

£18.5 million to tackle long COVID through research

- 4 research studies funded to better understand and address the longer-term effects of COVID on physical and mental health
- Approximately 1 in 10 people with COVID-19 continue to experience symptoms beyond 12 weeks
- Government funding for the projects approved in partnership with the National Institute for Health Research (NIHR) and UK Research and Innovation (UKRI)

People experiencing the longer-term effects of long COVID will benefit from £18.5 million to fund research projects to help better understand the causes, symptoms and treatment of the condition.

The funding will be given to 4 studies to identify the causes of long COVID and effective therapies to treat people who experience chronic symptoms of the disease.

The projects were chosen following a UK-wide call to find ambitious and comprehensive research programmes to help address the physical and mental health effects of COVID-19 in those experiencing longer-term symptoms but who do not require admittance into hospital.

Long COVID can present with clusters of symptoms that are often overlapping and/or fluctuating. A systematic review has highlighted 55 different long-term effects but common symptoms of long COVID include breathlessness, headaches, cough, fatigue and cognitive impairment or 'brain fog'. There is also emerging evidence that some people experience organ damage.

Approximately 1 in 10 people with COVID-19 continue to experience symptoms and impaired quality of life beyond 12 weeks ('long COVID').

Health and Social Care Secretary, Matt Hancock said:

I am acutely aware of the lasting and debilitating impact long COVID can have on people of all ages, irrespective of the extent of the initial symptoms.

Fatigue, headaches and breathlessness can affect people for months after their COVID-19 infection regardless of whether they required hospital admission initially.

In order to effectively help these individuals we need to better understand long COVID and identify therapeutics that can help recovery. This funding will kick-start 4 ambitious projects to do just that.

Amy, 27, has been experiencing ongoing breathing problems after first contracting COVID-19 3 months ago. She said:

I expected to be fully recovered within 2 weeks, but I actually isolated for 3 weeks because I just didn't feel comfortable going out. I was still really poorly.

At my age, I didn't expect to suffer symptoms for more than just a few days. Feeling that poorly for that long, hearing all the horror stories and things, I wondered if I would actually go back to normal.

I exercise a lot and it was really scary thinking that I might not actually get back to that again. It's quite shocking to me actually that 3 months on I'm still not really myself.

Chief Medical Officer for England and Head of the NIHR, Professor Chris Whitty said:

Good research is absolutely pivotal in understanding, diagnosing and then treating any illness, to ease symptoms and ultimately improve lives.

This research, jointly funded through the NIHR and UKRI, will increase our knowledge of how and why the virus causes some people to suffer long-term effects following a COVID-19 infection – and will be an important tool in developing more effective treatments for patients.

Health Minister, Lord Bethell said:

The UK is at the forefront of scientific research and innovation when it comes to the treatment of COVID-19. This work is vital in helping us to build on our knowledge and improve the treatment of the longer-term impacts of the virus.

This research will make the best use of available evidence to help us identify the causes, the consequences and most importantly the best treatments to help people recover from COVID-19 in the long term.

An independent panel of research experts and patients with long COVID recommended the following 4 studies for funding, at a cost of approximately £18.5 million:

- REACT long COVID (REACT-LC): led by Professor Paul Elliott, Imperial College London – £5.4 million over 3 years. The study will involve people in the community who have taken part in the REACT study of the

virus that causes COVID-19. Data will be analysed to find common factors to examine why some people get long COVID and others do not. The biological studies will help us understand what causes persistent symptoms and may point to possible treatments

- Therapies for long COVID in non-hospitalised individuals: from symptoms, patient-reported outcomes and immunology to targeted therapies (The TLC Study): led by Dr Shamil Haroon and Professor Melanie Calvert, University of Birmingham – £2.3 million over 2 years. The study will identify which treatments are most likely to benefit people with particular symptoms of long COVID and test supportive treatments to improve their quality of life
- Characterisation, determinants, mechanisms and consequences of the long-term effects of COVID-19: providing the evidence base for health care services: led by Professor Nishi Chaturvedi, University College London – £9.6 million over 3 years. The study will use data from more than 60,000 people to help define long COVID and improve diagnosis. It will also explain why some people get the condition, the typical effects on a person's health and ability to work, and the factors that affect recovery to inform the development of treatments offered to patients
- Non-hospitalised children and young people with long COVID (The CLoCk Study): Professor Sir Terence Stephenson, UCL Great Ormond Street Institute of Child Health – £1.4 million over 3 years. The study will teach us more about long COVID among children, how it can be diagnosed and how to treat it

Professor Fiona Watt, Executive Chair of the Medical Research Council, part of UKRI, said:

There is increasing medical evidence and patient testimony showing that a significant minority of people who contract COVID suffer chronic symptoms for months after initially falling ill, irrespective of whether they were hospitalised. These 4 large-scale projects will work with affected individuals to better understand and address these debilitating long-term impacts.

Patients with long COVID and members of the public were involved throughout the process of deciding which research proposals to fund.

The government, through the NIHR and UKRI, is also jointly funding major studies to characterise acute and longer term disease in hospitalised patients.

The Post-HOSPitalisation COVID-19 study (PHOSP-COVID) was backed by £8.4 million in funding and looks into the long-term physical and mental health implications of COVID-19 to support the development of new measures to treat NHS patients with coronavirus.

Both funders will continue to consider research proposals on long COVID.

NHS England launched new specialist long COVID NHS clinics across the

country, providing assessment for adults, children and young people alike. These clinics will play an invaluable role by helping medical experts assess, diagnose and treat thousands of people suffering with the debilitating long-term health implications of this virus.

There are now 69 specialist clinics operating across the country, supported with £10 million funding, with more due to open shortly.

The National Institute for Clinical Excellence (NICE) has issued official guidance on best practice for recognising, investigating and rehabilitating patients with long COVID.

Background information

For interviews with any of the funded researchers, please contact the NIHR press office on 020 3328 6730 or pressoffice@nhr.ac.uk.

Patients and the public were part of the expert group that determined the scope of the funding call, reviewed the proposals put forward by researchers, and sat on the committee that determined which research projects should be recommended for funding.

A video of interviews with the lead researchers and Amy, a person with long COVID, is available for use by the media. The video is available through the NIHR press office.

Footage is available on request from the NIHR press office.

An image of Monique, a person with long COVID, is available on request from pressoffice@nhr.ac.uk.

Annex A: study summaries and researcher quotes

1. REACT long COVID (REACT-LC), led by Professor Paul Elliott, Imperial College London – £5.4 million over 3 years

This project aims to characterise and better understand the genetic, biological, social and environmental signatures and pathways of long COVID. It will also identify factors affecting why some people experience long-term health effects of COVID-19, while others do not.

To date, most research on long COVID has been in hospitalised patients. The researchers will survey 120,000 people in the community who have taken part in the REACT study. Over 30,000 participants from REACT who tested positive for COVID-19, plus 90,000 who tested negative, will be invited to take part. Participants will be sent a survey about their health, symptoms and experiences. Participants with long COVID will be asked to join a panel to provide regular updates; while 60 will be invited for in-depth interviews. The researchers will develop a set of patient-reported outcomes that reflect the symptoms most important to people living with long COVID in the community.

Researchers will also invite up to 8,000 people with positive tests, including at least 4,000 with long COVID, for health tests and samples to test for genetic and other biological markers. This will help researchers understand mechanisms causing persistent symptoms and may point to possible treatments.

Professor Paul Elliott, Chair in Epidemiology and Public Health Medicine at Imperial College London, said:

Over the past 12 months, the acute impacts of COVID-19 have led to large numbers of hospitalisations and deaths, but the longer-term impact of the disease remains unclear. Growing evidence suggests that even after recovery, many patients will go on to experience symptoms that persist for months, impacting on their everyday lives.

By tapping into the huge pool of participants who have already provided vital insights as part of the REACT studies, we hope to be able to learn more about the biological basis of 'long COVID' and why some people may be more at risk.

This type of large-scale research, which has the potential to provide crucial insights and even possible treatments for long COVID, is only made possible with the help and support of members of the public.

Professor Sir Mark Caulfield, Chief Scientist at Genomics England said:

Genomics England are delighted to be partnering the REACT study and Imperial College to understand the role of genomics and other biomarkers in long COVID. Our work has already revealed gene regions that affect severe COVID.

Now, through this very welcome NIHR funding, we may provide new insights into how we can address the longer-term impact of this pandemic

2. Therapies for long COVID in non-hospitalised individuals: from symptoms, patient-reported outcomes and immunology to targeted therapies (The TLC Study), led by Dr Shamil Haroon and Professor Melanie Calvert, University of Birmingham – £2.3 million over 2 years

This project aims to identify which treatments are most likely to benefit people with particular symptoms of long COVID and test supportive treatments to improve their quality of life.

The researchers will identify around 2,000 patients with long COVID from GP

records. Study participants will be invited to use a digital platform to report long COVID symptoms and quality of life.

A subgroup of around 300 patients will receive blood and other biological tests to understand the immunology of long COVID and will wear a device that will measure their heart rate, oxygen saturation, step count and sleep quality.

The researchers will review evidence for long-COVID treatments, including drugs or supportive interventions (for example, for mental health or tiredness). Working with patients, doctors and other experts, the researchers will recommend treatments that should be tested in long-COVID patients and co-produce a targeted intervention for long COVID, tailored to individual patient need.

This will be delivered remotely in the community, via the Atom5™ app, providing critical support and information to empower patients in self-managing long COVID. In addition, they will provide tailored resources to support symptom management and nurse-led support for those with the severest symptoms.

The researchers will also use the digital platform to assess whether the treatments and supportive interventions reduce symptoms, improve quality of life, and are good value for money.

Co-Principal Investigator Dr Shamil Haroon, Clinical Lecturer in Primary Care at the University of Birmingham, said:

Individuals with long COVID frequently report experiencing diverse physical and psychological symptoms beyond 12 weeks that can be extremely debilitating.

People living with long COVID have indicated that they feel abandoned and dismissed by healthcare providers, and receive limited or conflicting advice.

Meanwhile, neither the biological or immunological mechanisms of long COVID, nor the rationale for why certain people are more susceptible to these effects, are yet clear, limiting development of therapies. It's essential we act quickly to address these issues.

Co-Principal Investigator Professor Melanie Calvert, Professor of Outcomes Methodology and NIHR Senior Investigator at the University of Birmingham, added:

It is clear that a large number of individuals that have had COVID-19 experience long-term effects on their health and well-being.

Our study aims to reduce their symptom burden and improve quality of life. Ultimately, people want to be able to enjoy life again and spend time with their friends and family.

It is clear that there is an urgent need for research to help explain the causes that drive the longer-term health effects of COVID-19 so that we can optimise patient care.

Our digital trial platform in primary care will not only facilitate research exploring the underlying cause of long COVID, but also the evaluation and co-production of suitable interventions.

3. Characterisation, determinants, mechanisms and consequences of the long-term effects of COVID-19: providing the evidence base for health care services, led by Professor Nishi Chaturvedi, University College London – £9.6 million over 3 years

This project aims to provide an evidence base for healthcare services to define what long COVID is and improve diagnosis. It will address why some people get the condition, the typical effects on a person's health and ability to work, and the factors which affect recovery. It will also look at how best to ensure patients are able to access the right treatment and support through health services.

The researchers will use data from more than 60,000 people drawn from a combination of national anonymised primary care electronic health records and longitudinal studies of people of all ages across the country. From these studies, people reporting long COVID and comparator groups, will be asked to wear a wristband measuring exercise ability, breathing and heart rate. Participants will also complete online questionnaires on mental health and cognitive function. They will also be invited to a clinic for non-invasive imaging to look at potential damage to vital organs, such as the brain, lungs and heart.

Findings will be shared with bodies involved in clinical guidelines (NICE, as collaborators in this project), with government (via the Chief Scientific Advisor), with the public via social media and other outputs, and the scientific community via research publications.

Professor Nishi Chaturvedi, Professor of Clinical Epidemiology at University College London (UCL), said:

By taking a whole-population perspective, including hard-to-reach groups, we hope to understand the enduring consequences of COVID and inform best practice for all of us.

4. Non-hospitalised children and young people with long COVID

(The CLoCk Study), Professor Sir Terence Stephenson, UCL Great Ormond Street Institute of Child Health – £1.4 million over 3 years

This research project aims to characterise symptoms typical of long COVID in non-hospitalised children and young people. It will also assess risk factors, prevalence and how long it lasts. This research will establish a medical diagnosis and operational definition of the condition, and look at how it might be treated.

The researchers aim to enrol 6,000 children and young people in the study, in 2 equal-size cohorts – consisting of 3,000 who have had a positive COVID-19 test, and 3,000 who have not. Participants will be asked whether they still have physical or mental problems at 3, 6, 12 and 24 months afterwards infection. Comparisons will then be made between the 2 cohorts. Carers and children and young people taking part will be involved in co-production of this study, and encouraged to complete surveys.

Results will be published, used to inform NHS services and health policy – and made available to participants. The study will provide data to help doctors to diagnose long COVID, establish how common it is, risk factors, and how long it goes on for.

Professor Sir Terence Stephenson, Nuffield Professor of Child Health at the UCL Great Ormond Street Institute of Child Health and Honorary Consultant Paediatrician at University College Hospital & Great Ormond Street Hospital, said:

We are delighted to have been awarded £1.36 million by NIHR to study long COVID in 11 to 17 year olds.

It is really important in science to ‘believe what you hear, not hear what you believe’, so we plan to ask 3,000 children and young people to tell us about the impact of COVID infection on their health over the next 2 years. We will also ask 3,000 young people who tested negative for COVID the same questions.

That will help us tease out whether ongoing problems are due to COVID infection or due to COVID lockdown, social isolation, and disruption of schools and friendships.

Annex B: further quotes

Dr Kiren Collison, NHS England Chair of the Long Covid Taskforce said:

Long COVID can be a debilitating condition leaving people with a range of physical and psychological symptoms, which is why the NHS takes the condition incredibly seriously and has invested £10 million to launch 69 specialised clinics across the country to

offer assessment and rehabilitation for the thousands of people who continue to suffer with long-term effects of coronavirus. This is a very new disease and as we're all still learning about this condition, further research about treatment options is hugely welcomed.

Monique, 32, has long COVID and was involved in the process of deciding which research to fund. She said:

As a relatively young, fit and healthy person I have been surprised to suffer from the debilitating effects of long COVID.

I was very keen to participate in the funding process of long-COVID research and hope the work from these studies will lead to furthering understanding and treatment for this new disease.

The impact of long COVID is being felt on a global scale and will influence times to come. It is crucial that more funding for research continues in this area.