

Summary of the Delivery Plan

Pathogen genomics has formed an intrinsic part of the Genomics for Precision Medicine Strategy (2017) and the Genomics Delivery Plan for Wales (2022-25). Recognising the range of transformative activities that are underway, we have developed a Pathogen Genomics Delivery Plan for 2026-2029 that builds on the activities envisaged within the Genomics Delivery Plan for Wales (2022-2025).

The Pathogen Genomics Delivery Plan encompasses Wales' strategic approach to mainstreaming pathogen genomics across the healthcare system and builds on the successes of Welsh Pathogen Genomics to date, including world first services such as our *C. difficile* service, and the leading role that Wales played in the genomic response to the COVID-19 pandemic. Looking forward, the Pathogen Genomics Delivery Plan outlines a set of areas of activity over the next three years to enhance diagnostics, surveillance, and preparedness for future threats.

Key Themes and Objectives

1. Strategic Context and Vision

- Wales has developed world-leading pathogen genomics capabilities since 2016.
- The plan aligns with UK-wide strategies like *Genome UK* and Welsh Government's *Genomics Delivery Plan for Wales (2022–2025)* and is complimentary to Pathogen Genomics strategies in Scotland and England.
- Genomics is a critical capability for precision public health, reducing health inequalities and improving outcomes, and is an increasingly essential tool across the spectrum of healthcare and public health provided with respect to infectious disease.

2. Guiding Principles

- **Patient and public engagement:** Transparency and co-production with our patients and public is an essential part of our activities.
- **Prudence:** Working towards a better understanding of value with respect to genomics, and improvements in how evidence is used to inform and support service provision
- **Bold ambition:** Aiming to build on Welsh strengths in areas where we can provide global leadership.
- **Collaboration:** Working across NHS Wales, academia, industry, and UK partners, as part of a larger Public Health system within Wales and the wider UK.

Delivery Plan Objectives

Clinical Services

There are 11 objectives led by Public Health Wales (PHW) in the Clinical Pathogen Genomics area, including:

1. **Governance Structures:** Establish the Public Health Genomics Programme and systems for delivery and monitoring of the transformation of healthcare and public health services by pathogen genomics.
2. **Service Improvement:** Enhance existing services (e.g., HIV, TB, *C. difficile*) through engagement with our staff, service users and patients.
3. **Pandemic Preparedness:** Act upon learning from the COVID-19 pandemic and recommendations from the COVID-19 inquiry. Develop key capabilities to improve our pandemic preparedness, including metagenomics and rapid sequencing.
4. **New Services:** Undertake work to develop new genomics services that build on existing Welsh strengths in Cryptosporidium, Toxoplasma, fungal and anaerobic pathogens.
5. **Transformational Services:** Work to develop transformational new services, including, potentially in sexually transmitted infections and through close-to-patient sequencing.
6. **Surveillance:** Improve our uses of genomic data in infectious disease surveillance.
7. **ONE Health:** Collaborate across human, animal, and environmental health in Wales and the UK, providing services and expertise as part of the larger ONE Health system.
8. **UK Collaboration:** Work to better standardise approaches, collaborate and share knowledge across UK nations.
9. **International Standards:** Contribute to global best practices and data sharing.
10. **Industry Partnerships:** Foster innovation and investment, building links with industry to attract investment and support the development of new services.
11. **Cross-GPW Development:** Work to develop services and capabilities that link human and pathogen genomic data, including to support activities including chronic disease detection/management and pharmacogenomics.

Theme 3: Research and Innovation

- Expand pathogen genomics research in Wales.

- Collaborate with academia and UK public health agencies.
- Implement recommendations from the Welsh Government Genomics Research Review.

Theme 4: Enablers

- **Digital Infrastructure:** Develop shared systems for pathogen genomic data storage, analysis, and sharing within Wales and across the UK.
- **Data Sharing:** Enable UK-wide and international collaboration.
- **Ethics and Consent:** Build frameworks for responsible data use.

Monitoring and Resourcing

- Specific activities and new service development will be dependent upon available funding. Work under the delivery plan may result in the creation of business cases to request additional investment.
- Progress against the delivery plan actions will be tracked via PHW's (through the Genomics Programme) and via the GPW governance board.
- Resourcing requirements may also encompass workforce development, and reallocation of capacity dependent upon the outcomes of evaluation activities.
- Pathogen genomics workforce planning includes clinicians, bioinformaticians, genomic epidemiologists, lab staff and staff in enabling services who will need to support the delivery of genomics services.