.0175	0.0198	0.376	0.9245	0.0183	0.000	0.0148	0.0183	0.420
21	Aplastic and other anaemias	0.8649	0.0071	0.000	-0.0309	0.0071	0.000	0.8810	0.0064	0.000	-0.0288	0.0064	0.000
22	Other anaemias	0.8552	0.0049	0.000	-0.0406	0.0049	0.000	0.8721	0.0045	0.000	-0.0376	0.0045	0.000
23	Coagulation defects, purpura and other haemorrhagic conditions	0.8782	0.0063	0.000	-0.0176	0.0063	0.006	0.8927	0.0059	0.000	-0.0170	0.0059	0.004
24	Other diseases of blood and blood-forming organs	0.8549	0.0084	0.000	-0.0409	0.0084	0.000	0.8707	0.0072	0.000	-0.0390	0.0072	0.000
25	Certain disorders involving the immune mechanism	0.8670	0.0086	0.000	-0.0288	0.0086	0.001	0.8830	0.0079	0.000	-0.0267	0.0078	0.001
26	Diseases of the thyroid <sup>a</sup>	0.8662	0.0029	0.000	-0.0296	0.0030	0.000	0.8816	0.0027	0.000	-0.0281	0.0027	0.000
27	Thyrotoxicosis <sup>a</sup>	0.8685	0.0035	0.000	-0.0273	0.0036	0.000	0.8836	0.0033	0.000	-0.0261	0.0033	0.000
28	Diabetes type 1 <sup>a</sup>	0.8630	0.0054	0.000	-0.0328	0.0055	0.000	0.8785	0.0049	0.000	-0.0313	0.0049	0.000
29	Diabetes type 2 <sup>a</sup>	0.8582	0.0027	0.000	-0.0376	0.0027	0.000	0.8747	0.0025	0.000	-0.0351	0.0025	0.000
30	Diabetes others <sup>a</sup>	0.8474	0.0199	0.000	-0.0484	0.0200	0.015	0.8632	0.0180	0.000	-0.0465	0.0181	0.010
31	Disorders of other endocrine glands	0.8573	0.0060	0.000	-0.0385	0.0060	0.000	0.8741	0.0054	0.000	-0.0357	0.0053	0.000
32	Metabolic disorders	0.8602	0.0064	0.000	-0.0356	0.0065	0.000	0.8765	0.0057	0.000	-0.0332	0.0057	0.000
33	Disturbances in lipoprotein circulation and other lipids <sup>a</sup>	0.8739	0.0025	0.000	-0.0219	0.0025	0.000	0.8882	0.0024	0.000	-0.0215	0.0023	0.000
34	Cystic fibrosis <sup>a</sup>	0.8682	0.0132	0.000	-0.0275	0.0132	0.037	0.8830	0.0124	0.000	-0.0268	0.0123	0.030

**Table 4** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
35	Inflammatory diseases of the central nervous system	0.8768	0.0082	0.000	- 0.0190	0.0082	0.020	0.8903	0.0075	0.000	- 0.0195	0.0074	0.009
36	Systemic atrophies primarily affecting the central nervous system and other degenerative diseases	0.8479	0.0184	0.000	- 0.0479	0.0184	0.009	0.8661	0.0166	0.000	- 0.0436	0.0166	0.009
37	Parkinson's disease <sup>a</sup>	0.8424	0.0057	0.000	- 0.0534	0.0057	0.000	0.8610	0.0051	0.000	- 0.0488	0.0051	0.000
38	Extrapyramidal and movement disorders	0.8604	0.0094	0.000	- 0.0353	0.0095	0.000	0.8763	0.0085	0.000	- 0.0334	0.0085	0.000
39	Sclerosis	0.7579	0.0271	0.000	- 0.1379	0.0271	0.000	0.7824	0.0261	0.000	- 0.1273	0.0261	0.000
40	Demyelinating diseases of the central nervous system	0.8576	0.0177	0.000	- 0.0381	0.0176	0.031	0.8748	0.0153	0.000	- 0.0349	0.0153	0.022
41	Epilepsy <sup>a</sup>	0.8556	0.0050	0.000	- 0.0402	0.0050	0.000	0.8726	0.0046	0.000	- 0.0372	0.0045	0.000
42	Migraine <sup>a</sup>	0.8622	0.0029	0.000	- 0.0336	0.0030	0.000	0.8783	0.0027	0.000	- 0.0314	0.0027	0.000
43	Other headache syndromes	0.8559	0.0113	0.000	- 0.0399	0.0114	0.000	0.8730	0.0099	0.000	- 0.0368	0.0099	0.000
44	Transient cerebral ischaemic attacks and related syndromes and vascular syndromes of brain in cerebrovascular diseases	0.8731	0.0038	0.000	- 0.0227	0.0037	0.000	0.8879	0.0035	0.000	- 0.0218	0.0034	0.000
45	Sleep disorders	0.8605	0.0046	0.000	- 0.0353	0.0046	0.000	0.8766	0.0040	0.000	- 0.0332	0.0040	0.000
46	Disorders of trigeminal nerve and facial nerve disorders	0.8626	0.0060	0.000	- 0.0332	0.0060	0.000	0.8782	0.0052	0.000	- 0.0315	0.0052	0.000

Table 4 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
47	Disorders of other cranial nerves, cranial nerve disorders in diseases classified elsewhere, nerve root and plexus disorders and Nerve root and plexus compressions in diseases classified elsewhere	0.8471	0.0134	0.000	- 0.0487	0.0134	0.000	0.8652	0.0119	0.000	- 0.0446	0.0119	0.000
48	Mononeuropathies of upper limb	0.8654	0.0029	0.000	- 0.0304	0.0030	0.000	0.8809	0.0028	0.000	- 0.0288	0.0027	0.000
49	Mononeuropathies of lower limb, other mononeuropathies and mononeuropathy in diseases classified elsewhere	0.8522	0.0084	0.000	- 0.0436	0.0084	0.000	0.8698	0.0074	0.000	- 0.0399	0.0074	0.000
50	Polyneuropathies and other disorders of the peripheral nervous system	0.8478	0.0068	0.000	- 0.0480	0.0069	0.000	0.8656	0.0060	0.000	- 0.0441	0.0061	0.000
51	Diseases of myoneural junction and muscle	0.8148	0.0246	0.000	- 0.0810	0.0246	0.001	0.8355	0.0229	0.000	- 0.0742	0.0229	0.001
52	Cerebral palsy and other paralytic syndromes	0.7924	0.0293	0.000	- 0.1034	0.0293	0.000	0.8153	0.0275	0.000	- 0.0945	0.0276	0.001
53	Other disorders of the nervous system	0.8536	0.0063	0.000	- 0.0422	0.0063	0.000	0.8709	0.0056	0.000	- 0.0389	0.0056	0.000
54	Disorders of eyelid, lacrimal system and orbit	0.8733	0.0060	0.000	- 0.0225	0.0060	0.000	0.8889	0.0052	0.000	- 0.0209	0.0053	0.000
55	Corneal scars and opacities	0.8745	0.0090	0.000	- 0.0213	0.0090	0.018	0.8874	0.0078	0.000	- 0.0224	0.0079	0.004
56	Other disorders of cornea	0.8743	0.0084	0.000	- 0.0215	0.0084	0.011	0.8884	0.0078	0.000	- 0.0214	0.0078	0.006
57	Diseases of the eye lens (cataracts)	0.8665	0.0036	0.000	- 0.0293	0.0036	0.000	0.8818	0.0034	0.000	- 0.0280	0.0033	0.000
58	Disorders of the choroid and retina	0.8526	0.0135	0.000	- 0.0432	0.0135	0.001	0.8691	0.0125	0.000	- 0.0406	0.0124	0.001

**Table 4** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
59	Retinal vascular occlusions	0.8829	0.0094	0.000	- 0.0129	0.0095	0.173	0.8971	0.0089	0.000	- 0.0127	0.0088	0.151
60	Other retinal disorders	0.8655	0.0035	0.000	- 0.0303	0.0035	0.000	0.8808	0.0033	0.000	- 0.0290	0.0032	0.000
61	Retinal disorders in diseases classified elsewhere	0.8704	0.0059	0.000	- 0.0254	0.0059	0.000	0.8852	0.0054	0.000	- 0.0245	0.0053	0.000
62	Glaucoma <sup>c</sup>	0.8665	0.0033	0.000	- 0.0293	0.0034	0.000	0.8817	0.0031	0.000	- 0.0280	0.0030	0.000
63	Disorders of the vitreous body and globe	0.8564	0.0090	0.000	- 0.0394	0.0090	0.000	0.8735	0.0080	0.000	- 0.0362	0.0080	0.000
64	Disorders of optic nerve and visual pathways	0.8659	0.0159	0.000	- 0.0298	0.0159	0.060	0.8810	0.0160	0.000	- 0.0288	0.0159	0.071
65	Disorders of ocular muscles, binocular movement, accommodation and refraction	0.8820	0.0052	0.000	- 0.0138	0.0052	0.008	0.8958	0.0046	0.000	- 0.0139	0.0046	0.003
66	Visual disturbances	0.8725	0.0059	0.000	- 0.0233	0.0059	0.000	0.8876	0.0054	0.000	- 0.0221	0.0055	0.000
67	Blindness and partial sight	0.8722	0.0116	0.000	- 0.0236	0.0115	0.040	0.8873	0.0103	0.000	- 0.0225	0.0103	0.029
68	Nystagmus and other irregular eye movements and other disorders of eye and adnexa	0.8674	0.0084	0.000	- 0.0284	0.0084	0.001	0.8821	0.0075	0.000	- 0.0277	0.0074	0.000
69	Otosclerosis	0.8866	0.0099	0.000	- 0.0092	0.0099	0.351	0.8998	0.0086	0.000	- 0.0100	0.0087	0.250
70	Ménière's disease <sup>a</sup>	0.8679	0.0067	0.000	- 0.0279	0.0068	0.000	0.8832	0.0059	0.000	- 0.0265	0.0059	0.000
71	Other diseases of the inner ear	0.8708	0.0037	0.000	- 0.0250	0.0037	0.000	0.8858	0.0034	0.000	- 0.0240	0.0033	0.000
72	Conductive and sensorineural hearing loss	0.8694	0.0039	0.000	- 0.0264	0.0039	0.000	0.8844	0.0036	0.000	- 0.0254	0.0035	0.000
73	Other hearing loss and other disorders of ear, not elsewhere classified	0.8584	0.0090	0.000	- 0.0374	0.0090	0.000	0.8754	0.0079	0.000	- 0.0343	0.0079	0.000
74	Presbycusis (age-related hearing loss)	0.8735	0.0032	0.000	- 0.0223	0.0032	0.000	0.8882	0.0030	0.000	- 0.0216	0.0029	0.000
75	Hearing loss, unspecified	0.8699	0.0033	0.000	- 0.0259	0.0032	0.000	0.8847	0.0030	0.000	- 0.0251	0.0029	0.000
76	Tinnitus	0.8676	0.0039	0.000	- 0.0282	0.0038	0.000	0.8829	0.0035	0.000	- 0.0269	0.0034	0.000

Table 4 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
77	Other specified disorders of ear	0.8648	0.0048	0.000	-0.0310	0.0048	0.000	0.8803	0.0045	0.000	-0.0294	0.0044	0.000
78	Aortic and mitral valve disease <sup>a</sup>	0.8713	0.0048	0.000	-0.0245	0.0048	0.000	0.8862	0.0044	0.000	-0.0235	0.0044	0.000
79	Hypertensive diseases <sup>a</sup>	0.8647	0.0023	0.000	-0.0311	0.0024	0.000	0.8803	0.0022	0.000	-0.0294	0.0022	0.000
80	Heart failure <sup>a</sup>	0.8514	0.0070	0.000	-0.0444	0.0070	0.000	0.8688	0.0064	0.000	-0.0410	0.0064	0.000
81	Angina pectoris	0.8595	0.0036	0.000	-0.0363	0.0037	0.000	0.8762	0.0033	0.000	-0.0336	0.0033	0.000
82	Acute myocardial infarction and subsequent myocardial infarction	0.8705	0.0051	0.000	-0.0253	0.0050	0.000	0.8854	0.0048	0.000	-0.0244	0.0047	0.000
83	AMI complex/other	0.8256	0.0319	0.000	-0.0702	0.0320	0.028	0.8456	0.0300	0.000	-0.0641	0.0300	0.033
84	Chronic ischaemic heart disease	0.8635	0.0036	0.000	-0.0323	0.0036	0.000	0.8788	0.0033	0.000	-0.0309	0.0033	0.000
85	Pulmonary heart disease and diseases of pulmonary circulation	0.8611	0.0087	0.000	-0.0347	0.0087	0.000	0.8778	0.0079	0.000	-0.0319	0.0078	0.000
86	Acute pericarditis	0.8682	0.0081	0.000	-0.0276	0.0081	0.001	0.8826	0.0075	0.000	-0.0272	0.0075	0.000
87	Other forms of heart disease	0.8689	0.0072	0.000	-0.0269	0.0072	0.000	0.8830	0.0066	0.000	-0.0267	0.0066	0.000
88	Atrioventricular and left bundle-branch block	0.8728	0.0070	0.000	-0.0230	0.0070	0.001	0.8876	0.0065	0.000	-0.0221	0.0064	0.001
89	Other conduction disorders	0.8734	0.0062	0.000	-0.0224	0.0063	0.000	0.8870	0.0056	0.000	-0.0228	0.0056	0.000
90	Paroxysmal tachycardia	0.8685	0.0042	0.000	-0.0273	0.0041	0.000	0.8836	0.0038	0.000	-0.0261	0.0037	0.000
91	Atrial fibrillation and flutter	0.8631	0.0033	0.000	-0.0327	0.0033	0.000	0.8786	0.0030	0.000	-0.0311	0.0030	0.000
92	Other cardiac arrhythmias	0.8733	0.0043	0.000	-0.0225	0.0043	0.000	0.8885	0.0039	0.000	-0.0212	0.0038	0.000
93	Complications and ill-defined descriptions of heart disease and other heart disorders in diseases classified elsewhere	0.8580	0.0133	0.000	-0.0378	0.0133	0.005	0.8741	0.0120	0.000	-0.0356	0.0119	0.003
94	Stroke	0.8562	0.0047	0.000	-0.0396	0.0047	0.000	0.8731	0.0043	0.000	-0.0366	0.0042	0.000
95	Cerebrovascular diseases	0.8593	0.0087	0.000	-0.0365	0.0087	0.000	0.8764	0.0077	0.000	-0.0334	0.0078	0.000



**Table 4** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
96	Sequelae of cerebrovascular disease	0.8526	0.0059	0.000	-0.0432	0.0059	0.000	0.8698	0.0054	0.000	-0.0400	0.0053	0.000
97	Atherosclerosis	0.8563	0.0060	0.000	-0.0395	0.0060	0.000	0.8736	0.0054	0.000	-0.0362	0.0054	0.000
98	Aortic aneurysm and aortic dissection	0.8495	0.0075	0.000	-0.0463	0.0076	0.000	0.8663	0.0068	0.000	-0.0435	0.0068	0.000
99	Diseases of arteries, arterioles and capillaries	0.8743	0.0066	0.000	-0.0214	0.0066	0.001	0.8892	0.0059	0.000	-0.0206	0.0058	0.000
100	Other peripheral vascular diseases	0.8492	0.0060	0.000	-0.0465	0.0060	0.000	0.8667	0.0054	0.000	-0.0431	0.0053	0.000
101	Phlebitis, thrombosis of the portal vein and others	0.8617	0.0049	0.000	-0.0340	0.0049	0.000	0.8777	0.0044	0.000	-0.0321	0.0044	0.000
102	Varicose veins of lower extremities	0.8786	0.0036	0.000	-0.0172	0.0036	0.000	0.8922	0.0033	0.000	-0.0176	0.0033	0.000
103	Haemorrhoids <sup>a</sup>	0.8661	0.0033	0.000	-0.0297	0.0033	0.000	0.8820	0.0031	0.000	-0.0277	0.0030	0.000
104	Oesophageal varices (chronic), varicose veins of other sites, other disorders of veins, nonspecific lymphadenitis, other non-infective disorders of lymphatic vessels and lymph nodes and other and unspecified disorders of the circulatory system	0.8648	0.0076	0.000	-0.0310	0.0076	0.000	0.8802	0.0072	0.000	-0.0296	0.0071	0.000
105	Respiratory allergy <sup>a</sup>	0.8711	0.0023	0.000	-0.0247	0.0023	0.000	0.8859	0.0022	0.000	-0.0239	0.0021	0.000
105A	Chronic lower respiratory diseases <sup>a</sup>	0.8665	0.0026	0.000	-0.0293	0.0026	0.000	0.8819	0.0024	0.000	-0.0279	0.0024	0.000
106	Bronchitis, not specified as acute or chronic, simple and mucopurulent chronic bronchitis and unspecified chronic bronchitis	0.8645	0.0064	0.000	-0.0313	0.0064	0.000	0.8803	0.0058	0.000	-0.0295	0.0058	0.000
107	Emphysema	0.8610	0.0092	0.000	-0.0348	0.0091	0.000	0.8765	0.0082	0.000	-0.0333	0.0081	0.000

Table 4 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
108	Chronic obstructive lung disease (COPD) <sup>a</sup>	0.8591	0.0030	0.000	-0.0367	0.0030	0.000	0.8756	0.0027	0.000	-0.0341	0.0027	0.000
109	Asthma, status asthmaticus <sup>a</sup>	0.8676	0.0028	0.000	-0.0282	0.0028	0.000	0.8830	0.0026	0.000	-0.0268	0.0025	0.000
110	Bronchiectasis	0.9037	0.0145	0.000	0.0079	0.0145	0.583	0.9159	0.0138	0.000	0.0061	0.0138	0.657
111	Other diseases of the respiratory system	0.8674	0.0062	0.000	-0.0284	0.0062	0.000	0.8828	0.0057	0.000	-0.0270	0.0056	0.000
112	Ulcers <sup>a</sup>	0.8540	0.0030	0.000	-0.0418	0.0030	0.000	0.8713	0.0028	0.000	-0.0384	0.0027	0.000
113	Inguinal hernia	0.8707	0.0039	0.000	-0.0251	0.0038	0.000	0.8853	0.0036	0.000	-0.0245	0.0035	0.000
114	Ventral hernia	0.8603	0.0097	0.000	-0.0355	0.0097	0.000	0.8770	0.0085	0.000	-0.0328	0.0085	0.000
115	Crohn's disease	0.8582	0.0064	0.000	-0.0376	0.0064	0.000	0.8747	0.0057	0.000	-0.0350	0.0056	0.000
116	Ulcerative colitis	0.8624	0.0050	0.000	-0.0334	0.0049	0.000	0.8783	0.0044	0.000	-0.0315	0.0043	0.000
117	Other non-infective gastroenteritis and colitis	0.8656	0.0057	0.000	-0.0302	0.0057	0.000	0.8812	0.0052	0.000	-0.0286	0.0051	0.000
118	Irritable bowel syndrome (IBS)	0.8652	0.0039	0.000	-0.0306	0.0039	0.000	0.8807	0.0035	0.000	-0.0290	0.0034	0.000
119	Other functional intestinal disorders	0.8563	0.0049	0.000	-0.0395	0.0050	0.000	0.8734	0.0043	0.000	-0.0364	0.0044	0.000
120	Diseases of liver, biliary tract and pancreas	0.8482	0.0065	0.000	-0.0476	0.0065	0.000	0.8660	0.0058	0.000	-0.0437	0.0058	0.000
121	Psoriasis <sup>a</sup>	0.8688	0.0036	0.000	-0.0270	0.0036	0.000	0.8841	0.0033	0.000	-0.0256	0.0033	0.000
122	Infectious arthropathies	0.8567	0.0084	0.000	-0.0391	0.0084	0.000	0.8729	0.0073	0.000	-0.0368	0.0073	0.000
123	Rheumatoid arthritis <sup>a</sup>	0.8447	0.0044	0.000	-0.0511	0.0044	0.000	0.8628	0.0040	0.000	-0.0470	0.0039	0.000
124	Inflammatory polyarthropathies, except rheumatoid arthritis <sup>a</sup>	0.8566	0.0033	0.000	-0.0392	0.0032	0.000	0.8732	0.0029	0.000	-0.0366	0.0029	0.000
125	Polyarthrosis (arthrosis)	0.8525	0.0078	0.000	-0.0433	0.0078	0.000	0.8698	0.0069	0.000	-0.0400	0.0069	0.000
126	Coxarthrosis (arthrosis of hip)	0.8549	0.0032	0.000	-0.0409	0.0032	0.000	0.8716	0.0030	0.000	-0.0381	0.0029	0.000
127	Gonarthrosis (arthrosis of knee)	0.8537	0.0028	0.000	-0.0421	0.0029	0.000	0.8707	0.0026	0.000	-0.0391	0.0026	0.000
128	Arthrosis of first carpometacarpal joint and other arthrosis	0.8564	0.0037	0.000	-0.0394	0.0038	0.000	0.8733	0.0033	0.000	-0.0365	0.0033	0.000
129	Acquired deformities of fingers and toes	0.8694	0.0034	0.000	-0.0264	0.0034	0.000	0.8841	0.0032	0.000	-0.0257	0.0031	0.000

**Table 4** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
130	Other acquired deformities of limbs	0.8613	0.0047	0.000	- 0.0345	0.0047	0.000	0.8770	0.0042	0.000	- 0.0328	0.0041	0.000
131	Disorders of patella (kneecap)	0.8568	0.0051	0.000	- 0.0390	0.0051	0.000	0.8740	0.0045	0.000	- 0.0358	0.0045	0.000
132	Internal derangement of knee	0.8370	0.0124	0.000	- 0.0588	0.0124	0.000	0.8564	0.0111	0.000	- 0.0534	0.0111	0.000
133	Derangement of meniscus due to old tear or injury	0.8651	0.0040	0.000	- 0.0307	0.0040	0.000	0.8804	0.0036	0.000	- 0.0294	0.0035	0.000
134	Internal derangement of knee, unspecified	0.8602	0.0050	0.000	- 0.0356	0.0050	0.000	0.8762	0.0044	0.000	- 0.0335	0.0044	0.000
135	Other specific joint derangements	0.8306	0.0174	0.000	- 0.0652	0.0174	0.000	0.8498	0.0155	0.000	- 0.0599	0.0155	0.000
136	Other joint disorders, not elsewhere classified	0.8491	0.0068	0.000	- 0.0467	0.0068	0.000	0.8667	0.0059	0.000	- 0.0431	0.0059	0.000
137	Systemic connective tissue disorders	0.8672	0.0042	0.000	- 0.0286	0.0042	0.000	0.8826	0.0038	0.000	- 0.0272	0.0037	0.000
138	Systemic lupus erythematosus	0.8753	0.0144	0.000	- 0.0205	0.0144	0.153	0.8910	0.0125	0.000	- 0.0187	0.0125	0.133
139	Dermatopolymyositis	0.8791	0.0258	0.000	- 0.0167	0.0258	0.518	0.8933	0.0238	0.000	- 0.0164	0.0238	0.491
140	Systemic sclerosis	0.8716	0.0169	0.000	- 0.0242	0.0169	0.151	0.8853	0.0157	0.000	- 0.0245	0.0157	0.118
141	Kyphosis, lordosis	0.8609	0.0074	0.000	- 0.0349	0.0074	0.000	0.8753	0.0066	0.000	- 0.0344	0.0065	0.000
142	Scoliosis	0.8475	0.0078	0.000	- 0.0483	0.0079	0.000	0.8651	0.0069	0.000	- 0.0446	0.0069	0.000
143	Spinal osteochondrosis	0.8154	0.0186	0.000	- 0.0804	0.0186	0.000	0.8365	0.0170	0.000	- 0.0733	0.0170	0.000
144	Other deforming dorsopathies	0.8336	0.0094	0.000	- 0.0622	0.0094	0.000	0.8529	0.0083	0.000	- 0.0568	0.0083	0.000
145	Other inflammatory spondylopathies	0.8287	0.0230	0.000	- 0.0671	0.0230	0.004	0.8488	0.0214	0.000	- 0.0610	0.0214	0.004
146	Spondylosis	0.8298	0.0066	0.000	- 0.0660	0.0066	0.000	0.8497	0.0059	0.000	- 0.0601	0.0060	0.000
147	Other spondylopathies and spondylopathies in diseases classified elsewhere	0.8579	0.0045	0.000	- 0.0379	0.0045	0.000	0.8740	0.0040	0.000	- 0.0357	0.0040	0.000
148	Cervical disc disorders	0.8434	0.0111	0.000	- 0.0524	0.0111	0.000	0.8616	0.0098	0.000	- 0.0482	0.0097	0.000
149	Other intervertebral disc disorders	0.8129	0.0103	0.000	- 0.0829	0.0103	0.000	0.8343	0.0094	0.000	- 0.0754	0.0094	0.000

Table 4 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
150	Other dorsopathies, not elsewhere classified	0.8244	0.0153	0.000	-0.0714	0.0153	0.000	0.8448	0.0139	0.000	-0.0650	0.0139	0.000
151	Dorsalgia	0.7917	0.0099	0.000	-0.1041	0.0100	0.000	0.8144	0.0093	0.000	-0.0954	0.0094	0.000
152	Soft tissue disorders	0.8508	0.0105	0.000	-0.0450	0.0104	0.000	0.8689	0.0092	0.000	-0.0408	0.0090	0.000
153	Synovitis and tenosynovitis	0.8619	0.0057	0.000	-0.0339	0.0056	0.000	0.8784	0.0050	0.000	-0.0314	0.0049	0.000
154	Disorders of synovium and tendon	0.8591	0.0063	0.000	-0.0367	0.0063	0.000	0.8753	0.0055	0.000	-0.0344	0.0055	0.000
155	Soft tissue disorders related to use, overuse and pressure	0.8441	0.0083	0.000	-0.0517	0.0083	0.000	0.8624	0.0073	0.000	-0.0474	0.0073	0.000
156	Fibroblastic disorders	0.8670	0.0039	0.000	-0.0288	0.0039	0.000	0.8823	0.0036	0.000	-0.0275	0.0035	0.000
157	Shoulder lesions	0.8458	0.0050	0.000	-0.0499	0.0051	0.000	0.8642	0.0045	0.000	-0.0455	0.0045	0.000
158	Enthesopathies of lower limb, excluding foot	0.8480	0.0111	0.000	-0.0478	0.0111	0.000	0.8660	0.0099	0.000	-0.0437	0.0099	0.000
159	Other enthesopathies	0.8302	0.0138	0.000	-0.0656	0.0138	0.000	0.8500	0.0124	0.000	-0.0598	0.0124	0.000
160	Rheumatism, unspecified	0.7622	0.0268	0.000	-0.1336	0.0268	0.000	0.7861	0.0262	0.000	-0.1236	0.0262	0.000
161	Myalgia	0.8579	0.0145	0.000	-0.0379	0.0145	0.009	0.8753	0.0127	0.000	-0.0345	0.0128	0.007
162	Other soft tissue disorders, not elsewhere classified	0.8379	0.0198	0.000	-0.0579	0.0197	0.003	0.8575	0.0181	0.000	-0.0522	0.0181	0.004
163	Other soft tissue disorders, not elsewhere classified: pain in limb	0.8489	0.0067	0.000	-0.0469	0.0067	0.000	0.8667	0.0059	0.000	-0.0430	0.0059	0.000
164	Fibromyalgia	0.6959	0.0481	0.000	-0.1999	0.0481	0.000	0.7198	0.0489	0.000	-0.1900	0.0489	0.000
165	Osteoporosis <sup>a</sup>	0.8599	0.0029	0.000	-0.0359	0.0029	0.000	0.8763	0.0027	0.000	-0.0335	0.0027	0.000
166	Osteoporosis in diseases classified elsewhere	0.8733	0.0103	0.000	-0.0225	0.0103	0.029	0.8875	0.0095	0.000	-0.0222	0.0094	0.018
167	Adult osteomalacia and other disorders of bone density and structure	0.8650	0.0038	0.000	-0.0308	0.0038	0.000	0.8805	0.0034	0.000	-0.0293	0.0034	0.000
168	Disorders of continuity of bone	0.8564	0.0180	0.000	-0.0394	0.0180	0.029	0.8741	0.0161	0.000	-0.0357	0.0161	0.026
169	Other osteopathies	0.8600	0.0068	0.000	-0.0358	0.0068	0.000	0.8765	0.0060	0.000	-0.0333	0.0059	0.000

**Table 4** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
170	Other disorders of the musculoskeletal system and connective tissue	0.8594	0.0068	0.000	- 0.0364	0.0068	0.000	0.8759	0.0060	0.000	- 0.0339	0.0059	0.000
171	Chronic renal failure (CRF) <sup>a</sup>	0.8665	0.0079	0.000	- 0.0293	0.0079	0.000	0.8825	0.0073	0.000	- 0.0273	0.0072	0.000
172	Congenital malformations: of the nervous, circulatory, respiratory system; cleft palate and cleft lip, urinary tract, bones and muscles, other and chromosomal abnormalities not elsewhere classified	0.8634	0.0035	0.000	- 0.0324	0.0035	0.000	0.8792	0.0032	0.000	- 0.0306	0.0032	0.000
173	Congenital malformations of eye, ear, face and neck	0.8716	0.0054	0.000	- 0.0242	0.0054	0.000	0.8869	0.0048	0.000	- 0.0228	0.0048	0.000
174	Other congenital malformations of the digestive system	0.8715	0.0082	0.000	- 0.0243	0.0082	0.003	0.8860	0.0074	0.000	- 0.0238	0.0074	0.001
175	Congenital malformations of the sexual organs	0.8713	0.0058	0.000	- 0.0245	0.0058	0.000	0.8861	0.0051	0.000	- 0.0236	0.0051	0.000
176	Dementia <sup>a</sup>	0.8152	0.0151	0.000	- 0.0806	0.0151	0.000	0.8354	0.0139	0.000	- 0.0744	0.0138	0.000
177	Organic, including symptomatic, mental disorders	0.8675	0.0096	0.000	- 0.0283	0.0096	0.003	0.8830	0.0087	0.000	- 0.0268	0.0087	0.002
178	Mental and behavioural disorders due to use of alcohol	0.8509	0.0060	0.000	- 0.0449	0.0060	0.000	0.8682	0.0054	0.000	- 0.0416	0.0053	0.000
179	Mental and behavioural disorders due to psychoactive substance use	0.8605	0.0059	0.000	- 0.0353	0.0059	0.000	0.8770	0.0053	0.000	- 0.0328	0.0052	0.000
180	Schizophrenia <sup>a</sup>	0.8451	0.0133	0.000	- 0.0507	0.0133	0.000	0.8633	0.0118	0.000	- 0.0464	0.0118	0.000
181	Schizotypal and delusional disorders	0.8840	0.0075	0.000	- 0.0118	0.0075	0.115	0.8977	0.0070	0.000	- 0.0120	0.0070	0.085

Table 4 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
182	Bipolar affective disorder <sup>a</sup>	0.8703	0.0097	0.000	-0.0255	0.0097	0.009	0.8850	0.0091	0.000	-0.0247	0.0090	0.006
183	Depression <sup>a</sup>	0.8171	0.0036	0.000	-0.0787	0.0036	0.000	0.8381	0.0034	0.000	-0.0716	0.0035	0.000
184	Mood (affective) disorders	0.8657	0.0146	0.000	-0.0300	0.0146	0.040	0.8798	0.0137	0.000	-0.0299	0.0136	0.028
185	Phobic anxiety disorders	0.8378	0.0154	0.000	-0.0580	0.0154	0.000	0.8570	0.0140	0.000	-0.0528	0.0140	0.000
186	Other anxiety disorders	0.8523	0.0088	0.000	-0.0435	0.0088	0.000	0.8702	0.0078	0.000	-0.0395	0.0078	0.000
187	Obsessive compulsive disorder (OCD) <sup>a</sup>	0.8616	0.0150	0.000	-0.0342	0.0150	0.023	0.8786	0.0137	0.000	-0.0312	0.0137	0.023
188	Post-traumatic stress disorder	0.8039	0.0197	0.000	-0.0919	0.0196	0.000	0.8260	0.0179	0.000	-0.0837	0.0179	0.000
189	Reactions to severe stress and adjustment disorders	0.8609	0.0072	0.000	-0.0348	0.0072	0.000	0.8782	0.0065	0.000	-0.0316	0.0065	0.000
190	Dissociative (conversion) disorders, somatoform disorders and other neurotic disorders	0.8360	0.0148	0.000	-0.0598	0.0148	0.000	0.8552	0.0134	0.000	-0.0546	0.0134	0.000
191	Eating disorders	0.8557	0.0218	0.000	-0.0401	0.0217	0.065	0.8738	0.0202	0.000	-0.0360	0.0202	0.074
192	Behavioural syndromes associated with physiological disturbances and physical factors	0.8672	0.0075	0.000	-0.0286	0.0075	0.000	0.8817	0.0064	0.000	-0.0280	0.0064	0.000
193	Emotionally unstable personality disorder	0.8450	0.0079	0.000	-0.0508	0.0078	0.000	0.8615	0.0072	0.000	-0.0483	0.0071	0.000
194	Specific personality disorders	0.8376	0.0100	0.000	-0.0582	0.0100	0.000	0.8570	0.0091	0.000	-0.0527	0.0092	0.000
195	Disorders of adult personality and behaviour	0.8559	0.0155	0.000	-0.0399	0.0155	0.010	0.8736	0.0141	0.000	-0.0362	0.0141	0.011
196	Mental retardation	0.9142	0.0236	0.000	0.0184	0.0237	0.436	0.9277	0.0215	0.000	0.0179	0.0215	0.404
197	Disorders of psychological development	0.8468	0.0169	0.000	-0.0490	0.0169	0.004	0.8651	0.0152	0.000	-0.0447	0.0151	0.003
198	Hyperkinetic disorders (ADHD) <sup>a</sup>	0.8456	0.0084	0.000	-0.0502	0.0084	0.000	0.8634	0.0075	0.000	-0.0463	0.0075	0.000

**Table 4** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
199	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	0.8704	0.0061	0.000	- 0.0254	0.0061	0.000	0.8846	0.0058	0.000	- 0.0251	0.0057	0.000
	<b>Denmark sample (base)</b>	0.8993	0.0017	0.000				0.9127	0.0015	0.000			
	North Denmark Region (sample 2-3)	0.8958	0.0016	0.000	- 0.0036	0.0008	0.000	0.9098	0.0015	0.000	- 0.0029	0.0006	0.000
	<b>Specific ages (dydx)</b>												
	Age 16	0.9121	0.0023	0.000	0.0003	0.0003	0.215	0.9270	0.0020	0.000	0.0001	0.0002	0.594
	Age 20	0.9121	0.0019	0.000	- 0.0003	0.0002	0.114	0.9264	0.0017	0.000	- 0.0004	0.0001	0.009
	Age 25	0.9097	0.0016	0.000	- 0.0007	0.0001	0.000	0.9236	0.0014	0.000	- 0.0007	0.0001	0.000
	Age 30	0.9061	0.0014	0.000	- 0.0008	0.0001	0.000	0.9198	0.0013	0.000	- 0.0008	0.0001	0.000
	Age 35	0.9024	0.0015	0.000	- 0.0007	0.0001	0.000	0.9161	0.0013	0.000	- 0.0007	0.0001	0.000
	Age 40	0.8992	0.0016	0.000	- 0.0005	0.0001	0.000	0.9130	0.0014	0.000	- 0.0005	0.0001	0.000
	Age 45	0.8970	0.0016	0.000	- 0.0003	0.0001	0.000	0.9109	0.0015	0.000	- 0.0003	0.0000	0.000
	Age 50	0.8958	0.0016	0.000	- 0.0002	0.0001	0.015	0.9098	0.0015	0.000	- 0.0001	0.0001	0.036
	Age 55	0.8954	0.0016	0.000	0.0000	0.0001	0.742	0.9095	0.0014	0.000	0.0000	0.0001	0.800
	Age 60	0.8953	0.0016	0.000	0.0000	0.0001	0.780	0.9098	0.0014	0.000	0.0001	0.0001	0.583
	Age 65	0.8947	0.0018	0.000	- 0.0002	0.0001	0.051	0.9098	0.0016	0.000	- 0.0001	0.0001	0.403
	Age 70	0.8922	0.0022	0.000	- 0.0008	0.0002	0.000	0.9083	0.0019	0.000	- 0.0006	0.0002	0.000
	Age 75	0.8857	0.0028	0.000	- 0.0019	0.0003	0.000	0.9033	0.0024	0.000	- 0.0015	0.0003	0.000
	Age 80	0.8719	0.0043	0.000	- 0.0037	0.0006	0.000	0.8920	0.0037	0.000	- 0.0032	0.0005	0.000
	Age 85	0.8468	0.0075	0.000	- 0.0065	0.0010	0.000	0.8702	0.0064	0.000	- 0.0057	0.0009	0.000

Note: *n* = 55,616 in all models

<sup>a</sup>Complex defined condition

**Table 5** ALDVMM predictions and marginal effects of representative 50-year-olds by sex: UK full model – chronic conditions, socio-economic, lifestyle and risk variables

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	No conditions	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
1	Chronic viral hepatitis	0.8409	0.0119	0.000	- 0.0394	0.0118	0.001	0.8540	0.0111	0.000	- 0.0380	0.0110	0.001
2	Human immunodeficiency virus (HIV) disease	0.8294	0.0209	0.000	- 0.0509	0.0208	0.015	0.8433	0.0196	0.000	- 0.0486	0.0195	0.013
3	Malignant neoplasms of other and unspecified localizations	0.8775	0.0050	0.000	- 0.0027	0.0049	0.574	0.8888	0.0047	0.000	- 0.0032	0.0046	0.486
4	Malignant neoplasms of digestive organs	0.8486	0.0067	0.000	- 0.0316	0.0066	0.000	0.8625	0.0061	0.000	- 0.0295	0.0060	0.000
5	Malignant neoplasm of colon	0.8676	0.0068	0.000	- 0.0127	0.0067	0.061	0.8800	0.0064	0.000	- 0.0120	0.0063	0.058
6	Malignant neoplasms of rectosigmoid junction, rectum, anus and anal canal	0.8827	0.0102	0.000	0.0024	0.0101	0.812	0.8938	0.0097	0.000	0.0018	0.0096	0.849
7	Malignant neoplasm of bronchus and lung	0.8737	0.0077	0.000	- 0.0066	0.0076	0.385	0.8853	0.0068	0.000	- 0.0067	0.0067	0.319
8	Malignant melanoma of skin	0.8769	0.0047	0.000	- 0.0034	0.0047	0.467	0.8886	0.0045	0.000	- 0.0034	0.0044	0.439
9	Other malignant neoplasms of skin	0.8843	0.0055	0.000	0.0040	0.0054	0.455	0.8953	0.0051	0.000	0.0034	0.0050	0.501
10	Malignant neoplasm of breast	0.8715	0.0035	0.000	- 0.0088	0.0033	0.008	0.8835	0.0033	0.000	- 0.0085	0.0031	0.007
11	Malignant neoplasms of female genital organs	0.8675	0.0061	0.000	- 0.0128	0.0059	0.030	0.8793	0.0057	0.000	- 0.0127	0.0055	0.021
12	Malignant neoplasm of cervix uteri, corpus uteri and part unspecified	0.8728	0.0054	0.000	- 0.0075	0.0052	0.154	0.8848	0.0050	0.000	- 0.0072	0.0048	0.136
13	Malignant tumour of the male genitalia	0.8756	0.0080	0.000	- 0.0047	0.0079	0.549	0.8868	0.0075	0.000	- 0.0052	0.0074	0.481
14	Malignant neoplasm of prostate	0.8797	0.0043	0.000	- 0.0005	0.0041	0.896	0.8909	0.0040	0.000	- 0.0011	0.0039	0.787
15	Malignant neoplasms of urinary tract	0.8783	0.0070	0.000	- 0.0020	0.0068	0.767	0.8896	0.0065	0.000	- 0.0023	0.0064	0.714
16	Brain cancer <sup>a</sup>	0.8860	0.0057	0.000	0.0057	0.0057	0.317	0.8966	0.0055	0.000	0.0046	0.0054	0.398



**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
17	Malignant neoplasms of ill-defined, secondary and unspecified sites, and of independent (primary) multiple sites	0.8756	0.0045	0.000	- 0.0047	0.0044	0.282	0.8868	0.0042	0.000	- 0.0051	0.0042	0.218
18	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	0.8745	0.0060	0.000	- 0.0058	0.0060	0.338	0.8866	0.0057	0.000	- 0.0053	0.0056	0.341
19	In situ neoplasms	0.8755	0.0045	0.000	- 0.0047	0.0043	0.272	0.8873	0.0041	0.000	- 0.0047	0.0039	0.231
20	Haemolytic anaemias	0.8862	0.0102	0.000	0.0059	0.0102	0.564	0.8972	0.0096	0.000	0.0053	0.0096	0.581
21	Aplastic and other anaemias	0.8698	0.0068	0.000	- 0.0105	0.0066	0.112	0.8819	0.0063	0.000	- 0.0101	0.0062	0.102
22	Other anaemias	0.8695	0.0051	0.000	- 0.0107	0.0051	0.033	0.8823	0.0047	0.000	- 0.0097	0.0046	0.037
23	Coagulation defects, purpura and other haemorrhagic conditions	0.8818	0.0061	0.000	0.0015	0.0061	0.806	0.8929	0.0058	0.000	0.0009	0.0057	0.871
24	Other diseases of blood and blood-forming organs	0.8570	0.0064	0.000	- 0.0233	0.0063	0.000	0.8697	0.0059	0.000	- 0.0223	0.0058	0.000
25	Certain disorders involving the immune mechanism	0.8696	0.0081	0.000	- 0.0107	0.0081	0.184	0.8816	0.0075	0.000	- 0.0104	0.0074	0.162
26	Diseases of the thyroid <sup>a</sup>	0.8718	0.0027	0.000	- 0.0085	0.0025	0.001	0.8836	0.0026	0.000	- 0.0084	0.0024	0.000
27	Thyrotoxicosis <sup>a</sup>	0.8723	0.0035	0.000	- 0.0080	0.0033	0.015	0.8842	0.0033	0.000	- 0.0078	0.0031	0.013
28	Diabetes type 1 <sup>a</sup>	0.8756	0.0052	0.000	- 0.0047	0.0051	0.358	0.8869	0.0049	0.000	- 0.0051	0.0048	0.290
29	Diabetes type 2 <sup>a</sup>	0.8701	0.0026	0.000	- 0.0102	0.0023	0.000	0.8822	0.0025	0.000	- 0.0098	0.0023	0.000
30	Diabetes others <sup>a</sup>	0.8726	0.0119	0.000	- 0.0077	0.0118	0.515	0.8841	0.0113	0.000	- 0.0079	0.0112	0.481
31	Disorders of other endocrine glands	0.8723	0.0050	0.000	- 0.0080	0.0048	0.098	0.8844	0.0046	0.000	- 0.0075	0.0045	0.091
32	Metabolic disorders	0.8600	0.0066	0.000	0.0203	0.0065	0.002	0.8734	0.0059	0.000	- 0.0186	0.0058	0.001
33	Disturbances in lipoprotein circulation and other lipids <sup>a</sup>	0.8775	0.0023	0.000	- 0.0028	0.0020	0.167	0.8888	0.0023	0.000	- 0.0032	0.0020	0.114
34	Cystic fibrosis <sup>a</sup>	0.8811	0.0115	0.000	0.0008	0.0115	0.941	0.8923	0.0110	0.000	0.0004	0.0110	0.974

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
35	Inflammatory diseases of the central nervous system	0.8816	0.0096	0.000	0.0014	0.0096	0.886	0.8926	0.0091	0.000	0.0006	0.0090	0.943
36	Systemic atrophies primarily affecting the central nervous system and other degenerative diseases	0.8686	0.0131	0.000	- 0.0117	0.0132	0.374	0.8824	0.0121	0.000	- 0.0096	0.0121	0.429
37	Parkinson's disease <sup>a</sup>	0.8664	0.0042	0.000	- 0.0139	0.0041	0.001	0.8788	0.0040	0.000	- 0.0132	0.0038	0.001
38	Extrapyramidal and movement disorders	0.8642	0.0102	0.000	- 0.0161	0.0101	0.113	0.8769	0.0094	0.000	- 0.0150	0.0093	0.104
39	Sclerosis	0.8501	0.0077	0.000	- 0.0302	0.0077	0.000	0.8638	0.0069	0.000	- 0.0282	0.0069	0.000
40	Demyelinating diseases of the central nervous system	0.8690	0.0087	0.000	- 0.0113	0.0086	0.192	0.8811	0.0080	0.000	- 0.0109	0.0080	0.172
41	Epilepsy <sup>a</sup>	0.8708	0.0039	0.000	- 0.0095	0.0037	0.010	0.8827	0.0037	0.000	- 0.0093	0.0035	0.008
42	Migraine <sup>a</sup>	0.8686	0.0025	0.000	- 0.0117	0.0024	0.000	0.8810	0.0024	0.000	- 0.0110	0.0022	0.000
43	Other headache syndromes	0.8740	0.0067	0.000	- 0.0063	0.0065	0.333	0.8859	0.0060	0.000	- 0.0061	0.0059	0.302
44	Transient cerebral ischaemic attacks and related syndromes and vascular syndromes of brain in cerebrovascular diseases	0.8714	0.0038	0.000	- 0.0088	0.0036	0.015	0.8836	0.0035	0.000	- 0.0084	0.0034	0.014
45	Sleep disorders	0.8721	0.0038	0.000	- 0.0082	0.0036	0.023	0.8840	0.0036	0.000	- 0.0080	0.0034	0.018
46	Disorders of trigeminal nerve and facial nerve disorders	0.8717	0.0050	0.000	- 0.0086	0.0049	0.077	0.8833	0.0046	0.000	- 0.0087	0.0044	0.049

**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
47	Disorders of other cranial nerves, cranial nerve disorders in diseases classified elsewhere, nerve root and plexus disorders and nerve root and plexus compressions in diseases classified elsewhere	0.8685	0.0065	0.000	- 0.0118	0.0065	0.069	0.8804	0.0060	0.000	- 0.0116	0.0059	0.051
48	Mononeuropathies of upper limb	0.8721	0.0028	0.000	- 0.0082	0.0025	0.001	0.8838	0.0027	0.000	- 0.0081	0.0024	0.001
49	Mononeuropathies of lower limb, other mononeuropathies and mononeuropathy in diseases classified elsewhere	0.8685	0.0053	0.000	- 0.0118	0.0051	0.022	0.8808	0.0048	0.000	- 0.0112	0.0047	0.018
50	Polyneuropathies and other disorders of the peripheral nervous system	0.8644	0.0050	0.000	- 0.0159	0.0048	0.001	0.8767	0.0046	0.000	- 0.0153	0.0045	0.001
51	Diseases of myoneural junction and muscle	0.8654	0.0156	0.000	- 0.0149	0.0156	0.338	0.8788	0.0138	0.000	- 0.0132	0.0137	0.335
52	Cerebral palsy and other paralytic syndromes	0.8403	0.0098	0.000	- 0.0400	0.0096	0.000	0.8548	0.0088	0.000	- 0.0372	0.0087	0.000
53	Other disorders of the nervous system	0.8664	0.0048	0.000	- 0.0138	0.0046	0.003	0.8787	0.0044	0.000	- 0.0133	0.0043	0.002
54	Disorders of eyelid, lacrimal system and orbit	0.8798	0.0052	0.000	- 0.0004	0.0051	0.931	0.8916	0.0048	0.000	- 0.0004	0.0048	0.932
55	Corneal scars and opacities	0.8666	0.0080	0.000	- 0.0137	0.0080	0.086	0.8788	0.0073	0.000	- 0.0132	0.0073	0.069
56	Other disorders of cornea	0.8647	0.0098	0.000	- 0.0156	0.0097	0.109	0.8766	0.0093	0.000	- 0.0153	0.0091	0.093
57	Diseases of the eye lens (cataracts)	0.8720	0.0035	0.000	- 0.0083	0.0033	0.013	0.8837	0.0034	0.000	- 0.0083	0.0032	0.009
58	Disorders of the choroid and retina	0.8512	0.0137	0.000	- 0.0291	0.0137	0.034	0.8647	0.0125	0.000	- 0.0273	0.0125	0.029

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
59	Retinal vascular occlusions	0.8940	0.0128	0.000	0.0137	0.0128	0.283	0.9046	0.0123	0.000	0.0127	0.0123	0.302
60	Other retinal disorders	0.8718	0.0034	0.000	- 0.0084	0.0032	0.009	0.8837	0.0032	0.000	- 0.0083	0.0031	0.007
61	Retinal disorders in diseases classified elsewhere	0.8732	0.0054	0.000	- 0.0071	0.0052	0.172	0.8846	0.0051	0.000	- 0.0074	0.0049	0.136
62	Glaucoma <sup>c</sup>	0.8696	0.0032	0.000	- 0.0106	0.0029	0.000	0.8816	0.0030	0.000	- 0.0104	0.0028	0.000
63	Disorders of the vitreous body and globe	0.8679	0.0090	0.000	- 0.0124	0.0089	0.163	0.8804	0.0080	0.000	- 0.0116	0.0079	0.146
64	Disorders of optic nerve and visual pathways	0.8686	0.0091	0.000	- 0.0117	0.0090	0.196	0.8805	0.0085	0.000	- 0.0115	0.0085	0.173
65	Disorders of ocular muscles, binocular movement, accommodation and refraction	0.8820	0.0052	0.000	0.0017	0.0051	0.740	0.8934	0.0049	0.000	0.0014	0.0048	0.766
66	Visual disturbances	0.8745	0.0053	0.000	- 0.0058	0.0052	0.263	0.8860	0.0050	0.000	- 0.0060	0.0049	0.220
67	Blindness and partial sight	0.8818	0.0083	0.000	0.0016	0.0082	0.850	0.8928	0.0079	0.000	0.0009	0.0078	0.913
68	Nystagmus and other irregular eye movements and other disorders of eye and adnexa	0.8752	0.0059	0.000	- 0.0050	0.0058	0.383	0.8866	0.0056	0.000	- 0.0053	0.0054	0.326
69	Otosclerosis	0.8844	0.0059	0.000	0.0041	0.0058	0.482	0.8951	0.0056	0.000	0.0031	0.0055	0.572
70	Ménière's disease <sup>a</sup>	0.8773	0.0058	0.000	- 0.0029	0.0057	0.608	0.8887	0.0055	0.000	- 0.0033	0.0054	0.536
71	Other diseases of the inner ear	0.8761	0.0034	0.000	- 0.0041	0.0032	0.200	0.8876	0.0032	0.000	- 0.0044	0.0031	0.152
72	Conductive and sensorineural hearing loss	0.8730	0.0039	0.000	- 0.0072	0.0037	0.052	0.8847	0.0037	0.000	- 0.0072	0.0035	0.040
73	Other hearing loss and other disorders of ear, not elsewhere classified	0.8752	0.0060	0.000	- 0.0051	0.0058	0.381	0.8866	0.0056	0.000	- 0.0054	0.0055	0.329
74	Presbycusis (age-related hearing loss)	0.8721	0.0033	0.000	- 0.0081	0.0031	0.009	0.8842	0.0031	0.000	- 0.0078	0.0029	0.008
75	Hearing loss, unspecified	0.8750	0.0033	0.000	- 0.0053	0.0031	0.084	0.8864	0.0031	0.000	- 0.0056	0.0029	0.058
76	Tinnitus	0.8716	0.0036	0.000	- 0.0087	0.0035	0.012	0.8836	0.0034	0.000	- 0.0084	0.0032	0.009

**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
77	Other specified disorders of ear	0.8700	0.0049	0.000	- 0.0103	0.0048	0.031	0.8818	0.0046	0.000	- 0.0102	0.0045	0.024
78	Aortic and mitral valve disease <sup>a</sup>	0.8748	0.0042	0.000	- 0.0055	0.0041	0.181	0.8866	0.0040	0.000	- 0.0054	0.0039	0.168
79	Hypertensive diseases <sup>a</sup>	0.8722	0.0023	0.000	- 0.0081	0.0020	0.000	0.8840	0.0022	0.000	- 0.0080	0.0019	0.000
80	Heart failure <sup>a</sup>	0.8648	0.0071	0.000	- 0.0155	0.0069	0.026	0.8771	0.0066	0.000	- 0.0149	0.0065	0.022
81	Angina pectoris	0.8685	0.0032	0.000	- 0.0118	0.0031	0.000	0.8809	0.0031	0.000	- 0.0111	0.0029	0.000
82	Acute myocardial infarction and subsequent myocardial infarction	0.8771	0.0051	0.000	- 0.0032	0.0049	0.509	0.8884	0.0047	0.000	- 0.0035	0.0046	0.444
83	AMI complex/other	0.8764	0.0201	0.000	- 0.0039	0.0200	0.846	0.8889	0.0174	0.000	- 0.0030	0.0173	0.860
84	Chronic ischaemic heart disease	0.8678	0.0035	0.000	- 0.0125	0.0033	0.000	0.8798	0.0033	0.000	- 0.0121	0.0031	0.000
85	Pulmonary heart disease and diseases of pulmonary circulation	0.8782	0.0085	0.000	- 0.0021	0.0085	0.805	0.8896	0.0081	0.000	- 0.0024	0.0081	0.765
86	Acute pericarditis	0.8709	0.0103	0.000	- 0.0094	0.0103	0.362	0.8826	0.0096	0.000	- 0.0093	0.0096	0.329
87	Other forms of heart disease	0.8629	0.0074	0.000	- 0.0174	0.0073	0.018	0.8756	0.0068	0.000	- 0.0164	0.0067	0.015
88	Atrioventricular and left bundle-branch block	0.8235	0.0108	0.000	- 0.0568	0.0109	0.000	0.8402	0.0104	0.000	- 0.0518	0.0105	0.000
89	Other conduction disorders	0.8668	0.0059	0.000	- 0.0135	0.0057	0.018	0.8786	0.0055	0.000	- 0.0134	0.0054	0.013
90	Paroxysmal tachycardia	0.8708	0.0037	0.000	- 0.0095	0.0035	0.008	0.8830	0.0035	0.000	- 0.0090	0.0033	0.007
91	Atrial fibrillation and flutter	0.8713	0.0033	0.000	- 0.0090	0.0030	0.003	0.8830	0.0031	0.000	- 0.0089	0.0029	0.002
92	Other cardiac arrhythmias	0.8769	0.0040	0.000	- 0.0034	0.0039	0.381	0.8886	0.0037	0.000	- 0.0033	0.0036	0.352
93	Complications and ill-defined descriptions of heart disease and other heart disorders in diseases classified elsewhere	0.8596	0.0105	0.000	- 0.0207	0.0104	0.047	0.8720	0.0098	0.000	- 0.0199	0.0098	0.041
94	Stroke	0.8701	0.0046	0.000	- 0.0102	0.0044	0.020	0.8820	0.0043	0.000	- 0.0100	0.0041	0.016
95	Cerebrovascular diseases	0.8762	0.0078	0.000	- 0.0041	0.0076	0.592	0.8881	0.0071	0.000	- 0.0039	0.0069	0.578

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
96	Sequelae of cerebrovascular disease	0.8668	0.0063	0.000	- 0.0134	0.0062	0.030	0.8789	0.0060	0.000	- 0.0130	0.0058	0.026
97	Atherosclerosis	0.8636	0.0059	0.000	- 0.0167	0.0058	0.004	0.8766	0.0055	0.000	- 0.0154	0.0054	0.005
98	Aortic aneurysm and aortic dissection	0.8620	0.0061	0.000	- 0.0183	0.0059	0.002	0.8743	0.0056	0.000	- 0.0177	0.0055	0.001
99	Diseases of arteries, arterioles and capillaries	0.8811	0.0062	0.000	0.0008	0.0060	0.895	0.8928	0.0058	0.000	0.0008	0.0057	0.882
100	Other peripheral vascular diseases	0.8619	0.0049	0.000	- 0.0184	0.0047	0.000	0.8745	0.0045	0.000	- 0.0175	0.0043	0.000
101	Phlebitis, thrombosis of the portal vein and others	0.8708	0.0044	0.000	- 0.0094	0.0042	0.025	0.8828	0.0041	0.000	- 0.0092	0.0039	0.020
102	Varicose veins of lower extremities	0.8751	0.0036	0.000	- 0.0052	0.0034	0.128	0.8866	0.0034	0.000	- 0.0054	0.0032	0.094
103	Haemorrhoids <sup>a</sup>	0.8722	0.0030	0.000	- 0.0081	0.0028	0.004	0.8841	0.0029	0.000	- 0.0079	0.0027	0.003
104	Oesophageal varices (chronic), varicose veins of other sites, other disorders of veins, nonspecific lymphadenitis, other non-infective disorders of lymphatic vessels and lymph nodes and other and unspecified disorders of the circulatory system	0.8750	0.0065	0.000	- 0.0052	0.0064	0.411	0.8865	0.0061	0.000	- 0.0055	0.0060	0.358
105	Respiratory allergy <sup>a</sup>	0.8738	0.0022	0.000	- 0.0065	0.0019	0.001	0.8855	0.0022	0.000	- 0.0065	0.0019	0.001
105A	Chronic lower respiratory diseases <sup>a</sup>	0.8724	0.0025	0.000	- 0.0079	0.0022	0.000	0.8841	0.0024	0.000	- 0.0079	0.0022	0.000
106	Bronchitis, not specified as acute or chronic, simple and mucopurulent chronic bronchitis and unspecified chronic bronchitis	0.8718	0.0064	0.000	- 0.0085	0.0064	0.183	0.8839	0.0059	0.000	- 0.0080	0.0058	0.168
107	Emphysema	0.8751	0.0104	0.000	- 0.0052	0.0104	0.616	0.8863	0.0099	0.000	- 0.0057	0.0098	0.562

**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
108	Chronic obstructive lung disease (COPD) <sup>a</sup>	0.8727	0.0028	0.000	- 0.0076	0.0025	0.003	0.8845	0.0026	0.000	- 0.0075	0.0024	0.002
109	Asthma, status asthmaticus <sup>a</sup>	0.8739	0.0026	0.000	- 0.0064	0.0023	0.006	0.8856	0.0025	0.000	- 0.0063	0.0022	0.005
110	Bronchiectasis	0.8854	0.0122	0.000	0.0051	0.0122	0.676	0.8960	0.0116	0.000	0.0040	0.0116	0.728
111	Other diseases of the respiratory system	0.8751	0.0059	0.000	- 0.0051	0.0058	0.374	0.8869	0.0054	0.000	- 0.0051	0.0053	0.339
112	Ulcers <sup>a</sup>	0.8677	0.0027	0.000	- 0.0125	0.0025	0.000	0.8803	0.0026	0.000	- 0.0116	0.0024	0.000
113	Inguinal hernia	0.8721	0.0037	0.000	- 0.0082	0.0036	0.021	0.8840	0.0035	0.000	- 0.0080	0.0033	0.016
114	Ventral hernia	0.8743	0.0067	0.000	- 0.0060	0.0066	0.366	0.8859	0.0064	0.000	- 0.0060	0.0063	0.337
115	Crohn's disease	0.8690	0.0049	0.000	- 0.0113	0.0048	0.018	0.8809	0.0046	0.000	- 0.0111	0.0045	0.014
116	Ulcerative colitis	0.8726	0.0039	0.000	- 0.0077	0.0037	0.040	0.8841	0.0038	0.000	- 0.0079	0.0036	0.027
117	Other non-infective gastroenteritis and colitis	0.8787	0.0049	0.000	- 0.0016	0.0048	0.734	0.8899	0.0046	0.000	- 0.0020	0.0045	0.650
118	Irritable bowel syndrome (IBS)	0.8727	0.0035	0.000	- 0.0076	0.0033	0.022	0.8845	0.0033	0.000	- 0.0075	0.0031	0.016
119	Other functional intestinal disorders	0.8708	0.0037	0.000	- 0.0094	0.0035	0.007	0.8829	0.0034	0.000	- 0.0091	0.0032	0.005
120	Diseases of liver, biliary tract and pancreas	0.8602	0.0057	0.000	- 0.0201	0.0057	0.000	0.8738	0.0051	0.000	- 0.0181	0.0050	0.000
121	Psoriasis <sup>a</sup>	0.8723	0.0033	0.000	- 0.0079	0.0031	0.011	0.8841	0.0032	0.000	- 0.0078	0.0030	0.008
122	Infectious arthropathies	0.8641	0.0079	0.000	- 0.0162	0.0078	0.039	0.8764	0.0073	0.000	- 0.0156	0.0071	0.029
123	Rheumatoid arthritis <sup>a</sup>	0.8636	0.0033	0.000	- 0.0167	0.0031	0.000	0.8760	0.0031	0.000	- 0.0160	0.0029	0.000
124	Inflammatory polyarthropathies, except rheumatoid arthritis <sup>a</sup>	0.8649	0.0030	0.000	- 0.0153	0.0028	0.000	0.8774	0.0029	0.000	- 0.0146	0.0026	0.000
125	Polyarthrosis (arthrosis)	0.8606	0.0079	0.000	- 0.0197	0.0078	0.012	0.8740	0.0070	0.000	- 0.0180	0.0069	0.009
126	Coxarthrosis (arthrosis of hip)	0.8563	0.0035	0.000	- 0.0240	0.0032	0.000	0.8696	0.0033	0.000	- 0.0224	0.0030	0.000
127	Gonarthrosis (arthrosis of knee)	0.8597	0.0028	0.000	- 0.0206	0.0025	0.000	0.8728	0.0026	0.000	- 0.0191	0.0024	0.000
128	Arthrosis of first carpo-metacarpal joint and other arthrosis	0.8654	0.0031	0.000	- 0.0149	0.0030	0.000	0.8781	0.0029	0.000	- 0.0139	0.0027	0.000
129	Acquired deformities of fingers and toes	0.8694	0.0034	0.000	- 0.0109	0.0032	0.001	0.8814	0.0032	0.000	- 0.0106	0.0030	0.000

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
130	Other acquired deformities of limbs	0.8685	0.0040	0.000	- 0.0117	0.0038	0.002	0.8804	0.0038	0.000	- 0.0116	0.0036	0.001
131	Disorders of patella (kneecap)	0.8681	0.0038	0.000	- 0.0122	0.0036	0.001	0.8805	0.0035	0.000	- 0.0115	0.0033	0.001
132	Internal derangement of knee	0.8541	0.0092	0.000	- 0.0262	0.0092	0.004	0.8685	0.0081	0.000	- 0.0235	0.0080	0.003
133	Derangement of meniscus due to old tear or injury	0.8647	0.0040	0.000	- 0.0156	0.0037	0.000	0.8769	0.0037	0.000	- 0.0151	0.0035	0.000
134	Internal derangement of knee, unspecified	0.8622	0.0045	0.000	- 0.0181	0.0044	0.000	0.8752	0.0040	0.000	- 0.0168	0.0039	0.000
135	Other specific joint derangements	0.8626	0.0066	0.000	- 0.0177	0.0064	0.006	0.8745	0.0062	0.000	- 0.0175	0.0061	0.004
136	Other joint disorders, not elsewhere classified	0.8586	0.0105	0.000	- 0.0217	0.0105	0.039	0.8722	0.0088	0.000	- 0.0198	0.0088	0.024
137	Systemic connective tissue disorders	0.8766	0.0038	0.000	- 0.0037	0.0036	0.314	0.8884	0.0035	0.000	- 0.0035	0.0034	0.292
138	Systemic lupus erythematosus	0.8941	0.0105	0.000	0.0138	0.0104	0.186	0.9047	0.0099	0.000	0.0127	0.0098	0.196
139	Dermatopolymyositis	0.8747	0.0082	0.000	- 0.0056	0.0081	0.489	0.8857	0.0078	0.000	- 0.0063	0.0077	0.415
140	Systemic sclerosis	0.8731	0.0175	0.000	- 0.0072	0.0174	0.679	0.8850	0.0157	0.000	- 0.0070	0.0157	0.658
141	Kyphosis, lordosis	0.8545	0.0096	0.000	- 0.0258	0.0095	0.007	0.8680	0.0083	0.000	- 0.0240	0.0083	0.004
142	Scoliosis	0.8633	0.0072	0.000	- 0.0170	0.0070	0.016	0.8762	0.0063	0.000	- 0.0158	0.0061	0.010
143	Spinal osteochondrosis	0.8384	0.0109	0.000	- 0.0419	0.0108	0.000	0.8535	0.0098	0.000	- 0.0385	0.0097	0.000
144	Other deforming dorsopathies	0.8561	0.0056	0.000	- 0.0241	0.0057	0.000	0.8698	0.0050	0.000	- 0.0221	0.0050	0.000
145	Other inflammatory spondylopathies	0.8522	0.0135	0.000	- 0.0281	0.0135	0.037	0.8668	0.0122	0.000	- 0.0252	0.0122	0.039
146	Spondylosis	0.8583	0.0039	0.000	0.0220	0.0037	0.000	0.8717	0.0035	0.000	- 0.0203	0.0033	0.000
147	Other spondylopathies and spondylopathies in diseases classified elsewhere	0.8624	0.0042	0.000	- 0.0179	0.0041	0.000	0.8751	0.0039	0.000	- 0.0169	0.0037	0.000
148	Cervical disc disorders	0.8665	0.0045	0.000	- 0.0138	0.0043	0.001	0.8782	0.0043	0.000	- 0.0138	0.0041	0.001
149	Other intervertebral disc disorders	0.8558	0.0046	0.000	- 0.0245	0.0045	0.000	0.8691	0.0041	0.000	- 0.0229	0.0040	0.000



**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
150	Other dorsopathies, not elsewhere classified	0.8532	0.0088	0.000	- 0.0271	0.0088	0.002	0.8675	0.0080	0.000	- 0.0245	0.0080	0.002
151	Dorsalgia	0.8478	0.0063	0.000	- 0.0325	0.0063	0.000	0.8625	0.0056	0.000	- 0.0295	0.0055	0.000
152	Soft tissue disorders	0.8722	0.0054	0.000	- 0.0081	0.0053	0.127	0.8838	0.0051	0.000	- 0.0081	0.0050	0.101
153	Synovitis and tenosynovitis	0.8680	0.0045	0.000	- 0.0123	0.0043	0.004	0.8804	0.0041	0.000	- 0.0116	0.0039	0.003
154	Disorders of synovium and tendon	0.8660	0.0048	0.000	- 0.0142	0.0047	0.002	0.8785	0.0044	0.000	- 0.0135	0.0042	0.001
155	Soft tissue disorders related to use, overuse and pressure	0.8595	0.0076	0.000	- 0.0208	0.0074	0.005	0.8728	0.0067	0.000	- 0.0192	0.0065	0.003
156	Fibroblastic disorders	0.8698	0.0038	0.000	- 0.0105	0.0036	0.004	0.8817	0.0036	0.000	- 0.0103	0.0034	0.002
157	Shoulder lesions	0.8637	0.0037	0.000	- 0.0166	0.0036	0.000	0.8769	0.0033	0.000	- 0.0150	0.0032	0.000
158	Enthesopathies of lower limb, excluding foot	0.8582	0.0106	0.000	- 0.0220	0.0104	0.034	0.8714	0.0093	0.000	- 0.0206	0.0091	0.023
159	Other enthesopathies	0.8603	0.0067	0.000	- 0.0200	0.0066	0.003	0.8734	0.0060	0.000	- 0.0186	0.0058	0.001
160	Rheumatism, unspecified	0.8539	0.0096	0.000	- 0.0264	0.0094	0.005	0.8663	0.0087	0.000	- 0.0257	0.0085	0.003
161	Myalgia	0.8771	0.0058	0.000	- 0.0032	0.0056	0.567	0.8883	0.0053	0.000	- 0.0037	0.0052	0.475
162	Other soft tissue disorders, not elsewhere classified	0.8649	0.0097	0.000	- 0.0154	0.0097	0.111	0.8784	0.0085	0.000	- 0.0136	0.0085	0.108
163	Other soft tissue disorders, not elsewhere classified: pain in limb	0.8639	0.0053	0.000	- 0.0164	0.0052	0.002	0.8768	0.0048	0.000	- 0.0152	0.0046	0.001
164	Fibromyalgia	0.5191	0.0343	0.000	- 0.3612	0.0345	0.000	0.5091	0.0365	0.000	- 0.3829	0.0368	0.000
165	Osteoporosis <sup>a</sup>	0.8690	0.0027	0.000	- 0.0113	0.0025	0.000	0.8811	0.0026	0.000	- 0.0109	0.0024	0.000
166	Osteoporosis in diseases classified elsewhere	0.8658	0.0111	0.000	- 0.0145	0.0111	0.190	0.8775	0.0105	0.000	- 0.0145	0.0105	0.166
167	Adult osteomalacia and other disorders of bone density and structure	0.8709	0.0036	0.000	- 0.0094	0.0034	0.006	0.8828	0.0034	0.000	- 0.0091	0.0032	0.005
168	Disorders of continuity of bone	0.8748	0.0155	0.000	- 0.0055	0.0154	0.720	0.8871	0.0141	0.000	- 0.0049	0.0141	0.729
169	Other osteopathies	0.8709	0.0059	0.000	- 0.0094	0.0059	0.110	0.8832	0.0054	0.000	- 0.0088	0.0053	0.097

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
170	Other disorders of the musculoskeletal system and connective tissue	0.8685	0.0049	0.000	- 0.0117	0.0047	0.013	0.8806	0.0045	0.000	- 0.0114	0.0043	0.009
171	Chronic renal failure (CRF) <sup>a</sup>	0.8808	0.0092	0.000	0.0006	0.0092	0.951	0.8922	0.0088	0.000	0.0002	0.0087	0.979
172	Congenital malformations: of the nervous, circulatory, respiratory system; cleft palate and cleft lip, urinary tract, bones and muscles, other and chromosomal abnormalities not elsewhere classified	0.8663	0.0034	0.000	- 0.0140	0.0031	0.000	0.8785	0.0032	0.000	- 0.0135	0.0030	0.000
173	Congenital malformations of eye, ear, face and neck	0.8812	0.0048	0.000	0.0009	0.0047	0.848	0.8925	0.0046	0.000	0.0005	0.0045	0.915
174	Other congenital malformations of the digestive system	0.8762	0.0072	0.000	- 0.0041	0.0071	0.561	0.8874	0.0068	0.000	- 0.0046	0.0067	0.492
175	Congenital malformations of the sexual organs	0.8751	0.0047	0.000	- 0.0051	0.0046	0.263	0.8867	0.0045	0.000	- 0.0053	0.0044	0.223
176	Dementia <sup>a</sup>	0.8423	0.0138	0.000	- 0.0380	0.0136	0.005	0.8559	0.0128	0.000	- 0.0361	0.0127	0.005
177	Organic, including symptomatic, mental disorders	0.8672	0.0068	0.000	- 0.0131	0.0067	0.050	0.8794	0.0063	0.000	- 0.0126	0.0062	0.043
178	Mental and behavioural disorders due to use of alcohol	0.8676	0.0052	0.000	- 0.0127	0.0051	0.012	0.8796	0.0049	0.000	- 0.0123	0.0048	0.009
179	Mental and behavioural disorders due to psychoactive substance use	0.8757	0.0044	0.000	- 0.0046	0.0043	0.285	0.8873	0.0042	0.000	- 0.0046	0.0041	0.254
180	Schizophrenia <sup>a</sup>	0.8599	0.0085	0.000	- 0.0203	0.0085	0.017	0.8734	0.0078	0.000	- 0.0186	0.0078	0.016
181	Schizotypal and delusional disorders	0.8925	0.0099	0.000	0.0122	0.0098	0.216	0.9028	0.0094	0.000	0.0109	0.0094	0.249

**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
182	Bipolar affective disorder <sup>a</sup>	0.8723	0.0114	0.000	- 0.0080	0.0114	0.481	0.8841	0.0108	0.000	- 0.0079	0.0107	0.459
183	Depression <sup>a</sup>	0.8513	0.0027	0.000	- 0.0290	0.0025	0.000	0.8655	0.0026	0.000	- 0.0265	0.0024	0.000
184	Mood (affective) disorders	0.8599	0.0109	0.000	- 0.0203	0.0108	0.061	0.8722	0.0102	0.000	- 0.0198	0.0102	0.051
185	Phobic anxiety disorders	0.8635	0.0107	0.000	- 0.0168	0.0107	0.116	0.8768	0.0098	0.000	- 0.0152	0.0097	0.119
186	Other anxiety disorders	0.8785	0.0072	0.000	- 0.0018	0.0071	0.801	0.8899	0.0069	0.000	- 0.0021	0.0067	0.757
187	Obsessive compulsive disorder (OCD) <sup>a</sup>	0.8647	0.0087	0.000	- 0.0156	0.0087	0.073	0.8777	0.0082	0.000	- 0.0143	0.0081	0.079
188	Post-traumatic stress disorder	0.8613	0.0107	0.000	- 0.0190	0.0106	0.074	0.8733	0.0101	0.000	- 0.0186	0.0100	0.062
189	Reactions to severe stress and adjustment disorders	0.8820	0.0066	0.000	0.0017	0.0066	0.795	0.8933	0.0063	0.000	0.0013	0.0063	0.834
190	Dissociative (conversion) disorders, somatoform disorders and other neurotic disorders	0.8651	0.0085	0.000	- 0.0152	0.0084	0.073	0.8780	0.0073	0.000	- 0.0139	0.0072	0.053
191	Eating disorders	0.9110	0.0290	0.000	0.0307	0.0291	0.291	0.9215	0.0288	0.000	0.0295	0.0287	0.304
192	Behavioural syndromes associated with physiological disturbances and physical factors	0.8768	0.0062	0.000	- 0.0035	0.0061	0.564	0.8879	0.0059	0.000	- 0.0041	0.0058	0.480
193	Emotionally unstable personality disorder	0.8634	0.0066	0.000	- 0.0169	0.0065	0.009	0.8752	0.0063	0.000	- 0.0167	0.0061	0.006
194	Specific personality disorders	0.8740	0.0059	0.000	- 0.0063	0.0057	0.273	0.8860	0.0054	0.000	- 0.0060	0.0053	0.259
195	Disorders of adult personality and behaviour	0.8785	0.0113	0.000	- 0.0017	0.0113	0.877	0.8898	0.0108	0.000	- 0.0022	0.0107	0.838
196	Mental retardation	0.9524	0.0229	0.000	0.0722	0.0231	0.002	0.9599	0.0211	0.000	0.0679	0.0212	0.001
197	Disorders of psychological development	0.8882	0.0122	0.000	0.0079	0.0122	0.514	0.9003	0.0111	0.000	0.0083	0.0111	0.452
198	Hyperkinetic disorders (ADHD) <sup>a</sup>	0.8732	0.0061	0.000	- 0.0071	0.0059	0.230	0.8850	0.0057	0.000	- 0.0070	0.0055	0.203

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
199	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	0.8747	0.0062	0.000	- 0.0056	0.0060	0.354	0.8862	0.0058	0.000	- 0.0058	0.0057	0.312
	<b>Denmark sample (base)</b>	0.8818	0.0021	0.000				0.8934	0.0019	0.000			
	North Denmark Region (sample 2-3)	0.8803	0.0021	0.000	- 0.0016	0.0007	0.019	0.8920	0.0019	0.000	- 0.0014	0.0006	0.024
	<b>Specific ages (dydx)</b>												
	Age 16	0.8990	0.0043	0.000	- 0.0003	0.0003	0.226	0.9122	0.0041	0.000	- 0.0005	0.0002	0.045
	Age 20	0.8973	0.0036	0.000	- 0.0005	0.0002	0.016	0.9100	0.0034	0.000	- 0.0006	0.0002	0.002
	Age 25	0.8943	0.0028	0.000	- 0.0007	0.0002	0.001	0.9065	0.0027	0.000	- 0.0007	0.0002	0.000
	Age 30	0.8909	0.0023	0.000	- 0.0007	0.0002	0.000	0.9029	0.0022	0.000	- 0.0007	0.0002	0.000
	Age 35	0.8877	0.0021	0.000	- 0.0006	0.0001	0.000	0.8994	0.0019	0.000	- 0.0007	0.0001	0.000
	Age 40	0.8847	0.0020	0.000	- 0.0005	0.0001	0.000	0.8964	0.0019	0.000	- 0.0006	0.0001	0.000
	Age 45	0.8822	0.0020	0.000	- 0.0004	0.0001	0.000	0.8939	0.0019	0.000	- 0.0004	0.0001	0.000
	Age 50	0.8803	0.0021	0.000	- 0.0003	0.0001	0.000	0.8920	0.0019	0.000	- 0.0003	0.0001	0.000
	Age 55	0.8789	0.0021	0.000	- 0.0002	0.0001	0.004	0.8907	0.0019	0.000	- 0.0002	0.0001	0.015
	Age 60	0.8781	0.0021	0.000	- 0.0001	0.0001	0.320	0.8901	0.0019	0.000	- 0.0001	0.0001	0.586
	Age 65	0.8779	0.0023	0.000	0.0000	0.0001	0.978	0.8901	0.0021	0.000	0.0001	0.0001	0.648
	Age 70	0.8780	0.0026	0.000	0.0001	0.0002	0.705	0.8907	0.0025	0.000	0.0002	0.0002	0.347
	Age 75	0.8784	0.0031	0.000	0.0001	0.0002	0.757	0.8916	0.0030	0.000	0.0002	0.0002	0.301
	Age 80	0.8784	0.0037	0.000	- 0.0001	0.0002	0.705	0.8924	0.0037	0.000	0.0001	0.0002	0.553
	Age 85	0.8773	0.0043	0.000	- 0.0004	0.0003	0.148	0.8924	0.0043	0.000	- 0.0001	0.0002	0.541
	<b>Education</b>												
	No education (base)	0.8778	0.0025	0.000				0.8895	0.0025	0.000			
	Student	0.8788	0.0041	0.000	0.0011	0.0038	0.778	0.8901	0.0041	0.000	0.0006	0.0038	0.885
	Short	0.8803	0.0021	0.000	0.0025	0.0020	0.197	0.8920	0.0019	0.000	0.0024	0.0020	0.219
	Middle (BSc eq)	0.8899	0.0024	0.000	0.0121	0.0024	0.000	0.9012	0.0024	0.000	0.0117	0.0024	0.000
	Higher (MSc+)	0.9029	0.0033	0.000	0.0252	0.0034	0.000	0.9139	0.0032	0.000	0.0244	0.0033	0.000
	<b>Ethnicity</b>												
	Danish (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Western	0.8704	0.0031	0.000	- 0.0099	0.0025	0.000	0.8833	0.0029	0.000	- 0.0087	0.0022	0.000
	Non-Western	0.8703	0.0032	0.000	- 0.0100	0.0024	0.000	0.8828	0.0030	0.000	- 0.0092	0.0022	0.000

**Table 5** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
<b>Income</b>													
	0.19 (25%)	0.8806	0.0021	0.000	- 0.0044	0.0046	0.339	0.8924	0.0020	0.000	- 0.0051	0.0048	0.292
	0.26 (50%)	0.8804	0.0021	0.000	- 0.0043	0.0046	0.346	0.8921	0.0019	0.000	- 0.0050	0.0048	0.299
	0.33 (75%)	0.8800	0.0021	0.000	- 0.0042	0.0045	0.355	0.8917	0.0019	0.000	- 0.0048	0.0047	0.307
<b>Marriage/partner</b>													
	Partner/married (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	No partner	0.8806	0.0020	0.000	0.0003	0.0006	0.574	0.8923	0.0019	0.000	0.0003	0.0005	0.564
<b>Children</b>													
	No children < 15 (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Children < 15	0.8804	0.0021	0.000	0.0001	0.0008	0.863	0.8921	0.0020	0.000	0.0001	0.0007	0.874
<b>Loneliness</b>													
	Not/seldom lonely (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Often lonely	0.8651	0.0028	0.000	- 0.0152	0.0019	0.000	0.8784	0.0026	0.000	- 0.0136	0.0017	0.000
<b>Stress</b>													
	80% least stressed (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	20% most stressed	0.8208	0.0028	0.000	- 0.0595	0.0026	0.000	0.8385	0.0027	0.000	- 0.0535	0.0023	0.000
<b>BMI</b>													
	BMI < 18.5	0.8788	0.0029	0.000	- 0.0015	0.0021	0.463	0.8905	0.0027	0.000	- 0.0015	0.0019	0.435
	BMI 18.5–25 (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	BMI > 25 < 30	0.8772	0.0021	0.000	- 0.0030	0.0007	0.000	0.8891	0.0019	0.000	- 0.0029	0.0006	0.000
	BMI ≥ 30 < 35	0.8742	0.0022	0.000	- 0.0061	0.0010	0.000	0.8863	0.0020	0.000	- 0.0056	0.0009	0.000
	BMI ≥ 35	0.8674	0.0027	0.000	- 0.0129	0.0019	0.000	0.8807	0.0024	0.000	- 0.0113	0.0017	0.000
<b>Smoking</b>													
	Do not smoke daily (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Smoke daily	0.8762	0.0022	0.000	- 0.0040	0.0008	0.000	0.8883	0.0020	0.000	- 0.0037	0.0007	0.000
<b>Drinking</b>													
	Do not exceed recommendations (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Exceed recommendations	0.8779	0.0023	0.000	- 0.0024	0.0012	0.047	0.8900	0.0021	0.000	- 0.0020	0.0011	0.065
<b>Exercise</b>													
	Exercise at least 4 h/day (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			

Table 5 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	Do not exercise	0.8690	0.0024	0.000	-0.0112	0.0010	0.000	0.8818	0.0022	0.000	-0.0102	0.0009	0.000
	<b>Fruit intake</b>												
	Do not meet recommendations (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	5 or more portions	0.8801	0.0024	0.000	-0.0002	0.0012	0.887	0.8918	0.0022	0.000	-0.0002	0.0011	0.877
	<b>SF-12 General Health (self-reported)</b>												
	Excellent	0.9791	0.0010	0.000	0.0988	0.0021	0.000	0.9832	0.0009	0.000	0.0912	0.0019	0.000
	Very good	0.9399	0.0014	0.000	0.0596	0.0015	0.000	0.9484	0.0012	0.000	0.0564	0.0014	0.000
	Good (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Fair	0.7625	0.0047	0.000	-0.1178	0.0045	0.000	0.7731	0.0045	0.000	-0.1188	0.0043	0.000
	Poor	0.6434	0.0171	0.000	-0.2369	0.0169	0.000	0.6659	0.0173	0.000	-0.2260	0.0171	0.000
	Missing	0.8812	0.0082	0.000	0.0009	0.0080	0.905	0.8942	0.0079	0.000	0.0022	0.0077	0.778
	<b>Long-term illness or disability (self-reported)</b>												
	No long-term illness (base)	0.8803	0.0021	0.000				0.8920	0.0019	0.000			
	Long-term illness	0.8075	0.0028	0.000	-0.0728	0.0022	0.000	0.8186	0.0027	0.000	-0.0733	0.0021	0.000

Note:  $n = 55,616$  in all models<sup>a</sup>Complex defined condition

**Table 6** ALDVMM predictions and marginal effects of representative 50-year-olds by sex: US base model—chronic conditions and age

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	No conditions	0.9149	0.0011	0.000				0.9249	0.0011	0.000			
1	Chronic viral hepatitis	0.8125	0.0384	0.000	- 0.1024	0.0383	0.008	0.8209	0.0409	0.000	- 0.1040	0.0408	0.011
2	Human immunodeficiency virus (HIV) disease	0.8984	0.0553	0.000	- 0.0165	0.0553	0.766	0.9099	0.0524	0.000	- 0.0150	0.0524	0.775
3	Malignant neoplasms of other and unspecified localizations	0.9058	0.0067	0.000	- 0.0091	0.0067	0.175	0.9168	0.0064	0.000	- 0.0081	0.0064	0.207
4	Malignant neoplasms of digestive organs	0.8584	0.0142	0.000	- 0.0565	0.0142	0.000	0.8706	0.0143	0.000	- 0.0543	0.0143	0.000
5	Malignant neoplasm of colon	0.9005	0.0075	0.000	- 0.0144	0.0074	0.053	0.9117	0.0073	0.000	- 0.0132	0.0072	0.065
6	Malignant neoplasms of rectosigmoid junction, rectum, anus and anal canal	0.9135	0.0082	0.000	- 0.0014	0.0082	0.867	0.9242	0.0078	0.000	- 0.0008	0.0078	0.922
7	Malignant neoplasm of bronchus and lung	0.8878	0.0094	0.000	- 0.0271	0.0094	0.004	0.8995	0.0092	0.000	- 0.0254	0.0092	0.006
8	Malignant melanoma of skin	0.9126	0.0062	0.000	- 0.0023	0.0061	0.710	0.9233	0.0058	0.000	- 0.0016	0.0058	0.778
9	Other malignant neoplasms of skin	0.9149	0.0077	0.000	0.0001	0.0077	0.995	0.9255	0.0073	0.000	0.0005	0.0073	0.941
10	Malignant neoplasm of breast	0.8936	0.0042	0.000	- 0.0213	0.0041	0.000	0.9051	0.0041	0.000	- 0.0199	0.0040	0.000
11	Malignant neoplasms of female genital organs	0.9053	0.0107	0.000	- 0.0096	0.0107	0.370	0.9164	0.0103	0.000	- 0.0085	0.0102	0.404
12	Malignant neoplasm of cervix uteri, corpus uteri and part unspecified	0.9023	0.0078	0.000	- 0.0126	0.0078	0.106	0.9136	0.0074	0.000	- 0.0114	0.0075	0.127
13	Malignant tumour of the male genitalia	0.9129	0.0179	0.000	- 0.0020	0.0178	0.910	0.9235	0.0171	0.000	- 0.0015	0.0170	0.931
14	Malignant neoplasm of prostate	0.9064	0.0053	0.000	- 0.0084	0.0052	0.103	0.9175	0.0050	0.000	- 0.0075	0.0049	0.130
15	Malignant neoplasms of urinary tract	0.8979	0.0078	0.000	- 0.0170	0.0078	0.029	0.9092	0.0075	0.000	- 0.0157	0.0075	0.037
16	Brain cancer <sup>a</sup>	0.9176	0.0075	0.000	0.0027	0.0075	0.719	0.9280	0.0071	0.000	0.0031	0.0070	0.660

Table 6 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
17	Malignant neoplasms of ill-defined, secondary and unspecified sites, and of independent (primary) multiple sites	0.8915	0.0064	0.000	- 0.0234	0.0063	0.000	0.9032	0.0062	0.000	- 0.0218	0.0061	0.000
18	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	0.9070	0.0075	0.000	- 0.0079	0.0075	0.295	0.9181	0.0072	0.000	- 0.0069	0.0072	0.337
19	In situ neoplasms	0.9013	0.0055	0.000	- 0.0136	0.0055	0.013	0.9124	0.0053	0.000	- 0.0126	0.0053	0.017
20	Haemolytic anaemias	0.9392	0.0167	0.000	0.0243	0.0167	0.145	0.9481	0.0152	0.000	0.0232	0.0152	0.128
21	Aplastic and other anaemias	0.9021	0.0089	0.000	- 0.0127	0.0089	0.153	0.9135	0.0086	0.000	- 0.0115	0.0085	0.178
22	Other anaemias	0.8965	0.0062	0.000	- 0.0184	0.0062	0.003	0.9080	0.0060	0.000	- 0.0169	0.0060	0.005
23	Coagulation defects, purpura and other haemorrhagic conditions	0.9140	0.0065	0.000	- 0.0009	0.0066	0.890	0.9246	0.0062	0.000	- 0.0003	0.0062	0.956
24	Other diseases of blood and blood-forming organs	0.8736	0.0143	0.000	- 0.0413	0.0143	0.004	0.8851	0.0144	0.000	- 0.0399	0.0143	0.005
25	Certain disorders involving the immune mechanism	0.8939	0.0106	0.000	- 0.0209	0.0106	0.049	0.9055	0.0103	0.000	- 0.0194	0.0103	0.059
26	Diseases of the thyroid <sup>a</sup>	0.8994	0.0030	0.000	- 0.0155	0.0030	0.000	0.9107	0.0030	0.000	- 0.0143	0.0029	0.000
27	Thyrotoxicosis <sup>a</sup>	0.9031	0.0041	0.000	- 0.0117	0.0041	0.004	0.9143	0.0039	0.000	- 0.0106	0.0039	0.006
28	Diabetes type 1 <sup>a</sup>	0.8945	0.0070	0.000	- 0.0204	0.0070	0.004	0.9058	0.0068	0.000	- 0.0191	0.0068	0.005
29	Diabetes type 2 <sup>a</sup>	0.8934	0.0026	0.000	- 0.0215	0.0025	0.000	0.9050	0.0025	0.000	- 0.0199	0.0024	0.000
30	Diabetes others <sup>a</sup>	0.8758	0.0351	0.000	- 0.0391	0.0351	0.265	0.8875	0.0349	0.000	- 0.0374	0.0349	0.283
31	Disorders of other endocrine glands	0.8817	0.0067	0.000	- 0.0331	0.0067	0.000	0.8936	0.0066	0.000	- 0.0313	0.0066	0.000
32	Metabolic disorders	0.8845	0.0070	0.000	- 0.0304	0.0070	0.000	0.8962	0.0068	0.000	- 0.0287	0.0068	0.000
33	Disturbances in lipoprotein circulation and other lipids <sup>a</sup>	0.9085	0.0019	0.000	- 0.0064	0.0018	0.000	0.9193	0.0019	0.000	- 0.0056	0.0017	0.001
34	Cystic fibrosis <sup>a</sup>	0.8542	0.0535	0.000	- 0.0607	0.0535	0.257	0.8670	0.0532	0.000	- 0.0579	0.0532	0.276



**Table 6** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
35	Inflammatory diseases of the central nervous system	0.9052	0.0152	0.000	- 0.0097	0.0152	0.521	0.9162	0.0146	0.000	- 0.0088	0.0146	0.547
36	Systemic atrophies primarily affecting the central nervous system and other degenerative diseases	0.8748	0.0157	0.000	- 0.0401	0.0156	0.010	0.8869	0.0155	0.000	- 0.0381	0.0154	0.014
37	Parkinson's disease <sup>a</sup>	0.8802	0.0055	0.000	- 0.0347	0.0055	0.000	0.8922	0.0054	0.000	- 0.0328	0.0053	0.000
38	Extrapyramidal and movement disorders	0.8975	0.0119	0.000	- 0.0174	0.0118	0.143	0.9090	0.0115	0.000	- 0.0160	0.0114	0.162
39	Sclerosis	0.8308	0.0104	0.000	- 0.0841	0.0103	0.000	0.8433	0.0106	0.000	- 0.0816	0.0104	0.000
40	Demyelinating diseases of the central nervous system	0.8874	0.0126	0.000	- 0.0275	0.0126	0.029	0.8992	0.0122	0.000	- 0.0257	0.0122	0.035
41	Epilepsy <sup>a</sup>	0.8873	0.0054	0.000	- 0.0275	0.0054	0.000	0.8992	0.0053	0.000	- 0.0258	0.0052	0.000
42	Migraine <sup>a</sup>	0.8895	0.0026	0.000	- 0.0254	0.0026	0.000	0.9012	0.0026	0.000	- 0.0237	0.0025	0.000
43	Other headache syndromes	0.8881	0.0088	0.000	- 0.0268	0.0088	0.002	0.9000	0.0086	0.000	- 0.0250	0.0085	0.003
44	Transient cerebral ischaemic attacks and related syndromes and vascular syndromes of brain in cerebrovascular diseases	0.9063	0.0045	0.000	- 0.0086	0.0044	0.053	0.9174	0.0042	0.000	- 0.0076	0.0042	0.073
45	Sleep disorders	0.8866	0.0052	0.000	- 0.0282	0.0051	0.000	0.8983	0.0050	0.000	- 0.0266	0.0050	0.000
46	Disorders of trigeminal nerve and facial nerve disorders	0.8988	0.0072	0.000	- 0.0161	0.0071	0.024	0.9101	0.0069	0.000	- 0.0149	0.0069	0.031

Table 6 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
47	Disorders of other cranial nerves, cranial nerve disorders in diseases classified elsewhere, nerve root and plexus disorders and nerve root and plexus compressions in diseases classified elsewhere	0.8878	0.0104	0.000	- 0.0271	0.0104	0.009	0.8997	0.0101	0.000	- 0.0253	0.0101	0.012
48	Mononeuropathies of upper limb	0.8931	0.0030	0.000	- 0.0218	0.0030	0.000	0.9047	0.0029	0.000	- 0.0203	0.0029	0.000
49	Mononeuropathies of lower limb, other mononeuropathies and mononeuropathy in diseases classified elsewhere	0.8900	0.0078	0.000	- 0.0249	0.0077	0.001	0.9018	0.0075	0.000	- 0.0232	0.0075	0.002
50	Polyneuropathies and other disorders of the peripheral nervous system	0.8807	0.0073	0.000	- 0.0341	0.0073	0.000	0.8927	0.0072	0.000	- 0.0322	0.0072	0.000
51	Diseases of myoneural junction and muscle	0.8750	0.0153	0.000	- 0.0399	0.0153	0.009	0.8871	0.0152	0.000	- 0.0378	0.0151	0.012
52	Cerebral palsy and other paralytic syndromes	0.8581	0.0142	0.000	- 0.0568	0.0142	0.000	0.8706	0.0141	0.000	- 0.0543	0.0142	0.000
53	Other disorders of the nervous system	0.8830	0.0071	0.000	- 0.0319	0.0071	0.000	0.8949	0.0070	0.000	- 0.0301	0.0069	0.000
54	Disorders of eyelid, lacrimal system and orbit	0.9076	0.0060	0.000	- 0.0073	0.0060	0.224	0.9186	0.0057	0.000	- 0.0064	0.0057	0.266
55	Corneal scars and opacities	0.8967	0.0173	0.000	- 0.0182	0.0173	0.291	0.9080	0.0168	0.000	- 0.0170	0.0167	0.310
56	Other disorders of cornea	0.9232	0.0096	0.000	0.0083	0.0096	0.388	0.9333	0.0090	0.000	0.0083	0.0090	0.356
57	Diseases of the eye lens (cataracts)	0.9059	0.0042	0.000	- 0.0089	0.0041	0.030	0.9170	0.0040	0.000	- 0.0080	0.0039	0.043
58	Disorders of the choroid and retina	0.8924	0.0190	0.000	- 0.0225	0.0190	0.236	0.9040	0.0185	0.000	- 0.0210	0.0185	0.256

**Table 6** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
59	Retinal vascular occlusions	0.9185	0.0094	0.000	0.0037	0.0094	0.696	0.9290	0.0088	0.000	0.0040	0.0088	0.645
60	Other retinal disorders	0.9031	0.0044	0.000	- 0.0118	0.0043	0.006	0.9143	0.0042	0.000	- 0.0107	0.0041	0.009
61	Retinal disorders in diseases classified elsewhere	0.8949	0.0085	0.000	- 0.0200	0.0085	0.018	0.9063	0.0083	0.000	- 0.0186	0.0082	0.024
62	Glaucoma <sup>c</sup>	0.9007	0.0039	0.000	- 0.0142	0.0038	0.000	0.9120	0.0037	0.000	- 0.0130	0.0036	0.000
63	Disorders of the vitreous body and globe	0.8814	0.0101	0.000	- 0.0335	0.0101	0.001	0.8934	0.0099	0.000	- 0.0316	0.0099	0.001
64	Disorders of optic nerve and visual pathways	0.9138	0.0135	0.000	- 0.0011	0.0136	0.936	0.9245	0.0128	0.000	- 0.0005	0.0129	0.971
65	Disorders of ocular muscles, binocular movement, accommodation and refraction	0.9110	0.0057	0.000	- 0.0038	0.0057	0.499	0.9215	0.0054	0.000	- 0.0034	0.0054	0.530
66	Visual disturbances	0.9140	0.0060	0.000	- 0.0008	0.0060	0.890	0.9247	0.0057	0.000	- 0.0002	0.0057	0.973
67	Blindness and partial sight	0.9116	0.0135	0.000	- 0.0033	0.0135	0.809	0.9225	0.0127	0.000	- 0.0025	0.0127	0.845
68	Nystagmus and other irregular eye movements and other disorders of eye and adnexa	0.9141	0.0112	0.000	- 0.0008	0.0112	0.945	0.9248	0.0106	0.000	- 0.0001	0.0105	0.991
69	Otosclerosis	0.9191	0.0073	0.000	0.0042	0.0073	0.564	0.9294	0.0069	0.000	0.0045	0.0068	0.512
70	Ménière's disease <sup>a</sup>	0.8836	0.0084	0.000	- 0.0313	0.0084	0.000	0.8952	0.0083	0.000	- 0.0297	0.0082	0.000
71	Other diseases of the inner ear	0.9037	0.0041	0.000	- 0.0112	0.0040	0.006	0.9148	0.0039	0.000	- 0.0102	0.0039	0.009
72	Conductive and sensorineural hearing loss	0.9051	0.0046	0.000	- 0.0098	0.0045	0.032	0.9162	0.0044	0.000	- 0.0088	0.0043	0.044
73	Other hearing loss and other disorders of ear, not elsewhere classified	0.8921	0.0090	0.000	- 0.0227	0.0090	0.012	0.9038	0.0087	0.000	- 0.0212	0.0087	0.015
74	Presbycusis (age-related hearing loss)	0.9083	0.0033	0.000	- 0.0066	0.0032	0.039	0.9193	0.0031	0.000	- 0.0057	0.0030	0.060
75	Hearing loss, unspecified	0.9061	0.0036	0.000	- 0.0087	0.0036	0.014	0.9172	0.0035	0.000	- 0.0078	0.0034	0.022
76	Tinnitus	0.8975	0.0041	0.000	- 0.0174	0.0040	0.000	0.9088	0.0039	0.000	- 0.0161	0.0039	0.000

Table 6 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
77	Other specified disorders of ear	0.9045	0.0057	0.000	- 0.0104	0.0056	0.066	0.9156	0.0054	0.000	- 0.0093	0.0054	0.085
78	Aortic and mitral valve disease <sup>a</sup>	0.9035	0.0056	0.000	- 0.0113	0.0056	0.042	0.9147	0.0054	0.000	- 0.0103	0.0054	0.055
79	Hypertensive diseases <sup>a</sup>	0.8968	0.0018	0.000	- 0.0181	0.0017	0.000	0.9082	0.0018	0.000	- 0.0167	0.0016	0.000
80	Heart failure <sup>a</sup>	0.8989	0.0073	0.000	- 0.0160	0.0072	0.027	0.9104	0.0070	0.000	- 0.0146	0.0069	0.035
81	Angina pectoris	0.8958	0.0039	0.000	- 0.0190	0.0038	0.000	0.9073	0.0037	0.000	- 0.0176	0.0037	0.000
82	Acute myocardial infarction and subsequent myocardial infarction	0.9125	0.0060	0.000	- 0.0024	0.0059	0.688	0.9233	0.0057	0.000	- 0.0017	0.0056	0.764
83	AMI complex/other	0.8696	0.0196	0.000	- 0.0453	0.0196	0.021	0.8818	0.0194	0.000	- 0.0431	0.0194	0.026
84	Chronic ischaemic heart disease	0.8986	0.0048	0.000	- 0.0163	0.0047	0.001	0.9100	0.0046	0.000	- 0.0150	0.0045	0.001
85	Pulmonary heart disease and diseases of pulmonary circulation	0.8993	0.0104	0.000	- 0.0156	0.0103	0.131	0.9107	0.0100	0.000	- 0.0142	0.0099	0.152
86	Acute pericarditis	0.9097	0.0149	0.000	- 0.0051	0.0149	0.729	0.9203	0.0143	0.000	- 0.0046	0.0143	0.746
87	Other forms of heart disease	0.8869	0.0135	0.000	- 0.0279	0.0135	0.039	0.8983	0.0134	0.000	- 0.0266	0.0133	0.046
88	Atrioventricular and left bundle-branch block	0.9095	0.0077	0.000	- 0.0054	0.0077	0.483	0.9204	0.0073	0.000	- 0.0046	0.0073	0.532
89	Other conduction disorders	0.9002	0.0103	0.000	- 0.0147	0.0103	0.153	0.9113	0.0100	0.000	- 0.0136	0.0100	0.171
90	Paroxysmal tachycardia	0.9013	0.0046	0.000	- 0.0136	0.0046	0.003	0.9125	0.0044	0.000	- 0.0124	0.0044	0.005
91	Atrial fibrillation and flutter	0.8990	0.0038	0.000	- 0.0159	0.0036	0.000	0.9103	0.0036	0.000	- 0.0147	0.0035	0.000
92	Other cardiac arrhythmias	0.9048	0.0050	0.000	- 0.0100	0.0050	0.043	0.9159	0.0048	0.000	- 0.0090	0.0047	0.057
93	Complications and ill-defined descriptions of heart disease and other heart disorders in diseases classified elsewhere	0.9000	0.0218	0.000	- 0.0149	0.0218	0.495	0.9114	0.0209	0.000	- 0.0135	0.0209	0.518
94	Stroke	0.8943	0.0051	0.000	- 0.0206	0.0050	0.000	0.9059	0.0049	0.000	- 0.0191	0.0049	0.000
95	Cerebrovascular diseases	0.8803	0.0086	0.000	- 0.0346	0.0086	0.000	0.8923	0.0084	0.000	- 0.0327	0.0084	0.000

**Table 6** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
96	Sequelae of cerebrovascular disease	0.8864	0.0075	0.000	- 0.0285	0.0075	0.000	0.8983	0.0074	0.000	- 0.0267	0.0073	0.000
97	Atherosclerosis	0.8960	0.0070	0.000	- 0.0189	0.0070	0.007	0.9076	0.0067	0.000	- 0.0174	0.0067	0.010
98	Aortic aneurysm and aortic dissection	0.8768	0.0125	0.000	- 0.0381	0.0124	0.002	0.8883	0.0124	0.000	- 0.0366	0.0123	0.003
99	Diseases of arteries, arterioles and capillaries	0.9060	0.0079	0.000	- 0.0089	0.0078	0.256	0.9171	0.0075	0.000	- 0.0079	0.0075	0.293
100	Other peripheral vascular diseases	0.8798	0.0069	0.000	- 0.0350	0.0069	0.000	0.8918	0.0068	0.000	- 0.0331	0.0068	0.000
101	Phlebitis, thrombosis of the portal vein and others	0.9006	0.0055	0.000	- 0.0143	0.0055	0.009	0.9119	0.0053	0.000	- 0.0131	0.0052	0.013
102	Varicose veins of lower extremities	0.9155	0.0043	0.000	0.0006	0.0043	0.881	0.9260	0.0041	0.000	0.0011	0.0041	0.796
103	Haemorrhoids <sup>a</sup>	0.9007	0.0034	0.000	- 0.0142	0.0034	0.000	0.9120	0.0032	0.000	- 0.0130	0.0032	0.000
104	Oesophageal varices (chronic), varicose veins of other sites, other disorders of veins, nonspecific lymphadenitis, other non-infective disorders of lymphatic vessels and lymph nodes and other and unspecified disorders of the circulatory system	0.9039	0.0102	0.000	- 0.0110	0.0102	0.279	0.9150	0.0098	0.000	- 0.0100	0.0098	0.308
105	Respiratory allergy <sup>a</sup>	0.9047	0.0016	0.000	- 0.0102	0.0015	0.000	0.9158	0.0015	0.000	- 0.0092	0.0014	0.000
105A	Chronic lower respiratory diseases <sup>a</sup>	0.9027	0.0023	0.000	- 0.0122	0.0022	0.000	0.9139	0.0022	0.000	- 0.0110	0.0021	0.000
106	Bronchitis, not specified as acute or chronic, simple and mucopurulent chronic bronchitis and unspecified chronic bronchitis	0.8948	0.0098	0.000	- 0.0201	0.0098	0.041	0.9063	0.0095	0.000	- 0.0186	0.0095	0.050
107	Emphysema	0.9022	0.0132	0.000	- 0.0127	0.0132	0.336	0.9135	0.0127	0.000	- 0.0115	0.0126	0.365

Table 6 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
108	Chronic obstructive lung disease (COPD) <sup>a</sup>	0.8917	0.0030	0.000	- 0.0232	0.0029	0.000	0.9033	0.0029	0.000	- 0.0216	0.0028	0.000
109	Asthma, status asthmaticus <sup>a</sup>	0.8993	0.0026	0.000	- 0.0156	0.0025	0.000	0.9107	0.0024	0.000	- 0.0143	0.0024	0.000
110	Bronchiectasis	0.9386	0.0135	0.000	0.0237	0.0135	0.079	0.9475	0.0122	0.000	0.0226	0.0123	0.066
111	Other diseases of the respiratory system	0.8973	0.0083	0.000	- 0.0176	0.0083	0.034	0.9088	0.0080	0.000	- 0.0161	0.0080	0.043
112	Ulcers <sup>a</sup>	0.8832	0.0028	0.000	- 0.0317	0.0027	0.000	0.8951	0.0027	0.000	- 0.0299	0.0026	0.000
113	Inguinal hernia	0.9073	0.0046	0.000	- 0.0076	0.0045	0.093	0.9182	0.0043	0.000	- 0.0067	0.0043	0.118
114	Ventral hernia	0.8989	0.0094	0.000	- 0.0160	0.0093	0.085	0.9104	0.0090	0.000	- 0.0146	0.0089	0.102
115	Crohn's disease	0.8855	0.0080	0.000	- 0.0294	0.0080	0.000	0.8971	0.0079	0.000	- 0.0278	0.0078	0.000
116	Ulcerative colitis	0.8928	0.0058	0.000	- 0.0221	0.0057	0.000	0.9043	0.0056	0.000	- 0.0206	0.0056	0.000
117	Other non-infective gastroenteritis and colitis	0.8963	0.0077	0.000	- 0.0186	0.0077	0.016	0.9078	0.0075	0.000	- 0.0172	0.0074	0.021
118	Irritable bowel syndrome (IBS)	0.8913	0.0045	0.000	- 0.0236	0.0044	0.000	0.9028	0.0044	0.000	- 0.0221	0.0043	0.000
119	Other functional intestinal disorders	0.8908	0.0049	0.000	- 0.0241	0.0049	0.000	0.9025	0.0048	0.000	- 0.0224	0.0047	0.000
120	Diseases of liver, biliary tract and pancreas	0.8802	0.0069	0.000	- 0.0346	0.0069	0.000	0.8922	0.0068	0.000	- 0.0327	0.0068	0.000
121	Psoriasis <sup>a</sup>	0.9002	0.0039	0.000	- 0.0147	0.0039	0.000	0.9116	0.0038	0.000	- 0.0133	0.0037	0.000
122	Infectious arthropathies	0.8931	0.0108	0.000	- 0.0218	0.0107	0.043	0.9047	0.0104	0.000	- 0.0202	0.0104	0.052
123	Rheumatoid arthritis <sup>a</sup>	0.8745	0.0041	0.000	- 0.0404	0.0041	0.000	0.8865	0.0041	0.000	- 0.0385	0.0040	0.000
124	Inflammatory polyarthropathies, except rheumatoid arthritis <sup>a</sup>	0.8858	0.0035	0.000	- 0.0291	0.0034	0.000	0.8975	0.0035	0.000	- 0.0274	0.0033	0.000
125	Polyarthrosis (arthrosis)	0.8785	0.0096	0.000	- 0.0364	0.0096	0.000	0.8905	0.0094	0.000	- 0.0344	0.0094	0.000
126	Coxarthrosis (arthrosis of hip)	0.8831	0.0036	0.000	- 0.0318	0.0035	0.000	0.8949	0.0035	0.000	- 0.0300	0.0034	0.000
127	Gonarthrosis (arthrosis of knee)	0.8771	0.0026	0.000	- 0.0377	0.0025	0.000	0.8891	0.0026	0.000	- 0.0359	0.0024	0.000
128	Arthrosis of first carpometacarpal joint and other arthrosis	0.8848	0.0035	0.000	- 0.0300	0.0035	0.000	0.8966	0.0035	0.000	- 0.0283	0.0034	0.000
129	Acquired deformities of fingers and toes	0.9041	0.0043	0.000	- 0.0108	0.0042	0.011	0.9151	0.0042	0.000	- 0.0098	0.0041	0.016

**Table 6** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
130	Other acquired deformities of limbs	0.8874	0.0068	0.000	- 0.0275	0.0067	0.000	0.8991	0.0067	0.000	- 0.0259	0.0066	0.000
131	Disorders of patella (kneecap)	0.8859	0.0047	0.000	- 0.0290	0.0046	0.000	0.8978	0.0045	0.000	- 0.0272	0.0045	0.000
132	Internal derangement of knee	0.8747	0.0088	0.000	- 0.0402	0.0088	0.000	0.8868	0.0087	0.000	- 0.0381	0.0086	0.000
133	Derangement of meniscus due to old tear or injury	0.9005	0.0047	0.000	- 0.0144	0.0046	0.002	0.9117	0.0045	0.000	- 0.0133	0.0045	0.003
134	Internal derangement of knee, unspecified	0.8865	0.0052	0.000	- 0.0284	0.0051	0.000	0.8980	0.0051	0.000	- 0.0269	0.0050	0.000
135	Other specific joint derangements	0.8782	0.0155	0.000	- 0.0367	0.0154	0.018	0.8903	0.0152	0.000	- 0.0347	0.0152	0.022
136	Other joint disorders, not elsewhere classified	0.8625	0.0072	0.000	- 0.0523	0.0072	0.000	0.8747	0.0072	0.000	- 0.0503	0.0071	0.000
137	Systemic connective tissue disorders	0.8912	0.0052	0.000	- 0.0237	0.0053	0.000	0.9028	0.0051	0.000	- 0.0222	0.0051	0.000
138	Systemic lupus erythematosus	0.9175	0.0119	0.000	0.0026	0.0118	0.826	0.9279	0.0111	0.000	0.0030	0.0110	0.787
139	Dermatopolymyositis	0.9390	0.0249	0.000	0.0241	0.0249	0.334	0.9479	0.0228	0.000	0.0229	0.0227	0.313
140	Systemic sclerosis	0.8610	0.0308	0.000	- 0.0538	0.0308	0.081	0.8738	0.0304	0.000	- 0.0511	0.0304	0.093
141	Kyphosis, lordosis	0.8660	0.0145	0.000	- 0.0489	0.0145	0.001	0.8781	0.0144	0.000	- 0.0468	0.0144	0.001
142	Scoliosis	0.8701	0.0092	0.000	- 0.0448	0.0092	0.000	0.8820	0.0091	0.000	- 0.0429	0.0091	0.000
143	Spinal osteochondrosis	0.8636	0.0156	0.000	- 0.0513	0.0156	0.001	0.8758	0.0155	0.000	- 0.0491	0.0156	0.002
144	Other deforming dorsopathies	0.8629	0.0072	0.000	- 0.0520	0.0071	0.000	0.8750	0.0072	0.000	- 0.0500	0.0071	0.000
145	Other inflammatory spondylopathies	0.8893	0.0134	0.000	- 0.0256	0.0133	0.055	0.9011	0.0130	0.000	- 0.0238	0.0129	0.065
146	Spondylosis	0.8606	0.0042	0.000	- 0.0542	0.0042	0.000	0.8729	0.0043	0.000	- 0.0521	0.0042	0.000
147	Other spondylopathies and spondylopathies in diseases classified elsewhere	0.8813	0.0059	0.000	- 0.0336	0.0059	0.000	0.8931	0.0058	0.000	- 0.0319	0.0058	0.000
148	Cervical disc disorders	0.8783	0.0096	0.000	- 0.0365	0.0095	0.000	0.8902	0.0095	0.000	- 0.0347	0.0094	0.000
149	Other intervertebral disc disorders	0.8574	0.0060	0.000	- 0.0574	0.0060	0.000	0.8698	0.0060	0.000	- 0.0552	0.0059	0.000

Table 6 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
150	Other dorsopathies, not elsewhere classified	0.8590	0.0119	0.000	- 0.0559	0.0118	0.000	0.8711	0.0119	0.000	- 0.0538	0.0119	0.000
151	Dorsalgia	0.8433	0.0051	0.000	- 0.0716	0.0050	0.000	0.8554	0.0052	0.000	- 0.0695	0.0051	0.000
152	Soft tissue disorders	0.8810	0.0088	0.000	- 0.0339	0.0088	0.000	0.8931	0.0086	0.000	- 0.0319	0.0085	0.000
153	Synovitis and tenosynovitis	0.8950	0.0058	0.000	- 0.0199	0.0058	0.001	0.9066	0.0055	0.000	- 0.0184	0.0055	0.001
154	Disorders of synovium and tendon	0.8876	0.0065	0.000	- 0.0273	0.0065	0.000	0.8992	0.0064	0.000	- 0.0257	0.0063	0.000
155	Soft tissue disorders related to use, overuse and pressure	0.8773	0.0085	0.000	- 0.0375	0.0086	0.000	0.8893	0.0084	0.000	- 0.0357	0.0084	0.000
156	Fibroblastic disorders	0.9058	0.0047	0.000	- 0.0091	0.0046	0.048	0.9168	0.0044	0.000	- 0.0081	0.0044	0.065
157	Shoulder lesions	0.8716	0.0036	0.000	- 0.0433	0.0035	0.000	0.8837	0.0035	0.000	- 0.0412	0.0035	0.000
158	Enthesopathies of lower limb, excluding foot	0.8782	0.0105	0.000	- 0.0367	0.0105	0.001	0.8900	0.0103	0.000	- 0.0349	0.0103	0.001
159	Other enthesopathies	0.8612	0.0088	0.000	- 0.0537	0.0088	0.000	0.8735	0.0088	0.000	- 0.0514	0.0088	0.000
160	Rheumatism, unspecified	0.8478	0.0154	0.000	- 0.0671	0.0154	0.000	0.8599	0.0156	0.000	- 0.0650	0.0156	0.000
161	Myalgia	0.8820	0.0092	0.000	- 0.0329	0.0092	0.000	0.8940	0.0090	0.000	- 0.0309	0.0090	0.001
162	Other soft tissue disorders, not elsewhere classified	0.8809	0.0109	0.000	- 0.0340	0.0109	0.002	0.8928	0.0106	0.000	- 0.0321	0.0106	0.003
163	Other soft tissue disorders, not elsewhere classified: pain in limb	0.8781	0.0070	0.000	- 0.0368	0.0070	0.000	0.8900	0.0069	0.000	- 0.0349	0.0069	0.000
164	Fibromyalgia	0.8592	0.0250	0.000	- 0.0557	0.0250	0.026	0.8716	0.0250	0.000	- 0.0534	0.0250	0.032
165	Osteoporosis <sup>a</sup>	0.8905	0.0030	0.000	- 0.0244	0.0029	0.000	0.9022	0.0030	0.000	- 0.0228	0.0028	0.000
166	Osteoporosis in diseases classified elsewhere	0.9225	0.0260	0.000	0.0076	0.0260	0.769	0.9327	0.0244	0.000	0.0077	0.0243	0.751
167	Adult osteomalacia and other disorders of bone density and structure	0.8956	0.0047	0.000	- 0.0193	0.0047	0.000	0.9070	0.0046	0.000	- 0.0179	0.0046	0.000
168	Disorders of continuity of bone	0.8925	0.0191	0.000	- 0.0224	0.0191	0.242	0.9042	0.0185	0.000	- 0.0207	0.0185	0.262
169	Other osteopathies	0.8867	0.0077	0.000	- 0.0282	0.0077	0.000	0.8985	0.0075	0.000	- 0.0264	0.0075	0.000



**Table 6** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
170	Other disorders of the musculoskeletal system and connective tissue	0.8884	0.0067	0.000	- 0.0265	0.0067	0.000	0.9001	0.0065	0.000	- 0.0248	0.0065	0.000
171	Chronic renal failure (CRF) <sup>a</sup>	0.9071	0.0085	0.000	- 0.0078	0.0085	0.357	0.9182	0.0081	0.000	- 0.0068	0.0081	0.400
172	Congenital malformations: of the nervous, circulatory, respiratory system; cleft palate and cleft lip, urinary tract, bones and muscles, other and chromosomal abnormalities not elsewhere classified	0.9003	0.0040	0.000	- 0.0146	0.0040	0.000	0.9116	0.0038	0.000	- 0.0133	0.0038	0.000
173	Congenital malformations of eye, ear, face and neck	0.9010	0.0065	0.000	- 0.0139	0.0065	0.033	0.9122	0.0062	0.000	- 0.0127	0.0062	0.041
174	Other congenital malformations of the digestive system	0.9050	0.0117	0.000	- 0.0099	0.0117	0.397	0.9160	0.0113	0.000	- 0.0090	0.0113	0.426
175	Congenital malformations of the sexual organs	0.9031	0.0072	0.000	- 0.0118	0.0072	0.103	0.9142	0.0070	0.000	- 0.0108	0.0069	0.120
176	Dementia <sup>a</sup>	0.8886	0.0158	0.000	- 0.0263	0.0158	0.096	0.9005	0.0153	0.000	- 0.0245	0.0153	0.109
177	Organic, including symptomatic, mental disorders	0.8974	0.0111	0.000	- 0.0175	0.0111	0.114	0.9088	0.0107	0.000	- 0.0161	0.0107	0.132
178	Mental and behavioural disorders due to use of alcohol	0.8846	0.0065	0.000	- 0.0303	0.0064	0.000	0.8964	0.0063	0.000	- 0.0285	0.0063	0.000
179	Mental and behavioural disorders due to psychoactive substance use	0.8979	0.0059	0.000	- 0.0170	0.0059	0.004	0.9094	0.0057	0.000	- 0.0156	0.0057	0.006
180	Schizophrenia <sup>a</sup>	0.8719	0.0108	0.000	- 0.0430	0.0108	0.000	0.8840	0.0107	0.000	- 0.0409	0.0106	0.000
181	Schizotypal and delusional disorders	0.9237	0.0088	0.000	0.0088	0.0088	0.317	0.9338	0.0082	0.000	0.0088	0.0082	0.281

Table 6 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
182	Bipolar affective disorder <sup>a</sup>	0.8959	0.0136	0.000	- 0.0190	0.0136	0.164	0.9073	0.0132	0.000	- 0.0177	0.0132	0.182
183	Depression <sup>a</sup>	0.8533	0.0025	0.000	- 0.0616	0.0023	0.000	0.8655	0.0026	0.000	- 0.0594	0.0023	0.000
184	Mood (affective) disorders	0.8849	0.0250	0.000	- 0.0300	0.0249	0.229	0.8962	0.0248	0.000	- 0.0288	0.0247	0.245
185	Phobic anxiety disorders	0.8726	0.0131	0.000	- 0.0422	0.0130	0.001	0.8847	0.0129	0.000	- 0.0403	0.0129	0.002
186	Other anxiety disorders	0.8889	0.0076	0.000	- 0.0260	0.0076	0.001	0.9007	0.0074	0.000	- 0.0242	0.0074	0.001
187	Obsessive compulsive disorder (OCD) <sup>a</sup>	0.8954	0.0132	0.000	- 0.0195	0.0131	0.137	0.9067	0.0128	0.000	0.0182	0.0128	0.153
188	Post-traumatic stress disorder	0.8410	0.0235	0.000	- 0.0739	0.0235	0.002	0.8533	0.0238	0.000	- 0.0717	0.0238	0.003
189	Reactions to severe stress and adjustment disorders	0.8929	0.0064	0.000	- 0.0220	0.0064	0.001	0.9045	0.0062	0.000	- 0.0204	0.0062	0.001
190	Dissociative (conversion) disorders, somatoform disorders and other neurotic disorders	0.8903	0.0088	0.000	- 0.0245	0.0087	0.005	0.9020	0.0085	0.000	- 0.0229	0.0085	0.007
191	Eating disorders	0.9111	0.0121	0.000	- 0.0038	0.0121	0.754	0.9220	0.0115	0.000	- 0.0030	0.0114	0.795
192	Behavioural syndromes associated with physiological disturbances and physical factors	0.8962	0.0133	0.000	- 0.0187	0.0133	0.159	0.9074	0.0129	0.000	- 0.0175	0.0129	0.174
193	Emotionally unstable personality disorder	0.8661	0.0146	0.000	- 0.0488	0.0146	0.001	0.8780	0.0147	0.000	- 0.0469	0.0146	0.001
194	Specific personality disorders	0.8834	0.0066	0.000	- 0.0315	0.0066	0.000	0.8953	0.0065	0.000	- 0.0297	0.0064	0.000
195	Disorders of adult personality and behaviour	0.9012	0.0136	0.000	- 0.0137	0.0136	0.316	0.9126	0.0130	0.000	- 0.0124	0.0130	0.343
196	Mental retardation	0.9154	0.0257	0.000	0.0005	0.0257	0.985	0.9260	0.0241	0.000	0.0010	0.0241	0.965
197	Disorders of psychological development	0.8843	0.0158	0.000	- 0.0305	0.0157	0.052	0.8961	0.0155	0.000	- 0.0288	0.0154	0.062
198	Hyperkinetic disorders (ADHD) <sup>a</sup>	0.8694	0.0082	0.000	- 0.0455	0.0081	0.000	0.8815	0.0081	0.000	- 0.0435	0.0080	0.000

**Table 6** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
199	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	0.9041	0.0086	0.000	- 0.0108	0.0086	0.208	0.9153	0.0082	0.000	- 0.0097	0.0082	0.237
	<b>Denmark sample (base)</b>	0.9179	0.0013	0.000				0.9278	0.0012	0.000			
	North Denmark Region (sample 2-3)	0.9149	0.0011	0.000	- 0.0030	0.0009	0.001	0.9249	0.0011	0.000	- 0.0028	0.0009	0.001
	<b>Specific ages (dydx)</b>												
	Age 16	0.9236	0.0017	0.000	0.0000	0.0001	0.902	0.9334	0.0015	0.000	0.0000	0.0001	0.954
	Age 20	0.9234	0.0014	0.000	- 0.0001	0.0001	0.349	0.9332	0.0012	0.000	- 0.0001	0.0001	0.233
	Age 25	0.9227	0.0011	0.000	- 0.0002	0.0001	0.013	0.9325	0.0010	0.000	- 0.0002	0.0001	0.005
	Age 30	0.9216	0.0010	0.000	- 0.0003	0.0001	0.000	0.9314	0.0010	0.000	- 0.0002	0.0001	0.000
	Age 35	0.9202	0.0010	0.000	- 0.0003	0.0000	0.000	0.9301	0.0009	0.000	- 0.0003	0.0000	0.000
	Age 40	0.9186	0.0010	0.000	- 0.0003	0.0000	0.000	0.9285	0.0010	0.000	- 0.0003	0.0000	0.000
	Age 45	0.9168	0.0011	0.000	- 0.0004	0.0000	0.000	0.9268	0.0010	0.000	- 0.0004	0.0000	0.000
	Age 50	0.9149	0.0011	0.000	- 0.0004	0.0000	0.000	0.9249	0.0011	0.000	- 0.0004	0.0000	0.000
	Age 55	0.9128	0.0012	0.000	- 0.0004	0.0000	0.000	0.9230	0.0011	0.000	- 0.0004	0.0000	0.000
	Age 60	0.9106	0.0013	0.000	- 0.0005	0.0001	0.000	0.9209	0.0012	0.000	- 0.0004	0.0001	0.000
	Age 65	0.9081	0.0014	0.000	- 0.0005	0.0001	0.000	0.9186	0.0013	0.000	- 0.0005	0.0001	0.000
	Age 70	0.9054	0.0016	0.000	- 0.0006	0.0001	0.000	0.9161	0.0015	0.000	- 0.0005	0.0001	0.000
	Age 75	0.9024	0.0019	0.000	- 0.0007	0.0001	0.000	0.9133	0.0018	0.000	- 0.0006	0.0001	0.000
	Age 80	0.8988	0.0023	0.000	- 0.0008	0.0001	0.000	0.9101	0.0023	0.000	- 0.0007	0.0001	0.000
	Age 85	0.8945	0.0029	0.000	- 0.0009	0.0002	0.000	0.9062	0.0028	0.000	- 0.0009	0.0001	0.000

Note: *n* = 55,616 in all models

<sup>a</sup>Complex defined condition

**Table 7** ALDVMM predictions and marginal effects of representative 50-year-olds by sex: US full model—chronic conditions, socio-economic, lifestyle and risk variables

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	No conditions	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
1	Chronic viral hepatitis	0.8892	0.0360	0.000	− 0.0446	0.0359	0.215	0.8982	0.0357	0.000	− 0.0432	0.0356	0.226
2	Human immunodeficiency virus (HIV) disease	0.9753	0.0374	0.000	0.0416	0.0374	0.266	0.9791	0.0323	0.000	0.0377	0.0324	0.244
3	Malignant neoplasms of other and unspecified localizations	0.9350	0.0062	0.000	0.0012	0.0061	0.848	0.9425	0.0058	0.000	0.0011	0.0057	0.847
4	Malignant neoplasms of digestive organs	0.8947	0.0142	0.000	− 0.0391	0.0141	0.006	0.9037	0.0139	0.000	− 0.0377	0.0139	0.007
5	Malignant neoplasm of colon	0.9314	0.0066	0.000	− 0.0024	0.0065	0.713	0.9392	0.0062	0.000	− 0.0022	0.0061	0.716
6	Malignant neoplasms of rectosigmoid junction, rectum, anus and anal canal	0.9394	0.0075	0.000	0.0056	0.0074	0.446	0.9467	0.0070	0.000	0.0053	0.0069	0.443
7	Malignant neoplasm of bronchus and lung	0.9206	0.0085	0.000	− 0.0132	0.0084	0.118	0.9289	0.0081	0.000	− 0.0125	0.0081	0.121
8	Malignant melanoma of skin	0.9310	0.0055	0.000	− 0.0028	0.0055	0.610	0.9387	0.0052	0.000	− 0.0026	0.0052	0.609
9	Other malignant neoplasms of skin	0.9431	0.0069	0.000	0.0094	0.0069	0.172	0.9501	0.0064	0.000	0.0088	0.0064	0.169
10	Malignant neoplasm of breast	0.9242	0.0038	0.000	− 0.0096	0.0036	0.009	0.9323	0.0036	0.000	− 0.0090	0.0035	0.009
11	Malignant neoplasms of female genital organs	0.9347	0.0091	0.000	0.0010	0.0091	0.916	0.9423	0.0086	0.000	0.0009	0.0085	0.915
12	Malignant neoplasm of cervix uteri, corpus uteri and part unspecified	0.9315	0.0065	0.000	− 0.0022	0.0064	0.727	0.9392	0.0062	0.000	− 0.0021	0.0061	0.725
13	Malignant tumour of the male genitalia	0.9484	0.0115	0.000	0.0146	0.0115	0.202	0.9550	0.0106	0.000	0.0137	0.0106	0.196
14	Malignant neoplasm of prostate	0.9343	0.0046	0.000	0.0005	0.0044	0.904	0.9419	0.0043	0.000	0.0005	0.0042	0.903
15	Malignant neoplasms of urinary tract	0.9322	0.0066	0.000	− 0.0016	0.0066	0.804	0.9399	0.0063	0.000	− 0.0015	0.0062	0.806
16	Brain cancer <sup>a</sup>	0.9441	0.0065	0.000	0.0103	0.0064	0.108	0.9510	0.0060	0.000	0.0097	0.0060	0.105

**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
17	Malignant neoplasms of ill-defined, secondary and unspecified sites, and of independent (primary) multiple sites	0.9230	0.0057	0.000	- 0.0108	0.0056	0.055	0.9312	0.0054	0.000	- 0.0102	0.0054	0.057
18	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	0.9328	0.0063	0.000	- 0.0010	0.0063	0.879	0.9405	0.0060	0.000	- 0.0009	0.0059	0.882
19	In situ neoplasms	0.9247	0.0051	0.000	- 0.0091	0.0050	0.068	0.9328	0.0049	0.000	- 0.0086	0.0048	0.070
20	Haemolytic anaemias	0.9548	0.0144	0.000	0.0210	0.0144	0.144	0.9608	0.0131	0.000	0.0194	0.0131	0.138
21	Aplastic and other anaemias	0.9243	0.0089	0.000	- 0.0095	0.0089	0.283	0.9324	0.0085	0.000	- 0.0090	0.0084	0.285
22	Other anaemias	0.9278	0.0050	0.000	- 0.0060	0.0049	0.217	0.9357	0.0047	0.000	- 0.0057	0.0046	0.219
23	Coagulation defects, purpura and other haemorrhagic conditions	0.9404	0.0056	0.000	0.0066	0.0055	0.233	0.9476	0.0052	0.000	0.0062	0.0052	0.229
24	Other diseases of blood and blood-forming organs	0.9199	0.0113	0.000	- 0.0138	0.0112	0.218	0.9282	0.0108	0.000	- 0.0131	0.0108	0.222
25	Certain disorders involving the immune mechanism	0.9201	0.0097	0.000	- 0.0137	0.0096	0.156	0.9284	0.0093	0.000	- 0.0130	0.0092	0.160
26	Diseases of the thyroid <sup>a</sup>	0.9261	0.0027	0.000	- 0.0077	0.0025	0.002	0.9341	0.0026	0.000	- 0.0072	0.0024	0.002
27	Thyrotoxicosis <sup>a</sup>	0.9291	0.0036	0.000	- 0.0047	0.0035	0.183	0.9369	0.0035	0.000	- 0.0044	0.0033	0.184
28	Diabetes type 1 <sup>a</sup>	0.9246	0.0059	0.000	- 0.0092	0.0058	0.115	0.9327	0.0056	0.000	- 0.0087	0.0055	0.118
29	Diabetes type 2 <sup>a</sup>	0.9292	0.0023	0.000	- 0.0045	0.0020	0.026	0.9371	0.0022	0.000	- 0.0043	0.0019	0.027
30	Diabetes others <sup>a</sup>	0.9282	0.0217	0.000	- 0.0056	0.0217	0.797	0.9361	0.0206	0.000	- 0.0053	0.0206	0.798
31	Disorders of other endocrine glands	0.9179	0.0058	0.000	- 0.0159	0.0056	0.005	0.9262	0.0055	0.000	- 0.0151	0.0054	0.005
32	Metabolic disorders	0.9137	0.0069	0.000	- 0.0200	0.0068	0.003	0.9223	0.0067	0.000	- 0.0191	0.0066	0.004
33	Disturbances in lipoprotein circulation and other lipids <sup>a</sup>	0.9344	0.0017	0.000	0.0007	0.0014	0.647	0.9420	0.0016	0.000	0.0006	0.0013	0.641

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
34	Cystic fibrosis <sup>a</sup>	0.9092	0.0345	0.000	- 0.0246	0.0345	0.477	0.9179	0.0333	0.000	- 0.0235	0.0333	0.482
35	Inflammatory diseases of the central nervous system	0.9411	0.0117	0.000	0.0074	0.0117	0.530	0.9483	0.0109	0.000	0.0069	0.0109	0.526
36	Systemic atrophies primarily affecting the central nervous system and other degenerative diseases	0.9038	0.0142	0.000	- 0.0300	0.0142	0.034	0.9126	0.0139	0.000	- 0.0287	0.0138	0.037
37	Parkinson's disease <sup>a</sup>	0.9173	0.0049	0.000	- 0.0164	0.0047	0.001	0.9258	0.0047	0.000	- 0.0156	0.0045	0.001
38	Extrapyramidal and movement disorders	0.9192	0.0111	0.000	- 0.0145	0.0110	0.187	0.9276	0.0106	0.000	- 0.0138	0.0106	0.191
39	Sclerosis	0.8821	0.0095	0.000	- 0.0516	0.0095	0.000	0.8913	0.0095	0.000	- 0.0500	0.0094	0.000
40	Demyelinating diseases of the central nervous system	0.9160	0.0114	0.000	- 0.0178	0.0114	0.118	0.9245	0.0109	0.000	- 0.0169	0.0109	0.121
41	Epilepsy <sup>a</sup>	0.9232	0.0045	0.000	- 0.0106	0.0043	0.015	0.9313	0.0043	0.000	- 0.0101	0.0041	0.015
42	Migraine <sup>a</sup>	0.9179	0.0024	0.000	- 0.0159	0.0022	0.000	0.9263	0.0023	0.000	- 0.0151	0.0021	0.000
43	Other headache syndromes	0.9221	0.0077	0.000	- 0.0117	0.0076	0.125	0.9303	0.0074	0.000	- 0.0111	0.0073	0.127
44	Transient cerebral ischaemic attacks and related syndromes and vascular syndromes of brain in cerebrovascular diseases	0.9343	0.0039	0.000	0.0005	0.0037	0.883	0.9419	0.0036	0.000	0.0005	0.0035	0.884
45	Sleep disorders	0.9256	0.0045	0.000	- 0.0082	0.0043	0.060	0.9337	0.0042	0.000	- 0.0077	0.0041	0.061
46	Disorders of trigeminal nerve and facial nerve disorders	0.9261	0.0065	0.000	- 0.0076	0.0065	0.238	0.9342	0.0062	0.000	- 0.0072	0.0061	0.241

**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
47	Disorders of other cranial nerves, cranial nerve disorders in diseases classified elsewhere, nerve root and plexus disorders and nerve root and plexus compressions in diseases classified elsewhere	0.9189	0.0097	0.000	- 0.0149	0.0096	0.122	0.9272	0.0093	0.000	- 0.0141	0.0092	0.125
48	Mononeuropathies of upper limb	0.9251	0.0027	0.000	- 0.0087	0.0025	0.001	0.9332	0.0026	0.000	- 0.0082	0.0024	0.001
49	Mononeuropathies of lower limb, other mononeuropathies and mononeuropathy in diseases classified elsewhere	0.9217	0.0066	0.000	- 0.0121	0.0065	0.061	0.9299	0.0063	0.000	- 0.0115	0.0062	0.062
50	Polyneuropathies and other disorders of the peripheral nervous system	0.9144	0.0065	0.000	- 0.0194	0.0063	0.002	0.9229	0.0062	0.000	- 0.0185	0.0061	0.003
51	Diseases of myoneural junction and muscle	0.9147	0.0133	0.000	- 0.0191	0.0132	0.149	0.9232	0.0128	0.000	- 0.0182	0.0127	0.153
52	Cerebral palsy and other paralytic syndromes	0.8867	0.0121	0.000	- 0.0470	0.0120	0.000	0.8959	0.0119	0.000	- 0.0454	0.0119	0.000
53	Other disorders of the nervous system	0.9140	0.0065	0.000	- 0.0198	0.0064	0.002	0.9225	0.0063	0.000	- 0.0189	0.0062	0.002
54	Disorders of eyelid, lacrimal system and orbit	0.9347	0.0053	0.000	0.0009	0.0053	0.859	0.9423	0.0050	0.000	0.0009	0.0049	0.860
55	Corneal scars and opacities	0.9232	0.0155	0.000	- 0.0106	0.0155	0.495	0.9314	0.0148	0.000	- 0.0100	0.0148	0.498
56	Other disorders of cornea	0.9464	0.0088	0.000	0.0126	0.0087	0.149	0.9531	0.0081	0.000	0.0118	0.0081	0.145
57	Diseases of the eye lens (cataracts)	0.9332	0.0035	0.000	- 0.0006	0.0034	0.867	0.9409	0.0034	0.000	- 0.0005	0.0032	0.870
58	Disorders of the choroid and retina	0.9264	0.0161	0.000	- 0.0074	0.0161	0.645	0.9344	0.0153	0.000	- 0.0070	0.0152	0.646

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
59	Retinal vascular occlusions	0.9460	0.0081	0.000	0.0122	0.0080	0.130	0.9527	0.0075	0.000	0.0113	0.0074	0.127
60	Other retinal disorders	0.9301	0.0038	0.000	-0.0037	0.0036	0.312	0.9379	0.0036	0.000	-0.0035	0.0034	0.314
61	Retinal disorders in diseases classified elsewhere	0.9257	0.0074	0.000	-0.0081	0.0073	0.270	0.9337	0.0071	0.000	-0.0077	0.0070	0.271
62	Glaucoma <sup>c</sup>	0.9281	0.0034	0.000	-0.0057	0.0032	0.080	0.9360	0.0032	0.000	-0.0054	0.0031	0.081
63	Disorders of the vitreous body and globe	0.9098	0.0096	0.000	-0.0240	0.0095	0.012	0.9185	0.0093	0.000	-0.0229	0.0092	0.013
64	Disorders of optic nerve and visual pathways	0.9323	0.0123	0.000	-0.0015	0.0123	0.900	0.9399	0.0116	0.000	-0.0014	0.0116	0.901
65	Disorders of ocular muscles, binocular movement, accommodation and refraction	0.9355	0.0049	0.000	0.0017	0.0048	0.729	0.9430	0.0046	0.000	0.0016	0.0045	0.724
66	Visual disturbances	0.9434	0.0052	0.000	0.0096	0.0051	0.059	0.9503	0.0048	0.000	0.0090	0.0047	0.058
67	Blindness and partial sight	0.9464	0.0106	0.000	0.0127	0.0106	0.232	0.9531	0.0098	0.000	0.0117	0.0098	0.229
68	Nystagmus and other irregular eye movements and other disorders of eye and adnexa	0.9432	0.0089	0.000	0.0094	0.0089	0.289	0.9502	0.0083	0.000	0.0088	0.0082	0.286
69	Otosclerosis	0.9431	0.0062	0.000	0.0093	0.0062	0.133	0.9501	0.0058	0.000	0.0087	0.0057	0.130
70	Ménière's disease <sup>a</sup>	0.9147	0.0080	0.000	-0.0191	0.0079	0.016	0.9232	0.0077	0.000	-0.0181	0.0076	0.017
71	Other diseases of the inner ear	0.9332	0.0036	0.000	-0.0006	0.0035	0.869	0.9408	0.0034	0.000	-0.0005	0.0033	0.870
72	Conductive and sensorineural hearing loss	0.9331	0.0040	0.000	-0.0007	0.0039	0.860	0.9407	0.0038	0.000	-0.0006	0.0037	0.862
73	Other hearing loss and other disorders of ear, not elsewhere classified	0.9268	0.0083	0.000	-0.0070	0.0082	0.394	0.9347	0.0079	0.000	-0.0066	0.0078	0.396
74	Presbycusis (age-related hearing loss)	0.9329	0.0031	0.000	-0.0009	0.0028	0.749	0.9405	0.0029	0.000	-0.0008	0.0026	0.749
75	Hearing loss, unspecified	0.9364	0.0031	0.000	0.0026	0.0030	0.372	0.9439	0.0029	0.000	0.0025	0.0028	0.370
76	Tinnitus	0.9241	0.0039	0.000	-0.0097	0.0037	0.010	0.9322	0.0037	0.000	-0.0092	0.0036	0.010



**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
77	Other specified disorders of ear	0.9322	0.0051	0.000	- 0.0016	0.0050	0.756	0.9399	0.0048	0.000	- 0.0015	0.0047	0.758
78	Aortic and mitral valve disease <sup>a</sup>	0.9300	0.0049	0.000	- 0.0038	0.0048	0.428	0.9378	0.0046	0.000	- 0.0036	0.0045	0.430
79	Hypertensive diseases <sup>a</sup>	0.9278	0.0017	0.000	- 0.0060	0.0013	0.000	0.9358	0.0016	0.000	- 0.0056	0.0012	0.000
80	Heart failure <sup>a</sup>	0.9296	0.0065	0.000	- 0.0042	0.0065	0.519	0.9374	0.0062	0.000	- 0.0039	0.0061	0.519
81	Angina pectoris	0.9236	0.0034	0.000	- 0.0102	0.0032	0.002	0.9317	0.0033	0.000	- 0.0097	0.0031	0.002
82	Acute myocardial infarction and subsequent myocardial infarction	0.9430	0.0047	0.000	0.0092	0.0047	0.047	0.9500	0.0044	0.000	0.0086	0.0043	0.046
83	AMI complex/other	0.9036	0.0156	0.000	- 0.0302	0.0156	0.053	0.9124	0.0153	0.000	- 0.0289	0.0152	0.057
84	Chronic ischaemic heart disease	0.9279	0.0039	0.000	- 0.0059	0.0037	0.114	0.9358	0.0037	0.000	- 0.0056	0.0035	0.116
85	Pulmonary heart disease and diseases of pulmonary circulation	0.9333	0.0091	0.000	- 0.0005	0.0090	0.959	0.9409	0.0085	0.000	- 0.0004	0.0085	0.959
86	Acute pericarditis	0.9428	0.0113	0.000	0.0090	0.0112	0.422	0.9498	0.0104	0.000	0.0084	0.0104	0.418
87	Other forms of heart disease	0.9143	0.0117	0.000	- 0.0195	0.0117	0.095	0.9228	0.0113	0.000	- 0.0185	0.0113	0.100
88	Atrioventricular and left bundle-branch block	0.9345	0.0067	0.000	0.0007	0.0066	0.918	0.9420	0.0063	0.000	0.0007	0.0062	0.916
89	Other conduction disorders	0.9281	0.0087	0.000	- 0.0057	0.0086	0.507	0.9360	0.0082	0.000	- 0.0054	0.0081	0.509
90	Paroxysmal tachycardia	0.9253	0.0041	0.000	- 0.0084	0.0039	0.031	0.9334	0.0039	0.000	- 0.0080	0.0037	0.032
91	Atrial fibrillation and flutter	0.9295	0.0032	0.000	- 0.0043	0.0030	0.153	0.9373	0.0030	0.000	- 0.0041	0.0029	0.156
92	Other cardiac arrhythmias	0.9249	0.0046	0.000	- 0.0089	0.0045	0.049	0.9330	0.0044	0.000	- 0.0084	0.0043	0.050
93	Complications and ill-defined descriptions of heart disease and other heart disorders in diseases classified elsewhere	0.9221	0.0191	0.000	- 0.0117	0.0191	0.540	0.9303	0.0183	0.000	- 0.0111	0.0182	0.544
94	Stroke	0.9276	0.0045	0.000	- 0.0062	0.0043	0.151	0.9355	0.0042	0.000	- 0.0059	0.0041	0.152
95	Cerebrovascular diseases	0.9140	0.0077	0.000	- 0.0198	0.0076	0.009	0.9225	0.0074	0.000	- 0.0189	0.0073	0.010

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
96	Sequelae of cerebrovascular disease	0.9258	0.0064	0.000	-0.0079	0.0063	0.208	0.9339	0.0061	0.000	-0.0075	0.0060	0.210
97	Atherosclerosis	0.9202	0.0061	0.000	-0.0136	0.0060	0.024	0.9285	0.0059	0.000	-0.0129	0.0058	0.025
98	Aortic aneurysm and aortic dissection	0.9096	0.0101	0.000	-0.0242	0.0100	0.016	0.9183	0.0098	0.000	-0.0231	0.0097	0.018
99	Diseases of arteries, arterioles and capillaries	0.9341	0.0061	0.000	0.0003	0.0060	0.965	0.9416	0.0058	0.000	0.0002	0.0057	0.966
100	Other peripheral vascular diseases	0.9124	0.0061	0.000	-0.0214	0.0060	0.000	0.9210	0.0059	0.000	-0.0204	0.0058	0.001
101	Phlebitis, thrombosis of the portal vein and others	0.9293	0.0047	0.000	-0.0045	0.0046	0.323	0.9371	0.0044	0.000	-0.0042	0.0043	0.326
102	Varicose veins of lower extremities	0.9377	0.0040	0.000	0.0039	0.0039	0.317	0.9451	0.0038	0.000	0.0037	0.0037	0.317
103	Haemorrhoids <sup>a</sup>	0.9266	0.0030	0.000	-0.0072	0.0028	0.011	0.9346	0.0028	0.000	-0.0068	0.0027	0.011
104	Oesophageal varices (chronic), varicose veins of other sites, other disorders of veins, nonspecific lymphadenitis, other noninfective disorders of lymphatic vessels and lymph nodes and other and unspecified disorders of the circulatory system	0.9333	0.0078	0.000	-0.0005	0.0077	0.949	0.9409	0.0073	0.000	-0.0005	0.0073	0.950
105	Respiratory allergy <sup>a</sup>	0.9287	0.0016	0.000	-0.0051	0.0012	0.000	0.9366	0.0015	0.000	-0.0048	0.0011	0.000
105A	Chronic lower respiratory diseases <sup>a</sup>	0.9307	0.0021	0.000	-0.0031	0.0018	0.091	0.9384	0.0020	0.000	-0.0029	0.0017	0.092
106	Bronchitis, not specified as acute or chronic, simple and mucopurulent chronic bronchitis and unspecified chronic bronchitis	0.9310	0.0077	0.000	-0.0028	0.0076	0.712	0.9387	0.0072	0.000	-0.0026	0.0072	0.713
107	Emphysema	0.9409	0.0117	0.000	0.0071	0.0117	0.545	0.9480	0.0109	0.000	0.0066	0.0109	0.543

**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
108	Chronic obstructive lung disease (COPD) <sup>a</sup>	0.9266	0.0026	0.000	- 0.0072	0.0024	0.003	0.9346	0.0025	0.000	- 0.0068	0.0023	0.003
109	Asthma, status asthmaticus <sup>a</sup>	0.9281	0.0023	0.000	- 0.0057	0.0020	0.006	0.9360	0.0022	0.000	- 0.0054	0.0019	0.006
110	Bronchiectasis	0.9541	0.0104	0.000	0.0203	0.0104	0.050	0.9602	0.0095	0.000	0.0189	0.0095	0.046
111	Other diseases of the respiratory system	0.9289	0.0070	0.000	- 0.0049	0.0069	0.479	0.9367	0.0066	0.000	- 0.0046	0.0066	0.481
112	Ulcers <sup>a</sup>	0.9170	0.0025	0.000	- 0.0167	0.0023	0.000	0.9255	0.0024	0.000	- 0.0159	0.0022	0.000
113	Inguinal hernia	0.9283	0.0043	0.000	- 0.0055	0.0042	0.186	0.9362	0.0040	0.000	- 0.0052	0.0039	0.189
114	Ventral hernia	0.9354	0.0079	0.000	0.0016	0.0078	0.837	0.9429	0.0074	0.000	0.0015	0.0073	0.838
115	Crohn's disease	0.9139	0.0073	0.000	- 0.0199	0.0072	0.006	0.9224	0.0070	0.000	- 0.0189	0.0069	0.006
116	Ulcerative colitis	0.9234	0.0053	0.000	- 0.0104	0.0052	0.047	0.9316	0.0051	0.000	- 0.0098	0.0050	0.048
117	Other noninfective gastroenteritis and colitis	0.9259	0.0068	0.000	- 0.0079	0.0067	0.242	0.9339	0.0065	0.000	- 0.0074	0.0064	0.245
118	Irritable bowel syndrome (IBS)	0.9213	0.0040	0.000	- 0.0125	0.0039	0.001	0.9295	0.0039	0.000	- 0.0119	0.0037	0.001
119	Other functional intestinal disorders	0.9190	0.0045	0.000	- 0.0148	0.0044	0.001	0.9273	0.0043	0.000	- 0.0141	0.0042	0.001
120	Diseases of liver, biliary tract and pancreas	0.9120	0.0059	0.000	- 0.0218	0.0058	0.000	0.9206	0.0057	0.000	- 0.0208	0.0056	0.000
121	Psoriasis <sup>a</sup>	0.9310	0.0036	0.000	- 0.0028	0.0034	0.410	0.9387	0.0034	0.000	- 0.0027	0.0032	0.407
122	Infectious arthropathies	0.9217	0.0105	0.000	- 0.0121	0.0105	0.248	0.9299	0.0101	0.000	- 0.0115	0.0100	0.252
123	Rheumatoid arthritis <sup>a</sup>	0.9093	0.0039	0.000	- 0.0244	0.0038	0.000	0.9180	0.0038	0.000	- 0.0233	0.0036	0.000
124	Inflammatory polyarthropathies, except rheumatoid arthritis <sup>a</sup>	0.9192	0.0032	0.000	- 0.0146	0.0030	0.000	0.9275	0.0030	0.000	- 0.0139	0.0028	0.000
125	Polyarthrosis (arthrosis)	0.9070	0.0088	0.000	- 0.0268	0.0087	0.002	0.9157	0.0085	0.000	- 0.0256	0.0084	0.002
126	Coxarthrosis (arthrosis of hip)	0.9110	0.0033	0.000	- 0.0228	0.0031	0.000	0.9196	0.0032	0.000	- 0.0218	0.0030	0.000
127	Gonarthrosis (arthrosis of knee)	0.9073	0.0025	0.000	- 0.0265	0.0022	0.000	0.9161	0.0024	0.000	- 0.0253	0.0021	0.000
128	Arthrosis of first carpo-metacarpal joint and other arthrosis	0.9148	0.0033	0.000	- 0.0190	0.0031	0.000	0.9233	0.0032	0.000	- 0.0181	0.0030	0.000
129	Acquired deformities of fingers and toes	0.9258	0.0039	0.000	- 0.0079	0.0038	0.037	0.9339	0.0038	0.000	- 0.0075	0.0036	0.039

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
130	Other acquired deformities of limbs	0.9190	0.0058	0.000	-0.0148	0.0057	0.009	0.9273	0.0056	0.000	-0.0141	0.0054	0.010
131	Disorders of patella (kneecap)	0.9163	0.0043	0.000	-0.0174	0.0041	0.000	0.9248	0.0041	0.000	-0.0166	0.0040	0.000
132	Internal derangement of knee	0.9011	0.0083	0.000	-0.0327	0.0082	0.000	0.9100	0.0081	0.000	-0.0313	0.0080	0.000
133	Derangement of meniscus due to old tear or injury	0.9230	0.0043	0.000	-0.0108	0.0042	0.010	0.9312	0.0041	0.000	-0.0102	0.0040	0.011
134	Internal derangement of knee, unspecified	0.9093	0.0050	0.000	-0.0245	0.0049	0.000	0.9180	0.0049	0.000	-0.0234	0.0048	0.000
135	Other specific joint derangements	0.9071	0.0145	0.000	-0.0267	0.0144	0.064	0.9158	0.0141	0.000	-0.0255	0.0140	0.068
136	Other joint disorders, not elsewhere classified	0.8955	0.0067	0.000	-0.0383	0.0066	0.000	0.9045	0.0066	0.000	-0.0369	0.0065	0.000
137	Systemic connective tissue disorders	0.9234	0.0046	0.000	-0.0104	0.0044	0.019	0.9315	0.0044	0.000	-0.0099	0.0042	0.020
138	Systemic lupus erythematosus	0.9433	0.0109	0.000	0.0096	0.0108	0.376	0.9503	0.0101	0.000	0.0089	0.0100	0.374
139	Dermatopolymyositis	0.9495	0.0217	0.000	0.0157	0.0217	0.470	0.9560	0.0200	0.000	0.0146	0.0199	0.463
140	Systemic sclerosis	0.8932	0.0293	0.000	-0.0406	0.0293	0.167	0.9023	0.0288	0.000	-0.0390	0.0288	0.175
141	Kyphosis, lordosis	0.9028	0.0131	0.000	-0.0310	0.0130	0.017	0.9117	0.0127	0.000	-0.0297	0.0127	0.019
142	Scoliosis	0.8989	0.0086	0.000	-0.0349	0.0085	0.000	0.9078	0.0084	0.000	-0.0335	0.0083	0.000
143	Spinal osteochondrosis	0.8874	0.0147	0.000	-0.0464	0.0146	0.002	0.8965	0.0145	0.000	-0.0449	0.0145	0.002
144	Other deforming dorsopathies	0.8976	0.0066	0.000	-0.0362	0.0065	0.000	0.9066	0.0065	0.000	-0.0348	0.0064	0.000
145	Other inflammatory spondylopathies	0.9140	0.0128	0.000	-0.0198	0.0128	0.121	0.9225	0.0124	0.000	-0.0188	0.0123	0.126
146	Spondylosis	0.8979	0.0041	0.000	-0.0358	0.0039	0.000	0.9069	0.0040	0.000	-0.0344	0.0038	0.000
147	Other spondylopathies and spondylopathies in diseases classified elsewhere	0.9127	0.0054	0.000	-0.0211	0.0053	0.000	0.9213	0.0052	0.000	-0.0201	0.0051	0.000
148	Cervical disc disorders	0.9155	0.0088	0.000	-0.0183	0.0088	0.037	0.9240	0.0085	0.000	-0.0174	0.0084	0.039
149	Other intervertebral disc disorders	0.8939	0.0055	0.000	-0.0398	0.0053	0.000	0.9030	0.0054	0.000	-0.0384	0.0053	0.000

**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
150	Other dorsopathies, not elsewhere classified	0.8942	0.0107	0.000	- 0.0396	0.0106	0.000	0.9033	0.0105	0.000	- 0.0381	0.0105	0.000
151	Dorsalgia	0.8824	0.0049	0.000	- 0.0514	0.0047	0.000	0.8915	0.0048	0.000	- 0.0498	0.0047	0.000
152	Soft tissue disorders	0.9153	0.0079	0.000	- 0.0185	0.0078	0.018	0.9238	0.0076	0.000	- 0.0176	0.0075	0.019
153	Synovitis and tenosynovitis	0.9188	0.0054	0.000	- 0.0150	0.0053	0.005	0.9271	0.0052	0.000	- 0.0143	0.0051	0.005
154	Disorders of synovium and tendon	0.9191	0.0060	0.000	- 0.0146	0.0060	0.014	0.9275	0.0058	0.000	- 0.0139	0.0057	0.015
155	Soft tissue disorders related to use, overuse and pressure	0.9090	0.0072	0.000	- 0.0248	0.0071	0.001	0.9177	0.0070	0.000	- 0.0237	0.0069	0.001
156	Fibroblastic disorders	0.9295	0.0042	0.000	- 0.0043	0.0041	0.288	0.9373	0.0039	0.000	- 0.0041	0.0038	0.287
157	Shoulder lesions	0.9042	0.0033	0.000	- 0.0296	0.0031	0.000	0.9131	0.0032	0.000	- 0.0283	0.0030	0.000
158	Enthesopathies of lower limb, excluding foot	0.9120	0.0098	0.000	- 0.0218	0.0097	0.025	0.9206	0.0094	0.000	- 0.0208	0.0094	0.026
159	Other enthesopathies	0.9008	0.0080	0.000	- 0.0330	0.0079	0.000	0.9097	0.0078	0.000	- 0.0316	0.0077	0.000
160	Rheumatism, unspecified	0.8938	0.0170	0.000	- 0.0400	0.0170	0.019	0.9028	0.0168	0.000	- 0.0386	0.0168	0.022
161	Myalgia	0.9104	0.0089	0.000	- 0.0234	0.0088	0.008	0.9190	0.0086	0.000	- 0.0223	0.0085	0.009
162	Other soft tissue disorders, not elsewhere classified	0.9055	0.0102	0.000	- 0.0283	0.0102	0.005	0.9143	0.0099	0.000	- 0.0271	0.0099	0.006
163	Other soft tissue disorders, not elsewhere classified: pain in limb	0.9070	0.0063	0.000	- 0.0268	0.0061	0.000	0.9157	0.0061	0.000	- 0.0256	0.0060	0.000
164	Fibromyalgia	0.8852	0.0301	0.000	- 0.0486	0.0301	0.107	0.8944	0.0299	0.000	- 0.0470	0.0299	0.116
165	Osteoporosis <sup>a</sup>	0.9181	0.0027	0.000	- 0.0157	0.0026	0.000	0.9265	0.0027	0.000	- 0.0149	0.0025	0.000
166	Osteoporosis in diseases classified elsewhere	0.9388	0.0238	0.000	0.0050	0.0238	0.834	0.9460	0.0222	0.000	0.0046	0.0221	0.835
167	Adult osteomalacia and other disorders of bone density and structure	0.9230	0.0042	0.000	- 0.0107	0.0040	0.008	0.9312	0.0040	0.000	- 0.0102	0.0039	0.008
168	Disorders of continuity of bone	0.9241	0.0167	0.000	- 0.0097	0.0167	0.560	0.9322	0.0159	0.000	- 0.0092	0.0158	0.561
169	Other osteopathies	0.9200	0.0075	0.000	- 0.0138	0.0075	0.064	0.9283	0.0072	0.000	- 0.0131	0.0071	0.067

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
170	Other disorders of the musculoskeletal system and connective tissue	0.9207	0.0063	0.000	-0.0131	0.0062	0.036	0.9290	0.0060	0.000	-0.0124	0.0059	0.037
171	Chronic renal failure (CRF) <sup>a</sup>	0.9392	0.0071	0.000	0.0054	0.0070	0.443	0.9464	0.0066	0.000	0.0051	0.0066	0.440
172	Congenital malformations: of the nervous, circulatory, respiratory system; cleft palate and cleft lip, urinary tract, bones and muscles, other and chromosomal abnormalities not elsewhere classified	0.9251	0.0036	0.000	-0.0087	0.0035	0.013	0.9332	0.0035	0.000	-0.0082	0.0033	0.014
173	Congenital malformations of eye, ear, face and neck	0.9342	0.0055	0.000	0.0005	0.0054	0.932	0.9418	0.0052	0.000	0.0004	0.0051	0.930
174	Other congenital malformations of the digestive system	0.9335	0.0097	0.000	-0.0003	0.0097	0.978	0.9411	0.0091	0.000	-0.0003	0.0091	0.977
175	Congenital malformations of the sexual organs	0.9295	0.0062	0.000	0.0043	0.0061	0.485	0.9374	0.0058	0.000	-0.0040	0.0058	0.487
176	Dementia <sup>a</sup>	0.9272	0.0127	0.000	-0.0066	0.0127	0.602	0.9351	0.0121	0.000	-0.0063	0.0120	0.601
177	Organic, including symptomatic, mental disorders	0.9212	0.0096	0.000	-0.0126	0.0096	0.189	0.9294	0.0092	0.000	-0.0120	0.0092	0.192
178	Mental and behavioural disorders due to use of alcohol	0.9263	0.0055	0.000	-0.0075	0.0054	0.161	0.9343	0.0052	0.000	-0.0071	0.0051	0.163
179	Mental and behavioural disorders due to psychoactive substance use	0.9349	0.0047	0.000	0.0011	0.0046	0.810	0.9424	0.0044	0.000	0.0010	0.0043	0.814
180	Schizophrenia <sup>a</sup>	0.9200	0.0098	0.000	-0.0138	0.0097	0.155	0.9283	0.0093	0.000	-0.0131	0.0093	0.159
181	Schizotypal and delusional disorders	0.9551	0.0066	0.000	0.0214	0.0066	0.001	0.9612	0.0060	0.000	0.0198	0.0060	0.001

**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
182	Bipolar affective disorder <sup>a</sup>	0.9278	0.0106	0.000	- 0.0059	0.0105	0.572	0.9358	0.0100	0.000	- 0.0056	0.0100	0.575
183	Depression <sup>a</sup>	0.9018	0.0022	0.000	- 0.0319	0.0018	0.000	0.9107	0.0022	0.000	- 0.0306	0.0018	0.000
184	Mood (affective) disorders	0.9329	0.0189	0.000	- 0.0009	0.0188	0.961	0.9405	0.0178	0.000	- 0.0009	0.0177	0.962
185	Phobic anxiety disorders	0.9161	0.0114	0.000	- 0.0176	0.0114	0.121	0.9246	0.0110	0.000	- 0.0168	0.0109	0.125
186	Other anxiety disorders	0.9285	0.0065	0.000	- 0.0053	0.0064	0.412	0.9364	0.0062	0.000	- 0.0050	0.0061	0.412
187	Obsessive compulsive disorder (OCD) <sup>a</sup>	0.9195	0.0112	0.000	- 0.0142	0.0112	0.203	0.9279	0.0108	0.000	- 0.0135	0.0107	0.208
188	Post-traumatic stress disorder	0.9104	0.0180	0.000	- 0.0234	0.0179	0.193	0.9191	0.0174	0.000	- 0.0223	0.0174	0.199
189	Reactions to severe stress and adjustment disorders	0.9324	0.0050	0.000	- 0.0014	0.0049	0.776	0.9401	0.0047	0.000	- 0.0013	0.0046	0.777
190	Dissociative (conversion) disorders, somatoform disorders and other neurotic disorders	0.9156	0.0076	0.000	- 0.0182	0.0075	0.015	0.9241	0.0073	0.000	- 0.0173	0.0072	0.017
191	Eating disorders	0.9407	0.0093	0.000	0.0070	0.0093	0.453	0.9478	0.0087	0.000	0.0065	0.0086	0.453
192	Behavioural syndromes associated with physiological disturbances and physical factors	0.9245	0.0122	0.000	- 0.0093	0.0122	0.446	0.9326	0.0116	0.000	- 0.0088	0.0116	0.449
193	Emotionally unstable personality disorder	0.9189	0.0109	0.000	- 0.0148	0.0108	0.171	0.9273	0.0105	0.000	- 0.0141	0.0104	0.176
194	Specific personality disorders	0.9216	0.0054	0.000	- 0.0121	0.0053	0.022	0.9299	0.0052	0.000	- 0.0115	0.0051	0.023
195	Disorders of adult personality and behaviour	0.9353	0.0090	0.000	0.0015	0.0090	0.866	0.9428	0.0085	0.000	0.0014	0.0084	0.865
196	Mental retardation	0.9410	0.0176	0.000	0.0072	0.0175	0.683	0.9481	0.0163	0.000	0.0067	0.0163	0.682
197	Disorders of psychological development	0.9281	0.0118	0.000	- 0.0057	0.0118	0.630	0.9360	0.0112	0.000	- 0.0053	0.0112	0.632
198	Hyperkinetic disorders (ADHD) <sup>a</sup>	0.9172	0.0069	0.000	- 0.0166	0.0068	0.015	0.9256	0.0067	0.000	- 0.0158	0.0065	0.016

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
199	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	0.9299	0.0069	0.000	- 0.0039	0.0068	0.569	0.9377	0.0066	0.000	- 0.0037	0.0065	0.571
	<b>Denmark sample (base)</b>	0.9353	0.0013	0.000				0.9428	0.0012	0.000			
	North Denmark Region (sample 2-3)	0.9338	0.0012	0.000	- 0.0015	0.0009	0.074	0.9414	0.0011	0.000	- 0.0014	0.0008	0.073
	<b>Specific ages (dydx)</b>												
	Age 16	0.9420	0.0028	0.000	0.0006	0.0003	0.034	0.9487	0.0026	0.000	0.0006	0.0003	0.027
	Age 20	0.9434	0.0021	0.000	0.0002	0.0002	0.335	0.9502	0.0019	0.000	0.0002	0.0002	0.273
	Age 25	0.9434	0.0016	0.000	- 0.0001	0.0001	0.179	0.9502	0.0015	0.000	- 0.0001	0.0001	0.239
	Age 30	0.9422	0.0014	0.000	- 0.0003	0.0001	0.000	0.9492	0.0013	0.000	- 0.0003	0.0001	0.000
	Age 35	0.9404	0.0012	0.000	- 0.0004	0.0001	0.000	0.9475	0.0012	0.000	- 0.0004	0.0001	0.000
	Age 40	0.9382	0.0012	0.000	- 0.0004	0.0000	0.000	0.9455	0.0011	0.000	- 0.0004	0.0000	0.000
	Age 45	0.9360	0.0012	0.000	- 0.0004	0.0000	0.000	0.9434	0.0011	0.000	- 0.0004	0.0000	0.000
	Age 50	0.9338	0.0012	0.000	- 0.0004	0.0000	0.000	0.9414	0.0011	0.000	- 0.0004	0.0000	0.000
	Age 55	0.9317	0.0012	0.000	- 0.0004	0.0000	0.000	0.9394	0.0011	0.000	- 0.0004	0.0000	0.000
	Age 60	0.9297	0.0012	0.000	- 0.0004	0.0000	0.000	0.9375	0.0012	0.000	- 0.0004	0.0000	0.000
	Age 65	0.9277	0.0013	0.000	- 0.0004	0.0001	0.000	0.9357	0.0012	0.000	- 0.0004	0.0001	0.000
	Age 70	0.9257	0.0015	0.000	- 0.0004	0.0001	0.000	0.9338	0.0014	0.000	- 0.0004	0.0001	0.000
	Age 75	0.9234	0.0017	0.000	- 0.0005	0.0001	0.000	0.9316	0.0016	0.000	- 0.0005	0.0001	0.000
	Age 80	0.9204	0.0021	0.000	- 0.0007	0.0001	0.000	0.9287	0.0019	0.000	- 0.0007	0.0001	0.000
	Age 85	0.9161	0.0026	0.000	- 0.0011	0.0002	0.000	0.9246	0.0025	0.000	- 0.0010	0.0002	0.000
	<b>Education</b>												
	No education (base)	0.9303	0.0014	0.000				0.9381	0.0014	0.000			
	Student	0.9368	0.0022	0.000	0.0065	0.0020	0.001	0.9442	0.0020	0.000	0.0061	0.0019	0.001
	Short	0.9338	0.0012	0.000	0.0035	0.0010	0.000	0.9414	0.0011	0.000	0.0033	0.0009	0.000
	Middle (bsc eq)	0.9403	0.0013	0.000	0.0100	0.0012	0.000	0.9475	0.0013	0.000	0.0094	0.0011	0.000
	Higher (msc+)	0.9469	0.0017	0.000	0.0165	0.0017	0.000	0.9536	0.0016	0.000	0.0155	0.0016	0.000
	<b>Ethnicity</b>												
	Danish (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Western	0.9192	0.0031	0.000	- 0.0146	0.0028	0.000	0.9275	0.0030	0.000	- 0.0139	0.0027	0.000
	Non-western	0.9194	0.0033	0.000	- 0.0144	0.0030	0.000	0.9277	0.0031	0.000	- 0.0136	0.0029	0.000



**Table 7** (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	<b>Income</b>												
	0.19 (25%)	0.9334	0.0012	0.000	0.0042	0.0018	0.019	0.9410	0.0012	0.000	0.0039	0.0017	0.019
	0.26 (50%)	0.9337	0.0012	0.000	0.0042	0.0018	0.018	0.9413	0.0011	0.000	0.0040	0.0017	0.018
	0.33 (75%)	0.9341	0.0012	0.000	0.0042	0.0018	0.017	0.9416	0.0011	0.000	0.0040	0.0017	0.017
	<b>Marriage/partner</b>												
	Partner/married (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	No partner	0.9323	0.0012	0.000	- 0.0015	0.0008	0.050	0.9400	0.0011	0.000	- 0.0014	0.0007	0.050
	<b>Children</b>												
	No children < 15 (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Children < 15	0.9362	0.0013	0.000	0.0024	0.0010	0.014	0.9436	0.0012	0.000	0.0022	0.0009	0.015
	<b>Loneliness</b>												
	Not/seldom lonely (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Often lonely	0.9107	0.0027	0.000	- 0.0231	0.0023	0.000	0.9194	0.0026	0.000	- 0.0220	0.0022	0.000
	<b>Stress</b>												
	80% least stressed (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	20% most stressed	0.8630	0.0018	0.000	- 0.0708	0.0013	0.000	0.8722	0.0019	0.000	- 0.0692	0.0013	0.000
	<b>BMI</b>												
	BMI < 18.5	0.9286	0.0029	0.000	- 0.0052	0.0027	0.057	0.9364	0.0028	0.000	- 0.0050	0.0026	0.056
	BMI 18.5–25 (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	BMI > 25 < 30	0.9273	0.0013	0.000	- 0.0065	0.0009	0.000	0.9352	0.0011	0.000	- 0.0061	0.0008	0.000
	BMI ≥ 30 < 35	0.9188	0.0017	0.000	- 0.0150	0.0014	0.000	0.9271	0.0016	0.000	- 0.0143	0.0013	0.000
	BMI ≥ 35	0.9042	0.0025	0.000	- 0.0296	0.0023	0.000	0.9131	0.0024	0.000	- 0.0283	0.0022	0.000
	<b>Smoking</b>												
	Do not smoke daily (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Smoke daily	0.9253	0.0015	0.000	- 0.0085	0.0011	0.000	0.9333	0.0014	0.000	- 0.0081	0.0010	0.000
	<b>Drinking</b>												
	Do not exceed recommendations (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Exceed recommendations	0.9258	0.0019	0.000	- 0.0080	0.0014	0.000	0.9338	0.0018	0.000	- 0.0076	0.0014	0.000
	<b>Exercise</b>												
	Exercise at least 4 hrs/day (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			

Table 7 (continued)

No.	Condition or covariable	Representative 50-year-old male with no chronic conditions						Representative 50-year-old female with no chronic conditions					
		Model prediction			Marginal effect			Model prediction			Marginal effect		
		$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value	$\beta$	SE	<i>p</i> value
	Do not exercise	0.9176	0.0018	0.000	- 0.0162	0.0012	0.000	0.9260	0.0017	0.000	- 0.0154	0.0012	0.000
	<b>Fruit intake</b>												
	Do not meet recommendations (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	5 or more portions	0.9372	0.0018	0.000	0.0034	0.0015	0.022	0.9446	0.0017	0.000	0.0032	0.0014	0.022
	<b>SF-12 General Health (self-reported)</b>												
	Excellent	0.9386	0.0012	0.000	0.0048	0.0005	0.000	0.9460	0.0011	0.000	0.0046	0.0004	0.000
	Very good	0.9382	0.0012	0.000	0.0045	0.0004	0.000	0.9456	0.0011	0.000	0.0042	0.0004	0.000
	Good (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Fair	0.8939	0.0036	0.000	- 0.0399	0.0032	0.000	0.9033	0.0034	0.000	- 0.0380	0.0031	0.000
	Poor	0.7688	0.0109	0.000	- 0.1650	0.0107	0.000	0.7808	0.0107	0.000	- 0.1606	0.0105	0.000
	Missing	0.9244	0.0028	0.000	- 0.0094	0.0025	0.000	0.9325	0.0027	0.000	- 0.0089	0.0024	0.000
	<b>Long-term illness or disability (self-reported)</b>												
	No long-term illness (base)	0.9338	0.0012	0.000				0.9414	0.0011	0.000			
	Long-term illness	0.9141	0.0023	0.000	- 0.0197	0.0018	0.000	0.9226	0.0021	0.000	- 0.0187	0.0017	0.000
	Missing	0.9272	0.0020	0.000	- 0.0066	0.0015	0.000	0.9352	0.0019	0.000	- 0.0062	0.0015	0.000

Note: *n* = 55,616 in all models<sup>a</sup>Complex defined condition

although some have also argued that the three countries have similar high educational population levels compared with other countries [75]. We find that the EQ-5D-3L educational sample means of the current study (Table 2) are similar to the older MEPS used for the previous catalogues: no degree 0.814 versus 0.83 and master's degree 0.919 versus 0.91. Overall, US EQ-5D-3L population means are also similar between the current sample and the MEPS, with 0.869 versus 0.867 in the MEPS for the overall mean; 0.883 versus 0.880 for men and 0.854 versus 0.850 for women. A similar pattern emerges across age groups [24, 26]. However, the differences across some conditions are slightly larger: diabetes 0.779–0.758, asthma 0.803–0.820 and hypertension 0.801–0.787, respectively [26]. We expect some differences between conditions because the current catalogue is based on doctor-reported conditions instead of the MEPS self-reports. Nevertheless, it is difficult to know to what extent the differences are due to the chronic conditions reporting methodology versus other reasons.

Moreover, other studies have found country population differences regarding mortality and ethnic, income and education composition [76, 77]. Thus, it cannot be ruled out that the US and partly UK unadjusted estimates of the current study could be larger (overestimated) than they would have been using 'native' samples, although the precise impact is unclear. Nevertheless, we might get some indication of the possible size of the impact from other studies. For example, research has shown that the UK VAS ratings (83) are close to the Danish estimates (84), compared with 81 in the USA.

Similarly, a cross-country mean EQ-5D-3L comparison based on the European value set gave close estimates between DK (0.866) and the UK (0.856) and less so for the USA (0.825). Although these studies are based on older datasets, this might be the pattern we expect to see due to population differences, whether they are due to health directly or any socioeconomic differences. Thus, given this evidence, we can expect the DK sample to be closer to the UK population-based scores than the US sample. At the same time, the US EQ-5D-3L estimates might be slightly overestimated on the basis of a Danish population than if we had used a US population. Furthermore, using foreign-based sample estimates, although not ideal, might still be more acceptable than other alternatives, such as not having any baseline or reference condition estimates or using other more unreliable sources [28]. Moreover, all regression models adjusted for sex and age, as well as the full regression model for socio-economic variables and health risks, including BMI, thus reducing the impact of possible population differences.

Finally, the present study includes the latest national EQ-5D-3L data available, but the age of data might be

a concern due to possible changes in HRQoL and treatments if improvements in technology and treatments, for example, lead to higher HRQoL. However, there does not seem to be evidence of positive changes in HRQoL across years or even decades. For example, comparing the latest available EQ-5L-3L population scores of 2010, 2013 and 2017, there is a slight decline from 0.85 to 0.83 (Danish norms) [78]. Another Danish study identified a slight decline from 0.89 in 2000 to 0.87 in 2010, suggestively due to an ageing population [56]. Other more recent Danish reports also suggest national declines in HRQoL. For instance, HRQoL measured by the SF-12 showed varying and slightly worsening national population health from 2010 to 2021 for physical health (10.0–11.3% having bad health in 2017 and 11.0% in 2021) and mental health dimensions (from 10.0% in 2010 to 13.2% having bad health in 2017, increasing to 17.4% in 2021) [79, 80]. This may indicate that population-based HRQoL is still slightly declining over time, although there seems to be an impact of COVID-19 around 2021 on mental health, in which long-lasting impacts on the population HRQoL are currently unknown. However, if anything, the estimates provided in the current study may be slightly conservative, e.g., lower, compared with the present time. Finally, any decline in HRQoL due to ageing populations over time can be factored in when modelling the population of interest using the provided regression estimates in catalogue two.

## 5 Conclusion

Along with the rapidly growing burden of chronic diseases in both prevalence, personal health and economic terms [33, 81–85], the future holds an increasing need for policy and decision-makers to prioritise and ensure most 'health per pound or dollar'. The current study provides updated, larger catalogues of EQ-5D-3L preference scores for the UK and the USA. The catalogues describe aspects of disease burden, including identifying diseases with the lowest HRQoL and which can be used in CEA to allocate healthcare resources. To our knowledge, this is the largest and most comprehensive mean-based regression modelling of EQ-5D-3L scores for chronic conditions for these two countries. The models enable valid comparisons and assessments of the impact of HRQoL between 199 chronic conditions, socioeconomic factors, health risks and lifestyle factors.

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**Author contributions** MFH made the underlying data management and the first draft of the paper, as well as Supplementary Material 1. MHA made first draft of all Supplementary Material 2 including guideline,

data and Stata do files. MFH and MHA equally made the study rationale and design, data modelling, critical evaluation and interpretation, and all revisions of the paper, supplementary materials and others.

## Declarations

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**Conflict of interest** MFH and MHA declare that they have no conflict of interest.

**Ethics approval** Not applicable.

**Consent to participate** Participants gave informed consent for the survey data. No other consent was required.

**Consent for publication** Not applicable.

**Availability of data and material** All data are kept on a secure server at Statistics Denmark, and due to legal requirements, the micro data underlying the present study cannot be made freely available. However, the estimated utilities and regression models are made freely available for analysts through Stata .ster files and the result presented in paper.

**Code availability** Stata do file code is available in Supplementary Material 2.

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