Report of the Welsh Health Protection System Review

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Contents

Introduction

1. This review of the Welsh Health Protection System (the System) was conducted during October 2022 to assess its strengths against an established benchmark of a high performing health protection system and to provide reasonable and actionable recommendations on the ways in which the health protection system in Wales could be further strengthened to meet or exceed the established benchmark.

2. The System in Wales had to adapt quickly to the Covid-19 pandemic. Changes were made in working practices, many of which have been or could be retained for the management of future incidents, outbreaks and emergencies. Consideration could also be given to continuing those practices that could strengthen routine endemic infectious disease control and prevention and/or mitigation of environmental hazards. It is critical that all agencies involved learn from the way the system operated during the pandemic and in the protracted recovery phase so that opportunities can be taken to understand and strengthen the new arrangements, and to contribute to more equitable health benefits across the nation.

3. This review has not addressed health protection arrangements and responses within or related to primary care, nor the infection prevention and control (IPC) arrangements in healthcare settings, though these have a significant part to play in any integrated health protection system. This is especially important as a gold standard health protection system needs to have the resilience to manage business as usual at all times and especially during emergencies, to constantly improve the health equity of the population, and to be prepared to manage and respond to health security threats and emergencies when they arise.

4. In order to fully accomplish this, there is not a need for the level of funding provided for the Covid response, but as in the recommendations below, there is a need to maintain core capacity in order to enable national and local preparedness to manage future threats and risks, especially in the immediate phase of an emergency. This will require human resources, expanded systems and stronger countermeasures.

5. The review team are grateful for the honesty and enthusiasm shown by all responders and for the support provided by the team in Welsh Government that helped organise this review.

Methods

6. Questionnaires (attached with list of those who completed), interviews of key persons (list of those interviewed attached), additional relevant documents (attached); and detailed minutes of the interviews recorded by the support team were reviewed for the assessment.

7. Though evidence was sought from experiences and learning during the Covid pandemic, the System was assessed for all hazards, including the malicious use of chemical, biological, radiological and nuclear materials or weapons with the intention to cause harm (CBRN).

8. The following areas of interest were assessed: system design; governance and accountability; workforce; leadership, collaboration and communication; intelligence; horizon scanning and anticipation.

9. The findings of the review are summarised in the tables in this document, and they have led to the recommendations made in this report for emergency preparedness and routine control. Further information can be obtained from the Welsh Government review team at HPAG.Secretariat@gov.wales.

10. The following vision on which to base the assessment was developed from the best practices outlined in the Framework for the Creation and Development of National Public Health Institutes by the International Association of National Public Health Institutes (frameworkfornphi.pdf (ianphi.org)).

11. The Welsh Health Protection System meets international best practice standards by providing:
    - timely political and technical guidance for routine and more equitable control of infectious diseases, as well as rapid guidance during all-hazard incidents and emergencies;
    - regular and up-to-date information about risks and hazards, and potential future risks; and
    - effective and sustainable actions at the national and local level to prevent, mitigate, control and communicate about risks that threaten the public health and economic stability of Wales.

12. Recommendations were made where gaps were identified and where improvements could be made.

13. In addition, the review team took note of the Wellbeing of Future Generations Wales Act (2015), which lays out principles for service development which are consistent with protecting health:
    - look to the long term so not compromising the ability of future generations to meet their own needs
    - taking an integrated approach
    - involving a diversity of the population in the decisions affecting them
    - working with others in a collaborative way to find shared sustainable solutions
    - acting to prevent problems from occurring or getting worse.

Overall conclusions and recommendations

14. Welsh Government commitment to building their Covid Test, Trace, Protect (TTP) response on existing local structures was welcomed by the service and was seen to be the most appropriate configuration, offering local knowledge and flexibility.

15. Practical solutions were developed to communicate and analyse epidemiological information to and from Welsh Government drawing on local, national and international data.

16. With all the innovation that occurred through the pandemic, and the increasing involvement of Health Boards in public health through their newly acquired local public health teams, most respondents reported that there needs to be a review of organisational and individual roles and responsibilities so that the health protection system, a network of organisations, is well understood and well prepared for the next emergency or outbreak.

17. Health protection partners need to co-produce a framework showing how they relate to each other, taking account of the need for clarity over leadership, collaboration and communication, both in the early stages of emerging threats and as incidents progress.

System Design

18. The trained staff available for health protection activities were swamped by the scale of response needed for Covid but local services managed to mobilise large numbers of non-specialist staff to deliver TTP effectively, with Welsh Government investment. The workforce at all levels, local, regional and national, faced many pressures to continue to deliver. Service delivery of routine functions in health and environmental health was impacted by the Covid control measures as well as displacement of staff.

19. The system needs to recover, building on the greater integration and cross-discipline understanding achieved over the last two years in order to ensure stronger, more equitable and sustainable routine public health service as well as emergency preparedness for emergencies in the future, be they caused by infectious disease, naturally occurring environmental incidents or deliberate chemical, biological, radiation or nuclear attacks.

Recommendation

20. Maintain large-scale sustainable integrated public health response capacity as seen during Covid by:

    - ensuring that backlogs in health services and public protection services are cleared and remain manageable, and do not lead to deterioration in the public's health and wellbeing, so ensuring more healthy people who are less vulnerable to infectious disease (ID) and non-ID threats.
    - continuing to bring the wider system, from the local to the regional and national levels, together in routine disease control activities, and in exercising and training for emergencies so that it works as one and does not become fragmented.

- ensuring that health board Public Health teams and local government Environmental Health teams continue to be strengthened by clarifying their respective core roles and responsibilities, including behaviour science, risk communication and infection prevention and control.

Governance and accountability

21. New arrangements were put in place to respond to the specific challenges of Covid. The importance of all organisations working together was shown in Covid and this needs to be protected for emergency preparedness for all hazards, and for safeguarding human health in the face of endemic infectious diseases and those diseases and risks that are non-communicable.

22. There are a range of organisation-wide and collaboration-wide plans for dealing with emergencies, incidents and outbreaks; and for dealing with endemic infectious diseases, but it is not clear how well integrated these plans are, whether they complement each other and how well they support collaborative working at local, regional and national levels.

Recommendation

- All health protection and civil contingency plans, as well as those for the control of endemic diseases, need to be reviewed collaboratively now and in the future, following the cycle of plan, train, educate, exercise, review, plan, to ensure they are fully developed, that they align with other co-dependent plans, including local and national civil contingency plans, and that they include clear lines of communication and support.
- Plans should be tested through multiagency exercises and workshops, with staff from all levels of the organisations taking part. Where feasible, voluntary organisations should be involved in these developmental processes.
- Accountability frameworks should be developed so that for any population data, inequalities can be routinely monitored and actions can be designed to tackle them.

Workforce

23. National incidents, emergencies, and endemic disease control rely on resilient local responses, especially those that require trust, and they cannot be delivered from a central resource alone. Local services require trained specialists, support workers and field epidemiologists who know the local area and who have the skills or are trained to fulfil their roles and can relate effectively with the public. Local delivery of TTP was seen to work well.

24. Members of staff in the health service and local authorities, whose pre-pandemic roles had been partially or wholly suspended, were redeployed into the Covid response. They and members of the public were recruited into the TTP service. Though staff are returning to their substantive roles in the NHS and in local government including in services for the environment including food safety, and for endemic infectious and non-communicable diseases, they are facing challenges as these services are still in recovery.

25. The new investment of specialist epidemiologists and Consultants in Communicable Disease/Consultants in Health Protection within Public Health Wales (PHW) was welcomed by the System and should strengthen the national, regional and local health protection system when posts have been filled. It was however also noted that local environmental health expertise needs to be retained and strengthened, given the expanding range of environmental concerns.

Recommendation

- Local resilience for all-hazard health protection needs to be retained following recovery from the Covid pandemic. For a local disease control or response team to be effective it needs support from both health protection specialists, public health laboratories and field epidemiologists. This multiagency relationship can be strengthened through joint training.
- The voluntary sector should be engaged nationally and locally to explore what contribution volunteers may make in endemic disease control and future significant events.
- Maintain rosters of volunteers and members of the public who provided support during the pandemic and determine whether feasible to keep them engaged in activities on a voluntary basis.
- Discussions should be initiated with universities and other tertiary education providers to explore mechanisms to engage students on health-related courses to support health protection and participate in present and future all-hazard exercises and responses.

Leadership, collaboration and communication

26. There were communication difficulties leading up to the rising tide of Covid in Spring 2020 but arrangements were made quickly to improve this, leading to a more joined-up response. There was an active multiagency health protection network prior to the pandemic that could be built on to provide good situational awareness and understanding for all relevant parts of the System. It is not clear how and when to engage with civil contingency partners as many incidents are dealt with entirely locally, with no need to stand up a strategic coordinated multiagency response.

Recommendation

- Aim to build on existing good relationships while opening up some of the routine communication mechanisms to civil contingency partners.
- Ensure communication systems can operate in all directions, not just one way, to provide feedback and allow recipients to engage fully.

Intelligence

27. New data handling systems were designed for new health protection activities. They worked well during the acute phase and opened up the potential for more electronic/digital systems to be used in routine health protection delivery. Home working was developed successfully for many workers and hybrid working patterns have become acceptable. There was much progress in genomics research and new techniques were developed in modelling. There were barriers

in sharing data between agencies and between Wales and the other UK nations but the reasons for this were not always clear.

Recommendation

- Review all data systems currently operating and explore how they can operate to agreed, shared standards and be combined, within the confines of Data Protection safeguards, to aid data capture and to increase their value in national and local surveillance.

Horizon scanning and anticipation

28. The key for being prepared for the next hazard with national impact, whatever its nature, and for better and more equitable control activities of endemic infectious diseases, is to be alert to the early signs of outbreaks or failures in routine control, to keep all informed and to realise that the response may be very different to any previous incident. Covid required a different approach to flu, it affected age groups differently, and transmission factors were different, therefore the control measures were different.

Recommendation

- Continue and strengthen four nation and international links and academia, for stronger horizon scanning, anticipation of emergency events, and identification of needs for better routine control.
- Maximise the health and therefore resilience of the population through health and wellbeing initiatives and the recovery of NHS and Public Protection services which have been impacted by Covid.

System Design

Summary of Findings

Principles of a high performing health system	Welsh System
Clear vision and mission statement that are understood and shared by staff. Mandates system-wide with clear and non-ambiguous understanding of responsibilities.	Health protection system mandates are described in commissioning contracts, MOUs, outbreak control plans, pandemic plans and major incident plans. Partners' roles are described but may have been extended and better clarified through Covid pandemic. Relies on many organisations working together in both routine and response modes. Connection between civil contingencies and health protection was not clear within Welsh Government initially but mechanisms have been put in place and understanding is better now. Local Infection Prevention and Control (IPC) leadership remains hard to ensure in healthcare settings at the health board level, despite active attempts to recruit specialists. Role of Public Protection Environmental Health was broadened, extended to contact tracing for respiratory viruses and into wider support for care homes but this contributed further to backlogs in their routine activities. Enthusiasm to build on the Team Wales/Once for Wales approach with exercises and training but need to include generic staff, who may be mobilised, as well as health protection staff, in exercises and training. Disconnect between UK and Welsh Government in the devolved areas of responsibility has widened. Different approach taken by England relating to some aspects of Covid policy led to confusion amongst public and businesses on the border over the advice, policy and guidance at any one time.

	The actions needed during the early phase of the pandemic were not clear. Civil contingency partners would have appreciated earlier communication to allow them to prepare. In the early stage of the pandemic there was no established connection within Welsh Government between health protection team and the policy leads for wider government areas such as education and business. Trusted relationships have since been developed.
Periodic strategic planning, using data and information to identify priorities and set measurable goals and targets to demonstrate impact.	Organisations engaged in emergency planning work to common principles, the Joint Emergency Services Interoperability Principles (JESIP) and joint decision models on joint emergency responses.
Ongoing surveillance linked to public health laboratory services that provides for systematic collection, analysis, interpretation and action on/ dissemination of results. Epidemiologic investigation of disease outbreaks and other public health events caused by all hazards including CBRN.	Multidisciplinary groups existed before the pandemic that could be used now to ensure civil contingencies leaders are kept informed regularly to improve awareness of the ongoing challenges in health protection. Findings from these groups can be used to inform policy. The groups include: • Public Protection Wales expert panels (covering pollution control, air quality, health and safety, food safety and port health) • Wales Water Health Partnership • Communicable Disease Expert Panel which meets quarterly • The Health Protection Advisory Group and its subgroups • Welsh Government's Health and Social Care Climate Emergency Programme Board • Consultant in Communicable Disease Control/Consultant in Health Protection Forum Some shared Information Technology (IT) platforms but not all. Enthusiasm to enhance current surveillance using newer digital technologies and genomics.

	The System would welcome more air quality monitoring in general and during incidents. Behavioural science needs to be emphasised as lifestyle choices have deteriorated during Covid, and healthy people are less vulnerable to infectious disease and non-ID threats. However, there are few dedicated staff at local level, and no shared description of their core roles and responsibilities.
Links to strong public health departments in universities.	Experts in Welsh Universities supported analysis of the pandemic, including extensive use of genomics, leading to substantial developments in diagnostic/analytical services.
Ability to form partnerships within government and with civil society and the private sector.	Working with industry considered helpful but not as well-developed as it might be. Procurement and distribution during pandemic was problematic, especially at beginning. Life Sciences Hub could be helpful partner, also lab diagnostics companies and companies for personal protective equipment (PPE). May need to stimulate innovation. Health protection teams have been set up in England. There are no equivalent teams in Wales but some Directors of Public Health are developing multidisciplinary/multiagency teams to maintain a level of awareness and preparedness locally. The Civil Contingency structures allowed regular communication of Welsh Government Civil Contingency leaders with Local Resilience Leaders and with Ministers. The Preparedness and Risk Group was set up. The need for timely political and technical guidance was recognised within Welsh Government. Public Health Strategic Coordinating Group allowed multiple briefing points to keep Local Resilience Forums (LRFs) and their Strategic Coordinating Groups (SCGs) fully briefed.

Written advance plans for what services to provide in a public health emergency, and what other organizations will provide in a response.	Respondents felt well-supported financially by Welsh Government during Covid pandemic but for future resilience, need to review and clarify the balance between policy, resource and delivery, and capacity to scale up as required. As the contact tracing response switched from being PHW led to local service led and the formal TTP service was established, one key missing aspect is the full definition of the role of health boards in health protection. Need to know what resource is available locally and how to mobilise it. Staff can be deployed into response activities from other parts of the local service organisations but this has an impact on routine service delivery. Backlog from Covid in NHS and Public Protection expected to take years to overcome at local level.
Assess surge capacity and advocate for resilience.	Surge capacity has been insufficient in the context of NHS treatment and care services, which are now dealing with delayed treatments and late presentations of conditions.

Detailed recommendations

Emergency Preparedness	**Routine control**
Maintain sustainable integrated response capacity as seen during Covid by continuing to bring the wider system, from the local to the regional and national levels, together in exercising and training so that it works as one and does not become fragmented.	Ensure that local Public Health and Public Protection teams continue to be strengthened with clear description of their core roles and responsibilities, including behavioural science, public health laboratories, environmental health and Infection Prevention and Control (IPC), while ensuring that backlogs in NHS and Public Protection services are cleared and do not lead to deterioration in the public's health and wellbeing, thus fostering more health equity and ensuring that all people are less vulnerable to infectious disease and non-ID threats.

Emergency Preparedness	Routine control
Assess surge capacity of NHS services and advocate for greater resilience as needed.	Consider stimulating innovation and local production of PPE and laboratory diagnostic tests for routine use, and as back-up in case of pandemic need.
Continue regular meetings of the Public Health Strategic Coordinating Group and include all hazards. Regular updates should be provided to the larger system including local Public Health teams, Public Protection, microbiology and civil contingencies.	Increase use of digital technologies, including participatory surveillance and access agreements for data sharing, in order to better assess current disease situation and increase detection sensitivity, and consider establishing an accountability framework that will indicate where inequalities are occurring.

Governance and accountability

Summary of Findings

Principles of a high performing health system	Welsh System
Multi-agency loose confederation of organizations acting independently with clear understanding of role in emergencies.	Standard Operating Procedures (SOPs) worked well for on-call activities of the Environmental PH Service in Wales, provided jointly by UK Health Security Agency Radiation, Chemicals and Environmental Hazards (Wales) Team and the PHW Environment Team. They were engaged in pandemic response through the Technical Advisory Group - Environmental Subgroup (TAG-E) particularly over ventilation and cleaning agents. However, they are concerned about resilience as they are a small team. Range of environmental events Food Standards Agency (FSA) deal with has not changed, but resilience still under review. There were easements in legislation for food safety (e.g. time-limited food labelling changes) allowed during pandemic that could be stood up again if needed.
Well established coordination mechanisms for routine functions in public health surveillance and response that are interspersed across government.	Accountability during pandemic was clear for LRF/SCG partners: health board Chief Executive to be informed by outbreak management team if partners are not working to the outbreak plan, and

	from there escalated to Ministers if necessary; partners worked to plan during pandemic and no need for informing ministers. Concern reported that there may be insufficient recognition and risk assessment capacity for plausible threats including pandemic, CBRN incidents, major incidents and ID outbreaks included in health board Integrated Medium Term Plans (IMTPs). Health Boards, Local Authorities and LRFs may lack understanding of how and when to mobilise internal resources jointly from within these partner organisations. Demarcation of roles between Welsh Government, PHW, and local services not sufficiently clear nor is understanding of the need for local flexibility.
Clear understanding and agreement to share resources during emergency responses with agreements that allow rapid and efficient sharing of data. Standard notification procedures for emergencies with established trigger points and criteria for action.	Resources and data were shared during emergency responses through a range of mechanisms including collaboration through surveillance programmes, regional and local Incident Management Teams and SBAR (Situation Background Assessment Recommendation) reports to Health Protection leaders in Welsh Government, but need to better articulate measures of success, benefits and risks, to account for money spent in health protection. Capacity to deploy staff from all agencies to work together written in documents; governance remains with the employing agency for all staff.
Consistent policies related to human subjects, data integrity, dignity and privacy.	New roles set up during Covid response may not have governance, accountability, support and communication pathways set up with them. Mobilisation of health resource at local level now appears to rest with HB Executives, particularly Directors of Public Health, with no health protection resource to draw from within the local Public Health team for these new roles.

	Some roles have transferred from one agency to another, or collaboration has been ended without full negotiation. Professionals and corporate memory drawn from one part of the system to another over last few years, moving to agencies with higher pay scales.
Public and governmental recognition and trust. Ensure independent advisory bodies for all technical activities.	Authority of central government and Chief Medical Officer (CMO) are accepted. Key role of oversight and holding to account sits with Welsh Government, not PHW.
Clear qualitative and quantitative indicators of success and accountability mechanism.	Academics are required to uphold professional standards according to their backgrounds, and their employing bodies may be asked to sign contracts/Memoranda Of Understanding (MOU) that have governance and accountability for their work written in.
Inclusion of voluntary sector (NGOs such as Red Cross) and private sector as appropriate in routine health and emergencies.	Voluntary sector was involved in supporting populations but not used for specific tasks in containment such as contact tracing. They must have clear remit and given adequate support if involved in response.

Detailed recommendations

Emergency Preparedness	**Routine Control**
All health protection and civil contingency plans need to be reviewed collaboratively now and in the future to ensure they are fully developed, that they align with other co-dependent plans, including local and national civil contingency plans, and that they include clear lines of communication and support. They should be tested through multiagency exercises and workshops, with staff from all levels of the organisations taking part. Voluntary organisations and universities should be involved in these developmental processes.	Co-develop formal framework from CMO level to local organisations that provides clear description of roles and operating procedures for existing and newly created health protection responsibilities and roles, fully supported by partnership agreements and MOUs.
Continue multidisciplinary multiagency cycle of plan, train, educate, exercise, review, plan at and between all levels of	Continue to create close links for health protection research with academia for prevention, control and response.

Emergency Preparedness	Routine Control
staff. Implement scenario exercises to clarify and implement roles at all levels, including voluntary sector (with possible task shifting), so that all can be trained together for all hazards including CBRN health emergencies.	
Update/produce training manuals for roles and operating procedures including clear timelines and triggers for emergency activities such as opening testing centres.	Ensure environmental resilience for all hazards including easements as required, and climate change mitigation.
Strengthen/pursue new agreements with other UK nations for health protection emergency response and to share experiences internationally in areas such as surveillance (e.g. create national WHO Collaborating Centre for surveillance).	Maintain and develop advisory bodies and rosters of volunteers for routine prevention and control, including independent academics and representatives of partners and voluntary groups, and if indicated and without conflict of interest, the private sector. Ensure that these groups are also included in national or regional emergency exercises.

Workforce

Summary of Findings

Principles of a high performing health system	Welsh System
Workers with training for health protection in a wide range of fields, including epidemiology, laboratory sciences, health policy, health communications, information technology, and management. Ensure linguistic and cultural diversity including with all partners.	Workforce distributed across the sectors but much of the expertise is held in the central organisations. Those people with expertise were under-supported, it was hard to take leave, could lead to 'single point of failure'. This has probably not changed as there are insufficient experts within health protection, including in Welsh Government, to allow shadowing and job sharing. General Public Health and Public Protection roles were suspended during pandemic lockdown, allowing released staff to support TTP and other responses. The decision to employ staff for TTP locally through the public sector allowed flexibility across the system and the ability to scale upwards and downwards as required. The local knowledge of the staff was seen as helpful. Staff taken on to deliver TTP who remain in post are facing redundancy in March 2023, though some have been essential for support to current health protection challenges such as Monkeypox. Some feel enabled and empowered to move on to new roles, some wish to develop more extensive health protection skills and to be retained. Those hosted by the NHS could act as deployable field epidemiologists to support Directors of Public Health, CCDC/CHP and Health Protection nurses on a range of incidents. If employed in local authorities they could continue to support Public Protection services dealing with the backlogs in statutory health protection functions. Conversely, they could all be considered as one group to be deployed flexibly between NHS and Public Protection health protection responses. If this were to be the case, there would need to be clear leadership and direction

	across both health boards and local authorities with strong partnership working. Operating model in PHW changed during pandemic with expert resources centralised from July 2021 into three regional hubs. Local Public Health Teams were also being prepared for transition from PHW into HBs.
Routine continuing education and monitoring of existing capacity and unmet needs leading to supplemental training as needed.	Investment in specialist staff for non-ID hazards has not grown in recent years despite workload growing in climate change, flooding, drought, heat, cold and air quality. Local Authority Environmental Health teams are not being invested in following Covid, with some being asked to make cuts.
Attract and retain skilled workers with clear career development pathways and regular succession planning to ensure incentives and job satisfaction. Establish and maintain working partnerships with universities following licensure requirements for public health professionals.	Flexibility during the pandemic created agility and staff gained additional skills. They are now being brought back to original roles while still delivering some pandemic response. Local Public Health Teams have been moved from PHW to Health Boards. They will need clear roles and responsibilities in their new organisations. Some staff are highly motivated to retain and possibly extend their health protection skills. There is a concern that consultants may decrease their involvement in on-call activities, leading to them losing skills in health protection. There is also concern they may not be so easily mobilised to support central health protection responses in future as they will be employed by Health Boards. EHOs have developed expertise in respiratory infection prevention and greater role supporting IPC in care homes but now need to address the backlog of their previously paused Public Protection responsibilities. Leaders report their staff have given heroic efforts and been flexible but there is little scope for flexing in this way again. Staff still in recovery, some even still in activation mode.

	Some staff felt they were exposed to high level of risk e.g. FSA staff worked on the frontline in large food processing units during pandemic even though they often felt anxious. Many want to return to previous roles where possible, retaining ability for hybrid model of working, home/office. Many staff groups would not have expected to be so heavily involved in a pandemic response so need to consider debriefing with them and including in Job Descriptions going forward. They are an important surge workforce. Employers should retain the details of those who have gained skills within the TTP service and encourage them to refresh their skills periodically through structured training so they can be called on again if needed. Staff welfare concerns include intensity, long hours, isolation, working in unfamiliar field, frustration over lack of work in preferred fields, confusion over roles, not being clear about the expectations on them; also discomfort that other staff did not appear to change from business as usual. Home working and additional measures to support staff welfare such as emails not to be sent before 9 AM and meetings not to be arranged before 9.30 AM were appreciated when implemented. Recruitment to current vacancies in Environmental Health in local authorities is difficult due to paucity of trained professionals and higher pay in competing agencies. There are diverse arrangements for setting standards for staff, depending on their entry path into the service. Professional standards of various standard setting groups should be aligned, complimentary and synergistic to support effective maintenance of quality and avoid duplication and

	confusion for new and existing staff as they consider their career pathways. Healthcare staff are not being trained as part of the wider health protection system but should be seen as an important source of surge support. Volunteers showed a high level of goodwill, helped where needed, and could possibly have done simple TTP activities.
Develop and oversee strategic plan, policies, and prevention and control programmes.	Some partner agencies have been invested in more than others - Consultants in Communicable Disease Control (CCDC) and Consultants in Health Protection (CHP) are being actively recruited into PHW. Some local services do not have a single identified CCDC/CHP with which to develop local health protection arrangements and are wary about picking up leadership roles in health protection citing confusion in roles and responsibilities. PHW has the competency and needs to be engaged with local services for robust health protection partnership. For non-ID emergencies arrangements are clearer and health protection is included in the Four Nations PH Emergency Preparedness Resilience and Response (EPRR) Group, which adds further support.

Detailed recommendations

Emergency Preparedness	Routine Control
Identify and sustain new working models for emergency arrangements that were created and shown to be effective during pandemic, with delegation and clarity of roles, responsibilities and support. The use of honorary contracts may help retain the effectiveness of cross-agency working.	Local resilience needs to be retained following recovery from the Covid pandemic. For a local response team for endemic disease and outbreak control to be effective it needs both the input of health protection specialists and the support of field epidemiologists. In addition, the voluntary sector should be engaged nationally and locally to explore what contribution volunteers may make

Emergency Preparedness	Routine Control
	for control at present, and for future emergencies and other significant events.
Create and regularly update rosters of staff and volunteers, including those employed during pandemic to support local response after they have been stood down, and offer annual gathering and training to keep skills up to date. Consider including 'providing support during health protection incidents' in model job descriptions for a wide range of non-specialist staff.	Regularly review health protection workforce needs and identify essential skills to complete routine health protection activities and rapidly mobilise for first response.
In addition to clarity of roles, bolster welfare by putting in place procedures to ensure sufficient welfare time (e.g. hours worked per week, annual leave) during emergencies and the recovery phase.	Discussions should be initiated with universities and other tertiary education providers to explore mechanisms to engage students on health-related courses to support routine health protection responses and participate in future all-hazard exercises and responses. Consider reinstating a four year EH degree with a third year on placement in LAs.
Consider including allied health students as part of future all hazard exercises in order to increase the pool of responders and increase interest in public health.	Assess the feasibility of task shifting including to qualified voluntary groups and establish training and certification programmes for support to routine control activities.
A needs-based multi-agency environmental public health training programme should be established, linked to a new competency framework for specialists in the field.	Develop clear hybrid model for home/office working that does not compromise health protection activities.
	Support/develop staff incentive and recognition programmes.
	PHW could start exploring commercial opportunities to generate income and sustainability with the new developments in lab testing, particularly in relation to genomics.
	Consider which standards healthcare assistants should be aligned with and open up career development pathways for them.

Leadership, collaboration and communication

Summary of Findings

Principles of a high performing health system	Welsh System
Internal collaboration and communication, delegation and team building. Collaboration with civil society and private sector based on comparative advantage and without conflict of interest. Influence policy decisions based on evidence about the environment and other conditions that affect health including behaviour change for more healthy lifestyles.	National emergencies require strong local responses. Small country, many people within Health Protection field know each other and local partners report strong working relationships and respected leadership. However, there was a lack of clarity on who should lead the initial response in the early stages of the pandemic. Local Government interacts with their communities in many ways. Through networks and services, it understands and addresses local health protection needs. Previous emergency plans did not hold up and inform the response to the pandemic but strong collaboration developed early and showed value of locally led response for national emergencies by developing systems delivered through existing public services. Collaborations between professionals and between organisations existed, which facilitated the response and some new arrangements such as Welsh Government's SEA (Science Evidence and Advice) set up in recovery phase. Local Government EHOs led and supported Care Homes for wide range of health protection hazards. In this recovery phase these arrangements are being reviewed. Military were valuable in supporting development of new system such as end-to-end process for sampling, testing, and results. FSA happy with level of collaboration and communication, saw outputs of

	technical assessments and reported good working relationships. Mechanism that provided ministerial approval to stand down non-pandemic health protection activities helped focus response on the pandemic. New pandemic mechanisms were identified, funded and successfully put in place. Local Health Protection Forum and/or Regional Oversight Group models have been set up in some regions but for some the essential Consultants in Communicable Disease Control/Health Protection have not yet been identified to support these local arrangements. Local Authority Chief Executives now meet PHW monthly to sustain collaboration post-pandemic. Communication flows not always clear – some senior leaders and staff felt excluded or learnt news after other partners they were working with; great concern about announcements from Welsh Government coming out directly to media/public before service leaders prepared, especially for announcements being made on Friday mornings and expecting implementation the following Monday. Better use could be made of existing resources by coordinating the flow of communication, lessening the need for duplication, and by facilitating cross-working between disciplines.
Provide technical assistance and easy-to-understand information to civil society and the public. Develop/update fact sheets and other materials including those to train first line responders and public health workers.	Central communications need to be responsive to the public and to the requirements of other non-health professionals, unions and politicians. Need to bridge the gap in knowledge, culture and assumptions. In some cases, more and more detailed guidance was produced when it would have been preferable to co-develop and update core guidance that was able to be interpreted for all situations.

	Changes in service sometimes implemented before full impact mapped through and with insufficient consultation.
Include and involve communities in the development and design of programmes to promote health and prevent disease.	Locally based phone support systems staffed by people who knew local communities provided practical advice.
Be part of the government's top-level planning for and management of the response to emergencies and disasters.	Need for sustained investment into Health Boards and Local Authorities with changing health protection roles (e.g. during Covid the central specialist health protection team supported response to non-Covid infections while other parts of PHW, Health Boards and Local Authorities picked up Covid duties) and consistency as Health Boards now mobilise non-specialist staff resource at local/regional level in new arrangements.

Detailed recommendations

Emergency Preparedness	Routine Control
Aim to build on existing good relationships while opening up some of the routine communication mechanisms to civil contingency partners.	Review how support is provided to registered care homes for healthcare related IPC and wider public health measures such as falls prevention. SOPs could be developed for use during Health Board and Public Protection staff visits in order to reduce duplication and use partner key skill sets.
Review and stress test the System regarding accountability and governance to offer leadership training and ensure new emergency response arrangements fit for purpose, with quality measures and support for executives out of hours.	Embed NHS, local authority and other leadership changes in co-produced policy and SOPs. Agree trigger points for escalating response.
Those involved in the health protection planning and preparedness system should engage with their Local Resilience Fora to make sure that emergency planning arrangements are fully integrated.	Develop generic locally led and managed Public Health workforce able to respond to wider Public Health challenges (e.g. directly observed treatment for TB, immunisation outreach and other PH programmes) for defined population groups and retain non-specialist locally based consultants in the national on-call system led by PHW for both national and local resilience.

Emergency Preparedness	Routine Control
	Create forum to regularly debrief now to hear local experiences and exchange best practice methods that make routine work easier and retain interest in health protection as Covid becomes endemic and interest wains.
	Engage with local partners routinely, prioritising risk mitigation as required.

Intelligence

Summary of Findings

Principles of a high performing health system	Welsh System
Identify disease problems and outbreaks; changes in rates of death, illness, and injury by cause; and all hazard risk and protective factors for death, illness, and injury.	Range of surveillance systems based on GP notifications, GP electronic records, hospital activity, microbiological results, programmed publications from surveys, school surveillance system, vaccination surveillance, bespoke systems established during emergencies, Office for National Statistics (ONS) surveys and registries etc. Technical Advisory Group (TAG) developed mechanism for calculating reproduction number R and gave sophisticated population-based models to inform policy development. They tried to balance the agreed five harms arising from Covid in their work.
Sustain ongoing systematic collection, analysis, interpretation of health data through public health surveillance. Link to information systems on hospital admissions, healthcare-related infections, patient safety, and specific information such as antimicrobial resistance.	Flows of information from local Incident Management Teams and SBAR reports from local and regional partners into Welsh Government officials worked well to keep briefed. Fed into the CMO's Health Protection Advisory Group Officials Steering Group to inform policy while not overwhelming the system with detail. Public Protection enforcement data relating to Covid regulations was collected by the service and reported weekly via a new system designed between Welsh Local Government Association (WLGA), Data Cymru, Welsh Government and Directors of Public Protection, which proved useful. Standardisation is seen as the key to mass production of high-quality information. There were barriers to some of the PHW data but the reasons weren't clear.

	There was lack of clarity over lines of responsibility and information templates during the initial stages of the pandemic. Concern about focus being placed on what is easily counted, leading to 'we must do something' bias while uncounted harms are ignored, forgotten or not recognised, and may continue to occur. Need a high level of trust in the system at all times to facilitate routine and emergency data sharing. Advice given by many methods, in-person, phone, email but lack of resource to keep track and ensure consistency, and to pick up themes in areas of concern. ONS survey of Covid stops March 2023. Covid now included in multiplex viral testing. Syndromic surveillance relying on GP electronic records, 111 and GP sentinel surveillance network needs to be increased, possibly expand information sources.
Link with valid laboratory services to surveillance, including infectious diseases, testing of environmental samples, food, and pharmaceuticals. Sustain a system of reference laboratories. Disseminate and use all-hazard results to guide public routine and/or urgent health action.	Digital solutions have been developed which need to be retained for future remote and hybrid working. PHW have developed digital working in Covid which will be retained. PHW system TARIAN worked well and could be expanded to include environmental incidents and emergencies, air quality, climate change. Concern about duplication of data entry required for TARIAN and TTP Case Record Management (CRM) system. Interest in exploring how to link the CRM system with TARIAN and extending both to cover all hazards. Modelling the molecular pathology of disease was complex but valuable.

	There were difficulties accessing resources for the labs. Some difficulties mitigated by decentralising resources. No unified surveillance of chemical incidents and their impacts on health. The FSA reporting system is still paper-based and does not yet benefit from electronic/digital technologies.
Access surveillance data from other sources if necessary.	Swansea University provided expertise in epidemiology and molecular modelling of ID. Bangor University conducted research and scientific review to inform policy advice. Bangor became the national surveillance hub for Covid in waste water. Additional sources of information during pandemic from other Government Departments and international trends monitored through published sources such as European and WHO surveillance and Swansea University's SAIL database. Dashboards developed for Covid combining much of this information updated regularly for internal use and for the public. Concern during the height of the pandemic that questions were asked that Wales couldn't answer and didn't have time or other resources to research, such as the risks related to traveling on public transport. Behavioural sciences need to help with the perceived 'intention-action gap' in protective behaviours, which may have facilitated transmission.
Participate in multinational regional and global surveillance efforts.	Lack of Welsh access to emerging UK scientific information and data though much data was sent from Wales.

Detailed recommendations

Emergency Preparedness	Routine Control
Codify response now to be ready for the next event and to try to mount a response that is commensurate with the level of threat.	Review all data systems currently operating and explore how they can be combined, within the confines of Data Protection safeguards, to aid data capture and to increase their value in surveillance.
Work with the other UK nations to improve two-way flows of scientific information and data.	Review existing surveillance and case record management systems and develop plan for analysis and use of data at local, regional and national levels.
Technical preparedness for robust and resilient monitoring systems, surveillance and risk assessment of emerging viral threats needs to be put in place.	Digitalise surveillance systems wherever possible using most up to date technologies, including those for communication.
Data and surveillance systems need to support local as well as central functions.	Establish clear data sharing agreements to underpin surveillance including patient records from the hospital/GP system to PHW and include electronic hazard notification into all existing surveillance systems including TARIAN.
	Strengthen links with international surveillance programmes.
	Integrate molecular pathology with population-based modelling for other pathogens.
	Establish high trust mechanisms for efficient data sharing between organisations and sectors.
	Be aware of the potential bias when monitoring harms which are easily counted, which may lead to action to address them, when other harms which are harder to quantify are continuing unnoticed.

Horizon scanning and anticipation

Summary of Findings

Principles of a high performing health system	Welsh System
Conduct or commission research that is critical to better characterise public health problems in the country, provide other evidence for policy -making, and evaluate effectiveness of existing and/or potential interventions including by epidemiological modelling. Conduct or commission large epidemiologic and multidisciplinary studies of interventions such as screening and management of high priority public health programmes. Sustain links to universities or other research institutions for commissioning and horizon scanning. Ensure mechanisms in place to translate research and horizon scanning into decisions, policies, and programmes.	A healthy population is the basis of health security as healthy people are more resistant to disease and more resilient in their responses to threats. Non-ID NHS and Public Protection services have been impacted by Covid but need support to recover now. Further events of major or global significance are anticipated by WG, understanding that future major events may not include lockdowns and that staff will need to continue and sustain routine duties throughout by increasing surge capacity. Voluntary sector may wish to play part beyond general wellbeing services. Large number of people, especially at local level, have gained health protection skills (though many of these are Covid specific). Strengthened local and national relationships that have been developed must be continued so that local knowledge held in local services can be easily accessed for local and national response. Various means of horizon scanning and prediction, including epidemiological modelling, are being used and continued input must be assured in order to anticipate potential hazards and develop longer view across the public sector.

Detailed recommendations

Emergency Preparedness	Routine Control
Participate in risk assessment at the animal/human interface through groups such as the UK Human and Animal Infections and Risk Surveillance Group (HAIRS) as a means of preventing	Continue and strengthen four nation and international links and academia, for stronger horizon scanning, anticipation of emergency events, and identification of needs for better routine control.

Emergency Preparedness	Routine Control
and/or rapidly responding to emergence of human infections.	
Regularly conduct exercises with various scenarios, covering all hazards, and include voluntary sector and allied health students with a goal of greater preparedness, resilience, expertise.	

Annex 1 - Blank questionnaire sent to all partners and list of respondents

Questionnaire - Independent review of the health protection system in Wales

Name of organisation:		
Description of your personal role:		
	Your organisation	**Other organisations with which you collaborated in this area of work**
What roles does your organisation have in the health protection system. How did your role chage during the coordinated response to the COVID 19 pandemic? Please label any new roles your organisation took on in response to COVID 19 pandemic as 'NEW' . Please also indicate the lead organisation for each role.		
Which roles that you listed above are working well? What issues/challenges do you face? Specifically mention the impact of the COVID 19 pandemic in your organisation and in any of the organisations with which you collaborated in this role?		
Which roles did not work well and what difficulties did you encounter during the COVID 19 pandemic?		
What new arrangements did you put in place to maintain resilience of service delivery and/or mitigate the wider impacts on the population in your area?		
What new arrangements have you retained for responding to future epidemics and pandemics?		
Which difficulties were not fully addressed in the COVID 19 response and so need to be reviewed during planning for future epidemics and pandemics or other major incidents?		
What do you need from collaborating organisations to protect your resilience in future epidemics and pandemics or other major incidents?		
We welcome case studies of 100 to 200 words each to illustrate any of the points above.		
Are there any other comments you wish to bring to the attention of the review team?		
Thank you for completing the questionnaire we look forward to discussing with you on 10 or 12 October. Regards David and Sara		
Please return the completed questionnaire to: **hpag.secretariat@gov.wales** by 3 October		

List of questionnaire respondents

NR NHS
NR NHS
NR NHS
NR NHS
NR NHS
NR NHS
Simon Wilkinson WLGA
NR PHW
Jonathan Davies FSA Cymru
NR UKHSA
NR UKHSA
Jo Williams (Assistant Director) Caerphilly CBC
Mark Thomas Neath Port Talbot CBC
Lynda Anthony City & County of Swansea Public Health Lead
Paul Kavanagh-Fields Consultant Lead for Regional TTP service BCUHB
NR Deputy Director, Public Health, Welsh Government
Jeff Beynon Public Protection Manager (Health and Consumer Protection), Pembrokeshire County Council
NR Senior Environmental Health Practitioner, on behalf of the Director of Public Protection
Jonathan Keen Regulatory Services Manager, Environment & Public Protection, Newport City Council Environmental Health
Head of Public Protection, Community & Leisure Services, Caerphilly County Borough Council
Huw Brunt Chief Environmental Public Health Officer, Welsh Government
Marion Lyons Senior Medical Officer, Welsh Government
NR TAG, Welsh Government

Annex 2 - List of interviews

Respondents were invited to indicate if they would like to attend an interview with the reviewers. The following responded and were therefore interviewed face to face or virtually via MS Teams.

Name	Role and organisation
NR	Director of Public Health, Aneurin Bevan University Health Board
Frank Atherton	Chief Medical Officer, Welsh Government
Nicola Benge	Consultant in Public Health, Powys Teaching Health Board
Mererid Bowley	Director of Public Health, Powys Teaching Health Board
Huw Brunt	Chief Environmental Public Health Officer, Welsh Government
Beverley Cadwallader	Professional Lead, Environmental Health and Trading Standards Services, Powys County Council
Tracey Cooper	Chief Executive, Public Health Wales
Catherine Davies	Senior Environmental Health Practitioner, Powys County Council
Gwilym Davies	Head of Planning Property and Public Protection, Powys County Council
Jonathan Davies	Head of Policy (Standards) and Consumer Protection, Food Standards Agency
Louise Davies	Director - Public Health Protection & Community Rhondda Cynon Taf County Borough Council
Ceri Edwards	Environmental Health Manager Caerphilly County Council
NR	Head of Trace Operations, Welsh Government
Andrew Jones	Deputy Director of Health Protection and Screening Services, Public Health Wales
Ian Jones	Vice Chair Directors of Public Protection Wales
NR	Deputy Director Public Health Policy and Programmes, Welsh Government
NR	Senior Environmental Health Advisor for Covid 19, Welsh Government
NR	National Director Health Protection and Screening Services/Executive Medical Director, Public Health Wales
Andrew Kibble	Senior Manager RCE Wales UKHSA Chemicals and Environmental Hazards (Wales)
Fiona Kinghorn	Director of Public Health, Cardiff &Vale University Health Board
Liz Lalley	Interim Director-Recovery and Restart, Welsh Government
Greg Langridge-Thomas	Strategic Program Manager for Test Trace Protect, Powys County Council
Owen Lewis	Head of Regulatory Policy and Local Authority Partnerships, Food Standards Agency
NR	Consultant in Health Protection/Training Programme Director, Public Health Wales
Marion Lyons	Senior Medical Officer, Welsh Government
Rob Orford	Chief Scientific Adviser for Health, Welsh Government

Name	Role and organisation
Teresa Owen	Director of Public Health, Betsi Cadwaladr University Health Board
Sioned Rees	Director of Health Protection, Welsh Government
Keith Reid	Director of Public Health, Swansea Bay University Health Board
Professor David Russell	Head of Unit RCE Wales UKHSA Chemicals and Environmental Hazards (Wales)
Giri Shankar	Director of Health Protection, Public Health Wales
Ffion Thomas	Deputy Director Civil Contingencies & National Security, Welsh Government
Rhys Thomas	Principal Environmental Health Officer Newport County Council and Chair of Environmental Health Wales Communicable Disease Expert Panel
Catherine Watts	Service Manager & Clinical Lead for Test Trace Protect, Powys Teaching Health Board

Annex 3 - Written papers and documents

Respondents were invited to submit documents for consideration by the reviewers. The following documents were received.

Aneurin Bevan University Health Board	• Gwent Test Trace Protect Service Evaluation Report • Regional Cell Delivery Programme (RCDP) Update (To provide a brief update of the key activity undertaken by the Regional Cell Delivery Programme 1st August - 19th September 2022)
Directors of Public Protection Wales	• All-Wales Health and Safety Expert Panel Response – Welsh Local Authorities and the Coronavirus (COVID-19) Pandemic • Local Authority and Public Health Wales Workshop to inform local discussions • Public Protection Services in Wales, Building for the Future • Public Protection Workforce Development Programme (5 years) • Workforce Development Fund Regulatory Compliance Officer Apprentice
Public Health Wales	• COVID-19 Response Proposal: Public Health Strategic Co-ordinating Support Group • Agenda - Public Health Strategic Co-ordinating Support Group 13/11/20 • Working together - Public Health Wales and Welsh Government Health Protection Divisions - Oversight of key health protection indicators across Wales • Terms of Reference for the UK Health Protection Committee • Terms of Reference for the UK Health Protection Oversight Group • UKHPC Work Programme April 22 • Health Protection Oversight Group - Work Programme • Four Nations Health Protection Oversight Group, Health Protection Workforce Sub Group - Terms of Reference • Book Chapter - What is the Health Protection Function? (shared in confidence) • Welsh Government Commissioned Independent Review of the Health Protection, Summary of comments from the CCDC Forum
Swansea Bay University Health Board	• Swansea Bay Health Protection Forum - Terms of Reference
UKHSA Chemicals and Environmental Hazards (Wales)	• Environment and Climate Public Health Surveillance Programme - Strategic Plan 2021 to 2026
Welsh Government	• Health protection-focused 'stock-take' of environmental incident management arrangements and capabilities in Wales • Outline Review of Health Protection System (PID V2)

	• Task and Finish Group 2: Digital solutions for contact tracing and redeployment of skilled TTP workforce • MEMORANDUM OF UNDERSTANDING (PART 1), Transfer of Local Public Health Teams from Public Health Wales to Local Health Boards (from Robin Jones) • TAG document regarding the five harms from Covid technical-advisory-group-5-harms-arising-from-covid-19_0.pdf (gov.wales) • Control plans published by Welsh Government during the pandemic Coronavirus control plans | GOV.WALES • HPAG Advisory Structure • COVID Intelligence Group (CIG) - Terms of Reference • Communicable Diseases Intelligence Group (CDIG) - Terms of Reference

Annex 4 - Review team biographies

NR

NR is a medical epidemiologist and Professor of Infectious Disease Epidemiology at the London School of Hygiene and Tropical Medicine. From 2009 to 2017 he was chair of the UK Health Protection Agency and then Public Health England, and during this period he also led the Centre on Global Health Security at Chatham House (London). From 1989 to 2009 NR held various leadership positions in infectious diseases at WHO, and in 2003 headed the WHO global response to SARS in his role as executive director of communicable diseases. In 1976, after spending two years working in India on smallpox eradication, NR was a member of the CDC (Atlanta) team to investigate the first Ebola outbreak in DRC and stayed on in sub-Saharan Africa for 13 years in various field research positions on Ebola, monkeypox, Lassa Fever, malaria and other tropical diseases. NR has published over 275 peer reviewed articles and book chapters, is editor of the Control of Communicable Diseases Manual, and is an elected member of the UK Academy of Medical Sciences and the US National Academy of Medicine. In 2009 he was named an Honorary Commander of the Most Excellent Order of the British Empire for services to global health.

Sara Hayes

Sara Hayes gained accreditation in General Practice and in the 1990's worked in Cardiff to help establish primary care services for the growing Somali community and an NHS welcome programme for refugee children, making use of health advocates to bridge language and culture gaps. She began formal public health training in 1994 and was Consultant in Communicable Disease Control/Head of Emergency Planning for Iechyd Morgannwg Health before moving into Welsh Government as Senior Medical Officer for Health Protection. She was in this post during the swine flu pandemic, when she took part in planning national, regional and local responses, and was instrumental in establishing community distribution of antiviral medication through existing local services. She was Acting Deputy CMO from September 2011 to January 2012. In 2012 she became Executive Director of Public Health for Abertawe Bro Morgannwg Health Board, publishing annual reports on the public health challenges for the local population. She headed up the Health Board's response to a measles outbreak, leading the establishment of open-access MMR clinics in local hospitals at weekends, and enabling improved MMR uptake through primary care. She was appointed by the Health Minister to chair the Welsh Government Liver Disease Group. She retired in 2017 but returned in April 2020 to support the Welsh Government response to Covid, where she remained until June 2021. She has subsequently been appointed Co-Chair of the Western Bay Substance Use Independent Commission looking at drug-related deaths. She has had many publications of peer-reviewed papers, reports and articles, including as Lead Cochrane author on a published systematic review.