Department of Health & Social Care

UK Public Health Rapid Support Team Annual Review – 2020/21

Global Health Security Programme

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1. Summary and overview

Project Title: UK-PHRST

Project Value (full life): £20 million

Review period: 1 April 2020 – 31 March 2021 (year 5)

Project's Start Date: 1 April 2016

Project's End Date: 31 March 2025

Summary of Project Performance

Year	2020	2021	
Project Score		A (achievement of all milestones within 2 of the 3 outputs)	
Risk rating	Amber/ Green	Amber/ Green	

1.1 Outline of project

Launched in 2016 and funded by Official Development Assistance (ODA) through the Department of Health and Social Care (DHSC), the UK Public Health Rapid Support Team (UK-PHRST) is an innovative government-academic partnership co-led by London School of Hygiene and Tropical Medicine (LSHTM) and Public Health England (PHE) (Now UK Health Security Agency), with a consortium of academic and implementing partners in the UK and around the world.

UK-PHRST is a multidisciplinary team of public health professionals and researchers with an integrated triple remit of outbreak response, research, and capacity development, with the following specific objectives:

- rapidly investigate and respond to disease outbreaks at the source, with the aim of stopping a public health threat from becoming a broader health emergency
- conduct research to generate an evidence base for best practice in disease outbreak interventions
- provide training to establish a cadre of personnel to rapidly deploy to respond to disease out-breaks

- assist in capacity development to enhance epidemic preparedness and response in low- and middle-income countries (LMICs) and contribute to supporting implementation of International Health Regulations

1.2 Summary of progress

UK-PHRST has continued to make good progress against the majority of outputs. The external evaluator, Itad, reported, “Despite limited human resources which have overstretched the team and inevitably restricted what they have been able to achieve, the programme is on track to achieve all its outputs”. Further detail relating to the specific outputs is outlined in section 3. There have been several key achievements across the programme this year, including those below.

Deployments

Between 1 April 2020 and 31 March 2021, 18 staff were deployed to support emergency outbreak responses. These were in partnership with The Gambia Ministry of Health (MoH), Africa Centres for Disease Control and Prevention (Africa CDC), World Health Organization (WHO) Bangladesh, Guinea MoH, WHO Tajikistan and in response to outbreaks of COVID-19 (4) and Ebola virus disease (1). Three deployments were through the bilateral mechanisms alongside the Foreign, Commonwealth and Development Office (FCDO) and in-country partners, including one joint deployment with Africa CDC, and 2 were through the WHO Global Outbreak Alert and Response Network (GOARN).

Of the 18 staff deployed, 11 were in-country deployments and the remainder were remote deployments managed from the UK. Two Field Epidemiology Training Fellows (one in person and one remotely) and 3 reservists (one in person and 2 remotely) supporting outbreak response were deployed over the year. A full summary of deployments is given in Annex 1.

> “UK-PHRST work is likely to have made a positive difference to … COVID-19 responses in Cox’s Bazar (Bangladesh), as well as to Africa CDC’s COVID-19 response, among others. There is also evidence of capacity having been developed as a consequence of UK-PHRST’s interactions with Africa CDC, Nigeria CDC and Cox’s Bazar”
>
> Itad external evaluation report

Despite the challenges with deploying overseas (a result of COVID-19 travel restrictions and border closures), the team rapidly adapted to a remote deployment model. Multiple staff were able to deliver a wide range of expertise from within the UK alongside overseas

partners. This led to new opportunities for effective delivery and, following the easing of travel restrictions, a blended approach to deployments has allowed greater flexibility with technical resources whilst maintaining a face-to-face presence, which is critical to effective partnership working. This blended model has potential to increase value for money, and further work is needed to fully develop and evaluate this approach.

> "[I]nnovations should be retained even when travel becomes easier again, as considered valuable and particularly relevant in the current climate … adopting a 'blended' model"

Itad external evaluation report

Most projects have been affected by COVID-19, largely due to diversion of staff and health resources both in partner countries and in the UK, and/or travel restrictions, which have prevented some in-field collaborative activities. A number of projects adapted very effectively to these challenges and 3 projects with previously planned field work requiring UK team presence in this period were able to deliver remotely: a COVID-19 seroprevalence survey in Cox's Bazaar, Bangladesh; Viral Haemorrhagic Fever exposure investigations among health workers and the community in Kasese, Uganda; and sample collection for Ebola virus antibody screening work in Guinea, the latter curtailed not by COVID-19 but by the Ebola outbreak in the same area.

Capacity development

In addition to the capacity development activities delivered through emergency deployments and collaborative research, there were several specific training and education developments. Further detail can be seen from the case studies in Annex 3

- A massive online open course (MOOC) on tackling COVID-19 was developed and run in March 2020 then updated and re-run in May 2020. Participants in both runs totalled over 230,000 from 186 countries, including over 123,000 LMIC-based participants from 132 LMICs. The course was presented in English, with translations provided in Chinese, Spanish, Portuguese, French, Italian, Arabic and Swahili.

- UK-PHRST developed a COVID-19: Psychological First Aid in Africa course, based on the Public Health England version, to show front-line responders in Africa how to recognise when people affected by the COVID-19 pandemic are in distress, and how to provide them with Psychological First Aid (PFA).

- The UK-PHRST Knowledge Sharing Hub has been created as an online resource to support access to learning and develop communities of practice around outbreak response. The hub includes videos, community forums and webinar links.

- A UK-PHRST competency framework was developed, setting out the core competencies for all staff as well as additional competencies for manager and team leaders' behaviour indicators. This framework will support competency-based training both within UK-PHRST and externally.

Programme evaluation

The external evaluator, Itad, completed its endpoint review of the project, and UK-PHRST team have worked on the recommendations from the midpoint review. For the endpoint review a ‘co-creation of recommendations’ participatory workshop was held by Itad in February 2021 with UK-PHRST and stakeholders, and the resulting recommendations will be addressed in the new financial year.

Overall score

The overall ‘A’ score is based on the achievement of all milestones for 2 of the 3 outputs, those around response to outbreaks and research to build the evidence base. Strong progress has been made towards the third output around capacity development, and it is recognised within the project that this is the area with the most need for future improvement. The score is also influenced by the fact that strong progress has been made towards greater integration of the components of the triple mandate that these outputs relate to. For example, through the increase in research projects arising from deployment activity and the crossover between capacity development and research in the development of MOOCs and research on these.

Overall, the project has met expectations and adapted well to be demands of an unpredictable and challenging year.

1.3 Progress against previous recommendations

Project management

Recommendation from 2019/20	Outcome	Comments
Build a 'UK-PHRST identity' and tackle any tensions within the consortium that may hinder smooth collaboration and efficiency	Ongoing	Partnership between LSHTM and PHE continues to be a strength of UK-PHRST as highlighted in the Itad report. Launch of UK-PHRST Knowledge Hub has provided a space to promote the work of the team across the remit and consolidate and strengthen UK-PHRST identity. The team started a matrix management approach internally which has strengthened coordination across the partners.
Clearly articulate UK-PHRST's remit across the triple mandate and set out clear ways of working within the consortium and with partners	Ongoing	Reworking of the Theory of Change (ToC) with increased emphasis on triple mandate. Strong collaborative relationships have continued with newer academic partners with contracts in place with Liverpool School of Tropical Medicine (LSTM) and University of Glasgow. UK-PHRST continues to work effectively with Oxford University on delivering a major research project on Lassa fever (see Annex 2).
Operationalise existing commitments to promoting equity and human rights	Ongoing	Gender, equity and human rights are considered in project design and staff aim to integrate these considerations into projects. A Human Rights and Equity lead role has been approved and will be recruited to in year 6 (2021/22). This role will focus on integrating equity and human rights into all UK-PHRST activities as well as support research in an outbreak prevention and control context.
Maintain a skilled workforce, including reservists	Achieved	A skilled and deployable workforce has been maintained in line with training and medical clearance expectations.
Develop a competency and skills	Achieved	Competency and skills framework has been completed and will be

Recommendation from 2019/20	Outcome	Comments
framework		published.
Coordinate, maintain and develop a list of projects and portfolio for UK Field Epidemiology Training Programme (FETP) Fellows	Ongoing	FETP fellows have remained engaged through deployments to the Gambia and remote support to Bangladesh for COVID-19 outbreak support.
Host another After Action Review focusing on gathering feedback from external stakeholders on UK-PHRST activities	Achieved	A virtual After-Action review was held on 13 January 2021 with delegates contributing to a number of recommendations.

Deployments

Recommendation from 2019/20	Outcome	Comments
Respond to at least 5 outbreaks with key partners in LMICs	Achieved	There have been in-person deployments to Bangladesh, The Gambia and Tajikistan (COVID-19) and Guinea (Ebola virus disease). A comprehensive programme of remote deployment support has been given to partners during the COVID-19 pandemic with Africa CDC and WHO (multiple countries).
Maintain operational capacity and processes to support rapid deployment	Achieved	Despite the rapidly changing travel landscape resulting from pandemic-related travel restrictions, the team have maintained the operational capacity to deploy staff rapidly and effectively.
Consider extending the standard time of deployment from 6 weeks to 12 weeks to maximise efficiencies, continuity and impact	Achieved	Through a blended approach of remote and in-person deployments, support on several deployments has been able to be flexible on a case by case basis. For example, in remote deployment support to Africa CDC.
Explore opportunities for delivering support to	Achieved	Delivery of expertise remotely to LMIC partners has continued

Recommendation from 2019/20	Outcome	Comments
LMIC partners remotely in light of the lessons captured from working on the COVID-19 pandemic and embed into the deployment model where appropriate		throughout 2020-21 with the team able to draw on the expertise of core team and reservists in an adaptable way.
Build on existing partnerships to enable engagement with regional response work	Achieved	Regional partnerships included work with Africa CDC, Medical Research Council Uganda, MoH in Bangladesh and WHO / GOARN.
Strengthen existing cross departmental working between UK-PHRST and other government departments on communication and coordination	Achieved	Regular meetings continue with FCDO colleagues to underpin operational support on deployment. Deployment to The Gambia supported by FCDO for logistics, and rapid assessment to Guinea in March 2021 was as part of a bilateral deployment with FCDO. Routine communication with UK Emergency Medical Team (UK-EMT) colleagues continues to facilitate shared working between teams.

Research

Recommendation from 2019/20	Outcome	Comments
Establish best practice in outbreak response and share lessons learnt	Ongoing	Progress has been made towards establishing best practice through robust evidence-based research undertaken throughout the year. Research findings have been shared through publications, presentations, case studies and seminars
Undertake field research and share to inform outbreak response	Achieved	Rapid Research Process was developed in year 5 (2020/21) allowing for a rapid project in Bangladesh to be undertaken through this model to inform outbreak response. This has resulted in a model which can be used for future rapid research.
Develop and evaluate tools for outbreak response	Ongoing	Research on evaluating and strengthening public mental health systems in Africa in response to the COVID-19 outbreak took place. The team also worked with Nigeria

Recommendation from 2019/20	Outcome	Comments
		CDC to develop diagnostic capacity for Lassa Fever and developed and innovative oral fluid serology assay to identify past infection with Lassa Fever Virus (Sierra Leone). UK-PHRST will continue to work with partners to evaluate the impact these tools have had.
Commit to strengthening the evidence base to support research into practice	Ongoing	16 active (new and ongoing) research projects in year 5 all aimed at strengthening the evidence base for better prevention, detection and management in outbreak response by, for example, using innovative approaches exploring barriers to intervention implementation (see Annex 2). Translating research into practice continues to be a key strategic goal.

Capacity development

Recommendation from 2019/20	Outcome	Comments
Finalise UK-PHRST capacity development approach	Ongoing	A paper outlining UK-PHRST approach to capacity development was developed in late year 5.
Embed capacity development within other elements of UK-PHRST activities	Ongoing	Capacity development continues to be a key element of the majority of research projects and deployments, strategic capacity development paper will strengthen this further in year 6.

Finance

Recommendation from 2019/20	Outcome	Comments
Ensure value for money through application of rigorous financial systems in line with ODA expectations	Achieved	A systematic approach to tracking finance is in place within both LSHTM and PHE management teams. An integrated report is prepared and submitted to Project Board on a quarterly basis.
Prepare and submit bid for further funding as part of the Comprehensive Spending Review to ensure	Achieved	Bid made for the one-year spending review and funding allocated until March 2022, with business justification document

Recommendation from 2019/20	Outcome	Comments
operations continue beyond 31 March 2021		for this submitted to DHSC and approved.
Review and revise quarterly forecasts taking into account impact of COVID-19 on delivery and communicate output with DHSC	Achieved	Quarterly forecasts were revised on a systematic basis and any changes communicated to DHSC.

Theory of Change

Recommendation from 2019/20	Outcome	Comments
Continue to review and revise the ToC as necessary with support from the external evaluation team, to ensure it reflects UK-PHRST's activities over the current funding period and fully captures all assumptions	Achieved	ToC reviewed and updated through co-creation workshop with Itad and now more aligned with strategic goals with increased emphasis on triple remit.

External engagement

Recommendation from 2019/20	Outcome	Comments
Work with partners in LMICs to identify capacity development needs in relation to outbreak response and research	Achieved	Ongoing capacity development work to support COVID-19 response on epidemiology, social science and data analysis alongside Africa CDC. Work with WHO and Bangladesh MoH on seroprevalence survey. Work with MRC Uganda on haemorrhagic fever project with remote training provision. Following deployment to The Gambia, UK-PHRST will undertake research project relating to COVID-19 in year 6.
Develop educational tools and courses on outbreak management	Achieved	MOOC on COVID-19 developed, tools and training shared through Knowledge Hub.
Set out, implement and monitor a communication and engagement plan to	Ongoing	Whilst a specific communication and engagement plan is yet to be established, the launch of UK-PHRST Knowledge Hub has created a

Recommendation from 2019/20	Outcome	Comments
increase awareness of what UK-PHRST is and does		dedicated platform for increasing awareness of UK-PHRST activities. Increased engagement and support from dedicated Comms Officer. Utilised Knowledge Hub to increase awareness of UK-PHRST including through webinars, case studies and blogs.
Find ways to collaborate more closely with other actors in the global health security space, especially across UK government programmes	Ongoing	Engaged with IHR Strengthening Project including capacity development work in Zambia. Continued engagement with FCDO.

Monitoring, evaluation and learning

Recommendation from 2019-20	Outcome	Comments
Revise current MEL systems to make sure they are fit for purpose, allow for monitoring and evaluation from output to outcome level, and support learning and adaptation	Ongoing	MEL system underwent detailed review in collaboration with external evaluators (Itad) with logframe and monitoring framework updated.

1.4 Recommendations

External evaluation (Itad) headline recommendations

1. Ensure sufficient capacity to adequately meet the demands of programme delivery and maximise successful outcomes across the triple mandate, by advancing recruitment plans, using reservists and FETPs where possible, and clearly articulating a request for more human resources in any future phase.

2. Deepen in-country networks and partnerships to achieve programme objectives (particularly in relation to sustainability) through an updated approach to partnerships.

3. Put greater emphasis on ensuring that research is used to inform decision making and to guide policy in LMICs, by articulating and implementing a research uptake strategy and further aligning research questions with needs.

4. Further define and embed UK-PHRST's scope of work and ways of working, especially within capacity development, and improve partners' awareness and understanding of UK-PHRST's mandate through an effective communications plan.

5. Continue to strengthen and implement UK-PHRST's approach to maximise chances to contribute to desired outcome level results and to be able to demonstrate contribution at this level.

6. Retain lessons learned during COVID-19 through a 'blended' approach combining in-person and remote support.

Project recommendations

These have been informed by the ITAD evaluation.

1. Incorporate a blended approach to deployments, including with reservists.

2. Implement training pathway incorporating a blended approach, tailored to team roles, and develop and pilot tailored Safeguarding training for working abroad in LMICs.

3. Map out and develop procedures for exit/transition plans for UK-PHRST across the triple remit to enhance long-term impact/sustainability.

4. Develop a 3-year research strategy informed by a gap analysis to identify priority areas of need and inform research themes.

5. Strengthen systematic monitoring of research uptake and impact.

6. Map out and conduct a gap analysis, and prioritise key networks and partnerships (national, regional, global) and develop and outline principles of working and alignment according to shared objectives with key partners.

7. Implement updated capacity development framework, setting out ways of working and accountability mechanisms.

8. Recruit and on-board an Equity and Human Rights advisor and implement gender and equity mainstreaming.

9. Identify ways to better measure and reflect the contribution of UK-PHRST of activities across the programme to further develop UK-PHRST monitoring and evaluation strategy

10. Engage in UKHSA transition and ensure the continued development of global health and rapid response functions, through UK-PHRST's unique partnership.

11. Contribute to the PHE-led New Variant Assessment Programme (NVAP) implementation as a member of the Programme and Project Boards.

2. Theory of Change (ToC)

2.1 Summary of changes to the ToC

During the year the team worked with Itad to revise the programme's Theory of Change (ToC), which outlines how UK-PHRST's research, outbreak response and capacity development activities contribute to an improvement in both UK and LMIC capacity to respond quickly and effectively to outbreaks.

Qualitative evidence from the Itad endpoint evaluation suggests the design of UK-PHRST project around the 'triple mandate' can be highly beneficial to the achievement of outcomes and as such the ToC places increased emphasis on the areas where UK-PHRST's triple mandate crosses over most closely. Particularly around:

- developing and delivering educational courses to support learning and research on outbreak response
- continuing to develop and strengthen partnership in global health architecture
- sharing lessons learned with the team and partners to improve response performance
- developing pre-positioned and fast track research protocols, and methods and tools across the triple mandate

2.2 Project's progress

UK-PHRST continues to contribute to the long-term outcome of "improved outbreak response through enhanced operational effectiveness, evidence-based research, and capacity building at global, regional and country levels, to reduce morbidity and mortality and the likelihood of outbreaks becoming public health emergencies".

Despite the challenges with deploying overseas (a result of COVID-19 travel restrictions and border closures), the team rapidly adapted to a remote deployment model, and has continued to maintain the speed and quality of UK support to outbreaks in LMICs.

Most research projects have also been affected to some extent by COVID-19, but a number of projects adapted very effectively to these challenges and some projects were able to deliver remotely.

Despite the impact of COVID-19 on the frequency of UK-PHRST deployments, the project continued to see new research projects directly linked to knowledge gaps in outbreak intervention, either originating from in-person or remote deployment or directly from the

pandemic experience, contributing to the knowledge base and informing policy-making. There is however a recognised need to strengthen systematic monitoring of research uptake and impact and to develop the longer-term vision for UK-PHRST research.

2.3 Changes to the logframe

During year 5, UK-PHRST Senior Management Team worked closely with Itad colleagues to review and update the logframe and Theory of Change. The aim of this collaborative review was to ensure the documents were better aligned and facilitated improved monitoring and reporting.

The updated version of the logframe (as of end year 5) is fully aligned with the revised ToC and contains indicators which adhere to the SMART approach (specific, measurable, achievable, realistic, timely).

This revision ensures that indicators and milestones better reflect the work of UK-PHRST and contribute towards outcomes. The revised logframe includes a new output indicator to measure UK-PHRST's contribution to capacity development through informal and on-the-job training and coaching.

For the purposes of this review, the output scoring in section 3 relates to the original logframe in place at the start of the period. Future reviews will use the updated version in place at the end of year 5, which is being finalised.

3. Detailed output scoring

3.1 Output 1

More effective UK response to outbreaks, including established operational capacity and processes to support rapid deployment for optimal field performance and assess value for money

Output number: 1

Output score: A

Impact weighting (%): 35%

Indicator(s)	Milestone for the review	Progress
Output indicator 1.1 Trained cadre of UK experts (epidemiology, laboratory, social science, clinical management, infection prevention and control, data science, logistics, research) ready to be deployed as/when required. Training includes general induction, safety and security, WHO training, UN training, institutional mandatory training and deployment course"	100% of core team in post and ready for deployment; Full team of reservists in place and 100% trained; 100% (6/6) FETP fellows trained and available to deploy	**Delayed**
Output indicator 1.2 Laboratory capacity supported in response through development of a "suitcase laboratory"" and deployment of lab team in LMIC's	Deployment of laboratory team in at least 2 LMICs	**Achieved**
Output indicator 1.3 Sharing of lessons learnt from deployment within	All deployments with formal debrief and lessons learnt; procedure	**Achieved**

Indicator(s)	Milestone for the review	Progress
the team to continuously improve performance	for on-call response to incidents, accidents or near-miss adapted/updated to respond to lessons learnt	
Output indicator 1.4 Monitoring framework developed and implemented into operational processes	Internal monitoring completed quarterly	**Achieved**
Output indicator 1.5 Value for money assessed through benchmarking salaries and training costs of those deployed (including backfilling of reservists) against hiring external consultants	Net benefit	**Achieved**

3.1.1 Supporting narrative

The milestone for the indicator around staff being in post and trained is identified as 'delayed' due to the movement of staff and onboarding of new team members. 100% of core team (6) are in post and ready for deployment; 72% of 14 reservists are fully trained; 69% of 16 FETP fellows are fully trained and available to deploy; 100% of 4 research fellows are fully trained. There were also delays to some staff completing the mandatory training as a result of the COVID-19 pandemic restrictions pausing certain face-to-face courses. Considering the challenges of conducting in-person training during social distancing measures, the induction course for UK-PHRST was reviewed and adapted to create a new remote course. The induction course was delivered simultaneously online through 2 live and interactive workshops (4 hours each) on the Zoom platform during January and February 2021. The first webinar was open to external participants and was attended by 279 attendees. The webinars have been converted into online courses and quizzes for future onboarding with the support of The Global Health Network, where they are hosted.

In 2020, UK-PHRST lead microbiologist deployed to Tajikistan as part of a scoping trip to assess the requirement of UK-PHRST suitcase laboratory for a COVID-19 outbreak. Microbiologists were also deployed to The Gambia and Bangladesh to support partners in the response to COVID-19 outbreaks.

To ensure operational readiness and optimise UK-PHRST deployment mechanisms, the modular flight case laboratory processes were tested via a comprehensive desktop and field exercise in the UK in February and March 2021 with external expert oversight. A report summarising the key recommendations and next steps to optimise laboratory deployments was produced and systems updated as a result.

Following each deployment, lessons were identified through a post-deployment debrief and summarised within End of Mission reports. UK-PHRST also piloted the first external partner debriefing exercise when the team returned from The Gambia. This gave opportunities to capture lessons from partners. These activities resulted in updated processes and new guidance for the team to use ahead of future deployments. In addition, a task and finish group was established to identify how UK-PHRST approach learning. A mapping exercise was conducted and areas for increased learning were identified. A programme wide After-Action Review was held in January 2021 with external stakeholders and the team launched an external partners feedback form so colleagues could provide anonymous feedback online. Further detail can be seen within the case studies (Annex 3)

Itad completed a value for money assessment as part of the external evaluation.

The score of an A for this output is based on the achievement of all milestones for the indicators. The score is also reflective of the fact that, thanks to its established operational capacity and processes, UK-PHRST has made a significant contribution to the UK’s response to COVID-19 in LMICs, both through in-person and remote support, as well as providing support for the response to the Ebola outbreak in the Republic of Guinea in early 2021 that occurred alongside COVID-19. Without UK-PHRST, it is doubtful that the UK would have been able to offer the same level of rapid and effective assistance to LMICs in the face of the pandemic, or delivered the same value for money in any support that could be offered.

3.1.2 Changes to the output

In collaboration with Itad, Output 1 was reviewed and revised during year 5. The aim was to strengthen outputs by ensuring indicators supporting Output 1 were 'SMART'. Some indicators outlined above were moved from the logframe as they aligned to the activity level. New indicators were proposed.

3.1.3 Recommendations

The milestones set for the year were able to represent progress toward achievement of the output and evidence of the ability to achieve this, however further iterations of the logframe (which are already underway) should include indicators that do more to demonstrate the direct results of response activities.

By year 6, output indicators will be revised and quantifiable measures such as defining what it means to be deployable within 48hrs will be provided.

3.2 Output 2

Research to build an evidence-base for optimum prevention and response conducted before, during and after outbreaks. Knowledge sharing and external funding to maximise benefit

Output number: 2

Output score: A

Impact weighting (%): 35%

Indicators	Milestone for the review	Progress
Output indicator 2.1 Research infrastructure established (strategy, protocol development, tools)	1. Development and undertaking >2 cross-disciplinary research projects in line with strategy 2. >4 research protocols dev eloped/adapted to guide early, mid- and end-of-outbreak investigation 3. >1 impact case study of a tool developed/adapted, or in use	**Achieved**
Output indicator 2.2 External funding to build on the UK-PHRST platform	1. >3 funding applications submitted (to complement UK-PHRST budget) for research or capacity building projects from external sources (named UK-PHRST investigator included) 2. Two research projects with new	**Achieved**

Indicators	Milestone for the review	Progress
	collaborators in academic consortium	
Output indicator 2.3 Knowledge sharing through presented and published analyses of evidence on optimal approaches to outbreak response	1. >15 articles or abstracts submitted for publication or international presentation 2. >12 presentations on UK-PHRST or its work at meetings and conferences where audience includes key stakeholders 3. Development of open access education Development of UK-PHRST digital hub	**Achieved**
Output indicator 2.4 Cumulative number of research projects developed during/emerging from UK-PHRST deployment or remote support	>50% of total research projects (>2 per year)	**Achieved**

3.2.1 Supporting narrative

Technical Steering Committee (TSC) meetings have been held on a monthly basis and additional members have been recruited to broaden LMIC representation. These meetings are attended by >75% of the membership and have provided timely scientific review of new and ongoing research projects (Annex 2).

Funding applications in year 5 were made to Gates Exemplars, European and Developing Countries Clinical Trials Partnership (EDCTP) and Global Effort on COVID-19 (GECO). The 2 research projects developed in year 4 with new collaborators have continued in year 5. New research projects were developed during year 5 with Glasgow University, Liverpool School of Tropical Medicine and MRC Uganda.

Eighteen UK-PHRST peer-reviewed manuscripts were published. UK-PHRST Knowledge Hub which provides open access to a wide range of UK-PHRST information, outputs and tools relating to research was launched.

Three research projects (out of a total of 6) were developed as a direct result of UK-PHRST deployments or remote support activities (50%):

- A population-based seroprevalence survey for COVID-19 in Cox's Bazar Rohingya Camps, Bangladesh, which was successfully developed through a rapid research project

- An action research study investigating ways in which MOOCs can be used to support outbreak response, undertaken as part of the development and running of UK-PHRST MOOC supporting the COVID-19 pandemic response

- A project on the development and evaluation of resources to support infection, prevention and control (IPC) engagement with caregivers in hospitals developed in direct response to a UK-PHRST IPC deployment in Cameroon

UK-PHRST also led on projects exploring gaps and barriers to mental health responses to COVID-19 and extracting lessons for the COVID-19 vaccine rollout from other population vaccination programmes. These were identified as shortfalls in LMIC pandemic responses and will contribute to the knowledge base to inform decision makers.

The score of an A for this output is based on the achievement of all milestones for the indicators. In this respect expectations for the delivery of research in the reporting year have been met. Also encouraging is the progress in the integration between the research and response aspects of the remit, with more projects arising as a result of requests for specific support from LMIC-based colleagues to target identified areas of unmet need. There has also been good progress toward ensuring the knowledge gained from UK-PHRST research activity is accessible to a wider audience of potential LMIC beneficiaries via information sharing through the newly established online Knowledge Hub.

3.2.2 Changes to the output

In collaboration with Itad, Output 2 was reviewed and revised during year 5 ahead of year 6. The aim was to strengthen outputs by ensuring indicators supporting output 2 were SMART. Some indicators outlined above were moved from the logframe as they aligned better to the activity level. Some indicators were strengthened to ensure quantifiable measures were achieved and new indicators were proposed. In addition, targets were reviewed to ensure they were fit-for-purpose.

3.2.3 Recommendations

To further strengthen UK-PHRST's research governance and ensure more effective scientific review, the TSC Terms of Reference will be reviewed and revised in year 6. The review aims to address weaknesses and ensure the TSC is fit-for-purpose.

In addition, a long-term Research Strategy is under development for completion in year 6. A Research Strategy outline plan has been presented at UK-PHRST Project Board and an evidence gap analysis to inform this work has been initiated.

The importance of translating research to practice remains a key strategic goal and more work should be done to explore and evaluate the pathways to impact of research activity.

The development of a clear overarching strategy for research in 2021/22 will help to ensure that the research output of the project contributes more effectively and coherently to the broader intended outcomes.

3.3 Output 3

Improved capacity for prevention, detection and control of outbreaks in ODA-eligible countries

Output number: 3

Output score: B

Impact weighting (%): 30%

Indicator	Milestone for review	Progress
Output indicator 3.1 Change in surveillance capacity in hub sites in ODA-eligible countries	Capacity of 3 hub sites developing toward independent response capability	**Not achieved**
Output indicator 3.2 Change in trained personnel for outbreak prevention, detection and response in ODA-eligible	Training supported in >3 ODA-eligible countries with >75% of participants meeting learning outcomes	**Achieved**

Indicator	Milestone for review	Progress
countries		
Output indicator 3.3 Change in capacity through sharing knowledge with key stakeholders in-country	Annual UK-PHRST workshop with partners in an ODA-eligible country	**Achieved**
Output indicator 3.4 Development of a competency framework for training of staff in LMICs	Competency framework agreed internally and adapted for external use	**Delayed**

3.3.1 Supporting narrative

Prior to year 5, the 'hub' approach was revised, and the team moved away from the model of using 3 pre-determined sites. The first indicator is therefore no longer relevant.

A full list of resources developed has been shared with partners via UK-PHRST Knowledge Hub. 94% (9296/9883) public health professionals from ODA countries have completed online and face to face training, MOOCs and capacity building activities once registered.

During deployments, colleagues have provided active input into technical working groups at a country level which supports a change in capacity during an outbreak (e.g. Bangladesh, The Gambia and Guinea), for example through developing surveillance and laboratory systems. UK-PHRST technical experts have also contributed to Infection Prevention and Control (IPC) and social science technical working groups with Africa CDC and the West Africa Social Science Epidemic Response Network at a regional level, contributing to a range of outputs including technical training, guidance, surveillance, and research. UK-PHRST has representation on the GOARN steering committee at a global level.

Twelve of the 16 research projects during this period included informal/on-the-job training, to develop research skills and support research delivery.

UK-PHRST has collaborated with the International Health Regulations (IHR) Strengthening Project to provide specific technical input to support the Zambia National Public Health Institute in their implementation of COVID-19 genomic surveillance.

UK-PHRST is one of several cross-HMG organisations supporting the New Variant Assessment Platform, an initiative to offer both UK genetic sequencing capacity to other countries and to create capacity for sequencing and identification of new variants through regional hubs LMICs. This programme will be aligned with the wider UK and cross-government global health activities and UK commitment to the global health security.

Several projects carried out in year 5 focused on the development and/or evaluation of tools for outbreak response in LMICs including:

1. setting up a MOOC on outbreak preparedness and response that was completed by over 236,000 people from 186 countries, with more than half of participants from LMICs; MOOCs are effective teaching tools that are rarely used by LMICs

2. a point of care test to expedite diagnosis of Crimean-Congo haemorrhagic fever in rural settings. Several projects have immediate and direct policy relevance not only to the host study country but more widely for application in many LMICs. For example, the implementation of new diagnostic algorithms during Lassa Fever outbreaks and strengthening preparedness to viral haemorrhagic fevers through serosurveillance of healthcare workers

UK-PHRST developed the competency framework within year 5 with a launch to LMIC partners planned in year 6. This has therefore been marked as delayed.

The score of a B for this output is based on the milestones set for this output being partially achieved. There have been a variety of notable activities to support LMICs with capacity development and significant progress in this compared to previous years. However, as recognised in the Itad endpoint evaluation, it remains the area of the triple mandate where there is most room for improvement.

3.3.2 Changes to the output

During year 5 the output indicators and milestones were revised. The hub site model is no longer in place so the first output indicator and milestone were removed. New indicators were proposed by Itad as part of their collaborative review with UK-PHRST. This included the addition of two new outputs relating to collaborative partnerships and strengthening of the LMIC response, outbreak management, and technical and research skills.

3.3.3 Recommendations

UK-PHRST to increase focus and measure on the tools developed which support capacity development activities. This includes implementation, evaluation and sharing of tools.

UK-PHRST to consider how to share these resources in addition to the newly established UK-PHRST Knowledge Hub.

A clearly defined strategy for capacity development finalised in 2021/22, and consideration of how this integrates with the other aspects of the triple mandate, would support progress in this area. It would be good to see more specific objectives for the next year, such as delivering partnership working on a particular area with a specific country or regional organisation.

4. Risk

The overall risk rating for the project is Amber. Due to the inherent uncertainties in predicting and responding to outbreaks of infectious diseases, UK-PHRST is considered a high-risk project. Despite a comprehensive series of mitigating measures in place to reduce each risk on the operational risk register, residual risk will always be present. This has been compounded by the uncertainties brought by the COVID-19 pandemic and challenges to staffing posed by a one-year spending period.

4.1 Overview

UK-PHRST maintains an operational risk register which is reviewed quarterly by UK-PHRST Senior Management Team. Key risks are communicated quarterly to UK-PHRST Project Board through the Director's Report. Any significant risks to the programme are escalated to DHSC Global Health Security Programme Board and internally through partner organisations. Within UKSHA (formerly PHE), the operational risk register is shared to Health Protection and Medical Directorate risk leads group and UK-PHRST have input into the tactical risk register as appropriate. Within LSHTM, risk at the research project level is monitored and mitigated through weekly Research Coordination Meetings, while overall programme risk is monitored by the Research Operations Officer and Faculty Office.

The key new risks to UK-PHRST programme in 2020/21 were a result of the short-term funding cycle and the travel restrictions imposed due to the COVID-19 pandemic.

As a result of border closures and flight disruption, travel overseas was considerably more challenging and in some cases, not possible this year. This meant that funding allocated for in-person deployments was less than anticipated and travel to complete capacity development and research work was not possible. This had an impact on overall spend and a risk to delivering to time and budget.

In addition, the delay in confirmation of funding for the year and the subsequent one-year funding cycle (until March 2022) had meant there is an impact on the programme being able to achieve its key objectives as projects cannot plan to operate beyond March 2022. This also impacts retention of staff and recruitment to new posts, as longer-term contracts cannot currently be offered.

Risks related to staff health and wellbeing overseas, having adequate surge capacity available through the reserve cadre, and delivering research projects to time, increased as a result of the COVID-19 pandemic.

As a result of increased domestic needs in the UK and restrictions to travel, it became more difficult for reservists to be released to support deployments. However, adaptations to UK-PHRST model mitigated this risk through application of remote deployments which allowed reservists to work part time from the UK on UK-PHRST activities, when these staff were available.

5. Project management: delivery and commercial considerations

5.1 Delivery against timeframe

Within UK-PHRST Implementation Plan, the main activities had target dates of 31 March 2021 and were divided into the following 2 key areas:

While on deployment:

- maintain operational capacity and processes to support rapid deployment
- deployment management and maintaining a skilled workforce
- responding to outbreaks with key partners
- establish best practice and identify research questions

As per the Itad evaluation, UK-PHRST's planned activities and outputs across the triple mandate have largely been achieved or exceeded or are making good progress towards achievement. Despite some delays in the project's first 4 years, capacity development indicators are now on track against targets.

Despite the COVID-19 pandemic changing the way the team deployed, the team succeeded in meeting the expected target of more than 5 deployments through a hybrid of in-person and remote support to partners.

The deployments that took place further demonstrated the integrated nature of the triple remit. For example, deployments to Bangladesh drew together emergency requests as well as research and capacity development. The collaborative work with Africa CDC initially started as an emergency request which incorporated elements of training and capacity development.

Furthermore, increased collaborations took place during deployments. The joint deployment scoping mission to The Gambia 2020 took place with colleagues from Africa CDC. This deployment has led to development of a research study on COVID-19 mortality which will take place in year 6.

The annual After-Action Review was held and the protocol for rapid research was developed and piloted during a UK-PHRST response in Bangladesh.

2. While not on deployment

- undertake field research and share to inform outbreak response
- develop and evaluate tools for response
- work with partners to identify capacity development needs and develop education and training on outbreak response
- develop competency frameworks
- assess value for money and progress plans and arrangements for project extension beyond the 2020 comprehensive spending review

The majority of these anticipated products were met by the target date of 31 March 2021. The Itad end-point evaluation report was slightly delayed until the end of April 2021. Due to the COVID-19 pandemic, opportunities to work with new partners were established and took place (e.g. Gates Ventures). The team undertook 6 new research projects during the year with activity on 16 research projects in total. A value for money assessment was delivered as part of the Itad end-point evaluation and significant input towards the comprehensive spending review took place. A draft competency framework was completed and circulated to the team by 31 March 2021 with implementation expected in year 6.

The Itad end-point report highlighted that there is good evidence of the positive contribution of UK-PHRST, especially to short-term outcomes on response and on capacity development.

5.2 Performance of partnerships

As highlighted in the Itad end-point evaluation there is strong collaboration between LSHTM and PHE as co-leads on the UK-PHRST project across different workstreams and organisational boundaries, and increasingly a sense of being unified as a team. UK-PHRST continues to be an adaptive and effective partnership which utilises the expertise and infrastructure of both lead organisations.

There is now a well-established, supportive and strong working relationship between the UK-PHRST SMT and the Global Health Security Delivery Team (comprising DHSC and

National Institute of Health and Care Research), with both formal and informal communication on a regular basis.

COVID-19 and the shift to remote working helped reinforce effective virtual communication practices independent of institutional affiliation or geographic location. These reflections as well as other lessons identified during the year have fed into plans for the next spending round to include a broader range of academic institutions to adequately counter research gaps across multiple disciplines.

There are strong collaborative relationships with the University of Glasgow and Liverpool School of Tropical Medicine, with contracts in place to manage the specific research projects in which they are involved.

UK-PHRST have taken a proactive role in coordinating activities with other partners during the last year, which has helped prevent duplication and overlap between UK-PHRST and other programmes at regional and country levels. UK-PHRST have a strong partnership with the Global Outbreak Alert and Response Network (GOARN). The programme has also enhanced collaborative partnerships with a number of regional institutions, such as Africa CDC and Nigeria CDC, especially during the COVID-19 pandemic.

A stakeholder mapping and gap analysis is planned to review and prioritise key partners and to inform the approach to partnership working for the next phase of the project.

6. Financial performance

6.1 Value for money assessment

Economy

Benchmarking analysis suggests that the current UK-PHRST model of hiring a full-time core deployable team is comparable to solely hiring short-term consultants or reservists but generates important benefits to the identity of the UK-PHRST project and improves the overall quality of services provided. Staff costs across the range of core deployable team positions (including provision for overheads) compared with the average price paid by PHE for reservists (which was translated into an annual cost for the same number of full-time equivalent positions) show a negligible difference in overall cost and as such UK-PHRST is confident that the current model is economically sound. A review of the UK-PHRST sponsored Field Epidemiology Training Program (FETP) model was also carried out in Q2-3 and the decision was made to change the partnership model from September 2021, specifically to stop funding fellows' salaries and co-ordinator time, but to continue close collaboration with the programme, including providing training and opportunities for fellows to support UK-PHRST delivery and join the reserve cadre upon graduation.

External (Itad) evaluation ranking: Good

Efficiency

The UK-PHRST programme has well-established standard government and externally audited procurement policies and procedures that ensure that the delivery of UK-PHRST will be cost effective. Efforts to measure and monitor efficiency are focused on budget utilisation. The UK-PHRST budget is monitored regularly, with UK-PHRST SMT meeting fortnightly to review and discuss budget-related issues. The scrutiny and feedback of UK-PHRST's governance structure (Project Board, Technical Steering Committee, Global Health Security Programme team) ensures a high-value output and value for money of UK-PHRST. Despite actual spending under budget, there has been strong performance against output indicators (see section 3), suggesting efficient project implementation.

External (Itad) evaluation ranking: Good

Effectiveness

Despite the COVID-19 pandemic, UK-PHRST has continued to work effectively in year 5. This has been achieved through an adaptive, blended approach of remote and in-person activities. A number of research projects adapted to the pandemic by supporting in-country research teams remotely with training and advice. UK-PHRST has contributed effectively, through remote engagement, as part the wider COVID-19 response in Africa and Asia, specifically through membership of Africa Task Force for Novel Coronavirus (AFCOR), and through remote support of WHO and partners in Bangladesh and Zambia. UK-PHRST will continue to capture lessons learnt around the effectiveness of its work, particularly the blended approach of the last year. The planned recruitment of a Monitoring and Evaluation Lead will further allow for UK-PHRST to measure, learn and improve on the effectiveness of the programme as we move forward.

External (Itad) evaluation ranking: Adequate

Equity

Equity and human rights are considered throughout the project design and all UK-PHRST interventions are designed to comply with UK law and promote equity and human rights. In response to findings under the equity sub-component in the Itad midpoint evaluation, one of the agreed recommendations (Recommendation 6) was to operationalise existing commitments to promoting equity and human rights in the work of UK-PHRST. To address this and strengthen our work around equity a learning brief was commissioned and a new Equity and Human Rights Advisor role is being established to ensure integration of equity and human rights concerns in all UK-PHRST activities and to support research into the effect of equity and human rights factors in outbreak prevention and control. Recruitment to this role will take place later in 2021.

External (Itad) evaluation ranking: Adequate

6.2 Quality of financial management

Financial management has been good overall for the reporting period, with almost the full £4m budget used. PHE provide DHSC with financial reports on a quarterly basis, which present a breakdown of expenditure incurred and any remaining forecasts for the year. A timetable of financial deadlines and reporting requirements for 2021/22 has been shared with PHE to enable timely reporting throughout the next financial year. PHE have put in place revised processes to allow quarterly forecasts to be shared with DHSC ahead of each quarter.

NIHR Central Commissioning Facility (CCF) monitor LSHTM's finances on behalf of DHSC. LSHTM produce quarterly financial reports, which NIHR CCF review and resolve any queries on ahead of the reports being shared with DHSC. Any changes in payment schedules are agreed between NIHR CCF and DHSC in advance of disbursements being made. NIHR CCF are in regular contact with the project team and are always quick to flag up any changes or concerns, which increases DHSC confidence in their management of this project.

Quarterly finance meetings are normally held by DHSC, and attended by PHE, LSHTM and NIHR CCF colleagues to discuss expenditure incurred, remaining forecasts for the year, any risks or assumptions built into forecasts, and any contingency plans if an underspend does materialise. Due to staffing pressures at DHSC the quarter 2 and 3 meetings did not take place, and it is a recommendation to ensure that these are held consistently going forward. A further recommendation for 2021/22 following the latest meeting, as agreed with PHE and LSHTM, is for the transfer of funding protocol to be revised to ensure it is effective and streamlined and that the respective financial reporting from the 2 organisations clearly show where funds have been transferred, to reduce the risk of any funding being erroneously double counted.

Date of last narrative financial report:11/03/2021

7. Monitoring evaluation and learning

Monitoring, Evaluation and Learning (MEL) systems have been strengthened with support from the external evaluation team and through the work of a dedicated working group on learning. The Theory of Change and logframe have been updated, and the working group on learning completed a mapping exercise and gap analysis to capture and strengthen existing learning activities (including all evaluation and routine reporting) and novel learning activities (including action research, post deployment surveys, logistics field trial and table top simulation exercise). An assistant professor in Monitoring, Evaluation and Learning will be recruited to the team in year 6 of the programme. A workshop was held with Itad and UK-PHRST senior management team SMT on 12 August and 16 September 2020 to review the Theory of Change and logframe indicators.

> "Efforts have been made to systematically document and disseminate lessons learned, including strengthened processes for collecting external feedback …This is expected to further strengthen external communication and learning practices"
>
> Itad external evaluation report

7.1 Evaluation

Itad were contracted by UK-PHRST to conduct an external performance evaluation and independent monitoring (PE&IM) of the programme from inception in late 2016 until April 2021, following on from a midpoint evaluation conducted between September 2019 and August 2020, this endpoint evaluation of UK-PHRST took place between September 2020 and April 2021.

The evaluation found that UK-PHRST's triple mandate is still valid and greater integration has been achieved in the last year across the 3 strands. The evaluation found broad agreement that the consortium model led by LSHTM and PHE adds value towards improving outbreak response through bringing together complementary expertise, experiences and partnerships and that maintaining the PHE and LSHTM equal partnership and adding collaboration with additional academic and public health institutions seems the right way forward for UK-PHRST.

Itad summarised that the UK-PHRST model is still valid and its relevance has increased during the COVID-19 pandemic.

7.2 Monitoring

The UK-PHRST logframe and monitoring approach was reviewed with Itad through co-development workshops in August and September 2020. The workshops focused on revising the logframe indicators and UK-PHRST ToC. Itad developed a monitoring tool after the workshops which was finalised in late 2020 after UK-PHRST feedback.

UK-PHRST continued to work with Itad up until March 2021 to strengthen monitoring. This has fed into our logframe and monitoring for year 6.

7.3 Learning

Across the programme, learning systems have been strengthened over the last year. In response to the Itad external evaluation, a Task and Finish Group was set up with the aim of reviewing and mapping the approaches to learning across the programme. This led to identification of gaps and in turn, development of processes to address these gaps. For example, it was noted that the team could enhance the opportunities for feedback from external international stakeholders. An online survey was subsequently developed and invitations extended to external partners for the UK-PHRST deployment debriefs. A paper summarising this work was completed and shared at several internal and external forums.

A virtual After-Action Review was held on 13 January 2021 to reflect on activities since June 2019. This workshop provided a forum for external stakeholders to share their reflections and experiences of working with UK-PHRST across the triple mandate and offer their input into future activities. Recommendations relating to partnership working, strategy, human resources, communication, teaching and training emerged from group discussions. These recommendations alongside those from Itad will feed into the implementation plan and activities for 2021/22.

A comprehensive review of the UK-PHRST Reserve Cadre has taken place which will inform the approach to future recruitment of individuals required to support UK-PHRST activities. The review found the model remains appropriate and led to several recommendations in relation to scope of work, the recruitment process, ways of working, and the breadth of skills and backgrounds. This also led to a collaborative exercise to engage reservists from partner organisations in Scotland, Northern Ireland and Wales.

Given the ongoing importance of monitoring progress and embedding learning across the programme, the team will be recruiting a Monitoring and Evaluation Lead in year 6.

8. Annexes

Annex 1: Summary of deployments 2020/21

Country	Outbreak	Date	Mode of Deployment	Team members deployed	Brief summary
Bangladesh	COVID-19	April – October 2020	GOARN	In person microbiologist (x2), data scientist Remote Field Epi (reservist), Senior Epi, data scientist, FETP and Infection Prevention and Control (IPC) (reservist)	At the request of WHO Bangladesh, a team of epi and data scientists supported the surveillance and response activities for the Cox's Bazar refugee camp. Working closely with colleagues in FCDO (formerly DFID) Bangladesh to develop strategies to reduce the spread of COVID-19. In-country microbiology support was delivered in August with the aim of strengthening quality control systems, streamlined processes and make recommendations for increased diagnostic capability Remote Infection, Prevention and Control (IPC) support aided in the review and development of IPC guidance and policy. Data science and analytical support to a Bangladesh Government run seroprevalence study to estimate prevalence of COVID-19 antibodies (in-person deployment in October).
Africa CDC (Ethiopia)	COVID-19	Mar-20	Bilateral	Remote Epidemiologist (x2), social scientist, IPC nurse, lead microbiologist,	Initially an epidemiologist, IPC specialist, social scientist and microbiologist were engaged directly at the Africa CDC headquarters in Ethiopia. Since their return to the UK, a comprehensive programme of remote support has continued with the Africa CDC team. <u>Epidemiology</u>

Country	Outbreak	Date	Mode of Deployment	Team members deployed	Brief summary
				clinical case management and logistics	Support to the surveillance technical working group: strategic and technical advice and guideline development on all aspects of COVID-19 surveillance including support to countries to set up alert and contact tracing systems, airport monitoring, and data systems Development of community health worker training for COVID-19, which has now been rolled out to Member States Support for national seroprevalence surveys <u>IPC</u> Support to webinar-based IPC training among health workers in member states Support to the IPC sub-group, which pulls together research activity on the continent related to IPC and COVID-19; the group has published review paper on ventilation in African health care settings Support for development of IPC guidelines that are specific to the Region <u>Laboratory</u> Assisting with developing Interim Guidance on the Use of Rapid Antibody Tests for COVID-19 Response <u>Social Science</u> Support to the establishment and running of a novel continent-wide rumour tracking system that uses human curated machine learning to track COVID-19 rumours on traditional and social media, and representing that system within the WHO-led Infodemiology Response Alliance Technical and coordination support for PERC | Prevent Epidemics a project that uses multiple data streams to track the secondary impacts of Public Health and Social Measures (PHSM) Support for development of continent-wide guidelines on physical

Country	Outbreak	Date	Mode of Deployment	Team members deployed	Brief summary
					distancing, developing a stepwise approach to the introduction of PHSM, and on easing of lockdowns
Tajikistan	COVID-19	Jun-20	GOARN	Lead Microbiologist and Field Epidemiologist	A deployment via GOARN to rapidly assess the response capabilities and diagnostics in Tajikistan in collaboration with European partners. No further deployment of the microbiology laboratory was advised.
Gambia	COVID-19	Sep-20	Bilateral	Epidemiologist, Field Epidemiologist, FETP, Lead Microbiologist, Microbiology reservist	Following a 2-week rapid assessment visit at the request of the MoH Gambia, a further deployment was made the Gambia to support COVID-19 response, specifically development of laboratory and surveillance capacity.
Guinea	Ebola	Mar-21	Bilateral	Senior Epidemiologist	Bilateral rapid assessment alongside FCDO Humanitarian Advisor to assess Ebola virus disease outbreak in Guinea. No further deployments anticipated.

Annex 2: UK-PHRST Research Projects year 5

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
RST5_06	COVID-19 vaccination strategies in low-resource settings: Lessons from vaccine implementation during recent epidemics, UK-PHRST	Active	[redacted], LSHTM / [redacted], LSHTM	Assessment of lessons learned from previous mass outbreak-related vaccination campaigns in low resource settings using key informant interviews, leading to recommendations for roll-out of COVID-19 vaccines across LMICs
RST5_05	Development and evaluation of resources to support IPC engagement with care giver in hospitals, UK-PHRST	Active	[redacted], PHE / [redacted] Gobt, CBCHS	Study establishes role and function of caregivers in a tertiary referral hospital in Cameroon, and will develop resources to support engagement on IPC with caregivers, pilots delivery of a multimodal intervention, and evaluates the effectiveness of this intervention.
RST5_00_01	Population-based seroprevalence survey for COVID-19 Cox's Bazar (CXB) Rohingya Camps, Bangladesh, UK-PHRST	Active	[redacted], LSHTM	COVID-19 Seroprevalence study in the Rohingya camps, Cox's Bazar, Bangladesh to determine Sars Cov-2 prevalence level in population.

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
RST5_04	How are we responding and how should we respond to COVID-19? Survey of public health and healthcare workers' assessment of implementation, acceptance and feasibility of current and future interventions worldwide, UK-PHST	Active	[redacted] LSHTM	Study provides insight into health care workers (HCWs) and Public health workers (PHWs) perceptions of practicality of, and barriers to, implementation and compliance with pharmaceutical and non-pharmaceutical interventions to mitigate impact of COVID-19 globally.
RST5_02	How can MOOCs be used to support outbreak response? An action research approach. UK-PHRST	Active	[redacted], LSHTM	Study assesses how can MOOCs be used to support outbreak response.
RST5_03	Feasibility assessment of a survey protocol using oral fluid-based anti-Ebola Virus (EBOV) immunoglobulin-G immunoassays to identify previously undetected EBOV infections in the high-risk Nzérékoré prefecture of	Active	[redacted], LSHTM	Feasibility assessment of a survey protocol using oral fluid-based anti-Ebola Virus (EBOV) immunoglobulin-G immunoassays to identify previously undetected EBOV infections in the high-risk Nzérékoré prefecture of Guinea.

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
	Guinea, UK-PHRST			
RST5_01	Strengthening public mental health capacity in Africa in response to the COVID-19 outbreak, UK-PHRST	Active	[redacted], LSHTM / [redacted], LSHTM	In collaboration with partners, study seeks to better understand the current mental health response to the COVID-19 pandemic in African countries, and what is needed to strengthen capacity of national leadership for improved public mental health systems.
RST4_03	Strengthening viral haemorrhagic fever preparedness in Uganda by serosurveillance of healthcare workers, UK-PHRST/University of Glasgow	Active	[redacted], University of Glasgow	Study quantifying exposure to VHF in healthcare workers and surrounding communities in rural Uganda to improve capacity for case-identification and infection risk reduction, prevention and control

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
RST4_01	Rapid response molecular diagnostics for Crimean-Congo Haemorrhagic Fever, UK-PHRST/Liverpool School of Tropical Medicine (LSTM)	Active	[redacted], LSTM / [redacted], PHE	Project aims to assist the economic development and welfare of CCHF endemic populations in LMICs, particularly those in marginalised areas with limited laboratory capacity by improving diagnosis and care of patients with CCHF and reducing mortality and morbidity.
RST3_02	Promoting earlier presentation of patients with Lassa fever: Health seeking behaviour and Lassa fever admissions in Sierra Leone, UK-PHRST	Active	[redacted], LSHTM	This project aims to improve understanding of Lassa fever identification, referral, treatment provision and health-seeking behaviour in post-Ebola Sierra Leone in order to provide recommendations to support earlier clinical presentation and reduced Lassa fever morbidity and mortality.
RST3_01_r1	How can we improve case management of Lassa Fever? A prospective study of cardiovascular function and ribavirin pharmacokinetics and	Active	[redacted], University of Oxford	This study investigates the role of cardiovascular dysfunction in Lassa fever, and identifies most appropriate dose of ribavirin to trial as a treatment.

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
	pharmacodynamics, UK-PHRST/University of Oxford			
RST3_05	Identification by TaqMan array card system and MinION sequencing of co-circulating pathogens that are clinically indistinguishable from Lassa Fever during seasonal Lassa virus outbreaks in Nigeria: a retrospective study - UK-PHRST	Complete	[redacted], PHE	This retrospective study examined samples from patients that met the case definition for Lassa fever during 2018 outbreak in Nigeria but which had tested negative for Lassa virus by RT-PCR. It retrospectively screened samples using the TaqMan array card system, with aim to identify causative pathogen(s). It also developed Nigeria Centre for Disease Control's (NCDC) diagnostic capacity, and conducted capacity-building/training with NCDC to improve preparedness for future outbreaks.
RST3_03	Development and testing of an innovative oral fluid serology assay to identify past infection with Lassa	Complete	[redacted], LSHTM	Development and testing of an innovative oral fluid serology assay to identify past infection with Lassa Fever Virus.

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
	Fever Virus, UK-PHRST/PHE Colindale			
EPIDZK3820B	Effective diagnostics and laboratory outbreak capability for Gastrointestinal pathogens in West Africa, UK-PHRST	Complete	[redacted], PHE	Project established post UK-PHRST deployment to Sierra Leone to assess outbreak-prone diseases in Sierra Leone and West Africa evading surveillance. It aimed to identify which pathogens were present in 'peacetime', address shortfalls in capacity and knowledge and further develop routine diagnostics for enteric disease outbreaks.
RST4_02	A Mixed Methods Analysis of Personal Protective Equipment and Infection Prevention Control Policies for Lassa Fever in Nigeria, UK-PHRST/Nigeria CDC	Complete	[redacted], PHE	A Mixed Methods Analysis of PPE and Infection Prevention Control Policies for Lassa Fever in Nigeria

NIHR Project Ref:	UK-PHRST Research Project - Full Title	Status at end of year5	Lead (s)	Description
RST3_07	Pathogen discovery in non-dengue haemorrhagic patients in the Philippines, UK-PHRST/LSHTM	Complete	[redacted], LSHTM	The main objective of the project was to conduct microbiology research in the Philippines and used the process as an opportunity to 'test' the deployment of the field laboratory.

Annex 3. UK-PHRST Case Studies

The UK-PHRST are deployed to outbreaks all over the world from Bangladesh to Nigeria to Sudan. Working alongside in-country staff from Minstries of Health, NGOs and other government organisations, UK-PHRST successfully help to combat the outbreak and protect countries against future threats to health. Read some of our stories below:

1. Using PPE in outbreak response

This project investigated the use of PPE to protect people from Lassa Fever, in specific Lassa Fever Treatment Centres (LTCs) across Nigeria.

2. Mystery pathogens and the role of the modular flight case mobile laboratory

To test and diagnose disease, UK-PHRST deployed research expertise and various components of the modular flight case laboratory via airline courier to The Philippines.

3. What does it take to deploy in 48 hours?

As part of the triple remit, the UK-PHRST have a cadre of experts available to deploy to an outbreak in a matter of 48 hours, but what does it take to be ready to deploy?