

Keele Core Sets of SNOMED CT Concept IDs: MIDAS Comorbidities (Adult). Supporting Documentation

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# PURPOSE

To define a series of lists of SNOMED CT Concept IDs lists suitable for practical application in UK primary care data for identifying consultations and clinical events for a defined selection of comorbidities in adults with a musculoskeletal pain condition.

# SCOPE

Comorbid health conditions identified in existing frameworks and defined using codes frequently recorded in primary care.

The full list of code lists produced and a link to downloadable versions can be found in Appendix A.

# METHODS

The information below provides details of the steps followed to derive the code lists. Figure 1 provides a summary.

## Identifying potentially relevant Concept IDs from existing studies (pathway 1)

Lists of each conditions Read codes and/or SNOMED CT Concept and Description IDs developed in prior and current studies within the School of Medicine, Keele University were collated:

* PAIN PATHWAY: Rheumatoid arthritis.
* MSKCOM: Renal disease, Mild/Moderate Liver disease, Diabetes and Diabetic complications, Rheumatoid Arthritis, Dementia, Anxiety, Depression, Stress, Respiratory Disease
* British Heart Foundation (BHF) Chest pain: Atrial Fibrillation, Angina, Heart Failure, Myocardial Infarction, Peripheral Vascular Disease, Coronary Heart Disease, Stroke/TIA.
* MEDDIP: Hearing loss

KPJ, GP, JH and JB had involvement in each of the listed studies. This allowed the team to identify available code lists for each of the identified comorbidities.

## Independent search of OpenSafely Codelists, SHRIMP(ref), HDR\_UK and NHS digital SNOMED Concept ID national usage 2019-20 & 2020-2021 (pathway 2)

An independent search of the [OpenCodelists SAFELY portal](http://www.opencodelists.org/) within the OpenSAFELY platform and the [SHRIMP SNOMED Electronic code list (ECL) builder](https://ontoserver.csiro.au/shrimp/ecl) was made by KPJ. For each of the defined comorbidities specific phrases searched for within SNOMED CT terms.

KPJ, GP and JB searched the [HDR\_UK phenotype library](https://phenotypes.healthdatagateway.org/phenotypes/) for existing code lists related to each of the comorbidities and downloaded code lists deemed relevant to the particular comorbidity.

Using the NHS digital SNOMED Concept ID national usage 2019-20 & 2020-2021, KPJ, GP, JH and JB searched for key words related to each of the comorbidities and saved any instance to be included in the combined code lists.

## Reducing the number of Concept IDs for practical application

The number of Concept IDs remaining after pathway 1 and 2 was felt to be impractical to apply in practice, and was likely to include a large proportion of codes either describing very rare conditions or rarely used. A stepwise methodology was undertaken to reduce the number of codes identified in the final code lists.

For each comorbidity the code lists were combined and any duplicate Concept ID’s were removed. Utilising the NHS digital SNOMED national usage data the usage rate was calculated per 10,000 persons in England, this rate was linked to each of the identified SNOMED Concept ID’s. To be included in the final lists the Concept ID had to have been used in either 2019-2020 or 2020-2021 national data, and in addition the rate had to be ≥0.5/10,000 persons. This reduced the lists to the penultimate version.

## Finalising the Core Set

For each of the code lists, a final relevance check was performed by GP, EP and JH. Prior to the check any instances where the Concept ID included descriptive terms including ‘(observable entity)’, ’(regime/therapy)’, ‘(environmental)’, ‘(occupation)’, ‘drug induced’, ‘(finding)’, ‘(situation)’, ‘(procedure)’, ‘family history’ or ‘referral’ were highlighted and specific instances were indicated for retention with the remaining instances removed.

The final list of the sets of SNOMED CT Concept IDs for Comorbidities and the number of codes within each listis provided in Appendix A.

Downloadable versions and the process for creating each of the lists can be found at:

[GitHub](https://github.com/JTB1983/MIDAS)

[OSF](https://osf.io/e542w/)

Keele University Data Repository (Link to be added)

# USING THE CODELISTS

Keele University is a member of the [UK Reproducibility Network](https://www.ukrn.org/) and committed to the principles of the [UK Concordat on Open Research Data](https://www.ukri.org/wp-content/uploads/2020/10/UKRI-020920-ConcordatonOpenResearchData.pdf). We have a longstanding commitment to sharing data from our studies to improve research reproducibility and to maximise benefits for patients, the wider public, and the health and care system.

We encourage the use of the codelists with appropriate citation and acknowledgement. The codelists are covered by an open source MIT License.

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The work presented here directly builds on work undertaken for the  MSKCOM (Nuffield Foundation OBF/43974), PAIN PATHWAY (National Institute for Health and Care Research (NIHR300826).), British Heart Foundation Chest pain (British Heart Foundation, reference PG/19/46/34307), MEDDIP (Dunhill Medical Trust (RPGF 1711/11)),

The OpenSafely website was used to develop the final code lists used in this study.

The Shrimp Electronic Code list (ECL) browser website was used to develop the final code lists used in this study.

NHS Digital SNOMED usage data was used to develop the final code lists used in this study, the data can be located at <https://digital.nhs.uk/supplementary-information/2022/snomed-code-usage>

Figure 1.Process of selecting Keele Core Sets of SNOMED CT Concept IDs: MIDAS comorbidities (Adult).

PATHWAY 1

PATHWAY 2

Search of Existing Keele Studies for each of the comorbidities

Add linked SNOMED Description ID’s/Terms

Search Open Safely code lists [www.opencodelists.org](http://www.opencodelists.org)

Search HDR\_UK for existing code lists <https://phenotypes.healthdatagateway.org/>

Created Lists for each comorbidity combined and duplicates removed

Search shrimp SNOMED code lists browser <https://ontoserver.csiro.au/shrimp/ecl>

Search NHS Digital usage data 2019-20, 2020-2021

Codes with a usage rate in England of less than 0.5/10,000 persons were removed

Relevance check performed by Keele Academic HCPs and Epidemiologists

## **APPENDIX A.** Keele Core Sets of SNOMED CT Concept IDs: MIDAS analysis comorbidities (Adult). Version 1.0, 2023-03-31

|  |  |
| --- | --- |
| Comorbidity code list | Number of SNOMED Concept ID’s |
| Cancer | 80 Concept IDs |
| Chronic Kidney Disease (CKD) | 62 Concept IDs |
| Cardiovascular Disease (CVD) | 168 Concept IDs |
| Digestive diseases (diverticular disease, inflammatory bowel disease, chronic liver disease) | 38 Concept IDs |
| Diabetes | 198 Concept IDs |
| Other inflammatory polyarthropathies, Systemic connective tissue disorder | 39 Concept IDs |
| Rheumatoid arthritis | 15 Concept IDs |
| Learning Disability | 28 Concept IDs |
| Respiratory disease | 210 Concept IDs |
| Visual impairment | 7 Concept IDs |
| Hearing impairment | 18 Concept IDs |
| Dementia | 30 Concept IDs |
| Eating Disorders | 5 Concept IDs |
| Serious Mental Illness | 29 Concept IDs |
| Anxiety and Depression | 64 Concept IDs |
| Alcohol abuse | 27 Concept IDs |
| Psychoactive | 68 Concept IDs |
| Neurological Diseases | 71 Concept IDs |