

INTRODUCTION

1. A paper on the proposed model to strengthen the National Health Protection Service was presented to EDT on 27th November 2018. It was noted that investments already made were positive first steps but the model developed required significant additional investment and the whole system approach to strengthening the National Health Protection Service required agreement with the health boards and other trusts. It was agreed that wider engagement with health boards and trusts should take place before proposals to the Minister were finalised.
2. The Chief Medical Officer and Chief Nursing Officer hosted a workshop on 17th May 2019 with key representatives from each health board and trust to discuss the proposed model. At the workshop there was general recognition of the challenges described and general endorsement of the proposals including staffing models presented. Although the financing of the known gaps in funding for the proposed model was not specifically addressed many delegates commented that they had been to like events in recent years without any progress being made
3. A decision is now required whether to recommend to the Minister for Health that the strengthening of the National Health Protection Service is a Welsh Government priority and as such this service should be prioritised for investment each year up to 2022/23.

BACKGROUND

Summary of the challenges:

4. The current microbiology/infection services in Wales are fragile and are struggling to deliver on a day to day basis the prevention, early diagnosis and frontline support that professionals and the public require. As a result, avoidable admissions are adding to the pressure on hospitals and clinicians in many cases do not have access to the early diagnostics they require to guide early and effective treatment which in turn impacts on in-patient bed days.
5. The current microbiology laboratory estate cannot exploit the opportunity that new testing technologies and robotics can provide. In addition to the lack of access to rapid testing, there are some specific workforce/skill capacity challenges, the current workforce needs to be reskilled and redeployed and the service is unable to recruit to key professional leadership roles.
6. Welsh Government has signed up to the UK AMR Action Plan (2019-2024) but health boards do not have the key professionals in place to support HCAI prevention and antimicrobial stewardship across community health and social care.
7. Welsh Government has signed up to the elimination of a range of communicable diseases; Hep B and C as a significant public health threat by 2030, and the elimination of measles and rubella. There are also WHO elimination goals, such as the elimination of TB by 2035 which Welsh Government may wish to sign up to. There is a minimum resource requirement to make these ambitions a reality in Wales.

8. The importance of this can also be illustrated by the changing epidemiology of a range of communicable diseases (such as TB) and infections with increasing prevalence in vulnerable/hard to reach groups (for example substance misusers, offenders and the homeless).
9. Welsh Government is developing a Clean Air Plan for Wales and there is increasing expectations from LAs and other partners for expert professional and analytical support on improving air quality and reducing health risks from environmental exposures.
10. Health security has become a greater public health threat, professionals are not confident that they could at all times provide an effective response to high consequence infections as there are points on the patient care pathway that are single person dependant.

Where do we want to be?: A strengthened and improved National Health Protection Service

11. The establishment of a strengthened and improved National Health Protection Service can address the challenges faced now and in the next decade and deliver for Wales the prevention, management and control of both infections and environmental risks that is so necessary. In addition it will address the significant inequalities currently experienced by vulnerable/hard to reach groups (such as substance misusers, offenders, homeless etc.). This is consistent with the priorities identified in 'A Healthier Wales'. Key aspects include:

Prevention and early interventions

- Every hospital will have visible infection service specialist presence supporting clinicians on the ward and in the community working with staff to minimise infection risk and patient harm.
- Early, effective treatment and management of infection to reduce the impact on patients health and the risk of further transmission.
- Increase the focus of prevention in the community including reducing health inequalities through the provision of outreach service to hard to reach groups.
- Support for rapid response to outbreaks and incidents in the community.
- Targeted epidemiological support so that local intelligence can improve local actions plans and outcomes.
- Increased emphasis on prevention and promoting care in the community e.g. all health and social care settings have access to infection reduction support from a range of providers including dentists, community pharmacies and third sector services.
- Expert professional and analytical support to improve air quality and reduce health risks from environmental exposures

Comprehensive diagnostic testing

- A reconfigured microbiology laboratory establishment across Wales that is fit for purpose, value for money and delivering high quality diagnostic services supporting local care (these reconfigured microbiology services would not necessarily change current management arrangements):

- A single laboratory network across Wales to provide clinically focused diagnostic services, taking advantage of new technologies to deliver rapid (<4 hour turnaround) near-patient results and efficient comprehensive infection diagnostics and characterisation.
- Expansion of 'hot' diagnostics (in all 16 acute hospitals) providing rapid (<4 hour) molecular facilities in all acute hospitals to provide testing for CSF, blood cultures, respiratory samples, norovirus, *C. difficile*, MRSA and Carbapenamase producing organisms (CPO).
- Consolidation of 'cold' diagnostics into two enhanced facilities providing comprehensive molecular testing/Genomics/Cultural bacteriology.
- One central laboratory providing – 'hot' and 'cold' diagnostics as above plus Reference laboratories/National Virology/National Sexual Health services.
- NHS Wales is supported 24/7 to manage rare and imported pathogens including in relation to health security.
- NHS Wales is able to attract and retain skilled professionals who can progress improvements in care.

Skilled Multi-disciplinary Workforce

- Integrated teams responsible for infection prevention, infection management, infection control and surveillance. The workforce will be multi-disciplinary with development of key skills and opportunities for career development and progression (including in nursing, clinical scientist and infection control leadership).
- Capacity in Public Health Wales to provide leadership and support for an increased focus tackling air pollution.
- As a result Wales will:
 - Attract and retain skilled staff for NHS Wales.
 - Provide equity of provision of infectious disease services dedicated to each health board area.
 - Have effective local surveillance to inform local action.
 - Support national and international surveillance.
 - Support research and innovation agenda.

12. In outlining the enhancements to both the laboratory network infrastructure and health protection services, it is important to highlight that Wales will continue to work collaboratively and co-operatively with partners including Public Health England in the provision of specialist laboratory and infectious disease services. This includes the continued provision in Wales of existing specialist and reference laboratory services to the rest of the UK e.g. Cryptosporidium, Toxoplasma and Anaerobe reference services. Similarly, Wales will continue to use and have access to specialist services in PHE including specialist laboratory reference services in Colindale and Porton Down.

13. A summary of the specific deliverables is set out at **Appendix 1**.

Feedback from workshop with Health Boards and Trusts

14. There was general recognition of the challenges described and endorsement of the proposals including staffing models presented. It was acknowledged that more details/discussion would be needed locally and there may need to be options for some of the developments. A summary of the feedback is set out in **Appendix 3**.

Investment already made in 2018/19 and 2019/20

15. The Welsh Government has already agreed to invest in this model through the allocation of **I&S** in capital funding in 2018-19 to automate the microbiology laboratory services across Wales and through the commitment to the continue the development of the Pathogen Genomics Unit in 2019-20. **I&S** In addition to this, Public Health Wales has agreed to invest **I&S** revenue funding to strengthen the National Health Protection Service commencing in 2019-20.

Further investment required in 2019/20 and beyond

16. Despite the investment already made there is a significant funding gap (particularly in future years) if we are to achieve the model necessary to strengthen and improve the National Health Protection Service. In summary further funding is required to:
- Achieve a reconfigured and rationalised microbiology service within Public Health Wales, which will provide rapid testing in all acute hospitals and more specialist testing in centralised laboratories.
 - Enable Public Health Wales to proceed with recruiting the specialist staff identified (the **I&S** ring-fenced in their core allocation for 2019/20 will cover their initial investment but full year costs and longer term staff costs means this cost increases considerably over the next few years and PHW cannot recruit until they receive guarantees about longer term resourcing).
 - Enable the Health Boards to recruit health protection nursing and antimicrobial stewardship resource for the community.
17. The overall investment required this year (2019/20) and over the following 3 years (up to 2022/23) together with the estimated gap in funding is set out at **Appendix 2**. The vast majority of the proposed investment sits within Public Health Wales who provide the specialised services to the Health Boards. The more generic elements of HCAI/AMR services sit with the Health Boards. In summary, the funding gap is estimated as follows:

• 2019/20 -	I&S
• 2020/21 -	
• 2021/22 -	
• 2022/23 -	

Governance and assurance

18. Whilst there are existing governance arrangements in place for Public Health Wales and the wider NHS, such a programme of work involving multiple partners

requires additional oversight to ensure we achieve a strengthened and improved National Health Protection Service.

19. Aside from ensuring that any additional financial investment has maximum impact there are a number of issues that will require an all Wales collaborative approach such as:

- Recruitment, training and placement of the workforce.
- Standardised operational procedures for new testing.
- All-Wales response to high consequence infections.
- Support for staff in Health Boards to ensure the adoption of a once for Wales approach and improvements necessary are delivered at scale.
- Development of appropriate performance indicators to ensure effective delivery.
- Agreement on intelligence required at a local level to drive behaviour change.
- Longer term horizon scanning to ensure we become proactive rather than reactive to developing health protection risks.

20. At the CMO's Health Protection Advisory Group it was agreed that a subgroup could be established to fulfil this function and report directly to the CMO. Any NHS groups established to deliver operational changes (such as the Public Health Wales Transformation Board) would report to this sub-group. The CMO would in turn report to EDT and the Minister for Health.

RECOMMENDATION

Appendix 1 – National Health Protection Service - Deliverables

Transition resource for reconfiguration of laboratory services

Time limited funding to help unlock and then augment laboratory transport provision. This can be done in partnership with Health Board pathology services. The funding requested would pay for additional input during transition which brings together the funding streams from Public Health Wales and Health Boards into a single service with the Welsh Health Courier Service.

The funding will provide transition funding for a number of logistical routes including:

- Wrexham to Rhyl
- Carmarthen to Singleton
- South East region

Resource for rapid molecular diagnostics in each acute hospital (x16)

Current technology provides the opportunity to deliver rapid testing and results that are of clinical significance and enable more timely patient management. Typically, once received in the laboratory, testing and reporting is undertaken within 2 hours. This is compared to alternative approaches that currently take more than four hours and more often a couple of days. This can make a significant difference, especially with regard to hospital resource utilisation. The benefits are unlikely to be cash releasing but will result in a more efficient and effective pathway, particularly for unscheduled care.

Public Health Wales would introduce rapid molecular testing at the 16 acute hospital sites around Wales (Wrexham, Glan Clwyd, Bangor, Bronglias, Wthybush, Glan Gwilli, Prince Phillip, Singleton, Morriston, Princess of Wales, Royal Glamorgan, Prince Charles, UHW, Llandough, Royal Gwent and Neville Hall).

By the end of 2019/20 Public Health Wales microbiology will have commenced the delivery of rapid screening (MRSA and CPO) and Enteric testing (to include C difficile and Norovirus). Full implementation including rapid testing for Central Nervous System and sexual health would follow in 2020/21. The benefits and outcomes of this would be realised at the local level including improved opportunities for timely individual patient management, management of spread of infection including outbreak control resulting in reductions to HCAs.

The funding requirements also include capital to help with the refurbishment of spaces at acute hospital sites to make 'hot laboratory spaces'. These are likely to be near MAU's, A&E or Critical Care areas, offering Near / Point of Care testing supported by Public Health Wales scientific staff.

Resource for molecular diagnostics to support routine scheduled care (in 3 'cold' laboratories)

Similarly to rapid molecular testing, there is an expanding ability to apply molecular testing to improve support to some scheduled elective care and out-patient service provision. This would be undertaken from the 3 proposed 'cold' laboratory sites and could provide 2/3 testing runs per day. These tests would be used to compliment the current culture methods (which can take two days to report) and would provide

options for clinicians to obtain more timely results in some circumstances. The benefits of this would again been seen locally and have potential to impact positively on patient care e.g. length of hospital stay.

In 2019/20 Public Health Wales microbiology services would scope the delivery of cold molecular testing for screening (MRSA and CPO) and blood-borne viruses. This together with molecular testing for Gentiourinary would be implemented in 2020/21.

Resource for sustaining and developing Pathogen Genomics service (funding already secured for 2019/20)

The funding allocated in the last two years has supported the establishment and initial development of Pathogen Genomics. Three services are now operational (sequencing of influenza, HIV and Mycobacterium TB) with work underway to launch further services:

- C. difficile Genomics and Typing (DIGEST) is in development with a planned service implementation in the first quarter of 2020.
- Antimicrobial Resistance and Genomic Typing (ARGENT) - the service is undergoing further development to sequence priority organisms to enable this to become routine testing. This is being introduced in phases starting in 2019, adding to the knowledge and skills of the Specialist Antimicrobial Chemotherapy Unit.

Capital resource for Laboratory automation (capital funding in 2018/19)

Capital funding was allocated in 2019/20 and implementation has commenced in line with the agreed planning timetable.

Dedicated procurement resource for Infection Services

The demand for procurement input would increase dramatically with the introduction and expansion of services, particularly for molecular testing. This resource would be spent on a dedicated procurement lead who would be employed by NWSSP and become an additional, ring-fenced resource for the Public Health Wales procurement team.

Enhanced specialist workforce within Public Health Wales (Health Protection/ Infectious disease / Microbiology and Environmental)

A comprehensive plan to deliver a blended workforce including Clinical, Biomedical and Environmental Scientists, specialist nurses working alongside medical Consultants in Microbiology, Infectious Diseases, Health Protection and Antimicrobial Pharmacy has been developed. A detailed enhanced specialist workforce table is set out on the next page:

Enhanced specialist workforce within Public Health Wales		Total Planned Additional Establishment WTEs
Enhanced Specialist Workforce	Infectious Disease/Microbiology/ Health Protection Consultant	11.00
	Public Health Microbiology Consultant	1.40
	Microbiology Medical Trainee	2.00
	Clinical Fellow (F2)	1.00
	Biomedical Scientist Band 7	8.00
	Clinical Scientist Microbiology/Infection Prevention Control (Band 8b)	3.00
	Physician Associate/Assistant (Band 8a)	8.00
	Administrative support (Band 4)	5.00
	Agency Locum Consultant	1.00
	Microbiology Medical Trainee	2.00
	Locum Appointed for Service (LAS) ST3	1.00
	Health Protection Nurse Band 8a	1.00
	Specialist Health Protection Nurse/ Scientist Band 7	3.00
	Environmental Scientist Band 7	2.00
	Non Pay Revenue Costs	
	TOTAL	49.40
Enhanced Field/Hospital Epidemiologist Capacity	Clinical Scientist Hospital Epidemiologist (Band 7)	7.00
	Non Pay Revenue Costs	
	TOTAL	7.00
Support for AMR & HCAI Reduction	Project Manager (Band 7)	1.00
	Specialist Information Analyst (Band 6)	1.00
	Specialist Analyst Programme (IT) (Band 6)	1.00
	Administrative Support (Band 4)	1.00
	Administrative Support (Band 3)	1.00
	Non Pay Revenue Costs	
	TOTAL	5.00
	GRAND TOTAL	61.40

The service proposal allows flexibility in recruitment, focusing on skills. As such, recruitment will include medical microbiology, infection prevention, consultants in communicable disease control and infectious diseases, specialist nursing and scientific posts.

This skilled workforce will:

- Support rapid diagnostic testing in all our acute hospitals in Wales.
- Provide leadership and support for infection management and antimicrobial stewardship to professionals in secondary care and the community.
- Work with all sectors in the community to prevent and reduce risks of infection (including through increased immunisation uptake in key groups) and maintain care in the community.
- Provide epidemiological intelligence to inform local action and influence behaviour change.
- Facilitate a comprehensive 24/7 health protection services.
- Enable an expert and timely response in the first 24 hours for high consequence infections prior to transfer to tertiary infectious disease services elsewhere in UK.
- Provide expertise necessary to reduce threats from air pollution and other environmental hazards.

Local Infection Control nursing and antimicrobial stewardship resource in the community setting (21 Health Board staff and 2 PHW staff)

A centrally managed (once for Wales), but locally focussed community infection prevention and antimicrobial stewardship resource. This would comprise:

- 2X Community IP&C Nurses (Band 7) and 1X Community Antimicrobial Pharmacist (8a) per Health Board (21 posts in total).
- Support through a Lead Community IP&C nurse (8b) and Lead Community Antimicrobial Pharmacist (8b) to be appointed within the Healthcare Associated Infection & Antimicrobial Resistance & Prescribing Programme (HARP) team of Public Health Wales.

1X (Band 7) IP&C Nurse and 1X (Band 8a) Community Antimicrobial Pharmacist would be appointed per Health Board as early as possible post funding decision (assuming 25% of full year staff costs in 2019/20). A further 1X Band 7 IP&C Nurse would be appointed per Health Board in 2020/21 (full year costs forecast).

Public Health Wales would recruit both Band 8b posts as early as possible post funding decision (assuming 25% of full year staff costs for 2019/20).

The Community pharmacy and IP&C nursing posts would be joint appointments between Public Health Wales and the Health Boards, ensuring embedding of the posts within existing Health Board/Trust structures for delivery of infection prevention and support for primary and community care. This aspect of the IP&C team would be centrally managed, co-ordinated and guided by a Public Health Wales Lead Community IP&C Nurse within the HARP team with overall leadership provided by the Consultant Nurse.

The Community Antimicrobial Pharmacist posts would work effectively within the current Health Board arrangements for pharmacy advisory posts but be centrally managed, co-ordinated and guided by a Public Health Wales Lead Community Antimicrobial Pharmacist with overall leadership provided by the Consultant pharmacist.

Support for AMR & HCAI Reduction including: Information analyst, nursing and management skills

Success in Antimicrobial Stewardship requires quality intelligence. To transform the current Antimicrobial Usage and Resistance Surveillance there needs to be greater resilience within Public Health Wales to deliver the necessary anti-biotic prescribing data analysis and reporting, as well as Information Technology staff to support the delivery of data through a web-portal and / or other electronic developments and to support data collection from other electronic systems such as ICNet or electronic prescribing systems.

Enhanced Field/Hospital epidemiologist capacity with skill mix

Increasing testing and surveillance requires a resource to utilise related data and ensure it is understood locally. This will be effective in informing local response plans; such as understanding factors influencing poor vaccine uptake; understanding the drivers of increased STIs, support infection prevention and control activities including analysis of ICNet outputs and support of the community Infection Prevention and Control nurses and Antimicrobial pharmacists.

The proposal is to increase capacity through the appointment of seven Band 7 Epidemiologists (one per Health Board). The Band 7 posts would be hosted locally within Health Boards and would have national oversight and co-ordination through the Public Health Wales Communicable Disease Centre. Elements of the resource would ensure the ability to develop the use of 'big data'.

New multi-disciplinary training programme

Developing and maintaining both current skills and those of future staff are critical to business delivery and sustainability. The identified funding would support professional development across disciplines.

Appendix 2 - Summary of costs for 2019/20 – 2022/23

Theme	Detail	2019/20 (£ ,000)		2020/21 (£ ,000)		2021/22 (£ ,000)		2022/23 (£,000)	
		Revenue	Capital	Revenue	Capital	Revenue	Capital	Revenue	Capital
Laboratory Infrastructure	Transition resource for reconfiguration of laboratory services								
	Resource for re-location of Cardiff laboratory to suitable accommodation								
Diagnostic developments	Resource for rapid molecular diagnostics in each acute hospital (x16)								
	Resource for cold service molecular diagnostics in 3 laboratories								
	Resource for sustaining and developing Pathogen Genomics service								
	Dedicated procurement resource for Infection Services								
Prevention Developments and Skilled Workforce	Enhanced specialist workforce								
	health protection nursing and antimicrobial stewardship resource in the community setting								
	Support for AMR & HCAI Reduction								
	Enhanced Field/Hospital epidemiologist capacity								
	New multi-disciplinary training programme								
TOTAL (£ ,000)									
Less current investment (WG funding for Pathogen Genomics, PHW current vacancies and ring-fenced core allocation).									

Irrelevant & Sensitive

FUNDING GAP	Irrelevant & Sensitive
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REDACTED

Appendix 3 – Summary of feedback from workshop with Health Boards and Trusts which took place on 17 May 2019

Education, Awareness and Behaviour Change

1. Promote personal responsibility messages with the public and health and social care staff around infection prevention and antimicrobial resistance (including staff in Third sector).
2. Upskill health and care staff in infection prevention and control.
3. Integrate infection prevention and control from 'floor to board'. Key message - 'it's everyone's business'
4. Appropriate training for specialist staff (including increasing education opportunities and numbers at trainee level (doctors, nurses and scientists).

Workforce

1. Need for a sustainable multi-disciplinary workforce model for the future.
2. Configuration of the workforce to increase capacity and capability that is not restricted by health board boundaries – portfolio careers, increase in skilled infection prevention / health protection nurses.
3. Review all clinical training to strengthen health protection elements.
4. Use of technology to support multi-disciplinary team approaches.

Information

1. Need for :
 - a. improved information flows across the whole system.
 - b. improved use of data and intelligence (surveillance and epidemiology) - developing early warning systems.
 - c. improvements in IT infrastructure to support system-working.

Developing a system approach to health protection incidents

1. Opportunity to rectify existing fragmentation by developing a system-wide (Once for Wales) description of health protection services that provides clarity around system leadership, roles, assurance and accountability.
2. Highlight that a response to 'high consequence infection' incidents uses the 'day to day' capacity and skills. Increase in capacity and capability of 'specialist infectious disease' services across Wales is required to a) ensure high quality normal service delivery; b) respond to e.g. high consequence infection incidents, and c) ensure future resilience by training future staff e.g SpRs, specialist nurses / scientists
3. Need to further strengthen the rapid response to emergencies and ability to mobilise health protection staff/skills across the system when surge in capacity is needed.
4. Review how health protection and infection prevention and control are reflected in National Pathology Network/ Collaborative Strategic Planning

Governance and Accountability

1. Embed infection prevention and control and responding to emerging threats into NHS planning and accountability frameworks – capital planning, LHB and Trust IMTPs, JET, accountability letters, PHW and LHB Exec to Exec conversations and MoUs.

2. Measurements and outcomes to include clinical, cost, benefits and value based healthcare.

REDACTED