

CVD-COVID-UK/COVID-IMPACT Research Outputs

The papers and preprints listed below have been produced on behalf of the [CVD-COVID-UK/COVID-IMPACT Consortium](#), supported by the [BHF Data Science Centre](#).

In line with the consortium's principles - based on a collaborative, transparent and inclusive ethos - all related analysis plans, protocols, code, phenotype code lists and reports are made publicly available via the centre's [collection on the HDR UK Gateway](#), repositories in the centre's [GitHub organisation](#) and through open-access publications (via the links below).

Published papers/reports and preprints

July 2025

Title: **The challenges of replication: a worked example of methods reproducibility using electronic health record data.** *PLOS One*

Project: CCU040_02: The challenges of replication: a worked example of methods reproducibility using routinely collected healthcare data

DOI: <https://doi.org/10.1371/journal.pone.0326335>

GitHub: https://github.com/BHFDSC/CCU040_01

Title: **Ethnic disparities in COVID-19 mortality and cardiovascular disease in England and Wales between 2020-2022.** *Nature Communications*

Project: CCU037_02: Ethnic disparities in health: a population-wide analysis of digital health records for mortality and cardiovascular risk in individuals diagnosed with COVID-19

DOI: <https://doi.org/10.1038/s41467-025-59951-4>

GitHub: https://github.com/BHFDSC/CCU037_02

Title: **Characteristics and early diagnosis of Motor Neuron Disease (MND) in 67 million individuals in England: a comparative study on phenotyping models derived by AI, Knowledge Graphs and the MND Association.** *medRxiv*

Project: CCU019_03a: Characteristics and early diagnosis of Motor Neuron Disease (MND) in 67 million individuals in England: a comparative study on phenotyping models derived by AI, Knowledge Graphs and the MND Association

DOI: <https://doi.org/10.1101/2025.07.01.25330428>

GitHub: https://github.com/BHFDSC/CCU019_03a

May 2025

Title: **A population-based cross-sectional investigation of COVID-19 hospitalizations and mortality among autistic people.** *Journal of Autism and Developmental Disorders*

Project: CCU030_02: COVID-19 hospitalisations and mortality in autistic people: a whole-country population study

DOI: <https://doi.org/10.1007/s10803-025-06844-6>

GitHub: https://github.com/BHFDSC/CCU030_02

May 2025

Title: **Making a case for an autism-specific multimorbidity index: a comparative cohort study.** *Journal of Autism and Developmental Disorders*

Project: CCU030_03: Making a case for an autism-specific bespoke multimorbidity index: a COVID-19 pilot study

DOI: <https://doi.org/10.1007/s10803-025-06823-x>

GitHub: https://github.com/BHFDSC/CCU030_03

April 2025

Title: **Replicating a COVID-19 study in a national England database to assess the generalisability of research with regional electronic health record data.** *BMJ Open*

Project: CCU040_03: Replicating a regional COVID-19 study in the national UK COVID-IMPACT database

DOI: <https://doi.org/10.1136/bmjopen-2024-093080>

GitHub: https://github.com/BHFDSC/CCU040_01

Title: **Incidence and prevalence of asthma, chronic obstructive pulmonary disease and interstitial lung disease between 2004 and 2023: harmonised analyses of longitudinal cohorts across England, Wales, South-East Scotland and Northern Ireland.** *Thorax*

Project: CCU052_01: How does the incidence and prevalence of asthma, ILD, and COPD change from 2019 to the end of 2022?

DOI: <https://doi.org/10.1136/thorax-2024-222699>

GitHub: https://github.com/BHFDSC/CCU052_01

Title: **Burden of cardiovascular diseases from 2020 to 2024: a national cohort in NHS England.** *Preprints with The Lancet*

Project: CCU072_01: Influence of COVID-19 on British burden of cardiovascular disease

DOI: <https://dx.doi.org/10.2139/ssrn.5203816>

GitHub: https://github.com/BHFDSC/CCU072_01

March 2025

Title: **Impact of COVID-19 pandemic on rates of congenital heart disease procedures among children: prospective cohort analyses of 26 270 procedures in 17 860 children using CVD-COVID-UK consortium record linkage data.** *Open Heart*

Project: CCU007_01: What are the differences in types of congenital heart disease (CHD) procedures in children during periods of lockdown and relaxation of lockdown, compared to before the COVID-19 pandemic?

DOI: <https://doi.org/10.1136/openhrt-2024-003054>

GitHub: https://github.com/BHFDSC/CCU007_01

February 2025

Title: **Peripandemic outcomes of infants treated for sentinel congenital heart diseases in England and Wales.** *Open Heart*

Project: CCU007_03: What are the effects of delays to surgery for CHDs on child's health and wellbeing over the one to two years following the start of the pandemic?

DOI: <https://doi.org/10.1136/openhrt-2024-002964>

GitHub: https://github.com/BHFDSC/CCU007_03

Title: **Hospital readmission after heart valve surgery in the United Kingdom.** *JTCVS Open*

Project: CCU007_11: Trend, early and midterm clinical outcomes of cardiac surgical interventions during covid era

DOI: <https://doi.org/10.1016/j.xjon.2025.02.001>

GitHub: https://github.com/BHFDSC/CCU007_11

January 2025

Title: **Prevalence and demographics of 331 rare diseases and associated COVID-19-related mortality among 58 million individuals: a nationwide retrospective observational study.** *The Lancet Digital Health*

Project: CCU019_01: Identification and personalised risk prediction for severe COVID-19 in patients with rare disorders impacting cardiovascular health

DOI: [https://doi.org/10.1016/S2589-7500\(24\)00253-X](https://doi.org/10.1016/S2589-7500(24)00253-X)

GitHub: https://github.com/BHFDSC/CCU019_01

December 2024

Title: **Use of sodium valproate and other antiseizure drug treatments in England and Wales: quantitative analysis of nationwide linked electronic health records.** *BMJ Medicine*

Project: CCU014_03: The impact of the COVID-19 pandemic on use of sodium valproate and implementation of recommendations of the Cumberlege report

DOI: <https://doi.org/10.1136/bmjmed-2023-000760>

GitHub: https://github.com/BHFDSC/CCU014_03

November 2024

Title: **Healthcare utilisation of 282,080 individuals with long COVID over two years: a multiple matched control, longitudinal cohort analysis.** *Journal of the Royal Society of Medicine*

Project: CCU049_01: Healthcare utilisation in individuals with Long Covid

DOI: <https://doi.org/10.1177/01410768241288345>

GitHub: https://github.com/BHFDSC/CCU049_01

November 2024

Title: **Surgical and transcatheter aortic valve interventions for aortic stenosis in England: sociodemographic variations in treatment trends and outcome over 20 years.** *Heart*

Project: CCU056_01: Socio-demographic make-up of patients undergoing surgical and transcatheter aortic valve intervention in England and the impact of COVID on this

DOI: <https://doi.org/10.1136/heartjnl-2024-324918>

GitHub: https://github.com/BHFDSC/CCU056_01

Title: **Routine measurement of cardiometabolic disease risk factors in primary care in England before, during, and after the COVID-19 pandemic: A population-based cohort study.** *PLOS Medicine*

Project: CCU008_01: The impact of the COVID-19 pandemic on the measurement of routine cardiometabolic disease risk factors in primary care

DOI: <https://doi.org/10.1371/journal.pmed.1004485>

GitHub: https://github.com/BHFDSC/CCU008_01

Title: **Risks of major arterial and venous thrombotic diseases after hospitalisation for influenza, pneumonia, and COVID-19: A population-wide cohort in 2.6 million people in Wales.** *Thrombosis Research*

Project: CCU002_04: Comparing the long-term risk of stroke/MI in patients after coronavirus infection with other respiratory infections

DOI: <https://doi.org/10.1016/j.thromres.2024.109213>

GitHub: https://github.com/BHFDSC/CCU002_04

Title: **Combinations of multiple long term conditions and risk of hospital admission or death during winter 2021-22 in England: population based cohort study.** *BMJ Medicine*

Project: CCU059_01: Combinations of multimorbidity and risk of hospitalisation or death in England during the winter season: a population-based study of 48 million people

DOI: <https://doi.org/10.1136/bmjmed-2024-001016>

GitHub: https://github.com/BHFDSC/CCU059_01

October 2024

Title: **Contemporary epidemiology of hospitalised heart failure with reduced versus preserved ejection fraction in England: a retrospective, cohort study of whole-population electronic health records.** *The Lancet Public Health*

Project: CCU045_02: Contemporary trends and impact of multiple long-term conditions in patients with heart failure with reduced and preserved ejection fraction following the onset of the COVID-19 pandemic

DOI: [https://doi.org/10.1016/S2468-2667\(24\)00215-9](https://doi.org/10.1016/S2468-2667(24)00215-9)

GitHub: https://github.com/BHFDSC/CCU045_02

October 2024

Title: **Association between ethnicity and emergency department visits in the last three months of life in England: a retrospective population-based study using electronic health records.** *BMJ Public Health*

Project: CCU024_02: Intersectional inequality in emergency department (ED) visits, in-hours and out-of-hours, in the last 3 months of life for people who died in England in 2020

DOI: <https://doi.org/10.1136/bmjph-2024-001121>

GitHub: https://github.com/BHFDSC/CCU024_02

Title: **Trends in pediatric hospital admissions caused or contributed by SARS-CoV-2 infection in England.** *The Journal of Pediatrics*

Project: CCU029_02: How do the characteristics of first ascertained SARS-CoV-2 related hospital admissions and the children admitted vary over time related to the pandemic waves of SARS-CoV-2?

DOI: <https://doi.org/10.1016/j.jpeds.2024.114370>

GitHub: https://github.com/BHFDSC/CCU029_02

Title: **The impact of COVID-19 vaccination on patients with congenital heart disease in England: a case-control study.** *Heart*

Project: CCU068_01: The impact of vaccination on the excess clinical risks of COVID-19 in patients with congenital heart disease

DOI: <https://doi.org/10.1136/heartjnl-2024-324470>

GitHub: https://github.com/BHFDSC/CCU068_01

Title: **The impact of the COVID-19 pandemic on cardiovascular risk factors and events in England: a population-based cohort study.** *Preprints with The Lancet*

Project: CCU003_05:

- 1) To describe the trends in incident diagnoses of hypertension and atrial fibrillation between November 2019 and March 2022 among the adult population of England, overall and in subgroups of interest
- 2) To estimate the incidence rates of acute myocardial infarction and acute stroke between November 2019 and March 2022 among the adult population of England, overall and in subgroups of interest

DOI: <https://dx.doi.org/10.2139/ssrn.4972808>

GitHub: https://github.com/BHFDSC/CCU003_05

August 2024

Title: **COVID-19 diagnosis, vaccination during pregnancy, and adverse pregnancy outcomes of 865,654 women in England and Wales: a population-based cohort study.** *The Lancet Regional Health - Europe*

Project: CCU018_01: Estimating the short- and longer-term risk of cardiovascular disease and intermediate traits in women infected with COVID during pregnancy

DOI: <https://doi.org/10.1016/j.lanepe.2024.101037>

GitHub: https://github.com/BHFDSC/CCU018_01

August 2024

Title: COVID-19 vaccination and birth outcomes of 186,990 women vaccinated before pregnancy: an England-wide cohort study. *The Lancet Regional Health - Europe*

Project: CCU036_01: Starting a course of COVID-19 vaccination before pregnancy and future pregnancy outcomes

DOI: <https://doi.org/10.1016/j.lanepe.2024.101025>

GitHub: https://github.com/BHFDSC/CCU036_01

July 2024

Title: Cohort study of cardiovascular safety of different COVID-19 vaccination doses among 46 million adults in England. *Nature Communications*

Project: CCU002_06: First, second and booster dose COVID-19 vaccination and the risks of arterial and venous vascular events

DOI: <https://doi.org/10.1038/s41467-024-49634-x>

GitHub: https://github.com/BHFDSC/CCU002_06

June 2024

Title: Vaccinations, cardiovascular drugs, hospitalisation and mortality in COVID-19 and Long COVID. *International Journal of Infectious Diseases*

Project: CCU060_01: Improving characterisation, prediction and intervention for COVID- and influenza-related morbidity and mortality

DOI: <https://doi.org/10.1016/j.ijid.2024.107155>

GitHub: https://github.com/BHFDSC/CCU060_01

Title: Risk of cardiovascular events following COVID-19 in people with and without pre-existing chronic respiratory disease. *International Journal of Epidemiology*

Project: CCU035_01: SARS-CoV-2 infection and risk of major vascular events in people with chronic respiratory diseases

DOI: <https://doi.org/10.1093/ije/dyae068>

GitHub: https://github.com/BHFDSC/CCU035_01

Title: A nationwide, population-based study on specialized care for acute heart failure throughout the COVID-19 pandemic. *European Journal of Heart Failure*

Project: CCU045_01: The impact of COVID-19 on heart failure epidemiology, quality of care and outcomes across primary and secondary care

DOI: <https://doi.org/10.1002/ejhf.3306>

GitHub: https://github.com/BHFDSC/CCU045_01

February 2024

Title: **Ethnicity data resource in population-wide health records: completeness, coverage and granularity of diversity.** *Scientific Data*

Project: CCU037_01: Implementing a novel approach to improve correctness, completeness, and granularity of ethnicity information using routinely collected data

DOI: <https://doi.org/10.1038/s41597-024-02958-1>

GitHub: https://github.com/BHFDSC/CCU037_01

January 2024

Title: **Undervaccination and severe COVID-19 outcomes: meta-analysis of national cohort studies in England, Northern Ireland, Scotland, and Wales.** *The Lancet*

Project: CCU051_01: Unvaccination and under-vaccination against SARS-CoV-2 in England

DOI: [https://doi.org/10.1016/S0140-6736\(23\)02467-4](https://doi.org/10.1016/S0140-6736(23)02467-4)

GitHub: https://github.com/BHFDSC/CCU051_01

October 2023

Title: **Understanding covid-19 outcomes among people with intellectual disabilities in England.** *BMC Public Health*

Project: CCU030_01: Understanding covid-19 outcomes among people with intellectual disabilities in England

DOI: <https://doi.org/10.1186/s12889-023-16993-x>

GitHub: https://github.com/BHFDSC/CCU030_01

August 2023

Title: **Sars-Cov-2 infection in people with Type 1 diabetes and hospital admission: an analysis of risk factors for England.** *Diabetes Therapy*

Project: CCU040_01: Investigating why some people with diabetes have a greater risk of becoming seriously unwell or dying with COVID-19

DOI: <https://doi.org/10.1007/s13300-023-01456-8>

GitHub: https://github.com/BHFDSC/CCU040_01

Title: **Antipsychotic drug prescribing and mortality in people with dementia before and during the COVID-19 pandemic: a retrospective cohort study in Wales.** *The Lancet Healthy Longevity*

Project: CCU016_01: Cardiovascular and cerebrovascular diseases related to antipsychotic prescribing in patients with dementia during the COVID-19 pandemic

DOI: [https://doi.org/10.1016/S2666-7568\(23\)00105-8](https://doi.org/10.1016/S2666-7568(23)00105-8)

GitHub: https://github.com/BHFDSC/CCU016_01

July 2023

Title: Hospital admissions linked to SARS-CoV-2 infection in children and adolescents: cohort study of 3.2 million first ascertained infections in England. *BMJ*

Project: CCU029_01: Hospital admissions linked to SARS-CoV-2 infection in children and adolescents: cohort study of 3.2 million first ascertained infections in England

DOI: <https://doi.org/10.1136/bmj-2022-073639>

GitHub: https://github.com/BHFDSC/CCU029_01

January 2023

Title: The impact of the COVID-19 pandemic on cardiovascular disease prevention and management. *Nature Medicine*

Project: CCU014_01: Assessing cardiovascular disease impact through medicines

DOI: <https://doi.org/10.1038/s41591-022-02158-7>

GitHub: https://github.com/BHFDSC/CCU014_01

Title: Harmonising electronic health records for reproducible research: challenges, solutions and recommendations from a UK-wide COVID-19 research collaboration. *BMC Medical Informatics and Decision Making*

Project: CCU005_03: Harmonising electronic health records for reproducible research: challenges, solutions and recommendations from a UK-wide COVID-19 research collaboration

DOI: <https://doi.org/10.1186/s12911-022-02093-0>

GitHub: https://github.com/BHFDSC/CCU005_03

November 2022

Title: Better End of Life 2022. Mind the gaps: understanding and improving out-of-hours care for people with advanced illness and their informal carers. Research report. *Marie Curie*

Project: CCU024_01: Mind the gaps: understanding and improving out-of-hours care for people with advanced illness and their informal carers.

URL: <https://www.mariecurie.org.uk/globalassets/media/documents/policy/beol-reports-2022/better-end-of-life-report-2022.pdf>

GitHub: https://github.com/BHFDSC/CCU024_01

Title: Effects of the COVID-19 pandemic on secondary care for cardiovascular disease in the UK: an electronic health record analysis across three countries. *European Heart Journal - Quality of Care and Clinical Outcomes*

Project: CCU003_04: Quantifying the impact of the COVID-19 pandemic on the provision of cardiovascular disease-related hospital healthcare in the UK

DOI: <https://doi.org/10.1093/ehjgcco/qcac077>

GitHub: https://github.com/BHFDSC/CCU003_04

November 2022

Title: Using national electronic health records for pandemic preparedness: validation of a parsimonious model for predicting excess deaths among those with COVID-19 – a data-driven retrospective cohort study. *Journal of the Royal Society of Medicine*

Project: CCU003_03: Using national electronic health records for pandemic preparedness: validation of a parsimonious model for predicting excess deaths among those with COVID-19.

DOI: <https://doi.org/10.1177/01410768221131897>

GitHub: https://github.com/BHFDSC/CCU003_03

September 2022

Title: Association of COVID-19 with major arterial and venous thrombotic diseases: a population-wide cohort study of 48 million adults in England and Wales. *Circulation*

Project: CCU002_01: SARS-CoV-2 infection and risk of venous thromboembolism and arterial thrombotic events

DOI: <https://doi.org/10.1161/CIRCULATIONAHA.122.060785>

GitHub: https://github.com/BHFDSC/CCU002_01

June 2022

Title: A retrospective cohort study measured predicting and validating the impact of the COVID-19 pandemic in individuals with chronic kidney disease. *Kidney International*

Project: CCU003_01: Predicting and validating risk of pre-pandemic and excess mortality during the COVID-19 pandemic in individuals with chronic kidney disease

DOI: <https://doi.org/10.1016/j.kint.2022.05.015>

GitHub: https://github.com/BHFDSC/CCU003_01

Title: COVID-19 trajectories among 57 million adults in England: a cohort study using electronic health records. *The Lancet Digital Health*

Project: CCU013_01: Characterising COVID-19 related events in a nationwide electronic health record cohort of 57 million people in England

DOI: [https://doi.org/10.1016/S2589-7500\(22\)00091-7](https://doi.org/10.1016/S2589-7500(22)00091-7)

GitHub: https://github.com/BHFDSC/CCU013_01_ENG-COVID-19_event_phenotyping

March 2022

Title: Evaluation of antithrombotic use and COVID-19 outcomes in a nationwide atrial fibrillation cohort. *Heart*

Project: CCU020: Evaluation of antithrombotic use and COVID-19 outcomes

DOI: <http://dx.doi.org/10.1136/heartjnl-2021-320325>

GitHub: <https://github.com/BHFDSC/CCU020>

March 2022

Title:	Risk of myocarditis and pericarditis following BNT162b2 and ChAdOx1 COVID-19 vaccinations. <i>medRxiv</i>
Project:	CCU002_03: COVID-19 vaccination and disease and the risks of myocarditis and pericarditis
DOI:	https://doi.org/10.1101/2022.03.06.21267462
GitHub:	https://github.com/BHFDSC/CCU002_03

February 2022

Title:	Association of COVID-19 vaccines ChAdOx1 and BNT162b2 with major venous, arterial, or thrombocytopenic events: A population-based cohort study of 46 million adults in England. <i>PLOS Medicine</i>
Project:	CCU002_02: COVID-19 vaccination and disease and the risks of major venous and arterial vascular events
DOI:	https://doi.org/10.1371/journal.pmed.1003926
GitHub:	https://github.com/BHFDSC/CCU002_02

December 2021

Title:	A nationwide deep learning pipeline to predict stroke and COVID-19 death in atrial fibrillation. <i>medRxiv</i>
Project:	CCU004_02: Prediction of stroke and COVID-19 death using deep learning and sequential medical histories in a nationwide atrial fibrillation cohort
DOI:	https://doi.org/10.1101/2021.12.20.21268113
GitHub:	https://github.com/BHFDSC/CCU004_02

April 2021

Title:	Linked electronic health records for research on a nationwide cohort of more than 54 million people in England: data resource. <i>BMJ</i>
Project:	CCU005: Data management and analysis methods
DOI:	https://doi.org/10.1136/bmj.n826
GitHub:	https://github.com/BHFDSC/Linked-EHR-England-2021