GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

Deep Dive: Infection Division

04/02/2025

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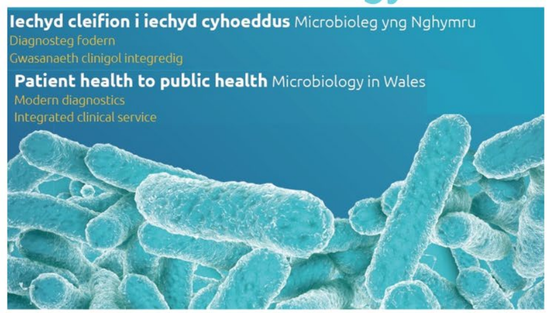
Background Slides

Background Information

INFECTION Division Aims/Vision/Strategy



Vision	Objective
An excellent clinically-focussed service delivered for all of Wales using state-of-the-art technology, in fit-for-purpose facilities by a motivated, competent and confident multi-professional workforce.	To enable the wider health system to prevent/reduce harm to individuals and the population from infection by providing specialist clinical and diagnostic knowledge and expertise.

2

- Clinical Infectious Diseases (Cardiff & Swansea)
  - ~1,440 ward consults/year in Cardiff
  - Direct care for 400 people living with HIV
- Clinical Microbiology Service
  - >44,000 consults/year across the Network
- Diagnostic Service
  - 2.1 million specimens/year

- Annual Budget ~ £54 million
- Budgeted establishment – 701 wte

Clinical Service

PHW – blended multi-professional Clinical Teams

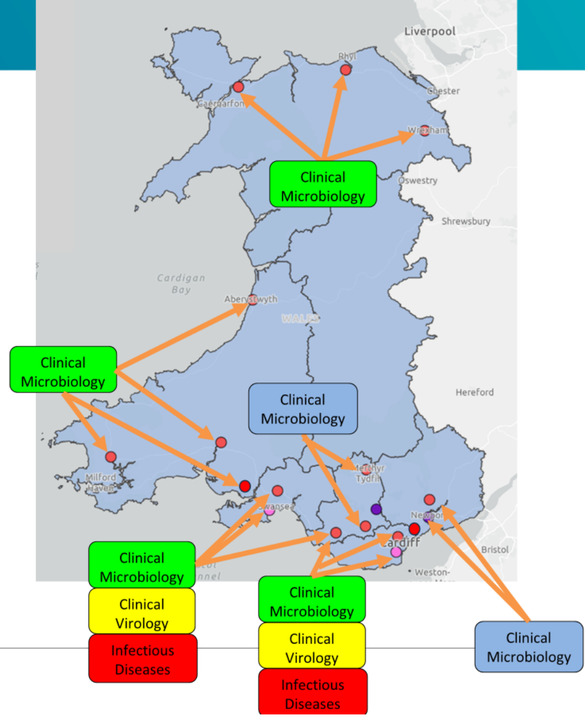
- Medical Consultants
- Medical Trainees
- Specialty/Specialist Grades (CESR)
- Consultant Clinical Scientists
- Trainee Clinical Scientists (HSST/STP)
- Advanced Nurse Practitioner
- Clinical Liaison Biomedical Scientists
- Physician Associates

- Microbiology
- Virology
- Infectious Diseases
- ID/Micro
- Virology/Micro
- ID/Virology
- Specialist & Reference services

2018 – 22.6 consultants
2024 – team of 74

Clinical Microbiology — non-PHW

- Conventional consultant service (inc Locums)



Diagnostic Service

Rapid Testing — **PHW**

- Rapid full Respiratory Testing
- Blood Culture incubators and rapid BCID
- Rapid Tests for CPO, *C.difficile*, MRSA, VRE and Norovirus,
- Urinary antigen

Micro Diagnostic & Rapid Testing

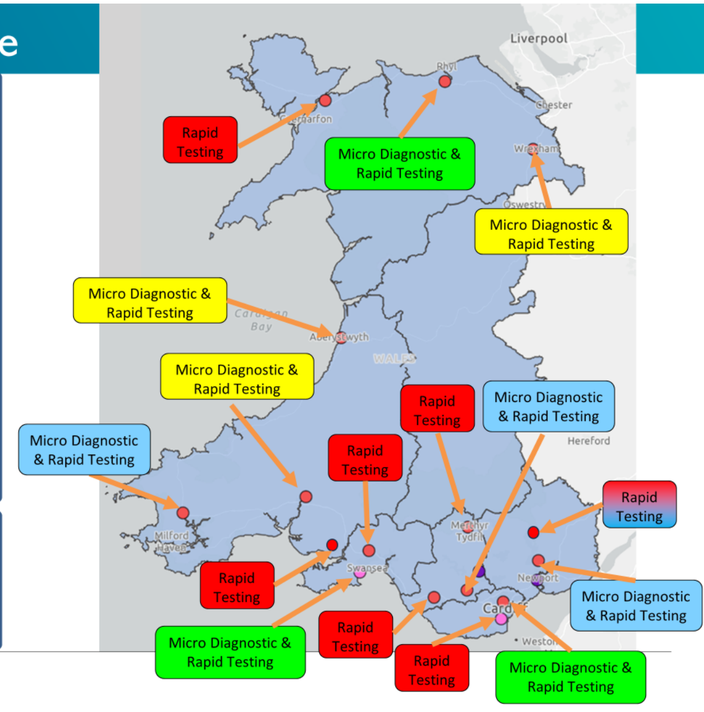
- Local Laboratories
- Microbiology service including Category 3 facilities

Micro Diagnostic & Rapid Testing

- Regional Laboratories
- Full Microbiology service including Category 3 facilities
- Virology Services

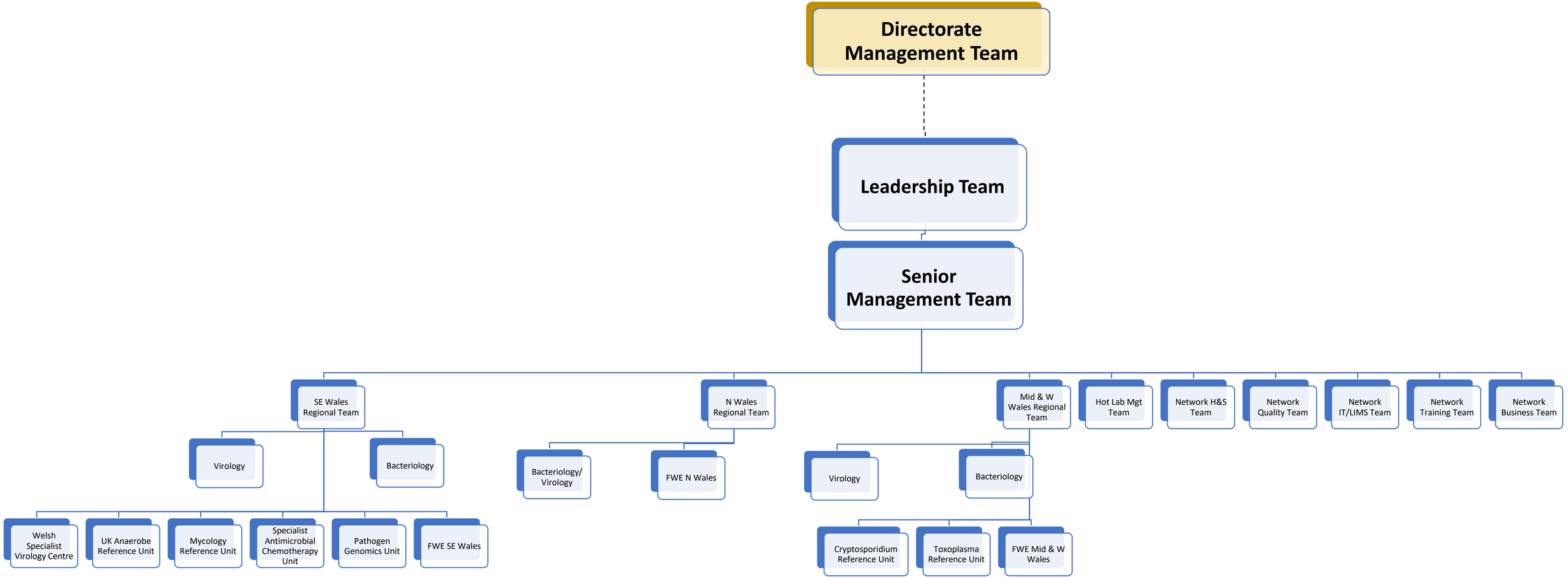
Micro Diagnostic & Rapid Testing — non-PHW

- Microbiology service including Category 3 facilities
- Limited Virology Services



Governance and Accountability Arrangements

Overview



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Committee Slides

Presenter –
Robin HOWE

25th November 2025

Key Achievements

Rapid Testing Closer to the Patient – 'Hot' Labs in all Labs

- 2018/19 - Rapid Respiratory Molecular Testing initial roll-out in 7 laboratories
- 2020/21 - 6 'Hot Labs' funded by WG for rapid respiratory testing plus alert organism screening and blood culture processing
- 2023 – development of rapid testing repertoire across all acute hospitals in Wales

Key Achievements

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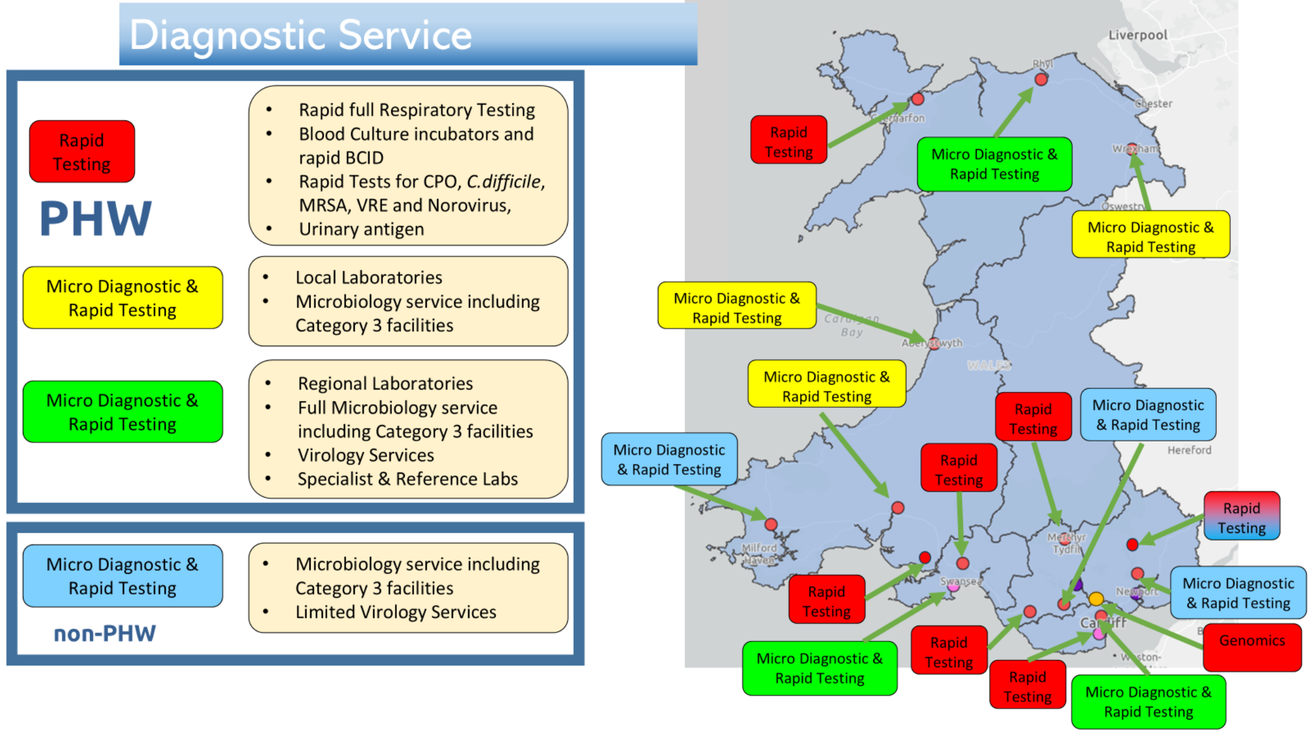
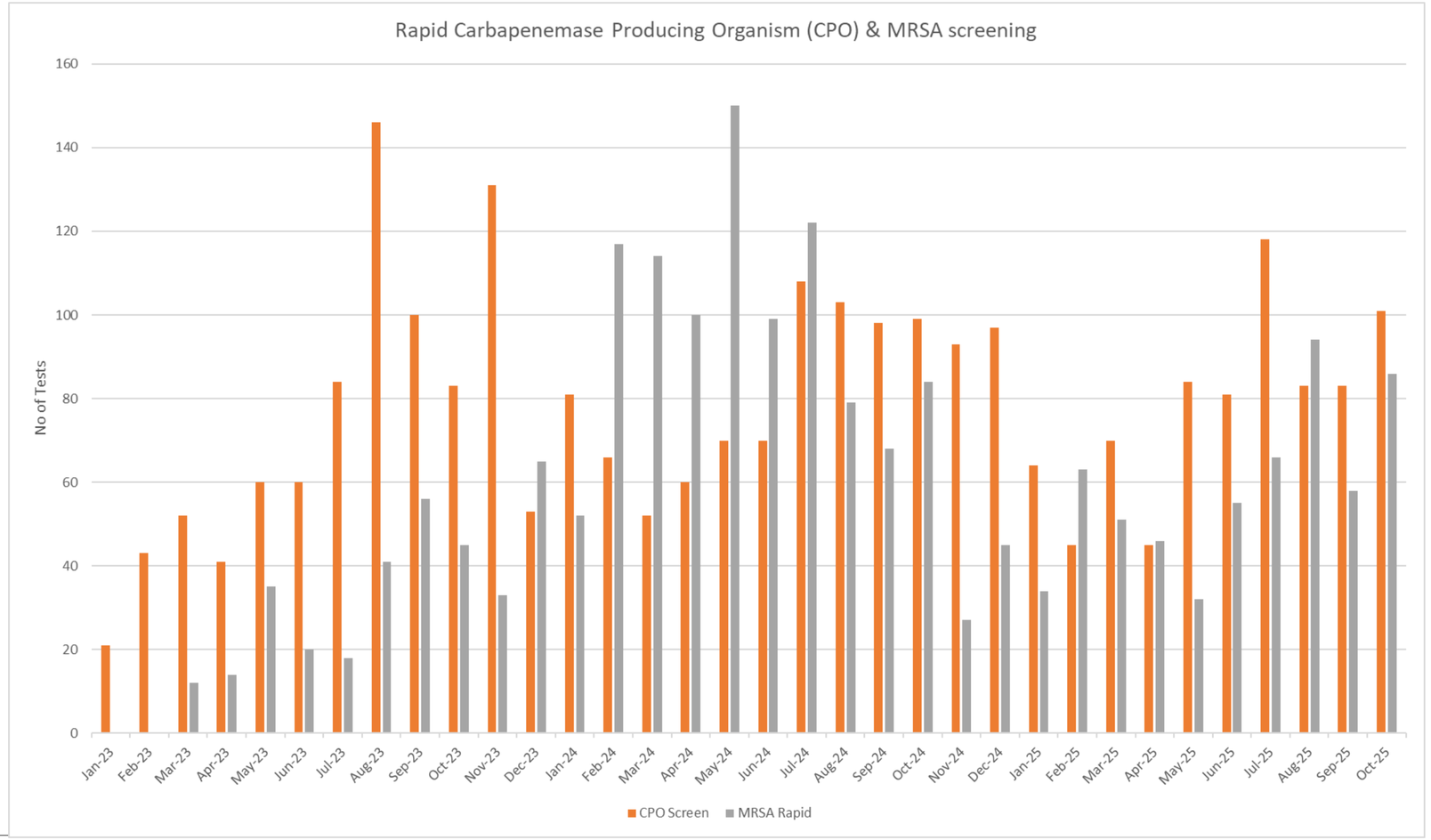


Key Achievements

Rapid Testing Closer to the Patient – 'Hot' Labs in all Labs

- Close to the Patient
- Rapid Testing
  - Rapid Diagnosis & Treatment
  - Facilitates patient flow



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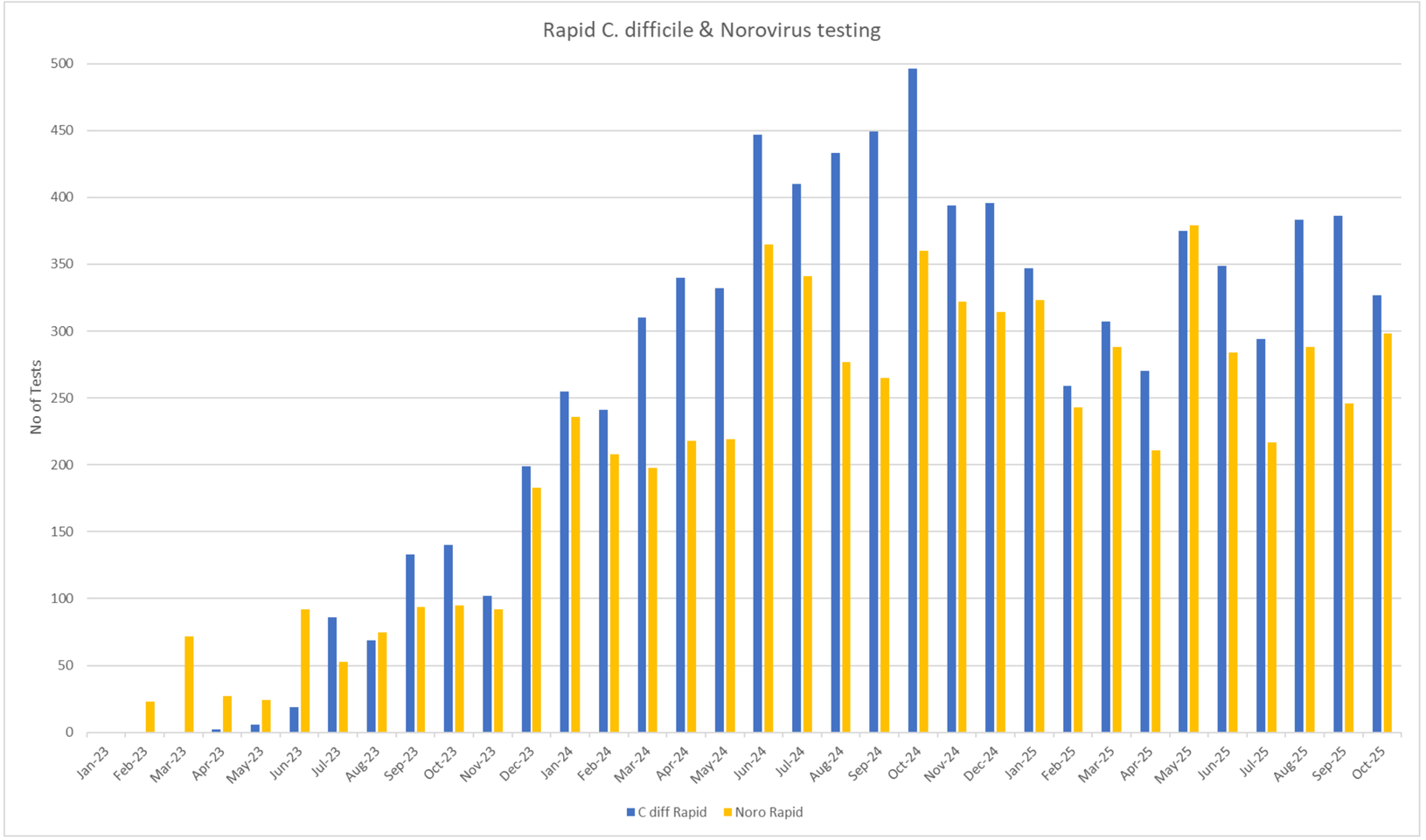

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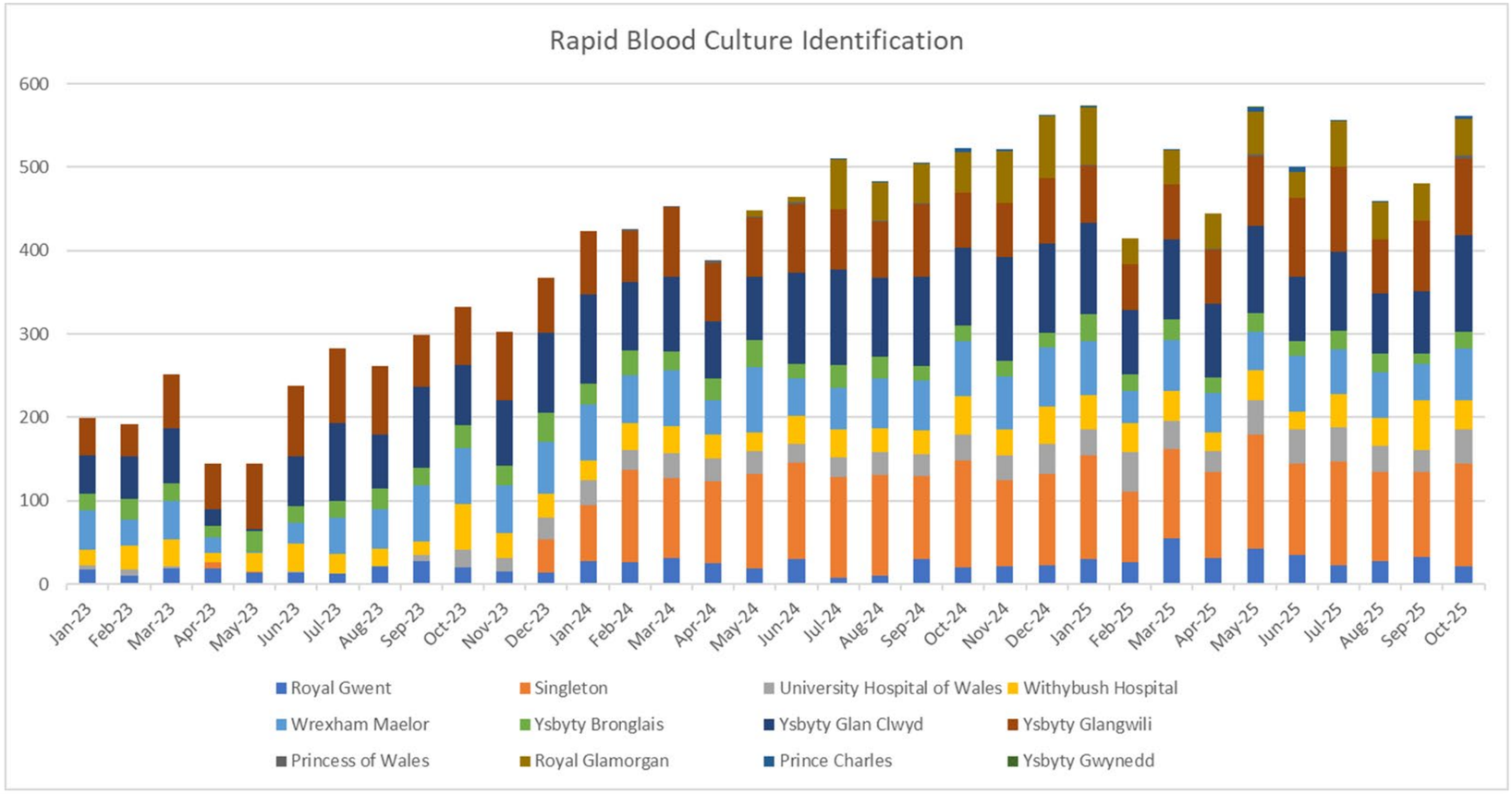


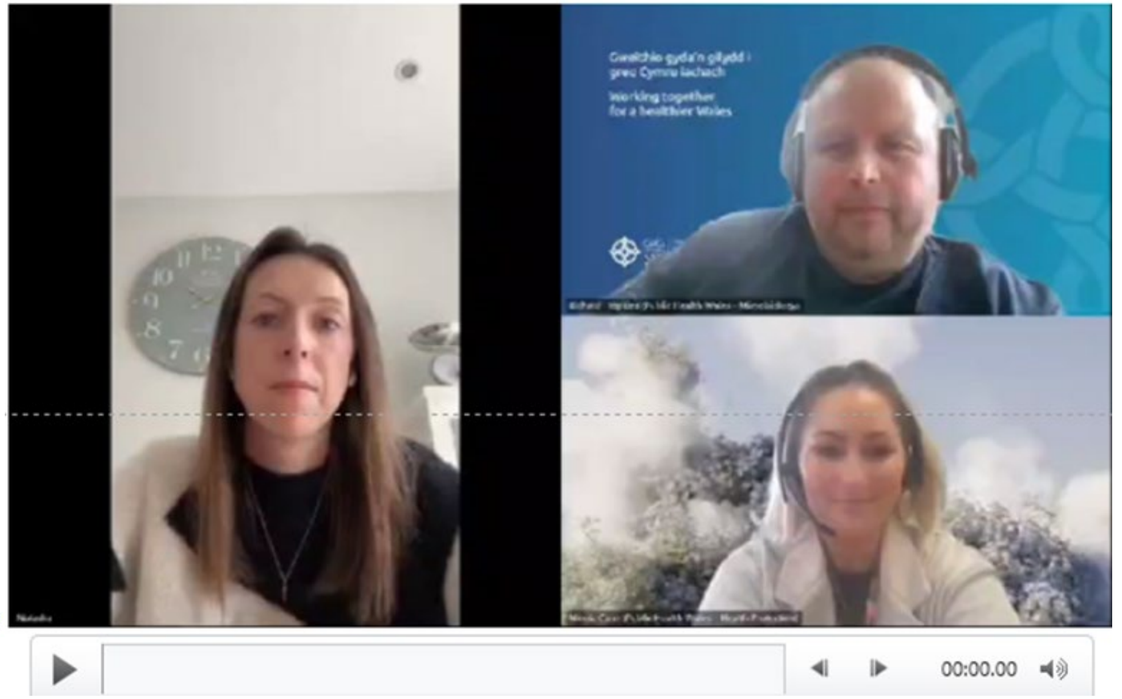
Key Achievements

Rapid Testing Closer to the Patient – 'Hot' Labs in all Labs

- Patient NG 30yr female, unwell postpartum.
  - BC set taken 1/2/24 14:00
  - Bottles received in Singleton 1/2/24 15:25
  - Bottles loaded onto analyser 1/2/24 15:30
  - Bottles flagged positive 2/2/24 00:24. Bottles unloaded by 24/7 team at Singleton, gram performed GPC ?strep in pairs and short chains.
  - Rapid ID method (sepsityper) undertaken with other positive BC's 2/2/24 01:51. Result Streptococcus pyogenes 2.28 A+++

```
Sepsityper Blood Culture Identification platform has given a positive result suggesting
the presence of Streptococcus pyogenes. This is a CE marked test, although still under
evaluation in the laboratory, and outside our accredited scope of testing. Please consider
this result in the context of the patient's clinical state and discuss with Microbiology
if any concerns.
```

  - Sensitivity on Streptococcus Pyogenes available at 19:00 on 2/2/24
  - Total time from bottle flagging positive to sensitivity available = 18.5hrs



Invasive Group A Streptococcal infection
Knee, wrist and perineum affected
Rapid treatment
Rapid Health Protection management
Discharged ITU 2/3/24
(no contacts affected)

Key Achievements

Rapid Testing Closer to the Patient – 'Hot' Labs in all Labs

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Key Achievements

Value-Based Healthcare

Value-Based Healthcare Workstream

Wound samples
Ear samples
Yeast identification
Genital samples
Urine AST

Pre-analytical
Analytical
Post-analytical

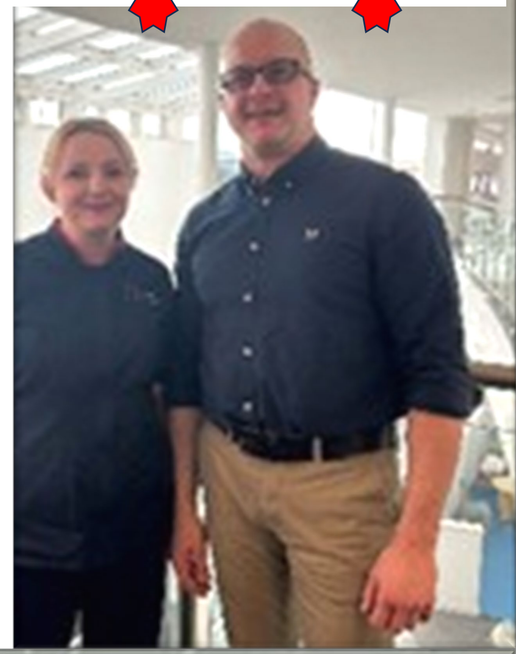
Key Achievements

Value-Based Healthcare- Microbiology in Wound Care

Building a Collaborative Community

- **ALL WALES WOUND AWARENESS GROUP (AWWAG):**
  - Webinars, case discussions, peer support;
  - Accessible to remote and rural wound care providers.

- **MULTI-PROFESSIONAL WOUND CARE COLLABORATIVE:**
  - Process mapping of the patient journeys across Wales;
  - Identifying best practice;
  - Standardisation and data collection;
  - Driving quality improvement and research.



Key Achievements

Value-Based Healthcare- Microbiology in Wound Care

Challenge	Action	Impact
Inconsistent wound swab practice	Shadowed frontline teams	Strengthened microbiology-clinical alignment
Lack of standardised guidance	Developed bilingual infographics	Reduced unnecessary sampling, improved stewardship
Limited microbiology education	Created ESR & Learning Wales course	Accessible training across care settings

Key Achievements

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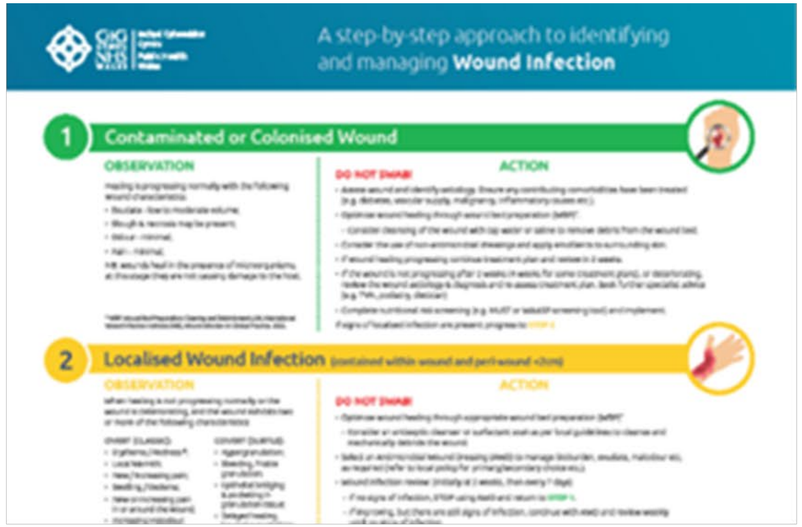

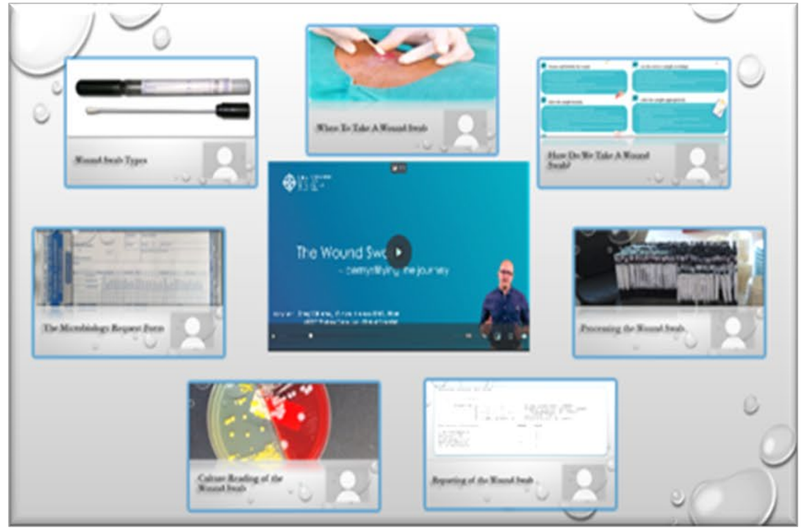

Key Achievements

Value-Based Healthcare- Microbiology in Wound Care

Why it Matters

- Standardisation of wound care practice
- Equality of patient care across Wales
- Improved microbiology-clinical communication
- Empowered staff through accessible education
- Aligned with NHS Wales priorities: quality, equity, innovation

"This initiative shows how listening, collaborating, and translating best practice into accessible education can drive meaningful service improvement — for the benefit of all staff and patients.“ – Greg Williams, Clinical Liaison BMS.

Key Achievements

POCT – Point Of Care Testing for BBV

Currently leading on two Welsh Government initiatives:

1) HIV POCT service implementation in Sexual Health Clinics offering PrEP across Wales.

2) Hepatitis C Virus (HCV) POCT service implementation and upscaling of testing in various community settings across Wales.

National PHW Point of Care Testing (POCT) Team, based at Wales Specialist Virology Centre (WSVC)

The team provide:

- BBV/POCT service implementation and oversight from a quality assurance perspective.
- Mass Blood Borne Virus(BBV) screening, including rapid POCT for Hepatitis C (High Intensity Test and Treat sessions (HITTs)).
- Rapid referral into specialist services and support with patient engagement.
- Educational sessions/training to upskill and implement BBV/POCT services.
- Feedback to the Health Board elimination groups to adopt and implement appropriate strategies designed to facilitate elimination.

LOUISE DAVIES (Senior Biomedical Scientist and National POCT Lead)

MORGAN CUTLAN (National Point of Care Testing Practitioner)

RYAN DAVIES (National Point of Care Testing Practitioner)

Key Achievements

POCT – Point Of Care Testing for BBV

Welsh Government remains committed to eliminating viral hepatitis as a public health threat by 2030

PHW have been charged with supporting the delivery of these goals. POCT plays an important role in achieving elimination though the implementation and application of rapid POCT services across Wales.

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Key Achievements

POCT – Point Of Care Testing for BBV

- **HIV POCT in Sexual Health Clinics that offer PrEP:**
  Implemented in 4 sites- C&V (Cardiff Royal Infirmary) and BCUHB (Wrexham, Rhyl and Bangor).
  Rapid 'HIV POCT' allows patient rapid access to PrEP medication at their initial appointment- improving the patient experience and reducing pressures on clinic times.

- **Mobile POCT pathway (two-tiered) in C&V and ABUHB:**
  Operated by third sector staff. Implementation and oversight provided by PHW POCT Team.

- **Two –tiered prison-based Hepatitis C POCT pathway:**
  Implemented in 3 prisons estates:

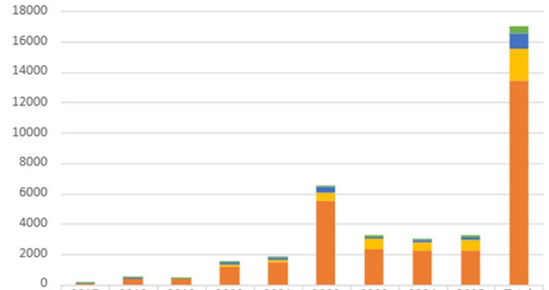
Step 1.
OraSure, OraQuick HCV

Antibody POCT (20mins)

Step 2.
Cepheid, GeneXpert HCV viral

load PCR POCT (60 mins)

The Volume of Point of Care Tests Performed in Wales (2017 - 2025)



	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
ACTIVE HCV PCR INFECTIONS	6	20	15	50	39	120	124	100	84	474
ANTIBODY POCT REACTIVE	6	54	35	125	138	387	119	156	167	1020
CEPHEID	0	0	0	190	141	517	713	558	692	2119
POCT	28	392	354	1139	1461	5525	2297	2224	2271	13420

POCT CEPHEID ANTIBODY POCT REACTIVE ACTIVE HCV PCR INFECTIONS

Key Achievements

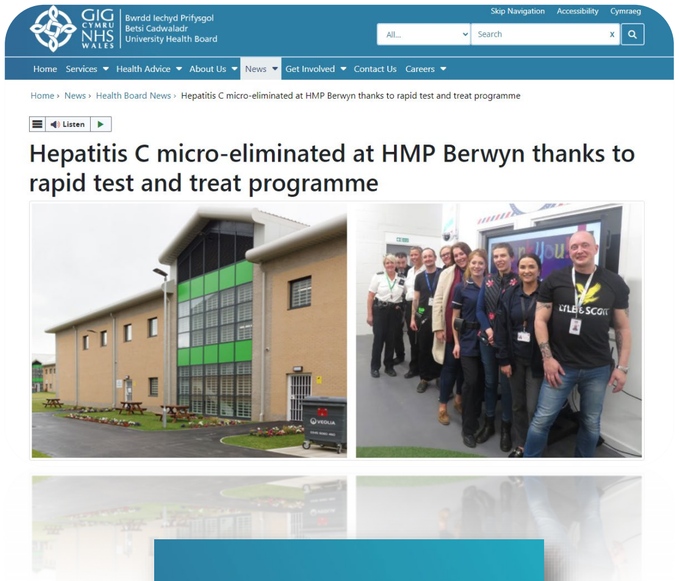
POCT – Point Of Care Testing for BBV

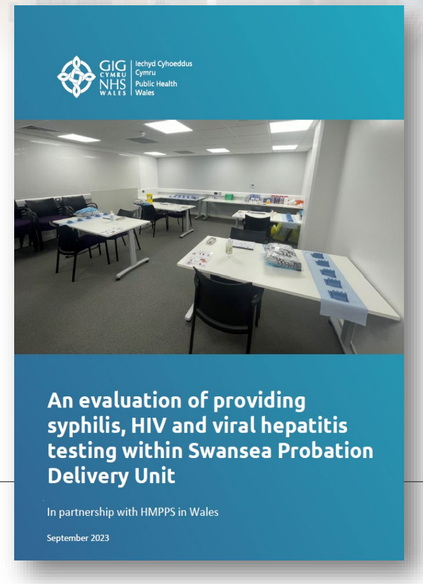
POCT SUCCESSES

- **PRISON:**
  - HMP, Berwyn (largest prison in UK, housing ~2100 men) announced micro-elimination on 28th Feb 24'.
  - *Alongside colleagues from BCUHB, the Hepatitis C Trust, We (PHW) were awarded the 'NHS Wales 2024 award for team culture' which recognised our multi-disciplinary team working to achieve micro-elimination at HMP Berwyn, the UK's largest prison.*
- **COMMUNITY:**
  - **POCT/BBV outreach at HM Probation, Swansea:** This was the first time BBV testing services had been available in this type of setting within the UK. 439 pts. were tested over 18 working days. Of the 439 tested, 56% has no evidence of ever being tested for BBV within NHS Wales records. Infections identified: 6 HCV, 1 HIV and 2 syphilis. Since this project similar undertakings have been conducted in other probation setting across Wales.

  - **Minority Ethnic Community POCT/BBV outreach event, Cardiff City Stadium:** Allowed us access to groups at risk of Hepatitis B and C (those from ethnic minority backgrounds with close links to high prevalence countries). 96 pts. were tested during the one day event. A pt. user experience evaluation was performed with very positive feedback received.

  - **Community Drug and Alcohol Team, POCT/BBV outreach:** Testing at 5 CDAT sites in CTMUHB. 553 pts. tested over a 32-day period. 40% of all clients tested. 17% antibody positivity- 10 active Hepatitis C infections identified. Appointment letter system used for the first time- 84% attendance linked to appointment letter.





Key Achievements

Molecular Diagnosis of Septic Arthritis

Conventional process – 24-48 hours

- Rapid testing
  - Identification & provisional resistance in 1 hour)
- Identification of fastidious organisms
- Identification of resistance

- Kit cost ~£140 vs ~£10 conventional
  - System savings from early diagnosis & treatment

BIOFIRE® FILMARRAY® TORCH

39 molecular targets

- Gram positive bacteria
- Gram negative Bacteria
- Yeasts
- Antimicrobial resistance genes

Panel Menu

The BIOFIRE® Joint Infection (JI) Panel Menu

Gram-Positive Bacteria

- *Anaerococcus prevotii/vaginalis*
- *Clostridium perfringens*
- *Cutibacterium avidum/granulosum*
- *Enterococcus faecalis*
- *Enterococcus faecium*
- *Finegoldia magna*
- *Parvimonas micra*
- *Peptoniphilus*
- *Peptostreptococcus anaerobius*
- *Staphylococcus aureus*
- *Staphylococcus lugdunensis*
- *Streptococcus* spp.
  - *Streptococcus agalactiae*
  - *Streptococcus pneumoniae*
  - *Streptococcus pyogenes*

Gram-Negative Bacteria

- *Bacteroides fragilis*
- *Citrobacter*
- *Enterobacter cloacae complex*
- *Escherichia coli*
- *Haemophilus influenzae*
- *Kingella kingae*
- *Klebsiella aerogenes*
- *Klebsiella pneumoniae group*
- *Morganella morganii*
- *Neisseria gonorrhoeae*
- *Proteus* spp.
- *Pseudomonas aeruginosa*
- *Salmonella* spp.
- *Serratia marcescens*

Yeast

- *Candida* spp.
  - *Candida albicans*

Antimicrobial Resistance Genes

Carbapenemases
- IMP
- KPC
- NDM
- OXA-48-like
- VIM

ESBL
- CTX-M

Methicillin Resistance
- *mecA/C* and MREJ (MRSA)

Vancomycin Resistance
- *vanA/B*

Key Achievements

Molecular Diagnosis of Septic Arthritis

Case Study

An 18 month old child presented with a limp following a coryzal illness. Initially thought to have a reactive (non-infective) arthritis due to him being relatively well and afebrile, his symptoms persisted, and he developed a large hip effusion. This was subsequently washed out in theatre and the same-day Biofire JI test was positive for *Kingella kingae*, a pathogen consistent with his presentation.

Subsequent extended cultures available 10 days later were negative as is common for this fastidious organism. The early positive Biofire JI result enabled targeted antibiotic therapy and an early oral antibiotic switch facilitating discharge from hospital.

The positive test result also increased confidence in the diagnosis for both the parents and the surgeon and allowed a specific follow-up plan to be actioned.

'In T&O we have found the Biofire extremely useful and it has helped us to make prompt management decisions.
In the scenario of a possible septic arthritis in a native joint versus the possibility of acute gout (or both!) the Biofire result has allowed us to make a decision regarding surgical intervention for infection or injecting a joint with steroid for gout, which almost always allows us to promptly discharge a patient home and decrease the burden on bed pressures.
These patients are obviously always followed up in OPC and the formal C&S results are reviewed.'

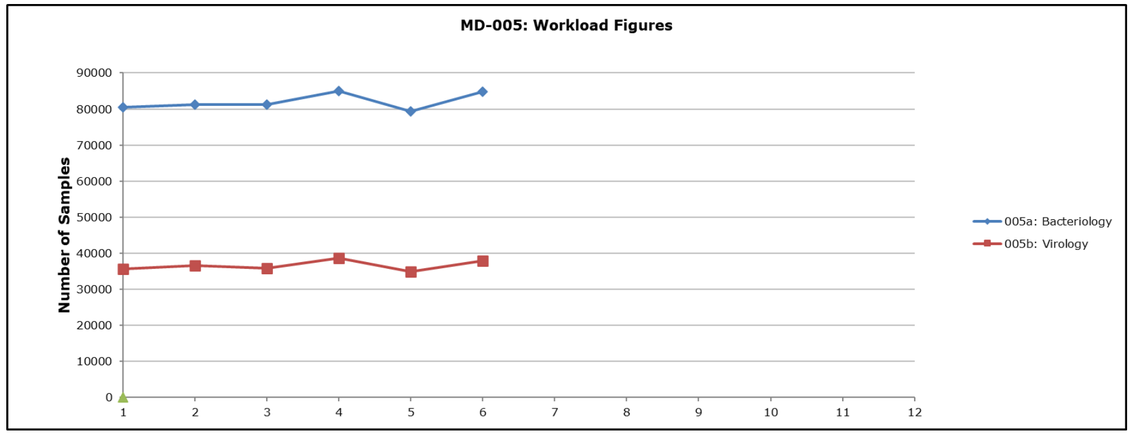
Consultant Trauma and Orthopaedics

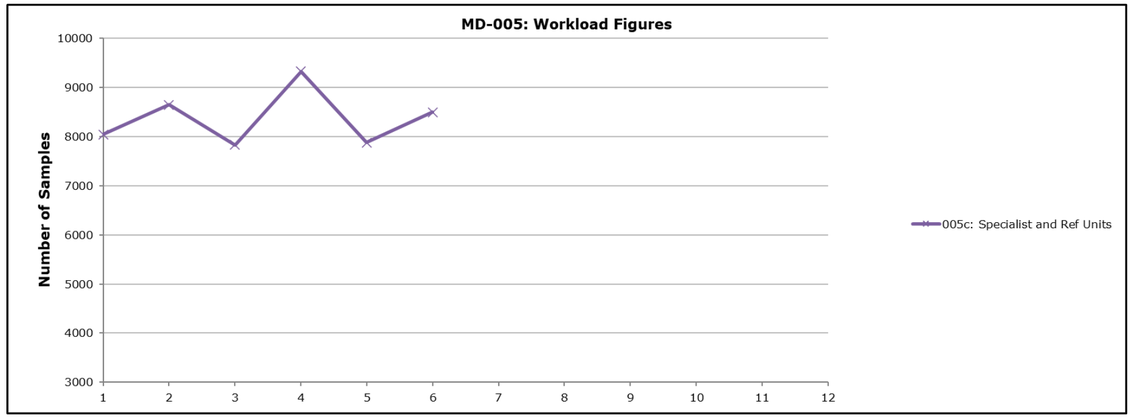
"The use of Biofire has definitely improved our diagnostic yield with regards to the treatment of Paediatric MSK infection. The detection of Kingella kingae (a common pathogen in paediatric MSKI) has always been hindered by infrastructure (previously needing a send-away test) and now we have the means to detect and treat early with confidence. This in the long run I am sure will translate into reduced intravenous therapy duration and thereby reduced inpatient stay.

Paediatric Consultant Trauma and Orthopaedics

Performance

Overview



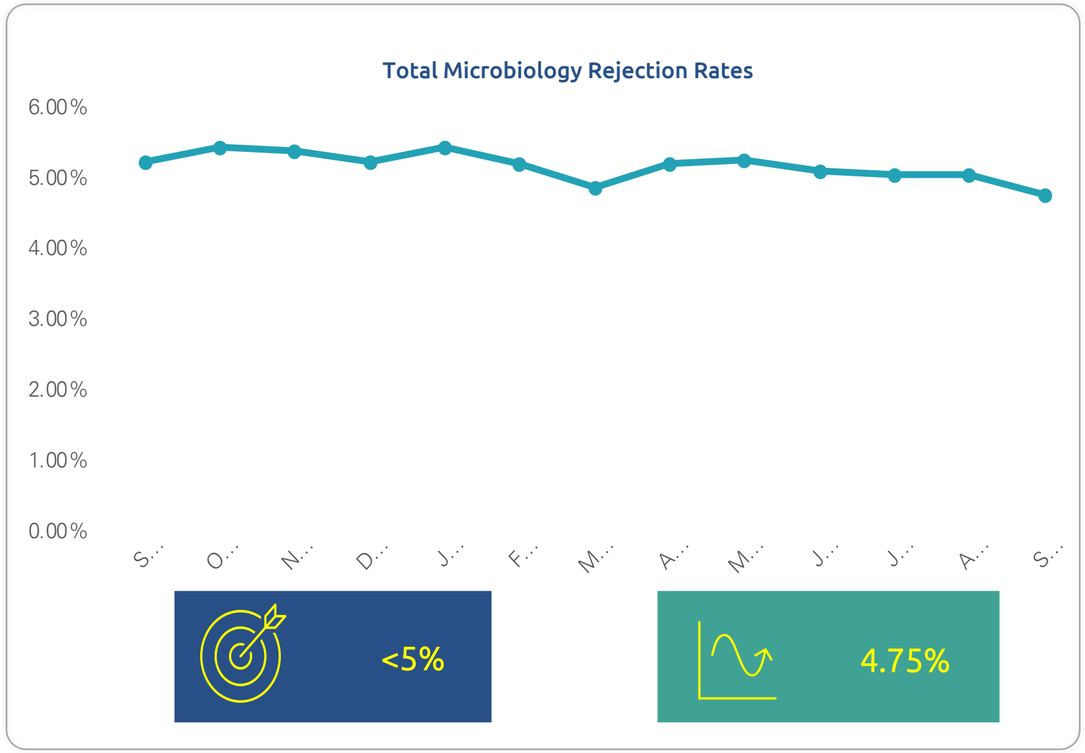


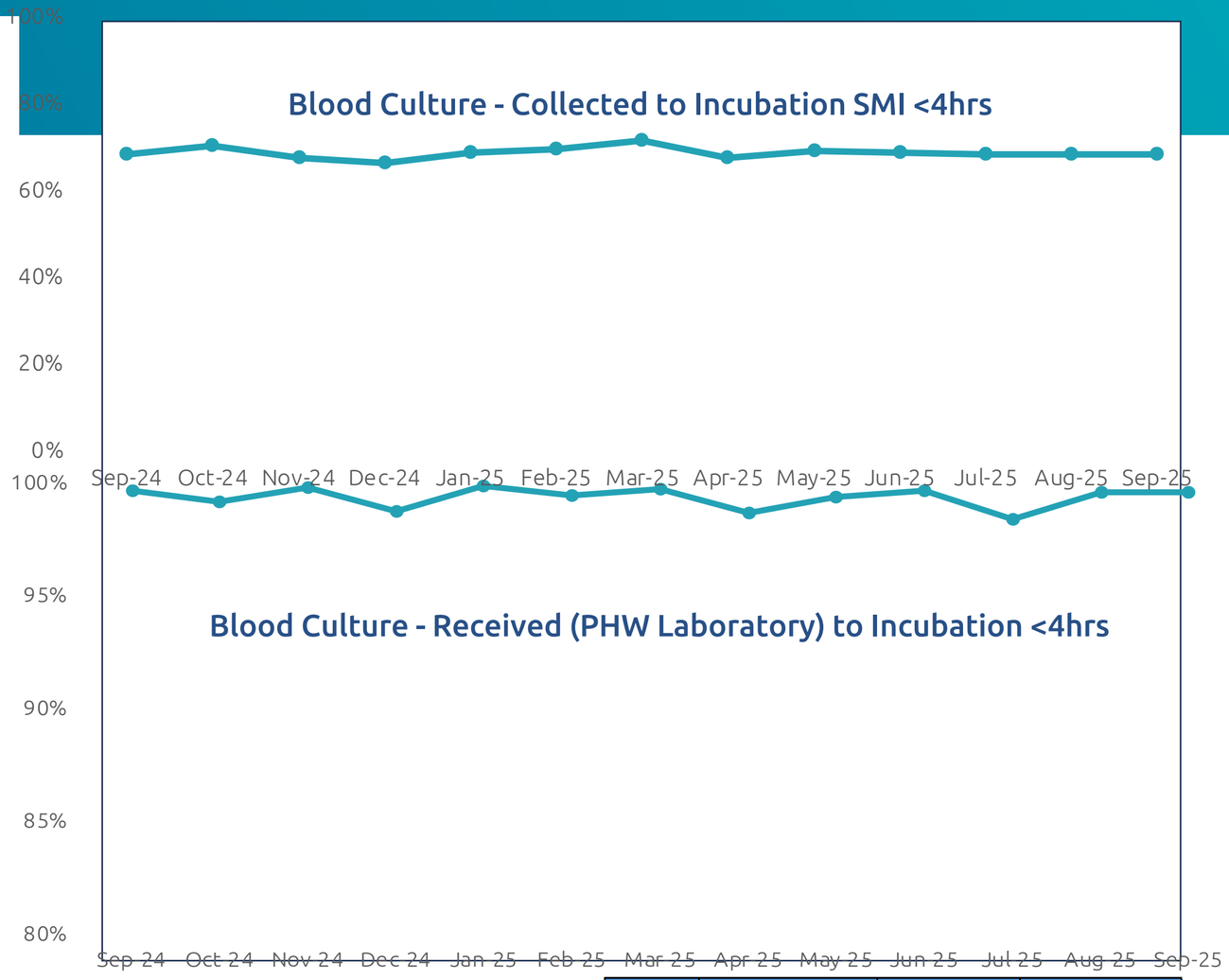
MD-002: Turnaround Time - % Compliance				
2020-2021	Quarter 1	Quarter 2	Quarter 3	Quarter 4
002a: Bacteriology	94	94		
002b: Virology	99	100		
002c: Specialist and Reference Units	99	99		
002d: Food, Water and Environmental	98	99		

MD-001: EQA Performance												
2020-2021	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
001a: Bacteriology	98	97	99	97	98	97						
001b: Virology	98	100	94	96	97	92						
001c: Specialist and Reference units	99	90	100	100	100	100						
001d: Food, Water and Environmental			99			98						

Performance

Trust Insights





Developing performance metrics focused on Blood Cultures to support improved Sepsis Care

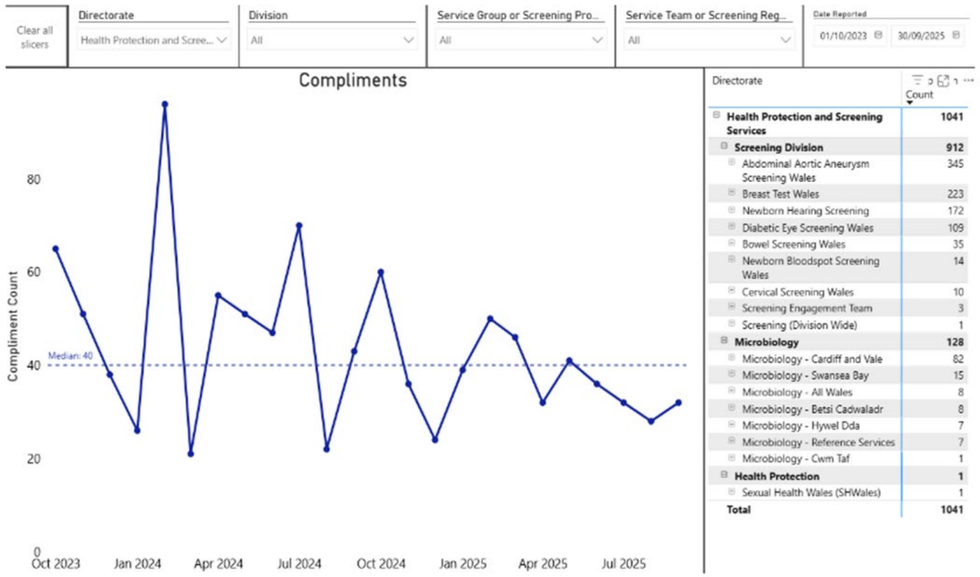
Optimal Blood Culture Volume 8-10mL

Health Board	Hospital	No of BC	Mean Volume
CTMUHB	R Glamorgan	708	8.5
	Princess of Wales	1,004	8.4
	Prince Charles	2,270	8.3
SBUHB	Morriston	6,850	7.5
	Singleton	1,432	7.0
HDUHB	Glangwili	3,051	6.7
	Bronglais	1,978	6.7
SBUHB	Neath Port Talbot	257	5.8
CAVUHB	UHW	11,770	5.6
	Llanelli	1,374	5.2
Velindre	Velindre	765	4.3
CAVUHB	Llandough	1,191	4.3

Performance

Complaints/Compliments

Compliments 1 Oct 23 – 30 Sep 25

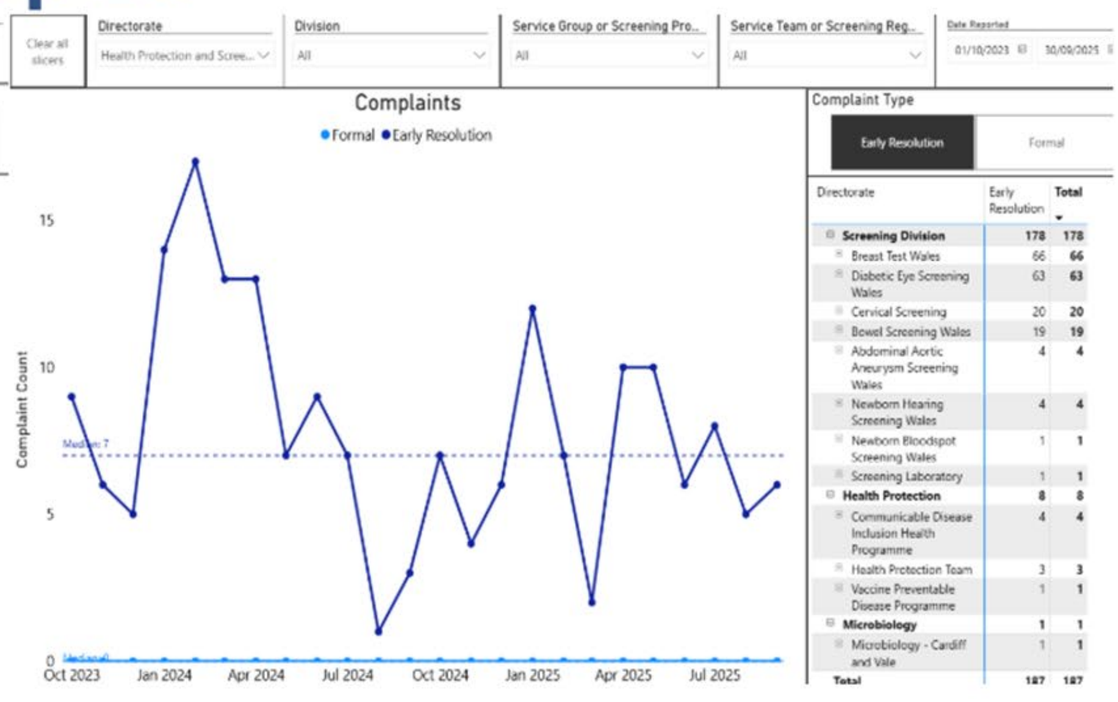


Directorate	Count
Health Protection and Screening Services	**1041**
Screening Division	**912**
Abdominal Aortic Aneurysm Screening Wales	345
Breast Test Wales	223
Newborn Hearing Screening	172
Diabetic Eye Screening Wales	109
Bowel Screening Wales	35
Newborn Bloodspot Screening Wales	14
Cervical Screening Wales	10
Screening Engagement Team	3
Screening (Division Wide)	1
Microbiology	**128**
Microbiology - Cardiff and Vale	82
Microbiology - Swansea Bay	15
Microbiology - All Wales	8
Microbiology - Betsi Cadwaladr	8
Microbiology - Hywel Dda	7
Microbiology - Reference Services	7
Microbiology - Cwm Taf	1
Health Protection	**1**
Sexual Health Wales (SHWales)	1
Total	**1041**

Complaints 1 Oct 23 – 30 Sep 25

Complaint Type: Early Resolution | **Formal**

Directorate	Formal	Total
Health Protection and Screening Services	**67**	**67**
Screening Division	**58**	**58**
Diabetic Eye Screening Wales	23	**23**
Breast Test Wales	22	**22**
Bowel Screening Wales	7	**7**
Cervical Screening	5	**5**
Screening Laboratory	1	**1**
Microbiology	**5**	**5**
Microbiology - Betsi Cadwaladr	2	**2**
Microbiology - Cardiff and Vale	2	**2**
Microbiology - Swansea Bay	1	**1**
Health Protection	**4**	**4**
Environmental Health Protection	2	**2**
Communicable Disease Inclusion Health Programme	1	**1**
Training and Guidance	1	**1**
Total	**67**	**67**



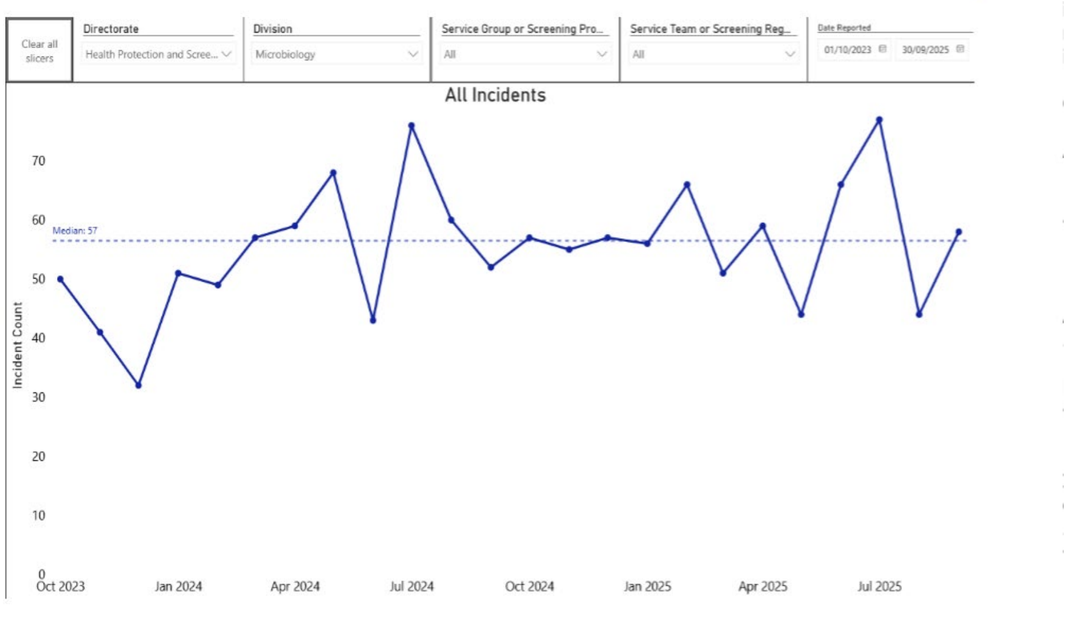
Complaint Type: **Early Resolution** | Formal

Directorate	Early Resolution	Total
Screening Division	**178**	**178**
Breast Test Wales	66	**66**
Diabetic Eye Screening Wales	63	**63**
Cervical Screening	20	**20**
Bowel Screening Wales	19	**19**
Abdominal Aortic Aneurysm Screening Wales	4	**4**
Newborn Hearing Screening Wales	4	**4**
Newborn Bloodspot Screening Wales	1	**1**
Screening Laboratory	1	**1**
Health Protection	**8**	**8**
Communicable Disease Inclusion Health Programme	4	**4**
Health Protection Team	3	**3**
Vaccine Preventable Disease Programme	1	**1**
Microbiology	**1**	**1**
Microbiology - Cardiff and Vale	1	**1**
Total	**187**	**187**

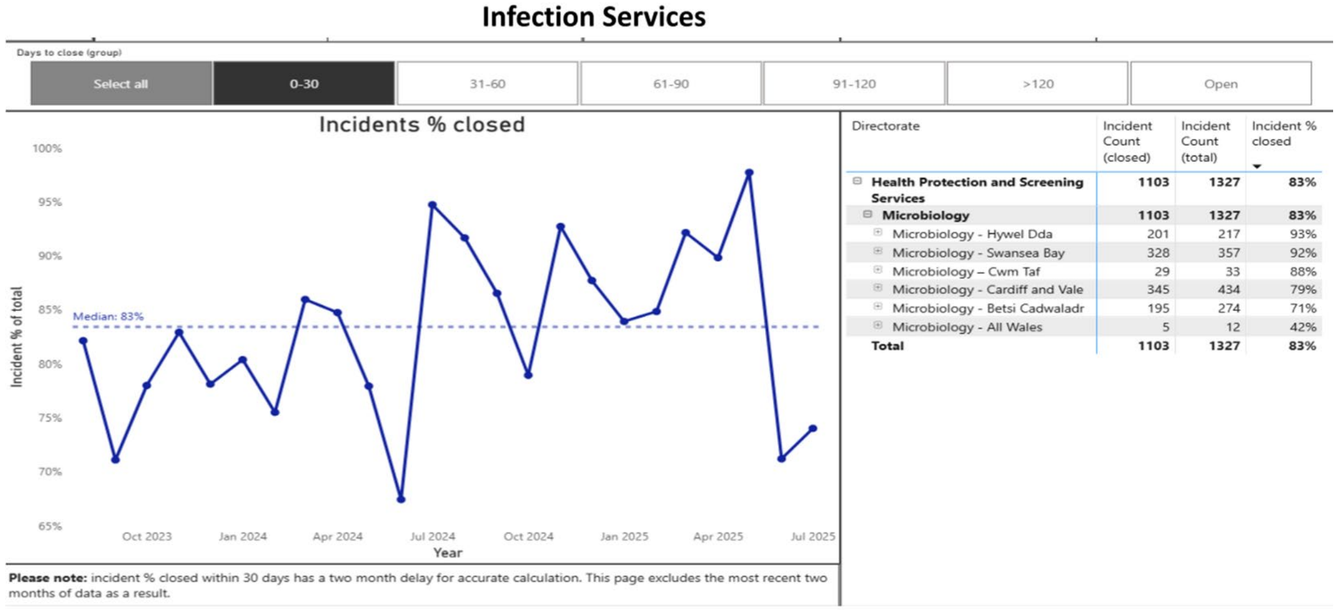
Performance

Incidents

Infection Services – Data 1 Oct 23 – 30 Sep 25



Target to close >85% of incidents within 30 days
Infection Median 83%



Directorate	Incident Count (closed)	Incident Count (total)	Incident % closed
Health Protection and Screening Services	**1103**	**1327**	**83%**
Microbiology	**1103**	**1327**	**83%**
Microbiology - Hywel Dda	201	217	93%
Microbiology - Swansea Bay	328	357	92%
Microbiology – Cwm Taf	29	33	88%
Microbiology - Cardiff and Vale	345	434	79%
Microbiology - Betsi Cadwaladr	195	274	71%
Microbiology - All Wales	5	12	42%
Total	**1103**	**1327**	**83%**

Please note: incident % closed within 30 days has a two month delay for accurate calculation. This page excludes the most recent two months of data as a result.

Divisional Risks

Most significant challenging risks around laboratory infrastructure

- Poor & aged estate
- Containment level 3 laboratories repeatedly fail safety checks
- Estate unfit for new technology
- Estate unfit for efficient working

Ref	Risk Cluster	Risk	Level Of Risk	Score
1601	IT/LIMS	An IT outage occurring outside of core working hours. Resulting in the loss of access to critical systems and services required for infection diagnostics and reporting. NB. Specifically during evenings (after 5pm) and overnight (until 8am); and during bank holiday periods. These periods typically have limited staffing and reduced technical support availability, increasing the potential impact and duration of service disruption.	Extreme	16
1959	Health & Safety	There is a risk that the temperature monitoring systems currently in place within all Microbiology laboratories may fail due to having reached end of life.	High	15
1551	Health & Safety	There is a risk that the physical infrastructure across the laboratory sites can result in harm to staff and/or jeopardise business delivery.	High	12
1669	IT/LIMS	There is a risk that there will be service and clinical implications only having access to LIMS 1.0 for six months post implementation of LIMS 2.0. The infection service would need a minimum of two years access post implementation to ensure access to legacy data in a timely manner. Access to all clinical and technical data held in the LIMS (including suppressed results/information, patient notes, audit trail and storage locations) is needed on demand all laboratory users.	High	12
1748	Health & Safety	There is a risk to the safety of staff (both PHW and Health Board staff) should a hazard group 3 organism with an aerosol transmission pathway (HG3AT) be isolated. Link to risk 1551	High	12
1592	Containment Level 3	There is a risk that the Health Board owned autoclaves are not replaced when reaching end of life or becoming poor in condition which results in a loss of service continuity affecting the safe sterilisation of multiple processes which include waste disposal across network laboratories. Identified autoclaves that are in poor condition or beyond end of life include: Bangor (one machine 40+ years old), Swansea (2 machines approx. 14 years old and in poor condition) and UHL (1 machine at end of life and in poor condition). Shared services approved engineers state end of life as 13 years.	High	10
1795	Initial Assessment Required	There is a risk that the Class II Microbiological safety cabinets across the network will fail.	High	9

Future Plans/Aspirations

Overview

- All-Wales Clinical & Diagnostic Infection Service
  - Merge remaining services in HDUHB, CTMUHB, ABUHB
- All-Wales Infectious Diseases service
- New fit-for-purpose laboratory spaces in SE Wales, Mid & W Wales, N Wales
  - Containment level 3 laboratories to modern standards
- Develop regional bacteriology robotics
- Further develop local laboratory network to develop appropriate near-patient rapid testing
- Introduce AI-supported diagnostics & reporting
  - AI-supported microscopy for faecal parasitology
  - AI-supported narrative reporting

Asks of the Committee

Overview

- Take assurance regarding the operations and development of the Infection Division

- Support the future plans/aspirations for the Infection Division