



Mobilising Research Excellence in the Midlands to Tackle COVID-19

Showcasing the dedicated work of academics, healthcare professionals and industrial partners from across the Midlands

Foreword

by Sir John Peace, Chairman of Midlands Engine

For those of us who call the Midlands home, we are rightly proud of our region - a region that has undergone huge growth but that has massive potential for more. COVID-19 does not change this. In fact, it deepens our resolve to see this unprecedented global health crisis through – and rebuild, ever-stronger. As this report shows, the Midlands has more than risen to the challenge of fighting the pandemic. This has been made possible with our huge strength in Health, Medical Technologies and Life Sciences and we are now excellently positioned to recover, grow and further unlock the potential of our region.



COVID-19 continues to have a profound effect on the lives of millions of people globally. Imposed restrictions to daily life have forced us to quickly adopt different ways of working, learning and connecting with each other. The research response has been faster and more globalised than ever before, and the Midlands has played a significant part in this.

In recent years, the Midlands has become a real focus in the UK for Health, Medical Technologies and Life Sciences. Over 1,200 businesses in the sector are based here, including the country's highest number of medical technologies companies and supporting over 33,000 high-skilled jobs. The region is also driving the sector internationally – not least because our world-class Midlands universities – seven of which have medical schools, are all working to promote strong collaboration between academia, industry and health. A prime example of this collaboration is soon to be seen through a vaccine to combat COVID-19. Following an agreement between Cobra Biologics and AstraZeneca UK, this vaccine is set to be manufactured on Keele University's Science and Innovation Park as part of a programme with the University of Oxford.

As this report demonstrates, the Midlands has moved swiftly to apply our wealth of capability in our hospitals, universities and businesses to support the global effort to develop treatments for COVID-19. The volume of research projects and clinical trials that our region is not just involved in, but in many cases is leading, is exceptional. Designing, recruiting and supporting clinical trials that have recruited over 50,000 patients represents a nationally significant effort over a very short space of time.

“The Midlands has moved swiftly to apply the wealth of capability in its hospitals, universities and businesses to support the global effort to tackle COVID-19”

Recognising the absolute connection between health and economy, the Midlands Engine partnership – together with partners from industry, academia, the health sector and public sector partners – has focused efforts to establish Midlands Engine Health. This important collaboration will look to champion the vast capabilities we have right here in the Midlands. Working together, we will showcase our strengths, bring forward new opportunities, accelerate sector-wide growth and maintain a powerful spotlight on the phenomenal capabilities and facilities our region has to offer in this field.

The achievements celebrated in this powerful publication – reflecting work in partnership across our region – offer some insight into the hugely valuable rewards our shared endeavours will reap through our Midlands Engine Health partnership in the coming months and years.

A Midlands Snapshot

£45M investment received to lead **>£90M** of COVID-19 research

542 sites participating in **46** COVID-19 Clinical Research Trials

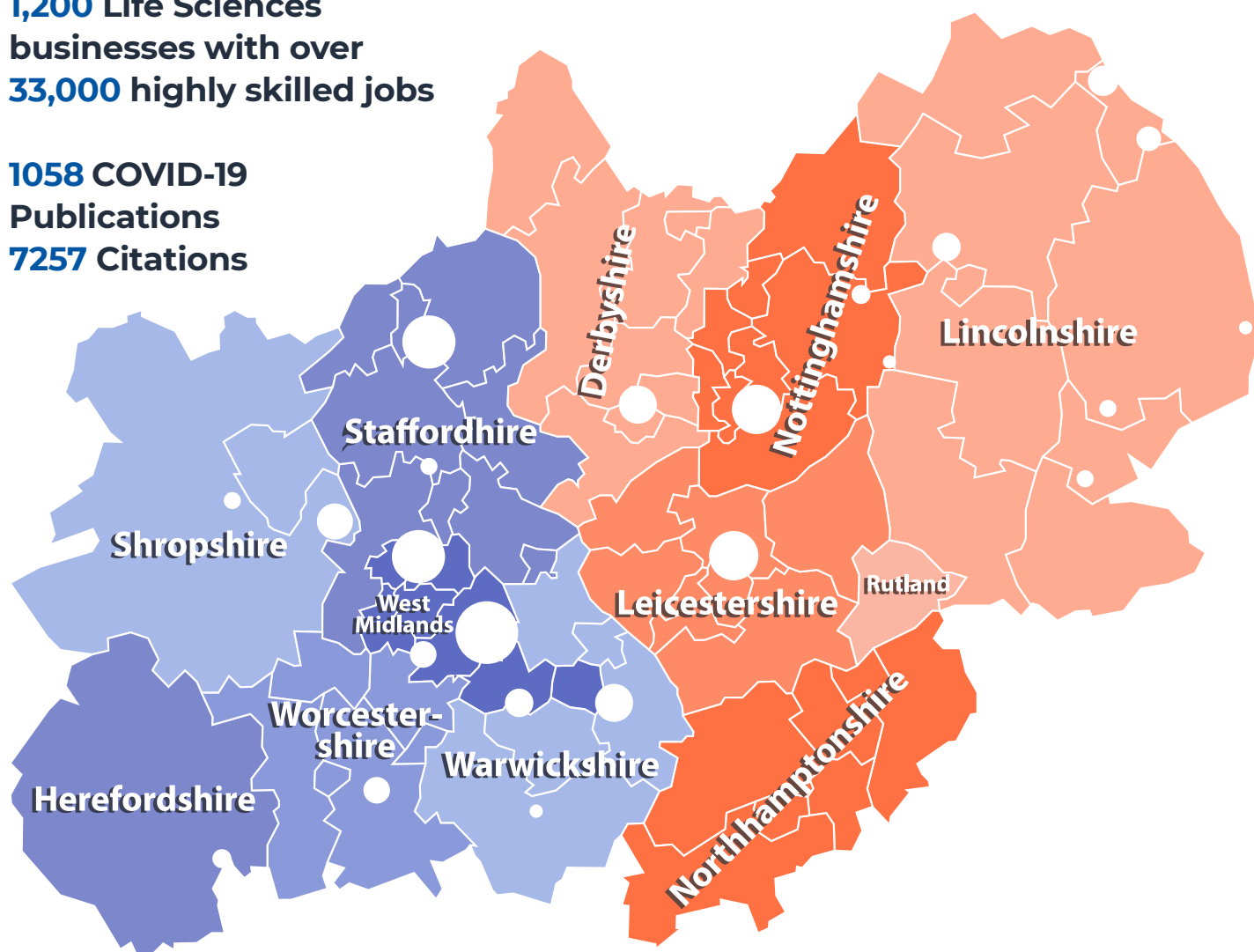
Leading **81** research programmes

>50,000 patients recruited to COVID-19 clinical trials

£24M NIHR co-funding awarded

1,200 Life Sciences businesses with over **33,000** highly skilled jobs

1058 COVID-19 Publications
7257 Citations



20 Universities

7 Medical Schools

21 Science and Innovation Parks

2 Life Science Opportunity Zones

2 Medilinks

1 HDR UK Substantive Site

52 NHS Trusts

17 Acute Trusts

Population of over **10 million**

2 Academic Health Science Networks

15 NIHR funded infrastructure

48 Clinical Commissioning Groups

Meeting The Challenge

Building on excellence to tackle COVID-19

In response to the COVID-19 pandemic, the UK has overcome considerable challenges. It is vital that we recognise the lessons the virus has taught us as well as the core assets enabling us to meet these challenges both locally and nationally. Despite the Midlands Life Science sector's historic under-representation in national Life Sciences investment, the region has not only delivered, but thrived in the new environment. It is clear that the Midlands is:

A world-leading COVID-19 clinical research environment:

"The Midlands is a distinctive UK centre for clinical trials, and research and development, having a wealth of experience across a wide range of diseases, conditions and clinical settings, all of which need specific trial designs to test and evaluate them accurately and sufficiently."

Driving Life Sciences Business In the UK Midlands Region (DIT, 2020)

The region has a proven reputation for design and delivery of world-class adaptive clinical trials at a national and international scale, and hosts Europe's second largest clinical trials cluster. The Midlands delivers innovation for patients and drives accelerated translational excellence in specialist areas including trial design, usability, testing and innovative engagement of patients and industry. We have a wide range of clinical specialisms, including respiratory disease, BAME health, and diabetes, and have led the global effort in the methodologies used to evaluate and accredit diagnostic tests for COVID-19.

The Midlands is delivering world-leading, life changing clinical research in response to COVID-19. Working together across the region, the NHS, universities and industry are meeting the challenge, driving lifesaving treatments for COVID-19 and improving outcomes.

During the pandemic, the Midlands' outstanding clinical trials investigators and infrastructure have worked with national organisations to streamline processes and have delivered complex and adaptive clinical trial designs, exceptional recruitment levels and high-quality execution at speeds that were previously thought to be impossible. By combining this with the ability to leverage expertise, integrated with local infrastructure and community engagement, the region now hosts a world-class COVID-19 clinical trials environment, delivering nationally-leading patient recruitment.

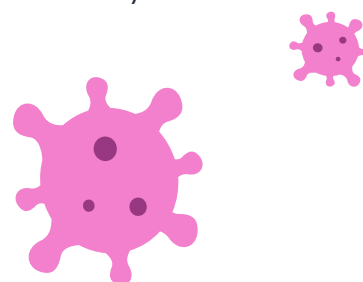
The voice for communities within science and policy:

A core strength of the Midlands' academic excellence and knowledge economy is data-driven healthcare. We host a rapidly-growing cluster of digital health companies (including more digital start-ups than any UK area outside of London), as well as world-leading academic and clinical expertise (such as the Centre for BME Health and the Health Data Research UK Midlands Substantive Site).

Utilising the close partnership between our cluster of excellence and large, diverse population, the region has led the UK's study and reporting of the impact of the COVID-19 virus on different socioeconomic and ethnic groups. Advising the Government, independent SAGE, local authorities and the global scientific community, regional partners have ensured that the UK's policies and interventions take into account the considerable difference in clinical outcomes identified by the Midlands academic expertise. We have also created near-real-time clinical dashboards for the NHS able to show geographical clustering and ethnicity impact before wider national capability. Inclusivity and participation are at the heart of the academic and clinical ambitions for the future the Midlands Health and Life Science sector.

Delivering excellence in genetics, immunology and cell biology:

The Midlands has considerable strength in fundamental Life Science research, culminating in the award of highly successful projects (such as the joint £6 million Cryo-EM facility which has been supporting remote collaborative research during lockdown) and delivery towards a number of national programmes e.g. the Midlands led the largest Genomic Medicine Centre taking part in the 100,000 Genomes Project (comprising a consortium of 17 trusts from across the region, coordinated by Birmingham Health Partners).



Regional partners have a variety of successful programmes: the Birmingham-led £6.5 million UK Coronavirus Immunology Consortium (UK-CIC) programme brings together UK immunology centres of excellence to research how the immune system interacts with SARS-CoV-2 to help develop better diagnostics, treatments and vaccines. We are a core partner of the £20 million UK COVID-19 Genomics UK Consortium (COG-UK), delivering large-scale and rapid whole-genome virus sequencing to local NHS centres and the UK government, with major contributions from the Universities of Birmingham, Nottingham and Warwick as well as several regional NHS Trusts. Midlands' partners are also playing a significant role in vaccine development, for example the Universities of Nottingham and Nottingham Trent are collaborating with Scancell Holdings plc to adapt its existing cancer vaccine platform for the development of a new vaccine.

The heart of UK manufacturing and medical technologies:

"The Midlands is the epicentre of advanced manufacturing and engineering in the UK, including innovative leaders in digital and collaborative production processes. Its extensive supply chain is reshaping chemicals, base and fabricated metals, electrical items, prefabrication and subcontracting including machinery for Life Sciences as well as other sectors."

Driving Life Sciences Business In the UK Midlands Region (DIT, 2020)

The Midlands has a substantial legacy in advanced manufacturing and engineering with over 20% of the UK's manufacturing employment (over 614,000 jobs) located in the region. Combined with our Life Science excellence, this allows the Midlands strength in medical technologies to provide an agile response to emerging challenges. In medical technology, the region boasts the highest number of UK companies and is the second-largest UK employer.

It is thanks to the diversity of this SME-driven landscape, its high-level skills and the supply chain that supports it, that the Midlands has been able to provide both sustainability and innovation during the pandemic, including the development of novel tests, optimising and testing of ventilators and their components, and delivery of PPE. Universities are supporting this work, for example, through world-leading facilities and expertise at the Medical Devices Testing & Evaluation Centre (MD-TEC) and integrated partnerships at Aston that have developed the SNAP device.

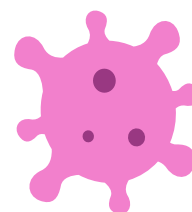
A vital point of support for to the national COVID-19 response:

In addition to leading and contributing to critical national programmes enabling the Government's core initiatives to fight COVID-19, the Midlands is also providing added value in a number of ways:

A collaborative cluster delivering scale and tackling challenges: The Midlands' strong academic-NHS ecosystem, cutting-edge facilities and innovative industry has rapidly delivered excellence across its clinical and research infrastructure. This has prepared the region to respond at scale to national/international requests and laid the foundations for successful UK partnerships, using our trusted relationships to apply creative new approaches, processes and attitudes, and overcome even the biggest challenges.

Supporting NHS frontline care and testing capabilities: All Midlands partners have dedicated staff, facilities and resources to support national NHS services, including the donation of tens of millions of pounds worth of PPE and equipment, the reallocation of hundreds of research personnel to support frontline care, dedication of world-leading facilities to testing/sequence both local and national samples, and the creation of the UK 'Your COVID Recovery' service. Additionally: Charnwood Campus, in Loughborough, has been announced as the UK's seventh "Lighthouse Lab", supplementing existing NHS labs working on the Government's National COVID-19 Testing Programme; while Birmingham Health Partners opened the first Pillar 2 Turnkey laboratory in the country at their medical school, as well as a collaborative Pathfinder lab with NHS partners; and the University of Warwick is supporting the new testing Mega Lab in Leamington Spa.

Mobilising supply chains and resource to create resilience: Thanks to innovative procurement practices and collation of industry efforts, the Midlands has been able to not only supply the region itself with in-demand products (such as PPE and reagents) but create additional resource for the rest of the UK, e.g. the Medilink Midlands Big Ask (supported the region's Academic Health Science Networks (AHSNs) and the PPE initiative driven by the Midlands Engine.



Lessons Learnt

As the scientific and clinical community approaches a more complete understanding of the COVID-19 virus, it is important to consider the lessons that have been learnt and build them into a plan for the future.

Speed, flexibility and partnerships are key:

Without any one of these, neither the Midlands nor the UK would have been able to respond to the pandemic in the way that has been achieved. A significant reduction in bureaucracy, a real-time rolling review of applications and clinical data, and a focus upon coproduction, have demonstrated what can be achieved by taking a flexible, multi-discipline and cross-organisation approach to rapid innovation. Our capacity to transform practice and produce resilience-focused strategies has delivered speed without compromising patient safety and product quality. Supporting this is the ability to develop and maintain virtual environments, better and more open data sources, new ways of working and a shift to patient-focused outcomes.

Partnership is the most important factor in the Midlands' leading role in driving the UK's COVID-19 response. In addition to the unprecedented collaboration between academic, clinical and industrial organisations enabling rapid translation of novel science into leading clinical trials and product development, partners have demonstrated their ability to disseminate knowledge across the globe, extending networks and expanding the available evidence base. Acting as anchor institutions, Midlands' partners are achieving their full potential to deliver real-world impact for their local populations and to spread translational impacts across a much wider geography than previously achieved.

Ignoring societal factors is a recipe for disaster:

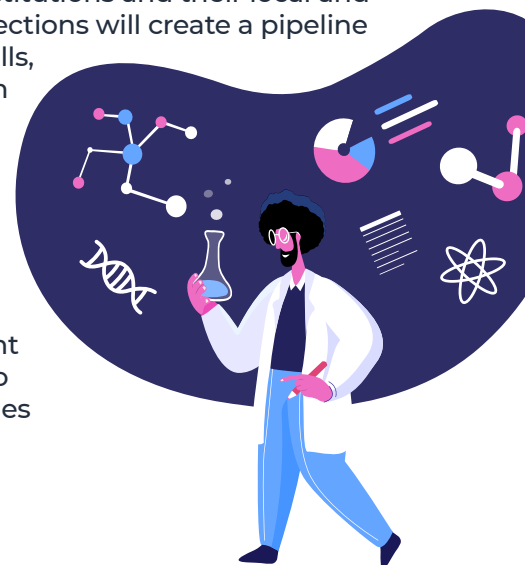
The COVID-19 response has necessitated a seismic shift from acute late-stage treatment to early-stage preventative medicine. For this to be fully realised and embedded in the UK health service, it is vital that the roles of socioeconomic, ethnicity, mobility, geography, culture and education be fully understood. Additionally, while it may be practical to group patients with underlying conditions, it does not address the root cause of the variations in clinical outcomes. Throughout the pandemic, Midlands' partners have stood side by side with the region's citizens, championing this message and prioritising the continuing need for both preventative and rehabilitative interventions.

The Place Agenda has never been more important:

Understanding the importance of Place and how best to 'level up' regions is not just a priority for national economic growth, it also has major implications for health outcomes, especially for COVID-19. Societal factors that impact on clinical outcomes often have a geographic element and so must be included in both local and national government policy and ambitions for growth. Co-design with and for communities has been a vital process throughout the pandemic. This strength has shown itself in the Midlands' high levels of recruitment to clinical trials, as well as practical translation of research and measures to take care into the community.

The virus has shone a light on the Government's devolution plans and highlighted the role of local organisations. The benefits of devolved responsibilities and a local-national shared agenda have been very apparent during the pandemic, particularly within local lockdown. Balancing national agendas with local need has enabled evidence-based policy approaches and increased understanding of how local practice can support and inform national policy. Moving forwards, coordinated data gathering and communication at a local, national and international level is vital to prevent future national lockdowns, further damaging the economy. It is also necessary to identify where decisions need to be made locally or nationally (e.g. employment) to achieve interventions. It is only through the activation of Place within the Political landscape that these can be achieved.

It is also important to consider the role of anchor institutions and how these can work together to create local, regional and national impact. Utilising anchor institutions and their local and international connections will create a pipeline to drive forward skills, education, research and innovation agendas. It is through this mechanism that Place can play its most powerful and timely role, allowing investment to deliver benefit to left behind industries and communities.



Procurement strategies can significantly impact future resilience:

An area of particular importance is the role and collective responsibility for local public bodies to practice sustainable, locally-focused procurement practices. Procurement is key in the delivery of positive impacts, creating opportunities for training, jobs and local resilience. Through creative and collaborative approaches, we can not only deliver against the social value act, but also create

Building towards a better future

With these lessons in mind, the Midlands has been developing assets and specialist clusters to support the regions' health and wealth, for example:

The National Rehabilitation Centre:

Construction is planned to begin next year, led by Nottingham University Hospitals NHS Trust with lead academic partners Universities of Nottingham and Loughborough. As part of getting young people with illness and injury back to work, the NRC will address the long-term implications of the respiratory trauma associated with COVID-19 and the need for targeted rehabilitation. Working with the University of Leicester-led 'Your COVID Recovery' programme and PHOSP clinical trials platform, as well as other national schemes, the NRC is ideally placed to deliver clinical, R&D and educational innovation in this space.

A UK Centre of Excellence for Regulatory Innovation & Delivery:

It is vital that the UK maintains its position as a global thought-leader in a post-coronavirus market, embracing opportunities for regulatory flexibility whilst robustly understanding risks and challenges. Linking to the joint academic-NHS Centre for Regulatory Science and Innovation in Birmingham, leveraging significant ongoing work with bodies such as MHRA, ABPI, ABHI, NHSX, EMA and FDA, as well as patient groups and the new Regulatory Horizons Council, the Midlands aims to cement

long term foundations from which local businesses can build. The Midlands Engine, with support from Midlands Innovation Health and Midlands Health Alliance, has been supporting local authorities with their discussion of a regional-level Dynamic Purchasing Systems for PPE provision. This would enable the creation of a sustainable domestic market in the Midlands, prevent reliance on overseas supply and give back to the private sector that has taken on enormous risk in their efforts to meet local and national PPE requirements.

its status as the leading UK region for Regulatory Science. The first step in this ambition is to create a unified UK Centre for Regulatory Innovation & Delivery, which will showcase the Midlands as a focal point for this activity and leverage a regional legacy of manufacturing expertise.

Birmingham Health Innovation Campus:

Due to open in 2023, this innovative healthcare technology campus will deliver cutting-edge facilities in healthcare data, genomics medicine and diagnostics, medical technologies and clinical trials. It will expand the region's ability to work with industry and the NHS to rapidly develop prototypes and deliver translation. The campus's potential has been demonstrated through the Birmingham Health Partners collaboration with Binding Site to produce COVID-19 antibody tests.

Midlands Engine Health:

ME Health will support and promote these new opportunities and the region's innovation-delivering strengths. By continuing to embed organisations such as Midlands Innovation Health and Midlands Health Alliance at the heart of this partnership (as well as industry, local Government and other regional partners), Midlands Engine Health will emphasise what the region can offer and what is needed at the most appropriate time. (see page 24 for further details).

Summary

The Midlands has considerably outperformed traditional expectations and firmly established its position in the UK Health and Life Sciences sector. Reinforced by recent studies highlighting the considerable underinvestment of public funding into the region despite its achievements in private research and development spend (The Missing £4 Billion, NESTA, 2020), it is clear to see what the Midlands is capable of achieving when supported at a national level. With the independent analysis run by the Midlands Engine Economic Observatory showing that the Midlands has the deepest economic exposure of any UK region, now is the time for the region to be recognised as a true Life Science Powerhouse.

Executive Summary

Through the dedicated work of the region's academics, healthcare professionals and industrial partners, in addition to high levels of our workforce supporting frontline care, the Midlands is:

Driving UK COVID-19 Research

- MI partners received £45 million to lead over £90 million of research excellence programmes directly targeting COVID-19.
- Midlands-led priority national programmes:
 - **UK-CIC:** Led by the University of Birmingham, the £6.5 million project is studying immune responses that could provide targets for new COVID-19 treatments and inform vaccine development.
 - **CO-CONNECT:** The University of Nottingham co-led £4 million project will help scientists access data to develop potential COVID-19 therapies and treatments.
 - **UK-REACH:** The £2.1 million trial, led by the University of Leicester, will work with more than 30,000 healthcare staff across the UK to assess their risk of COVID-19, based on the analysis of 2 million healthcare records.



Leading COVID-19 Trials Patient

Recruitment (Data accurate on 23/12/2020)

- Delivering over 15% of all UK patients recruited to COVID-19 trials (50,038 patients).
- The region has achieved nationally significant recruitment for the following clinical trials:
 - **ISARIC-4C:** collecting COVID-19 clinical data and samples – the Midlands has recruited over 20% of all UK patients (24,383).
 - **RECOVERY:** testing 6 existing medicines as potential COVID-19 treatments – the Midlands alone recruited almost 20% of UK patients (4,019).
 - **RECOVERY-RS:** comparing the effectiveness of 3 ventilation methods – the Midlands recruited nearly 40% of all UK patients (219).
 - **NHS CHECK:** health and experience of NHS staff – the Midlands has recruited 26% of UK patients (3,597).
- Midlands-led priority programmes:
 - **PHOSP:** The £8.4 million Leicester-led national consortium aims to understand and improve long-term health outcomes of hospitalised COVID-19 patients.
 - **REGAIN:** A University Hospitals Coventry & Warwickshire NHS Trust-led £1.2 million trial to assess the impact of online and at home physical and mental health support.

Supporting the Region and the Nation

Whether through supporting staff and students to volunteer within frontline care, reallocating expertise and resources to fight the pandemic (e.g. Birmingham's role as the first academic lab partner for NHS Test & Trace, Leicester University's screening programme and Keele University's PPE drive), or donating and mobilising tens of millions of pounds worth of equipment (e.g. Nottingham's 16 PCR machines, worth £1 million), the Midlands has held nothing back in its determination to support, inform and protect patients and the public. This includes delivery of a wealth of online services (e.g. Leicester's groundbreaking 'Your COVID Recovery' service) and evidence-based policy and practice expertise (e.g. Loughborough University's numerous studies of social impact and Aston University's review of the important role of pharmacists).

The Midlands Collective Response

Professor Kumar, Convener of Midlands Innovation Health and Dean of Medicine at the University of Warwick.

“Midlands Innovation Health brings together top talent and excellent research infrastructure available in the 7 research intensive Universities in the Midlands. Whether it is to do with developing novel tests or designing and executing clinical trials at speed, individually and collectively, MIH has shown agility and responsiveness to this major public health emergency, helped by significant reduction of bureaucracy. We can see from the snapshot of exemplar projects in this report, creative new approaches to solving this societal challenge using any method possible drawing from expertise across a wide range of disciplines. What is also positive is the way Universities, NHS and industry are collaborating not only across Midlands, but also across the UK and Internationally, with palpable improvement in the relationship between the institutions despite not being able to meet face to face. We will build on these positive developments from now on.”

The aforementioned academic strength of the Midlands is reflected, not only in its translation into clinical output and new technologies, but in the delivery of an impressive amount of publications. Since the beginning of the pandemic, the Midlands has produced over 1000 publications, which have been cited thousands of times. Our top publications show how the region has identified the impact of the pandemic on patient care, what risks COVID-19 poses to our patients, effective treatments for COVID-19, the impact of the virus on BAME communities, and many other areas of importance.

1058 Publications

7257 Cited

Valid 23rd
December 2020



Top Publications:

- Armitage, R. and Nellums, L.B. (2020) 'COVID-19 and the consequences of isolating the elderly', *The Lancet Public Health*: 5(5), pp. e256. DOI:10.1016/S2468-2667(20)30061-X
- Bangash, M.N., Patel, J. and Parekh, D. (2020) 'COVID-19 and the liver: little cause for concern', *The Lancet Gastroenterology and Hepatology*: 5(6), pp. 529-530. DOI:1016/S2468-1253(20)30084-4
- Ferner, R.E., Aronson, J.K. (2020) 'Chloroquine and hydroxychloroquine in covid-19', *The BMJ*: 369:m1432. DOI:10.1136/bmj.m1432
- Jordan, R.E., Adab, P. and Cheng, K.K. (2020) 'Covid-19: Risk factors for severe disease and death', *The BMJ*: 368:m1198. DOI:10.1136/bmj.m1198
- Khunti, K., Singh, A.K., Pareek, M. and Hanif, W. (2020) 'Is ethnicity linked to incidence or outcomes of covid-19?', *The BMJ*: 369:m1548. DOI:10.1136/bmj.m1548
- Ludvigsson, J.F. (2020) 'Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults', *Acta Paediatr*: 109(6), pp. 1088-1095. DOI:10.1111/apa.15270
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- Professor Ghosh in: Mao, R. et al. (2020) 'Implications of COVID-19 for patients with pre-existing digestive diseases', *The Lancet Gastroenterology and Hepatology*: 5(5), pp. 426-428. DOI:10.1016/S2468-1253(20)30076-5
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- Professor Khunti in: Bornstein S.R. et al. (2020) 'Practical recommendations for the management of diabetes in patients with COVID-19', *The Lancet Diabetes and Endocrinology*: 8(6), pp. 546-550. DOI:10.1016/S2213-8587(20)30152-2
- Professor Riley in: Wynants, L. et al. (2020) 'Prediction models for diagnosis and prognosis of covid-19: Systematic review and critical appraisal', *The BMJ*: 369:m1328. DOI:10.1136/bmj.m1328

Professor Hall, Director of the NIHR Nottingham Biomedical Research Centre and Co-Chair of the Midlands Health Alliance.

“It has been really pleasing to see how the Midlands Health Alliance community have come together regionally to support research and service delivery during the COVID-19 pandemic: this report contains numerous examples of joint working across different parts of the Midlands infrastructure. Nationally, the major part played by Midlands’ centres, particularly in recruitment to clinical trials, has been important. Without recruitment to these trials we would not have identified the drugs which we now know can be used in the treatment of hospitalised patients with COVID-19. The Midlands is also playing a significant role in the vaccine studies which have commenced. There have also been major contributions from individuals based in the Midlands to national planning for COVID-19, including important contributions to Department of Health and Social Care (DHSC), National Institute for Health Research (NIHR), UK COVID-19 Therapeutics Advisory Panel (UK-CTAP) and Scientific Advisory Group for Emergencies (SAGE) working. It is really encouraging to see the close working across the region and beyond which has happened, and I am delighted that MHA has been able to play a role in supporting this”.

54,280 people have registered their interest in taking part in vaccine trials

50,038 participants recruited to COVID-19 research trials – 15% of all recruitment



The Midlands has recruited **24,383** out of 120,621 for the ISARIC trial – **20%** of all recruitment

The Midlands has recruited **4019** out of 21,167 for the RECOVERY trial – **19%** of all recruitment

The Midlands has recruited **3597** out of 13,663 for the NHS CHECK trial – **26%** of all recruitment

The Midlands has recruited **5560** out of 29,743 for the SIREN trial – **19%** of all recruitment

The Midlands has recruited **367** out of 1491 for the PHOSP trial – **25%** of all recruitment

The Midlands has recruited **219** out of 557 for the RECOVERY RS trial – **39%** of all recruitment

Data collected 23/12/2020. Total figures account only for NIHR portfolio trials.

How The Life Science Business Community Has Responded

The Midlands Life Science community comprises over 1,200 companies, supporting over 30,000 jobs, and has played a key role in the national effort against COVID-19. The Midlands is ideally placed to tackle coronavirus, with the largest number of Life Science companies outside London and the South East, a research base consisting of 20 world-class universities and clinical research base which performed over 4,100 studies in 2019.

“The Midlands has a unique set of capabilities and offers for Life Science companies. Our tenacity and resilience allows us to weather whatever storms life throws at us. With COVID, as with any problem we are faced with, the Midlands Life Science industry delivered a solution to what seemed at times, an insurmountable obstacle. It's thanks to our companies that we were able to help those most in need at this time and make a significant contribution to addressing this world-wide pandemic.”

Dr Darren Clark, Chief Executive Medilink Midlands.

Medilink Midlands – The Big Ask

Medilink Midlands is working with partners to coordinate the region's response to COVID-19. So far, Medilink Midlands has had over 110 offers of support, from over 100 different Life Science companies across a wide range of areas, including:

- PPE
- Sanitisers
- Infection control
- Testing capabilities
- Ventilation manufacture
- Remote consultation and patient monitoring dressings
- Mental health and fitness
- Medical textiles
- Precision engineering
- Product design
- Critical care equipment

See below for examples of how the Midlands Life Science business community has helped in the fight against COVID-19.

Manufacturing a vaccine

A vaccine to combat COVID-19 is set to be manufactured at Keele University's Science and Innovation Park, following an agreement between Cobra Biologics and AstraZeneca UK. Cobra has signed a supply agreement to manufacture vaccine candidate AZD1222, previously known as ChAdOX1 n-CoV-19. The production agreement is part of a programme with the University of Oxford to ensure broad and equitable supply of the vaccine throughout the world, at no profit during the COVID-19 pandemic. [keele.ac.uk/business/newsandevents/ournews/2020/april/cobra/cobra-bio-leading-the-fight-against-covid-19.php](https://www.keele.ac.uk/business/newsandevents/ournews/2020/april/cobra/cobra-bio-leading-the-fight-against-covid-19.php)

A collaboration to accelerate the development of a lead COVID-19 drug candidate into human clinical trials has been announced by East Midlands-based Quotient Sciences and CytoAgents, Inc. [medilinkem.com/quotient-sciences-and-cytoagents-accelerate-potential-treatment-for-covid-19-cytokine-storm](https://www.medilinkem.com/quotient-sciences-and-cytoagents-accelerate-potential-treatment-for-covid-19-cytokine-storm)

ANA Therapeutics and Quotient Sciences announced a partnership to support the manufacturing of ANA Therapeutics' drug candidate, ANA001 (niclosamide capsules), which they are developing as a potential treatment for COVID-19. Quotient will scale up the capsule formulation, characterise and optimise the manufacturing process and ensure continuity of the drug throughout clinical trials. [medilinkem.com/ana-therapeutics-and-quotient-sciences-announce-partnership-to-manufacture-niclosamide-drug-candidate-as-a-potential-treatment-for-covid-19](https://www.medilinkem.com/ana-therapeutics-and-quotient-sciences-announce-partnership-to-manufacture-niclosamide-drug-candidate-as-a-potential-treatment-for-covid-19)

Developing COVID-19 testing capability

Source BioScience Limited, a highly accredited ISO:15189:2012 international laboratory services provider, has rapidly developed a robust COVID-19 testing capability to help with the Government's requirement to hit 100,000 tests per day. By 1st May, Source was receiving over 1000 samples a day into the laboratory and with more sample capacity needed, the company embarked on an ambitious plan to convert office space at their Nottingham HQ to a Class II laboratory able to supply 9,000+ tests per day. Operating a 24/7 laboratory, Source has continued to recruit in high volume. Currently staff has increased by 35+ with another 35 being employed to meet the national requirement. medilinkem.com/source-bioscience-develops-covid-testing-capability

The Binding Site has launched a new test to detect COVID-19 antibodies in people with recent exposure, who are asymptomatic, or have mild symptoms. With the focus on mild non-hospitalised patient blood samples, the SARS-CoV-2 Antibody ELISA assay was developed in partnership with the Birmingham Health Partners' Clinical Immunology Service with the initial antigen being provided by the University of Southampton. This latest development is a natural progression for The Binding Site, utilising its world-renowned knowledge of 35 years in developing highly precise, accurate blood tests that affect the immune system. The Company already produces over 35 million IVD tests per year for sale globally and expects this UK manufactured product to be in high demand. medilinkwm.co.uk/2020/08/regional-collaboration-delivers-quality-focussed-covid-19-test-kit-record-time



Derby-based SureScreen Diagnostics has developed a test that can detect COVID-19 within 10 minutes and render both self-isolation and incubation unnecessary. The test checks a patient's blood in a simple procedure and identifies the coronavirus between three to seven days after infection – before symptoms begin to appear. medilinkem.com/big-step-forward-in-coronavirus-detection-by-uk-firm

Digital Health interventions

Spirit Digital are directly supporting the delivery of patient care through two projects utilising their digital health and remote clinical monitoring platform - ClinTouch Vie:

1. Community 'Virtual Wards': ClinTouch Vie is being used by clinical teams at LPT with their patients as part of the NHS COVID-19 response to help them release hospital beds and manage vulnerable patients in the safety and comfort of their own homes.
2. Care Home remote monitoring: Manor Care Centre, a care home in Lincolnshire, has been working collaboratively with its local practice (Spilsby GP Practice) to implement ClinTouch Vie to provide continuity of care for its 40 residents in the care home. spirit-digital.co.uk/newsroom/the-covid-19-catalyst-how-the-pandemic-has-optimised-the-opportunity-for-digital-health

Telecare start-up Alcuris from Loughborough University has launched a digital platform that supports people at home by collecting data that provides reassurance to carers and actionable insights for authorities. memohub.co.uk

Meeting the ventilator challenge

Birmingham-based AE Aerospace supplies high-quality, precision-machined components for the aerospace and advanced engineering markets. The business has produced more than 6,000 complex turned/milled parts for the Smiths 'paraPAC plus' ventilator in less than two weeks after receiving a drawing. This is over double the company's monthly average of 2,500 parts per month.

Inspiration Healthcare have been involved in the Ventilator Challenge UK Consortium to help in the battle against COVID-19. This has included their dedicated 24/7 ventilator support helpline and their provision of other essential support. In addition to their involvement in the Ventilator Challenge UK, they also provided life-supporting equipment to the NHS during an extremely uncertain time. inspiration-healthcare.com/news/articles/inspiration-healthcare-ventilator-challenge-uk-involvement-91

PPE development, manufacture and procurement

At the peak of the COVID-19 crisis, in the West Midlands alone, PPE usage skyrocketed to an estimated:



Medilink West Midlands, the industry gateway for the West Midlands Academic Health Science Network, has been busy sourcing local manufacturers to produce high-quality surgical gowns for the region's NHS trusts. With work now underway, the region will benefit from up to 25,000 extra surgical gowns being produced a week. medilinkwm.co.uk/2020/06/medilink-west-midlands-connects-industry-nhs-produce-surgical-gowns

Textile manufacturers Footfalls and Heartbeats were very excited to announce 'Masks for the Masses', an initiative to help supply masks to key workers and organisations in Nottingham and the surrounding area. Several of their masks have now also been added to a permanent collection in The Framework Knitters Museum, which will immortalise them as part of Nottingham's rich history. medilinkem.com/masks-for-the-masses

Nottinghamshire-based JET PRESS is working with Rolls-Royce, Aston Martin, Multimatic, the Manufacturing Technology Centre and the NHS on a revolutionary new Aerosol Generating Procedure Shield. Fir Tree Buttons and Plastic Screw Cover

EVERY WEEK

Clips normally used in furniture manufacture play an important role in the finished product. JET PRESS also supply small plastic fasteners that are used to make PPE visors. Sales to one customer alone were 2.7 million in July. JET PRESS normally supplies around 35,000 a month. medilinkem.com/jet-press-use-furniture-fasteners-for-new-agp-shield

Rugby-based Autins Group has manufactured and supplied millions of PPE items, including nearly 200,000 face masks and millions of parts for visors to customers over the last four months, after securing a £3.05 million finance package. thebusinessdesk.com/westmidlands/news/2043647-acoustic-and-thermal-insulation-specialist-delivers-millions-of-ppe-items

Medilink West Midlands is working with Sylatech, a UK-based engineering company, on behalf of the West Midlands Combined Authority. Sylatech has launched a personal handheld device called the KeepSafe, designed to enable users to avoid touching handles, buttons, or grabbing items unnecessarily. medilinkwm.co.uk/2020/04/launch-new-personal-handheld-device-help-limit-spread-covid-19

Key Regional Case Studies

Post-HOSPitalisation COVID-19

PHOSP-COVID is a £8.4 million MRC/NIHR-funded Leicester-led national consortium aiming to understand and improve long-term COVID-19 outcomes. The study tracks 10,000 participants following their discharge from hospital, through one of three methods a) clinic and GP visits b) surveys, brain scans and blood, urine and sputum samples c) additional assessments.

Professor Brightling (University of Leicester) has brought together a multidisciplinary UK team, from 26 universities, 44 NHS trusts and over 150 academics in less than 5 months, to shed light on: the effects of COVID-19 on the body; biological molecules or genetic differences that may explain why some individuals experience long-term effects; who is at risk of such problems; and reveal early indicators. This is the biggest long-term follow up study of its kind globally.

The key to implementing PHOSP-COVID so quickly is the step change in the response to the need for research and is due to a truly national effort. Some examples are:

1. **DHSC/NIHR: COVID-19 Urgent Public Health research status** enabled PHOSP-COVID to gather evidence to inform national policy and enable new pathways to be developed quickly.
2. **DHSC/NIHR-UKRI/MRC COVID-19 Rapid Response Rolling Call** By revising the grant submission process and rapidly responding to the proposal, the study was awarded quickly. UKRI also brought together their most experienced workforce in support, pre and post award.
3. **National Academic and Academic Institutions Support:** PHOSP-COVID is holistic due to the dedication and harmonised research approach by academics across the UK to create a multidisciplinary environment beyond the lungs.
4. **Embedding a research platform into clinical care:** at the heart of PHOSP-COVID is the patient. It's extremely important that research is embedded into clinical care as much as possible to reduce the burden on the patient and research staff, many of whom are in the NHS trusts.
5. The dedication, compassion and "can do" attitude of the **NHS and University study teams** at each site to ensure PHOSP-COVID achieves its goals.



For more information visit www.phosp.org and follow @PHOSP_COVID on twitter.

West Midlands Black, Asian and Minority Ethnic (BAME) Group

The West Midlands BAME Group is a partnership of local research and academic organisations, which focuses on tackling health inequalities and seeks to reduce the disproportionate impact of COVID-19 on local BAME communities. It is led by the Clinical Research Network West Midlands (CRN WM) closely supported by the Network's Equality, Diversity and Inclusion Research Champions Group. The Group is planning to deliver a number of research projects and studies, some of which include undertaking an observational study to better understand the local BAME ageing population and exploring cancer tumour surveillance in BAME groups. In addition, they have recently undertaken the COVID-19 vaccination survey. The aim of this survey was to help better understand the views of people in the West Midlands and from across the country in relation to vaccines and vaccine research studies. The results of this are planned to be shared in October 2020 across the NIHR and NHS Partner Organisations. Partners are the CRN WM, the University of Birmingham, the University of Wolverhampton and the Royal Wolverhampton NHS Trust.

Delivering and ensuring transformational testing

The University of Birmingham (UoB), University Hospitals Birmingham NHS Foundation Trust (UHB) and Birmingham Health Partners have utilised their extensive genomic, virology and immunology expertise, in combination with their world-leading facilities, to drive the UK's response to COVID-19 testing:

- The University's Category 3 laboratories have been re-purposed to test 10,000 samples in 24 hours. This includes same-day testing for staff at UHB, the West Midlands Ambulance Service and Birmingham Women's and Children's Hospital.
- UoB (alongside the University of Nottingham) are partners within COG-UK, which aims to put the UK at the forefront of the genomics effort, and has sequenced >50% of the UK's samples.
- In just 10 weeks, the University and its spin-out company Binding Site have produced an antibody test that can detect even mild COVID-19 and will soon be available to the NHS.
- This has culminated in the University being named the first academic lab partner for NHS Test & Trace, increasing sample processing capacity by ~3,000 tests per day. They have now opened the first Pillar 2 Turnkey laboratory in the country at the medical school, which will provide testing for the local population including the campus. UHB are also opening a Pathfinder lab in collaboration with the University at Heartlands Hospital.



The NIHR Birmingham BRC are also leading an international collaboration (with WHO and the Foundation for Innovative New Diagnostics in Geneva) to create and maintain a suite of living systematic reviews of the evidence of the accuracy of tests and patient characteristics in the diagnosis of COVID-19.

Working with industry at speed and scale to tackle COVID-19

The University of Warwick's efforts to understand, diagnose, and treat COVID-19 was initiated early in March 2020 and spans a large spectrum of activities, ranging from the production of reagents for testing, and the development of a new assay based on sugar chemistry for diagnosis, to a large clinical trial evaluating alternatives to ventilators when treating critically ill patients. Remarkably, these were achieved and/or enacted within just a few weeks of initiation of the work, many in collaboration with industry.

In one of the major projects, Professor Gibson (Departments of Chemistry and Medicine) and colleagues discovered that a sugar, N-acetyl neuraminic acid (NAN), has high affinity for the SARS-CoV-2 spike protein, which is used by the virus to enter host cells. The work was done in collaboration with Dr Straube, whose group provided expertise in the scaling up and production of the spike protein. Professor Gibson's team linked the NAN to nanoparticles and have used the interaction between NAN-particle and the purified spike protein as a rapid means (under 30 minutes) to detect SARS-CoV-2 with remarkable specificity. The reaction is so specific that it discriminates SARS-CoV-2 from the highly related SARS-CoV-1. This test can be easily administered at the point-of-care and does not require any special training for healthcare workers. The work is being pursued in collaboration with Icen Diagnostics, which is developing the test for clinical trials, and also has the potential to be developed to detect other viral diseases, including zoonotic diseases.

Donating essentials to tackle COVID-19

The University of Nottingham is working with the NHS, Government and local communities to supporting the local and national efforts to fight against COVID-19 by:

- 1. Supplying machines to support the national testing effort:** The Universities of Nottingham and Nottingham Trent have supplied the Government with 16 PCR machines (worth £1 million) that can perform 20,000 tests a day nottingham.ac.uk/news/test-kits-for-c-19. The university also supplied essential category 2 cell culture safety cabinets, providing a highly controlled environment to protect scientists. nottingham.ac.uk/news/enabling-safe-covid-19-testing. Further supply of equipment was provided to local clinical labs, including the Maxwell RSC 48 Instrument (enabling the Queen's Medical Centre to triple daily testing), dry block heaters (for safe sample processing and reagent heating), 96-well plastic plates and adhesive sealing films for PCR machines, spare machine lamps, nitrile gloves and tissues.
- 2. Repurposing the university estate:** Unused space within the University has been given over to NHS colleagues for use as rest areas. The university is also working with local partners, to help provide accommodation for key workers (including its hotels, conference centres, and hall accommodation). While roughly 300 parking spaces have being supplied to NHS staff.
- 3. Supporting a Midlands food charity:** FareShare Midlands scrambled to set up a Nottingham office due to the sudden demand for services during lockdown. The university was able to help with volunteers and office equipment, as well as offering spare desks, tables, chairs and filing cabinets. nottingham.ac.uk/news/university-support
- 4. Enabling students' food surplus supermarket to meet the COVID-19 challenge:** Foodprint is an award-winning social enterprise run entirely by students and volunteers, supported by Enactus Nottingham (a student entrepreneurship based at the Business School). Foodprint previously supplied food to around 600 households, food banks, homeless shelters and school breakfast clubs but the COVID-19 outbreak and subsequent lockdown has seen demand increase dramatically. nottingham.ac.uk/news/foodprint-covid-challenge



Utilising local partnerships to tackle COVID-19

Keele Deal | Health represents a commitment between Keele University and local healthcare partners to address the region's health and care priorities. It builds on relationships with key health, care and industry partners, as well as patient, public, carer and client groups across Stoke-on-Trent, Staffordshire, Shropshire, Cheshire and Wolverhampton. In 2020, staff, students and businesses at Keele utilised Keele Deal | Health to deliver an impressive range of efforts to address the impacts of the pandemic. The initial emergency response included:

- the early release of clinical graduates and return of clinical staff to the NHS frontline
- the donation of all stocks of PPE
- student and staff volunteering
- the manufacturing of 100,000 litres of sanitiser for the NHS
- the provision of online legal advice to vulnerable households

In the latter stages of 2020, Keele University's response to COVID-19 included:

- Participation in Clinical Trials Unit supporting the NIHR's regional site where a 12-month study will take place to test the effectiveness of the Novavax COVID-19 vaccine candidate.
- Joining a key national programme, as part of the REal-time Assessment of Community Transmission (REACT-2), to evaluate pioneering diagnostic tests for the coronavirus, which will help determine how many people have been infected with the COVID-19 virus.
- Collaboration between the Institution of Engineering Designers and Keele University enables colleagues to help tackle some of the biggest issues affecting the NHS and care providers.
- Following an agreement between Cobra Biologics and AstraZeneca UK, a vaccine is being manufactured on Keele's Science and Innovation Park by Cobra Biologics.
- Professor Chew-Graham studied the experiences of 24 patients who continue to suffer prolonged symptoms of COVID-19, including chest pain, shortness of breath, muscle and joint pains, headaches, cognitive impairment known as 'brain fog', and fatigue. The research led to a new Royal College of General Practitioners e-learning training module as part of their Recovery from COVID-19 course to help GPs understand the long-term effects.

Keele University will shortly be launching Keele Deal | Recovery which will build on its strong and diverse history of local collaborations, setting out significant commitments that will aid and strengthen local recovery following COVID-19.

Raising Awareness

The importance of regulatory innovation for and beyond COVID-19

Professor Calvert, Professor Denniston and Dr Marston, Birmingham Health Partners - Centre for Regulatory Science and Innovation

COVID-19 has highlighted both the complexities and opportunities in bringing new diagnostics, medicines, medical devices and vaccines to market at pace, showcasing flexibility and rapidity of collaborative responses by academia, industry, health services and our regulatory agencies. Our ability to accelerate not only the vaccine but further high-tech solutions such as novel AI systems and diagnostic technologies for screening, triage and decision support, as well as low-cost, high-volume products such as PPE, will to a large extent determine the long-term toll of the virus, both economically and in human lives. All of this hinges on our regulatory environment.

Flexible, targeted innovation in regulation is a key priority in many recent UK research strategy recommendations, from the R&D Roadmap, Life Sciences Recovery Roadmap, Life Sciences Industrial Strategy and 'Regulation for the Fourth Industrial Revolution'. And yet the UK lacks a clear strategy around regulatory science in healthcare. Our departure from the EU adds a significant, specific national need for regulatory adaptation, carrying both opportunity and risk.

The UK must take a coordinated approach to foster and prioritise advances in regulatory science and innovation and build a workforce to ensure its sustainability and continuing evolution. This will require significant cross-sector collaboration, uniting industry, academia, NHS, funders, charities, regulators and citizens. The Midlands is already providing a beacon of leadership. Birmingham Health Partners hosts the Centre for Regulatory Science and Innovation and led a national call to action on this topic, supported by bodies including the Government's Regulatory Horizons Council, ABPI and ABHI to patient advocates. Our academic and NHS leaders set the first international standards for reporting of clinical trials of AI, and our Medical Devices Testing and Evaluation Centre (MD-TEC) advised both Cabinet Office and industry during the pandemic

Regulatory innovation led by the Midlands will be critical for the UK's future, underpinning global market competitiveness and citizen access to timely, safe and effective healthcare innovation.



Simplifying standards for COVID-19 PPE

Professor D. McNally, Head of the University of Nottingham Bioengineering Research Group

Early in the pandemic the EU Commission recognised that there was a strong possibility that there would be shortages of PPE. To this end, they issued a Recommendation 2020/403 on the 13th March 2020 with the objective of ensuring the availability of PPE and medical devices for adequate protection. This recommendation was aimed at all economic operators throughout the supply chain, as well as notified bodies and market surveillance authorities. One of the provisions of this document was to permit the manufacture of PPE to 'technical solutions' rather than harmonised standards. These technical solutions were simplified forms of the normal standards that retained all the provision required for COVID-19 protection and which maintained the applicable essential health and safety requirements laid down in Regulation (EU) 2016/425.

An example of one such technical solution was published by BSI for COVID-19 face shields. Normally, such face shields need to comply with EN 166:2001 'Personal eye-protection - Specifications'. This is an extensive and comprehensive document that covers everything from safety glasses to welding masks. Most of the scope of EN 166 is not relevant to COVID-19 protection, where a face shield simply needs to fit comfortably without causing irritation, be easy to see through without distortion, and provide sufficient coverage to protect from droplet splashes. The BSI technical solution pulled out these essential requirements.

By really simplifying both the manufacturing and regulatory testing requirements, these technical solutions allowed very rapid product development cycles. For example, the COVID-19 face shield designed and manufactured by the University of Nottingham took just over a week from initial design to CE marking. This simplification of regulation facilitated an agile solution to PPE manufacture that undoubtedly was responsible for saving many lives.

Why COVID-19 has exposed and exacerbated health inequalities based on ethnicity

Dr Paton, Aston University

COVID-19 disproportionately affects Black, Asian, and Minority Ethnic (BAME) people who are more likely to become critically ill and die. Discussion of this relationship has centred on the greater prevalence of certain underlying health conditions among people from BAME communities. However, this focus obscures the real reasons behind the BAME population's increased risk that, in fact, reflects fundamental socio-economic inequalities.

BAME communities are more likely to live in densely populated areas (98.1% and 97.4% Black and Asian minority groups vs 79.1% White populations), where it is difficult to social distance. Household composition can also make social isolation more difficult. Additionally, BAME communities are more likely to live in areas of poor air quality, which contributes to the development of high-risk underlying conditions e.g. asthma.

>50% of frontline staff/key workers and 40% of health professionals are from BAME backgrounds. BAME workers are also over-represented in jobs requiring face-to-face activity such as transport, distribution and essential retailers. Consequently, further consideration of both the impact of the virus and the measures employed is needed. To mitigate these effects, I have recommended to Parliament that the following actions are taken over the next 12 months.

- 1) Companies with high rates of agency/zero hours contracts required to offer workers PPE, with regular testing for higher risk occupations.
- 2) Guidance produced on shielding and PPE provision that addresses the increased risk for BAME frontline/keyworkers across all sectors.
- 3) The impact of COVID-19 on the BAME community featuring prominently in the Government's plan to scale back pandemic measures.
- 4) Research is needed to determine essential needs of these groups, keeping them safe from the disproportionate effect COVID-19 is having on BAME communities.
- 5) Finally, it is essential that the Government reviews how best to implement strategies to support and safeguard this group from unnecessary exposure and risk of infection.



The COVID-19 Catalyst – How the pandemic has optimised the opportunity for digital health

Spirit Digital

Although the virus has been devastating for so many, it has also accelerated development and adoption of technology across many areas of the healthcare system.

Prior to the pandemic, use of digital technology in the NHS was patchy and acceptance was slow. Some health teams were using it brilliantly, but many were not. Despite having a strong evidence base of successful outcomes for patients, the Spirit team were finding adoption of remote management technology to be a real challenge. It was clear how Spirit's digital platform could improve lives, save money and enable the clinical teams to focus their precious time on those who needed their expert care – but tradition was trumping innovation.

Nadine Miles, Director of Market Development at Spirit Health Group reflects on this.

“The pandemic has been the catalyst for clinicians to look at clinical services and see how we can use technology to support and care for our patients in new, safe and efficient ways.

We were able to deliver in weeks, what had previously been anticipated over a number of years, with thousands of respiratory patients now being monitored remotely.

As a business, we faced some challenges – not with our technology platform, but more around how we enabled hundreds of patients to access it quickly. For those patients who had their own smart-phones or tablets, it was a simple matter of sharing our software links. For those who didn't, we needed to send them a tablet device, pre-loaded with our software. Normally, one of the clinical team would have visited their home and sat with them to show how easy it is to use and help with any minor connectivity issues. To make sure all those receiving kit by post (due to the pandemic and social distancing) could get up and running we set up a call centre advice team to 'onboard' patients in a non-contact manner. All of this was done while some of our team began working from home. We also had to expedite a few of our hardware contracts and recruit new members of our team using Teams and Zoom!

We responded, by adapting to a fully de-centralised team, and proving it is possible to recruit and induct brilliant people in a hurry, we broadened our supply lines, enhanced our service delivery capacity, launched two additional products (Pulmonary Rehab and post COVID-19 Discharge) and forged great partnerships with healthcare organisations.”

The team at Spirit have been privileged to support the NHS and are proud to be working on multiple projects which are directly supporting the delivery of patient care.



For full information on COVID-19 activities, and the complete set of case studies and opinion pieces, please see the full ‘Mobilising Research Excellence in the Midlands to Tackle COVID-19’ report.

Delivering Participant Satisfaction

Experiences of being involved in Midlands' clinical research

'Anything to help our magnificent NHS.'

'I feel honoured to be able to help in some way'

'I have always been keen to put something back into the NHS having taken such a lot out over the years'

'It was the only contact apart from my partner and it gave me purpose.'

'It made me feel good and contributed to my positive mental health.'

'I like being able to support clinical care and learning from the experiences of others.'

'The pandemic was no reason to stop in a digital age'

'I felt that sensible decisions were made regarding the problems posed by COVID-19, NHS resources were being used properly and it was good to be aware of the changes.'

'It was a positive experience. It is encouraging that new research, including non-Covid studies are still going ahead. I also needed to be active in some way.'

'All the online meetings I have attended for Public Patient Involvement and Engagement have been just as good a real meeting'



Regionalism At The Heart Of Innovation

Professor Alec Cameron

**Vice-Chancellor and Chief Executive at
Aston University
Chair of Midlands Innovation**



“While universities have always been at the centre of the UK research landscape, our response during the COVID-19 pandemic has demonstrated beyond doubt the strength and breadth of the expertise we host. The Midlands is no exception to this.

Our partners have dedicated themselves to fight the virus, support communities and save lives. We have taken our responsibility very seriously and I thank each and every one of our staff and students for their support delivering these world-leading accomplishments.

Translating excellence into real world capabilities in rapid time is not only a job for a single institution, nor a single sector. The current situation has highlighted the importance of trusted partnerships and their potential to create, speed and deliver advanced health innovations. The Midlands is home to dynamic partnerships, such as Midlands Innovation and our health theme Midlands Innovation Health, which have enabled the region to collaborate effectively, tailoring activity to meet these new and specific needs. Universities, industry and the NHS each have a role to play and we are dedicated to supporting our collaborations to deliver their maximum potential.

I am incredibly proud of what we have achieved across the region, from scientific discovery to clinical endeavour and mobilisation of resource. This report rightly describes the Midlands as a Life Sciences Powerhouse and I look forward to what we will go on to accomplish in the future as we continue to battle with this devastating virus.”

Rebecca Brown

**Acting Chief Executive
University Hospitals of Leicester NHS Trust**



“Patients have the right to access research opportunities; it is a key part of the NHS constitution and something I and thousands of colleagues across the NHS wholeheartedly support. COVID-19 has made this principle even clearer, as research is our best hope for emerging from this pandemic soon. NHS organisations in the Midlands have responded by recruiting thousands of patients, providing evidence on what works and what doesn’t, and using this new knowledge to change clinical practice, increase survival rates and support patients on their path to recovery.

The Midlands region has made huge strides in recent years with strong partnerships and networks like the Midlands Health Alliance. This has enabled the NIHR infrastructure hosted by many NHS trusts in the region to better co-ordinate their research programmes through expert NHS investigators and deliver so much innovation and progress. Arguably, this has never been as apparent as now, when so many of us are united in the shared global response to the COVID-19 pandemic.

The achievements of the Midlands region highlighted throughout this report are astounding. They demonstrate not only what has been accomplished to date, but the promise of what we can continue to achieve as we work together to build and strengthen our NHS-academic-industry partnerships for the benefit of our patients, today and in the future. Our shared commitment is stronger than ever and I am proud of the role the NHS continues to play in supporting this vitally important work.”

Professor Martin Levermore MBE

**CEO, Medical Devices Technology
International Limited**
Chair of Medilink Midlands



“As a focal point of life science industry in the Midlands, Medilink Midlands has played a pivotal role from the onset of COVID-19; supporting the business community by connecting them with suppliers, distributors, key NHS contacts and other like-minded businesses who were pursuing similar COVID-related goals.

This led us to set up ‘The Big Ask’ alongside the East and West Midlands’ academic health science networks (AHSNs). The Big Ask is a central repository of the needs and wants of life science businesses in the Midlands, including included the manufacture of gowns, gloves, masks and face shields, COVID-19 testing, remote consultation, mental health services and medical textiles.

There have also been some exciting developments within Medilink itself, with the ongoing creation of Medilink Midlands. The reason we decided to look to formalise the revised structure now, of all times, was the recognition that in these times of uncertainty, what businesses need more than anything is reliability and steadfastness.

We saw the opportunity to give this to the Midlands life science community by providing a united, Midlands-wide front, in the form of Medilink Midlands. This operating model will ensure there is a truly region-wide life science network operating under a single governance structure, whilst the delivery of our sub-regional contracts continue.

For us here at Medilink Midlands, lockdown and COVID-19 has been an invaluable time to revise and reflect on our current internal processes and capabilities, take stock and adjust our approach to allow us to continue to best serve the Midlands life science community.”



Midlands Engine Health

Championing and amplifying our region's world-leading strengths in Health, Medical Technologies and Life Sciences.

In recognition of the fundamental connection between health and economy, the Midlands Engine partnership has worked closely with industry, academic, health sector and public sector partners to establish Midlands Engine Health. This collaboration will be crucial as we seek to champion and expand the world-leading capabilities we have, right here in the Midlands, in Health, Medical Technologies and Life Sciences.

Exceptional progress has been made by:

- Midlands Health Alliance, to connect industry experts with investigators within the NHS to develop collaborative opportunities;
- Midlands Innovation Health, to connect the medical strengths of seven Midlands universities with industry to create a joint academic-NHS innovation environment and drive cutting-edge research and skills development.

Midlands Engine Health will underpin and expand on the extensive work already achieved by these partners, enabling close collaboration to showcase our regional strengths, such as being host to the UK's largest cluster of MedTech companies, and delivering world-leading, clinical research that is improving outcomes for patients. With proven excellence in delivery, the Midlands hosts world-class health research infrastructure in numerous disease areas.

We will identify and capitalise on new opportunities, attract international investment and accelerate sector-wide growth. We will also seek to address clinical and social care needs, with a reflection on how COVID-19 has impacted our people, places and economy.

Together we can maintain a powerful spotlight on the phenomenal capabilities and facilities our region has to offer in this field, ensuring that we maximise the benefits of innovation for our regional economy and society in general.

Authors



Midlands Innovation Health (MIH) is a research and innovation partnership that coordinates and combines the collective excellence of seven Midlands universities to deliver improved health and regional growth. Driving disruptive translational interventions and influencing nationally, MIH draws together a critical mass of innovative regional stakeholders to impact national and global health challenges using local training strengths, expertise, networks, best practice and facilities. MIH also links the Midlands-based universities within a joint academic-NHS-industry innovation environment, to push forward

research, collaboration and skills in the Midlands medical sector.

MIH partners are the Universities of Aston, Birmingham, Keele, Leicester, Loughborough, Nottingham and Warwick. MIH acts as the Health branch of Midlands Innovation, a world-class multi-disciplinary collaboration that unites the power of university research with the unique strengths of Midlands industry to drive cutting-edge research, innovation and skills development.

Alex Archibald (Project Manager) - Midlands Innovation Health

Alexandra.Archibald2@nottingham.ac.uk



Midlands Health Alliance (MHA) is an alliance between NIHR infrastructure across the Midlands including Biomedical Research Centres, Clinical Research Facilities, Clinical Research Networks and Applied Research Collaborations plus the Academic Health Science Networks.

Together, the MHA will develop: a common strategy to maximise the impact of our research, tools and approaches to clinical patient recruitment and study setup, and a clear infrastructure for seamlessly signposting our capabilities to industry. We intend to increase our voice in national and international funding opportunities and secure regional investment to the Midlands. To this end, we work alongside the Midlands Engine and Midlands Innovation Health. We will develop a shared strategy for maximising the impact of NIHR funding for clinical experimental research through agreeing priority areas that we can address collectively and put the Midlands at the heart of UK biomedical research excellence. We aim to ensure a seamless offer to make it easier and quicker for industry to work with the leading expert investigators within the NHS to harness the exciting and wide ranging opportunities in this area.

Lois Daniels (Operations Manager) - Midlands Health Alliance

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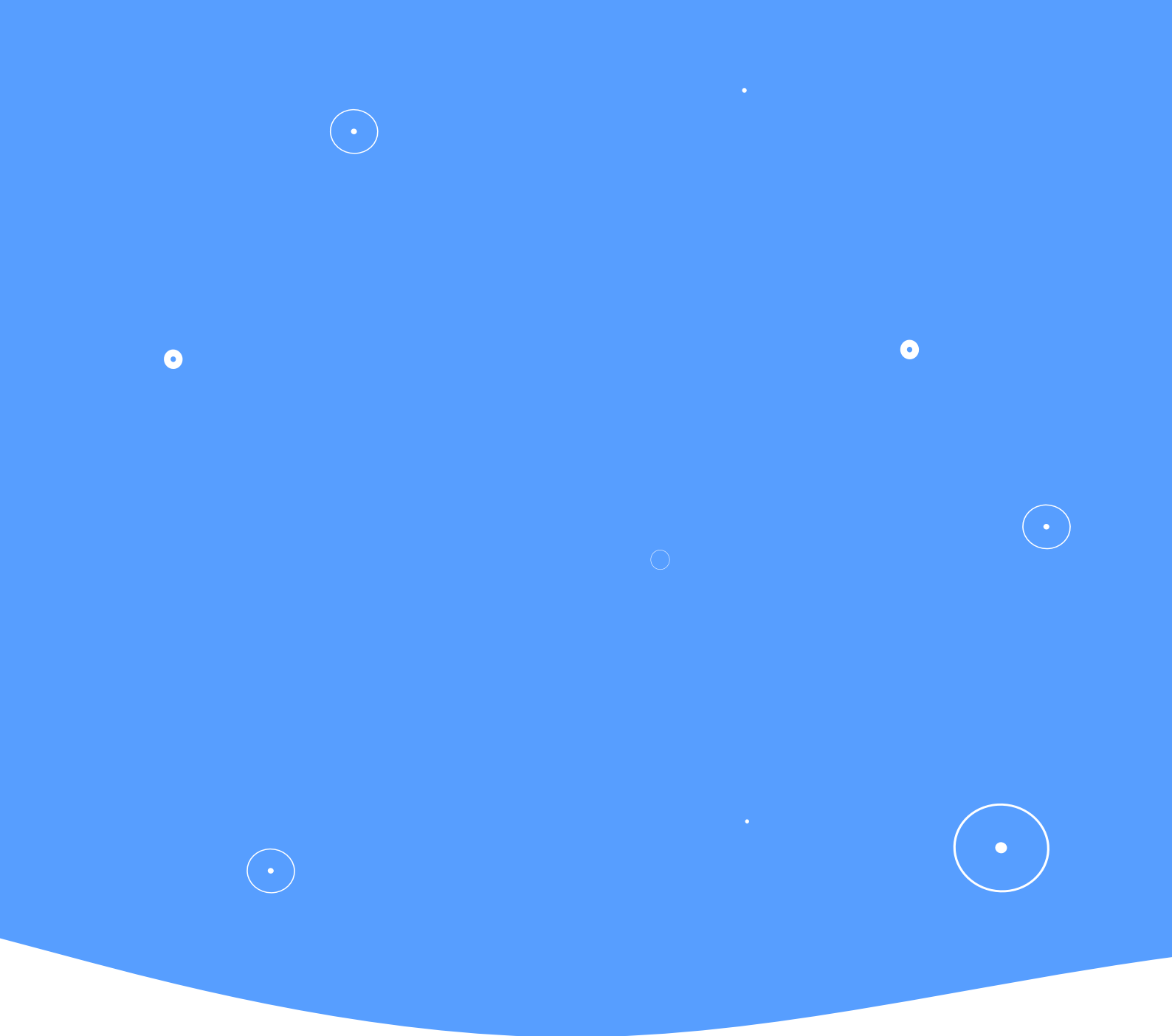
Medilink Midlands is the Midlands Life Sciences industry association, whose aim is to help companies establish, develop and grow. Its network of more than 8,000 contacts in over 1,700 organisations represents all aspects of the sector; from multi-nationals to high potential start-up companies, as well as the NHS and universities.

Working alongside the Midlands Engine and other strategic alliances, Medilink Midlands' helps stimulate additional and value-added growth of the Midlands as a prosperous community for Life Sciences.

With offices in Birmingham and Nottingham, Medilink Midlands provides specialist support to boost the region's economic output from Life Sciences.

Sam Burbage (Project Leader – Marketing) - Medilink Midlands

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Supported by:

