Foreword

During a year in which our lives were dominated by the global COVID-19 pandemic, NIHR played a central role in underpinning the nation’s scientific response, benefiting patients in the UK and globally. From funding and delivering studies that led to the first vaccines and treatments for the virus, to elucidating differential outcomes of infection for ethnic minority populations and the effects on mental health, to understanding the epidemiology of transmission and long COVID, the impact on government policy and health and care practice has been very wide-ranging.

This rapid progress in countering the virus was only possible because of the extraordinary generosity of people with COVID-19 and their families in volunteering to participate in research and the unprecedented, sustained efforts and collaboration of those working across the health and care systems in the UK. We are grateful to all including: front line health and care staff; researchers in the public and private sector; Research & Development (R&D) offices; research funders; regulators Health Research Authority (HRA) and Medicines and Healthcare products Regulatory Agency (MHRA); and NHS England and NHS Improvement. The long-standing investment in NIHR research infrastructure was also vital to the expedited response.

There were many positives to learn from the system’s response to the pandemic, which we are working with partners to embed in process and practice. The newfound cross-sector spirit of collaboration led to the establishment of the Recovery, Resilience and Growth programme and publication of the Future of UK Clinical Research Delivery vision in March. However, pivoting of the NHS to support those with COVID-19 meant there was significant damage to research in other conditions. Attempting to get research paused by the pandemic back on track was a key priority for our Restart Framework, but remains challenging.

We also wish to express our gratitude to staff in NIHR coordinating centres, people on our funding committees, expert reviewers and staff in the Department of Health and Social Care’s Science, Research & Evidence Directorate. These people went the extra mile in both so ably supporting the COVID response, and enabling personal awards and other research funding to be progressed. They also contributed to other government priorities such as reducing levels of bureaucracy for UK researchers, investigating how to make open access for peer-reviewed publications fit for the future and implementing the UK R&D Roadmap.
Although COVID-19 was the main UK and global priority in this year, the NIHR continued to support research to prevent, diagnose and treat multiple diseases and health conditions as well as social care, health service delivery and public health work. Some of the experiences and priorities of this unique year informed Best Research for Best Health: The Next Chapter, which we published in June 2021.

This outlines NIHR’s operational priorities now and into the future and identifies seven key areas of strategic focus.

Inevitably, this annual report covers only a small part of NIHR’s contribution to the health and wealth of the nation. We encourage you to find out more on our website or on our social media channels.
Funding research to tackle the COVID-19 pandemic

NIHR mobilised quickly to fund rapid research into COVID-19, ensuring swift access to funds for a number of pivotal research studies in the UK and in low and middle income countries (LMICs). As the pandemic developed, we turned our attention to research to manage the pandemic beyond the acute phase and the emerging phenomenon ‘long COVID’. The NIHR also played a key role in support of the National Core Studies group, commissioning research and supporting clinical trials that were identified as high priorities by the group.

Initiating a rapid research response as COVID-19 emerged

In February 2020, we invited researchers to submit proposals to tackle the COVID-19 outbreak through a £20 million ‘rapid response’ initiative, funded jointly by the NIHR and UK Research and Innovation (UKRI). The awarding of the first tranche of £10.5m was announced later that month, for six projects focused on developing and testing vaccines and therapies. In mid-April, 21 further studies were funded through this initiative, including the first drug trial in primary care.

Running rolling funding calls during the pandemic

The second phase of our research funding response began in late April, as the nature of the questions that needed to be addressed evolved and more data became available on the pandemic. We launched a new funding call with UKRI where applications were reviewed on a rolling basis, with a number of highlight notices calling for research proposals on specific topics.

Through the first highlight notices, we funded six projects to improve our understanding of the links between COVID-19 and ethnicity.
Funding for eight new research projects followed in September, focusing on how the virus spread. Another round of funding was provided to investigate the impact of the COVID-19 on mental health in October.

Testing the tests

In early 2020, the main test used to detect coronavirus infection involved sending samples away to laboratories, which took up to 72 hours to provide results. Brand new diagnostic tests in development had the potential to increase the speed and convenience of testing, but many of these new tests had yet to be thoroughly evaluated in the settings where they were likely to be used.

In June, we partnered with UKRI, Asthma UK and the British Lung Foundation to fund CONDOR, a national platform for evaluating new diagnostic tests in hospitals and in community healthcare settings. By robustly evaluating diagnostics in real-world settings, the platform could help increase the speed and convenience of COVID-19 testing.

Using data and samples to understand COVID-19

In early March 2020, at the instigation of the Deputy Chief Medical Officer, a group of academics launched the NIHR-funded COVID-19 Clinical Information Network (CO-CIN). CO-CIN provided a steady stream of high quality data to the Department of Health and Social Care and to the Scientific Advisory Group for Emergencies (SAGE) on patients hospitalised with COVID-19. The project has also produced a series of highly important peer-reviewed science papers that have been heavily cited and are of benefit to scientists worldwide.

Another study, the GenOMICC study, was funded in May to investigate whether there are genetic reasons that cause some people to become severely ill with COVID-19. Intelligence provided by this study is helping doctors make better decisions when treating patients with COVID-19.
Informing policy decisions and learning from the pandemic

From July to October, we funded responsive research to ensure health and social care policymakers had access to rapid evidence to support decision making and learning from the COVID-19 pandemic.

The NIHR Policy Research Programme funded 27 research projects to support recovery, renewal and reset of the health and social care systems, including an evaluation of NHS support for patients after hospitalisation for COVID-19 and creation of a knowledge base on international social care system responses to the pandemic. The NIHR Policy Research Units supplied rapid advice and reallocated funding for priority projects related to COVID-19.

Funding COVID-19 research in low and middle income countries

In partnership with UKRI, we developed and launched a call for global health research in May, on tackling COVID-19 in LMICs. The Global Effort on COVID-19 (GECO) Health Research call focused on four priority research topics highlighted by the World Health Organization: epidemiology; clinical management; infection prevention and control; and social sciences in the outbreak response.

Twelve new projects were funded in October, spanning more than 18 LMICs across three continents. We funded a further round of eight research projects in LMICs in February 2021.

Tackling long COVID

In November, NIHR and UKRI launched a £20 million joint research call to fund research into the longer-term physical and mental effects of ‘long COVID’ in people who had not been unwell enough to be admitted to hospital. Four new studies of long COVID were awarded £18.5m of funding in February, to help better understand the causes, symptoms and treatment of long COVID.

A second call for research proposals for up to £20m of funding was announced in March 2021, for research on treatments, healthcare services and diagnostics for adults and children with long COVID in non-hospitalised people.

Informing COVID-19 recovery strategies

In June, we called for research to better understand and manage the health and social care consequences of the pandemic beyond the acute phase. This funding round had a specific focus on research to inform recovery of the health, care and public health systems from the pandemic.

In December, we funded nine new research projects, totalling £5.5m. The research ranged from digital devices to help improve tracking and tracing in care homes, to remote rehabilitation regimes for patients affected by long COVID and tools and support systems to help staff boost their wellbeing and performance during further stages of the pandemic.
How NIHR research improved care during the pandemic

NIHR funded or supported COVID-19 studies, including three national platform trials of COVID-19 treatments, delivered evidence that directly informed patient care during the course of the pandemic. NIHR evidence also supported important policy decisions on how to manage the pandemic, with, for example, a number of directors and senior staff from NIHR Health Protection Research Units represented on the Scientific Advisory Group for Emergencies (SAGE), the Scientific Pandemic Influenza Group on Modelling (SPI-M) and the Scientific Pandemic Insights Group on Behaviours (SPI-B).

**RECOVERY, a study aimed at hospitalised patients**

On June 16 2020, RECOVERY identified the first drug that reduced mortality in hospitalised patients with respiratory complications of COVID-19. Dexamethasone reduced the risk of dying by one-third in ventilated patients and one-fifth in patients receiving oxygen only. The same day, the Government authorised the NHS to use the drug in the management of hospitalised patients with COVID-19.

In December, RECOVERY reported no clinical benefit from the antibiotic azithromycin for hospitalised patients with severe COVID-19. Convalescent plasma was also ruled out as a treatment for intensive care patients. However, an anti-inflammatory treatment tocilizumab (for rheumatoid arthritis), was found to reduce the risk of death for hospitalised patients and was subsequently recommended for use in the NHS.

**The PRINCIPLE trial, for treatment at home**

The first UK trial of COVID-19 drug treatments through GP practices rolled out in May, initially looking at preventing hospitalisation for people over 50 with pre-existing health conditions and expanding to include people of any age.

The following January, PRINCIPLE reported that the commonly used antibiotics azithromycin and doxycycline did not reduce the time taken for people to first report that they felt recovered from COVID-19.

**The REMAP-CAP study, for critically ill hospitalised patients**

The REMAP-CAP trial showed that a number of drugs were effective at treating COVID-19 in critically ill patients. Research in September published in the *Journal of the American Medical Association* showed that outcomes for severely affected patients could be significantly improved by using common, inexpensive corticosteroids. Improved outcomes from the use of the arthritis drug tocilizumab were reported in November.
In December, REMAP-CAP reported that among critically ill COVID-19 patients in intensive care units, anticoagulation drugs did not improve outcomes. However, from January 2021, intensive care patients with COVID-19 were given a combination of tocilizumab and sarilumab, both types of immune modulators, following results showing that the combination could reduce the relative risk of death by 24% when administered to patients within 24 hours of entering intensive care.

Investigating transmission of COVID-19 in key settings

NIHR funded and supported researchers undertook a number of studies to investigate and mitigate transmission of coronavirus in key settings such as schools, hospitals, households and public spaces.

For example, the SIREN study in healthcare professionals showed that previous infection with COVID-19 protects against future infection. And the NIHR Health Protection Research Unit in Respiratory Infections ATACCC study, the largest detailed COVID-19 household contact and transmission study globally to date, found that fully vaccinated people can contract and pass on COVID-19 in the home, but at lower rates than unvaccinated people.

Supporting health and care delivery during the pandemic

Service change research from the NIHR Applied Research Collaborations (ARCs) has enhanced the ability of the health and care system to deliver effective care during the pandemic and is developing an evidence base to support recovery and learning in the health and care system. For example, researchers at the NIHR ARC East of England developed a guide on how to care for older people in long term care during a pandemic, which has been taken up and promoted by a number of local authorities, national representative bodies and charities, and care sector representatives.

The NIHR ARCs, in partnership with the Academic Health Science Networks, are also working with the Beneficial Changes Network and the Accelerated Access Collaborative to identify innovative work, collaborative processes and good practice that has happened at the front line of health and social care in response to COVID-19. This collaboration helps identify and prioritise the high impact evidence-based changes that could be sustained in the future, through evaluation, shared understanding and lessons learnt.
Studying the effects of ‘long COVID’

In October, the NIHR Centre for Engagement and Dissemination (CED) published its first dynamic themed review of the scientific evidence on and lived experience of long-term ‘ongoing’ (or ‘long’) COVID-19. The review found that long COVID may be up to four different syndromes.

The second themed review into long COVID, which followed in March 2021, found that there was a considerable variation in the range of symptoms considered by researchers. This lack of consistency around case definition and measurement made it difficult to synthesise all the different emerging results, hindering clinical consensus on what long COVID actually is.

Shaping African responses to COVID-19

Genomic surveillance of COVID-19 by NIHR-supported researchers was used by the World Health Organization Africa Regional Office (WHO AFRO) to understand and respond to outbreaks across the continent.

Researchers in 13 countries across Africa were trained by the NIHR Global Health Research Unit on Tackling Infections to Benefit Africa (TIBA), based at the University of Edinburgh, to conduct real-time viral genomic surveillance. Since July, TIBA data has been used by 5 African countries to help characterise in-country emerging viral infections and shape the development of national policies and responses to COVID-19.

Contributing to understanding COVID-19 outcomes for minority ethnic people

Two NIHR-supported research projects on the relationship between ethnic background and how people are affected by COVID-19 reported in autumn that patients of black ethnicity had an increased risk of requiring hospital admission and were nearly twice as likely as white people to die from COVID-19.

In addition, a team of NIHR-supported researchers reported in December that ethnic minority healthcare workers were more likely than White staff to have built up antibodies to COVID-19, indicating that they were more likely to have been infected with coronavirus at some stage.
Funding and delivering vital vaccines research

NIHR research funding has played a critical role in the development of the University of Oxford/AstraZeneca vaccine, with the [NIHR Clinical Research Network](#) supporting the rapid delivery of trials for this vaccine and four other vaccines. The UK was the first nation to approve a COVID-19 vaccine thanks to our support.

**Supporting the development of the University of Oxford/AstraZeneca vaccine**

As early as April 2020, an experimental COVID-19 vaccine – developed with NIHR support including initial funding (with UK Research and Innovation) of £2.2 million – was administered to the first two healthy volunteers. This marked the first trial phase of ChAdOx1 nCoV-2019 – the vaccine that would become known worldwide as the Oxford/AstraZeneca vaccine.

By November, trials showed that this vaccine, administered in two doses, was 70.4% effective at least 14 days after dosage.

By the end of December, the UK Government had accepted the recommendation from the Medicines and Healthcare products Regulatory Agency (MHRA) to authorise the Oxford/AstraZeneca COVID-19 vaccine for use.

**Record recruitment to the Novavax vaccine trial**

The UK was the first country in the world to deliver the Phase 3 trial for the Novavax vaccine – the largest double-blind, placebo-controlled COVID-19 vaccine trial to be undertaken in the UK so far. The NIHR played a vital role in this study’s rapid recruitment of volunteers, which was completed just two months after opening.
In September, an initial 10,000 UK volunteers were invited to join this Phase 3 study from the NHS COVID-19 Vaccine Research Registry, developed in partnership with the NIHR. The first participants were enrolled at the new NIHR Patient Recruitment Centre in Blackpool only five days after the study opened.

Reporting in January 2021 showed that the Novavax COVID-19 vaccine was 89.3% effective at preventing COVID-19, including that it was effective against the new variants of concern.

Recruiting to the fifth COVID-19 vaccine trial in the UK

A UK-developed vaccine, and the first one to use an inactive version of the virus, began early Phase 1 and 2 trials in mid-December at four NIHR sites. This new vaccine candidate was pioneered by Global biotech company Valneva and developed in Livingston, West Lothian.

The Valneva vaccine was tested in 150 participants, to assess how the vaccine produces a safe and effective immune response against COVID-19. Following positive safety and immunogenicity results, Phase 2 and 3 trials started in April 2021, with research continuing into that financial year.

Supporting the world’s first alternating dose study

The world’s first COVID-19 vaccine alternating dose study launched in the UK in February. Supported by NIHR, it aimed to examine the use of different approved vaccines for the two doses, as well as different intervals between doses.

This study, referred to as the COVID-19 Heterologous Prime Boost study, or ‘Com-Cov’ study, involved more than 800 volunteers, aged 50-years-old and above, at eight NIHR sites across England. The research continued into the next financial year, reporting a robust immune response against COVID-19 in June 2021.

Understanding vaccine efficacy in a real-world setting

The EAVE II project in Scotland, funded by NIHR and UKRI, was the first to describe on a countrywide level the effectiveness of the Pfizer/BioNTech and Oxford/AstraZeneca jabs on preventing severe illness resulting in hospitalisation. These were the first results about vaccine efficacy to come from a real-world setting, as opposed to clinical trials.

Over 24.5M Number of people in the UK who had received a first dose of the Oxford/AstraZeneca vaccine by the end of March 2021
Findings published as a pre-print in February (and subsequently in The Lancet) showed that vaccinations were linked to a substantial reduction in the risk of COVID-19 admissions to Scotland’s hospitals. By week four after the initial dose, both vaccines were shown to reduce the risk of hospitalisation, by up to 85% for the Pfizer/BioNTech vaccine and 94% for the University of Oxford/AstraZeneca vaccine.
At the forefront of delivering COVID-19 research in the NHS

Through setting up a national prioritisation system and capitalising on being embedded in the NHS, the NIHR, via its research infrastructure, has been able to rapidly recruit participants to more than 100 urgent COVID-19 research studies. NIHR also helped to coordinate efforts on COVID-19 clinical trials by working with the UK COVID-19 Therapeutics Advisory Panel and other partners to link up site initiation and recruitment for four national early Phase 2 platform studies.

Prioritising Urgent Public Health research

In March 2020, we established a UK-wide portal for applying for funding and/or support for urgent COVID-19 research, to ensure the best use was made of limited NHS resources and that research was delivered at optimal capacity. Central to the prioritisation process was a UK-wide expert panel that designated the studies that should be prioritised for delivery as Urgent Public Health (UPH) research, based on criteria set by the Chief Medical Officer.

In April, every NHS Trust in the country was asked to intensify efforts to enrol patients into UPH studies, in a letter from the UK’s four Chief Medical Officers highlighting three key interventional trials: PRINCIPLE, RECOVERY and REMAP-CAP. By prioritising COVID-19 research, our UPH programme was central to the UK’s success in rapidly identifying life-saving treatments and vaccines in record time.

Developing a regional model to support rapid delivery of vaccine studies

We supported the establishment of a regional model of vaccine research delivery hubs across the UK to support the concurrent delivery of multiple large scale vaccine trials. This was established within weeks with NIHR Local Clinical Research Networks (CRN) and the devolved administrations drawing together a multitude of partner organisations.
Regional leads for these hubs came together as a collective under the leadership of CRN to deliver a regional COVID-19 vaccine research delivery offer.

**Sourcing and recruiting vaccine trial volunteers at pace**

The **NHS COVID-19 Vaccine Research Registry** - developed by NIHR, the government’s Vaccine Taskforce and NHS Digital - was launched in July for people across the UK to sign up to be contacted about taking part in COVID-19 vaccine trials. The first 100,000 volunteers for vaccine trials were registered by mid-August, with the registry reaching its target of 500,000 volunteers in May 2021.

This registry was vital in recruiting participants to over 14 vaccine trials, targeting a number of demographics at various stages of the pandemic.

**Recruiting the first patient in the world to key COVID-19 studies**

The first UK patient to join a worldwide COVID-19 study of protein kinase inhibitor drug – run by Novartis Pharmaceuticals – was recruited by the NIHR in Leeds in May.

This showed how the NIHR can support the rapid set-up of clinical research and the benefits of our UK-wide approach to prioritising COVID-19 research.

November saw the first global patient for a Phase 3 trial of the Janssen COVID-19 vaccine recruited in Dundee. In a separate trial, a participant recruited by the NIHR in Yorkshire became the first in the world to receive a new AstraZeneca COVID-19 monoclonal antibody treatment. The following month, the NIHR recruited the first global patient for an antibody treatment study for people who have come into contact with a confirmed COVID-19 case.

**Celebrating 1 million research participants**

In March, we announced that the NIHR had recruited 1 million participants in COVID-19 research, across more than 180 studies. Of these, more than 100 studies were funded or co-funded by the NIHR. This milestone has been achieved across England, Northern Ireland, Scotland and Wales by members of the public, NHS doctors and nurses, NIHR research staff and researchers, regulators, life science companies, research funders and policymakers.
Three days later, the NIHR and NHS launched the #ResearchVsCOVID ‘thank you’ campaign to celebrate the efforts of participants, researchers and healthcare professionals for their involvement.

**Encouraging people from minority ethnic groups to take part in COVID-19 research**

As of October, ethnic minorities were under-represented in vaccine clinical trials taking place across the UK, with only 11,000 volunteers from Asian and British Asian backgrounds and 1,200 Black, African, Caribbean or Black British.

In response, NIHR put out a call to people from minority ethnic groups to participate in vital COVID-19 vaccine studies, to improve the diversity of participants in vital COVID-19 vaccine research. Although take-up improved, ethnic minority representation in studies remained **below the UK population average** of 13.8%. These communities were further encouraged to learn more about taking part in COVID-19 research through a number of initiatives run by the NIHR Be Part of Research website and the NIHR-funded Centre for Ethnic Health Research.

**Managing research recovery**

In May, NIHR set out a framework to guide the **restarting of NIHR research activities that had been paused due to COVID-19**, to allow delivery of paused and new non-COVID-19 research to gradually resume alongside COVID-19 research. By January 2021, **69% of studies that were paused had restarted and 60% of these were recruiting participants**.

As COVID-19 cases began to surge in January and new variants emerged, we advised that research is supported as possible in line with the Restart Framework rather than recommending a national ‘pause’ of new studies as we did in Spring 2020. Further guidance followed in May 2021 on managing recovery of the UK clinical research portfolio, to support the recovery of research into conditions other than COVID-19 and increase the strength of the UK’s research base and life sciences sector.
Funding high quality, timely research

NIHR is committed to funding health, public health and social care research that leads to improved outcomes for patients and the public, and makes the health and social care system more efficient, effective and safe. We work closely with stakeholders across the system to ensure we address the challenges they face and are responsive to their research needs.

Reviewing the efficacy of a routine medical procedure

The landmark PREVENTT study, funded by the NIHR Health Technology Assessment (HTA) Programme, reported that giving anaemic patients intravenous iron therapy before major abdominal surgery – a routine procedure around the globe – was no better than a placebo.

Researchers led by a team at University College London (UCL) found that the treatment did not reduce the need for blood transfusions or the risk of death for anaemic patients after major surgery. The results of the study, published in September 2020, could reduce the number of treatments patients have to go through before surgery, making their experience less stressful and saving the NHS time and money.

Investigating the public health impacts of gambling harms

Gambling-related harm, such as financial and mental health problems, affects more than 300,000 people every year in the UK. The NIHR Public Health Research (PHR) Programme funded a team of researchers from the University of Sheffield to investigate ways to reduce the impacts of gambling-related harms to individuals and communities.

Their review, published in The Lancet Public Health, demonstrated that there is very little evidence to support the interventions available to people with gambling addictions. It recommended that the problem should be addressed at national and local government level, in the same way as other risky behaviours such as alcohol consumption and tobacco smoking.

How losing a few kilograms can slash the risk of diabetes

The largest diabetes prevention study in 30 years, funded by NIHR Programme Grants for Applied Research, reported in November that losing just a few kilograms of weight nearly halves the risk of developing type 2 diabetes.

NDPS findings, published in JAMA Internal Medicine, highlighted that providing support to help people with prediabetes to make small changes to their lifestyle, diet and physical activity over two years helped reduce the risk
of developing diabetes by 40-47%.
Simple interventions, involving counselling to encourage behaviour change, helped people make small achievable lifestyle changes that led to a modest weight loss (2-3 kilograms) and increased physical activity.

**Multiple sclerosis clinical trial to focus on people who can’t walk**

ChariotMS, the first multiple sclerosis (MS) clinical trial to focus only on people who cannot walk because of the condition, began in November, following funding from the NIHR Efficacy and Mechanism Evaluation Programme, a partnership between the NIHR and the Medical Research Council (MRC).

The trial is testing whether cladribine tablets (Mavenclad®) can slow the rate of upper limb disability progression in people with advanced MS, with a goal of leading to the first drug licensed to protect upper limb function.

**Assessing the effectiveness of new support resources for carers of people living with dementia**

In November, the PHR Programme funded the first UK assessment of ‘iSupport’, a World Health Organization (WHO) online training and support resource developed for family and friends supporting people with dementia. The role of these ‘informal carers’ can be very stressful, with many experiencing mental and physical illness.

*iSupport is designed to help dementia carers* provide good care and take care of themselves. They can use it at their own pace, accessing the parts they feel are most relevant to them using a computer, tablet or smartphone.

**New trial aims to improve the lives of people with cystic fibrosis**

In February 2021, the NIHR HTA Programme awarded funding to the University of Liverpool and Alder Hey Children’s Hospital to conduct the CF STORM trial, to improve the lives of people with cystic fibrosis (CF).

CF STORM will enrol people across the UK who are established on the effective triple therapy drug Kaftrio and take a daily nebulised mucoc- active therapy, to evaluate whether their daily treatment regime can be rationalised without a significant reduction in respiratory function.
NIHR’s ‘infrastructure’ supports the research we fund and underpins research funded by others. Our investment has transformed the health system’s ability to turn scientific discoveries into new or improved treatments and services. Uptake of these innovations across the nation is enabled by applied research studies delivered through our infrastructure.

Improving the care of patients with rare diseases through genetic sequencing

New research supported by the NIHR BioResource has demonstrated that sequencing whole genomes for patients with rare diseases can improve their diagnosis and care. The results come from two pilots that were part of the 100,000 Genomes Project.

The first study, published in the journal Nature in June 2020, sequenced the entire genomes of almost 10,000 NHS patients who had rare diseases. In the second study, also published in Nature, researchers looked at 886 patients with primary immunodeficiency, which affects the ability to fight infections caused by microbes. The analysis identified four new genetic associations linked with this condition.

Enabling late-phase commercial clinical research in the NHS

In November, NIHR launched five new national Patient Recruitment Centres (PRCs) in England, to enable more late-phase commercial clinical research to be delivered within the NHS. They are funded through a £7m investment as part of the Government’s Life Sciences Industrial Strategy and Sector Deal 2.

The first NIHR-funded research infrastructure wholly dedicated to delivering late stage commercial research, PRCs will increase the number of commercial studies that can be delivered within the UK – benefiting patients who will gain earlier access to innovative new treatments and diagnostics, as well as the NHS and wider economy by attracting additional investment.

How depression affects educational achievement in teens

Research by the NIHR Maudsley Biomedical Research Centre has shown that teenagers who receive a depression diagnosis during their school career show a substantial decline in academic attainment in Year 11.

With their findings, published in The British Journal of Psychiatry, the researchers suggest that targeted educational support for children struggling with depression might particularly benefit boys and those from deprived backgrounds, who were especially vulnerable subgroups in this study.
Symptoms of depression linked to increased risk of heart disease and stroke

People who experience symptoms of depression are more likely to develop heart disease or have a stroke than those who have good mental health, according to research supported by NIHR. Researchers at the NIHR Cambridge Biomedical Research Centre analysed the health records of over half a million people, with no history of heart and circulatory disease, who were enrolled into two different studies: UK Biobank (2006-2010) and the Emerging Risk Factor Collaboration (1960-2008).

In this 10 year follow up study, researchers found that participants with the most severe symptoms of depression were more likely to have developed heart disease or to have had a stroke. Results were published in the Journal of the American Medical Association.

Obesity may exacerbate the effects of Alzheimer’s disease

A research study at the NIHR Sheffield Biomedical Research Centre – published in the Journal of Alzheimer’s Disease Reports – suggests obesity might contribute toward neural vulnerability in cognitively healthy individuals and those with mild cognitive impairment. It also found that maintaining a healthy weight in mild Alzheimer’s disease could help preserve brain structure in the presence of age and disease-related weight loss.

The researchers concluded obesity may contribute toward neural tissue vulnerability and highlight the impact being overweight in mid-life could have on brain health in older age.

A new method to diagnose concussion using saliva

A study of UK rugby players by the NIHR Surgical Reconstruction Microbiology Research Centre has identified a method of accurately diagnosing concussion using saliva, paving the way for the first non-invasive clinical test for concussion for use in sport and other settings.

The results of SCRUM, published in the British Journal of Sports Medicine, show that specific salivary biomarkers can be used to indicate if a player has been concussed and provide insights into the body’s response to injury as it evolves from immediately after trauma.
Partnering with patients, service users, carers and communities

NIHR’s research is shaped in collaboration with patients, service users, carers and communities. People contribute at every stage of the research pathway and also play a vital role by volunteering to participate in studies and trials. We are determined that their perspectives and experiences are heard and acted upon and that their contributions are valued and recognised.

New centre to make health and care research representative, relevant and ready for use

In April 2020, we launched a new Centre for Engagement and Dissemination to bring together our activities in patient and public involvement, engagement and participation with our strengths in research dissemination.

Building on the work of the NIHR Dissemination Centre and NIHR INVOLVE, the centre leads NIHR’s work to make health and care research representative, relevant and ready for use. The centre also further enhances the strong collaborative culture already established in engaging with patients, service users, carers and the public across the NIHR, providing coordination and thought leadership across the health and care system.

Reaffirming our support for patient and public involvement, engagement and participation during the pandemic

At the start of April, we reaffirmed our continuing commitment to ensuring patients, carers and the public have a say in and help to shape health and care research during the COVID-19 pandemic.

The pandemic proved to physically and emotionally affect those who are part of patient and public involvement, engagement and participation communities, including while they are shaping and delivering NIHR research. In response, the NIHR Public Involvement Senior Leadership Team agreed to new commitments for public involvement and engagement in April, designed to remove as many obstacles as possible from people getting involved in research.

New handbook demonstrates the UK Standards for Public Involvement in action

A new handbook published in June shared the stories of organisations that tested and implemented the UK Standards for Public Involvement in their research. These organisations were part of a pilot programme in which 10 projects were chosen to test and implement the draft standards during 2018–2019.

The stories show some of the different ways the standards were implemented and integrated into research, and how the standards have improved the quality of public involvement. The selected projects spanned organisations, regions and research settings, showing how the standards can be applied to research across many different contexts and organisations.
Celebrating researchers who involve service users, carers and the public in mental health research

The winners of the NIHR Clinical Research Network (CRN), McPin Foundation and MQ Service User and Carer Involvement Awards 2020 were announced in October. The winning study team was EFFIP: E-support for families and friends of individuals affected by psychosis, based in South London.

The awards recognise the achievements of researchers who involve service users, carers and the public in each stage of the research process. The awards also celebrate the dedication and diligence of the public who get involved in mental health studies and make a difference to the development of new care and treatments.

Giving people from minority ethnic groups a stronger voice in research

In October, we established a Race Equality Public Action Group (REPAG) focused on public partnership. Hosted by the NIHR Centre for Engagement and Dissemination, the group aims to give people from minority ethnic groups communities a stronger voice in shaping priorities for research, the design and delivery of research, the recruitment of ethnic minority volunteers into studies, and the mobilisation of evidence into practice. The group is part of NIHR’s broader efforts to improve equality, diversity and inclusion in health and social care research.

New support on including under-served groups in clinical research

Research published in June 2020 found that of 1,518 COVID-19 studies registered on ClinicalTrials.gov, only six studies were collecting data on ethnicity. In response, in August we published new guidance for researchers and delivery teams on how to include under-represented groups in clinical research, developed by the CRN.

The guidance summarises what an under-served group is, and provides a roadmap suggesting intervention points to improve inclusion, examples of under-served groups and examples of barriers to inclusion.
Attracting, training and supporting the best researchers

NIHR is the nation’s largest funder of health and social care research training. We provide career pathways for clinical academics and non-clinical scientists and offer opportunities for nurses, midwives and allied health professionals to integrate research with clinical practice. We also build the research capacity and capability needed to respond to health and social care challenges.

Boosting careers in clinical education, advanced surgical technology, mental health and methodology

Four new NIHR Incubators were formed in August 2020 to support and advocate networking, training and career development support in areas that need a community-driven approach to increase academic research capacity. The four incubators are:

• The **Clinical Education Incubator**, which will promote the value and attractiveness of clinical education research as a career destination.

• The **Advanced Surgical Technology Incubator**, created to develop a multi-disciplinary operating theatre research workforce working across clinical, academic and commercial domains.

• The **Mental Health Incubator**, created to increase capacity in mental health research.

• The **Methodology Incubator**, which will focus on how to attract researchers into careers in methodological disciplines and support training and further specialisation.

Developing Principal Investigators of the future

Following a successful pilot in surgery, the Associate Principal Investigator (PI) scheme was made available to researchers in additional specialties in October. The scheme aims to develop doctors, nurses and allied health professionals who do not undertake research as part of their usual role, to help them become the PIs of the future while helping to deliver studies to time and target.
The expansion to the scheme covered the following speciality areas: cancer; ear nose and throat; gastroenterology; hepatology; and surgical trauma. Emergency care will also be rolling out the scheme on a pilot basis.

In November, the Associate PI scheme was opened for clinicians supporting the RECOVERY trial to be accredited, resulting in 240 Associate PIs registered in England, Wales and Scotland. Subsequently the scheme was rolled out to additional COVID-19 studies badged as Urgent Public Health research by the NIHR, with accreditation for REMAP-CAP going live in March 2021.

### Identifying community nursing research priorities

Community nurses from across the nation, led by a group of NIHR 70@70 senior nurse research leaders, announced in December a new project to give patients, carers and healthcare professionals the opportunity to have their say about the future of community nursing research.

The **NIHR 70@70 programme** was set up in 2019 to strengthen the research voice and influence of nurses and midwives in health and social care settings. The 70@70 team are working with the James Lind Alliance to gather, rank and prioritise views from all people involved in or affected by community nursing.

### Five research leaders awarded flagship NIHR career development awards

We announced the latest cohort of **NIHR Research Professors and NIHR Global Research Professors** in December. They joined the prestigious group of leading health and care researchers, taking the total to 54 who have been successful in gaining the highly competitive award.

The NIHR Research Professors appointed are Professor Sandra Bucci, a Professor of Clinical Psychology at the University of Manchester; Professor Emma Frew, a Professor in Health Economics based at the University of Birmingham; and Professor Veronica Kinsler, Professor of Paediatric Dermatology and Dermatogenetics based at University College London.
The new NIHR Global Research Professors are Professor Susanna Dunachie, Associate Professor at the University of Oxford and Consultant in Infectious Diseases and Medical Microbiology and Professor David Lissauer, a Professor of Global Maternal and Fetal Health at the University of Liverpool.

**New fellowship opportunities for individuals working in local authorities**

The NIHR Academy announced in January 2021 a pilot pre-doctoral fellowship scheme for people working in local authorities and supporting services. Designed to support the development of credible ‘practitioner academic’ career pathways within local authority settings, these fellowships will allow awardees to retain their existing employment contracts and salaries, while protecting their time to prepare an application for a PhD fellowship and undertake a fully-funded programme of relevant Masters level training.

This initiative will increase the capacity of local authorities and supporting services to generate and support research that will help tackle the complex health and care challenges of the future.

**NIHR Academy launches new mentoring programme**

In February, the NIHR Academy launched a new mentoring programme for post-doctoral Academy Members. The aim of the programme is to support the academic and career development of our post-doctoral communities.

The refreshed mentoring programme supports post-doctoral Academy Members from a broad range of professional and disciplinary contexts to seek a mentor from the senior NIHR leadership community.
Collaborating with other public funders, charities and industry

NIHR works closely with partners from across the public sector, medical research charities and the life sciences industry. Together we aim to create an integrated research system that meets the needs of patients and the public and positions the UK as a globally attractive destination for high-quality clinical research.

Supporting the translation of scientific advances into treatments for patients

In April 2020, the NIHR, NHS England and NHS Improvement jointly designated eight Academic Health Science Centres (AHSCs) in England. The AHSCs are designed to harness the strategic alignment between top universities and NHS organisations that combine excellence in research, health education and patient care. Working with partners, including local authorities and industry, they improve health and care services by translating scientific advances into benefits for patients and populations nationally.

Partnerships were awarded a five-year AHSC designation in Bristol, Cambridge, London, Manchester, Newcastle and Oxford. Their work will support the NHS Long Term Plan, the Life Science Vision and the goals of the Accelerated Access Collaborative (AAC), accelerating the speed of innovation in healthcare to the national population.

Largest ever genetic study into myalgic encephalomyelitis

A new £3.2m study – jointly funded by NIHR and the Medical Research Council – launched in June to search for genetic differences that may indicate underlying causes or increase in risk of developing myalgic encephalomyelitis (ME), also known as chronic fatigue syndrome (CFS). Very little is known about the causes of ME/CFS, or how to treat it effectively.

This study hopes to aid the development of diagnostic tests and targeted treatments. Participants volunteer from home by sending a saliva or ‘spit-and-post’ sample, which are then compared with samples from healthy controls.

New treatment for motor neurone disease shows promise in early trials

A new drug targeting the genetic cause of a rare form of motor neurone disease (MND) showed encouraging results in early research supported by the NIHR. MND is a disorder that affects the nerves in the brain and spinal cord that form the connection between the nervous system and muscles. Up to 2% of all cases of amyotrophic lateral sclerosis (ALS), a rare genetic form of MND, result from mutations in the gene superoxide dismutase 1 (SOD1).

The Phase 1–2 study, published in the New England Journal of Medicine, has shown that the drug tofersen has the potential to reduce the levels of the toxic protein generated by the faulty SOD1 gene. The study, sponsored by biotechnology company Biogen Inc, also showed that toferson is well tolerated by people with ALS.
A virtual trial approach to extend and accelerate recruitment to irritable bowel syndrome trial

A collaboration between one of the NIHR’s new National Patient Recruitment Centres and UK company Enteromed in November led to rapid recruitment to one of the first fully virtual interventional clinical trials conducted in England.

The RELIEVE IBS-D trial is testing a new treatment for irritable bowel syndrome with diarrhoea (IBS-D). Before the pandemic, the research team randomised 253 patients over 18 months at 28 sites in England, including GP, hospital and private clinics.

The new virtual approach, developed by the team at the NIHR Patient Recruitment Centre in Newcastle, extended the reach of this trial to IBS-D patients right across the UK from their own homes. This virtual approach resulted in rapid recruitment, with the 50th participant being randomised within just two months. It demonstrates that the virtual version of the trial has significantly out-performed the site-based version of the trial; a single site using a virtual approach recruited 67% faster than 28 sites using a traditional approach.
New charity partnerships for NIHR Academy

In May, two new charities joined four others to provide NIHR Charity Partnership Fellowships for researchers. Wellbeing of Women and Dunhill Medical Trust are now providing career development opportunities for doctoral and post-doctoral researchers through the NIHR Academy’s Fellowship Programme. The other charities are Chartered Society of Physiotherapy Charitable Trust, Kidney Research UK, Moorfields Eye Charity and Castang Foundation.

NIHR Charity Partnership Fellowships offer researchers the opportunity to be part of the charity’s active and supportive community, drawing on the enormous benefits and opportunities of cross-sector working.

New oncology collaboration established to drive forward translational cancer research

Oncology research experts from across the country came together in February 2021 to establish a new collaboration to accelerate cancer research, translating scientific discoveries into tangible benefits for patients.

The NIHR Oncology Translational Research Collaboration (TRC) brings together leading cancer researchers from across the NIHR’s Biomedical Research Centres to drive forward innovative research in key areas including early diagnosis, surgery, immunotherapy and radiotherapy. It will also complement research undertaken by other cancer research networks.
Funding applied global health research and training

Working closely with the global health research community, NIHR funds applied research and training for the benefit of the poorest people in more than 50 low and middle income countries (LMICs). By sharing learning and knowledge, we are able to build Research & Development capacity and capability in both the UK and LMICs.

Research funding boost for mental health in LMICs

In May 2020 £20 million was awarded by the NIHR Research and Innovation for Global Health Transformation (RIGHT) programme to six new research projects to tackle mental health issues in the poorest people worldwide.

The new four-year projects funded cover depression in pregnancy, after childbirth and in people with diabetes; treating psychosis and other serious and enduring mental disorders, and helping children with developmental disorders and their caregivers.

New funding programme to strengthen research capacity

In October, we launched a new funding programme to create Global Health Research Centres, which will undertake high-quality applied health research in LMICs and develop research capacity. Each centre will comprise a consortium of research institutions in LMICs and the UK that will undertake research on a specific topic where a need for coordinated, high quality research and research capacity strengthening has been identified.

The new Global Health Research Centres programme focuses on capacity building and training in LMICs by strengthening career pathways for researchers. The first centres, in non-communicable diseases, will be awarded funding in 2022.
Better post-surgery care would dramatically improve cancer survival

Patients’ chances of survival after cancer surgery is strongly linked with the standard of post-operation hospital care, new research by the NIHR Global Health Unit in Global Surgery suggests.

It reported that in LMICs, people were up to six times more likely to die from complications within 30 days of surgery compared with those in high-income countries. Investing in appropriate recovery and ward space, trained staff, early warning systems and critical care facilities would reduce the number of deaths.

Review highlights challenges around prevention and management of chronic respiratory disease

Researchers from the NIHR Global Health Research Unit on Lung Health and Tuberculosis in Africa (IMPALA) led a review in The Lancet looking at chronic respiratory diseases in LMICs and how they can provide equitable, affordable and high-quality care to affected communities.

The World Health Organization (WHO) has identified the prevention and control of chronic respiratory diseases as an urgent development issue and essential to the achievement of the Sustainable Development Goals. The NIHR-funded review highlighted key challenges around the prevention and management of chronic respiratory diseases and recommended solutions to eventually achieve true Universal Health Coverage.
New research to evaluate health benefits of a social housing programme in Brazil

Research initiated in March 2021 by the NIHR Global Health Research Group on Social Policy and Health Inequalities will be the first study and the largest in the world to evaluate the effect of a major social housing programme on health outcomes in a middle-income country.

This study, outlined in BMJ Open, will investigate the effects of social housing programmes on cardiovascular mortality and the incidence of infectious diseases, such as leprosy and tuberculosis, in more than a million people in Brazil. The team will also assess the impact of social housing on various subgroups, such as by ethnicity and socioeconomic position.

Community-led hypertension management programme proves cost effective

Research funded by the Joint Global Health Trials (JGHT) initiative, in which NIHR is a partner, has found that a hypertension management programme led by community health workers is effective at reducing blood pressure in rural communities in Bangladesh, Pakistan, and Sri Lanka.

The COBRA-BPS study, published in The Lancet Global Health in March, also found that the multi-component programme was cost effective and inexpensive to scale up. As such, the programme could be a viable strategy for responding to the growing cardiovascular disease epidemic in rural communities in LMICs.
Financial summary

<table>
<thead>
<tr>
<th>Area</th>
<th>2020/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research programmes</td>
<td>Spend (£m)</td>
</tr>
<tr>
<td>Health Technology Assessment</td>
<td>80.9</td>
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<tr>
<td>Health Services and Delivery Research</td>
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<tr>
<td>Programme Grants for Applied Research</td>
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<tr>
<td>Research for Patient Benefit</td>
<td>16.6</td>
</tr>
<tr>
<td>Invention for Innovation</td>
<td>17.3</td>
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<tr>
<td>Public Health Research</td>
<td>19.9</td>
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<tr>
<td>Systematic Reviews (Cochrane and Technology Assessment Reviews)</td>
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<tr>
<td>NIHR Innovation Observatory</td>
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<tr>
<td>Research Schools: Primary Care, Public Health and Social Care Research</td>
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<tr>
<td>Methodology (funded with Medical Research Council)</td>
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<tr>
<td>INVOLVE/Centre for Engagement and Dissemination</td>
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<tr>
<td>Health Protection Research Units</td>
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<tr>
<td>Blood and Transplant Research Units</td>
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<tr>
<td>Policy Research Programme</td>
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<tr>
<td>Other, including legacy programmes and management not attributed to specific programmes</td>
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<tr>
<td><strong>Research Programmes total (£m)</strong></td>
<td><strong>286.0</strong></td>
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<tr>
<td><strong>Infrastructure</strong></td>
<td>Spend (£m)</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>------------</td>
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<tr>
<td>Research Capability Funding</td>
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<tr>
<td>Clinical Research Network</td>
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<tr>
<td>Biomedical Research Centres</td>
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<tr>
<td>Patient Safety Translational Research Centres</td>
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<tr>
<td>Clinical Research Facilities</td>
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<td>Experimental Cancer Medicine Centres</td>
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<tr>
<td>Applied Research Collaborations</td>
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<tr>
<td>Research Design Service</td>
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<tr>
<td>Patient Recruitment Centres</td>
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<tr>
<td>Medtech and In vitro Diagnostics Cooperatives</td>
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<tr>
<td>Other (including dementia and Child Prosthetics)</td>
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<tr>
<td><strong>Infrastructure total (£m)</strong></td>
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<tr>
<th><strong>Faculty</strong></th>
<th>Spend (£m)</th>
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<tr>
<td>Integrated Academic Training (including academic clinical fellowships, lectureships and clinician scientist awards)</td>
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<td>Fellowships (including legacy training awards)</td>
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<tr>
<td>Senior Investigators</td>
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<td>Research Professorships</td>
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<td>70@70 Senior Nurse and Midwife Research Leader Programme</td>
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<tr>
<td>Other (including management and clinical academics)</td>
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<tr>
<td><strong>Faculty total (£m)</strong></td>
<td><strong>109.3</strong></td>
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</table>
### Systems

| Information systems that enable research | £4.4 |
| Knowledge services and data             | £1.3 |
| **Systems total (£m)**                  | **£5.7** |

### COVID-19

COVID-19 studies (including those funded by the Vaccines Task Force) 106.4

| **COVID-19 (£m)**                  | 106.4 |

### Total NIHR spend excluding Official Development Assistance (£m)

Total NIHR spend excluding Official Development Assistance (£m) 1,116.2

### Official Development Assistance (ODA)

<p>| Joint Global Health Trials Initiative | £5.5 |
| Global Health Research Units and Groups | £46.6 |
| Research and Innovation for Global Health Transformation | £10.5 |
| European and Developing Countries Clinical Trials Partnership | £4.0 |
| Global Research Professorships | £1.3 |
| Global Road Safety Facility | £1.8 |
| Antimicrobial resistance (AMR) operational research | £1.6 |
| AMR: Behaviour within and beyond the healthcare setting | £0.8 |
| AMR in the Global Setting: understanding the drivers of AMR | £1.8 |
| PDP-Global Antibiotic Research and Development Programme (GARDP) | £1.8 |
| Research for Health in Humanitarian Crisis | £2.4 |</p>
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Spend (£m)</th>
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<tr>
<td>Diagnostics, prosthetics &amp; orthotics to tackle health challenges in developing countries</td>
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<tr>
<td>Research to improve adolescent health in LMIC settings</td>
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<td>Global Alliance for Chronic Disease</td>
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<td>CEPI - New Vaccines for a safer world</td>
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<td>NIHR-Wellcome Partnership</td>
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<tr>
<td>Grand Challenges Canada - Mental Health Partnership</td>
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<tr>
<td>Global Effort on COVID-19 (GECO) Health Research</td>
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</tr>
<tr>
<td>Other</td>
<td>8.7</td>
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<tr>
<td><strong>Total ODA (£m)</strong></td>
<td><strong>105.3</strong></td>
</tr>
</tbody>
</table>

| Total NIHR spend including Official Development Assistance (£m) | **1,221.5** |
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