# Supplementary Table 1. List of chronic conditions examined, and codes used to define those morbidities

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| --- | --- | --- |
| **Condition used in this analysis** | **Condition subsets (to map to code lists)** | **Codes used or code list source** |
| Addison’s Disease |  | Read v2 codes: A176. C154. C1540 C1541 C1546 C154zICD10 codes: E27.1 E27.2 |
| Alcohol misuse |  | https://phenotypes.healthdatagateway.org/phenotypes/PH94/version/188/detail/#home |
| Ankylosing spondylitis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH99/version/198/detail/#home |
| Anxiety |  | https://phenotypes.healthdatagateway.org/phenotypes/PH104/version/208/detail/#home  |
| Aplastic anaemia |  | https://phenotypes.healthdatagateway.org/phenotypes/PH105/version/210/detail/#home |
| Asthma |  | https://phenotypes.healthdatagateway.org/phenotypes/PH109/version/218/detail/#home  |
| Atrial fibrillation |  | https://phenotypes.healthdatagateway.org/phenotypes/PH36/version/72/detail/#home  |
| Autism |  | https://phenotypes.healthdatagateway.org/phenotypes/PH110/version/220/detail/#home |
| Benign prostatic hyperplasia |  | https://phenotypes.healthdatagateway.org/phenotypes/PH39/version/78/detail/#home |
| Bipolar affective disorder |  | https://phenotypes.healthdatagateway.org/phenotypes/PH38/version/76/detail/#home |
| Bronchiectasis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH128/version/256/detail/#home |
| Cardiomyopathy | Dilated cardiomyopathyHypertrophic cardiomyopathyCardiomyopathy – other | https://phenotypes.healthdatagateway.org/phenotypes/PH145/version/290/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH185/version/370/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH129/version/258/detail/#home |
| Cerebral palsy |  | https://phenotypes.healthdatagateway.org/phenotypes/PH132/version/264/detail/#home |
| Chronic kidney disease | Chronic kidney disease (laboratory result defined)End stage renal disease | https://phenotypes.healthdatagateway.org/phenotypes/PH42/version/1527/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH45/version/90/detail/#home  |
| Chronic obstructive pulmonary disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH43/version/86/detail/#home |
| Coeliac disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH141/version/282/detail/#home |
| Coronary heart disease (CHD) | Myocardial infarctionStable anginaUnstable anginaCHD not otherwise specified | https://phenotypes.healthdatagateway.org/phenotypes/PH215/version/430/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH315/version/630/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH329/version/658/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH41/version/82/detail/#home |
| Cystic fibrosis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH40/version/80/detail/#home |
| Dementia |  | https://phenotypes.healthdatagateway.org/phenotypes/PH148/version/296/detail/#home  |
| Depression |  | https://phenotypes.healthdatagateway.org/phenotypes/PH149/version/298/detail/#home  |
| Diabetes mellitus other or not specified |  | https://phenotypes.healthdatagateway.org/phenotypes/PH152/version/304/detail/ |
| Diverticular disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH154/version/308/detail/#home |
| Eating disorders |  | https://phenotypes.healthdatagateway.org/phenotypes/PH159/version/318/detail/#home |
| Endometriosis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH162/version/324/detail/  |
| Epilepsy |  | https://phenotypes.healthdatagateway.org/phenotypes/PH165/version/330/detail/#home |
| Erectile dysfunction |  | https://phenotypes.healthdatagateway.org/phenotypes/PH44/version/88/detail/#home |
| Giant cell arteritis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH46/version/92/detail/#home |
| Gout |  | https://phenotypes.healthdatagateway.org/phenotypes/PH177/version/354/detail/#home |
| Haematological malignancy |  | https://phenotypes.healthdatagateway.org/phenotypes/PH60/version/120/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH63/version/126/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH68/version/136/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH186/version/372/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH199/version/398/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH239/version/478/detail/#home |
| Hearing loss |  | Read version 2 codes: 1C13300 2BL3.00 2BL4.00 F580100 F591400 F591600 F591C00 F592100 F598.00 1C17.00 2DG..00 2DH0.00 7311A00 7317C00 7320 7319600 7319 8D23.00 8D26.00 8D2..12 8M41.00 Z8B5300 Z8B5500 Z911100 Z911.00 8D2..12 ZV45G00 ZV45N00 ZV53200 ZV53D00 2BL5.00 F591900 F591A00ICD-10 codes: H90, Z45.3, Z46.1, Z97.4 |
| Heart block and bundle branch block | Atrioventricular block second degreeBifascicular blockTrifascicular blockAtrioventricular block third degreeLeft bundle branch blockRight bundle branch block | https://phenotypes.healthdatagateway.org/phenotypes/PH114/version/228/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH125/version/250/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH324/version/648/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH115/version/230/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH57/version/114/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH78/version/156/detail/#home |
| Heart failure |  | https://phenotypes.healthdatagateway.org/phenotypes/PH182/version/364/detail/#home |
| Heart valve disease | Rheumatic valve disorderNon-rheumatic aortic valve disorderNon-rheumatic mitral valve disorderMultiple valve disorder | https://phenotypes.healthdatagateway.org/phenotypes/PH81/version/162/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH219/version/438/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH220/version/440/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH212/version/424/detail/#home  |
| Human immunodeficiency virus |  | https://phenotypes.healthdatagateway.org/phenotypes/PH184/version/368/detail/#home  |
| Hyperparathyroidism |  | https://phenotypes.healthdatagateway.org/phenotypes/PH76/version/152/detail/  |
| Hypertension |  | https://phenotypes.healthdatagateway.org/phenotypes/PH189/version/378/detail/#home  |
| Inflammatory arthritis | Juvenile Arthritis Psoriatic Arthritis Reactive Arthritis Rheumatoid Arthritis | https://phenotypes.healthdatagateway.org/phenotypes/PH196/version/392/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH80/version/160/detail/ |
| Inflammatory bowel disease | Crohn’s DiseaseUlcerative colitis | https://phenotypes.healthdatagateway.org/phenotypes/PH144/version/288/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH326/version/652/detail/#home  |
| Intellectual disability | Down SyndromeOther intellectual disability | https://phenotypes.healthdatagateway.org/phenotypes/PH156/version/312/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH192/version/384/detail/  |
| Liver disease | Alcoholic liver diseaseAutoimmune liver diseaseChronic viral hepatitisCirrhosis and liver fibrosisFatty liverLiver failureOesophageal varicesPortal hypertension | https://phenotypes.healthdatagateway.org/phenotypes/PH202/version/404/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH111/version/222/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH137/version/274/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH140/version/280/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH168/version/336/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH203/version/406/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH334/version/668/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH243/version/486/detail/#home  |
| Lupus Erythematosus |  | https://phenotypes.healthdatagateway.org/phenotypes/PH83/version/166/detail/#home  |
| Motor Neurone Disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH62/version/124/detail/#home |
| Multiple sclerosis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH63/version/126/detail/#home  |
| Myasthenia gravis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH213/version/426/detail/#home  |
| Neuropathic bladder |  | https://phenotypes.healthdatagateway.org/phenotypes/PH218/version/436/detail/#home  |
| Obsessive compulsive disorder |  | https://phenotypes.healthdatagateway.org/phenotypes/PH223/version/446/detail/#home  |
| Obstructive and reflux uropathy |  | https://phenotypes.healthdatagateway.org/phenotypes/PH222/version/444/detail/ |
| Osteoarthritis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH63/version/126/detail/#home  |
| Osteoporosis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH225/version/450/detail/#home  |
| Paralysis |  | Read version 2 codes: 2835 F241100 F141.00 F241.00 F241000 F230000 F240.11 F240100 F240000 F232.11 F232.00 2836 F240.00 F242.00 F230.00 F230z00 2837 F230100ICD-10 codes: G82, G83.0, G80.8, G80.1, G80.3 |
| Parkinson’s Disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH77/version/154/detail/  |
| Paroxysmal tachycardias | Supraventricular tachycardiaVentricular tachycardia | https://phenotypes.healthdatagateway.org/phenotypes/PH84/version/168/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH90/version/180/detail/#home |
| Peripheral artery disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH235/version/470/detail/#home  |
| Peripheral neuropathy | Peripheral neuropathyAutonomic neuropathy | https://phenotypes.healthdatagateway.org/phenotypes/PH235/version/470/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH112/version/224/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH155/version/310/detail/#home (selected codes) |
| Polymyalgia rheumatica |  | https://phenotypes.healthdatagateway.org/phenotypes/PH74/version/148/detail/#home  |
| Primary malignancy | Individual cancers site/type | https://phenotypes.healthdatagateway.org/phenotypes/PH250/version/500/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH252/version/504/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH256/version/512/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH265/version/530/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH247/version/494/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH248/version/496/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH249/version/498/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH251/version/502/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH253/version/506/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH254/version/508/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH255/version/510/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH257/version/514/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH258/version/516/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH259/version/518/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH260/version/520/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH260/version/520/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH262/version/524/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH263/version/526/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH264/version/528/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH266/version/532/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH267/version/534/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH268/version/536/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH270/version/540/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH271/version/542/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH271/version/542/detail/#home |
| Primary thrombocytopenia |  | https://phenotypes.healthdatagateway.org/phenotypes/PH269/version/538/detail/#home |
| Psoriasis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH273/version/546/detail/#home  |
| Pulmonary fibrosis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH276/version/552/detail/#home  |
| Raynaud’s disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH277/version/554/detail/#home  |
| Schizophrenia |  | https://phenotypes.healthdatagateway.org/phenotypes/PH285/version/570/detail/#home  |
| Scleroderma |  | https://phenotypes.healthdatagateway.org/phenotypes/PH318/version/636/detail/#home |
| Secondary malignancy | Individual cancers site/type | https://phenotypes.healthdatagateway.org/phenotypes/PH292/version/584/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH290/version/580/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH291/version/582/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH294/version/588/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH293/version/586/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH295/version/590/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH289/version/578/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH297/version/594/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH299/version/598/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH298/version/596/detail/#home |
| Sick sinus syndrome |  | https://phenotypes.healthdatagateway.org/phenotypes/PH303/version/606/detail/#home  |
| Sickle cell disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH304/version/608/detail/#home |
| Sjogren Syndrome |  | https://phenotypes.healthdatagateway.org/phenotypes/PH307/version/614/detail/#home  |
| Sleep apnoea |  | https://phenotypes.healthdatagateway.org/phenotypes/PH309/version/618/detail/#home  |
| Stroke and transient ischaemic attack | Ischaemic strokeTransient ischaemic attackStroke not otherwise specified | https://phenotypes.healthdatagateway.org/phenotypes/PH56/version/112/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH88/version/176/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH84/version/168/detail/  |
| Substance misuse |  | https://phenotypes.healthdatagateway.org/phenotypes/PH317/version/634/detail/  |
| Thalassaemia |  | https://phenotypes.healthdatagateway.org/phenotypes/PH320/version/640/detail/#home |
| Thyroid disease | HyperthyroidismHypothyroidism | https://phenotypes.healthdatagateway.org/phenotypes/PH322/version/644/detail/#home  |
| Tubulo-interstitial nephropathy |  | https://phenotypes.healthdatagateway.org/phenotypes/PH89/version/178/detail/#home  |
| Type 1 diabetes mellitus |  | https://phenotypes.healthdatagateway.org/phenotypes/PH152/version/304/detail/ (includes algorithm to define type) |
| Type 2 diabetes mellitus |  | https://phenotypes.healthdatagateway.org/phenotypes/PH152/version/304/detail/ (includes algorithm to define type) |
| Upper GI acid conditions | Barrett’s oesophagusGastro-oesophageal reflux diseaseOesophagitis and oesophageal ulcerGastritis and duodenitisPeptic ulcer | https://phenotypes.healthdatagateway.org/phenotypes/PH118/version/236/detail/https://phenotypes.healthdatagateway.org/phenotypes/PH48/version/96/detail/#homehttps://phenotypes.healthdatagateway.org/phenotypes/PH224/version/448/detail/#home https://phenotypes.healthdatagateway.org/phenotypes/PH175/version/350/detail/ https://phenotypes.healthdatagateway.org/phenotypes/PH326/version/652/detail/#home |
| Urinary Incontinence |  | https://phenotypes.healthdatagateway.org/phenotypes/PH330/version/660/detail/ |
| Urolithiasis |  | https://phenotypes.healthdatagateway.org/phenotypes/PH331/version/662/detail/ |
| Venous thromboembolic disease |  | https://phenotypes.healthdatagateway.org/phenotypes/PH338/version/676/detail/ |
| Visual impairment and blindness |  | Read version 2 codes: 1B75. 2B6A. 2B6B. 2B6S. 2B7A. 2B7B. 2B7S. 2BBo. 2BBr. 6688 6689 668D. 8F6.. 8F61. 8F62. 8HlE. 9m08. 9NfB. 9NlD. F4041 F4042 F49.. F490. F4900 F4901 F4902 F4904 F4906 F4909 F490z F491. F4910 F4911 F4913 F4914 F4915 F4917 F491z F492. F4920 F4922 F4923 F4924 F4925 F492z F493. F494. F495. F4950 F4951 F4952 F4953 F4954 F4955 F4956 F4958 F495A F495z F496. F4960 F4961 F4962 F4963 F4964 F4965 F4966 F496z F497. F498. F499. F49A. F49B. F49C. F49y. F49z. F49z0 F4H73Fy1.. FyuL. SJ0z. Z96.. Z961. Z962. ZK74. ZN568 ZN56A ZRhO. ZRr6. ZV410ICD-10 code: H54 |