Public Health Genomics Programme - KRIC

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GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

Partneriaeth Genomeg Cymru
Genomics Partnership Wales

Llywodraeth Cymru
Welsh Government

Introduction

- Introduction to Programme
- Achievement highlights 23/24
- Overview of Programme structure
- Activities and needs
  - Planning for a Genomics Data Unit
  - Developing a genomics digital blueprint
  - Producing a genomics research plan
  - Building external collaborations

Public Health Genomics Programme

Programme Summary

Vision
Our aim is to drive the development of genomics services from patient to population, to protect and improve health and well-being and reduce health inequalities for the people of Wales.

Role
We work as systems leader, with stakeholders from across Wales and the wider UK, to identify, evaluate and oversee the implementation of genomics practices to prevent and control infectious, chronic, environmental, and occupational diseases in Wales.

Our IMTP Objectives for 23/24			
Conduct a review of pathogen UK genomics services.	*Stand up Public Health Genomics Programme.*	*Complete the move of PenGU to Cardiff Edge.*	*Produce a Pathogen Genomics Delivery plan for Wales.*

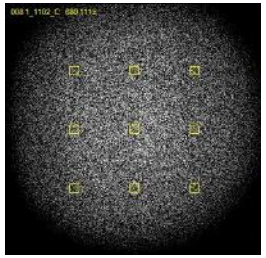
Our ambition
We want to realise a world class public health system where genomics data is routinely used across the gamut of public health activity. To achieve this, our ambition is to build and embed the capability for public health genomics in the Welsh NHS to better enable the right intervention, in the right population at the right time.

Facts and Figures

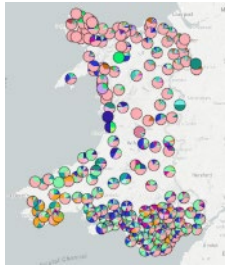
Public Health genomics activity involves more than 50 staff across PHW, distributed across the Infection and Health Protection divisions.

We operate five ISO accredited pathogen genomics services, covering diagnostics and surveillance activities.

We built and maintain open source software that has been used to generate millions of SARS-CoV-2 genomes globally.



We have the capacity to sequence over 2,000 pathogen genomes per week - more than 10x our capacity at the start of the pandemic.



Our services benefit thousands of Welsh patients each year, underpinning better diagnostics, outbreak management and surveillance.

In one year, we can generate and analyse more than 5x the amount of data held by the Library of Congress.

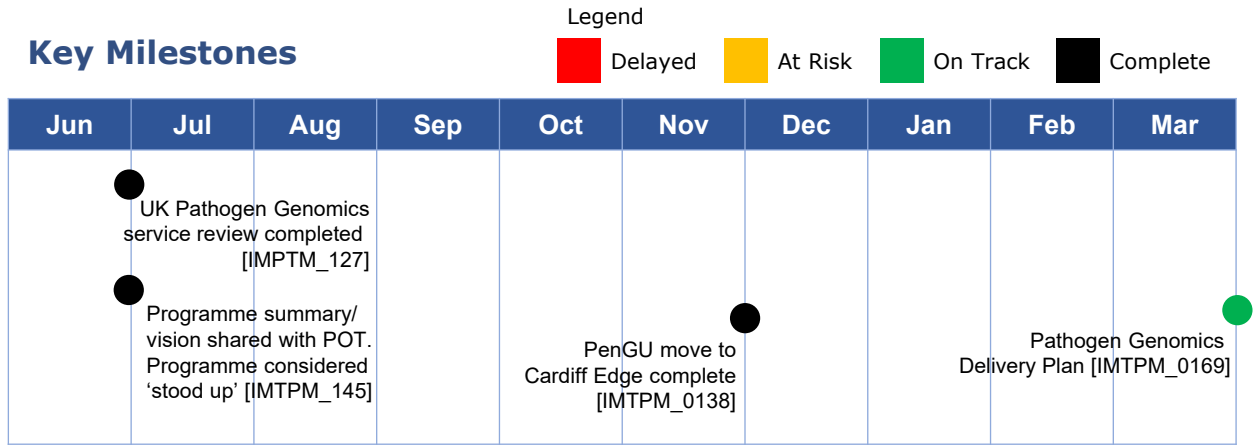
Public Health Genomics – Key Info

January 2023

Exec summary

Key points since last POT
• Reaccreditation of PenGU completed following move to Cardiff Edge
• Presentation of genomics activity at Festival of Genomics and Acceptance of paper in Nature Communications
• Work underway for Pathogen Genomics Delivery Plan, UKHSA pathogen strategy published

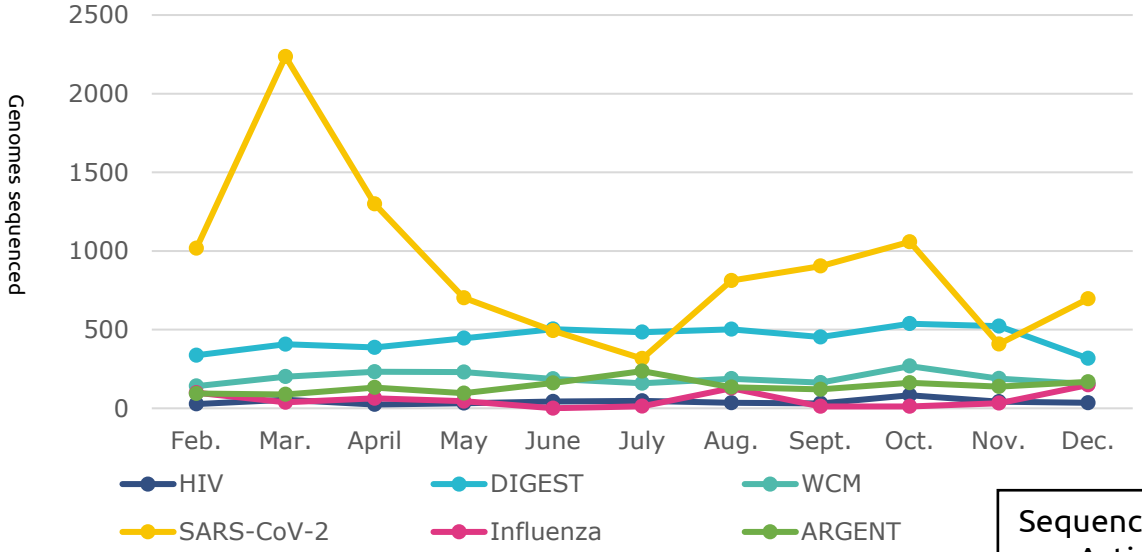
Key Milestones



Top three risks and issues

R/I	Description	RAG	Impact	Strategy	Path to Green	Trend
1.	Branding and comms/profile	A	Need to develop programme branding and engage with stakeholders within and outside of Wales	• Development of branding • Development of engagement plan • Development of website • Development of material around programme • Attendance at engagement events • Engagement with public	• Resourcing of activity, including from GPW • Commissioning of branding work • Engagement with WGP • Development and purchase of communications items • Web content development	↑
2.	IT and Data	A	Disruption due to IT issues in relation to Cardiff Edge and need to better articulate Genomics digital needs.	• Engagement with Digital staff directly. • Inclusion of IMTP objective for programme to describe its current digital estate and needs, developed with Digital.	• Strategic engagement with Digital • Operational engagement with digital design authority. • Development of appropriate documentation and policies within genomics.	→
3.	UK-wide partnerships	A	Lack of coordination in development of new services, late adoption of research outputs in Wales	• Development of academic partnership links • Development of a research plan. • Engagement with UK PHAs in key areas to develop partnerships • Inclusion of research in unit planning	• Development of research in unit planning • Development of research plan • Engagement within PHW and with Welsh Gov • Engagement with UKHSA, HPS and HSNI	→

Programme activity highlights – IN DEVELOPMENT*



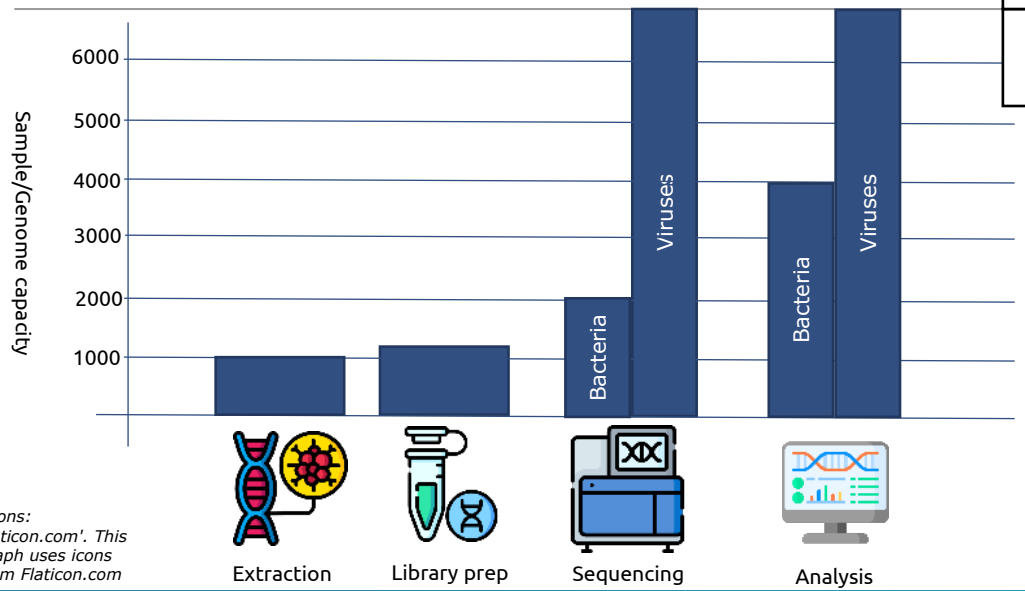
XX Reports using genomics

YY outbreaks analysed using genomics

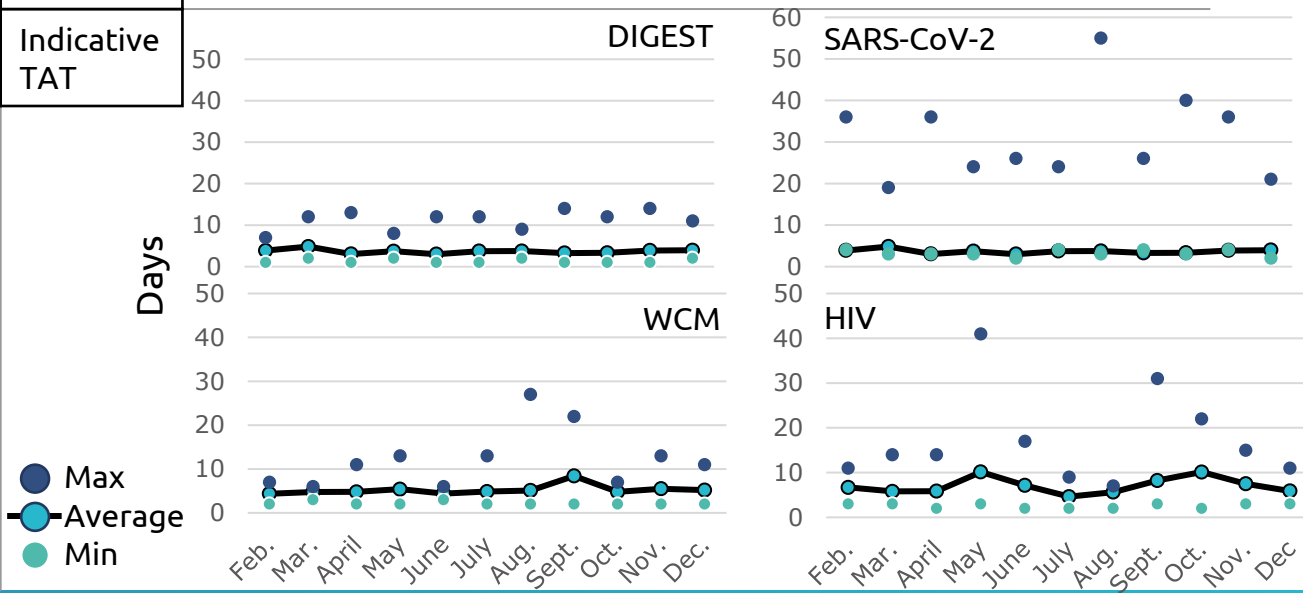
9000+ genomes shared to GISAID since January 2023

ZZ publications and guidance documents

Sequencing Activity	Epi Outputs
Lab Capacity	Indicative TAT



'Icons: Flaticon.com'. This graph uses icons from Flaticon.com



** Some of this is ripe for dashboarding*

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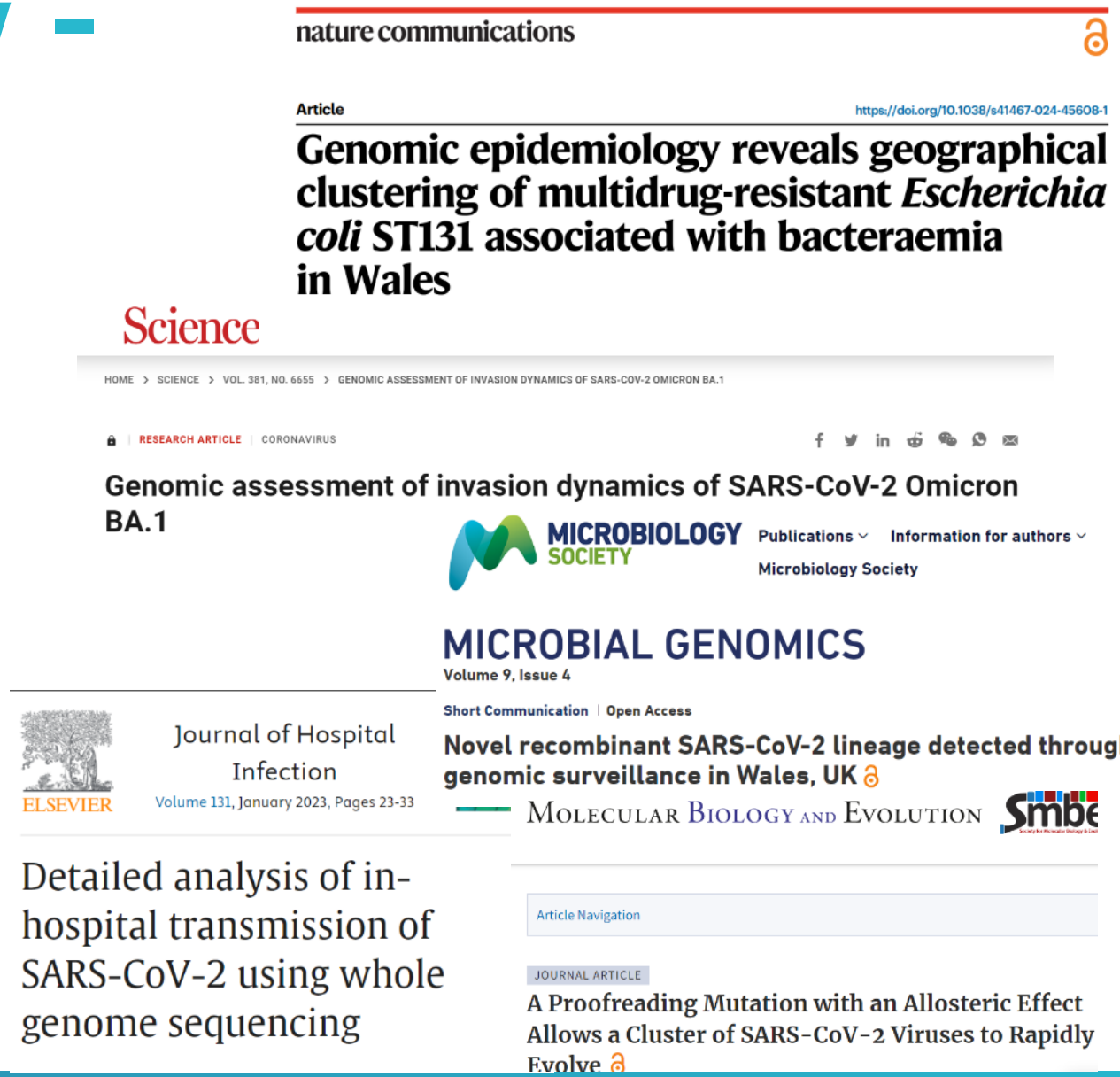
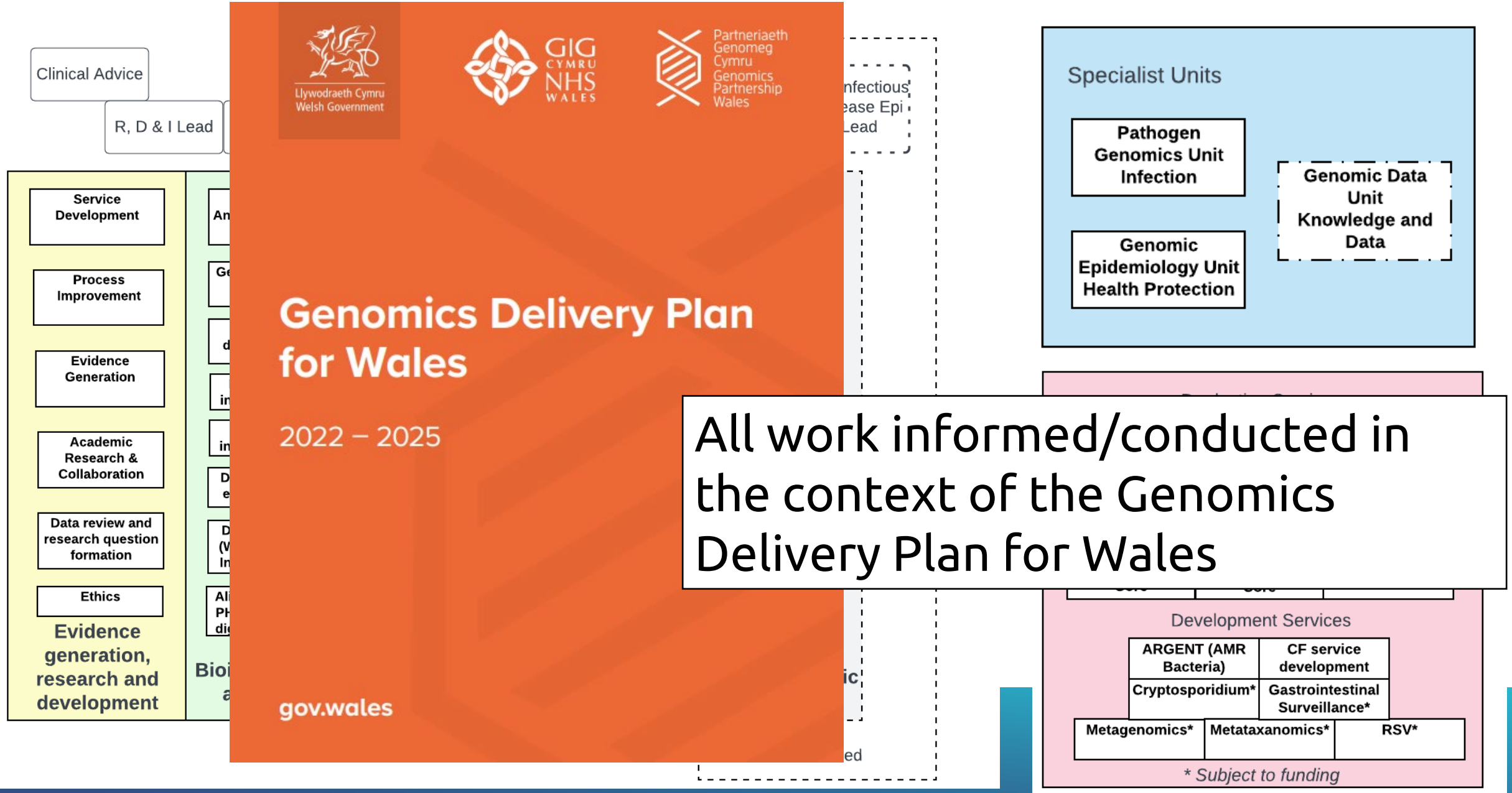
The Year in Review - highlights

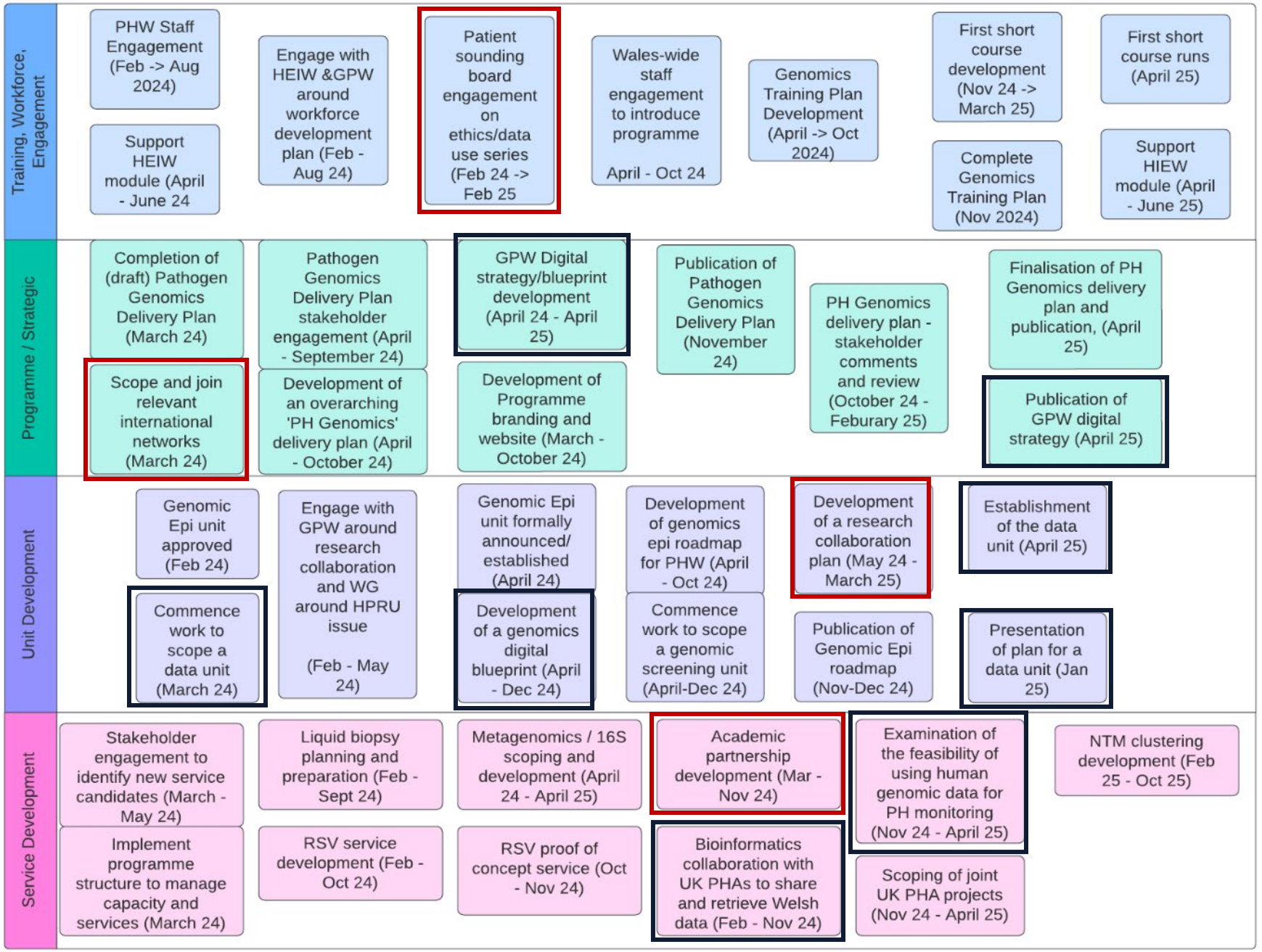
- Delivered move of PenGU to CIGC.
- Developed Programme structure, vision and ambition.
- Published five academic papers in 2023, and presented work at multiple conferences.
- We have publicly shared over 9,000 genomes since February 2023.
- We have consulted with the GPW Patient Sounding Board in relation to public health ethics and data.
- We have contributed to PHA4GE to develop international, open standards for genomic epi.
- We were a co-applicant in a research grant award for genomics research funding.



Programme Structure - reminder



All work informed/conducted in the context of the Genomics Delivery Plan for Wales



Key activities planned 24/25

- Key themes:
  - New services
  - Planning and Programme strategy
  - **Data**
  - **Research**
  - **Collaboration**

Planning for a Genomic Data Unit

- Problem/challenge:
  - Data is the fabric of the genomics enterprise.
  - Increasingly we will want to use genomics data for different things.
  - Activities such as information governance and ethics critical to genomics.
  - Makes sense to develop capability aligned to communities of practice already within the organisation.

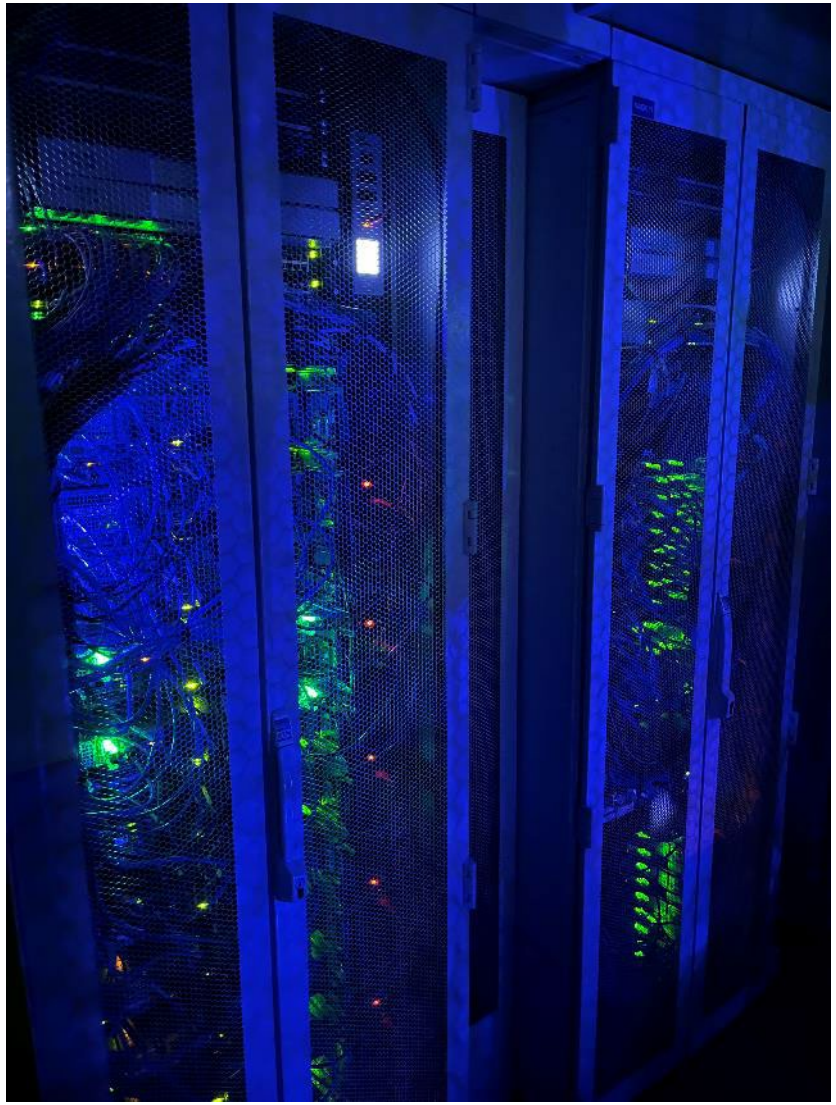
Image Credit: Alex Cagan

Planning for a Genomic Data Unit

- Solution:
  - We have a structure for the programme with core staff being bought together in Units.
  - Units sit within established line management and professional structures, but are accountable to the programme.
  - Given the critical importance of data to genomics, developing a genomic data unit is a priority.
  - The capability is needed, makes sense to build in a planned way.

Developing a genomic digital blueprint

- Context/problem:
  - Infrastructure is essential for genomics - our instruments have the potential to generate 2TB of data per week.
  - Need to develop a sustainable model for infrastructure.
  - PHW and GPW are working on digital (e.g., cloud) infrastructure, separately.
  - Potential for shadow IT and divergent systems.



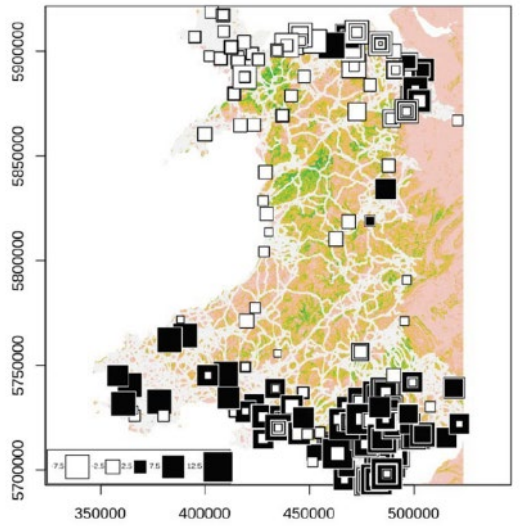
Developing a genomic digital blueprint

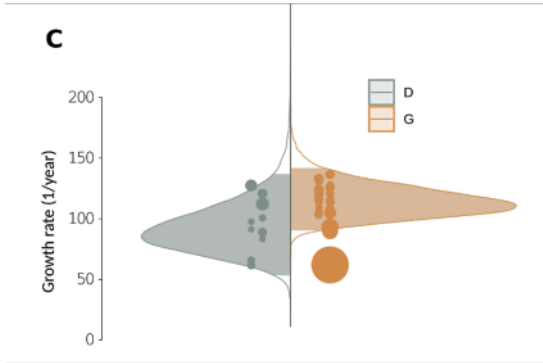
Infrastructure for All

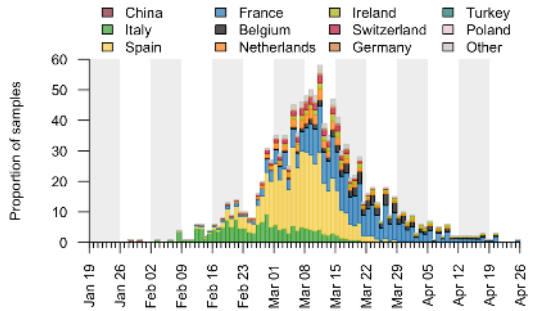
- Solution:
  - Develop a genomics data (infrastructure and software) blueprint.
    - Blueprint is something you use to build from.
  - Defines principles, processes and considerations for data/infrastructure development.
  - A starting point for genomics digital development.

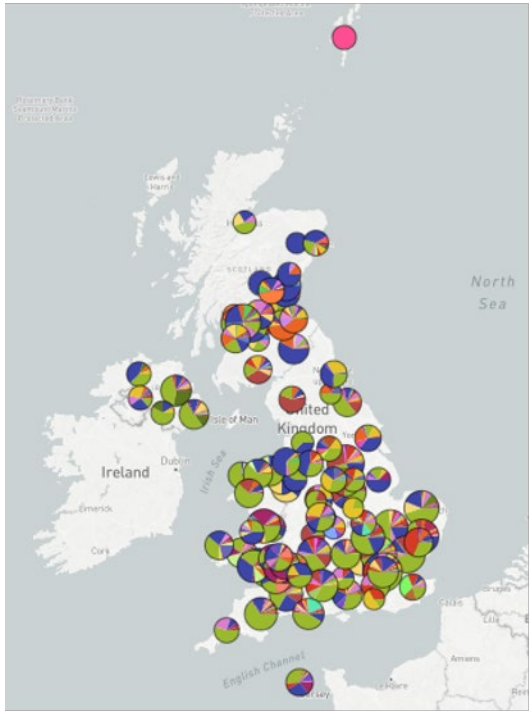
Producing a genomic research plan

- Problem:
  - Genomics is cutting edge science, with most of its uses in healthcare not known yet.
  - We have role to develop evidence and take innovation and implement it in service.
  - Research is an engine for innovation, and impacts all areas of our activity.
  - Research also provides money to build capacity while developing evidence.









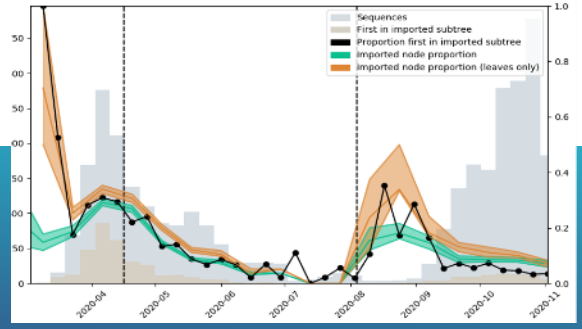


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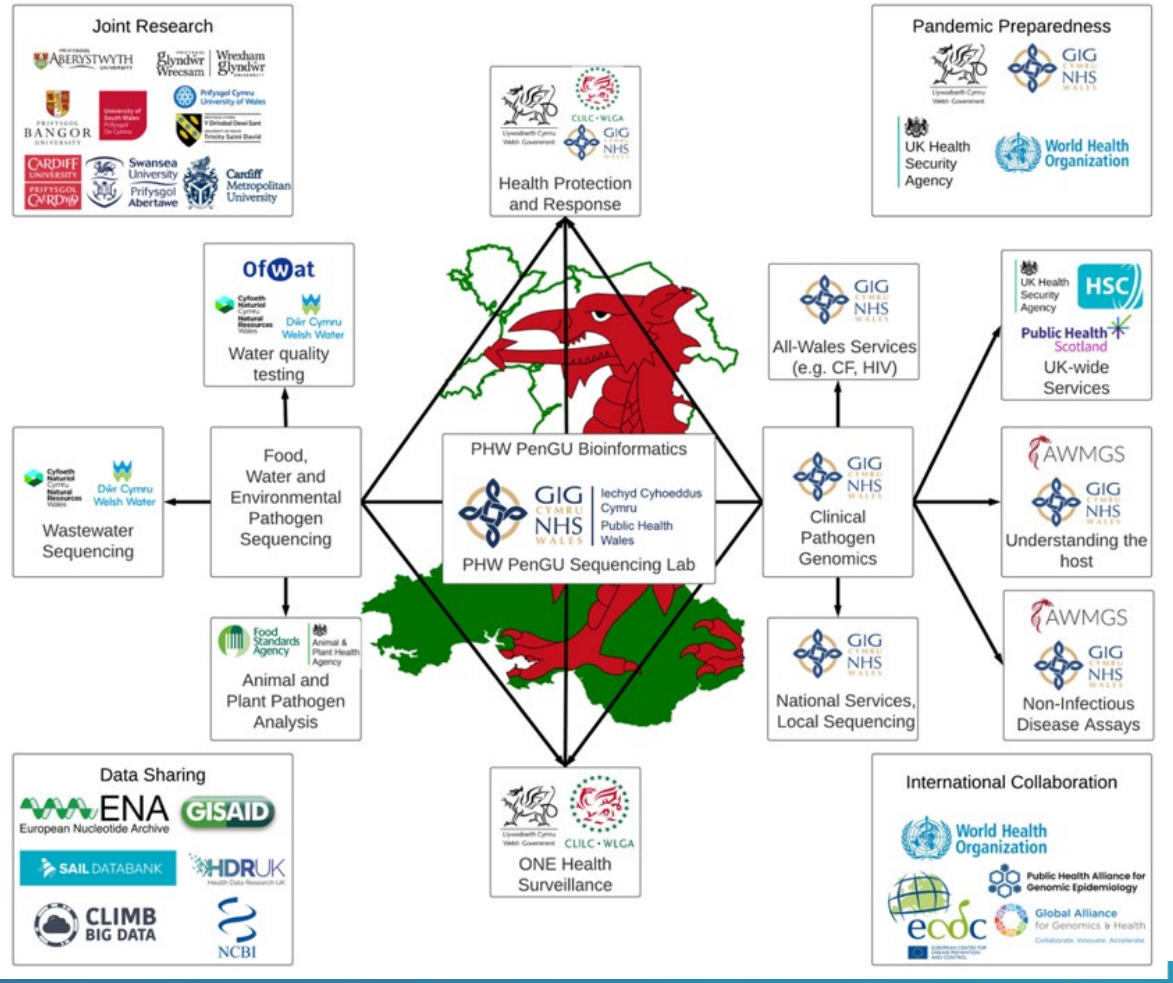
Image Credit: Alex Cagan

Building external collaborations

- Known needs:
  - Need to develop global best practice.
  - Need to develop international standards.
  - Need to improve our own processes, and avoid reinventing wheels.
  - Need to develop global genomic communities of practice.
  - Need to ensure we have access to academic experts/advice.

Building external collaborations



- Next steps:
  - Joining established networks;
    - Engagement with WHO/IPSN
    - Engagement with GA4GH
    - Engagement with UKMFC
  - Engaging to identify ways that we could engage with external activities (e.g., HPRUs).
  - Engaging within the HEI sector in Wales to develop academic partnerships.
  - Engaging around human genomics activity.

Conclusion

- 23/24 was spent developing the programme.
- Research and data considerations are now critical, and we have identified a set of activities for the coming year.
- We ask for advice and support to further develop these critical elements of work.
- We are very keen to involve staff from outside HPSS asap.