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The NHS genomics population health service

From ambition to action

An expert roundtable

The 10 Year Health Plan for England, published in July 2025, outlined the UK Government's ambition for genomics to provide health benefits to the whole population. The NHS is now acting on this ambition by establishing a new genomics population health service in England[1].

The new service will be delivered through the existing NHS Genomic Medicine Service (GMS), which will expand core applications of genomics in the health system beyond rare diseases and cancers to address wider population health needs.

The aim is set for the genomics population health service to be accessible to all by 2035. This will entail a considerable increase in activity that goes far beyond the 850,000 genomic tests delivered by the NHS GMS last year.

Establishing the service at this scale will depend on a number of strategic, operational and technical achievements, as well as time and resourcing. In the meantime, those tasked with setting up the service must develop a vision and plan for:

- which clinical and public health priorities the service will address
- what roles and responsibilities it will introduce in the workforce
- what data and digital infrastructure are required
- how it will interact with other parts of the health system

Broad multidisciplinary input, as well as patient and public engagement, will be crucial to meeting the challenges of building and delivering a service that responds to population health needs at scale. While there is much interest in what the new service will offer, there is a need for clarity about how it will be delivered.

To assist NHS England to plan the new service, in March 2026 PHG convened a roundtable that brought experts in health, research and policy together with officials to identify priorities and anticipate challenges. Our aim was to align the ambitions for a genomics population health service with the actions required to make progress towards its implementation.

This report outlines actions in four key areas — testing, data and digital infrastructure, workforce, and public and patient engagement — drawing on the views expressed by stakeholders at the roundtable. It is designed to support policymakers, NHS commissioners, public health teams and healthcare professionals tasked with the development and delivery of the new service.

Priorities for implementation

On the following page, we set out the findings of the roundtable in four domains of action, relating to testing, digital infrastructure, workforce, and patient and public engagement, and prioritise actions within each domain. The following sections explain these findings in more detail.

[1] The 10 Year Health Plan is specific to England and does not apply to the devolved nations (Scotland, Wales and Northern Ireland). The findings presented in this report are therefore focused on the needs of a genomics population health service in England.

Implementation steps

	Testing	Data and digital infrastructure	Workforce	Public and patient engagement
Near-term (1-3 years) Foundation and pilots	■ Improve roll-out of ‘tier 1’ genomic tests ■ Pilot new pharmacogenomic testing ■ Assess readiness of emerging tests and omic modalities	■ Ensure genomic data are accessible in the primary care system ■ Establish data standards for genomic data	■ Expand genomic capabilities outside of specialist care ■ Foster collaboration and shared learning of genomics across primary care and public health	■ Initiate community engagement and co-design of pilots ■ Use public dialogue to inform wider development of the service
Middle-term (3-6 years) Scaling and integration	■ Evaluate introduction of PGS ■ Identify new disease areas and risk models ■ Develop clinical pathways for rollout of pre-emptive pharmacogenomic testing	■ Integrate risk models into existing clinical platforms for GP use ■ Ensure the Unified Genomic Record is functional and linked to the Single Patient Record	■ Scale up community engagement and workforce training ■ Embed dedicated ‘product champion’ roles within Neighbourhood Health Coaching Teams	■ Continue community engagement to inform effective delivery ■ Use insights from Our Future Health and Genomics England to develop approaches, including on behaviour change
Long-term (6-9 years) Full-system integration and optimisation	■ Implement new genetic tests where substantiated with clinical utility evidence ■ Integrate and continue scale-up of omic modalities	■ Scale up data collection and analysis ■ Embed continuous learning between clinical delivery and research	■ Expand service delivery to involve wider healthcare professionals ■ Integrate genomics at scale to inform all relevant healthcare interactions	■ Establish a dynamic and equitable framework for service delivery ■ Ensure the framework remains responsive to evolving public needs and future technological changes

Testing

Roll-out of specific tests should be guided by established clinical and public health priorities. It may be advantageous to focus on supporting the pathways for existing tests, such as those for BRCA1/2 genes, Lynch syndrome and Familial Hypercholesterolemia, to develop solutions to current challenges of provision, before scaling up the service and introducing novel tests.

Early opportunities to expand the service include further piloting of pharmacogenomic testing in promising clinical areas, such as mental health prescribing. This may be effective at demonstrating near-term impact and can also help to inform wider roll-out.

Evaluation

Since many genomic tests of interest to the service will be cutting-edge, evaluation will be essential to assess the maturity of different genomic tests and whether they are ready for implementation. In each case, evaluation needs to consider the test context, encompassing the specific disease, the target population, and the purpose of the test.

Successful roll-out will also require positive results from feasibility studies and health economic assessments.

Regulators and other standards-setting organisations have a vital role to play in ensuring appropriate evaluation frameworks are used, which reflect the potential scale and scope of population genomic testing.

Polygenic scores present more complex challenges for evaluation that will need to be addressed before they can be implemented (for a summary of the challenges, see our report ‘Polygenic scores and public health services’). The collaborative trial planned with Our Future Health and Neighbourhood Health Services on the use of integrated risk scores for cardiovascular disease will provide further understanding around their implementation.

Research, innovation and learning

The service will need to be alert to developments in research and innovation, as this can help guide the adoption of ambitious initiatives such as newborn genomic screening. Its design should embed processes for continuous learning upfront and position the service to inform and respond to future research. Furthermore, tests that are used in the NHS need to be continually evaluated and the resulting data should be fed back into the design and commisioning of the service, and be used to develop guidance for healthcare professionals.

Working with Genomics England on the Generation Study and Adult Population Study, as well as with Our Future Health, provides opportunities to develop this model from the outset.

The application to population health of other ‘omic’ technologies, such as transcriptomics and proteomics, shows potential alongside and in combination with genomics, and as such should be considered within the scope of the service.

Whilst genomics may provide a helpful focal point, it will be beneficial to configure the service so that it also acts as a route for the adoption and integration of innovations emerging from these domains.

Offering a test

The ultimate ambition is for the genomics population health service to be accessible to all. However, it will be important to communicate that this does not equate to a universal testing offer in which all tests are available to everyone.

The challenge will continue to be making the right test available for the right people at an appropriate time and place. Tests should only be offered where there is an associated follow-up action or intervention, and the services to enable this are provided and available to those who require them.

Testing priorities

Near-term (1-3 years)

Foundation and pilots

- Improve roll-out of established ‘tier 1’ genomic tests (e.g. for Familial Hypercholesterolemia, Lynch syndrome, BRCA1/BRCA2 genes) and assess readiness of emerging tests (e.g. newborn sequencing).
- Initiate pilots for specific pharmacogenomic testing (e.g. mental health prescribing) based on MHRA/NICE recommendations
- Assess the value of additional omic capabilities such as transcriptomics, proteins, alongside or over genomics

Middle-term (3-6 years)

Scaling and integration

- Evaluate the introduction of polygenic scores (PGS), such as PGS-informed screening for high-impact conditions (e.g., cardiovascular disease, diabetes, and certain cancers) through public health programmes
- Use data from studies such as Our Future Health and Genomics England to inform new disease areas and risk models that benefit population health
- Develop clinical pathways for rollout of pre-emptive pharmacogenomics testing

Long-term (6-9 years)

Full-system integration and optimisation

- Implement newborn genomic testing and liquid biopsy-based cancer genomics testing based on satisfactory evidence of its clinical utility
- Continue scale-up and integrate new omic capabilities based on evidence of their clinical utility

Data and digital

The genomics population health service will depend on different kinds of data, including genomic, phenotypic, family history, and environmental data, and subsequent access through a robust digital infrastructure.

A strategic approach is required to move the service from raw data acquisition to an integrated, actionable system that supports the delivery of more personalised approaches to healthcare.

Getting the foundations right

To ensure actionability across the system, the service should first focus on foundational elements: the effective collection of family history data at scale and establishing structured data standards for genomic information. These standardised data should then be embedded into existing informatic pathways and integrated into Electronic Health Records for both primary and secondary care.

The service should align with wider NHS digital infrastructure, ensuring the Unified Genomic Record is functional and linked to the Single Patient Record. System integration should support more personalised healthcare via platforms like the NHS App, and enable the integration of disease risk models incorporating genomic data directly into existing clinical platforms for GP use.

Scaling up data collection

Beyond immediate clinical delivery, the service should enable scaled-up longitudinal and population-level data collection and analysis to support effective targeting of interventions, as well as service evaluation and future research.

While many infrastructural challenges rely on wider NHS data changes, genomics can serve as a lever through which broader data sharing can be enabled across the health system.

Anticipatory governance

For long-term success, the service will need to anticipate novel data governance challenges as its scope expands and, in line with the 10 Year Health Plan, set out to embrace and leverage AI and emerging technologies to optimise digital workflows.

Data and digital priorities

Near-term (1-3 years)

Foundation and pilots

- Ensure genomic data are accessible in the primary care system, using bespoke databases if necessary for short-term genomic data access by GPs
- Establish structured data standards

Middle-term (3-6 years)

Scaling and integration

- Start integrating risk models into existing clinical platforms for GP use
- Build robust data infrastructure needed for effective care
- Ensure the Unified Genomic Record is functional and linked to the Single Patient Record for personalised health delivery via the NHS App

Long-term (6-9 years)

Full-system integration and optimisation

- Fully integrate genomic information and data into an integrated clinical workflow
- Scale up data collection and analysis to support service evaluation and longitudinal studies
- Embed continuous learning between clinical delivery and research throughout the service

Workforce

Delivering on the ambitions of the service will require significant expansion of genomic resources and expertise beyond their current concentration in specialist secondary care services and into community settings.

This will require engagement with healthcare professionals involved in both frontline delivery, such as GPs, nurses and pharmacists, and operational roles, such as healthcare scientists and public health analysts, to co-design the service.

Education

Genomics is not routinely adopted in primary care and public health so the service is likely to introduce new responsibilities for which healthcare professionals will require support.

Targeted education will be important for communicating the relevance and actionability, particularly in a preventative context where information may be more uncertain.

Leadership and product champions

Coordinated leadership across clinical genetics and public health will help to ensure coherent strategy and effective deployment of resources, as well as to identify potential gaps at an early stage.

The service may also benefit from product champions to drive the delivery of genomics for population health in specific contexts, such as in primary care, public health or neighbourhood teams.

Embedding such roles in the practical delivery of relevant services could help to promote the adoption of genomics through peer-to-peer interactions.

Workforce priorities

Near-term (1-3 years)

Foundation and pilots

- Expand genomic skills and knowledge outside of specialist care, for example into primary care (GPs, nurses, pharmacists) with appropriate capabilities and capacity for testing, as well as education and support
- Foster collaboration and shared learning across genomics, primary care and public health

Middle-term (3-6 years)

Scaling and integration

- Scale up community engagement and continue training the workforce in genomics, identifying pain points to develop further training
- Increase capacity to deliver (e.g., embed dedicated ‘product champion’ roles within Neighbourhood Health Coaching Teams, to champion genomics delivery and support new clinical pathways in primary and community care)

Long-term (6-9 years)

Full-system integration and optimisation

- Involve a wider range of healthcare professions in service delivery
- Ensure genomics is integrated at scale throughout the service and capable of informing all healthcare interactions where genomics is relevant

Patient and public engagement

For the genomics population health service to succeed, it must evolve in line with public views and expectations.

A concerted approach to engagement and deliberation is required. This should include community engagement and co-design of pilot services at a local level, as well as public dialogue to promote broader understanding and allow wider input to inform overall development of the service.

Engaging with public views on data use and access, testing purposes, and return of results will be particularly important to support the co-design of appropriate and acceptable approaches.

Sample collection and future testing

The long-term retention of genomic data, such as within the Unified Genomic Record, is one component of the wider service for which further input may be required.

This potentially separates the acquisition of genomic data, via the collection and analysis of biological samples, from the generation of specific clinically-actionable findings. It could facilitate genomic testing in different contexts and at different times without needing to acquire additional samples.

However, the prospect that the purpose of testing could be unknown at the point at which the sample is acquired would be a significant shift in practice that deserves further deliberation with regard to the potential benefits, costs and uncertainties.

Continuous patient and public engagement

As the service develops, patient and public involvement and engagement (PPIE) must continue to support the effective delivery of public health and screening programmes. This process should also contribute to understanding of the role of behaviour change in health improvement, using insights gained through Our Future Health and other population health research programmes.

PPIE priorities

Near-term (1-3 years)

Foundation and pilots

- Initiate community engagement and co-design of pilot services so that they are tailored to local population needs
- Use public dialogue to inform wider development of the service, (e.g., on risk assessment and stratification, and patient data use and access)

Middle-term (3-6 years)

Scaling and integration

- Continue community engagement to inform the effective delivery of public health and screening programmes
- Develop understanding of the role of behaviour change in population health improvements - use insights from Our Future Health and Genomics England

Long-term (6-9 years)

Full-system integration and optimisation

- Establish a dynamic framework for service delivery that ensures the service is accessible to all and delivered equitably
- Ensure the framework remains responsive to evolving public needs and future technological changes

What needs to happen next?

The configuration of the genomics population health service is still forming and will be shaped by progress in genomic tests, clinical workflow needs, and evidence from health economics and feasibility studies. As a next step, the priorities we surfaced in the workshop will need transforming into a roadmap with clearly laid out milestones, resources and evaluation indicators.

Co-developing a service delivery roadmap

The roadmap should be co-developed with diverse stakeholder groups to ensure that it takes account of relevant perspectives.

It will be important to involve public health, clinical genetics, primary and neighbourhood care, as well as patients and the public, and implementation scientists, whose expertise in scalability and sustainability can help to shape the long-term success of the service. This should clarify cross-stakeholder priorities, uncover dependencies across different components of the service, and ultimately position the service to address unmet needs and deliver benefits to the whole population.

Ensuring sufficient investment to enable service delivery

There is recognition that establishing the genomics population health service at scale by 2035 will require significant investment. The case for this will depend on strong health economics evidence that proposed interventions work.

This remains a challenge in the field as, in some instances, the benefits of population-level genomics may take decades to demonstrate. Given this, the service should also seek to harness opportunities that deliver clinical and financial benefits in the near-term – for example, by reducing adverse drug reactions through pharmacogenomic testing.

Taking a dynamic approach to service development

The service should aim to establish strong foundations and effective processes through which it can continue to evolve, rather than settle on a static framework. Therefore, a dynamic approach will be required to enable the service to respond to evolving population health needs and changes in the technological landscape.

This approach should be based on a core framework for delivery that clearly outlines how the service will operate, through whom, and the interactions between its different components.

The framework should additionally embed measures to promote equitable access and outcomes across the population, and utilise and evolve existing ethical and legal oversight mechanisms in support of this.

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