National Core Studies Q4 2021 Impact Report

The COVID-19 National Core Studies (NCS) are a crucial part of the UK's ongoing pandemic response. Collectively, they ensure research scales to serve the UK's near term strategic, policy and operational needs, and build our resilience against health threats like COVID-19.

This new **quarterly report** aims to:

- Communicate the impact the National Core Studies are having on COVID-19 response
- Promote NCS Open Science data, tools and resources to ensure they are taken up
- Highlight where advances & learning gained during NCS translates into a legacy of stronger health threat preparedness

The **6** National Core Studies are:

Epidemiology and Surveillance led by Ian Diamond (Office for National Statistics) collects and analyses data to inform restrictions and protection against imminent outbreaks.

Clinical Trials Infrastructure led by Patrick Chinnery (Medical Research Council) accelerates delivery of large scale COVID-19 trials for drugs and vaccines.

Transmission and Environment (also known as PROTECT) led by Andrew Curran (Health and Safety Executive) improves understanding of COVID-19 virus transmission in different settings and environments.

Immunity led by Paul Moss (University of Birmingham) supports research to improve understanding of immunity against COVID-19, to inform back-to-work policies.

Longitudinal Health and Wellbeing led by Nish Chaturvedi (University College London) and Jonathan Sterne (University of Bristol) uses data from longitudinal studies to address the impact of COVID-19 and inform mitigating strategies

Data and Connectivity led by Andrew Morris (Health Data Research UK in partnership with Office for National Statistics) makes UK-wide health and administrative data available to catalyse COVID-19 research.

Highlights from NCS programme delivery in Q4 2021

Transmission & Environment NCS researchers came together in November with government policymakers and industry stakeholders for the programme's first conference on how the COVID-19 virus transmits, and how to stop it – available for catch-up here

Data & Connectivity NCS collaborated with Alan Turing Institute, who provided £1M of match-funding for 9 projects tackling ongoing, urgent COVID-19 questions using NCS-enabled datasets and infrastructure. User-led feedback and leveraging the data access process of the COVID-IMPACT Consortium led by BHF Data Science Centre reduced authorisation time from an average of 120 days to within 30 days for most projects

What to look out for from NCS in Q1 2022

Epidemiology & Surveillance NCS publish the latest COVID Infection Survey findings on how well vaccines work against Omicron here, and further work on inequalities and COVID-19 infection. The Schools Infection Survey, redeployed at pace in autumn 2021, will start releasing nationally representative estimates of antibody positivity in children and young people.

Transmission & Environment NCS announced plans via their website and Twitter for the next phase of their work, and invite stakeholders to respond to their survey to inform their priorities for research, translational guidance resources, and the long-term sustainability of UK research capacity on respiratory virus transmission.

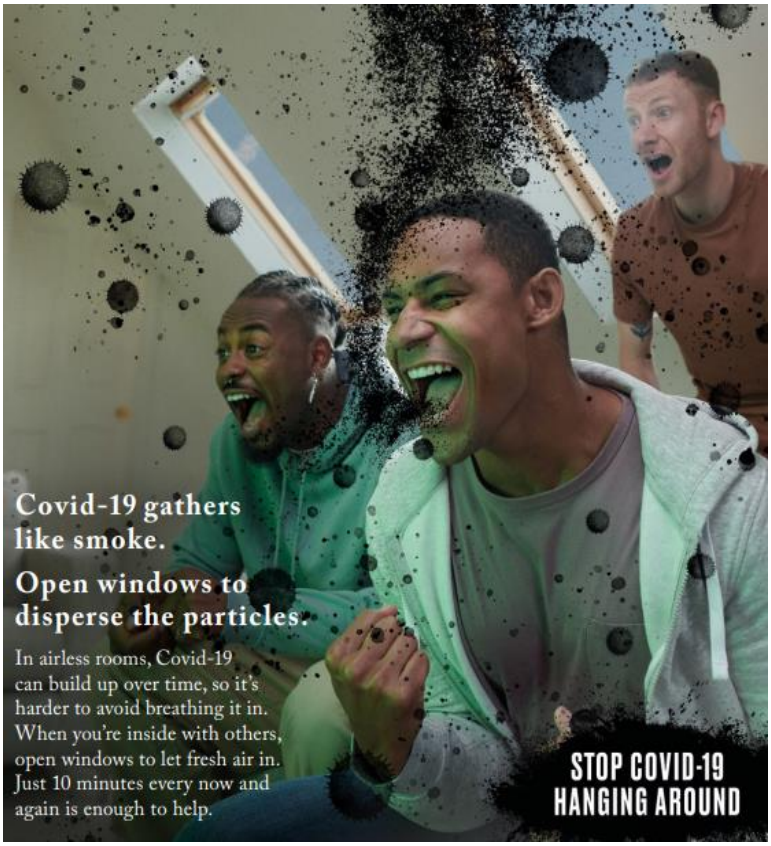
How are NCS insights informing COVID-19 response UK-wide?

How to mitigate airborne transmission

"64% of the public did not identify ventilation as an effective way to reduce the spread of COVID-19 at home" October 2021 survey

Airborne transmission and the importance of ventilation were previously under-valued parts of COVID-19 risk assessment.

Transmission & Environment NCS-funded researchers from the Universities of Cambridge and Leeds used experimental data on virus emission to build computer models of how particles we breathe out move in the air and how they are affected by ventilation.



The researchers directly advised the Department of Health and Social Care on the content of a public information campaign launched in November 2021 as part of increasing UK Government focus on mitigating airborne transmission of the COVID-19 virus.

How to track and respond to COVID-19 impact inequalities

"Data linkage, and [developing] quick processes to allow others to access linked data" are key lessons learned from the pandemic to date

UK Government Race Disparities Unit reports citing NCS-funded research and resources

Medical records do not regularly include many factors that influence health outcomes, such as ethnicity. This makes **tracking and reducing inequalities** in health threat response harder.

Data & Connectivity NCS worked with NHS Digital and the Office for National Statistics on a Public Health Research Database that solves this problem by linking health and administrative data for 29 million anonymised adults.

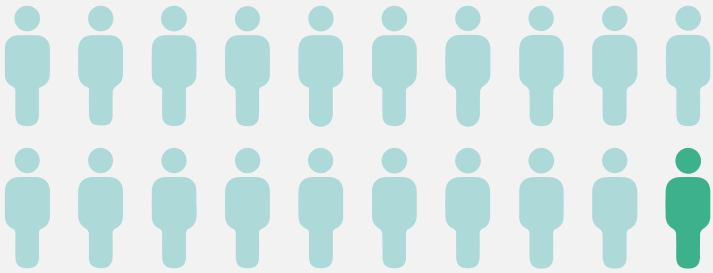
NCS-funded University of Leicester and Office for National Statistics researchers used it to find higher risk of severe COVID-19 for ethnic minority communities linked to obesity, and inequalities in vaccine uptake by ethnicity and age.

How are NCS insights informing COVID-19 response UK-wide?

What do we need to know to manage long COVID?

Research based on linked electronic health records and on longitudinal population studies makes vital contributions to our understanding of **risk factors for ill-health**, but these different sources of data have distinct strengths and limitations.

Longitudinal Health and Wellbeing NCS developed a new way to triangulate the two sources to study long COVID. They applied it to triangulate data from 45,000 longitudinal population study participants before and during the pandemic, with 1.2 million primary care records, using the OpenSAFELY platform. They found that being older, female and having poorer pre-pandemic health including asthma were the key long COVID risk factors.



5% of 30-50 year olds cannot carry on with daily life as normal 12 weeks after catching COVID-19

These findings formed the basis of a special report on long COVID to the UK government's Scientific Advisory Group for Emergencies in July 2021, and triggered an update in November 2021 of the National Institute for Health and Care Excellence guidelines on managing the long-term effects of COVID-19.

How many people currently have COVID-19?

"Thanks to the Office for National Statistics and its Infection Survey we had great insights into the incidence of asymptomatic infection; regional variations in prevalence, and the spread across demographics."

Simon Case, Cabinet Secretary

One foundation of COVID-19 response is a sound understanding of **how many people currently have COVID-19.**

The **Epidemiology & Surveillance NCS**-funded Coronavirus Infection Survey first launched in April 2020 and is one of the largest population sample surveys in the world.

The survey enables accurate estimates of positivity in the population - including those with asymptomatic infection who may not otherwise seek a test. In December 2021 it moved to twice weekly reporting to track the unprecedented rise in cases triggered by Omicron.

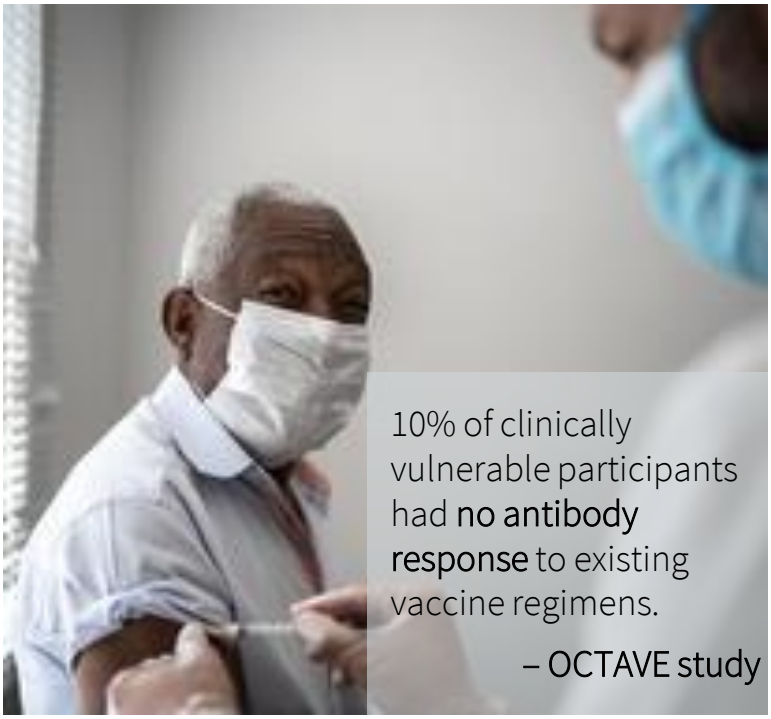
It has been used by cross-government stakeholders, including the Cabinet Office and 10 Downing Street to directly inform a broad range of policies on pandemic response, most recently in response to Omicron.

How are NCS insights informing COVID-19 response UK-wide?

How do we protect clinically vulnerable people?

Not everyone has the same quality of immune response following COVID-19 vaccination, and people with lower immune response may need additional protection.

Immunity NCS commissioned the OCTAVE and OCTAVE-DUO studies to examine **when and how to boost vaccine responses in clinically vulnerable people**. They identified a very low antibody response to two-dose vaccination in some clinically vulnerable people, and are trialling the best way to boost this response.



10% of clinically vulnerable participants had **no antibody response** to existing vaccine regimens.

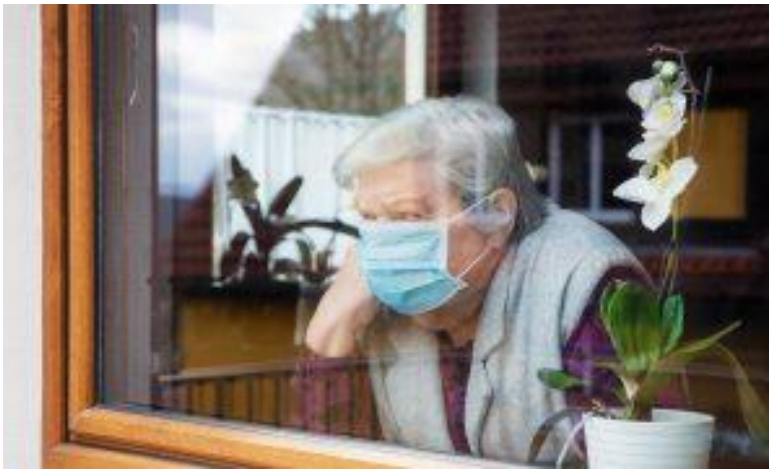
– OCTAVE study

The OCTAVE study findings are cited in JCVI's recommendation of third vaccine doses for immune suppressed people, released in September 2021.

How can we make data analysis agile enough to respond to quickly changing priorities?

The challenges posed by COVID-19 meant governments across the UK needed to analyse data across a wide range of different domains, and **get relevant expert intelligence, quickly**.

The One Wales initiative, supported by **Data and Connectivity NCS,** brought together a cross-institutional team of experts from research institutes, data custodians, government departments, the NHS and Public Health Wales. They generated intelligence in response to priorities for tackling COVID-19 in Wales as these developed. A key collaborator was the Secure Anonymised Information Linkage (SAIL) Databank, which contains anonymised health, administrative, social care, justice, housing and education data at population-scale. NCS funding supported new, rapid COVID-19 data flows.



This evidence supported Welsh Government policymakers at key times - including the design of targeted interventions to support the needs of those shielding, healthcare workers, and people living in deprived areas; mapping COVID-19 'hotspots' to inform pandemic response; and informing the government's subsequent approach to re-opening schools.

NCS are working with the public

via advisory groups, workshops and surveys, to shape and communicate our programmes

Data and Connectivity NCS convened a workshop with members of the public to understand their perspectives on making regional, linked health data available for research into vaccine safety. The workshop outputs will shape proposals to scale up this regional clinical data work.

Longitudinal Health & Wellbeing NCS developed a long Covid online forum to ensure that a wide cross-section of public/patient perspectives are included in discussions about how to define long Covid and in the broader research.

Immunity NCS established the UK COVID Vaccine Research Hub, a website providing trustworthy and up-to-date information on vaccine research for researchers, policymakers and the public.

A November public webinar on NCS research into vaccine safety led by NCS-funded experts is available to watch on the Data and Connectivity NCS webpage

Epidemiology & Surveillance NCS used public telephone helpline feedback from participants to make blood sampling kits for antibody testing easier to use and improve the quality of samples returned.

The media engaged with NCS results

every single day of Q4 2021, informing public understanding of topics from waning immunity to the threat posed by Omicron

The EAVE-II study, led by Aziz Sheikh at University of Edinburgh and delivered in collaboration with **Data and Connectivity NCS** and Public Health Scotland, found that Omicron is less likely to lead to hospitalisation. This was reported internationally including by Wall Street Journal, with direct comment from Scotland's First Minister Nicola Sturgeon.

National media including The Sun picked up of an interactive graphic developed by **Transmission & Environment NCS**-funded researchers for the British Medical Journal to help people understand how the COVID-19 virus is transmitted

Immunity NCS gave media briefings and interviews to Sky News and BBC Radio 4 on key findings from their CAIRO study of vaccine responses in older people

Epidemiology & Surveillance NCS COVID-19 Infection Survey had 6,298 media mentions - an average of 68 mentions per day

International media covered **Longitudinal Health & Wellbeing NCS**' finding that people with prior mental ill health were hit harder by pandemic disruption.

Key findings published by NCS teams

in Q4 2021 :

The **Data & Connectivity NCS**-funded EAVE II team looked at two-dose ChAdOx1 nCoV-19 vaccine protection against COVID-19 hospital admissions and deaths over time in Scotland and Brazil, and found evidence of waning vaccine protection within three months of the second vaccine dose.

A Longitudinal Health & Wellbeing NCS-funded study using the OpenSAFELY platform found that people discharged from a COVID-19 hospital admission had markedly higher risks for rehospitalisation and death than the general population, suggesting a substantial extra burden on healthcare.

A new model developed by **Transmission & Environment NCS**-funded researchers can predict the risk of airborne COVID-19 infection in an indoor space, given occupancy and CO_2 monitoring data.

A **Clinical Trials Infrastructure NCS** commentary reflected on how their approach of combining a platform trial portfolio with an independent Therapeutics Advisory Panel who select and trial therapies, could accelerate translation in other areas such as long term conditions.

An **Immunity-NCS** study found impaired antibody responses to COVID-19 vaccination in people with B cell chronic lymphocytic leukaemia. This impaired their neutralisation of the COVID-19 delta variant.

Key outputs across the NCS programme

489

Publications in academic journals, with 124 pre-prints

93

High-quality datasets made available via the Health Data Innovation Gateway, described in this brochure

190

NCS-linked uses in the Data Use Register, a new standard for transparent public reporting shared in this HDRUK white paper

847

Researchers supported through 86 projects

How do NCS resources make the UK better prepared for health threats?

Longitudinal Health and Wellbeing NCS established the UK Longitudinal Linkage Collaboration, bringing together information from longitudinal study volunteers with their routine records. This aligns previously complex legal, ethical and governance frameworks into a single streamlined access process for 24 pan-UK interdisciplinary study data sets.

Researchers are using the new resource to answer priority questions set by the government and from the NHS. The findings will be fed back to help guide policy and health care decisions.

UK Longitudinal Linkage Collaboration

Understanding the effects of new genetic variants of COVID-19 or other pathogens is essential to guide response – but at the moment, this can't be done quickly. The **Data & Connectivity NCS**-funded Outbreaks Data Analysis Platform, led by Kenny Baillie and Sharon Peacock from the Universities of Edinburgh and Cambridge, is linking clinical data from across the UK with viral and host genome sequencing, to detect and understand new variant threats quicker. The platform's streamlined data access process will, for the first time, use a single UK wide panel to transparently govern access to data from multiple custodians.

Clinical Trials Infrastructure NCS integrated 7 platform trials to test many potential COVID-19 treatments more quickly and with greater efficiency than conventional clinical trials. They were guided by the independent COVID-19 Therapeutics Advisory Panel who assessed over 300 potential therapies for testing. 45 interventions have been prioritised for entry into trials across phases I-III in diverse settings and groups of people. Protas, a non-profit organisation now launched to find treatments for other conditions, is capitalising on the high profile success of this platform trial approach.

Managed by:

HSE

COVID-19 Longitudinal Health & Wellbeing National Core Study

Government Office for Science

University of Birmingham

Office for National Statistics

HDRUK Health Data Research UK

PROTECT A COVID-19 National Core Study

UCL

Funded by

HM Treasury

NIHR National Institute for Health Research

UKRI UK Research and Innovation