



UK PUBLIC HEALTH RAPID SUPPORT TEAM

Four-year strategic framework

2018-2021

6 February 2018

*“Medicine, the only profession that labours incessantly to destroy
the reason for its existence.”*

- James Bryce

Contents

Abbreviations and acronyms used in this document	2
1. Executive summary	3
2. Background and context.....	5
3. Theory of change.....	6
Outbreak response	8
Research	9
Capacity building overseas.....	10
Assumptions	11
4. Core programme of work and implementation	11
5. Governance, guidance, and management	23
6. Reporting requirements	26
7. Risk management.....	26
8. Monitoring and evaluation	27
9. Financial management and accounting	28
10. Value for money	30
11. Logical and results framework.....	34
12. Stakeholder engagement and communications	34
13. Equality and human rights	34
14. APPENDIX: UK-PHRST Logical Framework	37

Abbreviations and acronyms used in this document

AFRO	WHO African Region Office
ASC	Academic Steering Committee
CDT	Core deployable team
DFID	Department for International Development
DHSC	Department of Health and Social Care
EVD	Ebola virus disease
FCO	Foreign and Commonwealth Office
FETP	Field Epidemiology Training Programme
GHS	Global health security
GOARN	Global Outbreak Alert and Response Network
HMG	Her Majesty's Government
IHR	International Health Regulations 2005
KCL	King's College London
LMIC	Low- and middle-income country
LSHTM	London School of Hygiene and Tropical Medicine
LSTM	Liverpool School of Tropical Medicine
MOU	Memorandum of Understanding
MRC	Medical Research Council
NIS	National Infection Service
NIHR CCF	National Institute for Health Research Central Commissioning Facility
ODA	Official Development Assistance
PB	Project Board
PHE	Public Health England
PSED	Public Sector Equality Duty
SRO	Senior Responsible Owner
ToC	Theory of Change
UK-EMT	UK Emergency Medical Team
UK-PHRST	United Kingdom Public Health Rapid Support Team
UNDSS	United Nations Department of Safety and Security
VfM	Value for Money
WHO	World Health Organization

1. Executive summary

The 2013-16 epidemic of Ebola virus disease in West Africa underscored the shortcomings of the global public health community to both respond to outbreaks and conduct critical research in complex humanitarian crises. Responding to this need, the UK government announced at the 2015 G7 summit the UK's commitment to help build the capacities required for countries to better prepare for, and respond to, public health threats and prevent them from becoming global health emergencies. As part of this commitment, the UK created the UK Public Health Rapid Support Team (UK-PHRST), funded by UK Official Development Assistance (ODA).

Formally launched in November 2016, the UK-PHRST is an innovative partnership between Public Health England and the London School of Hygiene and Tropical Medicine, with contractual arrangements to form an academic consortium with the University of Oxford and King's College London. The UK-PHRST's triple mandate is to integrate outbreak response, innovative research to generate evidence on best practices for outbreak control, and capacity building for outbreak response in ODA-eligible countries.

The UK-PHRST is an integral part of the HMG response to global health security, contributing to the strategic objectives of prevention, detection and early response to global health threats. The UK-PHRST will work closely with all UK HMG and academic partners and projects to ensure alignment of UK-PHRST objectives, activities and outputs across the broader HMG global health security, health system strengthening and research agenda. In addition to cross-UK collaborations, the UK-PHRST will work in partnership with local, regional, and international partners overseas, in particular in support of WHO/GOARN, to create and strengthen global capacities for outbreak prevention and control.

The UK-PHRST provides an integrated project to combat outbreaks of dangerous infectious diseases with benefits in the short-, intermediate-, and long-term. Linked to diverse infectious disease monitoring systems, the UK-PHRST identifies situations where the deployment of specialist expertise can mitigate these threats, rapidly deploying a standing team of multidisciplinary public health professionals and researchers as required. In addition to the benefits to stakeholders overseas, the UK-PHRST will help protect the UK population through the development of greater capacity to prevent, detect and respond to health threats internationally that might directly or indirectly affect the UK, resulting in potential health, economic or social harm.

Given the need to establish the UK-PHRST quickly, interim arrangements were put in place to create a functional administrative framework and core deployable team for roughly the first year of the UK-PHRST whilst a long-term framework was being developed and a full-time director recruited. In the first year of its existence, the UK-PHRST has already demonstrated its capacity to respond effectively to international health threats, deploying teams to respond to four outbreaks in sub-Saharan Africa and one in Asia. Furthermore, the UK-PHRST is presently sponsoring and executing 10 research projects, including one established during an outbreak (pneumonic plague in Madagascar), and has contributed to numerous training and capacity building endeavours in Sierra Leone, Uganda, Ethiopia, and elsewhere.

These measures now achieved, the UK-PHRST is transitioning from the interim stage to increasing field engagement and establishment of a long-term vision and programme to assure continued progress and growth. This document lays out the UK-PHRST Strategic Framework for years 2-5. Goals as the UK-PHRST move forward include 1) Continuing and expanding our role in providing rapid technical support to outbreaks in ODA-eligible countries, offering expertise and tools to streamline and optimize outbreak response, while interfacing and integrating more closely with other HMG actors engaged in global public

health, 2) Growing the UK-PHRST research portfolio from one of numerous independent projects to a more cohesive approach for maximum synergy, 3) Actively exploring, strengthening and developing innovative tools and approaches to be incorporated and validated in the field to optimize outbreak response, 3) Expanding horizons and building bridges to broad UK-wide technical and research expertise to develop a base for enhanced human and financial resources, 4) Developing a comprehensive and cohesive overseas training portfolio to develop a cadre of skilled personnel for outbreak response and research in ODA-eligible countries, and 5) Developing metrics and systematic methods of evaluation to enable more objective assessment of the effectiveness of outbreak response measures. All activities will be pursued in conjunction with a broad array of local, regional, and international partners dedicated, like the UK-PHRST, to making the world safer from outbreaks of infectious diseases.

2. Background and context

A review of the WHO emergency response following the 2013-16 West African Ebola virus disease (EVD) epidemic acknowledged the need for a global rapid response capability that could prevent public health events from escalating by reducing morbidity and mortality and related financial and security consequences.¹ At the 2015 G7 Conference the UK government announced the UK's commitment to help build the capacities required for countries to prepare for and respond to public health threats to prevent them from becoming global health emergencies. As part of this commitment, the UK created the UK Public Health Rapid Support Team (UK-PHRST), funded by UK Official Development Assistance (ODA) with a 5-year (2016-21) budget of £20 million (i.e. £4 million per year).

Formally launched in November 2016, the UK-PHRST is an innovative partnership between Public Health England (PHE) and the London School of Hygiene and Tropical Medicine (LSHTM). The UK-PHRST is linked to diverse infectious disease monitoring systems, identifying situations where the deployment of specialist expertise can mitigate these threats. When required, the UK-PHRST rapidly deploys on behalf of the UK Government a standing team of multidisciplinary public health professionals and researchers in countries that are eligible for ODA-funded assistance, which generally supports low- and middle-income countries (LMICs).² However, the UK-PHRST's remit extends beyond simply responding to outbreaks, seeking to identify and address the underlying causes. The UK-PHRST objectives are to:

- Within ODA-eligible countries, to support rapid investigation and response to disease outbreaks at the source, with the aim of stopping a public health threat from becoming a health emergency
- Conduct rigorous research to aid epidemic preparedness and response and improve future response
- Generate an evidence base for best practice in disease outbreak interventions within ODA-eligible countries
- Train a cadre of public health reservists for the UK-PHRST who could be rapidly deployed to respond to disease outbreaks
- Build capacity in-country for an improved and rapid national response to disease outbreaks and contribute to supporting implementation of the International Health Regulations (IHR)

The UK-PHRST functions as one key component of the UK's broad programme and commitment to global health, which builds on the commitments set out in 'Health is Global'³, and align with the principles set out in the 2015 UK Aid Strategy (tackling global challenges in the national interest)⁴. The functions will contribute to the UK's global health priorities of strengthening global health security (GHS), including supporting health diplomacy, contributing to global health and development, supporting learning and the evidence base for global action and mitigating the impact of health crises on commerce and prosperity, with

¹ Bausch DG. West Africa 2013 Ebola: From Virus Outbreak to Humanitarian Crisis. *Curr Top Microbiol Immunol.* 2017;411:63-92

² Although not completely overlapping, most ODA-eligible countries can also be characterized as LMICs and, for simplicity, will be referred to as such in this document.

³ Health is Global: an outcomes framework for global health 2011-15. HM Government, 2011. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215656/dh_125671.pdf

⁴ UK Aid: Tackling global challenges in the national interest. HM Treasury and Department for International Development, 2015. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/478834/ODA_strategy_final_web_0905.pdf

all actions underpinned by research and innovation. Key policy principles include strengthening the capacity of global health institutions, such as WHO, and maximising the synergy and effectiveness of UK AID investments, ensuring that the contribution of the UK to GHS is visible, credible, effective and of high impact.

Given the need to rapidly establish the UK-PHRST, interim arrangements were put in place to create a functional administrative framework and core deployable team (CDT) for the first year of the UK-PHRST while a permanent structure was being developed and a permanent director recruited. To date, the UK-PHRST has engaged in five outbreak responses in Ethiopia, Nigeria, Sierra Leone, Madagascar, and Bangladesh, is executing 10 research projects, and has contributed to numerous training and capacity building endeavours in Sierra Leone, Uganda, Ethiopia, and elsewhere. A detailed summary of these initial activities and achievements can be found in the UK-PHRST Year 1 Annual Review. Building on this interim activity, the UK-PHRST is now progressing toward increasing field engagement and establishment of the permanent infrastructure for UK-PHRST maintenance and growth. This document lays out the Strategic Framework for years 2-5.

3. Theory of change⁵

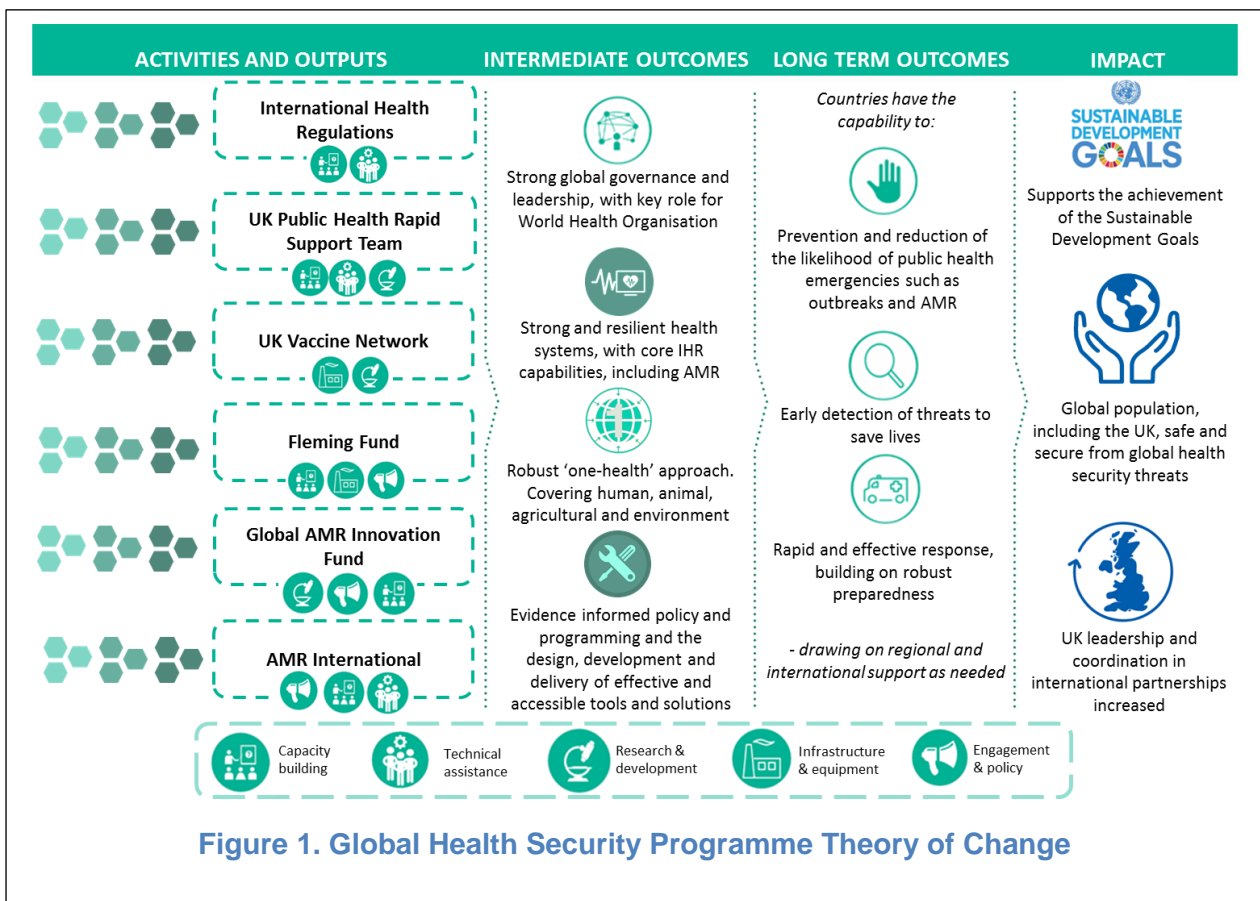
Early outbreak detection and rapid response are key to reducing the risk that public health events escalate from local to global threats, especially as globalisation and travel increasingly raise the risk of international spread of disease. Effective public health surveillance and early warning systems can limit the risk and magnitude of outbreaks by enabling early alert, rapid verification of signals, and timely response. In addition to saving lives and reducing morbidity, effective outbreak control is essential to limit the social, economic and indirect health burdens that often result from the impact on daily activities and health care systems. Whilst effective local surveillance and response capabilities are always the aspiration, where health systems are fragile, support from international partners, such as the UK-PHRST, may be needed.

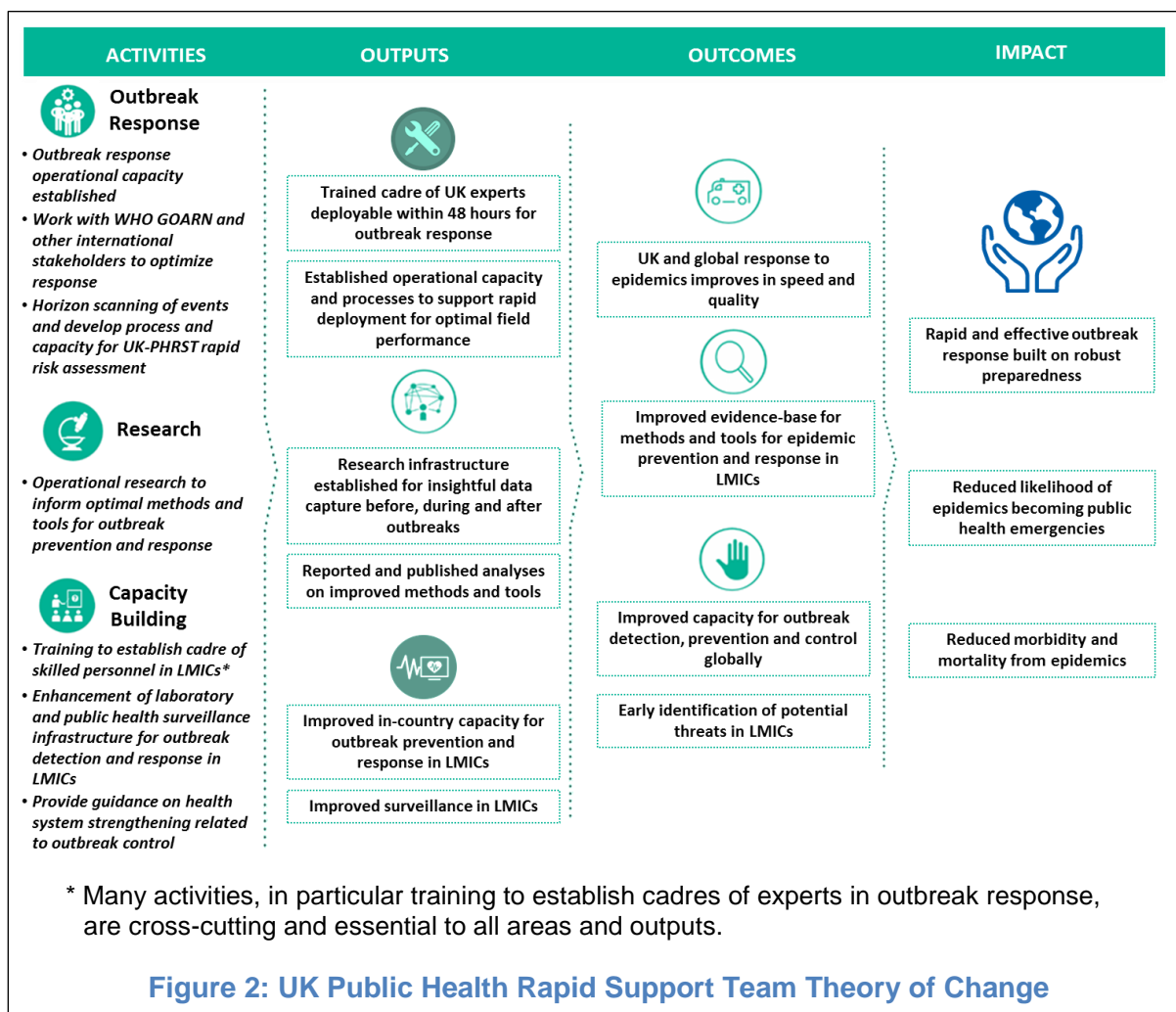
The UK-PHRST comprises one component of the broader GHS Programme that aims to support achievement of the Sustainable Development Goals, work toward a global population safe and secure from global health security threats, and increase UK leadership and coordination in international partnerships (Figure 1). The UK-PHRST will support these aims through its triple mandate of outbreak response, outbreak-related research and capacity building. In addition to functioning as a key component of cross-HMG GHS efforts, the UK-PHRST will form a bridge to key academic partners across the UK, as well as serve as an integral partner to the international community, especially WHO and GOARN, and other developing Rapid Response Teams. Working together, we will work to *prevent outbreaks from becoming public health emergencies, reduce morbidity and mortality, and ultimately make the world safer from outbreaks of infectious diseases* (Figure 2).

The UK-PHRST is intended to bring both domestic and international benefits, which include:

⁵ Theory of Change is essentially a comprehensive description and illustration of how and why a desired change is expected to happen in a particular context. It is focused in particular on mapping out or “filling in” what has been described as the “missing middle” between what a programme or change initiative does (its activities or interventions) and how these lead to desired goals being achieved. It does this by first identifying the desired long-term goals and then works back from these to identify all the conditions (outcomes) that must be in place (and how these related to one another causally) for the goals to occur. For more detail, see <http://www.theoryofchange.org/what-is-theory-of-change/>.

- Strengthened UK public health capacity and enhanced workforce with greater global awareness, experience and outbreak response capability
- Enhanced career pathways related to combating outbreaks and infectious diseases, with resultant increased experience, technical capacity, and leadership skills of UK personnel, enhancing UK ability to both deploy internationally and at home to future outbreaks and public health emergencies
- Increased resilience within the UK since experts can also be available to respond and support public health incidents nationally when not deployed elsewhere
- Improved preparedness and resilience against potential public health events of international concern in LMICs, also contributing to the strengthening of IHR
- Promotion of British skills, resources and proactive role in addressing global health challenges, including international training
- Reduction of risk of future economic and health disruption from unrecognised or uncontrolled outbreaks
- Building the UK's resilience to global threats through strengthened international networks that provide advance notice of threats and can elicit an early response





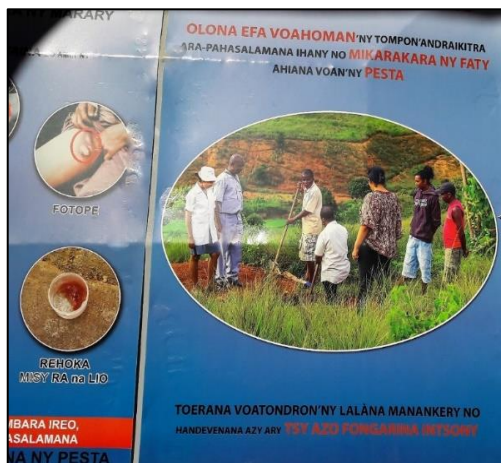
Outbreak response

Rapid public health responses have the potential to quickly control or even prevent outbreaks. To rapidly and effectively respond to outbreaks the UK requires a cadre of trained and skilled experts available for deployment (i.e. the UK-PHRST, including reservists, FETP Fellows and other affiliated personnel and trainees),⁶ close horizon scanning for early identification of potential threats and rapid risk assessment (see below), and operational capacity for rapid deployment (within 48 hours' of ministerial authorization) and optimal performance in the field. Rapid risk assessment sheds light on the local, national and international risk of a situation, and the need for and nature of the response. Once in the field responding to or preventing an outbreak, the UK-PHRST contributes services such as enhanced epidemiologic surveillance and analysis, information management, and technical guidance on public health control measures, laboratory diagnosis, clinical management, infection prevention and control, and community engagement.

The following two case studies from UK-PHRST early deployments are included to illustrate the potential benefits that will result from the work:

⁶ These personnel are a prerequisite for all UK-PHRST activities in outbreak response, research and capacity building overseas, and thus feed into all three intermediate and long-term UK-PHRST outcomes.

Case 1. Sierra Leone, Aug. 2017. Catastrophic flash floods and mudslides take at least 300 lives in the Sierra Leone capital of Freetown, the deadliest natural disaster in Sierra Leone's history. Thousands are left homeless in conditions of limited access to clean water, poor sewage standards, and underlying poor nutritional status. Recognizing the high risk of epidemics of water-borne disease such as cholera and typhoid fever, the Sierra Leone Government requests UK-PHRST support to implement enhanced epidemiologic and laboratory surveillance for water-borne diseases. The UK-PHRST responds rapidly with a 6-person team of epidemiologists, laboratory microbiologists, and a logistician who work side-by-side with Sierra Leonean colleagues as well as colleagues from the UK and other international stakeholders. Enhanced field surveillance and laboratory diagnostic capacity are quickly implemented. No outbreaks of water-borne diseases are noted—a deadly disaster potentially averted. Throughout the deployment, the UK-PHRST team relies heavily on laboratory infrastructure and trained laboratory personnel resulting in part from the recently completed DIFD-funded EPR programme and the ongoing PHE-funded Resilient Zero Programme, illustrating the benefits and synergies of HMG cross-government initiatives.



Case 2. Madagascar, Oct. 2017. Plague, already endemic in Madagascar, escalates to epidemic proportions, with hundreds of cases of the dangerous and highly transmissible pneumonic form. Furthermore, cases are noted in areas outside of the usual endemic zone, including in densely populated coastal cities, including the capital Antananarivo. At the request of the WHO/GOARN, the UK-PHRST rapidly deploys two epidemiologists and a case management expert to contribute to the international response. The French language skills of the recently recruited UK-PHRST team allows the UK to participate in outbreak control efforts in francophone Africa, illustrating the developing global nature of UK response capacity. Noting the difficulty in distinguishing cases of pneumonic plague from other respiratory disease, the UK-PHRST team quickly collaborates with local partners to set up a study on the clinical characterization of pneumonic plague, illustrating the potential of the UK-PHRST to rapidly implement research during an outbreak while still contributing to the outbreak control efforts. Through the contributions of a diverse international team led by WHO, the outbreak is ultimately brought under control.

Research

The field of outbreak response has developed over the years with logical and well-intentioned interventions from the local and international communities. However, recent failures, or at least sub-optimal responses, have revealed the world's lack of preparation to effectively implement research during outbreaks, as well as the need for a more evidence-based filter to evaluate optimal responses. In addition to evaluating the broader aspects of the operational response, during and after outbreaks, specific gaps in knowledge are often identified, the answers to which could potentially improve the response, limit transmission, and save lives. Recent technological innovations offer the promise of novel methods and tools but require field application and study to objectively assess their impact.

The UK-PHRST will collaborate with a broad array of UK, local and international partners to develop and evaluate (including before, during, and after outbreaks, as appropriate) improved methods and tools for outbreak prevention and response. Evidence generation, along with direct technical support provided by the UK-PHRST, can drive the development of tailored preparedness plans and response mechanisms that can be activated by LMICs as signals are detected. Research may encompass the range of domains relevant for improved surveillance, disease control and preparedness, including epidemiology and surveillance, data management, microbiology, infection prevention and control, clinical management, mental health and well-being, social sciences and communication (see more details on the UK-PHRST research programme on page 15). In addition to the generation of scientific evidence of potential immediate relevance to the field, this work, performed in collaboration with local investigators, generates partnership and mutual learning.

Capacity building overseas

James Bryce described medicine as, “the only profession that labours incessantly to destroy the reason for its existence.” Similarly, the UK-PHRST seeks to ultimately eliminate the need for its existence by building capacity for outbreak prevention and response overseas. We must work towards a world where LMICs no longer depend on support from the UK or other industrialized countries, because they have the capacity to prevent and respond to outbreaks themselves.

The UK-PHRST engagements overseas will provide a platform for capacity building, establishing a legacy of regional hubs for research and teaching. The most important resource (and indeed one cited as a major weakness combatting the 2013-16 West Africa EVD outbreak (Bausch 2017) is trained local personnel, which are essential to robust and resilient public health structures. The UK-PHRST, in collaboration with a wide array of partners, will contribute to the training of personnel in LMICs to help provide the knowledge and skills required for effective outbreak preparedness and response. Training needs will be assessed against a competency framework, developed in collaboration with local and regional partners, of both ‘hard’ and ‘soft’ skills for outbreak response, from basic to advanced levels. This competency framework will constitute the backbone of the capacity development work of the UK-PHRST, with each training activity designed to meet one or more of the competencies. We will consider flexible training modalities; depending on the needs and interests of partner countries, training may consist of didactic teaching in postgraduate courses (e.g. public health, epidemiology, microbiology, medicine and nursing) and national and regional FETP programmes as well as informal on-the-job training through joint outbreak response operations between UK-PHRST and national counterparts. When deemed appropriate, bursaries for short-term study or research experience in the UK to gain specific skills may be considered. Trainees may include, as appropriate, public health professionals in Ministries of Health, FETP Fellows, and students and technicians in

academic settings. Lastly, in addition to training, at selected sites the UK-PHRST will contribute to laboratory infrastructure development and provide strategic guidance on health systems strengthening related to outbreak control.

Assumptions

- Necessary human and financial resources are available for the UK-PHRST and partners
- LMICs request/accept support for outbreak response, related research, and capacity building
- Early outbreak detection and response reduces case counts, morbidity and mortality
- Response activities are effective in minimizing the impact of infectious disease outbreaks and emergencies on affected populations
- Research is feasible and acceptable within the context of outbreak response
- Trained staff in LMICs remain in the pool of experts and engaged in outbreak response efforts in their home countries and regions

4. Core programme of work and implementation

The UK-PHRST is a collaboration cutting across UK government and academia. Although we will logically take advantage of the historical strengths of the partner institutions (e.g. public health response at PHE and teaching and research at LSHTM), the UK-PHRST will function as a single cohesive group with unity of purpose. All CDT members will engage in outbreak response, research, and capacity building endeavours.

Responding to and preventing outbreaks

Deployments

The UK-PHRST stands ready to deploy within 48 hours' notice of HMG authorization. Deployments may be through participation in international teams, such as the WHO Global Outbreak Alert and Response Network (GOARN), bilateral agreements with other governments or in support of other UK actors, such as DFID and UK-EMT. The UK-PHRST will seek to arrive in the field as early as possible, providing rapid context analysis, rapid risk assessment of developing threats and feedback to Ministries of Health, HMG, UK-Med, WHO/GOARN, and other local and international stakeholders regarding transmission dynamics and required steps and capacities to stem transmission and optimize patient care. Having provided the early assessment, UK-PHRST will then provide, as far as possible, the required human, technical, and operational support to curtail transmission and reduce impact, complemented by UK-Med and a cadre of reservists to ensure surge capacity when necessary.

Core Deployable Team

The CDT for the UK-PHRST consists of the following:

- Epidemiologists (3)
- Laboratory Microbiologists (2)
- Case Management Specialists and Clinical Researchers (2) –one physician and one nurse
- Social Scientist
- Infection Prevention and Control Nurse

- Data Scientist
- Field Logistician

In addition, although his main role is in management and oversight, the UK-PHRST Director (Clinician-Epidemiologist-Researcher) is included in the CDT.

FETP Fellows

Developing a cadre of epidemiologists with the skills and experience to respond to outbreaks in LMICs is essential to controlling outbreaks both overseas and limiting risk of transmission and spread in the UK. Toward this goal, the UK-PHRST intends to work closely with the UK FETP, regularly integrating FETP Fellows into UK-PHRST activities. Each year, the UK-PHRST will provide funding for four designated FETP/UK-PHRST Fellows who will concentrate their activities (outside of required training modules for all Fellows) on UK-PHRST activities, including not only deployment to outbreaks, but also involvement and contribution to outbreak-relevant epidemiological research and capacity building activities. It is envisaged that the UK-PHRST will become an official FETP training site for 2018. When possible, UK-PHRST may also offer deployment opportunities to the rest of the FETP Fellows and other trainees. All deployable FETP fellows will undergo the same training as the CDT. In order for the UK to capitalize on the investment made in training and capacitating the two FETP/UK-PHRST Fellows over the course of their two-year programme, Fellows will commit to enlisting as UK-PHRST Reservists (see below) upon the conclusion of their fellowship. We anticipate the UK-PHRST to result in a cadre of experienced UK epidemiologists and leaders in the field of outbreak response and research, some of whom may ultimately work for the UK-PHRST, but at a minimum will be available as reservists.

Reservists

While the CDT is largely sufficient for a single deployment, it is insufficient should the UK-PHRST be called upon to deploy to more than one outbreak simultaneously or to provide sufficient surge capacity in the event of larger outbreaks or pandemics. Furthermore, depending upon the outbreak, there may be particular skills and subject matter expertise that are not present within the CDT. For these reasons, the UK-PHRST will also develop a cadre of reservists from public health, clinical microbiology, and biomedical institutions across the UK. After an open call, we anticipate vetting and enlisting 5-10 reservists for each of the positions listed above. In addition to technical skills, training, and field experience, we will seek to ensure that the UK-PHRST reservists have some of the required “soft skills”, such as foreign language and diplomatic relations aptitude, to complement the CDT. Reservists will be expected to undertake and maintain the same training as the CDT (see below).

While we anticipate that some reservists will already work in settings related to outbreak response, such as those based at PHE and LSHTM, and will thus be readily available, others working in some academic, private or civil service settings may require replacement, or “back-fill” of their posts while deployed. We are presently developing a policy for back-fill. Two key considerations are keeping within budget constraints and, since UK personnel may occasionally also be deployed through mechanisms outside of UK-PHRST, avoiding creation of a two-tiered system in which back-fill compensation from UK-PHRST drastically differs from that offered from another organization.

Epidemic Intelligence and Horizon Scanning

The UK-PHRST must rapidly identify global public health emergencies, prioritizing those that pose the greatest threat. To do so, the UK-PHRST first will continuously monitor a wide variety of epidemic intelligence and horizon scanning sources provided by PHE, DHSC, WHO/GOARN, and other partners. As early intelligence gathering is key to a rapid and

successful response, we will also explore avenues to accelerate the process in collaboration with HMG partners that have a continual presence in many LMICs, such as DFID, the Foreign & Commonwealth Office, and UK Embassies.

Risk assessment for deployment and prioritisation

Like all international organizations, UK-PHRST deployment overseas is contingent upon receiving an official request for assistance, either directly from a country government or indirectly through an authorized international body, such as WHO/GOARN or WHO Regional or Country Offices. When appropriate, the UK-PHRST may initiate informal discussions with officials in Ministries of Health, international organizations, or other relevant stakeholders to make them aware of the UK-PHRST's capacities and the potential for assistance through deployment. In all cases, however, an official request to HMG for UK-PHRST deployment must be received to initiate the process.

Since every deployment represents an opportunity cost for concomitant or future deployments, and since it is entirely possible that the UK-PHRST will receive simultaneous requests to deploy, with demand for support potentially exceeding capacity, a clear strategy is needed to evaluate and prioritize requests for assistance in terms of risk and impact. Identified threats will undergo standardized risk assessment and prioritization by the UK-PHRST team, taking into account:

- ODA-eligibility of the country in question
- The potential scale of the event in terms of case counts, excess morbidity and mortality; risk of spread locally, regionally and internationally; and ancillary factors such as potential economic impact or potential to produce civil unrest and insecurity
- UK-PHRST's capacity to fill the gaps in technical expertise and human resources through the CDT, reservists, FETP Fellows and affiliated personnel

Deployment may also be considered in order to undertake risk assessments, monitor conditions and prevent an outbreak from occurring in particularly precarious situations, such as following sudden-onset disasters or acute humanitarian emergencies. In addition, we plan to routinely deploy alongside the UK-EMT and UK-Med to provide public health support in the context of sudden onset disasters and other emergencies by providing epidemiologic, health information management, and laboratory surveillance. In unusual circumstances of need, deployment will be considered to provide epidemiologic, logistical, and administrative support to non-infectious emergencies in LMICs, for example, should the UK Centre for Radiation, Chemical and Environmental Hazards require such support in responding to an environmental hazard overseas.

Criteria for concluding deployment

The UK-PHRST role in outbreaks is to provide early risk assessment and to contribute to early stabilization and control. As such, most UK-PHRST deployments will be a maximum of 4-6 weeks' duration. This could be extended in the circumstances of major outbreaks or pandemics (likely calling upon UK-PHRST reservists) or in outbreaks in which the UK-PHRST is engaged in research and capacity building projects (see below). The criteria for concluding a deployment are:

- Stabilization of the outbreak with regard to declining number of cases
- Development of a viable plan for capacitation and transition of activities performed by UK-PHRST during the outbreak to a competent national or international partner (often trained by UK-PHRST)

- In the case of other deployments (e.g. deployment in support of UK-EMT): Initial Terms of Reference met and appropriate transition of activities undertaken

Training of the UK-PHRST deployable team

All personnel deployed by the UK-PHRST will undergo mandatory and extensive training designed to prepare them and assure their safety under the rigors of fieldwork in LMICs. After the completion of a training needs analysis against a competency framework, the current training programme was designed to align with deployment criteria of WHO and other UN agencies to allow rapid and seamless deployment through the UN system. It consists of six components (Table 1).

Table 1. Required training for the UK-PHRST deployable team

Training Course	Delivery Method	Notes/Objectives
UNDSS Basic Security in the Field	Online: https://training.dss.un.org/course/category/1	
UNDSS Advanced Security in the Field	Online: https://training.dss.un.org/course/category/2	
Induction/Pre-deployment Workshop	Face-to-face workshop	<ul style="list-style-type: none"> • Describe the background, structure and objectives of UK-PHRST • Explain the GHS context • Explain health and humanitarian architecture • Describe the deployment process, including the health and wellbeing considerations • Discuss deployment challenges and solutions • Explain communications and media handling
Security Awareness in Fragile Environments (SAFE)	3 day field-based training course	<ul style="list-style-type: none"> • Practical scenarios to exercise participants in staying safe on deployment, such as multiple terrorist attack scenario, movements and journey management, conflict management and first aid
Security Awareness in Close Protection (SAFE+)	1 day classroom based/practical workshop	<ul style="list-style-type: none"> • Includes operating procedures, responding to IDF/gunfire and bombs, and use of personal protective equipment
Deployment Course	4 day field-based course	<ul style="list-style-type: none"> • Simulation-based course • Presents many of the challenges likely faced on deployment, such as security risks, language difficulties, cultural differences and issues of team dynamics • Participants familiarise themselves with practical requirements and tools in the field (i.e. communications; electrical power; water, sanitation and hygiene; ethics and personal kit)

In 2018 the UK-PHRST will partner with GOARN to co-sponsor a series of Deployment Courses oriented specifically toward outbreak response teams. GOARN sponsors numerous such courses, but presently has no regular site or course in Europe. Developing this course in conjunction with GOARN will not only allow the UK-PHRST to contribute to the global cadre of trained personnel to combat outbreaks, establishing the UK-PHRST as a training

leader in this field, but also to have greater control over the frequency of courses to meet UK-PHRST training needs, particularly for the anticipated steady flow of reservists and FETP Fellows. A detailed training plan and budget are presently in development.

Lastly with regard to training, the UK-PHRST aspires to be a truly global force. As such, language skills are extremely important to facilitate engagement in areas where English is not the native language. French is particularly important for work in francophone Africa and Arabic for North Africa and the Middle East—two areas where many UK-PHRST deployments are likely to occur. A significant number of the CDT are multilingual. However, to augment and build upon this, the UK-PHRST will provide French or Arabic language training for all personnel, funded via UK-PHRST overhead. Other language training may be added in the future as the need arises.

Training needs will be continuously reassessed and adapt to changing needs and contexts. The focus will be on ensuring a robust comprehensive and developmental training programme that will support high quality service delivery.

Research

Conducting rigorous research to aid epidemic prevention, preparedness and response is an essential function of the UK-PHRST. When not occupied by outbreak response, the UK-PHRST CDT and collaborators will conduct research relevant to the prevention, detection and response to infectious disease outbreaks in ODA-eligible countries. This research may be operational (i.e. designed to improve effectiveness or efficiency of outbreak preparedness and response) or disease-specific, but always with the goal of providing evidence-based actionable conclusions to inform and optimize outbreak prevention and response in LMICs. The overall objectives of the UK-PHRST research programme are shown in Table 2.

Table 2. UK-PHRST research objectives (5 years)*

<p>Short-term. In the first two years the UK-PHRST will focus on establishing itself as an operational unit, developing a foundation for a long-term programme integrated with the UK-PHRST’s outbreak response and capacity building research remit. Short-term objectives are:</p>
<ul style="list-style-type: none"> • Establish the administrative infrastructure, management, and oversight of the UK-PHRST research programme, including an Academic Steering Committee (see below) and refine models of inter-site working to enhance synergies (both within the UK and internationally) • Define broad research work streams for the UK-PHRST (see details below) • Launch initial research endeavours through an array of peer-reviewed short-term projects, with ethical approval as required, to explore opportunities and resources and deliver swift results • Establish a process for UK-PHRST research growth and innovation through monthly meetings that consist of strategic planning, brain-storming sessions on innovations in outbreak response, seminars from invited speakers, research-in-progress updates, journal clubs, and meetings of a UK-PHRST Interest Group • Identify possible distinct and cross-cutting areas of research interest and expertise (e.g. Minlon sequencing, outbreak modelling, clinical research on Lassa fever) • Hold a ‘UK-PHRST Open House’ to facilitate interaction and collaboration with the wider UK research and public health communities • Develop communications and public engagement plans • Disseminate information about the UK-PHRST to the UK and global scientific and public health communities through participation and presentations at national and international research meetings
<p>Medium-term. In years 3-4 the UK-PHRST will continue to build on the developing framework to focus, refine and expand the programme. Medium-term objectives are:</p>

- Evaluate the efficacy, strengths and weaknesses, cost-effectiveness and Value for Money of the first two years of the UK-PHRST research programme
- Further develop and consolidate the major research work streams, all aimed at improving outbreak response to reduce morbidity and mortality, and ensure that they are aligned with development of country and region-specific UK-PHRST capacity building activities
- Disseminate research findings to policy makers (e.g. PHE, DH, DFID) and other national and international stakeholders (e.g. WHO, GOARN) through the development of guidelines and toolkits as well as academic papers
- Hold a yearly UK-PHRST Research Conference in and in conjunction with partners in LMICs
- Continue development of a wider UK-PHRST research network by enhanced collaborations with new partners in academia, government, and the private sector
- Use the UK-PHRST infrastructure as a platform from which to develop further externally-funded research programmes

Long term. In years 4-5 the UK-PHRST will further consolidate and expand on the gains made on the aforementioned short- and medium term objective. Long-term objectives are:

- Review and refine research priorities, boundaries, and performance in consultation with stakeholders to ensure alignment with the UK-PHRST Partnership Agreement and overall objectives
- Establish the UK-PHRST as a an exemplary programme for research integration into outbreak response that will be a model for creation of similar rapid support units in other countries, with willing guidance and direction from the UK-PHRST when requested
- Obtain substantial additional external research theme-specific funding in collaboration with a broad-base of partners from the UK and beyond
- Ensure that UK-PHRST personnel grow professionally, progressing to more senior positions in PHE and academia
- Develop a plan for UK-PHRST activity beyond Year 5, in consultation with PHE, DH, NIHR, LSHTM, and other funders and stakeholders

* The objectives stated here cover the complete 5-year period of UK-PHRST initial funding and will be periodically reviewed and revised as appropriate. As detailed in this document as well as in the UK-PHRST Year 1 Annual Review, many of the short-term objectives have already been achieved.

Outbreak response will necessarily take precedence over the non-outbreak research programme, so written research continuity plans will be required. To balance and assure the various commitments of the UK-PHRST's triple mandate, a team approach will be taken to the research, with close communication and built-in redundancy of essential tasks so that reasonable momentum can be maintained with the research even if some members are deployed for outbreaks. We expect all research to be published in peer-reviewed journals. In addition, any data, findings, and samples of immediate relevance to outbreak control programmes will be shared rapidly by more informal means as possible, while protection patient confidentiality, with later formal publication.

The UK-PHRST research portfolio can be divided into three distinct components: Research during outbreaks, research in the immediate wake of outbreaks, and a long-term research agenda to be conducted outside of outbreaks. The funding for the UK-PHRST research component varies by project year and is necessity flexible, depending on the demand on the overall budget of the team's response to outbreaks, which is unpredictable. We anticipate approximately 85% of the annual research budget to be spent on the long-term stable research agenda, with the remaining 15% dedicated to research during and in the immediate wake of outbreaks. As the UK-PHRST project progresses, we anticipate seeking additional funds from other sources to supplement this budget and to expand the range of research activities.

Research during outbreaks

The conventional and accepted approach in recent decades has been to separate research from the early outbreak response, with the rationale that performing research during the outbreak detracts from the public health response by diverting human, material, and financial resources to a lower priority (and indeed, until very recently, has often been criticized when proposed). Research is typically approached only when the outbreak is considered sufficiently under control. However, there are numerous problems with this approach: 1) Critical studies to inform best practices to stem transmission and optimise patient care often start too late and enrol insufficient numbers to provide conclusive results. Post-outbreak evaluations have repeatedly cited responding agencies' struggles to rapidly mobilize human, material and financial resources, 2) Opportunities to study and improve processes related to the initiation/early phases of response operations—often the most critical—are lost, 3) Divorcing or delaying the research from the response means that data collected up until the formal implementation of a study is not collected under informed consent, often presenting insurmountable regulatory hurdles and consequent loss of potentially extremely valuable knowledge since extant data and samples are not available for analysis, and 4) When framed appropriately, interventions conducted under research protocols have the potential to positively impact the outbreak, such as the study and use of a recombinant vaccine for Ebola virus disease studied through a Phase III clinical trial during the 2013-16 outbreak of that disease in West Africa.⁷

We believe that research must and can be done responsibly and ethically starting from the earliest phases of the outbreak response. In order to undertake this important endeavour, the UK-PHRST will first undertake extensive literature review and scientific evaluation to identify fundamental knowledge gaps and operational challenges and, where appropriate, disease-specific research questions, that can only be answered through research in the early phases of an outbreak (although preliminary and follow-up studies may be performed through work at one of the UK-PHRST stable research sites—see below). We will then develop generic but nevertheless detailed research protocols designed for rapid implementation in the event of an outbreak. The goal here is to develop a portfolio of various key questions and corresponding protocols to answer them, and be ready when the opportunity presents. These protocols will be shared with likely key partners in the field, such as ministries of health in endemic areas for key diseases, WHO (GOARN, Headquarters, Regional and Country Offices, as appropriate), MSF, US CDC and Africa CDC in order to obtain the maximum scientific feedback on the protocol and buy-in for rapid implementation if and when an outbreak occurs. Where appropriate, the protocols may be adapted to specific countries and contexts where future outbreaks are anticipated based on past experience, regular monitoring of epidemiologic data, and, when possible, disease modelling and prediction. The protocols will also be submitted for Ethics Committee approval at the relevant institutions both in the UK and in partner countries. We will also develop a standard operating procedure and checklist for rapid adaption and implementation of research once an outbreak is declared. This will entail steps such as rapid review and adaptation of the protocol to the partner country and population, social science and communications procedures for rapid community engagement, ethics committee review, and logistics. When the UK-PHRST is deployed through WHO/GOARN, research during outbreaks may be promoted and facilitated through guidelines being established through the WHO/GOARN Operational Research Task Force, of which the UK-PHRST Director is Co-Chair.

⁷ Henao-Restrepo *et al.* Efficacy and effectiveness of an rVSV-vectored vaccine in preventing Ebola virus disease: final results from the Guinea ring vaccination, open-label, cluster-randomised trial (Ebola Ça Suffit!). *Lancet*. 2017 Feb 4;389(10068):505-518

It is important to note here the unusually advantageous position of the UK-PHRST by virtue of its government-issued and funded *mandate* to conduct research related to outbreaks. The dedicated resource of full-time staff, with surge capacity through reservists, allows the UK-PHRST to concentrate on, as well as to estimate and dedicate in advance, the necessary, human, material, and financial resources for *both* its contribution to the public health response necessary for outbreak control *and* essential operational research. Therefore, the classic concern of research endeavours diverting resources and attention from outbreak control is avoided. Lastly, it must be noted that we recognize that each outbreak situation is different and that the UK-PHRST's top priority is to stop disease transmission to save lives. Our commitment to this goal will be unwavering even in contexts where research is not deemed logistically or ethically possible and/or where the national authorities are not supportive of the proposed study. Simply put, although we strongly advocate for research in the outbreak setting, the UK-PHRST's support during outbreaks is *not* contingent upon acceptance of research.

Research in the immediate wake of outbreaks

The UK-PHRST strives to not only respond to outbreaks but to identify the key causative factors and methods to prevent future outbreaks in the same region and elsewhere. In order to progress with this aim, during and immediately after each outbreak deployment the UK-PHRST will attempt to identify key research questions regarding outbreak-related factors and devise protocols for their investigation. These short-term scoping research projects are designed to be narrowly focused on key questions and implementable within ~6 months with a modest budget. They will have two major objectives: 1) Collect preliminary data on a subject or test initial hypotheses on methodologies, tools and techniques in order to determine whether more in-depth studies are warranted in the region in question, and 2) Provide a relatively low-cost low commitment mechanism to evaluate the capacity and compatibility of the in-country collaborating institution and personnel before making more major investments of time or money on long-term research projects.

For these short-term projects, the UK-PHRST will attempt to engage researchers from UK HMG, academic and other research centres, including their affiliated partners overseas, with the necessary subject matter expertise and potential interest in longer-term research engagement in the region. Aside from the obvious contribution of expertise in the field of research, engaging these UK researchers is intended to develop the potential for long-term research engagement and capacity building in LMICs where these short-term research projects show promise on the criteria noted above. The UK-PHRST does not have the mandate nor depth of personnel or funding to independently sponsor and execute multiple long-term research projects overseas. At the conclusion of the short-term project, the collaborating non-UK-PHRST investigator will generally be expected to take the lead, incorporating the preliminary data into a grant proposal to continue the work in more depth with outside funding, with UK-PHRST personnel playing a supportive role. In this way, UK-PHRST will serve as a mechanistic in-road to expand research opportunities and engagement in LMICs. We anticipate that at the conclusion of the first five years of the UK-PHRST's existence that it can be cited as the "spark" for numerous long-term research collaborations between UK researchers from various institutions and researchers overseas.

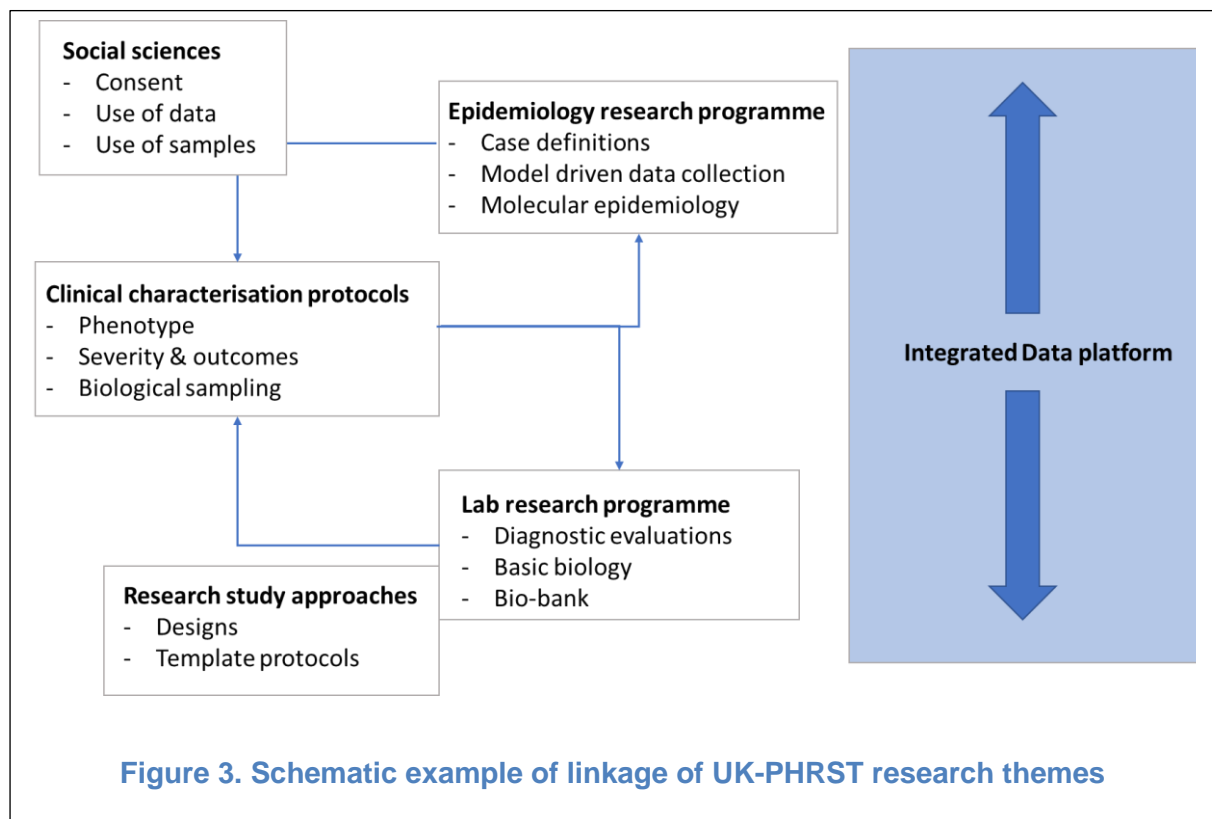
Research outside of outbreaks

Although outbreaks present important opportunities and obligations to conduct research, conducting research in the field during these acute events is challenging. Thus, when possible, outbreak-related research should be performed *outside* and *in advance* of the outbreak itself. The UK-PHRST will thus maintain an active research programme oriented toward preparedness for outbreak response.

Five research streams were defined in the PHE/LSHTM Joint Proposal:

- Epidemiology and population sciences
- Patient-centred research
- Microbiology and laboratory sciences
- Social sciences and community engagement
- Mental health and wellbeing

We aim to ensure cohesion and integration of these themes as far as possible, in particular between the first three, which are mainly quantitative in nature, and the final two, which are more qualitative (Figure 3). Within these broad domains, we will select important themes that a) focus resources on high priority infections and/or infections that provide a good model for a range of threats (e.g. haemorrhagic fever viruses, viral respiratory pathogens; faeco-oral transmission pathogens), b) tackle major questions, c) develop a cross-disciplinary approach, d) focus research capacity development around selected geographic hubs, and e) aim to be innovative in methodology.



Key research themes will cover a range of scientific perspectives, for example:

- Developing improved methods for the collection, analysis and presentation of information for surveillance and control
- Analysis of information from outbreaks and evaluation of the policy response to improve future public health responses
- Developing mathematical modelling capabilities to provide real-time situational awareness and future projections on outbreaks
- Patient-orientated research to refine the case definition and characterise the clinical features of outbreaks in order to inform the clinical and public health response, and improve models for future scenarios

- Ensuring that appropriate and ethical clinical trials can be established rapidly to help develop and test new therapeutic and preventative measures.
- Developing rapid microbiological and genetic sequencing capabilities adapted for the field to enable diagnosis of causative agents and analysis of outbreaks, taking into account antimicrobial resistance
- Social science research including developing methods for rapid assessment of community perspectives, and ensuring community engagement and involvement to inform contextually-adapted interventions
- Developing appropriate approaches for mental health and wellbeing support for affected communities, responders and their families

Choice of priority diseases

In addition to identifying key themes for the UK-PHRST research programme, we will identify a limited number of priority pathogens on which to focus (of course taking into account that previously unknown or under-estimated pathogens, such as Zika virus, may emerge to cause health threats and thus gain in importance as a research target). The choice of pathogens will take into account transmission routes and ease of spread, virulence, and potential to complement and collaborate with existing programmes, including WHO (R&D Blueprint for action to prevent epidemics), the Coalition for Epidemic Preparedness Initiative (CEPI) and the UK Vaccine Initiative. While definitive selection has not yet been made, an example might be:

- Water-borne transmission: Cholera, hepatitis E
- Airborne transmission: Influenza and MERS corona virus
- Zoonotic diseases with secondary person-to-person: Ebola, Marburg, and Lassa viruses
- Vector-borne transmission: Aedes-transmitted arboviruses (e.g. yellow fever, dengue, and Rift Valley fever viruses)

The research strategy will be reviewed and revised at least annually, with annual plans submitted to DHSC and the National Institute for Health Research (NIHR) and for approval.

To pursue these research aims, the UK-PHRST will establish a stable research presence in selected sites (see below regarding site selection). This overseas research model enables the UK-PHRST to have credible field presence and to gain an understanding the issues faced when working in LMICs. The overseas sites will provide a platform for capacity building and establishing a legacy, and enable the development of regional hubs for teaching and research. This recognizes that inter-epidemic research and capacity building needs an established presence. In our experience, this cannot be effectively achieved by short-term placements across multiple countries. Named academic investigators and support faculty will act as academic coaches for the UK-PHRST members to provide support and guidance.

Evaluation and selection of research proposals

All research proposals will first be evaluated by the UK-PHRST Academic Steering Committee (ASC, see below) for scientific rigour and feasibility, as well as alignment with overall UK-PHRST objectives. Proposals recommended for acceptance Protocols recommended for acceptance by the ASC will then undergo internal evaluation and triage by the UK-PHRST Senior Management Team (Director and Deputy Directors from LSHTM and PHE) with regard to consistency with overall UK-PHRST goals and budgets. The final list of approved proposals will then be sent to the NIHR for rapid review, including assurance that the proposal objectives are consistent with the goals of ODA funding. Although proposals will

be accepted from persons and institutions outside of the UK-PHRST, approximately two-thirds of funding will be reserved for research initiated by UK-PHRST CDT.

Affiliated research projects

Although CDT's primary research activities will obviously be oriented toward UK-PHRST-sponsored outbreak-related research, we recognize that staff may have related academic and public health research interests in the context of their appointments at academic or public health institutions. In many cases, these projects have the potential to leverage UK-PHRST capacities to bring in new opportunities and funding. We will therefore encourage UK-PHRST staff to pursue these related interests with the provisions that they must be 1) Discussed and approved by the UK-PHRST Director and Deputy Director for Research, 2) In keeping with the overall goals of responding to and preventing outbreaks of infectious diseases, 3) Not unduly impede direct UK-PHRST duties. For each project not directly sponsored by UK-PHRST, the involved staff, UK-PHRST Director and Deputy Director for Research will collectively decide whether the investigator's affiliation will be listed as UK-PHRST or, if deemed not sufficiently related to UK-PHRST goals, the investigator's institutional affiliation (e.g. LSTHM or PHE).

Capacity building and sustainability

Building capability overseas is a vital component of strengthening GHS and research. Less than a third of WHO Member States have implemented the IHR core capacities. The vast majority of those that have not are LMICs. Capacity building requires individual training, developing supportive and effective institutions, and ensuring strong support and commitment in-country to maintain and sustain that capacity. The UK has a strong track record in working with many of these countries, which provides a base on which the UK-PHRST can build, in particular building the capacity for in-country rapid response.

Development of overseas sites for research and capacity building

Although UK-PHRST outbreak deployments will build experience in multiple countries and create valuable contacts for future collaboration, long-term capacity building cannot be effectively achieved by these short-term engagements. Rather, it is imperative to create a stable and sustainable overseas platform for research and capacity building for outbreak response, which has an important added benefit of contributing to strengthening local capabilities to meet IHR.

In addition to the direct contribution to the capacity of overseas collaborators, these sites are essential for UK-PHRST-affiliated personnel, such as reservists and FETP Fellows, to gain an understanding of the contextual issues faced when working in LMICs prior to outbreak deployment. Furthermore, they will serve as sites to develop and evaluate innovative contributions to outbreak response, such as novel point-of-care and/or multiplex diagnostic assays or the use of social media to disseminate key messages regarding disease control. The intention is not to create new entities or structures, but rather for the UK-PHRST to contribute to established entities to enhance their capacity for rapid outbreak response and control. These may include collaboration with ministries of health, overseas academic institutions, and international organizations such as WHO-AFRO and Africa CDC. As our relationship progresses in these overseas sites, we plan to select appropriate collaborators to join our CDT. We will invite and sponsor them to undertake the training of the CDT described above and, when appropriate, deploy them alongside the London-based CDT. This initiative will expand the breadth and depth of the UK-PHRST but, more importantly, will provide both formal training and on-the-job experience to persons from LMICs, comprising first-steps of gaining and transferring the capacities to them.

The UK-PHRST will identify three main centres—one each in West Africa, East Africa, and Southeast Asia—for long-term development of research and outbreak response capacity. Centres will be selected based on consideration of a number of factors:

- Recognized need for capacity building with regard to outbreak response and research
- Vulnerability to disease outbreaks
- Institutional and political support and commitment
- Potential to leverage and contribute to existing collaborations of UK-PHRST partners, including academic affiliations through LSHTM (e.g. Gambia and Uganda Medical Research Council [MRC] Units), University of Oxford, and KCL, and countries identified by PHE for IHR strengthening
- Access to patients for clinical research and to key population groups for epidemiological research in a wide range of settings
- Academic systems in need of support and access to students for teaching and training
- Previous experience within UK-PHRST partners of working in the country or at the institution

We will avoid sites where there are already several research groups working and therefore the incremental benefit from UK-PHRST contributions would be limited. In order to learn from experience, keep within budget and personnel capacity, the sites will come online sequentially in the initial five-year timeline set out in the UK-PHRST Joint Proposal, starting with West Africa in year 1 (Sierra Leone has been chosen), East Africa in year 3, and Southeast Asia in year 4. Nevertheless, a degree of advance scouting and informal engagement with various countries in these regions is essential, and indeed has already begun. However, selection of these three research and capacity building centres does not preclude engagements in other ODA-eligible LMICs. Rather, we envisage that these centres will develop into regional hubs for UK-PHRST activity, with engagement at “spoke” sites as needed and appropriate. Key to this process will be taking advantage of centres within the well-established overseas networks of collaborators of LSHTM, University of Oxford, KCL, and PHE.

Training and teaching overseas

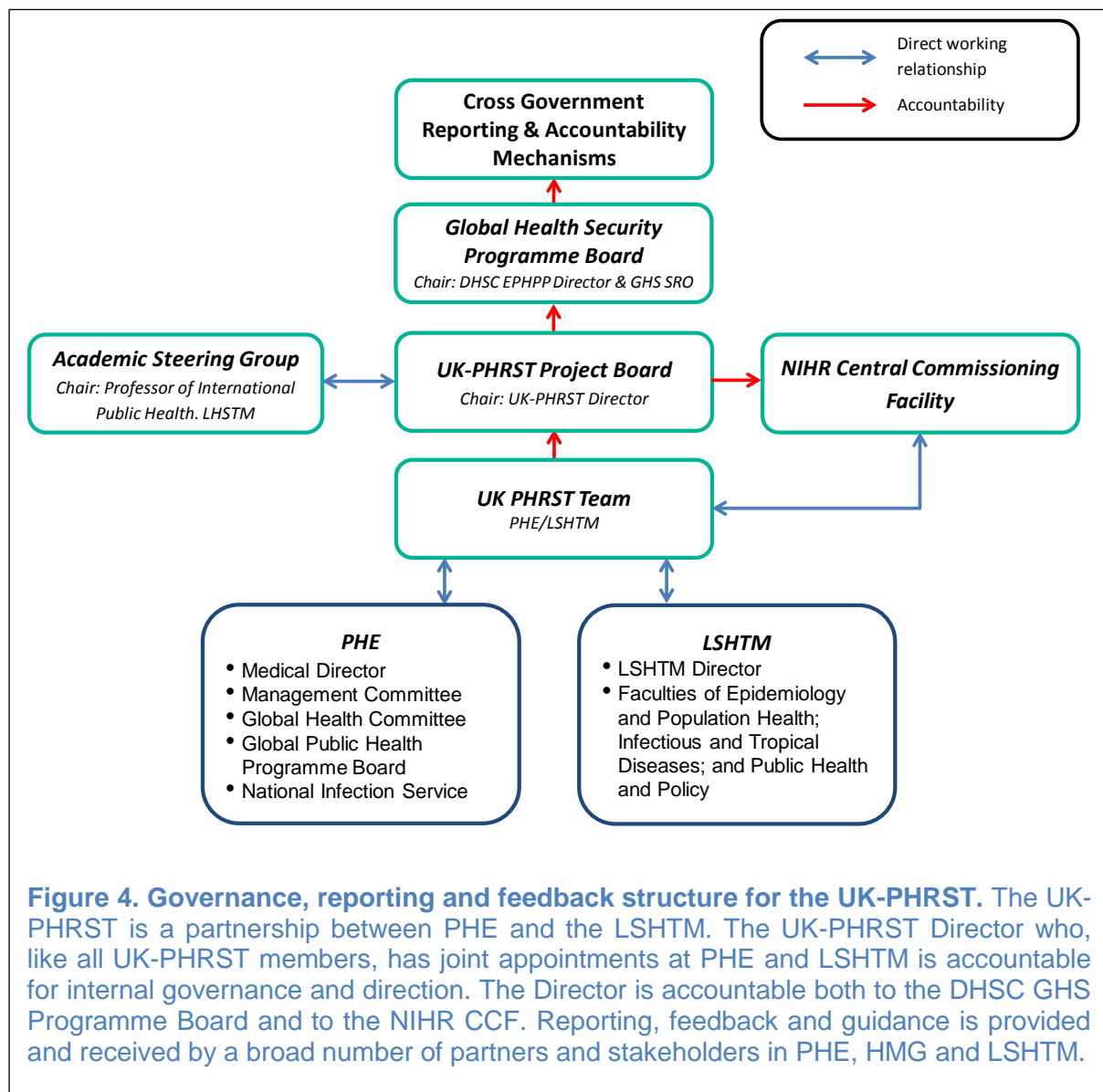
We will develop teaching modules oriented toward outbreak response and relevant research based on those used at LSHTM, PHE and our academic partners for delivery at the overseas research and teaching sites. Teaching modules will cover field epidemiology, clinical research, microbiology, social science and community engagement, IHR assessment and compliance, research methods, infection prevention and control, and emergency preparedness and outbreak response. Teaching will be delivered by members of the CDT, academic staff from the collaborating UK academic institutions and by public health experts from PHE. Local research associates recruited at the research and teaching sites will receive training in research and assist the CDT members in their operational programmes, with local partners gradually adopting the sponsorship of activities. One model that has met with success in the past is short courses held in LMICs (such as with the LSHTM East Africa DTM&H), open to enrolment (usually on drastically different price scales) and pairing of students from high-resource settings (e.g. LSHTM and University of Oxford) with those from LMICs to expand their mutual academic as well as cultural horizons.

The ultimate goal is to produce systems and materials, such as a two-week short course on Outbreak Control that can be replicated by others in diverse sites and settings, thereby expanding the capacity building activities of the UK-PHRST. We will explore using Moodle, Panopto and FutureLearn teaching systems for delivery of materials. Using FutureLearn will ensure that courses are freely available worldwide. The training modules will be trialled

initially at the research and capacity building sites and expanded to other countries in subsequent years according to need and demand. We also envisage developing the regional hub aspect by offering external training courses to key personnel in ODA eligible countries in the region, which could be provided face-to-face at the overseas research and teaching sites, by distance-learning, and free on-line courses. All formal training will be subject to evaluation.

5. Governance, guidance, and management

Governance arrangements were developed and put in place to oversee effective initiation of this UK-PHRST. The governance structure will now be strengthened and will reflect the joint nature of the partnership (Figure 4).



Global Health Security Programme Board

The GHS Programme Board is chaired by the Programme's Senior Responsible Owner (SRO) in the DHSC Directorate of Health Protection and Emergency Response. Members

represent the Programme's key partners (DHSC, PHE and DFID) and provide support to the Programme Director and SRO on progress and delivery. The GHS Programme Board holds the Director of the UK-PHRST to account for delivery of the UK-PHRST project. The Programme Board reports to the Cross-Government ODA Ministerial Group. These arrangements complement and respect the internal accountability arrangements in both PHE and LSHTM. The Global Health Oversight Group provides an additional opportunity for cross-government partners to consider and lead the strategy for Global Health across Government. The Chief Medical Officer also provides senior strategic direction.

UK-PHRST Project Board

A UK-PHRST Project Board (PB) will be established and will have quarterly meetings to assist the UK-PHRST in the following ways:

- Provide expert technical advice and challenge
- Contribute to strategic and operational discussions
- Assist the UK-PHRST in addressing any management or operational obstacles that may arise
- Review budget expenditures and forecasts
- Review progress against deliverables in the logframe indicators
- Ensure that appropriate links and alignment are made with other key elements of the HMG GHS agenda and that interdependencies with other planning processes are managed effectively
- Review the risk register on a regular basis, and assist with resolving strategic level risks and issues as raised by the UK-PHRST Director and SRO of DHSC's GHS Programme
- Serve as liaisons to their respective boards and organisations to ensure that they are appropriately informed on UK-PHRST progress

The role of the PB is to advise and provide recommendations on the development and implementation of the Strategic Framework that reflect the vision and meet UK-PHRST objectives. Decision power on PB recommendations rests with the UK-PHRST Director, who is accountable to the DHSC GHS Programme Board.

Board composition

The PB will be chaired by the UK-PHRST Director. Board members will be from across HMG (e.g. DHSC, PHE, NIHR, DFID, FCO), academia (e.g. LSHTM, University of Oxford, KCL, LSTM), and other stakeholders (e.g. WHO, MSF) and will hold two-year terms, renewable upon mutual agreement. Members will be selected based on their experience and expertise in the three key components of the UK-PHRST: Outbreak response, outbreak and infectious disease-related research, and capacity building/training for outbreak prevention, preparedness, and response. At least one PB member will also be a member of the UK-PHRST ASC to ensure communication and congruity between these two bodies.

Academic steering committee

Created in 2016, the UK-PHRST ASC is comprised of a group of expert scientists from participating UK-PHRST as well as external UK institutions to provide guidance on the research programme. The ASC's primary purpose is to develop, shape, and align the research programme with the UK-PHRST objectives to conduct rigorous research to generate an evidence base for best practice in outbreak preparedness and response in LMICs. As noted above, a major role of the ASC is to review research proposals. The ASC will also be asked to provide feedback on the results and conclusions from concluded

research projects to assure that quality and appropriate direction for the UK-PHRST are maintained.

Intersection with other UK programmes

Government programmes

The UK PHRST is an integral part of the HMG response to GHS, contributing to the strategic objectives of prevention, detection and early response to global health threats. As part of a coordinated, cross-government response, the UK-PHRST sits alongside the Fleming Fund, the Global AMR Innovation Fund, AMR International, UK Vaccine Network, the Global Public Health Programme's IHR Strengthening Project, DFID's Tackling Deadly Diseases in Africa Programme, UK-EMT, the NIS Global Health Oversight Group and various other endeavours as part of a comprehensive programme of investments aimed at increasing GHS. The UK-PHRST will work closely with all the aforementioned partners and projects to ensure that our work is aligned across the broader HMG GHS, health system strengthening and research endeavours, coordinating our efforts to assure continuity of our outbreak-focused work with the capacity building goals of the broader UK initiative. Through these collaborations, we will form links, create synergy and maximise impact.

A key interaction will be with PHE's Global Public Health Programme, in particular with the IHR Strengthening Project that identified many of the same countries and regions as the UK-PHRST (specifically, Sierra Leone, Nigeria, Ethiopia, Myanmar, and Pakistan). The ultimate goal of both projects is to develop and support health system capacity in LMICs. While UK-PHRST focuses on the capacity to prevent and respond rapidly to health emergencies, we recognize that such capacity is ultimately dependent on a broader base of health infrastructure and trained personnel in LMICs. The UK-PHRST will assure continuity of our outbreak-focused work with the capacity building goals of the Global Public Health Programme, providing a link between the immediate response to a crisis and the longer-term actions needed to strengthen systems to minimise future risk.

Academic partnerships

The UK-PHRST will seek to leverage and contribute to the many established projects of its academic partners. Of particular interest are the EBOVAC EVD vaccine trial in Sierra Leone, the MRC units in the Gambia and Uganda led by or being sponsored in part by LSHTM. In addition, University of Oxford has permanent tropical infectious diseases research centres in various sites, including Kenya, Thailand, Vietnam, Nepal, Laos, and Myanmar.

Team building and maintaining cohesiveness

Distinct administrative and financial procedures and work cultures between the two UK-PHRST principal partners (PHE and LSHTM), compounded by personnel dispersed in at least five disparate office sites, pose challenges to building a sense of unity and an operationally streamlined project. The following measures are implemented to enhance team building and ensure that the UK-PHRST functions as a cohesive unit:

- Fortnightly Senior Management Team meetings involving lead personnel and administrators from both PHE and LSHTM
- Monthly in-person meetings of all UK-PHRST staff
- Team building exercises through a yearly away-day (next planned for February 2018)

6. Reporting requirements

This strategic framework will be assessed periodically with evaluations commissioned by the UK-PHRST Director, GHS Programme Board, and/or NIHR CCF. Key elements of ongoing monitoring, review of progress and summary of achievements include:

- **Quarterly Highlight Reports** to the DHSC GHS Programme Board and the NIHR CCF. This report will include a high-level overview of progress, finances, risks, and their mitigation
- **Annual Review Report** to DHSC and NIHR CCF, which will include performance against logframe indicators
- **Situation Reports (SitReps)** to DHSC SRO on a weekly basis during operational deployments to provide HMG stakeholders (including NIHR) with updates on the response to an emergency situation as it evolves over time
- **End of Mission Reports** to HMG stakeholders to provide an assessment of the implementation of the mission's mandate and lessons identified for the UK-PHRST and wider HMG
- **Research Projects Progress Reports** to NIHR and the ASC annually
- **Financial Report (LSHTM contract)** to be provided both annually and on a quarterly basis (Oct, Jan, April, July) to NIHR CCF

Many of the above communications will be routinely further disseminated by DHSC to stakeholders across HMG, including to the Chief Medical Officer, NIS, DFID, and UK-EMT.

7. Risk management

The UK-PHRST has instituted a thorough and systematic risk management structure. This process ensures that the risks associated with the UK-PHRST are systematically and formally identified, assessed, and mitigated within acceptable levels.

Two distinct areas of risk are considered:

- Strategic risk – risks to the effective delivery of the UK-PHRST
- Operational risk – risks relating to staff safety and security during deployment

Strategic risk

A risk register has been developed for the UK-PHRST that is reviewed and updated on a quarterly basis. The register includes risks and issues and clearly outlines the causes, risks and potential impacts. During each quarterly review, a decision is made to whether the risk is closed, remains open or is escalated. This is then recorded appropriately. Key impact types include: Service delivery/quality, finance, Caldicott, public health and safety and security. The GHS Programme Board and NIHR are kept informed about key risks and mitigation measures and, when risks cannot be resolved at the UK-PHRST level, added to the GHS Programme and NIHR risk registers as appropriate. Risks may also be brought up for discussion and guidance with the PB.

Operational risk

Once a deployment has been approved and accepted, a comprehensive health, safety and security orientated risk assessment is carried out. This risk assessment is country and outbreak specific and focuses on protecting the health and wellbeing of deployed UK-PHRST staff members. The assessment is produced using PHE Safety Organiser software and covers a range of common hazards relating to travel, accommodation, health in the field, personal safety and communication. Most mitigating measures have been considered, adopted in advance and communicated to the deploying individuals as part of their induction, training and briefing processes. Other bespoke measures are also agreed as part of the risk assessment process. The risk assessment is approved and signed off by the UK-PHRST Director. An e-learning module on risk assessments is in development for use by UK-PHRST staff.

8. Monitoring and evaluation

Milestones and quantifiable deliverables and metrics will be measured against the logframe to ensure that all components for the program are properly addressed (and, as needed, revised and updated in the annual action plan). However, it is noted that these mostly monitor process and output, rather than outcome or impact.

Objective evaluation of the public health impact of outbreak response operations, biomedical research, and capacity building programmes is notoriously difficult. The most relevant indicators of mortality and morbidity are usually a function of multiple complex intertwined factors, and no control group exists to reliably determine the size and impact of an outbreak if a given response measure was not implemented. In the absence of easily reliable outcome indicators, we will rely on yearly process surrogates such as:

- Number and duration of outbreak deployments
- Number of personnel deployed
- Rapidity of deployment relative to recognized outbreak onset
- Number of research projects implemented and at what stage of outbreak (e.g. during, immediately after, or inter-epidemic)
- Number of persons trained
- Publications
- External funding
- Intellectual assets (i.e. Intellectual Property generation)

In addition to the above, the UK-PHRST will actively engage and collaborate in a process to develop and evaluate objective metrics and indicators related to outbreak response. A number of other stakeholders are actively engaged in the process of indicator development, with international pressure to develop a system to increase 'Monitoring and Accountability for Preparedness' (MAP), and debate over whether this should be an independent external monitoring mechanisms or a strengthened national process. PHE is working with the International Association of Public Health Institutions to develop a process for development and validation of indicators and UK-PHRST will work with colleagues managing the PHE IHR programme to actively contribute to those discussions. The new set of indicators to be developed, although oriented toward preparedness, will also be relevant to outbreak response. The UK-PHRST intends to collaborate in this process as an initial step, eventually taking it further with the goal of developing metrics and objective indicators specifically applied to the quality and impact of outbreak response. We intend to then ask an independent body to apply the process to evaluate the UK-PHRST, using the results to update and prospectively monitor our logframe.

Performance management

The UK-PHRST evaluations are structured around the ToC described above and monitored through the logframe based on the ToC to assess the causal logic of the intervention and determine whether all external factors affecting outcomes, impact, sustainability and up scaling have been carefully considered. The Strategic Framework makes use of a logic model approach as a means of clarifying accountability and performance expectations around a set of agreed processes, expected outputs, outcomes and impacts (see Appendix). It provides the basis for a performance measurement. Reporting will be against the logframe, with annual internal evaluations and periodic external evaluation of progress looking at both UK-PHRST outputs and purpose. The logframe will be maintained as live, in line with best practice, and updated each year to reflect progress and revised targets for following years. In addition, performance will be measured against specific objectives set in the UK-PHRST annual business plan. Lastly, in addition to DHSC and NIHR, we will communicate the data on performance indicators to, and actively seek feedback from, UK-PHRST partners overseas.

Lessons learned and knowledge management

A 'lessons identified' log is created during each deployment, with the aim of capturing areas relating to the deployment process that the team recognised could be strengthened. We are also developing an "Accident, Incident and Near Misses Reporting Tool." This information is also communicated to our overseas partners and, as appropriate, collaborators from the international community (e.g. WHO/GOARN) with whom we engaged for outbreak response, research, or capacity building for feedback. Recommendations are generated and, when appropriate, standard operating procedures created or revised to improve future deployments (i.e. lessons learnt and applied).

External evaluation

In order to assess process and impact of the UK-PHRST, in the beginning of year 3 we plan to arrange formal third party evaluation. The third-party evaluation will include testing of the stated ToC and underpinning assumptions. Where the evidence base for the ToC is weak, we will consider adapting the Monitoring and Evaluation strategy to collate evidence to address gaps.

9. Financial management and accounting

The UK-PHRST is funded from the ODA budget (Table 3). Consequently, in line with the Organisation for Economic Co-operation and Development rules, all spending must further the sustainable development and welfare of LMICs and be likely to contribute to a reduction in poverty.

Table 3. UK-PHRST budget summary for project years 2-5 (2018-21) (in £ 000s)

Expenditure Category	2017/18	2018/19	2019/20	2020/21
Operational Deployments	899	987	1,007	1,019
Research	1,250	904	896	792
Overseas Capacity Building	135	125	111	101
Microbiology Capability	344	127	127	127
Training	579	487	461	465
Overseas Sites	23	158	165	256
Service Development	99	303	323	313
Other Costs	172	411	410	427
<i>Sub-total: Core Team</i>	<i>3,500</i>	<i>3,500</i>	<i>3,500</i>	<i>3,500</i>
<i>Director's Office</i>	<i>500</i>	<i>500</i>	<i>500</i>	<i>500</i>
Total:	4,000	4,000	4,000	4,000

The Joint Proposal signed by the Public Health Minister in July 2016 as basis for the UK-PHRST acknowledges that “Although there is little to no flexibility in reallocating funds from one year to another, UK-PHRST will balance the needs of deployment against the operational research plan. Each year, the team will develop and prioritise operational research plans as essential or subject to contingency. Such flexibility will accommodate for 8-9 deployments per year (about £400,000 per year for deployment). Periodic assessments of the budget will allow the team to adequately respond to a heavy demand of outbreaks, while continuing to carry out essential research and capacity building activities”. The UK-PHRST thus operates under this unique and unavoidable fiscal balance and uncertainty.

Monitoring, reporting, and accounting of expenditures

The UK-PHRST will review expenditure on a quarterly basis and provide regular financial reports to the DHSC core team and NIHR, indicating actual spend, any re-profiling of spend and the planned spend for the following period. This will be a formal reporting mechanism by which to ensure UK-PHRST is on track towards the annual financial targets and ODA reporting requirements, including the requirement to budget expenditure within calendar year periods.

Actual costs are incurred in UK-PHRST by both PHE and LSHTM and each is responsible for ensuring that all recorded expenditure is eligible to be claimed under the rules of ODA funding. Actuals are monitored on a regular basis, with transactions being reviewed each month for completeness and accuracy. Where items have been incorrectly allocated, they will be moved with the support of the relevant finance department.

The UK-PHRST Director and Senior Programme Manager will take an overview of the financial position across both partners. They will be responsible for ensuring that a combined finance report covering all items of expenditure is completed on a quarterly basis and submitted to the Management Team for their information and action where appropriate.

The UK-PHRST Senior Management Team (Director, Deputy Directors from PHE and LSHTM, Microbiology Lead, Senior Programme Manager, and Programme Manager for LSHTM) meets every two weeks to discuss activities and review finances, including allocation of the non-staffing budgets between different activities. This process enables joint

reporting of financial information across the entire UK-PHRST, with the Senior Programme Manager, based at PHE, acting as the person with overall responsibility to report all financial activity. Approaches to underspends, with reallocation of unused funds to other UK-PHRST priorities, are being developed to maintain the Value for Money (VfM) of the operation. These will, of course, take into account existing contractual relationships with the various academic partners.

The financial position is reported externally to NIHR and DHSC regularly; with forecast and actual spend figures provided on a quarterly basis. Forecasts will be updated each month by the Programme Manager, and significant under or overspends will be discussed with the Director, to ensure that any surplus funds be spent on other PHRST priorities within the financial period required to be claimed under ODA rules. The partners have agreed a protocol for transferring funds between themselves should it ever be necessary to redistribute funding to ensure that all available money is spent on appropriate ODA-eligible items.

Framework for priority setting and resource allocation

It is important that the UK-PHRST prioritise spending to achieve objectives and ensure efficient resource allocation, thereby maximising impact and VfM. Given the unknown number of outbreaks and deployments in any given year, we foresee the need to have a system to balance the costs of deployments and research throughout the 4 year period and an expectation of needing to transfer funds between the allocated budgets for PHE (the primary implementer for outbreak response) and LSHTM (the primary implementer for research). This flexibility will require:

- Effective horizon scanning to inform potential requests
- Systematic prioritisation of areas of activity
- Effective allocation of resources
- Procedures and criteria for realignment
- Timely repurposing of unused/unspent budget
- Ensuring that VfM is achieved

10. Value for money

Why the UK-PHRST?

The UK-PHRST has been identified as a key deliverable in HMG's GHS agenda in the *National Security Strategy and Strategic Defence and Security Review (2015)*, noting that:

- Health crises can have regional and international impact. Diseases can spread rapidly, including across borders. The emergence of drug-resistant disease is an increasing global threat. A comprehensive approach overseas and at home is critical to protect British nationals and our wider interests, and to mitigate the impact of health threats in other countries.
- We will build on our international action to strengthen global health security, such as our leading contribution to combating the Ebola outbreak in West Africa. We will increase our investment, making greater use of the UK's world-leading expertise in public health and medical research.
- We will establish a new rapid response team of technical experts to deploy to help countries to investigate and control disease outbreaks. This team will include epidemiologists, microbiologists, clinicians, social scientists, infection control

specialists and researchers and will be on permanent standby. We will expand our Emergency Medical Team to provide medical assistance to help contain outbreaks when needed, including hundreds of doctors, nurses and specialist public health experts with field training.

- The purpose of the funding is to meet the salary and infrastructure costs incurred by the university/PHE partnership in establishing the UK-PHRST and carrying out an ODA-eligible programme. When not responding to a disease outbreak, the team will focus on operational research to better inform outbreak response. The team will also work towards building capacity for effective outbreak response in ODA-eligible countries and strengthening local capabilities to meet the IHR.
- To ensure that the UK-PHRST is effective and provides VfM, it is vital that this works within the cross-government GHS network and builds on the established partnerships within this, including with the strategic defence and biosecurity strategies. This will enable an enhanced intelligence and alert process to be established across government.
- Rapid response capacity to rapidly control outbreaks will avoid the financial, economic and reputational impact of major outbreaks and public health disasters. A report by the United Nations estimated that West Africa may lose up to \$15 billion over the next three years due to the impact of the Ebola outbreak on trade, investment and tourism. In March 2015 it was estimated that the cost of fighting Ebola was three times higher than it would have been to invest in preventative public health systems in the countries affected.
- The cost to both PHE and UK Government of the Ebola response was not just financial; it also affected the delivery of public health priorities within the UK. Establishing a standing team to respond to the increasing number of alerts and smaller requests for international response will be far more cost effective than continuing to divert specialists from their day jobs. It will also reduce the impact on delivery of public health in UK. Furthermore, tackling an outbreak at source reduces the risk of it escalating into a humanitarian crisis and the GHS threat to the UK.

The establishment of the UK-PHRST was through an external, national competitive tender process to ensure VfM. The tender was run through NIHR commissioning processes by the NIHR Central Commissioning Facility. Academic institutions in the UK were invited to tender applications for those 'who wish to collaborate with PHE to submit an application for a UK Rapid Response Team'. An independent selection panel reviewed applications and made recommendations to the DHSC in January 2016, followed subsequently by the crafting of the Joint Proposal between PHE and the chosen academic partner, LSHTM, which was signed by the Parliamentary Under-Secretary of State for Public Health in July 2016, providing a basis for the UK-PHRST to proceed.

Approach

VfM will be realised through prevented or more rapidly controlled outbreaks. By incorporating a specific research component into the UK-PHRST, these opportunities will be exploited to improve preparedness and response to current as well as future outbreaks. The UK-PHRST will follow the UK ODA VfM philosophy and guidance: "VfM means doing the best feasible programme, not just a good programme," measuring VfM against the "3Es"; economy, efficiency and effectiveness (Table 4). Objective indicators will be as outlined in the logframe (see Appendix). Aspects that will ensure VfM include:

- PHE has well established, government standard and externally audited procurement policies and procedures that ensure that the delivery of the UK-PHRST will be cost effective and will deliver good VfM.
- LSHTM and partners have similarly well-established standards and processes.

- The UK-PHRST will seek to maximise VfM by minimising duplication and overlap with work funded by others, either by the national government in the priority countries or through other donor support.
- Should elements of the UK-PHRST need to be contracted out to other agencies for delivery, VfM will be tested through a competitive tendering process.
- The scrutiny and feedback of both the PB and ASC will help ensure a high-value output of the UK-PHRST. We will ask both bodies to consider VfM aspects for the outbreak response, research, and capacity building arms of the UK-PHRST, looking both prospectively (i.e. for the proposed activities for the next year) as well as retrospectively (i.e. for concluded activities of the previous year).
- Regular review and comment from the GHS Programme Board will also help assure VfM
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Table 4. UK-PHRST value for money

<p>Economy (getting the right price for the project inputs)</p>	<ul style="list-style-type: none"> • Identifying synergies, working in collaboration and sharing intelligence, expertise and learning with other HMG projects and academic and research institutions • Evidence-based approach to identify best practice and effective interventions • PHE and LSHTM have an extensive range of subject specialists, global expertise and leadership. Access to this organizational capability will enable a robust and flexible approach to addressing UK-PHRST requirements • Access to the full range of PHE/LSHTM specialist functions, without requiring recruitment and appointment of specific experts who might not be fully utilised across the life of the project • When additional staff (reserve cadre) are deployed internationally, they are unavailable for domestic duties, which must be covered. UK-PHRST will apply HMG-approved costing models to ensure backfill for the deployment of personnel away from normal duties. • International air travel and accommodation costs will be incurred against standard civil service and ODA guidelines protocols, purchasing economy flights only except in extremis and booking all travel arrangements with as much forward notice as possible to secure the cheapest prices. • Working in partnership with other key stakeholders to reduce duplication and enable a sustainable fully funded approach through linking with the WHO Monitoring and Evaluation framework • Collaboration between UK health agencies will further strengthen cross-government working, help consolidate global health skills and competencies that already exist across UK health agencies and ultimately contribute to both global and UK national health security and prosperity.
<p>Efficiency (the cost of turning inputs into</p>	<ul style="list-style-type: none"> • The UK-PHRST triple mandate of outbreak response, research and capacity building results in all team members being continuously engaged in these interdigitating activities, alternating energies between them as

<p>outputs)</p>	<p>required.</p> <ul style="list-style-type: none"> • The recently published report on financing pandemic preparedness recommends that ‘development partners should fulfil and build on existing collective and bilateral commitments to help finance preparedness in countries needing support’.⁸ The partnership between PHE and LSHTM, along with University of Oxford and KCL, allows each institution to bring their own areas of expertise to the UK-PHRST, with academic excellence supporting the research function, and the operational skills and experience of staff employed in other parts of PHE being available to support the deployment function. • Partnerships developed through the project are strategic and will sustain beyond the project funding, as they are in the UK’s national interest. Enhanced UK technical expertise will endure beyond the project funding, as will the networks of technical linkages developed. This represents a long-term continuing return that extends beyond the initial benefit of the short-term technical support, and therefore makes for greater efficiency through greater sustainability. • The UK-PHRST’s future access to a reserve cadre of staff who can also be called upon to engage in deployments when the permanent team is already occupied will enable access to an even wider range of skills to deploy to a greater breadth of emergencies when required. • The UK-PHRST will be able to expand and contract its capacity and skills to meet changing needs in the field without having to retain a large number of full-time staff who would have limited opportunities to put their skills into practice. • Many resources and capacities developed by the UK-PHRST will be transferable to other countries as well as to WHO
<p>Effectiveness (how outputs are turned into outcomes and impact)</p>	<ul style="list-style-type: none"> • Measured against logframe (Appendix) and Monitoring and Evaluation in ToC context • UK cross-government response to recent EVD and Zika virus outbreaks were acknowledged as highly effective. Lessons from these experiences will be used to inform future responses to health and humanitarian emergencies • Effectiveness of UK-PHRST deployments evaluated regularly while teams are in the field, and then through debriefing upon return, ensuring that lessons can be identified and learnt, building on the experience for each subsequent deployment • Feedback on deployments also sought and incorporated from other stakeholders, including Ministries of Health, WHO/GOARN, and other agencies and partners on the ground in the area of operation as well as in the UK. Where appropriate, follow up trips for after-action review conducted to monitor and assess the effectiveness of the deployments. • Ensuring activities are context sensitive and that the local political, economic and operational environment and work with local stakeholders are considered to ensure sustainable impact • There is an in-built monitoring and evaluation process and flexibility within the project to change to meet local, public health and political needs. • Ensuring a sustainable approach though working with other stakeholders

⁸ From Panic and Neglect to Investing in Health Security: Financing Pandemic Preparedness at a National Level. International working group on financing preparedness, conference edition, May 2017, <http://documents.worldbank.org/curated/en/979591495652724770/pdf/115271-REVISED-IWG-Report-Conference-Edition-5-25-2017-1-1-optimized-low.pdf>

	<p>and host countries to ensure funding is secured locally</p> <ul style="list-style-type: none"> • Overseas capacity building function of UK-PHRST enhances effectiveness of local staff to manage outbreaks independently, progressing toward overall aim of LMIC self-sufficiency
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11. Logical and results framework

A detailed logical framework is presented in the Appendix.

12. Stakeholder engagement and communications

A strategy for stakeholder engagement and communications is currently being drafted with the assistance of the PHE and LSHTM Communications Departments.

13. Equality and human rights

Legislative basis

The UK-PHRST is subject to the laws of England and Wales and is obliged to comply with the provisions therein whilst in the UK and overseas.

Equality

The Equality Act 2010 is domestic law that exists to protect the rights of individuals and promote equality of opportunity for all. It consolidated the Race Equality Duty, Disability Equality Duty and Gender Equality Duty into a single Public Sector Equality Duty (PSED), covering all protected characteristics, using 'due regard' model, as for the former duties. The PSED requires public bodies to have due regard to the need to eliminate discrimination, advance equality of opportunity and foster good relations between different people when carrying out their activities. The protected characteristics covered by PSED are:

- Age
- Disability
- Gender reassignment
- Marriage and civil partnership
- Pregnancy and maternity
- Race
- Religion and belief
- Sex
- Sexual orientation

The 2014 International Development (Gender Equality) Act promotes gender equality in the provision by HMG of development and humanitarian assistance to countries outside the UK.

Human Rights

The 1998 Human Rights Act brought into UK Law the provisions of the European Convention on Human Rights, which in turn was developed originally, from the UN Declaration on Human Rights. It has therefore been developed in line with generally accepted international standards. Disease control is mentioned in various contexts in the UN

Convention on Human Rights and other International Human Rights Law, including in the International Covenant on Economic, Social and Cultural Rights that obliges the state to “prevent treat and control epidemic...diseases”. The Siracusa Principles in the 1985 International Covenant on Civil and Political Rights clarify that the state may take measures dealing with a serious threat to the health of the population or individual members of the population. However, it is further stated that a non-governmental or foreign agency has no role or legitimacy in enforcing public health measures. Although not strictly human rights law, in any public health action due regard is also to be paid to the WHO IHR.

Overarching principles and application in relation to the UK-PHRST

The underlying causes of infectious disease outbreaks almost invariably involve a complex web of biomedical, socio-cultural, and political factors. The worst outbreaks typically occur in areas of ongoing or recent civil strife in which equality and human rights are far from assured. Thus, the UK-PHRST recognizes that addressing only the biomedical aspects is insufficient to diminish the risk and frequency of outbreaks and to bring about long-term improvements in global health. As such, the UK-PHRST will not only have due consideration for its moral and legal obligations in relation to equality and humans rights, but will seek to be a champion in their promotion.

The UK-PHRST shall have due regard for principles of equality and human rights, at a minimum as put forth in the aforementioned legal frameworks, in all its activities. An awareness of the political complexity surrounding the implementation of human rights will be incorporated in all decision-making processes. The UK-PHRST will not discriminate or support any discrimination of persons holding a protected characteristic. When there is an objective justification that targeted interventions are required to support the most vulnerable in the course of carrying out UK-PHRST objectives, specific groups may be included or excluded from activities. Any targeted interventions will aim to reduce health inequalities.

UK-PHRST capacity building and research endeavours will seek to proactively support and develop local mechanisms to reinforce human rights, in co-operation with national staff, making the utmost effort to avoid discrimination; reduce health inequalities related to gender, race or ethnicity; and support marginalised communities and individuals. When possible, epidemiological data collected during outbreaks and research will be disaggregated according to gender to show regard for gender differences in disease incidence and outcomes (including, where possible, social consequences of infection).

The UK-PHRST will follow the ethical principles for human subjects’ research laid out in the Declaration of Helsinki, including approval of relevant Institutional Review Boards/Ethics Committees for all protocols prior to beginning the study.

The UK-PHRST is bound to respect national laws during deployments overseas. However, as stipulated in the aforementioned Siracusa Principles, as a foreign entity, it cannot engage in or be held accountable for enforcing public health law.

Human rights monitoring and evaluation

The UK-PHRST will take all opportunities to monitor and evaluate the effect of outbreaks of infectious disease as well as its own actions on the equality and human rights of residents of LMICs where it operates. This may include prospective assessment of the impact of an intervention, or using data collection that allows disaggregated analysis of public health interventions on vulnerable groups, including but not limited to children, women, disabled, and religious and ethnic minorities. UK-PHRST will formally address their standing and impact with regard to equality and human rights in year 3 of its 5-year initial inception.

Assessing the equality and human rights impact can be achieved in various ways; the WHO describes indicators of Human Rights that may be employed to assess the impact of public health policies and programs, acknowledging the need for both quantitative and qualitative data. Another more formalized and prospective approach is to complete a Human Rights Impact Assessment.

14. APPENDIX: UK-PHRST Logical Framework

Item	Description	Indicator	Milestones Year 1	Milestones Year 2	Milestones Years 3 -5	Means of Verification	Assumptions and Comments
Impact 1	Prevention of outbreaks in LMICs from becoming public health emergencies	N/A	Achievement of targeted outputs and activities for year 1 to meet desired outcome and impacts	Achievement of targeted outputs and activities for year 2 to meet desired outcome and impacts	Achievement of targeted outputs and activities for years 3-5 to meet desired outcome and impacts	N/A	While mortality and morbidity are important impact indicators during an outbreak response, using those as direct indicators of UK-PHRST impact is difficult, since doing so implies a direct causal inference between the quality of a public health response and the resulting mortality and morbidity. In reality, the factors influencing outcomes and impact of outbreak response are complex and multifactorial, with many being beyond the control of the UK-PHRST. Therefore, we will base the monitoring of UK-PHRST's impact largely on process and output indicators only, making cautious but reasonable assumptions about how those relate to mortality and morbidity.
Impact 2	Reduce morbidity and mortality from outbreaks in LMIC	N/A	Achievement of targeted outputs and activities for year 1 to meet desired outcome and impacts	Achievement of targeted outputs and activities for year 2 to meet desired outcome and impacts	Achievement of targeted outputs and activities for years 3-5 to meet desired outcome and impacts	N/A	
Outcome 1	Strengthening UK capacity for timely and efficient technical response to outbreaks and public health emergencies occurring in LMICs	N/A	Achievement of targeted outputs and activities for year 1 to meet desired outcome and impacts	Achievement of targeted outputs and activities for year 2 to meet desired outcome and impacts	Achievement of targeted outputs and activities for years 3-5 to meet desired outcome and impacts	N/A	As above
Output 1.1	Rapid response to outbreaks and public health emergencies	% UK-PHRST deployments ≤ 48 hours after approval of request for assistance	N/A	≥ 80% of deployments within 48 hours of approval	≥ 90% of deployments within 48 hours of approval	Log of deployment procedures	
Output 1.2	Core deployable team ready for deployment	% of core team hired and ready for deployment	≥ 80% of core team in post and ready for deployment	≥ 95% of core team in post and ready for deployment	≥ 95% of core team in post and ready for deployment	Employment contracts, training certificates for all essential training	
Output 1.3	FETP fellows trained and available to deploy	% of annual FETP cohort trained and available to deploy	33% (2/6) FETPs trained and available to deploy	≥33% (2/6) FETPs trained and available to deploy	≥33% (2/6) FETPs trained and available to deploy annually	Training certificates	Up to 100% of the FETPs could be trained every year. However, the understanding is that at least 2 FETP UK-PHRST Fellows in each annual cohort (cohort size of 6) will be trained for deployment and deploy with the UK-PHRST.
Output	Deployment of FETP	% of the total	N/A	≥ 20% of	≥ 20% of deployed	End of Mission	FETPs in Y2 would contribute to 6m person-

Item	Description	Indicator	Milestones Year 1	Milestones Year 2	Milestones Years 3 -5	Means of Verification	Assumptions and Comments
1.4	Fellows	deployed staff who are FETP		deployed staff-time are FETPs	staff-time are FETPs	reports	time deployment and CDT 24m person-time, while reservist cadre is being trained. From Y3, reservist cadre would contribute to 6m person-time/annually. Thus FETP target in 6/30 (20%) in Y2 and 6/36 (17%) afterwards but target stays at 20%.
Output 1.5	Reservist cadre ready to deploy	% reservist cadre selected, trained, and ready for deployment	Strategy for identification, selection and training of reservists drafted	≥ 50% of target reservist cadre selected and trained	100% of target reservist cadre selected and trained	Selection documents, training certificates	The demand for being part of the UK-PHRST reservist cadre meets the requirements for reservists. Timely deployment training is available to all reservists.
Output 1.6	Deployment of reservist cadre	% of the total deployed staff who are reservists	N/A	None. Reservists being trained	≥ 17% of deployed staff time	End of Mission reports	As above. 6/36 (17%) in Y2 and beyond
Output 1.7	Operational and technical support in LMICs during outbreaks	% of the minimum target of UK-PHRST deployments in response to outbreaks and/or public health emergencies	Target 4 deployments	Minimum 5 deployments	Minimum 5 deployments annually	End of Mission reports	The number of requests for assistance and deployment will at least meet the minimum target.
Output 1.8	Improved HMG early identification and prioritisation of outbreak response activities	Number of activities of technical advice for outbreak response provided through the UK-PHRST, with support of UK-PHRST institutions	Respond to all requests from HMG	Respond to all requests from HMG and ensure appropriate wider institutional input when and where required	Respond to all requests from HMG and ensure appropriate wider institutional input when and where required	Log of requests and of response / advice provided	
Output 1.9	Awareness and preparedness of response for threats that may require assistance from the UK-PHRST	% of request for assistance on UK-PHRST radar prior to the request, and for which a basic risk assessment was undertaken by UK-PHRST	N/A	Target ≥ 70%	Target ≥ 90%	Risk assessment and alert log	
Output 1.10	Cost effective deployment of UK-PHRST	Benchmarking of salary and training costs of experts deployed (including	N/A	Net benefit	Net benefit	Net benefit	This crude benchmarking assumes that (1) external consultants could be recruited for deployments when needed and that (2) benefit of training is short term. However, in

Item	Description	Indicator	Milestones Year 1	Milestones Year 2	Milestones Years 3 -5	Means of Verification	Assumptions and Comments
		backfilling of reservist posts) against hiring of external consultants to undertake the specific tasks					reality, the benefit is longer term, so the cost of investing in core deployable team and reservist cadre is higher than their shorter-term contribution.
Outputs 1.11	Effective contracting out, when required	Choice of contractor based on competitive tendering process		Ad hoc	Ad hoc	Record of competitive tender	
Outcome 2	Improved capacity in LMICs for outbreak detection, response and control	N/A	Achievement of targeted outputs and activities for year 1 to meet desired outcome and impacts	Achievement of targeted outputs and activities for year 2 to meet desired outcome and impacts	Achievement of targeted outputs and activities for years 3 - 5 to meet desired outcome and impacts	N/A	See assumptions for impacts.
Output 2.1	Development of a competency framework for training of staff in LMICs	Competency frameworks agreed upon by all stakeholders	N/A	Competency framework agreed upon by all collaborative institutions	Competency framework agreed upon by any new partner with whom UK-PHRST engages for capacity development in LMICs	Competency framework published	
Output 2.2	Mapping and identification of relevant partners for capacity development /training in LMICs	Stakeholder analysis undertaken and engagement with partners	Active engagement with key stakeholders in LMICs and participation in training	Stakeholder analysis undertaken in all capacity development hubs and formal collaboration mechanisms agreed upon	N/A	Training reports, minutes and reports from meetings, stakeholder analysis document, MoUs	
Output 2.3	Development of training needs analysis in capacity development and research hubs overseas	Undertake a training needs analysis in each capacity building hub	N/A	Completed in 1/3 hub	Completed in all three hubs (100%)	Needs analysis document	
Output 2.4	Capacity development options proposed and costed against existing	Options and economic analysis undertaken	N/A	Completed in 1/3 hub (33%)	Completed in all three hubs (100%)	Options paper and economic analysis	

Item	Description	Indicator	Milestones Year 1	Milestones Year 2	Milestones Years 3 -5	Means of Verification	Assumptions and Comments
	capacity and initiatives to ensure value for money						
Output 2.5	Capacity development plan developed and agreed with partners in LMICs	% of training and research hubs overseas with agreed capacity development plan	N/A	≥ 33% (1/3) of training and research hubs with capacity development plan in place	100% of training and research hubs with capacity development plan in place	Capacity development plans made available	Capacity development plan will be developed in Sierra Leone first, and then in each of the other training hubs.
Output 2.6	Training provided as per needs and capacity development plan	% of training activities achieving		≥ 80% of planned training activities achieved	≥ 80% of planned training activities achieved	Training reports	Students/trainees engage in the programme and appropriate buy-in and facilitation from collaborating institutions in-country to deliver training
Output 2.7	Training participants meeting their learning and training objectives	% of training participants fulfilling their training objectives	N/A	Target ≥ 50%	Target ≥ 70%	Formal assessment, self-assessment, and training feedback	Students/trainees engage in training activities and training objectives set are realistic
Output 2.8	Timely and effective budget planning and forecasting	Annual capacity building budget plan shared and agreed in advance of each financial year	N/A	N/A	N/A	Budget plan, internal and external audits	
Outcome 3	Improve knowledge for outbreak detection, response and control in LMICs	N/A	Achievement of targeted outputs and activities for year 1 to meet desired outcome and impacts	Achievement of targeted outputs and activities for year 2 to meet desired outcome and impacts	Achievement of targeted outputs and activities for years 3 - 5 to meet desired outcome and impacts	N/A	See assumptions for impacts.
Output 3.1	Improved evidence base on outbreak preparedness and response in LMICs	% of minimum target number of new research projects undertaken to improve outbreak preparedness and response in LMIC	Minimum 9 research projects	A minimum of 2 new projects in each of the five main research streams	TBD	Research proposals	
Output 3.2	Improved evidence base on outbreak preparedness and response in LMICs	% target peer-reviewed manuscripts submitted for publication	Not applicable	Minimum 10 UK-PHRST manuscripts submitted	Minimum 15 UK-PHRST manuscripts submitted annually	Submitted publications	Assuming that submitted manuscripts will be published. Not committing to publication in the logical framework, as publication times may differ and are beyond the control of the UK-PHRST. A 'UK-PHRST manuscript' defined as either (i) at least one UK-PHRST

Item	Description	Indicator	Milestones Year 1	Milestones Year 2	Milestones Years 3 -5	Means of Verification	Assumptions and Comments
							member as first, second or last author or (ii) a publication with UK-PHRST authors in related to an outbreak to which UK-PHRST personnel deployed or otherwise made a significant contribution (e.g. data analysis, modelling support).
Output 3.3	Strengthening methods and tools to rapidly support outbreak response	% of minimum target research projects to either evaluate or develop methods and tools for outbreak response	Not applicable	A minimum of one new project in each of the 5 main research streams		Research/ audit proposals	
Output 3.4	Strengthening methods and tools to rapidly support outbreak response	% of tools developed or strengthened that have been used in outbreak response	None	Minimum target is 20% (i.e. evidence from 1 of the minimum 5 research projects used during a response)	≥ 50%	End of Mission reports and illustration of tool used on the ground	Nature of the deployment and expertise required allow testing and use new/enhanced tools developed
Output 3.5	Effective research budget allocation	In a competitive research bidding, funded research proposals to demonstrate value for money	N/A	N/A	N/A	Research proposals, research budget plan	
Output 3.6	New funding (i.e. complementing UK-PHRST budget) for research or capacity building projects	New proposals submitted by UK-PHRST personnel	N/A	>2	>4	# proposals submitted with UK-PHRST personnel as Principal Investigator	Funding is competitive. Proposal submission does not guarantee funding.

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