

# British Regional Heart Study (BRHS)



## BRHS Data User Guide

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# BRHS Data User Guide

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## Accessing the British Regional Heart Study (BRHS) data through UKDS

To support in-depth research, the BRHS provides detailed individual-level data. This data is accessible through the UK Data Service (UKDS) SecureLab, a national Trusted Research Environment (TRE). Access is governed by the **Five Safes** framework, which ensures: *safe data, safe people, safe projects, safe settings, and safe outputs*.

- The BRHS Data Collection is available to users registered with the UK Data Service.
- Commercial use is not permitted.
- Use of the data requires approval from the data owner or their nominee.
- Registered users must apply for access via a Secure Access application.
- Registered users must complete the Safe Researcher Training course.
- Registered users must be based in the UK when accessing data.
- The Data Collection must be accessed via a secure connection method in a safe environment approved by the UK Data Service.

## The British Regional Heart Study (BRHS)

The British Regional Heart Study (BRHS) is a long-term cohort investigating the causes of cardiovascular disease (CVD) in men and seeking to understand the effect of co-morbidities on CVD & ageing. The BRHS provides a geographically and socially representative cohort for the prospective investigation of CVD in British men spanning over four decades. Established in 1978-80, with 7735 male participants (mostly white Caucasian), the BRHS study has benefited from four repeated assessments of the men at ages in middle (40-59 years) and later life (60-79, 72-91 and 79-98 years). Participants have been followed up at four life stages for a wide range of health outcomes, including all-cause mortality and CVD morbidity, physical disability and frailty using GP records and participant questionnaires. This unique ageing cohort with extensive phenotyping, genotyping and detailed follow-up has contributed to the study of healthy cardiovascular ageing including prevention of CVD, heart failure, stroke, diabetes and related disabilities (frailty, dementia) in older age and to add to our understanding of the biological ageing process on CVD risk.

### Research

Research from the BRHS provides scientific-based evidence and knowledge for clinical guidelines and policy in the management and prevention of CVD. Our research has gone beyond CVD prevention, looking at strategies to improve the health of older people, including reducing co-morbidity related to CVD, frailty and dementia. BRHS research has –

- identified several determinants of heart failure including adverse socioeconomic factors, airway obstruction, nutritional status and excessive sleep.
- established the importance of body composition (obesity and sarcopenia) in CVD.
- identified dietary and physical activity and sedentary patterns as well as trajectory patterns from middle-age to older age associated with CVD risk and mortality.
- investigated how CVD risk is related to health challenges in later life including mobility limitation, frailty, cognitive impairment, oral health and hearing impairment.
- pioneered the use of scoring systems for estimating risk of major cardiovascular events, draws attention to the value of regular moderate physical activity in the prevention of cardiovascular disease and the role of overweight and obesity in the origin of cardiovascular disease and diabetes mellitus. It continues to examine the role of many of the 'newer' risk factors for cardiovascular disease and provides material for the estimation of trends in the incidence and prevalence of coronary heart disease.

## Key publications about the BRHS

The following publications are **key BRHS references** that discuss the background and design of the British Regional Heart Study and are commonly cited by researchers using the BRHS data.

Publication 1 provides a description of the study design, while publication 2 details the origins and background of the study.

1. Shaper AG, Pocock SJ, Walker M, Cohen NM, Wale CJ, Thomson AG. British Regional Heart Study: cardiovascular risk factors in middle-aged men in 24 towns. *BMJ* 1981; 283(6285):179-186. DOI: [10.1136/bmj.283.6285.179](https://doi.org/10.1136/bmj.283.6285.179)
2. S J Pocock, A G Shaper et al. British Regional Heart Study: geographic variations in cardiovascular mortality, and the role of water quality *Br Med J.* 1980 May 24; 280(6226): 1243–1249. doi: [10.1136/bmj.280.6226.1243](https://doi.org/10.1136/bmj.280.6226.1243)

## BRHS Cohort profile papers

**Three cohort profile papers** have been published that provide a description of the study and the follow-up over forty years.

1. The British Regional Heart Study 1975–2004.  
Walker M, Whincup PH, Shaper AG. *International Journal of Epidemiology*, Volume 33, Issue 6, December 2004, Pages 1185–1192, <https://doi.org/10.1093/ije/dyh295>
2. Cohort Profile Update: The British Regional Heart Study 1978–2014: 35 years follow-up of cardiovascular disease and ageing.  
Lennon LT, Ramsay SE, Papacosta O, Shaper AG, Wannamethee SG, Whincup PH. *International Journal of Epidemiology*, Volume 44, Issue 3, June 2015, Pages 826–826g, <https://doi.org/10.1093/ije/dyv141>
3. Cohort Profile Update: The British Regional Heart Study 1978–2018: 40 years of follow-up of older British men.  
Kimble R, McLellan G, Lennon LT, Papacosta AO, Mathers JC, Wannamethee SG, Whincup PH, Ramsay SE. *International Journal of Epidemiology*, 2022, 1–8. <https://doi.org/10.1093/ije/dyac122>

**All BRHS publications** can be found on the BRHS website at:

<https://www.ucl.ac.uk/epidemiology-health-care/research/primary-care-and-population-health/research/ageing/british-regional-heart-study-brhs-1>

## Funding

The study has been funded by major grants from: British Heart Foundation (BHF), Medical Research Council (MRC), The Dunhill Medical Trust and National Institute for Health Research (NIHR).

## Ethics

The collection, use, and sharing of data in research involving human participants must adhere to ethical and legal obligations. The British Regional Heart Study follows strict protocols and research guidelines, which are reviewed and approved by research ethics committees to ensure compliance with these obligations.

### Ethical approval statement

Prior to 2003, ethical oversight for this study was provided by the Local Research Ethics Committees. Since 10th October 2003, the Multi-Centre Research Ethics Committee has provided ethical approval. Ethical approval for this study was obtained from the National Research Ethics Service (NRES) Committee London – Central (Reference number: MREC/02/2/91). All participants provided informed written consent, and the study was conducted in accordance with the principles of the Declaration of Helsinki.

### Full Title of Study:

British Regional Heart Study: A Prospective Study of Cardiovascular Morbidity and Mortality in British Men and Women

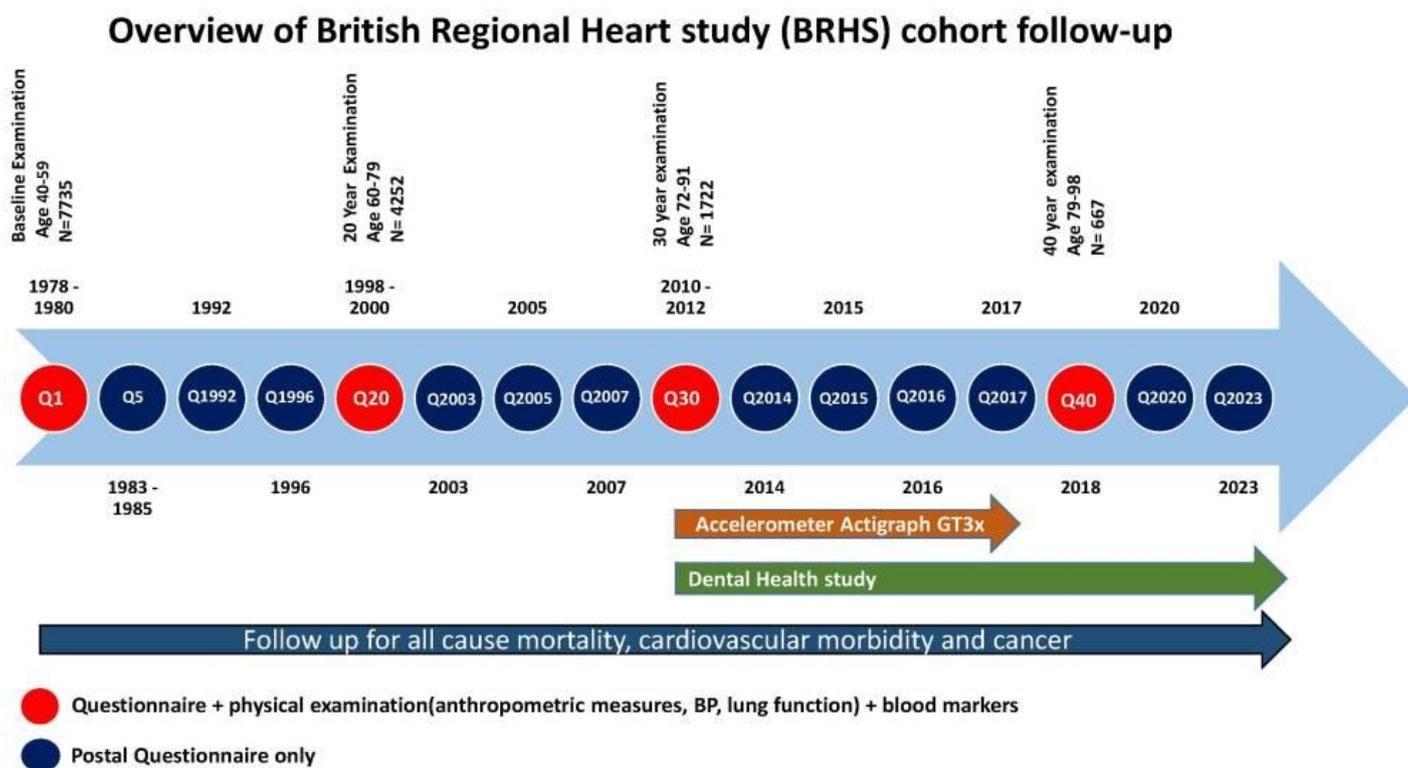
IRAS ID: 191747  
Name of Main REC : London MREC  
REC Reference Number: MREC/02/2/91  
Date of Favourable Ethical Opinion: 10th October 2003  
Sponsor: University College London (UCL)  
Sponsor Project ID: 09/0197

Amendments:	Date of Amendment	Date of Approval
1 – Linkage to Armed Services Medical Records	01 Jul 2006	26 Sep 2006
2 – Physical Assessment (Q30 Survey)	15 Apr 2009	15 May 2009
3 – Dental Assessment Added to Q30 Survey	01 Jul 2010	26 Jul 2010
4 – Linkage to NHS Hospital Episode Statistics	02 Oct 2013	11 Oct 2013
5 – Notification of Change of PI for BWHHS	29 Sep 2015	02 Oct 2015
6 – Linkage to NHS Mental Health Minimum Data Set (MHMDS) and Diagnostic Imaging Dataset (DIDS)	05 Jul 2017	25 Aug 2017
7 – Physical Assessment (Q40 Survey)	06 Mar 2018	09 Apr 2018
8 – Not Submitted	N/A	N/A
9 – Non-substantial ID EA-57114: Notification that Newcastle University will be a Joint Data Controller and Processor for NHS Digital Contracts	30 Sep 2022	N/A
10 – Notification of Change of Chief Investigator and Notification of Change to the Arrangements for Storing Samples	November 2023	May 8, 2024
11- Substantial amendment Onward sharing of the pseudonymous deposit in UK Data Service (UKDS)	15 September 2025	7 October 2025

## Consent

All participants provided consent. Written consent forms have been obtained since 1998. (Appendix 1:1998-2000 consent form). Further consent forms were included with the follow-up postal questionnaire in 2003 (Appendix 2: 2003 consent form). Consent was reaffirmed during the physical examination survey in 2010- 12 (Appendix 3: 2010-12 consent form) and was reaffirmed again in 2018 (Appendix 4:consent form 2018). The study is listed on the **Section 60/Section 251 register from the Confidentiality Advisory Group at the Health Research authority.**

Figure 1: Study timeline and Overview of the British Regional Heart study (BRHS) cohort follow-up



### Map: British Regional Heart Study Towns in England, Scotland and Wales



## BRHS Study overview

**The British Regional Heart Study (BRHS) was established to examine the factors responsible for heart disease and stroke in Great Britain.**

### Origins & Background of the British Regional Heart Study (1975-78):

The origins of the British Regional Heart Study (BRHS) lie in the Seven Countries Study of Ancel Keys and his colleagues, in the Framingham Study in the United States and in the work in the United Kingdom of Professor J N Morris and his collaborators in the MRC Social Medicine Unit.

### BRHS Cohort profile paper 1

[The British Regional Heart Study 1975-2004.](#)

[Walker M, Whincup PH, Shaper AG. International Journal of Epidemiology, Volume 33, Issue 6, December 2004, Pages 1185–1192](#)

### How did the study come about?

During the early 1970s, mortality rates from coronary heart disease (CHD) were exceptionally high in the UK. A twofold regional variation existed with particularly high rates in South Wales, Northern England, Scotland, and Northern Ireland. There was considerable interest in the possibility that 'soft' drinking water was a risk factor for CHD and that variations in water hardness/softness across Britain might account for these geographical variations.

A 5-year proposal by Professor Gerry Shaper and colleagues was submitted to the Medical Research Council to examine the factors responsible for the considerable regional variation in coronary heart disease, hypertension, and stroke in Great Britain, and to determine the causes of these conditions in order to provide a rational basis for recommendations towards their prevention. This proposal embraced the water hardness hypothesis but extended the potential of the data collected to produce a more substantial and wider ranging enquiry into the causes of CHD both at the individual and the regional level.

### BRHS study population

#### Who is in the sample?

Sampling began with the selection of 24 of the 253 towns and Metropolitan boroughs with populations > 50 000 in England, Wales and Scotland at the 1971 census. Two towns were selected from each of the 12 Regions in Britain to meet the following criteria:

- Population size (50–100 000 in 1974).
- Representation of the Region in terms of:
  - cardiovascular mortality rates
  - water quality (a range of hard and soft water areas were identified in collaboration with the Water Research Centre, Medmenham).
  - socio-economic activity (with reference to the Webber classification).
  - High mobility towns (New towns and large conurbations) were avoided.

The sampling frame was based in General Practice at a time when age-sex registers were uncommon (1977), but General Practice lists covered >95% of the population. With the help of the District Medical Officer (Community Health Physician) in each town, a single group General Practice was identified based on the following criteria:

- A patient list >7500 (with at least three partners).
- Representative of the socio-economic profile of the town.
- Willing to participate in a 5-year study.

## The BRHS men

Almost 10 000 middle-aged men aged 40–59, (400 from each town) were drawn at random from four, 5-year stratified age bands of each practice age-sex register. These had to be made for the purpose in 18 of the 24 practices selected.

Invitations were sent, signed by their General Practitioner (GP), encouraging the men to attend the cardiovascular health check at a local venue, usually the Practice premises. A few men (<10) in each town, who were physically or mentally unable to attend, were excluded from the invitation list by the GP. **With a 78% response rate, a total of 7735 men aged 40–59 years (approximately 300 from each town) were recruited and examined.**

## Baseline BRHS data (1978-80):

In 1978-80, a longitudinal study of cardiovascular disease was initiated in 7735 men aged 40-59 years drawn from one general practice in each of 24 British towns – this comprised the **baseline sample of the BRHS cohort**. The towns were selected using data from a previous study of 253 towns (S J Pocock, A G Shaper et al. British Regional Heart Study: geographic variations in cardiovascular mortality, and the role of water quality [Br Med J. 1980 May 24; 280\(6226\): 1243–1249](#)). A wide range of physical, physiological, biochemical and haematological measurements were made in these men and questionnaires relating to their lifestyle and medical and family histories were completed.

## Follow up of the BRHS cohort

The prospective follow up of the BRHS has produced information on determinants of coronary heart disease and stroke in middle-aged and older men in Great Britain and has extended its enquiries and analyses to diabetes mellitus, heart failure and to cancer. The figure below shows an overview of the BRHS cohort follow-up.

The longitudinal follow-up of all the BRHS participants has allowed investigating the incidence of mortality and morbidity relating to cardiovascular disease and to other conditions such as diabetes mellitus, heart failure and cancer, with reference to the interplay between individual and environmental risk factors. Follow-up has been achieved through close collaboration with the general practices, the participants and central registers (for example, the Office of Population and Census Surveys (OPCS), Health and Social Care Information Centre (HSCIC), NHS Digital). The prospective study contains reports of major cardiovascular events among study participants made by general practitioners obtained from regular (two-yearly) review of the General Practice (GP) records (including all hospital and clinic correspondence) and participant completed postal questionnaires. The cohort participants have also been followed-up through regular physical examinations and postal questionnaires - see figure below.

The BRHS cohort was follow-up through sixteen postal questionnaires and four physical examinations.

## Leading of the follow-up clinical physical examinations

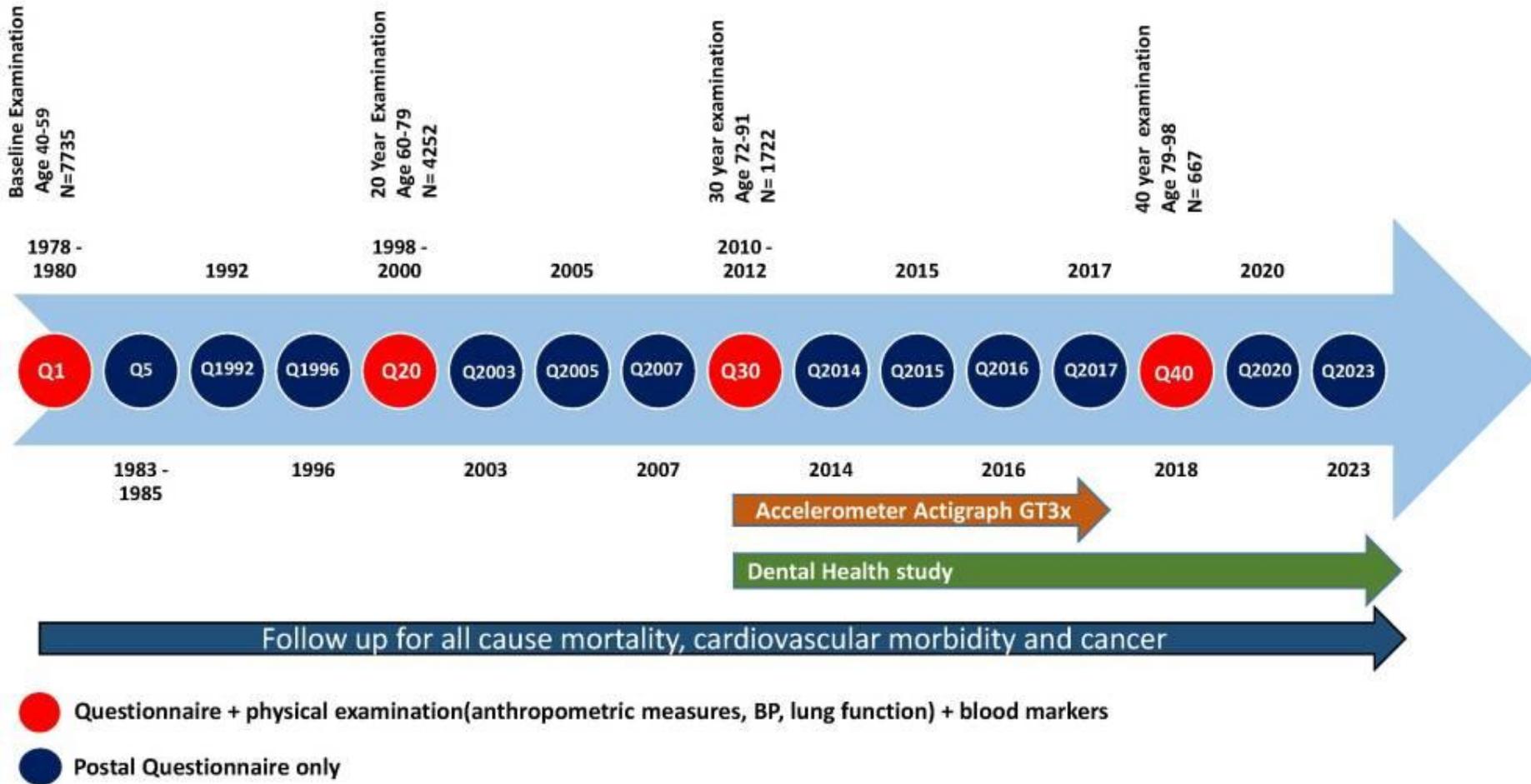
The initial (Baseline) physical examination in 1978-1980 (Q1) was led by Professor Gerry Shaper

The 20 year follow-up physical examination in 1998-2000 (Q20) was led by Professors P Whincup and S Ebrahim

The 30 year follow-up physical examination in 2010-2012 (Q30) was led by Professors P Whincup and G Wannamethee

The 40 year follow-up physical examination in 2018-2019 (Q40) was led by Professor Sheena Ramsay

# Overview of British Regional Heart study (BRHS) cohort follow-up



## Follow up through physical examinations:

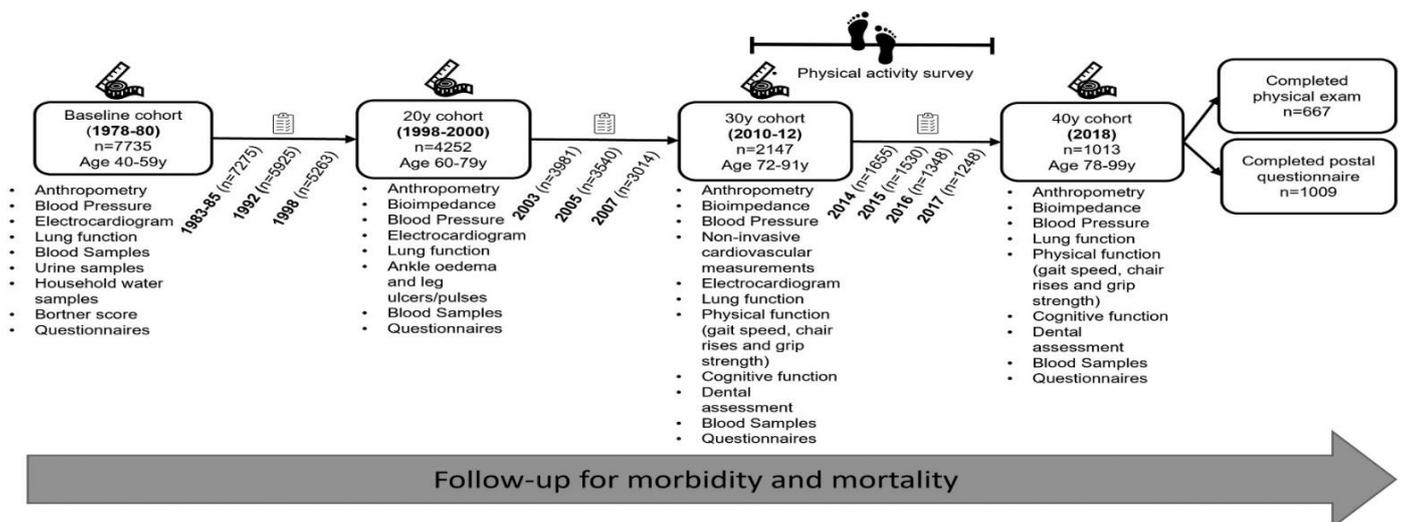
The cohort has been followed up at regular intervals for re-examinations at ages 60–79 years (1998–2000) and 71–92 years (2010–12) and 78-98 years (2018-19). At each time point, clinical measurements were carried out on each man by a team of specially trained nurses. The re-examinations were carried out in the original 24 towns where men were recruited at baseline. Participants who had migrated from their original town were offered a choice between examination either in their original town, another BRHS town of their choice or examination in London. Home visits were offered to those unable to attend the examination centres.

**Table 1. Response rates, number examined and cohort age range by physical examination**

Physical examination Year	Follow-up time point	Age range	Number of participants examined	Response rate %
1978-1980	Baseline (Q1)	40-59	7735	78
1998-2000	20-year follow-up (Q20)	60-79	4252	77
2010-2012	30-year follow-up (Q30)	71-92	1722	55
2018-2019	40-year follow-up (Q40)	78-98	667	41

Through the physical re-examinations, the cohort was followed up on a wide range of physical, physiological, biochemical and haematological measurements (see figure below).

**Figure:** British Regional Heart Study (BRHS) follow-up timeline (Kimble R et al. IJE 2022,1–8. <https://doi.org/10.1093/ije/dyac122>)



Participation in the BRHS physical examinations throughout the 40-year follow-up					
Baseline 1978-80	20 year follow-up 1998-2000	30 year follow-up 2010-12	40 year follow-up 2018-19	N	%
Q1	Q20	Q30	Q40		
✓	X	X	X	3349	43.3
✓	X	X	✓	6	0.1
✓	X	✓	X	99	1.3
✓	X	✓	✓	29	0.4
✓	✓	X	X	2609	33.7
✓	✓	X	✓	49	0.6
✓	✓	✓	X	1011	13.1
✓	✓	✓	✓	583	7.5
<b>7735</b>	<b>4252</b>	<b>1722</b>	<b>667</b>	<b>7735</b>	<b>100.0</b>

**Table 2. Overview of physical and clinical measurements collected through BRHS physical examinations 1978-2018**

	1978-80 Baseline examination	1998-2000 20 year examination	2010-2012 30 year examination	2018-2019 40 year examination
	(Q1)	(Q20)	(Q30)	Q40)
Height	X	X	X	X
Weight	X	X	X	X
Arm circumference		X	X	X
Triceps skinfold		X	X	X
Subscapular skinfold		X	X	X
Waist Circumference		X	X	X
Hip Circumference		X	X	X
Calf Circumference				X
Ankle Oedema		X	X	
Leg Pulses - Dorsalis Pedis		X		
Leg Pulses - Post Tibial		X		
Lung Function	X	X	X	X
Ethnicity		X	X	X
Blood Pressure (BP)	X	X	X	X
- Seated BP	X	X	X	X
- Standing BP		X	X	
- Pulse Rate	X	X	X	X
Gait Speed			X	X
Chair Rises			X	X
Grip Strength			X	X
Bioimpedance		X	X	
- Bodystat (Body composition analyser)		X	X	
- Tanita Body composition analyzer			X	X
Electrocardiogram (ECG)	X	X	X	
Dental assessments			X	X
Vascular ultrasound			X	
- Carotid intima-media thickness (CIMT)			X	
- Carotid distensibility (CD)			X	
- Carotid-femoral pulse wave velocity (PWV)			X	
- Pulse wave analysis (PWA)			X	
- Ankle-brachial pressure index			X	
Bloods sample	X	X	X	X
- Blood group	X			
- Genetic material (blood sample)		X	X	X
- Metabolites (blood sample)		X		
- Blood Biomarkers	X	X	X	X
Cognitive Assessment - Test Your Memory			X	X
Bortner Score	X			

Table 3: Overview of **biomarkers** from the four BRHS physical examinations 1978 – 2018

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	1978-80 Baseline examination	1998-2000 20 year examination	2010-2012 30 year examination	2018-2019 40 year examination
	(Q1)	(Q20)	(Q30)	(Q40)
<b>Blood samples</b>	X	X	X	X
<b>Genetic Material (Blood)</b>		X		
<b>Frozen samples</b>		X	X	X
<b>BIOCHEMISTRY</b>				
Alkaline Phosphatase (ALP)	X	X	X	X
Bilirubin (Total)	X	X	X	X
Cadmium	X			
CHDR			X	X
Lead	X			
Magnesium		X	X	X
Potassium	X	X	X	X
Protein (total)		X	X	X
Sodium	X	X	X	X
<b>HAEMATOLOGY</b>				
Basophils Absolute Value			X	
Blood Group	X			
Carboxyhaemoglobin		X		
Eosinophils Absolute Value			X	X
Haematocrit	X	X	X	X
Haemoglobin	X	X	X	X
Lymphocytes Absolute Value			X	
Mean Cell haemoglobin (MCH)	X	X	X	X
Mean Cell Haemoglobin	X	X	X	X
Mean Cell Volume (MCV)		X	X	X
Mean Platelet volume (MPV)	X	X	X	X
Monocytes Absolute Value			X	X
Neutrophils Absolute Value			X	X
Platelets		X	X	X
Red blood cell count (RBC)	X	X	X	X
Red Blood Cell Distribution Width			X	X
Rhesus	X			
White blood cell count (WBC)	X	X	X	X
<b>RENAL-HEPATIC</b>				
Alanine Aminotransferase (ALT)		X	X	X
Albumin	X	X	X	X
Aspartame Transaminase (AST)	X	X	X	X
Calcium	X	X	X	X
Calcium orthophosphates (CaPO4)	X			
Creatinine	X	X	X	X
Estimated Glomerular Filtration Rate		X	X	X
Gamma-Glutamyl transferase				
Gamma-glutamyl transpeptidase (GGTP)	X			
Globulin	X			
Nephelometric fibrinogen		X		
Parathyroid hormone (PTH)		X		
Phosphate		X	X	X
Urate	X	X	X	X
Urea	X	X	X	X

**Table 3. Overview of biomarkers from the four BRHS physical examinations 1978 – 2018**

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<b>Cont.</b>	1978-80 Baseline examination	1998-2000 20 year examination	2010-2012 30 year examination	2018-2019 40 year examination
	(Q1)	(Q20)	(Q30)	(Q40)
<b>BLOOD LIPIDS</b>				
Cholesterol (Total)	x	x	x	x
High Density Lipoprotein cholesterol	x	x	x	x
Lipoprotein (LPa)			x	
Low Density Lipoprotein cholesterol (LDL)		x	x	x
Triglyceride	x	x	x	x
<b>GLUCOSE-INSULIN</b>				
Cysteine		x		
Cysteinylglycine (CysGly)		x		
Glucose	x	x	x	x
Glycated Haemoglobin (HbA1c)		x	x	x
Insulin		x	x	x
Insulin-like growth factor 1 (IGF-1)			x	x
Proinsulin			x	
<b>INFLAMMATION-HAEMOSTASIS</b>				
Activated partial thromboplastin time		x		
Activated Protein C Resistance		x		
Carboxymethyl lysine (CML)			x	
C-Reactive protein (CRP)		x	x	x
Cystatin C			x	
Factor II				
Factors IX		x		
Factors VII		x		
Factors VIII		x		
Fibrin D-dimer		x	x	x
Fibrinogen		x		
Growth Differentiation Factor (GDF-15)				x
Interleukin-18 (IL-18),				
Interleukin-6 (IL-6),		x	x	x
Lysine (% of lysine that is glycated (CML			x	
Lysine concentration			x	
Mid-regional proadrenomedullin (MRproADM)		x		
Plasma Viscosity		x		
Receptor for Advanced Glycation End			x	
Tissue plasminogen activator (t-PA)		x	x	
Tumor Necrosis Factor alpha (TNFa)				
von Willebrand factor		x	x	x

**Table 3. Overview of biomarkers from the four BRHS physical examinations 1978 – 2018**  
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<b>Cont.</b>	1978-80 Baseline examination	1998-2000 20 year examination	2010-2012 30 year examination	2018-2019 40 year examination
	(Q1)	(Q20)	(Q30)	(Q40)
<b>VITAMINS, ADIPOKINES, OTHER</b>				
Adiponectin		x	x	
CD40				
Copeptin		x	x	
Cotinine		x		
Ferritin				
Folate				
High-Sensitivity Troponin T (hsTnT)			x	
Homocysteine		x		
Leptin		x	x	
Metabolites -Blood		x		
N-terminal pro B-type natriuretic				
Troponin T (TnT)		x		x
Vitamin B12				
Vitamin C		x		
Vitamin D		x	x	x
Vitamin E		x		

**Table 4. Overview of derived variables available at each BRHS physical examination study timepoint**

These variables are included the *derived variables datasets* for each follow-up **physical examination** timepoint. Methods are described in the associated documentation files.

Derived variables	1978-80 Baseline (Q1)	1998-2000 20 year Survey (Q20)	2010-2012 30 year Survey (Q30)	2018-2019 40 year Survey (Q40)
Description				
Smoking status categories	✓	✓	✓	
Alcohol drinking categories	✓	✓		
Physical activity score categories	✓	✓	✓	
Accelerometer derived variables (Step count, CPM)			✓*	
Body Mass Index (BMI)	✓		✓	✓
Index of Multiple Deprivation (IMD)		✓**	✓**	
<b>Diet: Elderly Dietary Index (EDI)</b>				
EDI Bread component score		✓	✓	✓
EDI Vegetables component score		✓	✓	✓
EDI Fruit component score		✓	✓	✓
EDI Legumes component score		✓	✓	✓
EDI Meat component score		✓	✓	✓
EDI Cereals component score		✓	✓	✓
EDI Olive oil component score		✓	✓	✓
EDI Fish/Seafood component score		✓	✓	✓
EDI Dairy component score		✓	✓	✓
EDI Alcohol			✓	
EDI Total score (excluding the Alcohol component) (sum of the 9 EDI component scores)		✓	✓	✓
EDI Total score (including the Alcohol component) (sum of the 10 EDI component scores)			✓	
<b>Diet: Healthy Diet Indicator (HDI)</b>		✓	✓	
<b>Diet: Estimates of Macronutrient &amp; micronutrient intake</b>				
Fat		✓	✓	✓
Saturated fat		✓	✓	✓
Polyunsaturated fat		✓	✓	✓
Protein		✓	✓	✓
Carbohydrate		✓	✓	✓
Starch yes		✓	✓	✓
Sugar		✓	✓	✓
Alcohol		✓	✓	✓
Cereal fibre		✓	✓	✓
Vegetable fibre		✓	✓	✓
Vitamin C		✓	✓	✓
Total daily k calories		✓	✓	✓
Cholesterol		✓	✓	✓
Retinol (i.e. dietary vitamin A)		✓	✓	✓
Beta carotene		✓	✓	✓
Alpha tocopherol (i.e. dietary vitamin E)		✓	✓	✓
Dietary intake linoleic acid		✓	✓	✓
Iron		✓	✓	✓
<b>Diet: Dietary patterns (PCA Factor scores &amp; quartiles)</b>				
High fat/low fibre diet		✓	✓	
High fat/low fibre diet quartiles		✓	✓	
Prudent diet		✓	✓	
Prudent diet quartiles		✓	✓	
High sugar diet		✓	✓	
High sugar diet quartiles		✓	✓	

\* Variables are included in the Accelerometer dataset, \*\* variables are included in the Participant profile file.

cont.

Derived variables	1978-80 Baseline (Q1)	1998-2000 20 year Survey (Q20)	2010-2012 30 year Survey (Q30)	2018-2019 40 year Survey (Q40)
<b>Medications</b>				
Statins		✓	✓	
Fibrates		✓		
Anion exchange resins		✓		
Nicotinic Acid		✓		
Fish Oil		✓		
Ispaghula		✓		
Lipid lowering drugs		✓		✓
Aspirin use		✓		
Antiplatelet - Aspirin +BNF 2.9		✓		
Warfarin BNF 2.8.2.0		✓		
Blood pressure lowering medications		✓	✓	✓
Diabetic med Insulin BNF codes 6.1.1		✓	✓	✓
Diabetic medication BNF codes 6.1.2		✓	✓	✓
<b>Fasting duration</b>		✓		
<b>Body composition</b>				
Fat Free Weight (mass)		✓		
Fat Mass		✓		
Q20 Body fat		✓		
Height standardised IMPEDANCE (height <sup>2</sup> /q20impedance)		✓		
<b>ECG derived variables based on Minnesota codes from ECG</b>				
MI or Ischaemia grade	✓	✓	✓	
Left Ventricular Hypertrophy		✓	✓	
Right Ventricular Hypertrophy		✓	✓	
Conduction defects based in Minnesota codes form ECG				
LBBB = Left Bundle Branch Block		✓	✓	
RBBB = Right Bundle Branch Block		✓	✓	
CHB = Complete Heart Block		✓	✓	
WPW= Wolff Parkinson White syndrome		✓	✓	
* Atrial Fibrillation only		✓	✓	
* Atrial Flutter only			✓	
* Atrial Tachycardia only			✓	
* Atrial Fibrillation OR Flutter			✓	
* Atrial Fibrillation OR Flutter OR Tachycardia			✓	
<b>Frailty components</b>				
Exhaustion- no energy			✓	✓
Unintentional weight loss			✓	✓
Low physical activity			✓	✓
Slow walk			✓	✓
Low grip			✓	✓
<b>Frailty - score categories</b>			✓	✓
<b>Test Your Memory (TYM)</b>				
TYM Total score			✓	✓**
TYM categories			✓	✓**

✓\*\*\*derived variables can be found in the Test Your Memory (TYM) dataset

**Table 5. Overview of adjusted or standardised variables at each BRHS physical examination study timepoint**

These variables can be found in the **derived variables datasets** for each of the four BRHS follow-up physical examination timepoint. Methods are described in the associated documentation file.

<b>Derived variables</b>	1978-80 Baseline (Q1)	1998-2000 20 year Survey (Q20)	2010-2012 30 year Survey (Q30)	2018-2019 40 year Survey (Q40)
<b>Description</b>				
<b>Blood pressure</b>				
Sitting SBP (mean of 2 readings -adjusted)	✓	✓	✓	
Sitting DBP (mean of 2 readings -adjusted)	✓	✓	✓	
Standing SBP (mean of 2 readings -adjusted)		✓		
Standing DBP (mean of 2 readings -adjusted)		✓		
<b>FEV1 (height standardised)</b>		✓	✓	
<b>Anthropometric measurements</b>				
Hip Circumference (adjusted)		✓		
Subscapular skinfold (adjusted)		✓		
Triceps skinfold (adjusted)		✓		
Waist Circumference (adjusted)		✓		

## Follow up through postal questionnaires:

The BRHS cohort has been followed up through periodic postal questionnaires collecting detailed information on a wide range of health-related behaviours, overall health, diagnoses and self-reported symptoms and social factors. These questionnaires are a valuable resource for research into the health status of older adults in the 21<sup>st</sup> century - see **Table 6** below for questionnaire, timepoint, cohort age range and response rates.

A general overview of the topics covered in these questionnaires and the questions included at each study time point is available in **Table 7** Overview of questions included in the BRHS questionnaires from 1978 to 2020 below.

**Table 6: Response rates, number responded, cohort age range by Questionnaire follow-up time point**

Questionnaire Year	Study Timepoint	Follow-up time point	Age range of cohort	Number of completed questionnaires	Response rate %
1978-80 Baseline	Q1 (Baseline)	Baseline	40-59	7735	78
1983-85	Q5	3-5 year	45-64	7275	98
1992	Q92	12-14 year	52-74	5925	91
1996	Q96	16-18 year	56-78	5263	88
1998-2000	Q20 – Main questionnaire	20 year	60-79	4252	77
1998-2000	Q20 - Physical Activity & Diet questionnaire	20 year	60-79	4582	83
2003	Q03	23-25 year	62-85	3981	80
2005	Q05	25-27 year	64-87	3540	79
2007	Q07	27-29 year	66-89	3014	75
2010-2012	Q30	30 year	71-92	2137	68
2014	Q2014	34-36 year	73-96	1655	64
2015	Q2015	35-37 year	74-97	1530	66
2016	Q2016	36-38 year	75-98	1348	65
2017	Q2017	37-39 year	76-99	1248	66
2018	Q40	40 year	78-98	1009	62
2020	Q2020	42-44 year	80-100	802	62
2023	Q2023	43-45 year	83- 100	518	59

**Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)**

See copies of questionnaires for the exact wording of the questions used. Corresponding question numbers are given in the cells of table below.

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
COVID 19																C1-C15	7.22
Medical History (MH)- self reported doctor diagnosis																	
MH: Acute coronary syndrome											2.0a	2.0a	2.0a	2.0a	2.0	2.0	
MH: Angina	10.1	2.0	3.0	3.0	1.0c		2.0c	2.0c	2.0c	2.0a	2.0a	2.0b	2.0b	2.0b	2.0b	2.1	2.1
MH: Aortic Aneurysm			3.0	3.0	1.0f		2.0g	2.0g	2.0g	2.0b	2.0b	2.0c	2.0c	2.0c	2.0c	2.2	2.2
MH: Atrial Fibrillation										2.0c	2.0c	2.0d	2.0d	2.0d	2.0d	2.3	2.3
MH: Deep Vein Thrombosis					1.0h		2.0i	2.0i	2.0i	2.0d	2.0d	2.0e	2.0e	2.0e	2.0e	2.4	2.4
MH: Heart attack	10.1	2.0	3.0	3.0	1.0a		2.0a	2.0a	2.0a	2.0e	2.0e	2.0f	2.0f	2.0f	2.0f	2.5	2.5
MH: Heart failure				3.0	1.0b		2.0b	2.0b	2.0b	2.0f	2.0f	2.0g	2.0g	2.0g	2.0g	2.6	2.6
MH: High blood pressure	10.1	2.0	3.0	3.0	1.0e		2.0e	2.0e	2.0e	2.0h	2.0g	2.0h	2.0h	2.0h	2.0h	2.7	2.7
MH: High cholesterol							2.0f	2.0f	2.0f	2.0g	2.0h	2.0i	2.0i	2.0i	2.0i	2.8	2.8
MH: Narrowing or hardening of the leg arteries				3.0	1.0g		2.0h	2.0h	2.0h	2.0i	2.0i	2.0j	2.0j	2.0j	2.0j	2.9	2.9
MH: Pulmonary Embolism (clot on the lung)					1.0i		2.0j	2.0j	2.0j	2.0k	2.0j	2.0k	2.0k	2.0k	2.0k	2.10	2.10
MH: Other problems of the heart and circulation							2.1	2.1	2.1	2.1	2.0m	2.0l	2.0l	2.0l	2.0l	2.11	2.11
MH: Details of other problems of the heart and circulation							2.1	2.1	2.1	2.1a	2.0n	2.0m	2.0m	2.0m	2.0m	2.12	2.12
MH: Other heart trouble	10.1	2.0	3.0	3.0	1.0d		2.0d	2.0d	2.0d	2.0j							
MH: Stroke	10.1	2.0	3.0	6.0	3.0		3.0	3.0	3.0	3.0	2.0k	3.0	3.0	3.0	3.0	3.0	3.0
MH: Stroke - Year of last occurrence				6.0	3.0		3.0	3.0	3.0	3.0					3.0	3.0	3.0
MH: Stroke - Did the symptoms last for more than 24 hours?				6.0	3.0a		3.1	3.1	3.1	3.0a		3.0a	3.0a	3.0a	3.0a	3.1	3.1
MH: Stroke - Have you made a complete recovery from your stroke?				6.0			3.2	3.2	3.2	3.0b		3.0b	3.0b	3.0b	3.0b	3.2	3.2
MH: Stroke - Following your stroke, do you still need any help in carrying out everyday activities?				6.0			3.3	3.3	3.3	3.0c					3.0c	3.3	3.3
MH: Stroke - Stroke, which body parts were affected?				6.0													
MH: Stroke - Transient Cerebral Ischemic Attack											2.0l						
Medical History (MH)- Investigations - self reported																	
MH: HEART INVESTIGATIONS Investigations and special treatment for conditions affecting your heart and circulation			4	4	2		4			4	3	4	4	4	4	4	4
MH: HEART INVESTIGATIONS - A referral for an echocardiogram ("echo")															4.0a	4.0	4.0
MH: HEART INVESTIGATIONS - An exercise ECG ("stress" or "treadmill") test			4.0	4.1			4.3	4.0c	4.0c	4.0c					4.0b	4.1	4.1
MH: HEART INVESTIGATIONS -CT scan of coronary arteries																4.2	4.2
MH: HEART INVESTIGATIONS -Angiogram or X-ray of coronary arteries (using a dye)			4.0	4.2			4.4	4.0d	4.0d	4.0d	3.0a	4.0a	4.0a	4.0a	4.0c	4.3	4.3
MH: HEART INVESTIGATIONS -Angioplasty (balloon treatment of coronary artery, PCI, stents)			4.0	4.3	2.0a		4.5	4.0e	4.0e	4.0e	3.0b	4.0b	4.0b	4.0b	4.0d	4.4	4.4
MH: HEART INVESTIGATIONS -Coronary artery bypass graft operation ("heart bypass" or "CABG")			4.0	4.4	2.0b		4.6	4.0f	4.0f	4.0f	3.0c	4.0c	4.0c	4.0c	4.0e	4.5	4.5

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

See copies of questionnaires for the exact wording of the questions used. Corresponding question numbers are given in the cells of table below.

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
MH: HEART INVESTIGATIONS -Surgery to aorta for aneurysm			4.0														
MH: HEART INVESTIGATIONS -Other heart surgery – Valves			4.0														
MH: HEART INVESTIGATIONS -Other heart surgery – Pacemaker			4.0														
MH: HEART INVESTIGATIONS -Any other major surgery			4.0														
MH: HEART INVESTIGATIONS -Other tests, investigations or operations on your heart, arteries or veins?				4.7			4.7	4.0g	4.0g	4.0g					4.0f	4.6	4.6
MH: HEART INVESTIGATIONS -Details of other tests, investigations or operations on your heart, arteries or veins?							4.7	4.0g	4.0g	4.0h					4.0g	4.7	4.7
MH: HEART INVESTIGATIONS -Referral to a heart specialist			4.0				4.1	4.0a	4.0a	4.0a							
MH: HEART INVESTIGATIONS -Referral to chest pain clinic							4.2	4.0b	4.0b	4.0b							
MH: HEART INVESTIGATIONS -Admission to hospital with chest pain, angina or heart attack				4.5													
MH: HEART INVESTIGATIONS -Admission to hospital with other heart trouble				4.6													
MH: HEART INVESTIGATIONS -Have you ever taken part in a cardiac rehabilitation exercise programme?													4.1		4.1	4.8	4.8
MH: HEART INVESTIGATIONS - Cardiac Rehab -If yes, which year was this?													4.1a		4.2	4.9	4.9
Medical History (MH)- self reported doctor diagnosis																	
MH: Diabetes				8	5		5	5	5	5	4	5	5	5	5	5	5
MH: Diabetes	10.1	2.0	3.0	8.0	5.1		5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
MH: Diabetes year of diagnosis			5.3	8.1	5.1a		5.1	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
MH: Diabetes - any complications of diabetes affecting your: feet/ kidneys/eyes/nerves							5.2	5.1	5.1	5.1	4.1	5.1	5.1	5.1	5.1	5.1	5.1
MH: Diabetes - Have your eyes been checked for signs of diabetes? Give the year of last check							5.3										
MH: Diabetes- in what year did you begin regular treatment			5.4	8.2													
MH: Diabetes Treatment- Diet				8.3													
MH: Diabetes Treatment- Tablets				8.4													
MH: Diabetes Treatment- Insulin				8.5													
MH: Diabetes Treatment- attend diabetic clinic			5.5	8.7													
MH: Cancer					4		6	6	6	6	5	6	6	6	6	6	6
MH: Cancer			3.0		4.0		6.0	6.0	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
MH: Cancer Year of first diagnosis					4.0a		6.0a	6.0	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
MH: Cancer Site (parts of the body affected)			3.0	5.1	4.0a		6.0b	6.1	6.1	6.1	5.1	6.1	6.1	6.1	6.1	6.1	6.1
MH: Other medical conditions				5			8		8	7	6	7	7	9	7	7	7
MH: Alzheimer’s disease											7.0a	7.0a	7.0a	9.0a	7.0a	7.0	7.0

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

See copies of questionnaires for the exact wording of the questions used. Corresponding question numbers are given in the cells of table below.

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
MH: Anaemia										7.0a	7.0b	7.0b	7.0b	9.0b	7.0b	7.1	7.1
MH: Asthma	10.1	2.0	3.0	5.0			8.0a	7.0a	8.0a	7.0b	7.0c	7.0c	7.0c	9.0c	7.0c	7.2	7.2
MH: Bronchitis	10.1	2.0	3.0	5.0			8.0b	7.0b	8.0b	7.0c	7.0d	7.0d	7.0d	9.0d	7.0d	7.3	7.3
MH: Cataract							8.0c	7.0c	8.0c	7.0d	7.0e	7.0e	7.0e	9.0e	7.0e	7.4	7.4
MH: Chronic Kidney disease									8.0n		7.0f	7.0f	7.0f	9.0f	7.0f	7.5	7.5
MH: Chronic obstructive pulmonary disease (COPD)										7.0e	7.0g	7.0g	7.0g	9.0g	7.0g	7.6	7.6
MH: Crohn's disease										7.0f					7.0h	7.7	7.7
MH: Dementia											7.0h	7.0h	7.0h	9.0h	7.0i	7.8	7.8
MH: Depression				5.0			8.0d	7.0d	8.0d	7.0g	7.0i	7.0i	7.0i	9.0i	7.0j	7.9	7.9
MH: Emphysema							8.0e	7.0e	8.0e	7.0h	7.0j	7.0j	7.0j	9.0j	7.0k	7.10	7.10
MH: Gall bladder disease	10.1	2.0	3.0	5.0			8.0f	7.0f	8.0f	7.0i	7.0k				7.0l	7.11	7.11
MH: Gastric, peptic or duodenal ulcer	10.1	2.0	3.0	5.0			8.0g	7.0g	8.0g	7.0j	7.0l				7.0m	7.12	7.12
MH: Glaucoma				5.0			8.0h	7.0h	8.0h	7.0k	7.0m	7.0k	7.0k	9.0k	7.0n	7.13	7.13
MH: Gout	10.1	2.0	3.0	5.0			8.0i	7.0i	8.0i	7.0l	7.0n	7.0l		9.0l	7.0o	7.14	7.14
MH: Liver disease, cirrhosis or hepatitis								8.0	7.0	7.0m	7.0o				7.0p	7.15	7.15
MH: Macular degeneration										7.0n	7.0p	7.0m	7.0l	9.0m	7.0q	7.16	7.16
MH: Osteoporosis				5.0			8.0j	7.0j	8.0j	7.0o	7.0q	7.0n	7.0m	9.0n	7.0r	7.17	7.17
MH: Parkinson's disease							8.0k	7.0k	8.0k	7.0p	7.0r	7.0o	7.0n	9.0o	7.0s	7.18	7.18
MH: Pneumonia				5.0			8.0l	7.0l	8.0l	7.0q	7.0s	7.0p	7.0o	9.0p	7.0t	7.19	7.19
MH: Prostate trouble							8.0m	7.0m	8.0m	7.0r	7.0t				7.0u	7.20	7.20
MH: Shingles										7.0s					7.0v	7.21	7.21
MH: Thyroid disease	10.1	2.0	3.0	5.0												7.22	7.23
MH: Ulcerative colitis										7.0t					7.0w	7.23	7.24
MH: Other conditions 1	10.1	2.0					8.0n	7.0n	8.0o	7.0u	7.0u	7.0q		9.0q	7.0x	7.24	7.25
MH: Other conditions 2	10.1	2.0	3.0													7.25	7.26
Physical Health: The World Health Organisation (Rose) chest pain questionnaire	6	4	7	9	6		12	14	14	13	11	10	10	10	8	8	8
Chest Pain: Do you ever have any pain or discomfort in your chest?	6.1	4.1	7.1	9.1	6.0		12.0	14.0	14.0	13.0	11.0	10.0	10.0	10.0	8.0	8.0	8.0
Chest Pain: When you walk at an ordinary pace on the level, does this produce chest pain?	6.5	4.3	7.3	9.3	6.1c		12.0a	14.1	14.1	13.1	11.1	10.1	10.1	10.1	8.1	8.1	8.1
Chest Pain: When you walk uphill or hurry, does this produce chest pain?	6.6	4.4	7.4	9.4	6.1d		12.0b	14.2	14.2	13.2	11.2	10.2	10.2	10.2	8.2	8.2	8.2
Chest Pain: Do you know the cause of the pain					6.1a												
Chest Pain: Mark of the chest image where you get this pain or discomfort	6.4	4.2	7.2	9.2	6.1b												
Chest Pain: When did you last get this pain	6.2																
Chest Pain: How often do you get this pain	6.3																
Chest Pain: When you get any pain or discomfort in your chest on walking, what do you do	6.7	4.5	7.5	9.5	6.1e												

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Chest Pain: Does the pain or discomfort in your chest go away if you stand still?	6.8	4.6	7.6	9.6	6.1f												
Chest Pain: How long does it take to go away?	6.9	4.7	7.7	9.7	6.1g												
Chest Pain: Overall is the chest pain					6.1h												
Chest Pain: Have you previously had chest pain, which has stopped because of an operation?				9.8	7.0												
Chest Pain: if yes, operation details				9.8	7.0a												
Chest Pain: Have you ever had a severe pain across the front of your chest lasting for half an hour or more?	5.1	5.1	8.1	10.1	8.0												
Chest Pain: If yes, what year did this happen		5.3	8.2	10.3	8.0a												
Chest Pain: Mark of the chest image where you get this pain or discomfort	5.2																
Chest Pain: Did you see a doctor because of this pain? Cause of pain?	5.3	5.2	8.3	10.2	8.0b												
<b>Physical Health: MRC Respiratory Symptoms</b>																	
<b>Breathlessness:</b>			10	12			13	15	15	14	13	11	12	11	9	9	9
Breathlessness: Do you ever get short of breath walking with other people of your own age on level ground?	8.1		10.1	12.1			13.0	15.0	15.0	14.0	13.0	11.0	12.0	11.0	9.0	9.0	9.0
Breathlessness: On walking uphill or upstairs, do you get more breathless than people of your own age?	8.2		10.2	12.2			13.1	15.1	15.1	14.1	13.1	11.1	12.1		9.1	9.1	9.1
Breathlessness: Do you ever have to stop walking because of breathlessness?	8.3		10.3	12.3			13.2	15.2	15.2	14.2	13.2	11.2	12.2		9.2	9.2	9.2
Breathlessness: In the past year have you been awoken at night by an attack of shortness of breath?							13.3	15.3	15.3	14.3	13.3	11.3	12.3		9.3	9.3	9.3
<b>Cough and Wheeze</b>			11	14				15	15	15	12		11		10	10	10
Cough and Wheeze: Do you usually bring up phlegm (or spit) from your chest first thing in the morning in the winter?	7.1		11.1	14.1				15.4	15.4	15.0	12.0		11.0		10.0	10.0	10.0
Cough and Wheeze: Do you bring up phlegm like this on most days for as much as three months in the winter each year?	7.2		11.2	14.2				15.5	15.5	15.1	12.1		11.1		10.1	10.1	10.1
Cough and Wheeze: In the past four years have you had a period of increased cough and phlegm lasting for 3 weeks or more?	7.3		11.3	14.3				15.6	15.6	15.2					10.2	10.2	10.2
Cough and Wheeze: Does your chest ever sound wheezy or whistling?	7.4		11.4	14.4				15.7	15.7	15.3					10.3	10.3	10.3
Cough and Wheeze: If yes, does this happen on most days or nights?	7.5		11.4	14.4				15.8	15.8	15.4					10.4	10.4	10.4
Cough and Wheeze: Does the weather affect your breathing and if so at what season of the year is it most affected			11.5														

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
<b>Chest infections and antibiotics</b>																	
Chest infections and antibiotics: How many times in the past year have you had a chest infection requiring antibiotic treatment from your doctor?								15.9	15.9	15.2					10.5	10.5	10.5
<b>Operations</b>								13	13	12					11	11	11
Operations: Have you had any major operations in the last 10 years?				5.2				13.0	13.0	12.0					11.0	11.0	11.0
Operations: If yes, please give details:								13.0	13.0	12.1					11.1	11.1	11.1
<b>Bladder control/ Faecal Incontinence</b>																	
Incontinence: have you leaked even a small amount of urine?															11.2	11.2	11.2
Incontinence: Did urine incontinence last more than a month																11.3	11.3
Incontinence: have you leaked even a small amount of faecal matter?																11.4	11.4
Incontinence: Did faecal incontinence last more than a month																11.5	11.5
<b>Physical Health: Leg Pain (Edinburgh Claudication Questionnaire)</b>	9		9	11	9			17	17	18	15				12	12	12
Physical Health: Ankle Swelling				13.0													
Physical Health: Arthritis	10.1	2.0	3.0	5.0			7	9	9	8	9	8	8	7	13	13	13
Physical Health: Joint pain, swelling or stiffness							9	10	10	9	10	9	9	8	14	14	14
Physical Health: Lower back pain							10	11	11	10	7				15	15	15
<b>Physical Health: Falls</b>			20	22.1			11.2	12	12	11	14	13	13	12	16	16	16
Physical Health: Fractures				22.2			11	12	12	11	8.0	12	13		17	17	17
Physical Health: Dizziness			20				11	12	12	11.0	14.0	14.0	13.5	13.0	17	17.10	17.10
<b>Physical Health: Eyesight</b>				5.4	5.4		16	16	16	16	16	15	14	14	19	21	21
Physical Health: Hearing				5.4	5.4		17	16	16	17	17	16	15	15	20	20	20
Physical Health: Weight		7	12	15			14	18	18	19	18	17	16	18	21	19	19
Physical Health: Height																19	21
<b>Your overall health: Euro QoL ED-5L</b>		1.0	2.0	2.0	13		18	23	22	23	27	24	24	21	18	18	18
Overall health: Pain/discomfort					13.1		18.1	23.1	22.1	23.1	27.1	24.1	24.1	21.1	18.1	18.1	18.1
Overall health: Usual activities e.g. work, study, housework, family or leisure activities					13.2					23.2	27.2	24.2	24.2	21.2	18.2	18.2	18.2
Overall health: Mobility					13.4		18.2	23.2	22.2	23.3	27.3	24.3	24.3	21.3	18.3	18.3	18.3
Overall health: Anxiety/depression					13.5		18.3	23.3	22.3	23.4	27.4	24.4	24.4	21.4	18.4	18.4	18.4

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Overall health: Health scale 0-100					13.7		18.7	23.8	22.8	23.5	27.5	24.5	24.5	21.5	18.5	18.5	18.5
Overall health: Self care					13.3												
Overall health: Self-rated general health		1.0	2.0	2.0	13.0		18.0	23.0	22.0	23.0	27.0	24.0	24.0	21.0	18.0	18.0	18.0
Memory					13.6			23.7	22.7								
Health Behaviours: Smoking																	
Smoking	12	9	14	16	10		20	19	19	20	20	19	18	17	22	22	22
Smoking: Cigarettes?	12.1i		14.6	16.6	10.0						20.0	19.0	18.0	17.0	22.0	22.0	22.0
Smoking: Pipe	12.4	9.3	14.4	16.2	10.3		22.0	20.0	20.0	20.3							
Smoking: Cigar	12.5	9.3	14.4	16.2	10.4		22.1	20.1	20.1	20.4							
Smoking: If hand-rolled, how much tobacco do you use a week?					10.1a		20.2	19.2									
Smoking: Do you want to give up smoking?				16.1			20.3	19.3									
Smoking: Have you tried to give up smoking?				16.1			20.4	19.4									
Smoking: Cessation help offered?							20.5	19.4									
Smoking: Cessation what helped							21.1										
Smoking: Secondary Exposure: Does your wife/ partner smoke cigarettes					10.5												
Smoking: Cessation reasons			14.8	16.7													
Taste and smell: ability to smell things?															62.1	49.0	48.0
Taste and smell: ability to taste food or drink?															62.2	49.1	48.1
Health Behaviours: Alcohol																	
Alcohol Intake	11	10	15	17	11		23	21	21	21	21	20	19	16	23	23	23
Alcohol Intake: Would you describe your present alcohol intake as	11.6i	10.1	15.1	17.1	11.0		23.0	21.0	21.0	21.0	21.0	20.0	19.0	16.0	23.0	23.0	23.0
Alcohol Intake: How much do you usually drink on the days when you drink alcohol?	11.6iii	10.2	15.2	17.2	11.1		23.1	21.1	21.1	21.1	21.1	20.1	19.1	16.1	23.1	23.1	23.1
Alcohol Intake: How many alcoholic drinks do you have during an average week?					11.2		23.2	21.2	21.2	21.2	21.2	20.2	19.3		23.2	23.2	23.2
Alcohol Intake: Have you ever been a regular drinker of more than 6 drinks per day?			15.3	17.3													
Alcohol Intake: What type of drink do you usually take?	11.6ii		15.4	17.4	11.3		23.3	21.3	21.3	21.3	21.3				23.3	23.3	23.3
Alcohol Intake: Changes in your alcohol intake?			15.5	17.5	11.5		23.6	21.6	21.6	21.7	21.6						
Alcohol Intake: Reasons for reduction			15.6	17.6	11.6		23.7	21.7	21.7	21.8							
Alcohol Intake: When do you drink alcohol with meals....					11.4		23.5	21.5	21.5	21.6							
Alcohol Intake: CAGE questionnaire																	

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Alcohol Intake: Have you ever felt you ought to cut down on your drinking			16.1						21.8	21.9							
Alcohol Intake: Have people annoyed you by criticizing your drinking			16.2						21.9	21.10							
Alcohol Intake: Have you ever felt bad or guilty about your drinking			16.3						21.10	21.11							
Alcohol Intake: Have you had a drink first thing in the morning (eye-opener) to steady your nerves or get rid of a hangover			16.4						21.11	21.12							
Alcohol Intake: Ex-Drinkers			17														
Alcohol Intake: Ex-Drinkers - why do you not drink at present?		10.3	17.1	17.6													
Alcohol Intake: Ex- Drinkers- Did you drink in the past		10.4	17.2														
Alcohol Intake: Ex-Drinkers- How often do you drink?		10.5															
Alcohol Intake: Ex- Drinkers- Number of drinks per day		10.6															
Alcohol Intake: Ex drinkers- how long have you given up			17.3														
Water intake															24	24	24
How many glasses of water do you drink a day?															24.0	24.0	24.0
Diet: Snacks														29	25	D10	D10
Diet: How many times a day do you snack on Savoury snacks (e.g. crisps/ salted nuts)?														29.0	25.0a	D10.0	D10.0
Diet: How many times a day do you snack on sweet snacks (e.g. biscuits /cakes/chocolate/sweets)?														29.1	25.0b	D10.1	D10.1
Health/ Social Services: Meals															25	25	
Health/ Social Services: Do you receive help with preparing your meals?															25.1	25.0	
Health/ Social Services: Meals provided by Social/Local Authority services or private provider?															25.1a	25.1	
Health/ Social Services: Meals provided by Friends/family?															25.1b	25.2	
Health/ Social Services: Meals provided by other															25.1c	25.3	
Muscle strength and endurance activities							19.5	24.8	23.8	22.9	23.8		20.8	20.8	28	28	27
Grip Strength- Rate your hand grip strength compared to other people your age?											22	21		25	29	29	28
Strengthening and Balance Exercises											24.0		21.0		30	30	29
Mobility Aids: Do you use any mobility aids?										28.0	26.0	23.0	27.0	26.0	33.0	33	32
Mobility: How would you describe your current mobility?															40.0	33.0	32.0

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023	
Health Behaviours: Physical activity (PA)	13		18	18	12	Q20	19	24	23	22	23	22	20	20	26	26	25	
PA: Do you make regular journeys every day or most days either walking or cycling?					12.0		19.0	24.0	23.0	22.0	23.0	22.0	20.0	20.0	26.0	26.0	25.0	
PA: Do you walk or cycle to work each day	13.1i		18.1	18.1														
PA: Work Journeys- How many minutes do these journeys take in total each day	13.1i		18.2	18.2														
PA: Apart from work journeys, do you walk or cycle on weekdays	13.1ii		18.3	18.3														
PA: Non work journeys- time	13.1ii		18.4	18.4														
PA: Would you say that in your occupation you are or were physically?	13.1iii		18.5															
PA: How many hours do you normally spend walking e.g. on errands or for leisure in the average week?					12.1		19.0a	24.1	23.1	22.1	23.1	22.1	20.1	20.1	26.1	26.1	25.1	
PA: Which of the following best describes your usual walking pace?					12.2		19.1	24.2	23.2	22.2	23.2	22.2	20.2	20.2	26.2	26.2	25.2	
PA: How many hours do you normally spend cycling in the average week?					12.3		19.2	24.3	23.3	22.3	23.3		20.3	20.3	26.3	26.3	25.3	
PA: On a normal day, how many times do you climb a flight of stairs, (assuming that 1 flight of stairs has 10 steps)?													20.4	20.4				
PA: Do not climb stairs						3.0					23.4		20.4	20.4	26.4	26.4	25.4	
PA: Compared with a man who spends two hours on most days on activities such as: walking, gardening, household chores, DIY projects, how physically active would you consider yourself?	13.2		18.6	18.5	12.4		19.3	24.4	23.4	22.4	23.5	22.3	20.5	20.5		26.5	26.6	25.6
PA: Do you do active physical exercises such as running, swimming, dancing, golf, tennis, squash, jogging, bowls, cycling, hiking, etc.?	13.3		18.8	18.6	12.5		19.4	24.5	23.5	22.5	23.6		20.6	20.6		26.6	26.7	25.7
PA: If you ticked frequently, please state type of activities:	13.4		18.9	18.6	12.5a		19.4a	24.6	23.6	22.6	23.6a		20.6a	20.6a	26.7	26.8	25.8	
PA: How many times a month on average do you take part in these activities?			18.11								23.6b		20.6b	20.6b				
PA: In winter	13.6		18.11	18.7	12.5c		19.4b	24.7	23.7	22.7	23.7a		20.7a	20.7a	26.8	26.9	25.9	
PA: In summer	13.6		18.11	18.7	12.5c		19.4b	24.7	23.7	22.8	23.7b		20.7b	20.7b	26.9	26.10	25.10	
PA: How many years have you been engaged in these sorts of physical activities	13.5		18.10	18.6	12.5b													
PA: Gardening - Light hours per week			18.7															
PA: Gardening - moderate hours per week			18.7															
PA: Gardening - Heavy hours per week			18.7															
PA: How many miles do you walk in an average week						1.1												
PA: How many journeys of at least a mile do you walk each week						1.2												
PA: Household Activities Hours per week Light activities						2.0												

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PA: Household Activities Hours per week Moderate activities						2.0											
PA: Household Activities Hours per week Heavy activities						2.0											
PA: Other Activities in the past year						4.0											
PA: Do you participate in vigorous activities						5.0											
PA: Time spent on vigorous activity						5.1											
PA: Activity levels compared with three years ago						5.2											
PA: Activity levels reduced why?						5.3											
PA: General Fitness										27	25		22		27	27	26
PA General Fitness: Can you do any of the following activities:																	
PA General Fitness: run a short distance?										27.0	25.0		22.0		27.0	27.0	26.0
PA General Fitness: do heavy work around the house (e.g. lifting & moving heavy furniture)										27.1	25.1		22.1		27.1	27.1	26.1
PA General Fitness: do gardening (e.g. raking leaves, weeding & pushing the lawn mower)										27.2	25.2		22.2		27.2	27.2	26.2
PA General Fitness: participate in moderate activities like golf, bowling, dancing or doubles tennis?										27.3	25.3		22.3		27.3	27.3	26.3
PA General Fitness: participate in strenuous sports like swimming or singles tennis?										27.4	25.4		22.4		27.4	27.4	26.4
PA General Fitness: have sexual relations?										27.5	25.5		22.5		27.5	27.5	26.5
Recent Illness: Stress and illness in last 3 months															41	39	38
Recent Illness: Have you been stressed or severely ill in the past 3 months?															41.0	39.0	38.0
Recent Illness: Are you currently experiencing dementia and/or prolonged severe sadness?															41.1	39.1	38.1
<b>Disability</b>			19	21	14		15	22	24	24	28	25	25	22	31	31	31
Disability: Do you have any long-standing illness, disability or infirmity?				21.1	14.0		15.0	22.0	24.0		28.0	25.0	25.0	22.0	31.0	31.0	30.0
Disability: What is the long-standing illness/ problem?				21.1													
Disability: Does this long-standing illness or disability limit your activities in any way?				21.1	14.0a		15.0a	22.0a	24.0a		28.0a	25.0a	25.0a	22.0a	31.0a	31.1	30.1
Disability: Long-standing illness how does limit activities?				21.1													
Disability: Long-standing illness do you receive a disability allowance?					14.0b		15.0b	22.0b	24.0b		28.0b	25.0b	25.0b	22.0b	31.0b	31.2	30.2
Disability: Impacts Going up or down stairs			19.1	21.2	14.1a		15.1a	22.1a	24.1a	24.1a	29.1a	26.0a	26.0a	23.0a	32.0a	32.0	31.0
Disability: Impacts of Bending down			19.1	21.2	14.1b		15.1b	22.1b	24.1b	24.1b	29.1b	26.0b	26.0b	23.0b	32.0b	32.1	31.1
Disability: Impacts Straightening up			19.1	21.2			15.1c	22.1c	24.1c	24.1c	29.1c	26.0c	26.0c	23.0c	32.0c	32.2	31.2
Disability: Impacts Keeping your balance			19.1	21.2	14.1c		15.1d	22.1d	24.1d	24.1d	29.1d	26.0d	26.0d	23.0d	32.0d	32.3	31.3
Disability: Impacts Going out of the house			19.1	21.2			15.1e	22.1e	24.1e	24.1e	29.1e	26.0e	26.0e	23.0e	32.0e	32.4	31.4
Disability: Impacts Walking 400 yards			19.1	21.2	14.1d		15.1f	22.1f	24.1f	24.1f	29.1f	26.0f	26.0f	23.0f	32.0f	32.5	31.5

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Disability: Current health impacts Job at work paid employment			19.2	21.3	14.2a		15.2a	22.2a	24.2a	24.2a	29.2a	26.1a	26.1a	23.1a	32.1a	32.6	31.6
Disability: Current health impacts Household chores			19.2	21.3	14.2b		15.2b	22.2b	24.2b	24.2b	29.2b	26.1b	26.1b	23.1b	32.1b	32.7	31.7
Disability: Current health impacts social life			19.2	21.3	14.2c		15.2c	22.2c	24.2c	24.2c	29.2c	26.1c	26.1c	23.1c	32.1c	32.8	31.8
Disability: Current health impacts Sex life			19.2	21.3			15.2d	22.2d	24.2d								
Disability: Current health impacts Interests and hobbies			19.2	21.3	14.2d		15.2e	22.2e	24.2e	24.2d	29.2d	26.1d	26.1d	23.1d	32.1d	32.9	31.9
Disability: Current health impacts Holidays and outings			19.2	21.3	14.2e		15.2f	22.2f	24.2f	24.2e	29.2e	26.1e	26.1e	23.1e	32.1e	32.10	31.10
Disability: Current health impacts Family relationships			19.2	21.3	14.2f												
Disability: Current health impacts: Do you have any difficulties getting about outdoors?			19.3								29.3	26.2	26.2	23.2	32.2	32.11	31.11
<b>Sleeping Patterns</b>							18	23	22	29	32	29	30	27	63	50	49
Sleep: On most nights, how would you rate the quality of your sleep?							18.4	23.4	22.4	29.0	32.0	29.0	30.0	27.0	63.0	50.0	49.0
Sleep: Hours spent sleeping - Night / Day							18.5	23.4	22.4	29.1	32.1	29.1	30.1	27.1	63.1a	50.1	49.1
Sleep: How often do you feel excessively sleepy during the day?													30.3		63.2	50.3	49.3
Sleep: During the last month, did you have difficulties falling asleep at night?								23.5	22.5	29.3	32.3	29.3	30.4		63.3	50.4	49.4
Sleep: During the last month, have you often woken up during the early hours and are unable to get back to sleep?								23.6	22.6	29.4	32.4	29.4	30.5		63.4	50.5	49.5
Sleep: During the last month, have you had trouble maintaining sleep at night?											32.5	29.5	30.6		63.5	50.6	49.6
Sleep: During the last month, how often do you wake up feeling tired and worn out after the usual amount of sleep?												29.6	30.7		63.6	50.7	49.7
Sleep: Do you snore while asleep							18.6			29.6	33.0					50.8	49.8
Sleep: During the last month, have you snored loudly while asleep?										29.7	33.1		30.8		63.7		
Sleep: most frequent reasons for waking										29.5							
Sleep: Sleep apnoea															63.8	50.9	49.9
Sleep: Have you ever been told that you hold your breath during sleep (stop breathing for at least 10 seconds)										29.8	33.2						
Sleep: Have you ever woken short of breath during sleep										29.9	33.3						
<b>Activities of daily living (ADL)</b>							28	31	29	25	30	27	28	24	34	34	33
ADL: What is the furthest you can walk on your own without stopping and without discomfort?							28.0	31.0	29.0	25.0	30.1	27.0	28.0	24.0	34.0	34.0	33.0
ADL: Can you walk up and down a flight of 12 stairs without resting?							28.1	31.1	29.1	25.1	30.2	27.1	28.1	24.1	34.1	34.1	33.1
ADL: When standing, can you bend down and pick up a shoe from the floor?							28.2	31.2	29.2	25.2	30.3	27.2	28.2	24.2	34.2	34.2	33.2

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
ADL: When sitting, can you rise from a chair of knee height, without using your hands?												27.3	28.3	24.3	34.3	34.3	33.3
ADL: Would you say there has been any change in your ability to do practical things in the past two years?													28.4		34.4	34.4	33.4
<b>Instrumental Activities of Daily Living (IADLs):</b>							29	32	30	26	31	28	29	30	35	35	34.0
IADL: Reaching or extending your arms above shoulder level							29.0a	32.0a	30.0a	26.0a	31.0a	28.0a	29.0a	30.0a	35.0a	35.0	34.0
IADL: Pulling or pushing large objects like a living room chair							29.0b	32.0b	30.0b	26.0b	31.0b	28.0b	29.0b	30.0b	35.0b	35.1	34.1
IADL: Walking across a room							29.0c	32.0c	30.0c	26.0c	31.0c	28.0c	29.0c	30.0c	35.0c	35.2	34.2
IADL: Getting in and out of bed on your own							29.0d	32.0d	30.0d	26.0d	31.0d	28.0d	29.0d	30.0d	35.0d	35.3	34.3
IADL: Getting in and out of a chair on your own							29.0e	32.0e	30.0e	26.0e	31.0e	28.0e	29.0e	30.0e	35.0e	35.4	34.4
IADL: Dressing and undressing yourself on your own							29.0f	32.0f	30.0f	26.0f	31.0f	28.0f	29.0f	30.0f	35.0f	35.5	34.5
IADL: Bathing or showering							29.0g	32.0g	30.0g	26.0g	31.0g	28.0g	29.0g	30.0g	35.0g	35.6	34.6
IADL: Feeding yourself, including cutting food							29.0h	32.0h	30.0h	26.0h	31.0h	28.0h	29.0h	30.0h	35.0h	35.7	34.7
IADL: Getting to and using the toilet on your own							29.0i	32.0i	30.0i	26.0i	31.0i	28.0i	29.0i	30.0i	35.0i	35.8	34.8
IADL: Lifting and carrying something as heavy as 10 lbs, (e.g. a bag of groceries)							29.0j	32.0j	30.0j	26.0j	31.0j	28.0j	29.0j	30.0j	35.0j	35.9	34.9
IADL: Shopping for personal items such as toilet items or medicine by yourself							29.0k	32.0k	30.0k	26.0k	31.0k	28.0k	29.0k	30.0k	35.0k	35.10	34.10
IADL: Doing light housework (e.g. washing up)							29.0l	32.0l	30.0l	26.0l	31.0l	28.0l	29.0l	30.0l	35.0l	35.11	34.11
IADL: Preparing your own meals by yourself							29.0m	32.0m	30.0m	26.0m	31.0m	28.0m	29.0m	30.0m	35.0m	35.12	34.12
IADL: Using the telephone by yourself							29.0n	32.0n	30.0n	26.0n	31.0n	28.0n	29.0n	30.0n	35.0n	35.13	34.13
IADL: Taking medications by yourself							29.0o	32.0o	30.0o	26.0o	31.0o	28.0o	29.0o	30.0o	35.0o	35.14	34.14
IADL: Managing money (e.g. paying bills etc)							29.0p	32.0p	30.0p	26.0p	31.0p	28.0p	29.0p	30.0p	35.0p	35.15	34.15
IADL: Using public transport on your own							29.0q	32.0q	30.0q	26.0q	31.0q	28.0q	29.0q	30.0q	35.0q	35.16	34.16
IADL: Driving a car on your own							29.0r	32.0r	30.0r	26.0r	31.0r	28.0r	29.0r	30.0r	35.0r	35.17	34.17
IADL: Gripping with hands (e.g. opening a jam jar)								32.0s	30.0s	26.0s	31.0s	28.0s	29.0s	30.0s	35.0s	35.18	34.18
<b>Cognitive Impairment / Dementia</b>																	
Memory: How often do you have trouble remembering things?										37.0	47.0	37.0	39.0	39.0	64.0	51.0	50.0
Memory: Did you have more trouble than usual remembering recent events?										37.1	47.1	37.1	39.1		64.1	51.1	50.1
Memory: Did you have more trouble than usual remembering a short list of items such as a shopping list?										37.2	47.2	37.2	39.2	39.1	64.2	51.2	50.2
Memory: Did you have trouble remembering things from one second to the next?										37.3	47.3	37.3	39.3	39.2	64.3	51.3	50.3
Memory: Did you have any difficulty in understanding or following spoken instruction?										37.4	47.4	37.4	39.4	39.3	64.4	51.4	50.4

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Memory: Did you have more trouble than usual following a group conversation or a plot on TV due to your memory?										37.5	47.5	37.5	39.5	39.4	64.5	51.5	50.5
Memory: Did you have trouble finding your way around familiar streets?										37.6	47.6	37.6	39.6	39.5	64.6	51.6	50.6
Memory: Did you have trouble getting things organised/ organising your day?										37.7	47.7	37.7	39.7	39.6	64.7	51.7	50.7
Memory: Did you have trouble concentrating on things e.g. reading a book?										37.8	47.8	37.8	39.8	39.7	64.8	51.8	50.8
Memory: Forgetfulness- has forgetfulness affected your daily life?												37.9	39.9	39.8	65.0	52.0	51.0
Recent major life events								30			40		36		66	53	52
Appetite: Quality of appetite												18.0	17.0	19.0	36.0	36.0	35.0
Appetite and eating: Illness															37.0	37.0	36.0
Appetite and eating: Malnutrition															39	38	37
Shopping for food															38	38.4	37.4
Oral Health: Dental Health (mouth, teeth and or dentures)										30	36	31	32	31	50	40	39
Oral Health: General Dental Health										30	36	31	32	31	50	40	39
Oral Health: Your teeth										30	36	31	32	31	51	40	39
Oral Health: Back teeth(molars)															52	41	40
Oral Health: Difficulty chewing																	
Oral Health: Do you have difficulty chewing any foods because of problems with your teeth, mouth or dentures?												31.2	32.2	31.2	53.1	42.0	41.0
Oral Health: Do you avoid eating some foods because of problems with your teeth, mouth or dentures?												31.3	32.3	31.3	53.2	42.1	41.1
Oral Health: Does it take you longer to finish a meal than other people of your own age?												31.4	32.4	31.4	53.3	42.2	41.2
Oral Health: Tooth brushing														31.5	54	43	42
Oral Health: Toothbrush used?																43.0	42.0
Oral Health: How frequently do you brush your teeth?														31.5	54.1	43.1	42.1
Oral Health: Do you have difficulty brushing your teeth?															54.2	43.2	42.2
Oral Health: Visiting the dentist							24.1d	25.2d		32	36		32.7		55	44	43
Preventative Health Care: Have you seen your dentist in the last year?							24.1d	25.2d					32.7		55.0	44.0	43.0
Oral Health: Reason to go to the dentist / hygienist for:										32.0					55.1	44.1	43.1
Oral Health: Reason for not visiting the dentist- difficulty to get to the dental surgery															55.2	44.2	43.2

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Oral Health: Reason for not visiting the dentist- financial cost																44.3	43.3
Oral Health: Reason for not visiting the dentist- No Need																44.4	43.4
Oral Health: Reason for not visiting the dentist- Other																44.5	43.5
Oral Health: How long has it been since you last visited the dentist										32.1	36.0						
Oral Health: Dental problems										30	37	31	32	33.0	56	45	44
Oral Health: Toothache										30.6a		31.9a	32.8a	33.0a	56.1	45.0	44.0
Oral Health: Loose tooth										30.6b	37.2c	31.9b	32.8b	33.0b	56.2	45.1	44.1
Oral Health: Sensitive teeth										30.5	37.1	31.9c	32.8c	33.0c	56.3	45.2	44.2
Oral Health: Mouth ulcers															56.4	45.3	44.3
Oral Health: Bleeding gums											37.2b	31.9d	32.8d	33.0d	56.5	45.4	44.4
Oral Health: Other gum problems												31.9e	32.8e	33.0e	56.6	45.5	44.5
Oral Health: Soreness or cracking around the corners of the mouth															56.7	45.6	44.6
Oral Health: Fractured tooth										30.6d	37.2d						
Oral Health: Loose ill-fitting dentures										30.6d	37.2e						
Oral Health: bad position of teeth (eg crooked or gap) deformity of the mouth										30.6c	37.2f						
Oral Health: Colour, shape or size of teeth										30.6e							
Oral Health: or any other dental condition please specify										30.6f	37.2g						
Oral Health: dental difficulties or difficulties											37.2h						
Oral Health: Toothache, sensitive tooth, tooth decay (hole in tooth)											37.2a			33	56	45	44
Oral Health: In the past 6 months have you experienced toothache or severe discomfort with your teeth?										30.4	37.0						
Oral Health: Dental problems affecting your daily life										30.7	37.3				57	46	45
Oral Health: Dentures												31	32	32.0	58	47	46
Oral Health: Upper Teeth												31		32	59	47	46
Oral Health: Lower Teeth												31		32.0	60	47	46
Oral Health: Dry Mouth -Xerostomia Inventory (XI)										31	38	32	33	34	61	48	47
Social Engagement: Time Use							30	33	27		46	36	38.0	38	67	54	53
Social Engagement: Looking after wife/partner							30.0	33.0a	27.0a	34.0a	46.0a	36.0a	38.0a	38.0a	67.0a	54.0	53.0
Social Engagement: Looking after other adult family members or friend							30.0	33.0b	27.0b	34.0b	46.0b	36.0b	38.0b	38.0b	67.0b	54.1	53.1
Social Engagement: Looking after grandchildren							30.0	33.0c	27.0c	34.0c	46.0c	36.0c	38.0c	38.0c	67.0c	54.2	53.2
Social Engagement: Spending time with family, friends and neighbours								33.0d	27.0d	34.0d	46.0d				67.0d	54.3	53.3

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Social Engagement: Talking to friends/relatives on the telephone/video calls									27.0e	34.0e	46.0e				67.0e	54.4	53.4
Social Engagement: In paid work							30.0	33.0e	27.0f	34.0f	46.0f				67.0f	54.5	53.5
Social Engagement: In voluntary work							30.0	33.0f	27.0g	34.0g	46.0g				67.0g	54.6	53.6
Social Engagement: In a pub or club							30.0	33.0i	27.0j	34.0k	46.0k				67.0h	54.7	53.7
Social Engagement: Attending religious services							30.0	33.0j	27.0k	34.0l	46.0l				67.0i	54.8	53.8
Social Engagement: Playing cards, games, or bingo							30.0	33.0k	27.0l	34.0m	46.0m				67.0j	54.9	53.9
Social Engagement: Visiting the cinema/restaurants/sporting events							30.0	33.0l	27.0m	34.0n	46.0n				67.0k	54.10	53.10
Social Engagement: active sports or exercise				18.8													
Social Engagement: On housework				18.8			30.0	33.0g	27.0h	34.0h	46.0h				67.0l	54.11	53.11
Social Engagement: On light gardening (pruning and weeding)				18.8			30.0	33.0h	27.0i	34.0i	46.0i				67.0m	54.12	53.12
Social Engagement: On heavy gardening (digging & mowing)				18.8			30.0	33.0h	27.0i	34.0j	46.0j				67.0n	54.13	53.13
Social Engagement: Watching television/videos/DVD's							30.0	33.0m	27.0n	34.0o	46.0o	36.0d	38.0d	38.0d	67.0o	54.14	53.14
Social Engagement: Reading							30.0	33.0n	27.0o	34.0p	46.0p	36.0e	38.0e	38.0e	67.0p	54.15	53.15
Social Engagement: Attending class or course of study							30.0	33.0o	27.0p	34.0q	46.0q				67.0q	54.16	53.16
Social Engagement: Using a computer								33.0p	27.0q	34.0r	46.0r	36.0f	38.0f	38.0f	67.0r	54.17	53.17
Social Engagement: Driving or sitting in a car										34.0s	46.0s	36.0g	38.0g	38.0g	67.0s	54.18	53.18
Social Engagement: Have you been on any day or overnight trips in the last year?							31.0	34.0	28.0	36.0	46.1		38.1		68.0a	55.1	54.1
Social Engagement: Have you been on holiday in the last year?			23.7	19.7			31.0	35.0	28.1	36.1	46.2		38.2		68.0b	55.2	54.2
Social Engagement: Are you planning to go on holiday next year?			23.8	19.8							46.3		38.3		68.0c	55.3	54.3
Social Engagement: Do you use the internet and/or email?								36.0	28.2	36.0	46.4		38.4		68.0d	55.4	54.4
Social Engagement: Do you use social media?															68.0e	55.5	54.5
Social Engagement: Do you use a "touch screen" mobile phone?															68.0f	55.6	54.6
Social Engagement: Have you written a personal letter or email in the last week?			23.3	19.3							46.5		38.5		68.0g	55.7	54.7
Social Engagement: Do you take a weekly or monthly magazine or journal?			23.4	19.4							46.6		38.6		68.0h	55.8	54.8
Social Engagement: Did you vote in the last general or local elections?			23.6	19.6							46.7		38.7		68.0i	55.9	54.9
Social Engagement: Do you have access to a telephone			23.1	19.1													
Social Engagement: Have you made a personal phone call in the last week			23.2	19.2													
Social Engagement: Do you attend religious services or meetings			23.5	19.5													
Social Engagement: Do you use the public library			23.9	19.9													

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Social Engagement: Are you a member of any club, society or group			23.10	19.10													
Social Engagement: Have you attended a meeting of the club, society or group in the last month?			23.11	19.11													
Loneliness- UCLA -3																	
Loneliness: UCLA -3: How often do you feel you lack companionship?											45.0	35.0	37.0	37.0	69.0a	56.0	55.0
Loneliness: UCLA -3: How often do you feel isolated from others?											45.1	35.1	37.1	37.1	69.0b	56.1	55.1
Loneliness: UCLA -3: How often do you feel left out?											45.2	35.2	37.2	37.2	69.0c	56.2	55.2
Loneliness: How often do you feel in tune with the people around you?											45.3	35.3	37.3	37.3	69.0d	56.3	55.3
Loneliness: I feel lonely															72.0n	59.13	58.13
Loneliness- Contact with relatives and friends					15.0											C12-13	55.4-11
Depression/ Tiredness / Exhaustion											34	30	31	28	70	57	56
During the past week, how often did you feel that everything you did was an effort?											34.0	30.0	31.0	28.0	70.1	57.1	56.1
During the past week, how often did you feel that you could not get "going"?																	
Geriatric Depression Scale										38.0	48	38	40	40	71	58	57
Geriatric Depression Scale: Are you basically satisfied with your life?										38.0a	48.0a	38.0a	40.0a	40.0a	71.0a	58.0	57.0
Geriatric Depression Scale: Do you feel that your life is empty?										38.0b	48.0b	38.0b	40.0b	40.0b	71.0b	58.1	57.1
Geriatric Depression Scale: Are you afraid that something bad is going to happen to you?										38.0c	48.0c	38.0c	40.0c	40.0c	71.0c	58.2	57.2
Geriatric Depression Scale: Do you feel happy most of the time?										38.0d	48.0d	38.0d	40.0d	40.0d	71.0d	58.3	57.3
Geriatric Depression Scale: Do you drop many of your activities and interests?										38.0e	48.0e	38.0e	40.0e	40.0e	71.0e	58.4	57.4
Geriatric Depression Scale: Do you prefer to stay at home, rather than going out to do new things?										38.0f	48.0f	38.0f	40.0f	40.0f	71.0f	58.5	57.5
Geriatric Depression Scale: Did you feel full of energy?										38.0i	48.0g	38.0g	40.0g	40.0g	71.0g	58.6	57.6
Geriatric Depression Scale: Do you often feel helpless?										38.0g					71.0h	58.7	57.7
Geriatric Depression Scale: Do you feel pretty worthless the way you are now?										38.0h							
Geriatric Depression Scale: Do you think that most people are better off than you are?										38.0j							
Geriatric Depression Scale: Are you in good spirits most of the time?										38.0k							

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<b>Older People's Quality of Life questionnaire (OPQOL-brief)</b>																	
OPQOL-brief: I enjoy my life overall											49.0a		40.1a		72.0a	59.0	58.0
OPQOL-brief: I look forward to things											49.0b		40.1b		72.0b	59.1	58.1
OPQOL-brief: I am healthy enough to get out and about											49.0c		40.1c		72.0c	59.2	58.2
OPQOL-brief: My family, friends or neighbours would help me if needed											49.0d		40.1d		72.0d	59.3	58.3
OPQOL-brief: I have social or leisure activities/hobbies that I enjoy doing											49.0e		40.1e		72.0e	59.4	58.4
OPQOL-brief: I try to stay involved with things											49.0f		40.1f		72.0f	59.5	58.5
OPQOL-brief: I am healthy enough to have my independence											49.0g		40.1g		72.0g	59.6	58.6
OPQOL-brief: I can please myself in what I do											49.0h		40.1h		72.0h	59.7	58.7
OPQOL-brief: I feel safe where I live											49.0i		40.1i		72.0i	59.8	58.8
OPQOL-brief: I get pleasure from my home											49.0j		40.1j		72.0j	59.9	58.9
OPQOL-brief: I take life as it comes and make the best of things											49.0k		40.1k		72.0k	59.10	58.10
OPQOL-brief: I feel lucky compared to most people											49.0l		40.1l		72.0l	59.11	58.11
OPQOL-brief: I have enough money to pay for household bills											49.0m		40.1m		72.0m	59.12	58.12
<b>Center for Epidemiologic Studies Depression Scale Revised (CESD-R10)</b>																	
CES Depression-R10: I was bothered by things that usually don't bother me																	
CES Depression-R10: I had trouble keeping my mind on what I was doing																	
CES Depression-R10: I felt depressed																	
CES Depression-R10: I felt that everything I did was an effort																	
CES Depression-R10: I felt hopeful about the future																	
CES Depression-R10: I felt fearful																	
CES Depression-R10: Sleep: My sleep was restless																	
CES Depression-R10: I was happy																	
CES Depression-R10: I felt lonely																	
CES Depression-R10: I could not "get going"																	
<b>Patient Health Questionnaire-9 (PHQ-9)</b>																	
PHQ-9: Depression: The impact of these problems for you to do your work, take care of things at home, or get along with other people?																	

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

See copies of questionnaires for the exact wording of the questions used. Corresponding question numbers are given in the cells of table below.

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Local Area- Services										39							
Local Area- Services: Would you say that this is an area in which you enjoy living?										39.0							
Local Area- Services: Social and leisure activities for people like yourself										39.0a							
Local Area- Services: Facilities for people of your age										39.0b							
Local Area- Services: The quality & frequency of rubbish collection										39.0c							
Local Area- Services: Your local health service (e.g. your GP or the local hospital)										39.0d							
Local Area- Services: Local transport to where you want to go										39.0e							
Local Area- Services: Your area for having somewhere nice to go for a walk										39.0f							
Your Local Area- Safety										40							
Your Local Area- Safety Walking alone in the daytime										40.0a							
Your Local Area- Safety Walking alone after dark										40.0b							
Your Local Area- Greenery- Neighbourhood has lots of green space.										41.0							
Your Local Area- Environment:										42							
Demographic data		8	13	23	16		27	29	25	33	39	33	34	35	73	60	59.0
Demographic data: Martial Status	1.3	8.1	13.1	23.1	16.0		27.0	29.0	25.0	33.0	39.0	33.0	34.0	35.0	73.1	60.0	59.0
Demographic data: If you are widowed, divorced/separated, please give the year when this occurred:							27.0a	29.1	25.1	33.1					73.2	60.1	59.1
Demographic data If married- does your wife work		8.2															
Demographic data: Currently, who do you live with?				23.2	16.1		27.1	29.2	25.2	33.2	39.1	33.1	34.1	35.1	73.3	60.2	59.2
Demographic data: Where were you born- Town, County, Country	1																
MH: Birthweight- self reported							D20a										
Demographic data: How many years have you lived within 10 miles of this town	1.2																
Demographic data: If you have moved to this area within the last 5 years, where did you come from	1.2																
Demographic data: How many children do you have	1.4																
Demographic data: Please state the age at which your full-time education ended				23.5													
Demographic data: Do you have any pets?					16.4										74.0	61.0	64.0

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
FAMILY HISTORY (FH)																	
FH: Diabetes - Have any of your close blood relatives ever had diabetes?				8.6	5.0												
FH Occupation, Work & Retirement What job did your father do for the longest period of his working life			21.5														
FH Occupation, Work & Retirement: Father Job Manual or non-manual			21.7														
FH: Birthweight of your Children						D20b											
FH Father- Where was he born- Town, County, Country	2.1																
FH Father - is he still alive?	2.2		6.1	24.1													
FH Father- how old was he when he died	2.3		6.2	24.1													
FH Father- Cause of his death	2.4			24.1													
FH Father - Heart Trouble	2.4		6.3	24.1													
FH Father - High Blood Pressure	2.4		6.3	24.1													
FH Father - Stroke	2.4		6.3	24.1													
FH Father - respiratory disease	2.4			24.1													
FH Father - Diabetes			6.3														
FH Father - Cancer of Lung	2.4			24.1													
FH Father - other cancer	2.4			24.1													
FH Father - Cancer	2.4		6.3	24.1													
FH Father - Accident or injury	2.4			24.1													
FH Father - Other	2.4			24.1													
FH Mother- Where was she born- Town, County, Country	3.1																
FH Mother - is she still alive?	3.2		6.4	24.2													
FH Mother- how old was she when she died	3.3		6.5	24.2													
FH Mother- cause of death	3.4			24.2													
FH Mother - Heart Trouble	3.4		6.6	24.2													
FH Mother - High Blood Pressure	3.4		6.6	24.2													
FH Mother - Stroke	3.4		6.6	24.2													
FH Mother - respiratory disease	3.4			24.2													
FH Mother - Cancer of breast	3.4			24.2													
FH Mother - other cancer	3.4			24.2													
FH Mother - Cancer	3.4		6.6	24.2													
FH Mother - Accident or injury	3.4			24.2													
FH Mother - Other	3.4			24.2													
FH Mother - Diabetes			6.6														

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
FH Siblings- How many OLDER siblings do you have			6.7														
FH Siblings- How many YOUNGER siblings do you have			6.8														
FH Siblings- Are you one of twins or triplets			6.9														
FH Siblings - Heart Trouble			6.10														
FH Siblings - High Blood Pressure			6.10														
FH Siblings - Stroke			6.10														
FH Siblings - Diabetes			6.10														
FH Siblings - Cancer			6.10														
FH Siblings- did any of your siblings die at birth or in their first year of life?			6.11														
FH Paternal Grandmother Year of Birth, Place of Birth, Age at death									26.0								
FH Parental Grandfather Year of Birth, Place of Birth, Age at death									26.1								
FH Maternal Grandmother Year of Birth, Place of Birth, Age at death									26.2								
FH Maternal Grandfather Year of Birth, Place of Birth, Age at death									26.3								
<b>Wealth: Financial resources</b>											41	34		36		62	61
Wealth: Home ownership		8.3	13.2	23.3	16.2		27.2	29.3	25.3	33.3	41.0	34.0	35.0	36.0	75.0	62.0	60.0
Wealth: How are you managing financially?								29.6	25.7	33.5	41.1				76.0	62.1	61.0
Wealth: Financial support on retirement -Pension				23.8				29.7	25.8								
Wealth: Private medical insurance							27.6	29.6	25.6								
Wealth: Private medical treatment							27.7										
Wealth: Car available for your own use?				23.4	16.3		27.4	29.5	25.5	33.4	43.0				77.0	63.0	63.0
Wealth: How many cars are there available for use in your household		8.4	13.3														
<b>Personal circumstances:</b>																	
Personal circumstances: Do you currently drive yourself?											43.1				77.1	63.1	63.1
Personal circumstances: have you given up driving											43.2						
Personal circumstances: If yes, at what did you give up driving											43.3						
Personal circumstances: Why did you give up driving?											43.4						
Personal circumstances: Which transport do you use most often						1.0											
Personal circumstances: During the winter is your accommodation warm?							27.3	29.4	25.4								62
Personal circumstances: Managing your health																	65.1

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Personal circumstances: Managing the health of others in your household																	65.2
Personal circumstances: Maintaining your physical activity																	65.3
<b>Fuel Poverty:</b>											42.0				78.0	64.0	61
Heating System to heat home:					16.5						42.3						
Fuel used to heat home					16.5												62
Fuel used for Cooking					16.7												
Home insulation:					16.6						42.4						
Occupation, Work & Retirement	4	11	21	23	17		27.5										
Occupation, Work & Retirement: Unemployment		12															
<b>Early Life- up to 10</b>																	
Early Life circumstances: Did you have a bathroom in your house			22.1														
Early Life circumstances Did you have a hot water tap in your house			22.2														
Early Life circumstances Did you share a bedroom with siblings			22.3														
Early Life circumstances: Did your family own a car			22.4														
<b>Illness and Injury</b>																	
Illness or injury: Have you had an illness or injury which has kept you off work for more than one month		6.1															
Illness or injury: How long was the longest sick period		6.3															
Illness or injury: What was the illness or injury		6.4															
<b>Wellbeing: ONS Four measures of personal well-being</b>																	
Wellbeing: Satisfaction											44.0						
Wellbeing: Happiness											44.1						
Wellbeing: Anxious											44.2						
Wellbeing: Worthwhile											44.3						
<b>Vitamins and minerals</b>				7.6	18.6			28	35	46	52				79	65	67
<b>Medicines - British National Formulary Codes</b>					18		26	27	34	45	52	40	43	42	81	66	68
Medication: Do you take any regular medication?	10.2	3.0	5.0	7.4			25.0	26.0	33.0	44.0	51.0	39.0	42.0	41.0	80.0	66.0	68.0
Medication: If yes, do you take treatment to lower blood pressure	10.2	3.1	5.1		18.0		25.0c	26.0b	33.0b	44.1	51.1						
Medication: If yes, do you take treatment to lower blood cholesterol	10.2						25.0d	26.0c	33.0c	44.2	51.2						
Medication: If you are on treatment to lower your cholesterol, please give the name of the medicine							25.1a	26.1a	33.1a	44.3							

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Medication: If you are on treatment to lower your cholesterol, please tell me the amount you take each day							25.1b	26.1b	33.1b								
Medication: If yes, do you take treatment for any form of heart disease							25.0b	26.0a	33.0a								
Medication: If yes, do you take treatment to lower triglycerides			5.1						33.0d								
Medication: Diuretics		3.1	5.1														
Medication: Tranquilisers	10.2	3.1	5.1														
Medication: Anti-depressants			5.1														
Medication: Sleeping Tablets			5.1														
Medication: Insulin injections	10.2	3.1	5.1														
Medication: Tablets for diabetics	10.2	3.1															
Medication: Diet for diabetics			5.1														
Medication: Pain killers	10.2																
Medication: Anti Coagulants	10.2																
Medication: Other regular treatment	10.2		5.1														
Medication: Other treatment please specify		3.1	5.1														
<b>Blood Cholesterol Test</b>					19												
Cholesterol: Have you had your blood cholesterol measured				5.3	19.0												
Cholesterol: If yes, what was the result				5.3	19.0a												
Cholesterol: If High, have you been advised to take any particular action- Diet					19.0b												
Cholesterol: If High, have you been advised to take any particular action- Drug					19.0b												
<b>Recent medication uses within the last 48 hours</b>	10.3																
Medication used within the last 48 hours: Tranquilisers	10.3																
Medication within the last 48 hours: Pain killers	10.3																
Medication use within last 48 hours: Anti-hypertensive drugs	10.3																
Medication used within the last 48 hours: Anti Coagulants	10.3																
Medication use within last 48 hours: Lipid Lowering drugs	10.3																
Medication within last 48 hours: Oral anti diabetics	10.3																
Medication used within the last 48 hours: Insulin injections	10.3																
Medication used within the last 48 hours: Any Others	10.3																
Medication within the last 48 hours: Don't Know	10.3																

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Medication Aspirin use			5.2	7.1	18.3		25.0a	26.2	33.2	44.4							
Medication: Warfarin use					18.4					44.8							
Medication: GTN use					18.5												
Health/ Social Services:													41				
Health/ Social Services: Home Help/ home care assistant													41.0a				
Health/ Social Services: Nursing Services													41.0b				
Health/ Social Services: approximately how many times in the last year have you consulted your GP about a health problem?													41.0c				
Health/ Social Services: Meals on Wheels													41.0d				
Health/ Social Services: Physiotherapist													41.0e				66.8
Health/ Social Services: Occupational Therapist													41.0f				
Health/ Social Services: Speech Therapist													41.0g				
Health/ Social Services: Social Worker													41.0h				
Health/ Social Services: Day Centre													41.0i				
Health/ Social Services: Day Hospital													41.0j				
Health/ Social Services: GP (Family doctor)													41.0k				66.1
Health/ Social Services: During the last 3 months, did you attend the casualty or outpatient department of hospital as a patient													41.1				
Health/ Social Services: What was the problem													41.1				
Health/ Social Services: Optician													41.2a				
Health/ Social Services: Audiologist													41.2b				
Health/ Social Services: Dental Health care services																	66.2
Health/ Social Services: Getting Medication																	66.0
Health/ Social Services: Social care & support services																	66.3
Health/ Social Services: Medical Appointments																	66.4
Health/ Social Services: Hospital Appointments																	66.5
Health/ Social Services: Planned surgeries																	66.6
Health/ Social Services: Dental treatment																	66.7
Health/ Social Services: other planned treatment (eg Chemotherapy)																	66.9
Health Care								25	32	43							
Preventative Health Care: how many times in the last year have you consulted your GP about a health problem?							24.2	25.0	32.0	43.0							
Preventative Health Care: If none, in what year did you last consult a GP about a health problem?							24.0	25.1	32.1	43.1							
Preventative Health Care: Blood pressure check							24.1a	25.2a	32.2a	43.2							

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Preventative Health Care: Blood Cholesterol check							24.1b	25.2b	32.2b	43.3							
Preventative Health Care: Flu vaccination							24.1c	25.2c	32.2c								10.6
Preventative Health Care: Foot care from a chiropodist							24.1e	25.2e									
Blood Fasting - time					20												
Diet: Are you on any special diet e.g. vegetarian, low fat, diabetic?				20.2		D1		D1.0		D1.0					D1.0		
Diet: If yes, please give details:						D1		D1.1		D1.1					D1.1		
Diet: Meat	11.1			20.1							D1		D1			D1	D1
Diet: Beef including minced beef, beef burgers						D2a		D2.0		D2.0					D2.0	D1.0	D1.0
Diet: Lamb						D2b		D2.1		D2.1					D2.1	D1.0	D1.0
Diet: Pork, bacon, ham, salami						D2c		D2.2		D2.2					D2.2	D1.0	D1.0
Diet: Chicken, turkey, other poultry	11.1			20.1		D2		D2.3		D2.3					D2.3	D1.1	D1.1
Diet: Tinned meat of all types, corned beef, etc						D2e		D2.4		D2.4					D2.4	D1.2	D1.2
Diet: Pork Sausages						D2f		D2.5		D2.5					D2.5	D1.3	D1.3
Diet: Beef Sausages						D2g		D2.6		D2.6					D2.6	D1.3	D1.3
Diet: Meat Pie, Pasties						D2h		D2.7		D2.7					D2.7	D1.3	D1.3
Diet: Liver, kidney, heart						D2i		D2.8		D2.8					D2.8	D1.4	D1.4
Diet: Fish	11.1			20.1							D2		D2			D2	D2
Diet: White fish cod, haddock, hake, plaice, fish fingers, etc						D3a		D3.0		D3.0					D3.0	D2.0	D2.0
Diet: Kippers, herrings, pilchards, tuna, sardines, salmon, mackerel including tinned						D3b		D3.1		D3.1					D3.1	D2.1	D2.1
Diet: Shellfish						D3c		D3.2		D3.2					D3.2	D2.2	D2.2
Diet: Vegetables fresh, tinned, dried, frozen				20.1							D3		D3			D3	D3
Diet: Potatoes: boiled, baked, mashed						D4a		D4.0		D4.0					D4.0		
Diet: chips or fries from shop						D4 bi		D4.1		D4.1					D4.1		
Diet: chips or fried cooked at home						D4b ii		D4.2		D4.2					D4.2		
Diet: roast potatoes						D4b iii		D4.3		D4.3					D4.3		
Diet: Green vegetables, salads				20.1		D4c		D4.4		D4.4					D4.4		
Diet: Carrots						D4		D4.5		D4.5					D4.5		
Diet: Parsnips, swedes, turnips, beetroot, and other root vegetables						D4e		D4.6		D4.6					D4.6		
Diet: Baked or butter beans, lentils, peas, chickpeas, sweetcorn						D4f		D4.7		D4.7					D4.7		
Diet: Onions cooked, raw, pickled						D4g		D4.8		D4.8					D4.8		
Diet: Garlic						D4h		D4.9		D4.9					D4.9		
Diet: Spaghetti and other pasta						D4i		D4.10		D4.10			D6		D4.10	D6.0	D6.0
Diet: Rice all types except pudding rice						D4j		D4.11		D4.11			D6		D4.11	D6.1	D6.1
Diet: Tomatoes fresh, tinned, pureed						D4k		D4.12		D4.12					D4.12		

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Diet: How often do you eat fresh vegetables in summer				20.1		D4l		D4.13		D4.13					D4.13	D3.2	D3.2
Diet: How often do you eat fresh vegetables in winter				20.1		D4m		D4.14		D4.14					D4.14	D3.3	D3.3
Diet: Fresh Fruit				20.1							D3		D3			D3	D3
Diet: How often do you eat fresh Fruit in summer						D4a		D5.0		D5.0					D5.0	D3.0	D3.0
Diet: How often do you eat fresh fruit in winter						D4b		D5.1		D5.1					D5.1	D3.1	D3.1
Diet: Number of apples eaten a week						D4c		D5.2		D5.2					D5.2		
Diet: Number of pears eaten a week						D4		D5.3		D5.3					D5.3		
Diet: Number of oranges or grapefruit eaten a week						D4e		D5.4		D5.4					D5.4		
Diet: Number of bananas eaten a week						D4f		D5.5		D5.5					D5.5		
Diet: Number of other fruits eaten a week (please give name and quantity)						D4g		D5.6		D5.6					D5.6		
Diet: Cheese	11.1			20.1							D5		D5			D5	D5
Diet: Full-fat cheese e.g. Cheddar, Leicester, Stilton, Brie, soft cheeses						D6		D6.0		D6.0					D6.0	D5.0	D5.0
Diet: Low-fat cheese e.g. Edam, Cottage cheese, reduced fat cheeses						D6		D6.1		D6.1					D6.1	D5.1	D5.1
Diet: Bread	11.2			20.3							D4		D4			D4	D4
Diet: White bread						D7a		D7.0		D7.0					D7.0	D4.0	D4.0
Diet: Brown bread						D7b		D7.1		D7.1					D7.1	D4.1	D4.1
Diet: Whole meal						D7c		D7.3		D7.3					D7.3	D4.1	D4.1
Diet: Bread rolls						D7		D7.4		D7.4					D7.4		
Diet: Crispbread Ryvita, cream crackers, etc						D7e		D7.5		D7.5					D7.5	D6.2	D6.2
Please give name of crispbread etc:								D7.6		D7.6					D7.6		
Diet: White bread: how many slices/ rolls per day and thickness						D7f i		D7.7		D7.7					D7.7		
Diet: Brown bread: how many slices/ rolls per day and thickness						D7f ii		D7.8		D7.8					D7.8		
Diet: Whole bread meal: how many slices/ rolls per day and thickness						D7f iii		D7.9		D7.9					D7.9		
Diet: Bread rolls: how many slices/ rolls per day and thickness						D7f iv		D7.10		D7.10					D7.10		
Diet: Breakfast Cereals	11.1										D6		D6			D6.3	D6.3
Diet: Grapenuts, Porridge, Ready Brek, Special K, Sugar Puffs, Rice Crispies						D8a		D8.0		D8.0					D8.0		
Diet: Cornflakes, Muesli, Shredded Wheat, Sultana Bran, Weetabix						D8b		D8.1		D8.1					D8.1		
Diet: Bran Flakes, Puffed wheat,						D8c		D8.2		D8.2					D8.2		
Diet: All Bran, Wheat Bran						D8		D8.3		D8.3					D8.3		
Diet: Another Cereal please give name:						D8e		D8.4		D8.4					D8.4		
Diet: Biscuits, puddings and sweets											D8		D8			D8.1	D8.1
Diet: Digestive biscuits, plain biscuits						D9a		D9.0		D9.0					D9.0		

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Diet: Sweet biscuits, sponge cakes, scones, buns						D9b		D9.1		D9.1					D9.1		
Diet: Ice cream, sweet yoghurts, trifle						D9c		D9.2		D9.2					D9.2		
Diet: Fruit cake, fruit bread, plum pudding						D9		D9.3		D9.3					D9.3		
Diet: Fruit tart, jam tart, fruit crumble						D9e		D9.4		D9.4					D9.4		
Diet: Milk puddings, rice, tapioca						D9f		D9.5		D9.5					D9.5		
Diet: Tinned fruit, jellies						D9g		D9.6		D9.6					D9.6		
Diet: Sweet sauces, chocolate, custard						D9h		D9.7		D9.7					D9.7		
Diet: Chocolate, chocolate bars, sweets all types						D9i		D9.8		D9.8					D9.8		
Diet: Eggs	11.1																
Diet: Eggs boiled, poached, fried, scrambled						D10a		D10.0		D10.0					D10.0		
Diet: Eggs in baked dishes e.g. flans, quiches, soufflés, egg custard, etc						D10b		D101		D101					D101		
Diet: Other foods																	
Diet: Soups of all kinds, home-made, tinned, packet						D11a		D11.0		D11.0					D11.0		
Diet: Nuts, nut butter e.g. salted or unsalted peanuts						D11b		D11.1		D11.1	D8		D8		D11.1	D8.0	D8.0
Diet: Savoury snacks e.g. potato crisps, corn chips, crackers						D11c		D11.2		D11.2	D8		D8		D11.2	D8.0	D8.0
Diet: Chutney, brown sauce, tomato sauce						D11		D11.3		D11.3					D11.3		
Diet: Sweet spreads e.g. jam, honey, marmalade chocolate spread						D11e		D11.4		D11.4					D11.4		
Diet: Drinks and Juices n-alcoholic																	
Diet: Natural fruit juices including tomato juice						D12a		D12.0		D12.0					D12.0		
Diet: Fizzy drinks and n-diet squashes						D12b		D12.1		D12.1					D12.1		
Diet: Low calorie (diet) squashes and fizzy drinks						D12c		D12.2		D12.2					D12.2		
Diet: Milk	11.5			20.6		D13		D13		D13	D9		D9		D13	D9	D9
Diet: Salt						D15		D14		D14					D14		
Diet: FATS	11.3			20.5													
Diet: What do you usually spread on bread?						D14a		D15.0		D15.0					D15.0		
Diet: How do you normally spread the fat?						D14b		D15.1		D15.1					D15.1		
Diet: How often do you eat home-fried food cooked with: -						D14c											
Diet: Lard, dripping, solid vegetable oil								D15.2		D15.2					D15.2		
Diet: Liquid vegetable oil								D15.3		D15.3					D15.3		
Diet: How many people normally eat in your household?						D16		D16.0		D16.0					D16.0		
Diet household: Butter						D17		D16.1		D16.1					D16.1		
Diet household: Margarine						D17		D16.2		D16.2					D16.2		
Diet household: Lard and solid vegetable oil						D17		D16.3		D16.3					D16.3		
Diet household: Liquid vegetable oil						D17		D16.4		D16.4					D16.4		
Diet household: Olive Oil						D17		D16.5		D16.5	D7		D7		D16.5	D7.0	D7.0

Table 7: Overview of questions included in the BRHS questionnaires by study time point (1978 to 2023)

See copies of questionnaires for the exact wording of the questions used. Corresponding question numbers are given in the cells of table below.

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Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
Diet household: Cream						D17		D16.6		D16.6					D16.6		
Diet household: Full- fat cheese						D17		D16.7		D16.7					D16.7		
Diet household: Low-fat cheese						D17		D16.8		D16.8					D16.8		
Diet household: Sugar	11.4					D17		D16.9		D16.9					D16.9		
Diet: Coffee						D18a		D17.0		D17.0					D17.0		
Diet: Tea						D18c		D17.4		D17.4					D17.4		
Diet: Other Hot Drinks						D18e		D17.7		D17.7					D17.7		
Diet: Alcoholic Drinks						D19		D18.0		D18.0	D11		D11		D18.0	D11.0	D11.0
Supplementary questions/ General comments											X	X	X	X	X	X	S3
Your views- health or healthy long life																	S1
Your experience of being a BRHS cohort participant																	S2
Help received in completing survey form																	S4

Question	Baseline (Q1)	Q5	Q1992	Q1996	Q20 Main	Q20 PA & Diet	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q2018	Q2020	Q2023
<b>Cognitive and Personality questionnaires: - Self completed during physical examinations</b>																	
Bortner- personality questionnaire	X																
Test your memory (TYM) - cognitive questionnaire										X					X		

**Table 7.1 Overview of derived variables available at each BRHS Questionnaire timepoint**

These variables are included in the *derived variables datasets*. They are mainly derived from questionnaire data. Methods are described in the associated documentation files.

(Note: Table 4 includes derived variables from the follow-up physical examination measures).

Year of follow-up questionnaire:	1978-80	1983-85	1992	1996	1998-00	2003	2005	2007	2010-12	2014	2015	2016	2017	2018-19	2020	2023
	Q1 Baseline	Q5	Q92	Q96	Q20	Q2003	Q2005	Q2007	Q30	Q2014	Q2015	Q2016	Q2017	Q40 Q2018	Q2020	Q2023
<b>Variables</b>																
Town at Baseline (Q1) 1978-80	PP	✓	✓	✓	PP	✓	✓	✓	PP	✓	✓	✓	✓	PP	✓	✓
Social class at Baseline (Q1) 1978-80	PP	✓	✓	✓	PP	✓	✓	✓	PP	✓	✓	✓	✓	PP	✓	✓
Age	PP	✓	✓	✓	PP	✓	✓	✓	PP	✓	✓	✓	✓	PP	✓	✓
Smoking status categories	✓		✓	✓		✓			✓			✓				
Alcohol status (categories)	✓		✓	✓												
Physical activity score (categories)	✓		✓	✓					✓							
Diet: Macronutrient & micronutrient intake					✓		✓		✓					✓		
Diet: Elderly Dietary Index (EDI)					✓				✓					✓		
Diet: Healthy Diet Indicator (HDI)					✓				✓							
Diet: Dietary patterns					✓				✓							
Medications																
Blood pressure medication					✓									✓		
Lipid lowering medication					✓				✓					✓		
Diabetic					✓									✓		
Frailty components and score									✓	✓				✓		
Test Your Memory (TYM) score									✓					TYM		

PP = variables are found in the Participant Profile dataset for study timepoints: Q1, Q20, Q30, Q40

TYM = variables are found in the TYM dataset

## Follow up for morbidity through General Practice (GP) records

The GP record review is a review of BRHS participants' GP records (i.e. primary care records) for specified non-fatal events mostly related to cardiovascular disease, although this has subsequently been extended to include additional cardiovascular events and treatment, diabetes, cancer, dementia and frailty (see Table 8). The aim of the GP record review has been to identify and record the date of these events. The reviews have been carried out since baseline (1978-80) through to 2024 at intervals, typically every one or two years.

**Table 8. Overview of Morbidity events collected through General Practice (GP) records**

Morbidity Event types	Year when data collection for events commenced
Myocardial infarction (MI)	Baseline (1978)
Angina	Baseline (1978)
Stroke	Baseline (1978)
Transient ischemic attack (TIA)	Baseline (1978)
Coronary artery bypass graft (CABG)	1983
Percutaneous transluminal coronary angioplasty, (PTCA)	1983
Diabetes	1988
Heart failure (HF)	1996
Cancer	1996
Peripheral vascular disease (PVD)	1998
Deep vein thrombosis (DVT)	2000
Pulmonary embolism (PE)	2000
Abdominal aortic aneurysm	2000
Atrial fibrillation	2014
Dementia	2014
COVID-19	2020
Frailty/Frailty score	2020

## Follow up for mortality

All BRHS cohort participants (n=7735) have been flagged for death notifications through Central Registries in England and Scotland since the study baseline (1978-80). Information is received on the date of death, and coded cause of death - International Classifications of Disease codes (ICD10 to 4-digits). This data is provided annually by NHS Digital or its predecessor organisations. **Permission for onward sharing of these data is not available.**

## Follow up for cancer

All BRHS cohort participants have been flagged for cancer notification through the Cancer Registry since baseline (1978-80). Information is received on the date of cancer diagnosis, the site and type of cancer. The type of cancer is provided in the form of an International Classifications of Disease code (ICD9, ICD10). This data is provided by NHS England, NHS Scotland or their predecessor organisations. **Permission for onward sharing the Cancer Registry data is not available.**

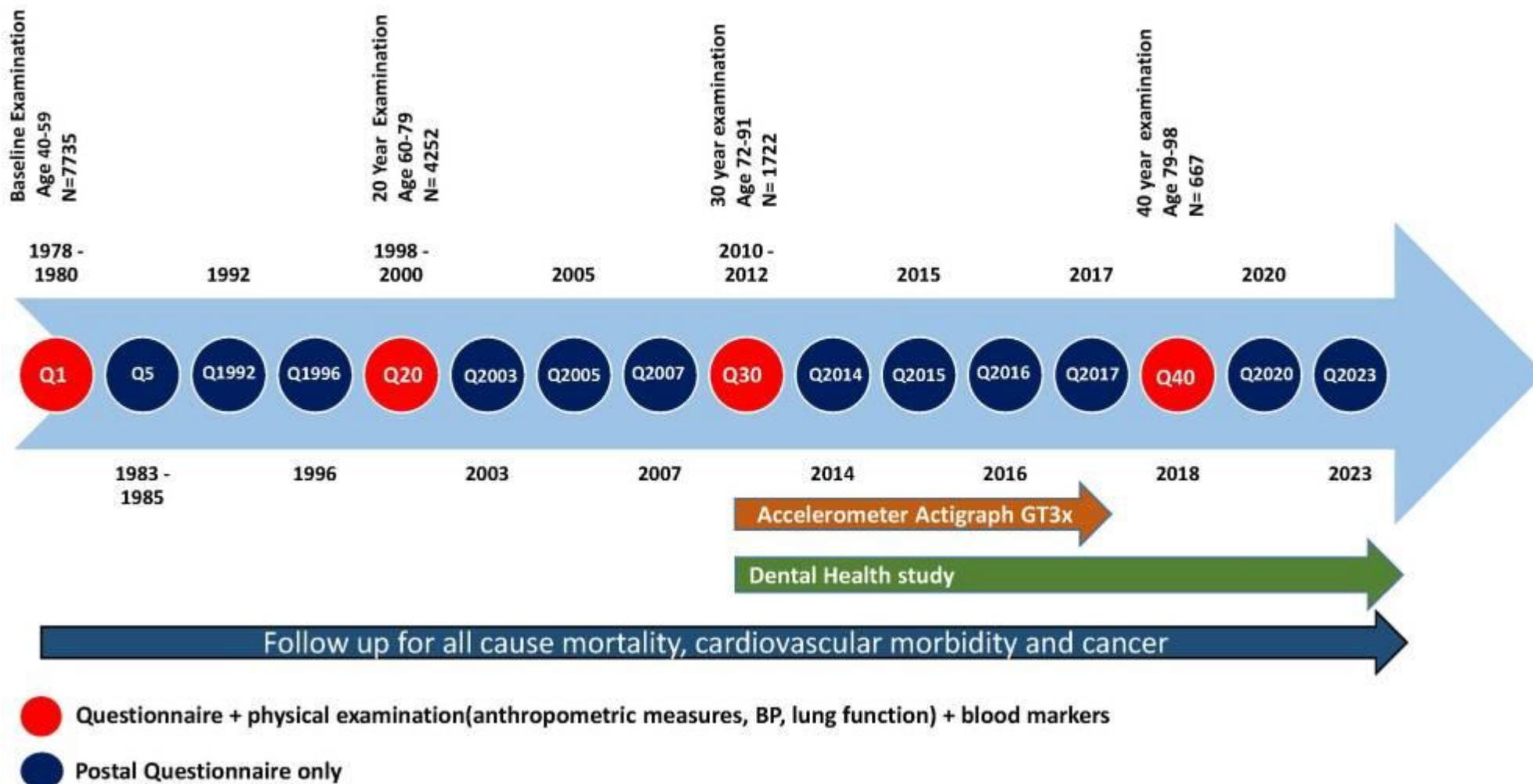
## **Follow up through linkage to routine health records**

In 2018, the BRHS cohort was linked to routine health records - NHS Hospital Episode Statistics (HES), Mental Health Services Data Set (MHSDS) and Diagnostic Imaging Datasets (DID). This linkage provides retrospective and prospective data.

- Hospital Episode Statistics (HES) is a database containing details of all admissions, A&E attendances and outpatient appointments at NHS hospitals in England.
- Mental Health Services Data Set (MHSDS) collects data from the health records of individuals who are in contact with mental health services- our study remit is dementia focused.
- The Diagnostic Imaging Dataset (DID) is a central collection of detailed information about diagnostic imaging tests carried out on NHS patients, The DID captures information about the details of the test (type of test and body site).

**Permission for onward sharing these data is not available.**

## Overview of British Regional Heart study (BRHS) cohort follow-up



## Data sources

BRHS data available on UKDS come from five main sources. These are:

1. BRHS physical/clinical examinations (indicated by red circles in the figure above).
2. BRHS postal questionnaires (indicated by red + blue circles in the figure above).
3. BRHS Follow-up on morbidity events through General Practice (GP) and primary care record reviews
4. BRHS follow-up for all-cause mortality since the study baseline (1978–80), obtained via central registries in England and Scotland.
5. External data linked to the BRHS cohort (e.g. air pollution, climate/weather data, IMD data)

## Data documentation files, datasets and data dictionaries

Each dataset is accompanied by a SAS program that includes an input statement to read the dataset, a data dictionary listing all the data variables, and a documentation file that provides a description of the dataset, along with any relevant notes and methods related to the data variables. To gain a better understanding of the data, users should review the documentation files before beginning to work with the data.

### The datasets

The datasets are provided in ASCII format, with each dataset accompanied by a SAS programme containing an input statement to read the data. Most datasets are in free format (space-delimited), though some are in fixed format. Additionally, each dataset has a corresponding a data dictionary and a documentation file.

### The data documentation (methods) files

The documentation (methods) files provide a description of the dataset, along with important notes and methods related to the data variables within the dataset. For instance, the documentation file for the biomarker data will include details on the laboratory methods used for each biomarker while the documentation file for derived variables will include descriptions of how variables were derived.

### The Data dictionaries

Data dictionaries provide a list of all variables included in the dataset. They also include the dataset name, the corresponding SAS program, units or category labels, the number of non-missing and missing values, and the range of values. Additionally, there is a "Methods Section" column that references the relevant methods section number within the documentation file.

For example, a dataset containing biomarkers will have a data dictionary listing the biomarkers, their units, and references to the laboratory analysis methods, all of which are detailed in the documentation file.

### Annotated BRHS Questionnaires

The questionnaires have been annotated with BRHS variable names, and copies are included in the folder for the specific study time point, along with the dataset, data dictionary, and documentation file.

## Variable and file naming convention

The naming convention for the BRHS datasets and variables is shown in Table 9 below.

All BRHS file names begin with the prefix “BRHS”. The naming convention for the **datasets** and the **documentation files** is slightly different and can be seen in Table 9 below.

### Variable naming convention

Variable names will begin with the BRHS study timepoint label as shown in the Table 9 below. For example, for 1978-80 Baseline Q1, data variables will begin with prefix “q1” whereas for 2017 data variables, the variables name will begin with prefix “q2017”.

### Dataset naming convention

Dataset names begin with the prefix BRHS which is then followed by BRHS study timepoint label shown in the table (e.g. For 1978-80 Baseline Q1, datasets will begin with BRHSQ1).

The letter V followed by a number (e.g. V2) in the file name indicates the file version number.

### Documentation file naming convention

Documentation file names begin with prefix BRHS followed by the study timepoint year (e.g. 1983-5) and the study timepoint label in brackets. (e.g. BRHS 1983-85 (Q5)).

### Extra Note for filenames

The filename prefix indicates the study time point, either by **calendar year** or by **follow-up year** (i.e. years since baseline).

Time point prefixes using follow-up years are as follows:

- Q1: Baseline (1978-80)
- Q5 : 5 year follow-up time point (1978-80 + 5 years => 1983-85)
- Q20: 20 year follow-up time point (1978-80 +20 years => 1998-2000)
- Q30: 30 year follow-up time point (1978-80 +32 years => 2010-12)
- Q40: 40 year follow-up time point (1978-80 +40 years => 2018-19)

### Attention: Important Note on Time Point prefixes

Care should be taken when using the **1983–85 (Q5)** and **2005 (Q05)** data. These refer to **different time points**:

1. **Q5**: 5-year follow-up postal questionnaire (five years after baseline, conducted in 1983–85)
2. **Q05**: Data from the 2005 postal questionnaire

Similarly:

- **Q20**: 20-year follow-up (20 years after baseline, conducted in 1998–2000)
- **Q2020**: Data from the 2020 postal questionnaire

**Table 9. BRHS Variable and file naming convention**

Study timepoint Year	Study timepoint label	Follow-up year time point	BRHS <b>Datasets</b> naming convention according to study time point  File name <b>prefix:</b>	BRHS <b>Documentation files</b> naming convention according to study time point  File name <b>prefix:</b>	BRHS <b>Variables</b> naming convention according to study time point  Variable name <b>prefix:</b>
1978-80 Baseline	Q1 (Baseline)	Baseline	BRHSQ1	BRHS Baseline 1978-80 (Q1)	q1
1983-85	Q5	3-5 year	BRHSQ5	BRHS 1983-85 (Q5)	q5
1992	Q92	12-14 year	BRHSQ1992	BRHS 1992 (Q92)	q92
1996	Q96	16-18 year	BRHSQ1996	BRHS 1996 (Q96)	q96
1998-2000	Q20	20 year	BRHSQ20	BRHS 1998-2000 (Q20)	q20
2003	Q03	23-25 year	BRHSQ2003	BRHS 2003 (Q03)	q03
2005	Q05	25-27 year	BRHSQ2005	BRHS 2005 (Q05)	q05
2007	Q07	27-29 year	BRHSQ2007	BRHS 2007 (Q07)	q07
2010-2012	Q30	30 year	BRHSQ30	BRHS 2010-12 (Q30)	q30
2014	Q2014	34-36 year	BRHSQ2014	BRHS 2014 (Q2014)	q14
2015	Q2015	35-37 year	BRHSQ2015	BRHS 2015 (Q2015)	q15
2016	Q2016	36-38 year	BRHSQ2016	BRHS 2016 (Q2016)	q16
2017	Q2017	37-39 year	BRHSQ2017	BRHS 2017 (Q2017)	q17
2018	Q40	40 year	BRHSQ40	BRHS 2018-19 (Q40)	q40
2020	Q2020	42-44 year	BRHSQ2020	BRHS 2020 (Q2020)	q2020
2023	Q2023	43-45 year	BRHSQ2023	BRHS 2023 (Q2023)	q2023

## BRHS DATASETS

### Data from the BRHS Physical examinations

The BRHS cohort participants were invited to four physical examinations between 1978 and 2024. The table below shows the type of data that is available at each physical examination study time point. More information and a description of what is included in each of the datasets is contained in the documentation (methods) files associated for each dataset.

NOTE: Study time points for the follow-up physical examinations are often referred to as Q1, Q20, Q30, Q40 which correspond to the Baseline and the 20,30 and 40 year follow-up study time points.

**Table 10: Overview of data (datasets) available at each of the four BRHS physical examination study time points**

Baseline 1978-80 Q1	20 year follow-up 1998-2000 Q20	30 year follow-up 2010-12 Q30	40 year follow-up 2018-19 Q40
Questionnaire	Questionnaire Questionnaire on Physical Activity and Diet	Questionnaire	Questionnaire
Physical examination measurements ECG	Physical examination measurements ECG	Physical examination measurements ECG data	Physical examination measurements
Blood biomarkers	Blood biomarkers Metabolite data	Blood biomarkers	Blood biomarkers
		Vascular measures	
		Dental examination data	Dental data
		Cognition Test Your Memory (TYM)	Cognition -Test Your Memory (TYM)
Derived variables	Derived variables	Derived variables Accelerometer derived variables	Derived variables
Participant profile data (sociodemographic)	Participant profile data (sociodemographic)	Participant profile data (sociodemographic)	Participant profile data (sociodemographic)
Bortner questionnaire (Type A personality behaviour)			
	Air pollution data	Air pollution data	
	Climate data		

## **BRHS Baseline physical examination 1978-80 (Q1)**

At baseline (1978-80), 7735 BRHS cohort participants underwent a physical examination and were administered a questionnaire.

Separate datasets are available which contain data for:

- The Baseline Questionnaire
- Physical examination measurements
- ECG
- Blood biomarkers
- Derived variables
- Participant profile data (sociodemographic)
- Bortner questionnaire (Type A personality behaviour)

### **Physical examination protocol**

Also included is the physical examination protocol document which outlines the study's objectives, design, methods, and procedures, as well as the types of assessments conducted. It also details the organization of the field study, including specific information on how data collection and scheduling were managed during the baseline physical examination. This document is included in the Physical examination measurements files.

- BRHS Baseline 1978-80 (Q1) Physical examination protocol.pdf

### **List of files**

A List of all files, including datasets, data dictionaries and documentation (methods) files, available at this study time point is shown in the table below.

<b>List of BRHS Baseline 1978-80 (Q1) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>FILE NAME</b>
<b>Baseline Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ1 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 Qr.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) Questionnaire Data notes and Coding protocol V1.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) Questionnaire Data dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS Baseline 1978-80 questionnaire Q1 V1.pdf
<b>Physical examination measurements</b>		
ASCII data file:	ASCII	BRHSQ1 PhysExam Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 PhysExam dat.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) Physical exam measurements Documentation V1.pdf
Methods: Physical examination full protocol	PDF	BRHS Baseline 1978-80 (Q1) Physical examination protocol.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) Physical exam measurements Data Dictionary V1.xlsx
<b>ECG</b>		
ASCII data file:	ASCII	BRHSQ1 ECG Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 ECG dat.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) ECG Documentation V2.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) ECG Data Dictionary V2.xlsx
<b>Blood biomarkers</b>		
ASCII data file:	ASCII	BRHSQ1 Blood markers Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 Blood markers dat.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) Blood biomarkers Documentation V2.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) Blood biomarkers Data dictionary V2.xlsx
<b>Derived variables</b>		
ASCII data file:	ASCII	BRHSQ1 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) Derived variables Documentation V2.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) Derived variables Data dictionary V2.xlsx
<b>Participant profile data (sociodemographic)</b>		
ASCII data file:	ASCII	BRHSQ1 Participant profile UKDS Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 Participant profile UKDS dat.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) Participant profile data Documentation UKDS.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) Participant profile Data dictionary UKDS.xlsx
<b>Bortner Score (Type A personality behaviour)</b>		
ASCII data file:	ASCII	BRHSQ1 Bortner score Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1 Bortner score dat.sas
Documentation (Methods):	PDF	BRHS Baseline 1978-80 (Q1) Bortner questionnaire Documentation_V2.pdf
Data dictionary:	Excel	BRHS Baseline 1978-80 (Q1) Bortner questionnaire Data dictionary V2.xlsx

## BRHS 20 year follow up physical examination 1998-2000 (Q20)

At this study time point, 4252 BRHS cohort participants underwent a physical examination - and completed a postal questionnaire. An additional postal questionnaire with detailed questions on physical activity and diet was completed by 4582 cohort participants.

Separate datasets are available which contain data for:

- Main Questionnaire
- Questionnaire on Physical Activity and Diet
- Physical examination measurements
- ECG
- Blood biomarkers
- Derived variables
- Participant profile data (sociodemographic)
- Climate data
- Air pollution
- Metabolite data

### Physical examination protocol

Also included is the physical examination protocol document which outlines the study's objectives, design, methods, and procedures, as well as the types of assessments conducted. It also details the organization of the field study, including specific information on how data collection and scheduling were managed during the baseline physical examination. This document is included in the Physical examination measurements files.

- BRHS 1998-2000 (Q20) 20yr follow-up Physical examination protocol.pdf

### List of files

A List of all files, including datasets, data dictionaries and documentation (methods) files, available at this study time point is shown in the table below.

<b>List of BRHS 1998-2000 20-year follow-up (Q20) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>FILE NAME</b>
<b>Main Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ20 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 Qr.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20yr follow-up Main Qr Data notes and Coding protocol V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20yr follow-up survey Main Qr Data Dictionary V2.xlsx
Annotated Questionnaire:	PDF	BRHS 1998-2000 20 year follow-up survey Main Qr Q20.pdf
<b>Questionnaire on Physical Activity and Diet</b>		
ASCII data file:	ASCII	BRHSQ20 PhysAct Diet Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 PhysAct Diet Qr dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20yr follow-up survey Physical Activity and Diet Qr Data notes and coding protocol V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20yr follow-up survey Physical Activity and Diet Qr Data dictionary V2.xlsx
Annotated Questionnaire:	PDF	BRHS 1998-2000 20 year follow-up survey Physical activity and Diet Qr Q20.pdf
<b>Physical examination measurements</b>		
ASCII data file:	ASCII	BRHSQ20 PhysExam Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 PhysExam dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Physical exam measurements Documentation V2.pdf
Methods: Physical examination full protocol	PDF	BRHS 1998-2000 (Q20) 20yr follow-up Physical examination protocol.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Physical exam measurements Data dictionary V2.xlsx
<b>ECG</b>		
ASCII data file:	ASCII	BRHSQ20 ECG Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 ECG dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up ECG Documentation V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up ECG Data dictionary V2.xlsx
<b>Blood biomarkers</b>		
ASCII data file:	ASCII	BRHSQ20 Blood markers Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 Blood markers dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Blood biomarkers Documentation V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Blood biomarkers Data dictionary V2.xlsx
<b>Derived variables</b>		
ASCII data file:	ASCII	BRHSQ20 Derived and adjusted variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 Derived and adjusted variables dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Derived & adjusted variables Documentation V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Derived & adjusted variables Data dictionary V2.xlsx

Cont.

<b>List of BRHS 1998-2000 20-year follow-up (Q20) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>FILE NAME</b>
<b>Participant profile data (sociodemographic)</b>		
ASCII data file:	ASCII	BRHSQ20 Participant profile data Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 Participant profile data.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Participant profile data Documentation V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Participant profile Data dictionary V2.xlsx
<b>Climate data</b>		
ASCII data file:	ASCII	BRHSQ20 Climate data Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 Climate data .sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Climate data Documentation V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Climate Data dictionary V2.xlsx
<b>Air pollution</b>		
ASCII data file:	ASCII	BRHSQ20 AirPollution UKDS Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 AirPollution UKDS Restricted dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Air pollution UKDS data Documentation.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Air pollution UKDS Data dictionary.xlsx
<b>Metabolite data</b>		
ASCII data file:	ASCII	BRHSQ20 Metabolites Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ20 Metabolites dat.sas
Documentation (Methods):	PDF	BRHS 1998-2000 (Q20) 20 year follow-up Metabolite data Documentation V2.pdf
Data dictionary:	Excel	BRHS 1998-2000 (Q20) 20 year follow-up Metabolites Data dictionary V2.xlsx

## **BRHS 30 year follow-up physical examination 2010-2012 (Q30)**

At this study time point, 1722 BRHS cohort participants underwent a physical examination and 2137 completed a postal questionnaire.

Separate datasets are available which contain data for:

- Questionnaire
- Physical examination measurements
- ECG data
- Blood biomarkers
- Vascular measures
- Dental examination data
- Cognition Test Your Memory (TYM)
- Derived variables
- Participant profile data
- Air pollution
- Accelerometer - derived physical activity variables

### **Physical examination protocol**

Also included is the physical examination protocol document which outlines the study's objectives, design, methods, and procedures, as well as the types of assessments conducted. It also details the organization of the field study, including specific information on how data collection and scheduling were managed during the baseline physical examination. This document is included in the Physical examination measurements files.

- BRHS 2010-12 (Q30) 30yr follow-up Physical examination protocol.pdf

### **List of files**

A List of all files, including datasets, data dictionaries and documentation (methods) files, available at this study time point is shown in the table below.

## List of BRHS 2010-2012 30-year follow-up (Q30) files

FILE DESCRIPTION	File format	FILE NAME
<b>Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ30 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Qr dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Questionnaire Data notes and Coding protocol V1.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2010-12 30 year follow-up survey Qr Q30 V1.pdf
<b>Physical examination measurements</b>		
ASCII data file:	ASCII	BRHSQ30 PhysExam Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 PhysExam dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Physical exam measurements Documentation V2.pdf
Methods: Physical examination full protocol	PDF	BRHS 2010-12 (Q30) 30yr follow-up Physical examination protocol.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Physical exam measurements Data Dictionary V2.xlsx
<b>ECG</b>		
ASCII data file:	ASCII	BRHSQ30 ECG Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 ECG dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up ECG Documentation V2.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up ECG Data Dictionary V2.xlsx
<b>Blood biomarkers</b>		
ASCII data file:	ASCII	BRHSQ30 Blood markers Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Blood markers dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Blood biomarkers Documentation V1 .pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Blood biomarkers Data dictionary V1.xlsx
<b>Vascular measures</b>		
ASCII data file:	ASCII	BRHSQ30 Vascular Measures Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Vascular Measures dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Vascular Measures Documentation V1.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Vascular Measures Data Dictionary V1.xlsx
<b>Dental measures</b>		
ASCII data file:	ASCII	BRHSQ30 Dental Exam Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Dental Exam dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Dental Exam Documentation V1.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Dental Exam Data dictionary V1.xlsx
<b>TYM Cognitive assessment</b>		
ASCII data file:	ASCII	BRHSQ30 TYM Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 TYM dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up TYM Cognitive assessment Documentation V2.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up TYM Cognitive assessment Data Dictionary V2.xlsx

Cont.

<b>List of BRHS 2010-2012 30-year follow-up (Q30) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>FILE NAME</b>
<b>Derived variables</b>		
ASCII data file:	ASCII	BRHSQ30 Derived and adjusted variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Derived and adjusted variables.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Derived & adjusted variables Documentation V2.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Derived & adjusted variables Data Dictionary V2.xlsx
<b>Participant profile data (sociodemographic)</b>		
ASCII data file:	ASCII	BRHSQ30 Participant profile data Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Participant profile data.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Participant profile data Documentation V1.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Participant profile Data Dictionary V1.xlsx
<b>Air pollution</b>		
ASCII data file:	ASCII	BRHSQ30 AirPollution UKDS Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 AirPollution UKDS Restricted dat.sas
Documentation (Methods):	PDF	BRHS 2010-12 (Q30) 30yr follow-up Air Pollution UKDS Documentation.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Air Pollution UKDS Data Dictionary.xlsx
<b>Accelerometer variables (Derived physical activity variables)</b>		
ASCII data file:	ASCII	BRHSQ30 Accelerometer PhysAct Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ30 Accelerometer PhysAct Derived variables dat.sas
Methods:	PDF	BRHS 2010-12 (Q30) 30yr follow-up Derived Accelerometer variables Documentation.pdf
Data dictionary:	Excel	BRHS 2010-12 (Q30) 30yr follow-up Derived Accelerometer variables Data Dictionary.xlsx

## BRHS 40 year follow-up physical examination 2018 (Q40)

At this study time point, 667 BRHS cohort participants underwent a physical examination and 1009 completed a postal questionnaire.

Separate datasets are available which contain data for:

- Questionnaire
- Physical examination measurements
- Blood biomarkers
- Dental data
- Cognition -Test Your Memory (TYM)
- Derived variables
- Participant profile data

### Physical examination protocol

Also included is the physical examination protocol document which outlines the study's objectives, design, methods, and procedures, as well as the types of assessments conducted. It also details the organization of the field study, including specific information on how data collection and scheduling were managed during the baseline physical examination. This document is included in the Physical examination measurements files.

- BRHS 2018-19 (Q40) 40yr follow-up Physical examination protocol.pdf

### List of files

A List of all files, including datasets, data dictionaries and documentation (methods) files, available at this study time point is shown in the table below.

List of BRHS 2018-2019 40-year follow-up (Q40) files		
FILE DESCRIPTION	File format	FILE NAME
<b>Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2018 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2018 Qr .sas
Documentation (Methods):	PDF	BRHS 2018 (Q40) Questionnaire Data notes and Coding Protocol V1.pdf
Data dictionary:	Excel	BRHS 2018 (Q40) Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2018 questionnaire Q2018 V1.pdf
<b>Physical examination measurements</b>		
ASCII data file:	ASCII	BRHSQ40 PhysExamUKDS Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ40 PhysExamUKDS.sas

Documentation (Methods):	PDF	BRHS 2018-19 (Q40) 40yr follow-up Physical exam measurements Documentation UKDS V3.pdf
Methods: Physical examination full protocol	PDF	BRHS 2018-19 (Q40) 40yr follow-up Physical examination protocol.pdf
Data dictionary:	Excel	BRHS 2018-19 (Q40) 40yr follow-up Physical exam measurements UKDS Data Dictionary V2.xlsx
<b>Blood biomarkers</b>		
ASCII data file:	ASCII	BRHSQ40 Blood markers Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ40 Blood markers dat.sas
Documentation (Methods):	PDF	BRHS 2018-19 (Q40) 40 year follow-up Blood biomarkers Documentation V3.pdf
Data dictionary:	Excel	BRHS 2018-19 (Q40) 40yr follow-up Blood biomarkers Data dictionary V2.xlsx
<b>Derived variables</b>		
ASCII data file:	ASCII	BRHSQ40 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ40 Derived variables data.sas
Documentation (Methods):	PDF	BRHS 2018-19 (Q40) 40yr follow-up Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS 2018-19 (Q40) 40yr follow-up Derived variables Data Dictionary V1.xlsx
<b>Participant profile data (sociodemographic)</b>		
ASCII data file:	ASCII	BRHSQ40 Participant profile data Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ40 Participant profile data.sas
Documentation (Methods):	PDF	BRHS 2018-19 (Q40) 40yr follow-up Participant profile data Documentation V1.pdf
Data dictionary:	Excel	BRHS 2018-19 (Q40) 40yr follow-up Participant profile Data Dictionary V1.xlsx

## Data from Postal Questionnaires

**Note:** Datasets for questionnaires conducted during one of the four physical examination time points are not listed here; they are included with the files related to the corresponding physical examination.

Therefore, the following questionnaire datasets are **not listed/included** here:

- 1) Baseline 1978-80 (Q1)
- 2) 1998-2000 20 year follow-up (Q20)
- 3) 2010-2012 30 year follow-up (Q30)
- 4) 2018-2019 40 year follow-up (Q40)

### Datasets (postal questionnaires)

Each of the follow-up questionnaires has two associated datasets.

#### Dataset 1. Questionnaire data

The dataset contains the data from the questionnaire.

#### Dataset 2. Derived variables (from postal questionnaires) dataset

This dataset includes variables that:

1. have been derived from the questionnaire data, and/or
2. key variables that need to be carried forward across study time points to support statistical analyses.

For example, the BRHS study town (i.e. the town participants were recruited from) and participants' baseline social class are included in all questionnaire-derived datasets.

Age is a derived variable that has been calculated at each study time point and is provided either in the derived variables file or in the participant profile file.

The number of derived variables included in each dataset may vary. For instance, derived smoking or physical activity categories may be available for some, but not all, time points.

For full details on which derived variables are included in a specific dataset and how they were generated, please refer to the relevant documentation or methods file and **Table 7.1** above.

### **Questionnaire Data dictionaries**

Data dictionaries provide a list of the questionnaire questions along with their corresponding BRHS variable names, value ranges, the number of participants who responded to each question, and the number of missing responses. Where necessary, they also include references to the relevant sections of the documentation or methods file for clarification on coding or response values.

Category labels corresponding to the numerical data codes can be found by directly viewing the questionnaires.

### **Questionnaire Documentation (methods) files**

The BRHS Questionnaire Data Notes & Coding Protocol files provide information on the questionnaire methodology, including the type of questionnaire used, the BRHS study time point (year of follow-up), mailing dates, cohort age range, number of completed questionnaires, and overall response rate.

These files also contain details on known data inconsistencies or errors, as well as coding instructions and category codes used for coding open-ended questions.

## LIST OF QUESTIONNAIRE FILES BY STUDY TIME POINT

BRHS 1983-85 Follow-up questionnaire (Q5) files		
FILE DESCRIPTION	File format	FILE NAME
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ5 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ5 Qr.sas
Documentation (Methods):	PDF	BRHS 1983-85 (Q5) Questionnaire Data notes and Coding protocol V1.pdf
Data dictionary:	Excel	BRHS1983-85 (Q5) Questionnaire Data dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 1983-85 questionnaire Q5 V1.pdf
<b>Derived data</b>		
ASCII data file:	ASCII	BRHSQ5 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ5 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS1983-85 (Q5) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS1983-85 (Q5) Derived variables Data dictionary V1.xlsx

BRHS 1992 Follow-up questionnaire (Q92) files		
FILE DESCRIPTION	File format	FILE NAME
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ1992 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1992 Qr.sas
Documentation (Methods):	PDF	BRHS 1992 (Q92) Questionnaire Data notes and Coding protocol V1.pdf
Data dictionary:	Excel	BRHS 1992 (Q92) Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 1992 questionnaire Q1992 V1.pdf
<b>Derived data</b>		
ASCII data file:	ASCII	BRHSQ1992 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1992 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS1992(Q92) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS1992 (Q92) Derived variables Data dictionary V1.xlsx

BRHS 1996 Follow-up questionnaire (Q96) files		
FILE DESCRIPTION	File format	File Name
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ1996 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1996 Qr.sas
Documentation (Methods):	PDF	BRHS 1996 (Q96) Questionnaire Data notes and Coding protocol V1.pdf
Data dictionary:	Excel	BRHS 1996 (Q96) Questionnaire Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 1996 questionnaire Q1996 V1.pdf
<b>Derived data</b>		
ASCII data file:	ASCII	BRHSQ1996 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ1996 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS1996(Q96) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS1996 (Q96) Derived variables Data dictionary V1.xlsx

Cont.

**LIST OF FILES BY STUDY TIME POINT**

<b>BRHS 2003 Follow-up questionnaire (Q03) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2003 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2003 Qr.sas
Documentation (Methods):	PDF	BRHS 2003 (Q03) Questionnaire Data notes and Coding protocol V2.pdf
Data dictionary:	Excel	BRHS 2003 (Q03) Qr Data Dictionary V2.xlsx
Annotated Questionnaire:	PDF	BRHS 2003 questionnaire Q2003 V1.pdf
<b>Derived data</b>		
<b>File Name</b>		
ASCII data file:	ASCII	BRHSQ2003 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2003 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2003(Q03) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2003(Q03) Derived variables Data dictionary V1.xlsx

<b>BRHS 2005 Follow-up questionnaire (Q05) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2005 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2005 Qr.sas
Documentation (Methods):	PDF	BRHS 2005 (Q05) Questionnaire Data notes and Coding Protocol V2.pdf
Data dictionary:	Excel	BRHS 2005 (Q05) Qr Data Dictionary V2.xlsx
Annotated Questionnaire:	PDF	BRHS 2005 questionnaire Q2005 V1.pdf
<b>Derived data</b>		
<b>File Name</b>		
ASCII data file:	ASCII	BRHSQ2005 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2005 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2005(Q05) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2005(Q05) Derived variables Data dictionary V1.xlsx

<b>BRHS 2007 Follow-up questionnaire (Q07) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2007 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2007 Qr.sas
Documentation (Methods):	PDF	BRHS 2007 (Q07) Questionnaire Data notes and Coding protocol V2.pdf
Data dictionary:	Excel	BRHS 2007 (Q07) Qr Data Dictionary V2.xlsx
Annotated Questionnaire:	PDF	BRHS 2007 questionnaire Q2007 V1.pdf
<b>Derived data</b>		
<b>File Name</b>		
ASCII data file:	ASCII	BRHSQ2007 Derived variables.dat
SAS programme to read data:	SAS	Read BRHSQ2007 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2007(Q07) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2007(Q07) Derived variables Data dictionary V1.xlsx

Cont.

**LIST OF FILES BY STUDY TIME POINT**

<b>BRHS 2014 Follow-up questionnaire (Q2014) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2014 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2014 Qr.sas
Documentation (Methods):	PDF	BRHS 2014 (Q2014) Questionnaire Data notes and Coding Protocol V1.pdf
Data dictionary:	Excel	BRHS 2014 (Q2014) Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2014 questionnaire Q2014 V1.pdf
<b>Derived data</b>		
		<b>File Name</b>
ASCII data file:	ASCII	BRHSQ2014 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2014 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2014(Q2014) Derived variables Documentation V2.pdf
Data dictionary:	Excel	BRHS2014(Q14) Derived variables Data dictionary V2.xlsx

<b>BRHS 2015 Follow-up questionnaire (Q2015) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2015 Qr Restricted.dat
SAS programme to read data:	SAS	READ BRHSQ2015 Qr.sas
Documentation (Methods):	PDF	BRHS 2015 (Q2015) Questionnaire Data notes & Coding Protocol V1.pdf
Data dictionary:	Excel	BRHS 2015 (Q2015) Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2015 questionnaire Q2015 V1.pdf
<b>Derived data</b>		
		<b>File Name</b>
ASCII data file:	ASCII	BRHSQ2015 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2015 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2015(Q15) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2015(Q15) Derived variables Data dictionary V1.xlsx

<b>BRHS 2016 Follow-up questionnaire (Q2016) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2016 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2016 Qr.sas
Documentation (Methods):	PDF	BRHS 2016 (Q2016) Questionnaire Data notes & Coding Protocol V1.pdf
Data dictionary:	Excel	BRHS 2016 (Q2016) Qr Data dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2016 questionnaire Q2016 V1.pdf
<b>Derived data</b>		
		<b>File Name</b>
ASCII data file:	ASCII	BRHSQ2016 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2016 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2016(Q2016) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2016(Q2016) Derived variables Data dictionary V1.xlsx

Cont.

**LIST OF FILES BY STUDY TIME POINT**

<b>BRHS 2017 Follow-up questionnaire (Q2017) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2017 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2017 Qr.sas
Documentation (Methods):	PDF	BRHS 2017 (Q2017) Questionnaire Data notes & Coding Protocol V1.pdf
Data dictionary:	Excel	BRHS 2017 (Q2017) Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2017 questionnaire Q2017 V1.pdf
<b>Derived data</b>		
ASCII data file:	ASCII	BRHSQ2017 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2017 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2017(Q2017) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2017(Q2017) Derived variables Data dictionary V1.xlsx

<b>BRHS 2020 Follow-up questionnaire (Q2020) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2020 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRSQ2020 Qr dat.sas
Documentation (Methods):	PDF	BRHS 2020 (Q2020) Questionnaire Data notes and Coding protocol V1.pdf
Data dictionary:	Excel	BRHS Q2020 Qr Data dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2020 questionnaire Q2020 V1.pdf
<b>Derived data</b>		
ASCII data file:	ASCII	BRHSQ2020 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2020 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2020(Q2020) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2020(Q2020) Derived variables Data dictionary V1.xlsx

<b>BRHS 2023 Follow-up questionnaire (Q2023) files</b>		
<b>FILE DESCRIPTION</b>	<b>File format</b>	<b>File Name</b>
<b>Postal Questionnaire</b>		
ASCII data file:	ASCII	BRHSQ2023 Qr Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2023 Qr dat.sas
Documentation (Methods):	PDF	BRHS 2023 (Q2023) Questionnaire Data notes and Coding Protocol V1.pdf
Data dictionary:	Excel	BRHS 2023 (Q2023) Qr Data Dictionary V1.xlsx
Annotated Questionnaire:	PDF	BRHS 2023 questionnaire Q2023 V1.pdf
<b>Derived data</b>		
ASCII data file:	ASCII	BRHSQ2023 Derived variables Restricted.dat
SAS programme to read data:	SAS	Read BRHSQ2023 Derived variables dat.sas
Documentation (Methods):	PDF	BRHS2023(Q2023) Derived variables Documentation V1.pdf
Data dictionary:	Excel	BRHS2023(Q2023) Derived variables Data dictionary V1.xlsx

## Data from the BRHS Follow up for morbidity through General Practice (GP) records (i.e. primary care records)

### All non-fatal events dataset (raw data)

This dataset contains all non-fatal morbidity event data collected through the BRHS General Practice (GP) Record Review during the follow-up period (1978-80 (Q1) to 2024). Each cohort participant may have up to 20 events. The dataset includes events recorded up to December 2025. However, not all participants were followed until that date. Complete follow-up for all participants is only available up to **30 July 2025**. Therefore, **30 July 2025 should be used as the end-of-follow-up cut-off date** for all analyses.

#### List of files

BRHS Follow-up period 1978-80 (Q1) to 2024		
FILE DESCRIPTION	File Format	File name
ASCII data file:	ASCII	BRHS ALL RR EVENTS 1978Q1_RR2024 UKDS Restricted.dat
SAS programme to read data:	SAS	Read BRHS ALL RR EVENTS 1978Q1_RR2024 UKDS Restricted dat.sas
Documentation (Methods):	PDF	BRHS ALL RR EVENTS 1978Q1_RR2024 UKDS Documentation.pdf
Data dictionary:	Excel	BRHS ALL RR EVENTS 1978Q1_RR2024 UKDS Data Dictionary.xlsx

## Derived Event-outcome datasets with combined fatal and non-fatal events

### Event-outcome datasets

#### How the datasets were created

The dataset described above—comprising all raw non-fatal morbidity event data collected through the BRHS General Practice (GP) Record Review during the follow-up period (1978–80 (Q1) to 2024), together with fatal event data obtained from Central Registry death notifications—was processed to identify the first fatal or non-fatal occurrence of each of 16 specified event outcomes (see Table 11 for the list of outcomes). These first-occurrence events were identified within the six predefined follow-up periods listed below. The follow-up period was truncated on 30 July 2024, the date on which the GP Record Review is considered complete.

Event-outcome datasets (combining non-fatal and fatal events where appropriate) were generated for follow-up periods beginning at each of the four physical examinations (Q1, Q20, Q30, Q40).

In addition, for Q30 and Q40, an additional dataset was generated for follow-up periods beginning at the time of the corresponding postal questionnaires. The start date for these follow-up periods was defined as the date on which each BRHS cohort participant completed the respective questionnaire.

These additional datasets for Q30 and Q40 were necessary, because more participants completed the postal questionnaires than attended the physical examinations (2147 vs 1722 at Q30; 1009 vs 667 at Q40). In contrast, at Q1 and Q20 the same number of cohort participants completed both the questionnaire and the physical examination (7735 at Q1 and 4252 at Q20) because, by virtue of the design, only those attending the examination were asked to complete the questionnaire.

Not all outcomes were available for each follow-up period. The 16 event outcomes and their corresponding follow-up periods are shown in Table 11 below.

To protect confidentiality, recorded dates of death were perturbed by randomly adding 1 to 14 days to the actual date.

## What is included in the Event-outcome datasets

The datasets include the following variables for each event outcome type:

1. Start and end dates of the follow-up period
2. Event prevalence at the start of follow-up
3. Event occurrence **status** during follow-up (none, non-fatal, fatal)
4. Date of the first event (non-fatal or fatal) occurring during follow-up period
5. Date of death from any cause (for censoring)
6. Censoring date (date of death or date of exiting the study)

## Event-outcome Datasets

**Dataset 1. Event Outcome file for period: 1978-80 (Q1) to 2024**

**Dataset 2. Event Outcome file for period: 1998-2000 (Q20) to 2024**

**Datasets 3. Event Outcome files for period: 2010-2012 (Q30) to 2024**

3.1 Period: Q30 Physical examination to 2024 GP Record review

3.2 Period: Q30 Questionnaire (Q30Qr) to 2024 GP Record review

**Datasets 4. Event Outcome files for period: 2018-2019 (Q40) to 2024**

4.1 Period: Q40 Physical examination to 2024 GP Record review

4.2 Period: Q40 Questionnaire (Q40Qr) to 2024 GP Record review

For a complete list of files see **List of files - Event outcome data files** section below.

## Follow-up periods for each dataset

	Follow-up period	
Dataset	Start date	End date
1	1978-1980 Baseline Physical examination date	2024 GP Records Review (30 July 2024)
2	1998-2000 20-year Physical examination date	2024 GP Records Review (30 July 2024)
3.1	2010-2012 30-year Physical examination date	2024 GP Records Review (30 July 2024)
3.2	2010-2012 30-year Questionnaire completion date	2024 GP Records Review (30 July 2024)
4.1	2018-2019 40-year Physical examination date	2024 GP Records Review (30 July 2024)
4.2	2018-2019 40-year Questionnaire completion date	2024 GP Records Review (30 July 2024)

**Table 11. Overview of Event Outcomes included in the event outcome datasets by follow-up period**

		Follow-up period						
		Dataset 1	Dataset 2	Datasets 3.1 & 3.2		Datasets 4.1 & 4.2		
Event outcome	Non-fatal/fatal events	1978-80 (Q1) Baseline Physical examination to 2024 GP Record review	1998-2000 (Q20) 20-year Physical examination to 2024 GP Record review	2010-2012 (Q30) 30-year Physical exam or Questionnaire to 2024 GP Record review		2018-2019 (Q40) 40-year Physical exam or Questionnaire to 2024 GP Record review		
		(Q1-RR24)	(Q20-RR24)	(Q30-RR24)	(Q30Qr-RR24)	(Q40-RR24)	(Q40Qr-RR24)	
				Start date: Physical examination	Start date: Questionnaire completion	Start date: Physical examination	Start date: Questionnaire completion	
1	Myocardial Infarction (MI)	(non-fatal + fatal events)	✓	✓	✓	✓	✓	✓
2	Angina	(non-fatal events)	✓	✓	✓	✓	✓	✓
3	Heart failure	(non-fatal events)	⊗	✓	✓	✓	✓	✓
4	Stroke	(non-fatal + fatal events)	✓	✓	✓	✓	✓	✓
5	Transient Ischaemic Attack	(non-fatal events)	✓	✓	✓	✓	✓	✓
6	CVD (MI or Stroke)	(non-fatal + fatal events)	✓	✓	✓	✓	✓	✓
7	Diabetes	(non-fatal events)	✓	✓	✓	✓	✓	✓
8	Atrial fibrillation (AF)	(non-fatal events)	⊗	✓	✓	✓	✓	✓
9	Peripheral Vascular Disease (PVD)	(non-fatal events)	⊗	✓	✓	✓	✓	✓
10	Pulmonary Embolism (PE)	(non-fatal events)	⊗	✓	✓	✓	✓	✓
11	Deep Vein Thrombosis (DVT)	(non-fatal events)	⊗	✓	✓	✓	✓	✓
12	Coronary artery bypass graft (CABG) or Percutaneous transluminal coronary angioplasty (PTCA)	(non-fatal events)	⊗	✓	✓	✓	✓	✓
13	Vascular dementia	(non-fatal events)	⊗	⊗	✓	✓	✓	✓
14	Other dementia	(non-fatal events)	⊗	⊗	✓	✓	✓	✓
15	Alzheimer's	(non-fatal events)	⊗	⊗	✓	✓	✓	✓
16	Any type of dementia	(non-fatal events)	⊗	⊗	✓	✓	✓	✓
⊗ Event not available within this follow-up period								

## List of files - Event outcome data files

<b>BRHS EVENT OUTCOME FILES</b>		
<b>Event outcomes Q1 (Baseline) to RR24</b>		
<b>1. Follow-up period 1978-80 (Q1) to 2024</b>		
<b>File description</b>	<b>File format</b>	<b>File name</b>
ASCII data file:	ASCII	BRHS EventOutcomes Q1_RR24 Restricted.dat
SAS programme to read data:	SAS	READ BRHS EventOutcomes Q1_RR24 Restricted dat.sas
Documentation (Methods):	PDF	BRHS Event Outcomes Q1_RR24 Documentation.pdf
Data dictionary:	Excel	BRHS EventOutcomes Q1_RR24 Data Dictionary.xlsx
<b>Event outcomes Q20 to RR24</b>		
<b>2. Follow-up period 1998-2000 (Q20) to 2024</b>		
<b>File description</b>	<b>Format</b>	<b>File name</b>
ASCII data file:	ASCII	BRHS EventOutcomes Q20_RR24 Restricted.dat
SAS programme to read data:	SAS	Read BRHS EventOutcomes Q20_RR24 Restricted dat.sas
Documentation (Methods):	PDF	BRHS Event Outcomes Q20_RR24 Documentation.pdf
Data dictionary:	Excel	BRHS EventOutcomes Q20_RR24 Data Dictionary.xlsx
<b>Event outcomes Q30 Physical Examination to RR24</b>		
<b>3.1 Follow-up period 2010-2012 (Q30) to 2024</b>		
<b>File description</b>	<b>Format</b>	<b>File name</b>
ASCII data file:	ASCII	BRHS EventOutcomes Q30_RR24 Restricted.dat
SAS programme to read data:	SAS	Read BRHS EventOutcomes Q30_RR24 Restricted dat.sas
Documentation (Methods):	PDF	BRHS Event Outcomes Q30_RR24 Documentation.pdf
Data dictionary:	Excel	BRHS EventOutcomes Q30_RR24 Data Dictionary.xlsx
<b>Event outcomes Q30 Questionnaire to RR24</b>		
<b>3.2 Follow-up period 2010-2012 (Q30Qr) to 2024</b>		
<b>File description</b>	<b>Format</b>	<b>File name</b>
ASCII data file:	ASCII	BRHS EventOutcomes Q30Qr_RR24 Restricted.dat
SAS programme to read data:	SAS	Read BRHS EventOutcomes Q30Qr_RR24 Restricted dat.sas
Documentation (Methods):	PDF	BRHS Event Outcomes Q30Qr_RR24 Documentation.pdf
Data dictionary:	Excel	BRHS EventOutcomes Q30Qr_RR24 Data Dictionary.xlsx
<b>Event outcomes Q40 Physical Examination to RR24</b>		
<b>4.1 Follow-up period 2018-2019 (Q40) to 2024</b>		
<b>File description</b>	<b>Format</b>	<b>File name</b>
ASCII data file:	ASCII	BRHS EventOutcomes Q40_RR24 Restricted.dat
SAS programme to read data:	SAS	Read BRHS EventOutcomes Q40_RR24 Restricted dat.sas
Documentation (Methods):	PDF	BRHS Event Outcomes Q40_RR24 Documentation.pdf
Data dictionary:	Excel	BRHS Event Outcomes Q40_RR24 Data Dictionary.xlsx
<b>Event outcomes Q40 Questionnaire to RR24</b>		
<b>4.2 Follow-up period 2018-2019 (Q40Qr) to 2024</b>		
<b>File description</b>	<b>Format</b>	<b>File name</b>
ASCII data file:	ASCII	BRHS EventOutcomes Q40Qr_RR24 Restricted.dat
SAS programme to read data:	SAS	Read BRHS EventOutcomes Q40Qr_RR24 Restricted dat.sas
Documentation (Methods):	PDF	BRHS Event Outcomes Q40Qr_RR24 Documentation.pdf
Data dictionary:	Excel	BRHS Event Outcomes Q40Qr_RR24 Data Dictionary.xlsx

## Mortality Follow-up data

### Follow-up period: Baseline 1978-80 (Q1) to August 2025

All BRHS cohort participants (n=7735) have been flagged for death notifications through Central Registries in England and Scotland since the study baseline (1978-80). Information is received on the date of death, and coded cause of death using International Classifications of Diseases 10<sup>th</sup> Revision (ICD-10). The data has been provided annually by NHS Digital/NHS England, NHS Scotland or their predecessor organisations.

#### Recommended cutoff date

For the most recent month (August 2025), death notifications are likely to be incomplete because some reports may be delayed due to post-mortem examinations and other administrative procedures. Therefore, it is advisable to treat **31 July 2025 as the cutoff date for complete mortality data.**

To protect participant confidentiality:

- The original 4-digit **ICD-10** codes have been **recoded** into **3-digit ICD-9** codes.
- **Dates of death have been perturbed** (i.e., randomly shifted by adding a random number of 1 to 14 days)

### What is included in the BRHS Mortality Dataset

1. Perturbed date of death (day, month, year)
2. Cause of death

#### 2.1 Cause of death category

Using ICD-9 codes, deaths have been categorised in a separate 7 category variable, as:-

#### **Cause of death category:**

1= Major CHD/MI death (ICD-9 codes :410 – 4149)

2= Stroke death (ICD-9 codes: 430 – 4389)

3= Other CVD death (ICD-9 codes: 390 - 459(excluding 410-4149 and 430-4389))

4=Non-CVD deaths all other ICD-9 codes (i.e. excluding all ICD codes listed in 1-3)

8 = Died abroad - Cause unknown

9= Alive

10 = Lost to follow-up

#### 2.2 ICD-9 3-digit code for cause of death (International Classification of Diseases, 9th Revision)

#### **IMPORTANT NOTES:**

- The ICD-9 variable is an **alphanumeric** variable and therefore needs to be treated as character/string/text variable while analysing the data.
- Those who died abroad or whose cause of death for some reason is unknown (cdeath=8) or who were lost to follow up (cdeath=10), will not have an ICD-9 code.

3. A perturbed censoring date (indicating when a participant either died or was lost to follow-up)

## LIST OF FILES

<b>FOLLOW-UP MORTALITY DATA file</b>		
<b>File description</b>	<b>File Format</b>	<b>File name</b>
Follow-up period 1978-80 (Q1) to 2025		
ASCII data file:	ASCII	BRHS ALLMORT_uptoAUG2025 P14 Restricted.dat
SAS programme to read data:	SAS	Read BRHS ALLMORT_uptoAUG2025 P14 Restricted dat.sas
Documentation (Methods):	PDF	BRHS ALLMORT_uptoAUG2025 P14 Documentation.pdf
Data dictionary:	Excel	BRHS ALLMORT_uptoAUG2025 P14 Data Dictionary.xlsx

## Cancer Follow-up data

All BRHS cohort participants (n = 7,735) have been flagged for cancer notification through the Cancer Registry since the study baseline (1978–1980). Information has been received on the date of a cancer diagnosis registration and the type of cancer. Cancer type is provided using the International Classification of Diseases, 10th Revision (ICD-10).

These data were supplied by NHS England, NHS Scotland, or their predecessor organisations.

**To protect participant confidentiality, the following steps were taken:**

- Original 4-digit ICD-10 codes were recoded into less granular 3-digit ICD-9 codes.
- Dates of cancer diagnosis registration were perturbed by randomly shifting them by 1–14 days.

### Follow-up period

Start of follow up: Baseline 1978–1980 (Q1)

End of follow-up : 2024 - **Recommended cutoff date for cancer events: 30 June 2024**

This dataset includes all cancer events registered with the Cancer Registry during the follow-up period. Although events are recorded up to 9 August 2024, the data are likely to be complete for all participants only up to 30 June 2024, as some events may not yet have been reported.

### What is included in the BRHS Cancer Dataset

Each BRHS cohort participant may have up to seven cancer diagnoses. Accordingly, each participant record has seven lines of data, one for each potential cancer event. Events are listed in chronological order, with the earliest event first. For example, Line 1 contains the date and type of the participant's first cancer diagnosis.

### Variables included in the BRHS Cancer Dataset

- **Event number**  
Events are numbered from 1 to 7, indicating the order in which they occurred (e.g. 1st, 2nd, ..., 7th). Events are sorted chronologically within each participant's record.
- **Event date – Cancer Registration Date**  
This is the cancer registration date for a cancer diagnosis. The date has been perturbed by adding a random number of days (1–14) to the actual diagnosis date.
- **Type of cancer**  
The type of cancer is classified using the International Classification of Diseases, 9th Revision (ICD-9), as an ICD-9 3-digit code.

## LIST OF FILES

FOLLOW-UP CANCER DATA files			
Follow-up period 1978-80 (Q1) to 2024			
File description	Size	File Format	File name
ASCII data file:	995 kB	ASCII	BRHS CANCER FILE 7735 2025 P14 Restricted.dat
SAS programme to read data:	932 B	SAS	Read BRHS CANCER FILE 7735 2025 P14 dat Restricted.sas
Documentation (Methods):	223 kB	PDF	BRHS CANCER FILE 7735 2025 P14 Data Documentation.pdf
Data dictionary:	19.7 kB	Excel	BRHS CANCER FILE 7735 2025 P14 Data Dictionary.xlsx

## Linked data

The BRHS data have been linked to:

### Mortality data

All BRHS cohort participants (n=7735) have been flagged for death notifications through Central Registries in England and Scotland since the study baseline (1978-80). Information is received on the date of death, and coded cause of death - International Classifications of Disease codes (ICD10). The data has been provided annually by NHS Digital/NHS England, NHS Scotland or their predecessor organisations.

### Cancer registration data

All BRHS cohort participants have been flagged for cancer notification through the Cancer Registry since baseline (1978-80). Information is received on the date of cancer diagnosis, the site and type of cancer. The type of cancer is provided in the form of an International Classifications of Disease code (ICD9, ICD10). The data has been provided annually by NHS Digital/NHS England, NHS Scotland or their predecessor organisations.

### Air pollution data

BRHS cohort participants' address locations were linked to routine monitoring data from the Automatic Urban and Rural Network (AURN). Air pollution exposure data were based on BRHS participants' address locations (postcodes) at the 20-year follow-up in 1998-2000 (Q20) and the 30-year follow-up in 2010-12 (Q30). Data included particulate matter 10 (PM<sub>10</sub>) and nitrogen dioxide (NO<sub>2</sub>). Datasets can be found within the two study time points (Q20, Q30).

### Climate/weather data

Climate data were obtained from the UK Meteorological Office ([www.metoffice.gov.uk](http://www.metoffice.gov.uk)) for the 4252 BRHS participants who attended the 1998-2000 (Q20) 20-year follow-up physical examination. Climate data was linked to each participant based on the date he was examined, the nearest weather station and the post code of the participant's residence. The dataset can be found within the study time point (Q20) files.

### Index of Multiple Deprivation (IMD)

The Indices of Multiple Deprivation (IMD) for England, Scotland, and Wales were linked to the BRHS cohort participants using Lower Super Output Areas (LSOAs) in England and Wales, and Data Zones in Scotland. IMD are measures of neighbourhood-level socioeconomic deprivation. These national scores of deprivation are collected at aggregate level for small geographical units called 'super output areas', of which the lower super output area (LSOA) is the smallest with an average of 1500 people; small area units in Scotland are called 'Data Zones' (average of 750 people).

IMD score in the BRHS were linked and available at two time points: 1998-2000 (Q20) 20-year follow up, and the 2010-12 (Q30) 30-year follow up.

At the 20-year follow up, the IMD scores for the BRHS cohort were based on LSOAs derived from postcodes of residence of the participants then aged 60–79 years. IMD for England 2004, Scotland 2004 and Wales 2005 were used. These IMD measures were based on specific area-level indicators mostly from 2000 to 2001, and therefore applicable to this time point of the BRHS cohort in 1998 to 2000.

Similarly, at the 2010-12 (Q30) 30-year follow up, IMD scores for the BRHS cohort were based on LSOAs derived from postcodes of residence in 2010–2012. IMD for England 2011, Scottish IMD 2012 and Welsh IMD 2008 were used since these corresponded closest to this time point of the BRHS cohort in 2010-12.

Since the BRHS cohort comprises men from England, Scotland and Wales, the IMD scores (from England, Scotland and Wales) were standardised to obtain a combined IMD measure for the BRHS cohort at both time points. The derived standardised IMD score variable can be found within the <<participant profile>> dataset at each of these two study time points (Q20 and Q30).

Note: The Index of Multiple Deprivation (IMD) data for England is obtainable from the Ministry of Housing, Communities & Local Government (MHCLG).

IMD data is released by the MHCLG, and it can be accessed through their official website or data.gov.uk. The data provides rankings for areas in England, helping to identify levels of deprivation across different regions. <https://www.gov.uk/government/collections/english-indices-of-deprivation>

For Scotland and Wales, similar indices are available from the respective devolved governments (e.g., Scottish Index of Multiple Deprivation for Scotland).

## Using the BRHS data

### Read the supporting material in the BRHS User Guide

#### Read the suggested key publications

A good way to gain better understanding of the BRHS study is to read some of the **key publications** listed in the BRHS Key publications section (above). Three important papers detailing the cohort profile have been published, offering a comprehensive description of the study and its follow-up over forty-five years.

#### Read the documentation files associated with each selected dataset

When working with the data, it is crucial to read the documentation (methods) files associated with each dataset to gain a clearer understanding of the data. These files contain important details about the data and the methods of how they were collected/analysed or derived.

#### Read the BRHS Questionnaires

When using the Questionnaire data, it is essential to refer to the annotated copies of the questionnaires, which include the BRHS variable names. This will help ensure the correct variables are used and provide a better understanding of the context in which the questions were asked, how they were answered and to better understand the source of any missing values.

#### Finding variables

To locate the data of interest, users can refer to the overview tables provided in this user guide (listed below), as well as browse the copies of the BRHS questionnaires.

The overview tables, which are searchable, indicate the data and/or datasets that are available at each of the study time point.

A list of the searchable overview tables below, can be used to find data of interest.

Table 2. Overview of **physical & clinical measurements** collected through the BRHS physical examinations 1978-2018

Table 3. Overview of **biomarkers** from the four BRHS physical examinations 1978 – 2018

Table 4: Overview of **variables derived** available at each BRHS physical examination study timepoint

Table 5. Overview of **adjusted or standardised variables** at each BRHS physical examination study timepoint

Table 7: Overview of **questions** included in the **BRHS questionnaires** by study time point (1978 to 2023)

Table 7.1 Overview of **variables derived** available at each BRHS Questionnaire timepoint

Table 8: Overview of **morbidity events** collected through General Practice (GP) records

Table 10: Overview of **data (datasets)** available at each of the four **BRHS physical examination** study time points

Table 11: Overview of **Outcome events (non-fatal/fatal)** included in the outcome event files by follow-up period

#### Find datasets of interest and their documentation files

Once you identified the study time point/s of interest you can proceed to finding the dataset

- Go the BRHS DATASETS section (above)
- Select the Study time point of interest
- Go to the List of files table of the selected study time point
- Identify the data/dataset of interest
- Download/open the corresponding documentation file and data dictionary for the dataset of interest
- Search/Find the variables of interest. The documentation file contains a list and a description of all available variables

## Key variables

KEY VARIABLES	
Description	BRHS variable name
Participant identifier – Study ID	serial
Age at BRHS study time point (*=q1, q5, q92 ..... q2023)	*age
Town from which the BRHS participants were recruited from at baseline 1978-80 (Q1)	q1town
Social class Based on the Registrar General's six social classes, using the 1970 OPCS manual for occupational classification. Based on longest held occupation	q1sc

The study ID variable is included in all BRHS datasets, allowing for dataset merging.

The baseline Town, Social Class and age variables are included at each study time point, either in the Derived Variables or the Participant Profile datasets. For time points Q1, Q20, Q30, and Q40, they appear in the Participant Profile datasets; for all other time points, they are included in the Derived Variables datasets.

## Derived variables

Derived variables are created from one or more existing variables to support data analysis. At each BRHS study time point, there is a dataset containing all the available derived variables for that time point, many of which have been used in the data analysis for BRHS publications. The methods for creating these derived variables are outlined in the corresponding documentation (methods) files. Examples of derived variables are age, BMI, smoking status categories etc. (For example, Baseline Q1 derived variables are in dataset *BRHSQ1 Derived variables Restricted.dat*)

## Missing values

Responses on questionnaires or measurements may be absent for various reasons. It is recommended to refer to the data dictionaries and documentation (methods) files, which provide details on the missing value codes used for each variable in the dataset. In the BRHS datasets, missing numerical data is typically represented by dots (.), while missing character/text data is indicated by blank fields. However, other codes are also used to denote missing values which will be recorded in the data dictionary and documentation file associated with the dataset being used.

## Merging the BRHS datasets

Datasets should be merged using the participant identifier variable, <serial>, which is present in each dataset. Before merging, ensure the datasets are sorted by the <serial> variable. The number of records in each dataset may vary; for example, the physical examination dataset will generally have more records than the blood biomarkers dataset, as not all participants provided a blood sample. After merging, missing data for biomarkers will be created for participants without a biomarker record, and vice versa, if there is blood sample data but no physical examination data. In rare cases, a blood sample may have been collected without a complete physical examination being conducted.

The <serial> variable can be used to merge datasets from the same or different study time points. For instance, you can use the <serial> variable to merge the Questionnaire and Physical Examination datasets from the same study time point, or merge Questionnaire datasets from two different time points (e.g., Q20 and Q30 questionnaires).

## **APPENDICES**

### **Consent forms**

Appendix 1. BRHS Consent form 1998-2000

Appendix 2. BRHS Consent form 2003

Appendix 3. BRHS Consent form 2010-12

Appendix 4. BRHS Consent form 2018-19

## APPENDIX 1

### BRHS Consent form used at the 20 year physical examination 1998-2000

#### 21.0 Consent to follow up studies

An important part of this study is to observe the future health of the people taking part. We are therefore seeking your permission to receive specific information related to heart disease and stroke, particularly from the records held by your general practitioner. All these details would be treated in **absolute confidence** by the Research Team.

Do you agree to us following your future health through your health records?

<sub>1</sub> Agreed      <sub>2</sub> Not Agreed

We will arrange to have your blood sample checked for cholesterol and other factors which are important for heart disease risk. The results of these tests will be sent back to your doctor in the next four to five weeks. If any of the results give cause for concern, you will be asked to make an appointment with your doctor.

Do you agree to us passing the test results to your doctor?

<sub>1</sub> Agreed      <sub>2</sub> Not Agreed

Part of your blood sample will be frozen and kept for special scientific studies of factors affecting heart disease risk, which may help us to understand how to prevent heart disease in the future. Among the factors we may need to study will be the way in which genetic factors affect heart disease risk.

Would you allow us to use your sample in this way?

<sub>1</sub> Agreed      <sub>2</sub> Not Agreed

I agree to allow the Research Team to continue to study my health in accordance with the criteria above. I understand that any details recorded will be treated in complete confidence.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**BRHS Consent form 2003 (Sent with Postal Questionnaire 2003)**

Study Number: «SERNO»

<p style="text-align: center;"><b>BRITISH REGIONAL HEART STUDY</b></p> <p style="text-align: center;"><b>CONSENT FORM</b></p>
---

Dear Mr «SURNAME»,

As you know, we have been following your health and that of almost 8,000 other men since you joined the British Regional Heart Study more than 20 years ago. The information has been extremely valuable in contributing to our understanding and the prevention of heart disease and stroke in Britain.

Following the future health of all the men taking part remains a very important part of the study. However, because of new data protection laws, we are only able to continue to do this if you give us **specific written permission**.

In order to update your health record effectively, we need to obtain routine information from your family doctor and, where appropriate, from hospitals and several National Health Service agencies listed below\*. We are particularly concerned to know about illnesses of the heart and circulation, diabetes, cancer and other disabling conditions. Even if you do not have any of these conditions, the review of your medical records is of very great importance to us. The information we obtain is kept securely and is only seen by members of our small research team.

Your consent is entirely voluntary and can be withdrawn at any time and your medical care from the National Health Service will not be affected, whether or not you agree to our request.

Do you agree to allow us to follow your future health in this way?

Agreed                       Not agreed

Please sign and date below

\_\_\_\_\_ Date: \_\_\_\_ / \_\_\_\_ / 20 \_\_\_\_  
«FIRST\_NAME» «SECOND\_NAME» «SURNAME»

\*The agencies related to the National Health Service are: -  
-the National Health Service Central Register  
-the General Register Office  
-the National Cancer Intelligence Centre  
-the Primary Care Patient Registration Service

**Please return this form with the questionnaire in the envelope provided.**

**THANK YOU VERY MUCH FOR YOUR HELP.**

## APPENDIX 3

### BRHS Consent form used at the 30 year physical examination 2010-2012

#### CONSENT

We will arrange to have your blood sample checked for cholesterol and other factors which are important for heart disease risk. The results of the blood tests and other measurements will be sent back to your doctor in the next four to five weeks. If any of the results give cause for concern, you will be asked to make an appointment with your doctor.

1. Do you agree to us passing the test results to your doctor?

<sub>1</sub> Agreed                      <sub>2</sub> Not Agreed

Part of your blood sample will be frozen and kept for special scientific studies of factors affecting heart disease risk, which may help us to understand how to prevent heart disease in the future. Among the factors we may need to study will be the way in which genetic factors affect heart disease risk.

2. Would you allow us to use your sample in this way?

<sub>1</sub> Agreed                      <sub>2</sub> Not Agreed

Following the future health of all the men taking part remains a very important part of the study. However, because of new data protection laws, we are only able to continue to do this if you give us **specific written permission**.

In order to update your health record effectively, we need to obtain routine information from your family doctor and, where appropriate, from hospitals and several National Health Service agencies listed below\*. We are particularly concerned to know about illnesses of the heart and circulation, diabetes, cancer and other disabling conditions. Even if you do not have any of these conditions, the review of your medical records is of very great importance to us. The information we obtain is kept securely and is only seen by members of our small research team.

3. Do you agree to us following your future health through your health records?

<sub>1</sub> Agreed                      <sub>2</sub> Not Agreed

I agree to allow the Research Team to continue to study my health in accordance with the criteria above. I understand that any details recorded will be treated in complete confidence.

Signed: \_\_\_\_\_

Print name: \_\_\_\_\_

Date: \_\_\_\_\_

\*The agencies related to the National Health Service are:-

- the NHS Information Centre
- the General Register Office
- the National Cancer Intelligence Centre
- the Primary Care Patient Registration Service

## APPENDIX 4

### BRHS Consent form used at the 40 year physical examination 2018

#### Station 3: BRHS CONSENT FORM

Affix Label: Serno/batch

#### BRITISH REGIONAL HEART STUDY ASSESSMENT 2018

Please write your initials inside the box to indicate if you agree with each statement or leave blank if you disagree.	
	<b>AGREE</b>
1. I have read and understand the Information Leaflet, and have had the opportunity to ask questions.	<input type="checkbox"/>
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	<input type="checkbox"/>
3. I give permission for the results of the blood tests and the clinical measurements made today to be available to my doctor.	<input type="checkbox"/>
4. I give permission for long-term storage and use of my blood samples for health-related research purposes (even after my incapacity or death).	<input type="checkbox"/>
5. I am willing to continue with existing permissions for access to my medical and other health-related records*, and for long-term storage and use of this and other information about me, for <b>health-related research purposes</b> (even after my incapacity or death).	<input type="checkbox"/>
6. I give permissions for linkage to my dental care records	<input type="checkbox"/>
I agree to allow the Research Team to continue to study my health in accordance with the criteria above. I understand that any details recorded will be treated in complete confidence.	

Signed \_\_\_\_\_

Print name \_\_\_\_\_ Date: \_\_\_\_\_

Researcher: Initials \_\_\_\_\_ Date: \_\_\_\_\_

\*Medical and other health-related records from agencies related to the National Health Service: NHS Digital Hospital Episode Statistics (HES), Minimum Mental Health Dataset (MMHDS)- Diagnostic Imaging Dataset (DIDS), the General Register Office, Cancer Registry, Primary Care Patient Registration Service.