

# New implementation plan to deliver world-leading genomic healthcare

- Government launches implementation plan to deliver world-leading genomic healthcare to patients, improving diagnosis, treatment and prevention
- Diversity and reach of genomics set to expand through engagement and research programmes to better treat deadly diseases such as cancer

Patients across the UK will benefit from better healthcare, treatments and faster diagnosis as the government sets out how it will continue to deliver world-leading genomic healthcare.

Genomics is the study of genetic information and can help diagnose diseases earlier and more accurately, reduce some invasive procedures and enable tailored treatments. Building on the success of the 100,000 Genomes Project, our commitment is to sequence 1 million whole genomes – 500,000 genomes in the NHS and 500,000 in UK Biobank, which will transform healthcare in the UK and create jobs. In 2018 to 2019, genomics contributed £1.9 billion to our economy.

The UK's continued international leadership makes it an attractive location for private-sector investment, helping drive the country's economic recovery as we look to build back better, and deliver the government's ambition of becoming a global life sciences hub.

Working with key partners across the genomics community, the bold new [Genome UK implementation plan 2021 to 2022](#) published today sets out 27 commitments to deliver over the next year including 5 high-priority actions:

1. Faster diagnosis and treatment of cancer using genomics through partnership working between Genomics England and NHS England/Improvement to identify technologies that could be used to enable faster and more comprehensive genomic testing for cancer.
2. Whole genome sequencing for patients with rare diseases and cancer as part of the NHS Genomic Medicine Service. This builds on the success of the 100,000 Genomes Project, making the NHS the only healthcare system worldwide to routinely offer this life-changing test for earlier diagnosis.
3. Engage closely with different communities to ensure diverse datasets, through bespoke screening programmes. This will ensure everyone across the UK can benefit from genomic healthcare and our genomic databases are representative of our diverse population. This is essential for equitable access to new techniques, such as polygenic risk scores (PRS) which compares a person's risk to others with a different genetic makeup, and pharmacogenomics, which examines the role of the genome in the body's response to drugs.
4. Our Future Health, the UK's largest-ever research programme, will begin recruiting up to 5 million people representative of the UK population, to collect and link multiple sources of health information, helping

researchers to discover new ways to detect and prevent the development of diseases. This was originally established as the Accelerating Detection of Disease challenge through £79 million of UK Research and Innovation (UKRI) funding.

5. Develop global standards and policies for sharing genomic and related health data. The National Institute for Health Research, Medical Research Council and Wellcome Trust will, over the next 5 years, provide a total of £4.5 million of funding to the Global Alliance for Genomics and Health, ensuring standards are easily accessible and usable by global genomic programmes and data-sharing initiatives, placing the UK at the forefront of secure sharing of international genomic and health-related data.

Speaking in the House of Commons today, the Health and Social Care Secretary Matt Hancock said:

We will transform the UK into a life sciences superpower. We'll build on the success story of our life sciences during the pandemic which has led the world in everything from vaccine development, to finding effective treatments that work, to genomic sequencing.

Today we've published our Genome UK implementation plan for how we can build on this even further including our commitment to sequence 1 million whole genomes. Because genomics saves lives, and I'm determined the UK stays at the forefront of this vital new technology.

If we draw on ingenuity like this, we can keep up the fight against COVID-19, and also tackle the other things that stop us living healthier lives like cancer, dementia, and heart disease.

So, we're increasing UK investment in research and development bringing much more of the supply chain onshore sparing no effort to attract the brightest innovators and the best manufacturers and the benefits will be felt in Newquay, Newport, Newry and Newton Mearns.

Minister for Innovation Lord Bethell said:

The UK has a proud history in developing genetic and genomic technologies which improve the lives of patients across the country and globally.

This implementation plan demonstrates the great strides we have already made since the launch of Genome UK and outlines the actions we are taking to progress key commitments over the next year.

It is vital that we continue to maintain and develop our global leadership in this field, to realise the full potential offered by genomics.

This first phase implementation plan follows on from [Genome UK: the future of healthcare](#) published in 2020, which set out a vision to create the most advanced genomic healthcare system in the world, to deliver better healthcare at lower cost.

The plan contains ambitious England-specific and UK-wide commitments, reflecting the devolved nature of healthcare while highlighting our strengths when we work together – for example, the world-leading COVID-19 genome sequencing consortium, COG-UK.

Genomics is just one example of this government's commitment to driving forwards health innovation in the UK, which will be central to our future health resilience, the growth of our world-leading life sciences sector and improving patient care.

These commitments are important first steps to realising Genome UK's vision and ensuring everyone in the UK will benefit from genomics, by having access to predictive, preventative, and personalised healthcare.

Chris Wigley, Genomics England CEO, said:

Since the days of Darwin, Rosalind Franklin, Crick and Watson and Fred Sanger, the UK has been at the forefront of genomic science. With this publication it's exciting to see the next chapter of that story coming to life. Our ecosystem has come together as never before through the difficult times of the pandemic – and this implementation plan will allow us to build on this collaboration between all of the world-leading genomics institutions in the UK.

Professor Dame Sue Hill, NHS England Chief Scientific Officer, said:

The NHS is already a global leader in genomics and has introduced a range of new cutting-edge tests for people with rare diseases and cancer over the last year, despite the pandemic.

Genomics can truly transform the way patient care is delivered, helping to predict and prevent disease, personalise treatments and ultimately save lives.

Welsh Government Health and Social Services Minister Eluned Morgan said:

We have a strong focus on harnessing genomics technologies in order that we improve the health and prosperity of the people of Wales. We are proud of our fully established and accredited pathogen genomics service which has been, and continues to be, world leading in genomics pathogen sequencing and a key component of our response to COVID-19. We will continue to expand upon our pathogen sequencing service to ensure that Wales remains at the forefront of

this global field.

We are committed to the implementation of the ambitious and pioneering UK-wide genomics strategy and will continue to work closely across the UK to adopt a truly 4-nations approach to our delivery where possible, alongside seeking the advice and strategic direction from Genomics Partnership Wales.

## Supportive quotes

Professor Charles Swanton, Cancer Research UK's chief clinician, said:

The opportunities to apply genomics in healthcare are enormous, particularly in the detection and treatment of cancer. From diagnosing cancer much earlier, to the development and deployment of increasingly personalised medicines to treat tumours in those with early or minimal residual disease, as well as late stage cancer, genomics has the potential to make a life-saving difference.

We are pleased to see the publication of the government's first Genome UK implementation plan and the commitments it makes to use genomics in improving the lives of patients with cancer. I look forward to continued collaboration through my role on the National Genomics Board, and seeing the Genome UK vision continue to become a reality in the years to come.

Tony Wood, Senior Vice President, Medicinal Science and Technology GSK, said:

As industry leaders in applying functional genomics to improve medicine discovery and development, we welcome the publication of the Genome UK implementation plan for 2021 to 2022. The commitments in the plan, including action to develop a functional genomics initiative, will help to reinforce the important virtuous circle of genomic healthcare and research, generating new insights into the causes and mechanisms of disease and supporting the discovery of new and more successful drug targets – for the benefit of patients and the UK life sciences industry.

Nick Meade, joint interim Chief Executive of Genetic Alliance and Director of Policy, said:

The 100,000 Genomes Project has demonstrated the enormous benefits that genomic diagnosis can bring to people affected by rare disease. We are therefore especially pleased to see the announcement in the Genome UK implementation plan that the NHS Genomic Medicine Service is now rolling out whole genome sequencing

to all patients with a rare disease as part of routine care. We agree with the assessment in the Plan – this is a transformational milestone for rare disease patients – and we look forward to engaging with future Genome UK implementation.

Hugh Whittall, Director of Nuffield Council on Bioethics, said:

It is good to see that a commitment to ethical consideration is fully integrated into the implementation plan for the Genome UK strategy. Engagement with communities and early discussion of ethical challenges will be vital to the successful implementation of genomics in healthcare.

## **Background information**

[Genome UK: 2021 to 2022 implementation plan](#)

Genome UK runs over 10 years and some of its 45 commitments are long term and will be delivered through cumulative action over the coming years. Therefore, in the first phase plan, the focus has been on defining clear commitments that will be progressed in 2021 to 2022, through confirmed funding sources.

Future iterations of this plan will be aligned with the Spending Review cycles and will be developed closely with partners to ensure the objectives are delivered and value for money is provided.

This iteration of the implementation plan is largely England-focused, but some aspects are UK-wide – for example, the world-leading research programme, COVID-19 Genomics UK Consortium (COG-UK). The Office for Life Sciences will continue to work with the devolved administrations, via the National Genomics Board and other venues, to ensure continued close collaboration on the implementation of Genome UK.

It is vitally important to build and maintain trustworthiness by involving patients, the public and the NHS workforce in developing and implementing genomic healthcare, including ethical and privacy considerations. Several actions set out in the implementation plan directly support this.