



Department
of Health &
Social Care

Global Antimicrobial Resistance Innovation Fund (GAMRIF) Annual Report: 2019/20

Global Health Security Programme

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Clearance Checklist

	Name	Date
Quality Assurance sign off	Global Health Security Programme Management Office	13 August 2020
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Abbreviations and Acronyms

Acronym	Meaning
AMR	Antimicrobial Resistance
BARDA	Biomedical Advanced Research and Development Authority (USA)
BBSRC	Biotechnology and Biological Sciences Research Council (UKRI)
BMBF	Federal Ministry of Education and Research (Germany)
CARB-X	Combatting Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator
CMO	Chief Medical Officer
CONICET	National Scientific and Technical Research Council (Argentina)
CSR	Comprehensive Spending Review
DFID	Department for International Development (UK)
DNDi	Drugs for Neglected Diseases initiative
DSHC	Department of Health and Social Care (UK)
EAB	Expert Advisory Board
FIND	Foundation for Innovative New Diagnostics
FY	Financial Year
GAMRIF	Global AMR Innovation Fund
GARDP	Global Antibiotic Research and Development Partnership
GHS	Global Health Security
HMT	Her Majesty's Treasury (UK)
IATI	International Aid Transparency Initiative
IDRC	International Development Research Centre
IUK	Innovate UK (UKRI)
LMIC	Low- and Middle-Income Country
LVIF	Livestock Vaccines Innovation Fund
MoST	Ministry of Science and Technology (China)
MOU	Memorandum of Understanding
MRC	Medical Research Council (UKRI)

Acronym	Meaning
NERC	Natural Environment Research Council (UKRI)
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
PD	Product Developer
PDP	Product Development Partnership
R&D	Research and Development
RDT	Rapid Diagnostic Test
S&A	Stewardship and Access
SME	Small and Medium Enterprises
SR15	Spending Review 2015
STI	Sexually Transmitted Infection
TPP	Target Product Profile
UKRI	UK Research and Innovation
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WP	Work Packages

Introduction

Outline of the Global Health Security programme

In the 2015 Spending Review (SR15), the Global Health Security (GHS) team was allocated £477m of UK Official Development Assistance (ODA) funding to develop projects in and for low- and middle-income countries (LMICs), with the aim of contributing to a 'world safe and secure from infectious disease threats and promotion of Global Health as an international security priority.' The GHS portfolio accounts for 34% of total Department of Health and Social Care (DHSC) ODA funding for the SR15 period. The programme is made up of 5 projects: Fleming Fund; Global Antimicrobial Resistance Innovation Fund (GAMRIF); UK Public Health Rapid Support Team; International Health Regulations Strengthening project and the UK Vaccine Network project. Through delivery of each of these projects the GHS programme aims to support ODA-eligible countries to:

- prevent and reduce the likelihood of public emergencies such as disease outbreaks and antimicrobial resistance (AMR)
- detect health threats early to save lives
- provide rapid and effective response to health threats

Outline of the Global AMR Innovation Fund project

GAMRIF is a £50m ODA fund that was established to invest in underfunded and neglected areas of early-stage, innovative research and development (R&D) that address AMR for the benefit of people in low- and middle-income countries (LMICs). GAMRIF is a One Health (see definition below) fund that invests in product development research across human, animal and environmental health. The fund supports high-quality research from around the world that has the potential to lead to tangible innovations that will help to prevent, detect and/or treat drug-resistant infections in resource-poor settings. GAMRIF's specific aims are to:

- establish international research partnerships and support research competitions that fund innovation and development of new technologies and interventions to tackle AMR
- leverage investment from other partners and donors to support sustainable financing in AMR R&D
- establish research partnerships using a One Health approach

- fund projects that will develop solutions specifically for LMICs, where the burden of AMR is greatest

Through achieving these objectives, GAMRIF advances the aim of the GHS programme to prevent and reduce the future burden of AMR in LMICs, while also supporting improved disease detection and response.

What is One Health?

One Health is an approach to designing and implementing programme, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

The areas of work in which a One Health approach is particularly relevant include the control of zoonoses (diseases that can spread between animals and humans, such as Ebola and Rift Valley Fever) and combatting antimicrobial resistance.

Many of the same microbes infect animals and humans, as they share the eco-systems they live in. Efforts by just one sector cannot prevent or eliminate the problem.

Successful public health interventions require the cooperation of human, animal, and environmental health partners. The Global Health Security programme works with the World Health Organisation (WHO), the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) to promote multi-sectoral responses to antimicrobial resistance, risk from zoonoses, and other public health threats at the human-animal-ecosystem interface.

GAMRIF Portfolio at a Glance

GAMRIF responds to a recommendation from the independent 2016 [Review on AMR](#) chaired by Lord O'Neill, which advocated for a global innovation fund to provide early-stage research funding in neglected areas of AMR R&D. In 2017, DHSC convened an Expert Advisory Board ([EAB](#)) to advise on the scientific scope and direction of GAMRIF funds. In parallel, £10m had been committed to a UK-China bilateral research partnership after securing a bilateral agreement with and co-funding from the Ministry of Science and Technology (MoST) in China, which reinforced the mutual interest of the UK and China in combatting AMR.

GAMRIF has secured additional financing to support the GHS programme to meet financial targets through cost-effective, value for money investments that align with wider global health security priorities and GAMRIF's mandate. This has led to a total of £60.5m being committed to date.

GAMRIF works across bilateral initiatives, global initiatives, and product development partnerships (PDPs) to advance research within its scope. As of 31 March 2020, the portfolio includes the following seven work packages within three partnership models.

Bilateral Partnerships

Work Package 1 (WP1): UK-China, Innovation & Collaboration to tackle AMR

- A bilateral partnership between DHSC and MoST to support innovation focusing on unique areas of AMR research and development in human and animal health, with consortia of academic and research partners in both countries. This is co-funded by MoST and managed on behalf of GAMRIF by Innovate UK (IUK).
- This UK-China collaboration, where UK researchers are funded by the UK government and the Chinese by the Chinese government, will support innovative and unique research and development projects benefitting people in LMICs that neither country could carry out on their own. The UK does not spend ODA in China for this partnership.

Work Package 4 (WP4): UK-Argentina, Tools to tackle AMR in the Environment

- A bilateral partnership between the UK and Argentinean governments to support the best scientific research to tackle AMR in agriculture and mitigate the impact on the environment. This is co-funded by Argentina's National Scientific and Technical Research Council (CONICET) and managed on behalf of GAMRIF by the Biotechnology and Biological Sciences Research Council (BBSRC), with support from the Natural Environment Research Council (NERC).

Global Initiatives

Work Package 2 (WP2): Accelerating Antibacterial Innovation with Combatting Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X)

- An investment into a global partnership supporting the best scientific research around the world to develop new vaccines and alternative innovations to traditional antibiotics that can be used to prevent and treat drug-resistant bacterial infections in humans. This is managed on behalf of GAMRIF by CARB-X, hosted by Boston University in the United States. Other CARB-X funders include BARDA with in-kind support from NIAID (both US government agencies), Wellcome Trust, the Bill and Melinda Gates Foundation (BMGF) and the German Federal Ministry of Education and Research (BMBF).

Work Package 3 (WP3): InnoVet-AMR, Innovative Veterinary Solutions for AMR with the International Development Research Centre (IDRC)

- An investment into a global partnership supporting the best scientific research around the world to develop new vaccines and alternative innovations to antibiotics to fight AMR in livestock and aquaculture production and reduce the use of antibiotics as growth promoters. This is co-funded and managed on behalf of GAMRIF by IDRC in Canada.

Work Package 7 (WP7): Vaccine Innovation with the BactiVac Network

- An investment into a global partnership supporting the best early-stage research to accelerate the development of vaccines for AMR in humans and animals. This is delivered on behalf of GAMRIF by the BactiVac Network, hosted by University of Birmingham.

Product development partnerships (PDPs)

Work Package 5 (WP5): Innovation in AMR Diagnostic tools with the Foundation for Innovative New Diagnostics (FIND)

- An investment into two projects with FIND to a) develop technological methods to connect point-of-care data to larger database and surveillance systems and b) develop new diagnostic technologies for drug-resistant gonorrhoea.

Work Package 6 (WP6): New Antibiotic Treatment for Drug-Resistant Gonorrhoea with the Global Antibiotic Research and Development Partnership (GARDP)

- An investment to support the development of a new antibiotic for drug-resistant gonorrhoea, which is supported by access strategies for LMICs.

Context of this Annual Review

This is the second annual review for the GAMRIF project and covers the 2019/20 financial year (April 2019-March 2020). This year marks GAMRIF's first full year of implementation across all work packages, with individual research projects launching throughout the year.

As of March 2020, the core GAMRIF team consists of:

- 1 x Head of Global AMR Strategy and Delivery (who splits time between International AMR Diplomacy and GAMRIF)
- 1 x Project Lead

- 1 x Science and Research Coordinator
- 1 x Project Support Officer

It is worth noting that at the end of the 2019/20 financial year the GAMRIF team transitioned to a full work-from-home setting as the COVID-19 pandemic worsened and lockdown in the UK began. Nearing the end of the financial year, the team began monitoring COVID-related impacts and mitigating risks. This carried into 2020/21 and will be a key theme for the next GAMRIF annual review.

Summary of project's last annual review

2017/19 Delivery RAG Ratings

- **Project Management RAG rating** during the previous reporting review period (April 2017 to March 2019): Amber
- **Project Management RAG rating** at the end of the previous reporting review period (March 2019): Amber/Green
- **Finance RAG rating:** Amber
- **Theory of Change RAG rating:** Green
- **External Engagement RAG rating:** Amber/Green
- **Overall Project Delivery Confidence RAG rating for 2017 to 2019:** Amber/Green

2017/19 Key recommendations

The following recommendations were made and accepted by the GHS Programme Board at the last annual review:

Project Management

	Recommendation	Current status
1.i	Review LogFrame indicators and milestones following this Annual Review, to ensure that indicators are appropriate for the work packages as well as the data already collected, ensuring that indicators and milestones can be tracked on a regular basis.	Complete
1.ii	Monitor the accuracy of financial forecasts from 1/4/2019 to 1/10/2019, and reassess if more frequent, formal finance meetings with delivery partner(s) are required.	Complete
1.iii	Develop appropriate project-level governance where this does not currently exist for GAMRIF work packages during the implementation period. Initiate the chosen governance structure by the end of Q2 2019/20.	Complete

Finance

	Recommendation	Current status
2.i	Continue to work closely with CARB-X to support their ODA eligibility processes and to increase quality applications that fall within the GAMRIF scope, scaling up efforts as needed to achieve spending targets.	Complete
2.ii	Strengthen financial forecasting processes to ensure that processes are robust and can provide timely data on changes expected to the budgets for GAMRIF-funded research projects.	Complete
2.iii	Ensure appropriate coverage of published documents and data across GAMRIF portfolio, and that the quality of public documentation is sufficient to achieve a score of at least 65% against the IATI (IATI) standard.	Complete
2.iv	Increase delivery partner awareness of IATI standards and available resources to encourage partners to publish their data on Aidstream.	Ongoing

Theory of Change

	Recommendation	Current status
3.i	Develop an approach for measuring Technology Readiness Levels (TRLs), or advancement of innovations across the One Health portfolio	Ongoing
3.ii	Update the Theory of Change behaviour change outcome to more accurately reflect areas where GAMRIF is expected to affect behaviour change.	Complete
3.iii	Work across Her Majesty's Government (HMG) and with external partners to ensure that research and products will be accompanied by appropriate plans/activities to support access in LMIC settings, including to ensure that conditions regarding stewardship, access, commercialisation and policy translation will be upheld.	Ongoing
3.iv	Ensure strong alignment of the GAMRIF Theory of Change with the LogFrame, to include the comparable impact and intermediate outcomes of the GAMRIF project.	Complete

External Engagement

	Recommendation	Current status
4.i	Publish a GOV.UK landing page and a GAMRIF logo for early 2019/20.	Complete
4.ii	Formalise a communications strategy for the GAMRIF project that will guide systematic communications and engagement activities up to the end of the programme in 2021/22, including a communications monitoring strategy and branding strategy.	Complete
4.iii	Leverage research results as appropriate for public interest stories to a) continue advocating for increased donor investment into AMR; and b) increase public knowledge to maintain political momentum and support stewardship for new technologies and innovations for AMR.	Ongoing

Key achievements in 2019/20

In 2019/20, GAMRIF moved fully into implementation phase across all 7 work packages, delivering on its mandate to support early-stage AMR R&D research across the One Health agenda. Funding was disbursed to 58 research projects, including to the 30 projects that started during the year. Through these, GAMRIF is specifically targeting identified priority areas such as vaccines and alternatives to antibiotics for humans and animals (WP1, WP2, WP3, WP7); diagnostic connectivity (WP5); and the environment (WP4). The portfolio is also delivering on GAMRIF's mandate to support the best research in the world, irrespective of location, including small and medium enterprises (SMEs) and researchers in low- and middle-income countries (LMICs).

Other highlights include:

- In WP1, projects began work and received funding after initial contracting in 2018/19 (January 2019), with their Chinese partners contracted later in 2019/20.
- In WP2, 8 projects were funded with CARB-X. Additional projects focusing on non-traditional approaches were approved by GAMRIF with final contract execution pending at the end of the reporting year.
- In WP3 projects were contracted, launched and began work on schedule. A proposal for using the uncommitted research funding (CAD\$967,000) was also developed for supporting effective product development, quality assurance and regulatory engagement (described later in case study 5). As a result, the full budget was committed when this proposal was approved in March 2020.

- In WP4 projects were contracted, launched and began work on schedule, with a public announcement in October 2019. Projects also completed a joint policy translation proposal and ODA statement, both of which were accepted and will create integrated policy outputs with wider transferability to other developing economies (described later in case study 2). This integrated work absorbed the remaining £200,000 from the original budget so the full allocation is now committed.
- WP5 continued throughout 2019/20 with an extension to the sexually transmitted infection (STI) diagnostic programme. This programme was initially planned to end at the end of 2019/20. However, original timelines were overly ambitious to develop a novel diagnostic for a drug-resistant condition. The extension increases the likelihood of success. The connectivity project with FIND progressed well, with a pilot programme launch in Zambia, in collaboration with the national public health institute (described later in case study 3).
- WP6 originally included a £1m commitment to GARDP through the Drugs for Neglected Diseases initiative (DNDi), the organisation in which GARDP was incubated when first launched. This initial grant closed at the end of 2018/19. At the same time GARDP transitioned to become a separate legal entity. Due to substantial progress and value for money in GARDP's STI programme, and following comprehensive due diligence, GAMRIF committed an additional £3.5m to GARDP with a new funding agreement extending from July 2020 until March 2022.
- In WP7, there were 2 separate research calls. The first launched by 1 March 2019 (1 month before the start of the 2019/20 reporting period), but 2019/20 saw the continuation and progress across projects. The second call completed, and projects were contracted and began work in October 2019. At the end of 2019/20, GAMRIF had initiated a no-cost extension to allow extensions to a number of grants and to mitigate the impact of COVID-19, which started to emerge in the early months of 2020. Due to the short-term nature of these projects, 9 projects also closed in 2019/20. See Annex 1 for a snapshot of knowledge translation outputs, as well as case study 1 below.

Case study 1: GAMRIF funds researchers developing vaccines specifically for LMIC contexts through BactiVac (WP7)

Researchers show how vaccines designed to curb antibiotic use can be delivered without using needles.

During birth, bacteria known as Group B Streptococcus (GBS) can pass from mother to baby, causing meningitis, blood poisoning and pneumonia in the infant. This is a particular problem in LMICs.

Mothers can be given antibiotics to prevent this happening, but babies can still develop fatal infections. Reducing antibiotic use is critical in the fight against AMR, so GAMRIF funded Dr Sudaxshina Murdan and her colleagues at University College London together with further collaborators at the Biovac Institute in South Africa and the National Institute for Biological Standards and Control (NIBSC) in the UK, to try and solve this problem.

Rather than giving an injection, they wanted to make a vaccine for pregnant women that could simply be placed under the tongue. This would be pain-free, practical and cheap. This would also avoid the need for additional injection supplies and trained professionals to administer the vaccine, which is of benefit in low-resource settings.

They tested their idea in the laboratory using mice. Interestingly, the under-the-tongue vaccine worked and was also more effective than an injection at generating immunity in the vagina, mouth and gut. Also, it was equally as good as an injection at generating immunity in the blood, meaning immunity generated by the mother could pass to the foetus during pregnancy, further protecting the newborn against GBS infections.

Experiments also showed that the dose of the vaccine could be lowered five-fold and still work, thereby significantly reducing cost, and that changing the other ingredients of the vaccine could reduce possible toxicity without compromising immunity.

The GAMRIF team collaborated with delivery partners and wider stakeholders on 3 launch events. This included:

A launch and inception workshop for InnoVet-AMR (WP3) projects on 10-13 June 2019 in Ottawa, Canada, with all project teams involved and representation from 13 different countries. This workshop fostered a common understanding of the programme and targets for product development and delivery, and initiated thinking on cross-cutting issues (e.g. commercialisation, regulatory issue, and gender) through group and one-on-one sessions

A launch workshop with UK and Argentinean partners (WP4) in Buenos Aires on 1-3 October 2019, with additional opportunities for knowledge sharing on 4 October with the National Food Safety and Quality Service (Servicio Nacional de Sanidad y Calidad Agroalimentaria, or SENASA). The 5 project teams worked closely together to develop the policy translation proposal (case study 2)

The GAMRIF team also worked with Innovate UK, the Medical Research Council (MRC), the British Embassy in Beijing and UKRI China to plan and co-host an AMR workshop on 3-5 December 2019 in Beijing, China. This launched the GAMRIF UK-China projects (WP1). It also launched bilateral projects supported by the MRC, while bringing lessons learned from a previous MRC-NSFC research call which finished in summer 2019.

Case study 2: UK-Argentina AMR programme (WP4) is greater than the sum of its parts

The five bilateral research projects devised a policy translation proposal to maximise value for money and ensure outputs have benefits beyond Argentina.

This partnership will develop tools and solutions to tackle the development and spread of drug-resistant bacteria in the environment, which pose a significant threat to human health. GAMRIF challenged the 5 UK-Argentina projects to work together on a plan to combine the findings from their respective research streams. The researchers gathered at the UK-Argentina 'AMR in the Environment' partnering workshop in Buenos Aires, Argentina (October 2019), and developed a policy translation and integration plan.

This plan details how the work will be mutually reinforcing rather than duplicative. Expected outputs include better methods for measuring environmental AMR between and within livestock production systems, and knowledge exchange between farmers and policy makers to change practice and implement policy that will improve health in livestock production systems. This plan will strengthen the ODA credentials of this work by building in transferability to other Latin American settings (such as Brazil and Colombia) and emerging economies with agriculture sectors (Kenya, India, and Bangladesh). For example, mapping different science-policy pathways to accelerate adoption of cost-effective antibiotic mitigation measures by producers will be of general relevance to LMICs seeking to improve their national antimicrobial action planning.

The policy integration outcomes are additional to those of the individual projects, offering excellent value for money and high-impact results, and the collaborative approach intends to foster a greater sense of a research community between the UK and Argentinean scientists.

1. Project Management

Delivery assessment for reporting year

RAG rating for 2019/20: Amber/Green

RAG rating for 2017/19: Amber/Green

RAG trend: Stable

Evidence of managing the delivery of project

Overview of delivery management

At the end of the 2018/19 financial year, GAMRIF had a risk rating of Amber/Green. This rating remained fairly stable throughout the 2019/20 reporting year, although the project saw an increase of risk with the onset of the COVID-19 pandemic.

Quarter 1 (April – June 2019)

Q1 milestones included the successful InnoVet-AMR inception workshop and project launch announcement. Projects were also selected and contracting begun for the UK-Argentina bilateral work package. During Q1, all projects in the UK-China WP were successfully contracted in the UK but were delayed due to contracting timelines in China. The GAMRIF team worked closely with UKRI China and the British Embassy in Beijing to help support the process and mitigate the impact of delays on the partnerships. The team presented the GAMRIF portfolio and strategic directions to the then Chief Medical Officer for England as well as the CEO of Defra's Veterinary Medicines Directorate for continued senior engagement.

Quarter 2 (July – September 2019)

Strategic planning continued into Q2 as the GAMRIF team developed an extensive proposal for the planned 2019 spending review. While the Comprehensive Spending Review (CSR) was postponed until 2020, the work in 2019 will provide a strong springboard for the upcoming negotiations with Her Majesty's Treasury (HMT) in the 2020/21 financial year. GAMRIF also completed a due diligence assessment on GARDP as a new legal entity and received ministerial approval to continue funding the GARDP STI programme to the end of March 2022. The new grant agreement began in July 2019.

Quarter 3 (October – December 2019)

Moving into Q3, the risk ratings were increased to Amber. This was a result of continued delays with contracting the Chinese partners in WP1 having knock-on impacts on timely delivery and associated spending by the UK grantees. The GAMRIF team kept in close contact with counterparts in China and escalated this risk as appropriate. The rating was also downgraded due to the risks associated with a smaller than expected portfolio in WP2, with underspends forecasted. GAMRIF and CARB-X increased the frequency of finance meetings and revised the financial reporting and forecasting for better oversight and greater efficiency (implementing Recommendation 1.ii, which is now complete). The FIND programme encountered technical delays, which were mitigated through an extension that provided more realistic timelines for the ambitious programme. This was accompanied by increased light-touch technical reports and finance communications to monitor risks, with the projects getting back on track by the end of Q4.

Quarter 4 (January – March 2020)

By Q4, GAMRIF funding was awarded to 5 new CARB-X projects, a more efficient contracting process was rolled out and a reassuring number of highly relevant ODA-eligible applications were received, giving the CARB-X portfolio better stability. In October 2019, the contracts with the Chinese researchers were released and whilst some projects were by then subject to delays of up to 10 months, the team decided the RAG rating should not be adjusted pending the approval of a no-cost extension on the UK side. Almost immediately, COVID-19 was discovered in Wuhan, China, leading to mass shutdowns across China in Q4 and causing further delays. This was compounded as the virus spread globally and UK-based partners were also affected by the shutdown.

Governance

The 2017/19 annual review recommended that the project team assess (and if appropriate, establish) suitable project-level governance where not already in existence (see 2017/19 Key recommendations in previous section). In response, the team reviewed the standing governance mechanisms in Q1 2019/20 and confirmed that all global initiatives and PDP work packages have existing structures that provide scientific and strategic oversight and allow for senior scrutiny where necessary.

The review also considered the bilateral work packages and suggested that the high-level oversight during the establishment of the partnerships plus the existing UKRI infrastructure and on-going project-level conversations provided sufficient opportunity for challenge and scrutiny. Meanwhile, the team continued to escalate risks and issues through the GHS programme board, which has provided consistent oversight of GAMRIF's delivery.

On the basis of the team’s review and recommendations, it was agreed that given the diversity of GAMRIF’s portfolio another governance structure would not add any additional value above existing mechanisms. However, reflecting on the underlying recommendation around leveraging more opportunities for cross-portfolio learning and improvement, the GAMRIF team instead developed plans for closer attention between delivery partners and the GAMRIF expert advisory board (EAB).

In January 2020, the team began organising a large international multi-day meeting in London, UK with the EAB and delivery partners to achieve these aims. As GAMRIF has a wide range of projects with different international delivery partners, this meeting would give the partners a chance to come together face-to-face, to share learnings across the portfolio and find mechanisms to add value. This event would also bring together delivery partners and EAB members to oversee current progress and future developments. However, by early March 2020 it became clear that an in-person meeting would be impossible due to COVID-19 and the event previously scheduled for May 2020 was cancelled. Virtual meetings in 2020/21 were agreed and will endeavour to meet the same aims and ensure continual learning and adaptive management across GAMRIF’s work packages and the portfolio as a whole.

Evidence that the project is meeting the agreed milestones and deliverables

The following milestones / deliverables were achieved by GAMRIF for this reporting year.

Output Indicator 1

Table 1: Indicators for GAMRIF Output 1, to foster international partnerships to increase attention and leverage funding towards AMR research and innovations for the benefit of people in LMICs

Output Indicator	Milestones / deliverables
1.1	<p>Indicator: The amount of resources, both funding and in-kind, leveraged for AMR research and development with a benefit for people in LMICs</p> <p>2019/20 Target: £5 million. Additionally, leverage in-kind resources from donors and partner organisations.</p> <p>2019/20 Outcome: Target exceeded. During 2019/20, GAMRIF leveraged significant additional funding through several programmes thus delivering on the original mandate of GAMRIF to leverage funding for LMIC-focused R&D from other international donors. While this is difficult to quantify precisely, it is</p>

Output Indicator	Milestones / deliverables
	<p>a reasonable assumption that the planned target of £5m has not just been met but exceeded.</p> <p>A total of £263,567 of funding plus in-kind technical support was leveraged through the BactiVac projects (WP7). These resources come from the projects' academic partners, industry partners (both small and medium-sized enterprises (SMEs) and large pharmaceuticals), a research institute and another government agency. A further £5,631,175 of follow-on funding was also secured by BactiVac funded projects. In addition, nearly £280,000 was leveraged in InnoVet-AMR projects (WP3), including funding from other governments to co-support projects and industry funding to support student scholarships to join the research teams.</p> <p>CARB-X co-funders (BARDA, Wellcome Trust and BMBF) have contributed approximately US\$18m toward GAMRIF co-funded CARB-X PDs for programmes with benefit to LMICs. It is difficult to quantify the exact proportion of these leveraged funds that will directly benefit LMICs as GAMRIF projects already do. However, there is still considerable additional funding that is supporting research with direct intent to benefit LMICs than had GAMRIF not been a CARB-X funding partner. This is in addition to the investment from the Bill and Melinda Gates Foundation (BMGF) to CARB-X, which has been counted by GAMRIF previously.</p>
1.2	<p>Indicator: Number of international-facing partnerships held between GAMRIF and other strategic partners that bring attention to One Health research and innovation in AMR globally, and political leverage for the UK 2019/20 Target: N/A – new partnerships were not originally planned for this year. 2019/20 Outcome: 1 new agreement (6 others maintained).</p> <p>6 partnerships were in place at the start of 2019/20, and a new funding agreement was signed between DHSC and GARDP (the previous funding agreement was between DHSC and DNDi, which ended in March 2019).</p>
1.3	<p>Indicator: Global meetings, discussions and other knowledge sharing opportunities are held and directly supported by GAMRIF, which bring together researchers from LMIC organisations Target: ≥ 40 LMIC researchers engaged. GAMRIF supports 2 international meetings with participants from LMIC research organisations. Outcome: Target exceeded. Over 85 LMIC researchers were engaged through key events, and GAMRIF supported 4 international meetings.</p> <p>The InnoVet-AMR public launch (10 June 2019) was followed by the InnoVet-AMR inception workshop (11-12 June 2019). This was attended by 13 researchers from LMIC organisations, as well as other team members. Through this meeting, international teams could collaborate in-person, the InnoVet-AMR team set clear objectives for the funding, and teams received individualised support from regulatory and gender consultants.</p>

Output Indicator	Milestones / deliverables
	<p>The UK-Argentina 'AMR in the Environment' launch workshop (1-3 October 2019) was attended by around 45 academics, with at least 16 researchers present from the Argentinean project teams, as well as representatives from the funding agencies involved in the initiative. This workshop led to a collaborative policy translation plan that will integrate results across all 5 projects (see case study 2).</p> <p>The UK-China launch event 'Partnerships to Tackle the Global Challenge of AMR' (3-5 December 2019) had 106 attendees (49 UK participants and 57 Chinese participants). Teams collaborated in-person, while learning from other bilateral AMR research projects with the MRC, which had previously completed and shared lessons learned. Several expert speakers also joined to provide expert guidance and to set ambitions for the following years. FIND launched the 'One Health Surveillance Platform for AMR' with the Zambia National Public Health Institute (23 January 2020) at a side event of the 3-day 'Pan-Africa Workshop on Effective Implementation of a National Action Plan on AMR' in Lusaka, Zambia (see case study 3). The launch was attended by representatives from 11 countries in the region.</p>

GAMRIF aimed to leverage £5m in additional funding or in-kind support to the projects in the portfolio. However, this sub-indicator is not simple to quantify, particularly in WP2 where the bulk of leveraging has already occurred through awarding funding to CARB-X from the BMGF. At the end of 2019/20, approximately US\$18m was allocated from other CARB-X funders to support projects that are ODA-eligible in full or have ODA-eligible components. This funding from other sources is evidence for the broader value of CARB-X's funding model as GAMRIF could not fund these projects alone. It also provides evidence for GAMRIF's wider impact to leverage funding for early-stage product development that will benefit people in LMICs and that would not have been tailored as such without GAMRIF presence on the CARB-X funding panel. The GAMRIF team also became aware that the previously leveraged funds for CARB-X from the BMGF may not be spent in full due to fewer applications meeting the specific funding scope. This will be monitored during 2020/21.

In developing the new funding agreement with GARDP as a new legal entity, GAMRIF found potential linkages to DHSC's Global Health Research team to fund a separate GARDP programme, leading to further investment into AMR R&D.

Finally, there have been several events in addition to those in Indicator 1.3 that have provided opportunities for GAMRIF partners to promote important issues. For example, an InnoVet-AMR team member was a panellist at the 3rd International Symposium on Alternative to Antibiotics in Bangkok, Thailand and shared a funder's perspective on regulatory issues for developing alternatives. Additional events (including BactiVac's 3rd

Annual Meeting in Kilifi, Kenya in March 2020) were due to take place with GAMRIF support in Q4 but were postponed due to COVID-19 restrictions.

Case study 3: Ground-breaking One Health AMR Surveillance Platform launched (WP5)

The platform enables data-driven decision making to tackle AMR in Zambia and beyond.

To tackle AMR, we need robust surveillance systems. FIND has worked with the Zambia National Public Health Institute and software engineers to launch the One Health Surveillance Platform for Antimicrobial Resistance. This new data management system will track and map the emergence of resistance, in humans and animals, forming the basis of national surveillance programmes, and enabling the Zambian government to make data-driven decisions. The platform was designed to ensure burden-free implementation for health workers, no new data silos, long-term sustainability, and is open-source.

Zambia has several established data sources but have previously lacked a systematic approach towards the collection and analysis of this data. Furthermore, this new system will make it even easier to submit AMR data to GLASS (Global Antimicrobial Surveillance System, a WHO initiative).

The system could improve disease surveillance beyond AMR by identifying and monitoring outbreaks and enhancing clinical care. Following the launch event, several other African countries have expressed interest in implementing a similar AMR surveillance system.

Output Indicator 2

Table 2: Indicators for GAMRIF Output 2, to enhance bilateral research partnerships that support AMR research

Output Indicator	Milestones / deliverables
2.1	<p>Indicator: The number of bilateral research projects between researchers from the UK and a bilateral partner that receive funding towards an agreed upon project</p> <p>2019/20 Target: 19 projects (14 continued, 5 new)</p> <p>2019/20 Outcome: Target achieved. 19 bilateral projects (14 UK-China, 5 UK-Argentina) received funding from GAMRIF during 2019/20.</p>
2.2	<p>Indicator: The number and range of knowledge translation outputs produced by funded projects</p> <p>2019/20 Target: Increasing number of knowledge translation products are produced. A variety of products are produced to reach different audiences.</p> <p>2019/20 Outcome: Bilateral partners reported >30 knowledge translation outputs during 2019/20. They include:</p> <ul style="list-style-type: none"> • 9 meetings • 6 presentations • 5 media activities • a public engagement event • a poster presentation • online case studies • engagement with industry and public health bodies, and activities relating to capacity-building, education, policy translation and recognition • one partner created further employment opportunities as the technology was embedded in Chinese hospitals
2.3	<p>Indicator: Successful research competitions are ran and as a result GAMRIF funding for bilateral partnerships is allocated to selected projects</p> <p>2019/20 Target: 29.7% of bilateral funding disbursed to selected research projects</p> <p>2019/20 Outcome: During the year 2019/20, 26.3% of bilateral funding was disbursed to selected research projects.</p>

As GAMRIF implementation for the UK-China programme only started in early 2019, the projects are largely a year underway. As previously mentioned, there have also been slow starts with contracting delays and impacts of COVID-19 on projects. Additionally, projects in the UK-Argentina programme were only launched in Q3 2019/20, therefore they were only just getting underway during this reporting period.

Regardless, there has been good progress with outputs under the bilateral projects. The projects are progressing as expected with the projects largely on track despite being in early stages. This is a testament of the ability of projects to progress items where possible, and to make up activity once their partners were contracted. The previous annual review highlighted that the bilateral partnerships were higher risk in the set-up phase; however, implementation appears stable. This could also be a result of using UKRI as a delivery partner, which is an organisation with a long history in delivering these research programmes.

There are also a considerable number of knowledge translation outputs, with a substantial range that will be monitored over GAMRIF’s lifetime. This already shows that projects are sharing knowledge in educational and policy-translation methods aside from ‘traditional’ research outputs. For example, researchers in the UK-Argentina project were broadcasted on BBC television as part of World Antibiotic Awareness Week.

Output Indicator 3

Table 3: Indicators for GAMRIF Output 3, to support global initiatives that foster innovation in AMR research and product development, to develop knowledge and research that will have benefit for LMICs

Output Indicator	Milestones / deliverables
3.1	<p>Indicator: The number of research projects within global initiatives that receive funding towards an agreed upon project 2019/20 Target: 16 new projects. 2019/20 Outcome: Target exceeded. 36 projects in the global initiatives programmes received funding during this reporting period, with 20 new projects during this reporting period.</p> <p>8 CARB-X projects, 11 InnoVet-AMR projects and 17 BactiVac projects were active during 2019/20. Of the new projects, 6 are with CARB-X, 5 are with InnoVet AMR, and 9 are with BactiVac.</p>
3.2	<p>Indicator: The number and range of knowledge translation outputs produced by funded projects 2019/20 Target: Increasing number of knowledge translation products are</p>

Output Indicator	Milestones / deliverables
	<p>produced. A variety of products reach different audiences 2019/20 Outcome: Our partners from global initiatives reported >32 knowledge translation outputs during 2019/20. They include:</p> <ul style="list-style-type: none"> • 4 presentations • 4 workshops • 3 academic papers • 3 public engagement activities • 2 academic posters • 2 meetings • 2 public health educational engagements • a social media engagement activity • an article submitted to an industry magazine and a booklet
3.3	<p>Indicator: Successful research competitions are ran and, as a result, GAMRIF funding for global initiative partnerships is allocated to selected projects 2019/20 Target: 32.7% of global initiatives funding disbursed 2019/20 Outcome: 23.2% of global initiative funding was disbursed to our global initiative partnerships.</p> <p>Delays in onboarding and contracting with projects in the CARB-X portfolio meant that the amount disbursed in 2019/20 was lower than planned, as mentioned before.</p>
3.4	<p>Indicator: The number of research projects that have participated in training, capacity building or mentorship as a part of carrying out their research program 2019/20 Target: 15 projects participate in training, capacity building or mentorship. 2019/20 Outcome: Target exceeded. 19 research projects funded through global initiatives partners have participated in capacity building or mentorship.</p> <p>Across the InnoVet-AMR programme (WP3), 25 institutional personnel received training, mainly on technical processes such as wild phage isolation and DNA extraction techniques. There were opportunities for 2 students from an LMIC to receive training in Canada. All InnoVet-AMR projects have access</p>

Output Indicator	Milestones / deliverables
	<p>to regulatory and gender consultants.</p> <p>All 8 GAMRIF-funded CARB-X projects that were active during 2019/20 had access to project-specific assistance from the CARB-X Global Accelerator Network experts who are on hand to enhance CARB-X product developer capacities. Product developers are coached on areas such as regulatory strategy, study design and clinical microbiology.</p>

Global initiatives are producing a range of different knowledge translation outputs already, with both conventional academic products as well as wider engagement activities being delivered. For example, a project in the InnoVet-AMR portfolio led a training on antibiotic use in farming with 25 farmers in attendance. This is evidence of outreach that could influence wider practice even with early research results.

The metrics in this section also do not capture the wider range of capacity building outputs and added value across the unique model of each GAMRIF delivery partner. For example, BactiVac project administrators provide tailored support to projects such as assisting researchers with the application process where the English language application forms may pose a barrier, while also building critical skills such as contract writing. This intends to build sustainable capacities in BactiVac’s network, which has over 1,000 members from across 75 countries. Additionally, within the CARB-X Global Accelerator Network, product developers benefit from the learnings of other projects including across non-ODA projects, which provides strong added value. A discovery by 1 developer is likely to directly or indirectly benefit developers working on ODA projects through accelerator network support. Finally, across the InnoVet-AMR portfolio, projects have received invaluable tailored support from gender and regulatory consultants with further support for other product development skills planned in the coming year.

This support from delivery partners speaks to the unique model of each organisation, with the intention to develop researcher capacities for tangible product development outputs.

Output Indicator 4

Table 4: Indicators for GAMRIF Output 4, to support product development partnerships to develop affordable innovations that will reach commercialisation

Output Indicator	Milestones / deliverables
4.1	<p>Indicator: The number of pilot implementations of GAMRIF-funded AMR innovations in selected LMIC trial sites 2019/20 Target: 3 new pilot sites finalised 2019/20 Outcome: Target exceeded. 5 new pilot sites finalised in LMICs.</p> <p>A FIND diagnostic connectivity Pilot #1 (Zambia V1.0 of the One Health System) was installed in the government-approved hosting environment on 23 January 2020. This will test a novel platform for data collection and analysis in different sectors in Zambia and aims to support data-driven decisions while mapping AMR emergence.</p> <p>A second pilot for this technology was installed at the Institut Pasteur in Dakar, Senegal. This was achieved in a 3-month period though reuse of learnings from the Zambia work.</p> <p>A FIND Burkina Faso feasibility study pilot launched in November 2019. The aim of the study is to evaluate an end-to-end mobile dengue fever case management and e-surveillance system, refined based on user feedback, technical workshops in Burkina Faso with potential for scale up to AMR based on outcomes of the evaluation.</p> <p>GARDP Phase III zoliflodacin clinical trials were announced on 30 September 2019 and include patients with uncomplicated urogenital gonorrhoea from clinical trial sites in Thailand and South Africa. Preparation for trials are underway.</p>
4.2	<p>Indicator: The number of published reports that share results from product development towards a global audience 2019/20 Target: 2 new reports 2019/20 Outcome: Target exceeded. 8 new reports that share results from product development towards a global audience were published by GAMRIF-funded PDPs this year.</p> <p>This includes 4 target product profiles (TPPs) and 4 academic publications. TPPs provide details on the minimum and optimal performance and operational characteristics of priority diagnostic tests.</p> <p>Researchers, developers, and manufacturers use TPPs to ensure that R&D activities are focused on relevant products and designed for the contexts (such as low resource setting) and needs of end-users.</p>

Output Indicator	Milestones / deliverables
	<p>The FIND connectivity project published 2 TPPs this year for technologies to: 1) read rapid diagnostic tests using a mobile app and 2) develop a clinical decision support algorithm.</p> <p>The FIND STI project also published 2 TPPs this year on the FIND and WHO websites, to: 1) detect <i>Neisseria gonorrhoeae</i> and determine its antibiotic resistance profile and 2) detect gonorrhoea only, or gonorrhoea and chlamydia.</p> <p>FIND published 1 academic paper for diagnosing STIs in resource-constrained settings, while GARDP published 3 papers relevant to the ongoing development of zoliflodacin and the relevance to international isolates and strains.</p>
4.3	<p>Indicator: Funded innovations achieve milestones that advance the product down the commercial pipeline 2019/20 Target: 2 new products achieve new milestones 2019/20 Outcome: Target achieved. 2 key milestones agreed with FIND and GARDP were achieved and are listed below. This continues to move the development of these 2 innovations along the R&D pipeline with tangible in-country developments.</p> <p>GARDP: The antibiotic zoliflodacin entered Phase III clinical trials. The trial will include patients with uncomplicated urogenital gonorrhoea from clinical trial sites in Thailand and South Africa, and was announced on 30 September 2019.</p> <p>FIND Project 1: Connectivity Pilot #1 Zambia V1.0 of the One Health System was installed in the government-approved hosting environment (Smart Zambia) on 23 January 2020 (see case study 3)</p>
4.4	<p>Indicator: Successful research competitions are ran and, as a result, GAMRIF funding for PDPs is allocated to selected projects 2019/20 Target: 67.0% of PDP funding disbursed 2019/20 Outcome: 45.3% of funding was disbursed to our PDPs this financial year.</p> <p>The difference between expected and actual funding dispersal is explained due to delays encountered by the 2 FIND projects. Further details are provided in the finance section.</p>

PDPs in the GAMRIF portfolio met key milestones for ongoing technical product development. In the previous reporting period, GAMRIF expected to report the publication of 3 TPPs. This was delayed and has now been achieved this year, with 1 more TPP published than expected.

A notable technical challenge led to the delays in funding disbursement. FIND encountered challenges when trying to navigate a feasible regulatory submission route for a rapid diagnostic test app. This is due to the fact that digital health product regulation is still evolving for most stringent regulatory authorities with no clear precedents to follow. While alternative routes were found and delays mitigated, this caused some delays to the FIND connectivity project, impacting indicator 4.4.

There were significant achievements from the PDPs that are not covered in

Output Indicator 4

Table 4 indicators. This includes GARDP progressing Phase III trials in the US with patients already enrolled ahead of the schedule for other trial sites. This is a critical achievement for developing zoliflodacin. Across FIND and GARDP combined, there were over 40 knowledge translation outputs, including 9 presentations, 8 workshops, 4 target product profiles, in-country newspaper coverage, training materials, and a database developed.

It is worth noting that some academic publications referenced under indicator 4.2 are not openly accessible. While the project encourages open access publications, moving forward the GAMRIF team will seek to make this a firm requirement in future commercial agreements with partners.

Evidence of Risk Management

The following key GAMRIF portfolio-level risks with 12 or above rating were reported and monitored by the team during 2019/20. A score of 12 means an Amber/Red risk rating with either a possible likelihood/high impact or a likely likelihood/medium impact.

Table 5: Risks rated 12 or higher at a GAMRIF portfolio level

Risk	Mitigation Actions	RAG rating	Current Status / Update
<p>Finance/Delivery: [Ongoing risk]</p> <p>The current funding profile</p>	<p>GAMRIF team to continue to work closely with delivery partners that have historically varying forecasts, increasing</p>	<p>Amber/ Red</p>	<p>Work packages have a variety of funding schedules which help meet targets and account for slippages in work packages.</p>

Risk	Mitigation Actions	RAG rating	Current Status / Update
<p>could become unrealistic, as setting up a research fund takes time and 5 years is short for scientific research.</p> <p>This could lead to slippage in the overall funding profile and research delivery results, which may affect overall Her Majesty's Treasury (HMT) ODA target contribution from GAMRIF.</p>	<p>communications and improving financial reporting as necessary.</p> <p>Use options offered by a diverse set of delivery partners to mitigate varying profiles, integrating this consideration in future funding decisions.</p> <p>Monitor financial impacts closely considering COVID-19 impact.</p>		<p>This was a key lesson learned for the programme; to have flexible funding schedules such as advance tranche payments to continue to reach the year-end ODA spending targets. GARDP's re-addition to the portfolio also solidifies the diversity of funding schedules.</p> <p>All delivery partners have provided financial forecasts and delivery timelines, and the GAMRIF team continues to work with delivery partners to ensure forecasts are accurate. Increased financial meetings with clearer articulation of DHSC needs has helped improve forecasts and mitigate reduce risks.</p> <p>The RAG rating for this risk was Amber in February 2020 as most work packages were spending as predicted but due to COVID-19, the RAG rating increased to A/R. This is being closely monitored by GAMRIF.</p>

Risk	Mitigation Actions	RAG rating	Current Status / Update
<p>Delivery: [Ongoing risk] Administering research competitions and monitoring the research requires appropriate staff resources.</p> <p>If delivery partners lack capacity, this could affect timeliness in running research competitions and managing awardees, which could impact overall success of relevant work packages</p>	<p>The GAMRIF team should remain aware of partner capacity particularly when commissioning extra input. Remain updated with vacancies across delivery partners and leverage existing mechanisms such as governance meetings to raise concerns and seek appropriate action.</p> <p>Continue to monitor impact on staffing due to COVID-19.</p>	Amber/ Red	<p>Since the last annual review, GAMRIF has seen significant hiring within the majority of our delivery partner teams, including senior individuals who are now in post.</p> <p>The GAMRIF core team continues to monitor the partner resource risk, with some vacancies affecting capacity during the reporting year. CARB-X Joint Oversight Committee meetings have been useful for monitoring organisational vacancies.</p> <p>This risk increased at the end of the reporting year due to impacts from COVID-19, where delivery partner personnel may be re-prioritised to COVID-19 response work</p>

Risk	Mitigation Actions	RAG rating	Current Status / Update
<p>Delivery: [New risk] GAMRIF-funded product developers (PDs) either go bankrupt or disinvest from the AMR R&D space.</p> <p>The AMR product development space struggles with market failure; SMEs are struggling to stay in business in the current landscape.</p> <p>If this risk is to materialise for GAMRIF PDs, they would be unable to deliver the project's objectives as expected, resulting in low value for money.</p>	<p>GAMRIF to support the Global AMR Diplomacy team in work on support for SMEs, Phase 2 and 3 funding, and reimbursement models.</p> <p>GAMRIF to use this evidence to pitch for increased funding in the late 2020 spending review bid.</p>	Amber/ Red	<p>2019 saw 2 significant bankruptcies in the anti-infective SME sector – Achaogen and Melinta, despite both having promising R&D ventures and/or recently approved new antibiotics.</p> <p>GAMRIF remains engaged on this issue, largely through CARB-X and through the work of the UK Government on market incentives.</p> <p>However, this is a risk that is within a far larger ecosystem than GAMRIF but will have project-level knock-on impacts if not monitored and considered more widely across the Global AMR Diplomacy team, which works very closely with GAMRIF under the shared Head of Global AMR Strategy and Delivery role.</p>

The following key GAMRIF bilateral agreement risks with 12 or above rating were reported and monitored by the team during 2019/20. A score of 12 means an Amber/Red risk rating with either a possible likelihood/high impact or a likely likelihood/medium impact.

Table 6: Risks rated 12 or higher across bilateral initiatives

Risk	Mitigation Actions	RAG rating	Current Status / Update
<p>Delivery: [New risk]</p> <p>New partnerships and complex research projects being co-ordinated across different countries by partners can lead to delays.</p> <p>Different systems, processes and ways of working are likely to be challenging for aligning milestones and processes for bilateral projects.</p> <p>This risk could impact the delivery of GAMRIF's milestones and LogFrame targets.</p>	<p>Remain in contact with all partners including through diplomatic channels and develop specific actions to manage risks.</p> <p>Increase communication frequency with key stakeholders such as Embassy, UK Science and Innovation Network (SIN) and international UKRI staff.</p> <p>Develop internal contingency plans to mitigate delays where they may be out of HMG's control.</p>	<p>Amber/ Red</p>	<p>Due to the complexity of bilateral agreements and our research projects, there were delays with contracting Chinese partners in the UK-China work package.</p> <p>As a result, spending and delivery for this work package is delayed.</p> <p>This risk was escalated through diplomatic channels and UKRI China.</p> <p>All contracts were eventually signed in October 2019 but due to the COVID-19 outbreak and lockdown in China at the end of the reporting year, the work package experienced even further delays.</p> <p>These delays were raised at programme board level. UK projects were able to progress a large portion of work, and some Chinese partners</p>

Risk	Mitigation Actions	RAG rating	Current Status / Update
			<p>began work at risk if comfortable.</p> <p>GAMRIF collected re-profiled finances and workplans and will explore extensions to the projects where necessary.</p> <p>The team also remains flexible in our approach and we continue to have open conversations throughout the lifecycle of the projects.</p>

The following key global research initiatives risks with 12 or above rating were identified by GAMRIF for this reporting year. A score of 12 means an Amber/Red risk rating with either a possible likelihood/high impact or a likely likelihood/medium impact.

Table 7: Risks rated 12 or higher at across Global Initiatives

Risk	Mitigation Actions	RAG rating	Current Status / Update
<p>Delivery: [Ongoing risk]</p> <p>Products funded by GAMRIF are not accompanied by appropriate stewardship and access (S&A) plans, and, as a result, future health innovations are not accessible in LMICs.</p>	<p>Continue working with stakeholders who have interests in this area to support appropriate S&A planning for research projects and engaged a wider range of stakeholders with expertise (e.g. Access to Medicines Foundation).</p> <p>Integrate different technical areas and mechanisms to support R&D that will have an increased likelihood for product access.</p>	<p>Amber / Red</p>	<p>GAMRIF supported a wider range of stakeholders to be brought into S&A discussions in both global workshops and within WP2 where specific S&A work is underway. Stakeholders engaged included the Access to Medicines Foundation, GARDP and the Clinton Health Access Initiative.</p> <p>GAMRIF contributed to the set-up of a S&A workshop organised by GARDP and has engaged heavily with CARB-X S&A guidance process over the past year, including engaging DFID in this work.</p> <p>This risk has remained elevated until a strong S&A guidance document is developed for CARB-X PDs.</p>

During this reporting period, 1 new issue was added to the GAMRIF project-level risk register as well as being included at Global Health Security Programme level.

This issue was added in February 2020 due to the outbreak of the novel coronavirus in Wuhan, China, following the declaration by the WHO Director General that the outbreak represented a Public Health Emergency of International Concern (PHEIC) under the International Health Regulations (2005). At this time, this outbreak was largely contained in China and was seen to be a specific issue to WP1 with a direct impact on the UK-China projects. This was due to potential health impacts in China, travel bans, shortages of supplies, lockdowns and closures of laboratories as well as researchers potentially moving over to support the R&D efforts among other factors. During the regular risk review in February 2020, the team agreed to reach out to the British Embassy in Beijing to monitor the situation.

This evolved into COVID-19 which was declared to be a pandemic by WHO on 11 March 2020. At the end of the reporting period for this Annual Review, the GAMRIF team was already working to mitigate the impacts of COVID-19 on the full portfolio, which was no longer limited to WP1. This is an ongoing issue in 2020/21 at the time of writing this review, and it is expected to remain as such for the team and GAMRIF-funded projects for the foreseeable future. Mitigations are ongoing since March 2020, and this will be a central topic for the 2020/21 GAMRIF Annual Review.

Safeguarding

DHSC has a zero-tolerance policy on issues of safeguarding. Any safeguarding issues are escalated to the internal DHSC safeguarding lead as well as the Foreign Commonwealth Development Office's (FCDO, formerly DFID) Safeguarding Unit where cases are investigated with appropriate actions taken. A critical part of the safeguarding policy is 'lessons learning' to reflect and act on any changes that need to be implemented and highlighted through the individual case.

Safeguarding has been a key focal area of the wider GHS team this year. As part of the annual reporting process the GAMRIF team sought evidence and assurance from delivery partners regarding updates to safeguarding process, where this was not covered in a recent funding agreement or due diligence assessment. Through this process, the team was assured that GAMRIF partners had robust mechanisms in place to manage safeguarding risks and any gaps are being actively addressed.

No safeguarding risks have emerged for the GAMRIF programme. It is recognised that a lack of reporting can be cause for concern. However, to note, the majority of projects have been lab-based during this reporting year. This could have contributed to a lower safeguarding risk compared to a traditional development programme that has increased

interaction in-country with vulnerable communities. Regardless, the team remains aware of this concern and has reporting processes embedded across work packages.

Recommendations for Project Management

- 1.1 GAMRIF should increase risk management practices and partner communications during 2020/21 to mitigate likely impacts of COVID-19 on financial and technical delivery.
- 1.2 Consider opportunities to enhance GAMRIF risk management procedures, looking at best practices for looking at opportunities as well as threats. Share best-practices across the GHS programme for wider learning.
- 1.3 New funding agreements/grant agreements should require open access publications to enforce best practice for accessing information across the global research community.

2. Finance

Delivery assessment for reporting year

RAG rating for 2019/20: Amber/Green

RAG rating for 2017/19: Amber

RAG trend: Improvement

Funding summary 2019/20

Total project budget for 2019/20 (as of April 2019)	£15.00m
Total project budget profiled for 2019/20	£17.10m
Total annual project budget spend for 2019/20	£14.44m*
Spend rate against original project budget	96.3%

* An additional £3.64m of departmental repurposed ODA funds was spent by GAMRIF in 2019/20, as well as £0.2m in admin spending.

This is not measured within the spend rate as this reallocated from additional ODA budget, but represents high-value investments in line with GAMRIF's mandate.

When spending from these other budget lines is considered, GAMRIF's total 2019/20 spend is £18.08m.

The tables on the following page set out the GAMRIF spending record for 2019/20 with explanatory notes. Further explanatory narrative follows the tables.

Work package spending against budgets

Table 8: GAMRIF financial delivery in 2019/20 as per original HMT agreed scope and budget

Work package	Original Business Case budget profile (£m) *	Actual end of FY, including accruals (£m)	Variance against profile (£m)	% spend compared to profile in business case
WP1: UK-China	3.50	2.83	-0.67	80.86%
WP2: CARB-X	6.00	2.45	-3.55	40.83%
WP3: IDRC	2.90	4.28	1.38	147.59%
WP4: UK-Argentina	1.70	1.28	-0.42	75.29%
WP5a: FIND Connectivity	2.00	2.10	0.10	105.00%
WP6: GARDP	1.00	1.50	0.50	150.00%
Total	17.10	14.44	-2.66	84.44%

* The £15m GAMRIF 2019/20 budget was originally over profiled in the original Programme Business Case as per best practice to compensate for likely delays and underspends. GAMRIF has spent nearly the full budget on original programming.

Table 9: Additional GAMRIF expenditure in 2019/20 as a result of securing unused funds from the GHS Programme budget to support DHSC in meeting global health security objectives

Work package	Original Business Case Budget profile (£m) *	Actual end of FY, including accruals (£m)
WP5b: FIND STI	0.00	3.03
WP7: BactiVac	0.00	0.59
Total	0.00	3.62

* While not included in the original business case for GAMRIF, the additional budget was subsequently approved for allocation to these work packages, which were deemed to represent strong value for money and supports additional progress against GAMRIF aims. This has supported GAMRIF and the GHS programme to meet expected spending on strong investments.

As shown in Table 8, the GAMRIF project largely met the annual budget originally established and agreed with HMT in the programme business case for 2019/20, with a 96.3% spend rate achieved against the original £15m budget allocated.

This is evidence to follow-up from Recommendation 2.ii in the previous annual review (see 2017/19 Key recommendations in introductory section).

The 96.3% spend against budget does not include the additional budget that GAMRIF secured in 2019/20 (Table 9) and approved for allocation, as these were deemed strong value for money investments that support progress against GAMRIF aims.

The original profile for all WPs in the programme business case (Work package spending against budgets

Table 8) were estimates and developed before funding agreements and associated payment profiles were agreed with delivery partners. Therefore, variance is not the strongest indicator of financial delivery, however it is worth commenting on work package performance.

As discussed earlier in this review, some projects in WP1 had delayed starts due to differing timelines in contracting between UK and China partners. This had downstream impacts on spending disbursement. Despite this, WP1 still managed to spend 80.9% of its original budget profile in this reporting period and to produce quality research. We expect the outstanding spend will be made up in the coming year(s). GAMRIF meets on a quarterly basis with the GHS Finance Manager and the Innovate UK finance team to monitor and improve forecasting for all UK-China projects, and there have been marked improvements in financial reporting since the beginning of the financial year.

WP2 has underspent against the budget profiled this financial year. This is due to delays in on-boarding projects into the CARB-X portfolio, as well as having a lower-than-expected number of ODA-eligible projects on-boarded in the previous period with knock-on impacts on this year's spending. Nearing the end of the financial year, there have been substantial improvements in the speed of contracting, with several additional projects being approved by GAMRIF to allocate the majority of GAMRIF's budget to CARB-X. This should increase spend reliability in future years but will continue to be closely monitored in GHS.

WP3 shows greater spend than expected, which is the result of speedy project contracting by 1 April 2019 and associated disbursement of the first tranches to the project teams, as opposed to overspend risk. This programme was ahead of schedule at the start of 2019/20 and is on track to meet targets. This early spending has helped to balance the underspend elsewhere and will also help reduce pressure from future financial years.

WP4 has spent according to agreed project disbursement tranches. The original GAMRIF budget in Work package spending against budgets

Table 8 was developed before final work package level-budgets were finalised with delivery partners, which was finalised with project selection including the policy translation proposal. This work package is on track with the final budget, with a reconciliation exercise to be led by BBSRC in 2020.

Under WP5, spend has been on track compared to the original programme business case; however, there were some spending delays identified in Q3 2019/20. This was due to delays on both the connectivity and STI projects, as a result of overly ambitious original timelines, regulatory challenges (as discussed in Section 2) and necessary delays to launch in-country pilots. FIND also aligned a TPP with WHO and GARDP, which took extra time but will have future payoff for ensuring research and policy development for drug-resistant gonorrhoea are aligned with the diagnostic test. Therefore, GAMRIF granted FIND a 12-month extension, with funding carried over into 2020/21 thus reducing 2019/20 spend.

In WP6, the new funding agreement included a £1.5m disbursement to cover all costs in 2019/20. This funding agreement was initiated based on the positive results GARDP achieved during its incubation period with DNDi, and provides strong value for money, as the multi-funder model allows GAMRIF to support Phase III trials that would be too costly to fund alone while also providing financial flexibility across the GHS-wide portfolio. GAMRIF had anticipated additional spending with GARDP (compared to original plans of £1m) and therefore, had built in a contingency for this agreement.

In WP7, during Q3, BactiVac identified a small underspend in research costs and requested that this funding be used to support their Annual Network Meeting, which was to be held in Kilifi, Kenya, in March 2020. This was approved by the GAMRIF team prior to the decision to postpone the meeting due to COVID-19. In parallel, several projects also required no-cost extensions. As a result, at the end of the reporting period, GAMRIF and BactiVac agreed a no-cost extension until 30 November 2020 to cover research grant-level extensions and the delayed event, with a small amount of funding carried into 2020/21. This timeline and the impacts of COVID-19 on the remaining projects and the event will continue to be monitored in 2020/21.

Overall, the GAMRIF project largely spent to budget, despite delays in some work packages. The flexibility offered by some delivery partners such as the PDPs, has allowed for nimble annual funding profile changes. This was a key reason for developing a variety of partnership models in GAMRIF's original design, which has proven effective and has managed inevitable issues that arise when supporting R&D.

Evidence of activities undertaken to meet IATI transparency standards

Self-assessed score against the IATI transparency standards: Excellent (80-100%)

At the start of this reporting period, the GAMRIF team went through an exercise with the GHS programme to provide a full upload of programme documentation to the International Aid Transparency Index (IATI). This included publishing data entries for all 7 work packages, GAMRIF Programme Business Case and the funding agreements for all delivery partnerships.

The processes for publication were completed according to advice from the GHS Project Management Office, as well as working closely with DHSC Global Health Research team to ensure alignment across the department's ODA spending teams.

This completed a recommendation from the previous annual review (see 2017/19 Key recommendations in the introductory section).

This exercise was finalised prior to a Publish What You Fund (PWYF) review, which was completed in October 2019. DHSC received a weighted score of 82.1, which is considered "Very Good". This received positive coverage across several news outlets, with DHSC being the only HMG department outside DFID to receive such a score. This was the first time GAMRIF and DHSC had been assessed on its transparency work and uploads to IATI and this demonstrated the strong commitment of the programme to fulfil its transparency obligations. One general recommendation from the PWYF assessment was to prioritise improving the quality and amount of performance data, particularly results or shared learning, so this will be a key focus for GAMRIF and the wider GHS programme in the 2020/21 financial year. This score is a huge achievement for DHSC over such a short space of time.

The team are committed to maintaining and updating the data published to IATI to ensure this remains accurate and transparent. The GHS programme has put in place a monthly publication timetable for 2020 for all financial transactions, which will enable the Department to be scored 100% against each of the 35 IATI indicators. In 2019 publication of transactions was on a quarterly basis, which limited the overall score attainable to 95% against each of indicator. At the end of the reporting period, the GAMRIF team was in the process of completing another upload of data.

As an ongoing recommendation (see 2017/19 Key recommendations), GAMRIF continues to increase partner awareness of IATI and general transparency principles. Some partners have already uploaded data, and others have committed to uploading in the upcoming reporting year. Other partners who have not uploaded have other commitments to open

publication or transparency, for example, through platforms like ResearchFish or organisational global access policies with published research findings.

During 2019/20, GAMRIF fed into a UKCDR report that provided an overview of the AMR funding landscape, called [Antimicrobial Resistance in International Development: UK Research Funding Landscape](#). This report was published on 19 September 2019, but also reflects inputs dating back to the 2018/19 financial year, which were not covered in the previous annual review.

Evidence of ability to administer ODA funding

During GAMRIF's set-up phase, each funding agreement was developed to include specific text that recognises that the funding provided by DHSC is strictly classed as ODA. This makes clear that funds disbursed from GAMRIF must be used for activities that can be classified as ODA-eligible according to the rules laid out by the Organisation for Economic Cooperation and Development (OECD). These agreements also require delivery partners to alert the GAMRIF team should a risk arise that would cause funds to be spent on non-ODA-eligible activities. Scope changes are also investigated to ensure ODA eligibility remain, and ongoing eligibility is confirmed through routine monitoring.

To ensure that ODA fund disbursement remains consistent with the OECD guidance, the GAMRIF team has taken the following mitigating actions:

- requiring ODA justifications from CARB-X funding applicants to explicitly describe the ODA compliance of the proposed research
- requiring or encouraging the participation of LMIC partners to help ensure the project remains context-specific and of direct benefit to LMICs and to support resource-strengthening and capacity-building within in-country research institutions
- including ODA eligibility in the scope of research calls, and subsequently as a part of the scientific evaluation criteria for independent reviewers. This ensures downstream funding remains ODA-eligible
- There have been more tailored specific actions for some work packages, depending on the nature of their research. Case study 4 directly responds to Recommendation 2.i from the previous reporting period, which required increased work to embed ODA eligibility in CARB-X and has been achieved.

Case study 4: Embedding ODA with CARB-X

GAMRIF and CARB-X have had intensive collaborations that have built capabilities for CARB-X to attract, review, on-board and monitor ODA programmes

There has been substantial collaboration between CARB-X and GAMRIF over the reporting period to improve ODA eligibility processes for both project selection and on-going monitoring. Process improvements include:

- a streamlined application process with improved detailed guidance and communication documents for potential applicants
- an updated application form to more clearly link proposed R&D activities and ODA-eligibility
- increased capacity on the scientific review board to assess the relevance of projects for LMIC healthcare contexts, with experts attending scientific review meetings
- a pool of 3 ODA consultants now work with CARB-X to assess ODA eligibility, provide feedback and direction to applicants, and have helped refine CARB-X's guidance materials which are available online

This has resulted in better applications and a streamlined approval process for ODA eligible projects, which has improved CARB-X's focus on funding AMR research in LMICs. The 'non-traditional' round, also known as Round 1, had 33% applicants with ODA applications while the 'Vaccines and Biotherapeutics' round, also known as Round 2, had 85% applicants with ODA applications. Using its wider funding pot, CARB-X is now also funding programmes that would be ODA eligible outside GAMRIF's scientific scope, which is a testament to the impact and sustainability of this work.

Other examples of ODA oversight include work with GARDP and the UK-Argentina work packages. For example, negotiating the GARDP new funding agreement made clear that introduction of zoliflodacin into LMICs could occur sometime after (e.g. 4-5 years) approval by a major regulatory authority. Zoliflodacin remains principally for patients in LMICs, where the burden of drug-resistant gonorrhoea is highest. GAMRIF requested a greater focus on activities that would inform policy changes and ensure sustainable access, such as developing a bespoke access strategy for priority countries. This was evidenced through detailed Theory of Change that provided reassurance that funding would have a direct benefit to patients being treated in resource-poor healthcare settings.

Additionally, an original requirement of the UK-Argentina research was for projects to be ODA-compliant and produce policy translation outputs with implications for LMICs beyond Argentina. During project selection, in addition to the possible prospect of Argentina

graduating from the OECD Development Assistance Committee (DAC) list, there were concerns of ODA-eligibility and transferability beyond Argentina for some projects. Transferability is important to create a wider impact. As a result, the team reserved £200k from the final budgets to invest into policy translation with an accompanying ODA statement outlining wider impacts outside of Argentina (see case study 2). The projects were tasked with developing a joint project integration proposal and a satisfactory ODA statement outlining the wider implications outside of Argentina (See section on Evidence of Value for Money for more detail).

Evidence of Value for Money (VfM)

GAMRIF is ensuring Value for Money in each of the following areas:

Economy (minimising the cost of resources used or required inputs)

GAMRIF seeks to maximise economies of scale and leverage co-benefits from other organisations or fellow GHS projects wherever possible. Key examples of these efforts include:

- co-hosting the UK-Argentina ‘kick-off’ event in October 2019 with CONICET (who were able to provide in-kind support for the workshop, including venue provision) and the British Embassy Buenos Aires (who were able to promote the event through their existing communications channels and host a reception at the Ambassador’s residence at no additional cost to GAMRIF)
- collaborating with MRC on a joint UK-China event in December 2019 where GAMRIF was able to achieve economies of scale through a single venue hire and other event management expenditure and where GAMRIF benefitted from additional budget available from MRC, including for venue hire, catering and communications
- ensuring that CARB-X would source and fund specialist ODA consultants from within their existing budget envelope rather than providing additional funding out with the agreed contract
- maximising any travel undertaken by the the Head of Global AMR Strategy and Delivery to seek strategic opportunities to represent and meet with GAMRIF partners when travelling for global AMR diplomacy work (and vice versa)

Efficiency

The relationship between the output from goods or services and the resources to produce them)

The GAMRIF team continue to seek efficiencies across the portfolio of our projects. This has included simple actions such as sharing the relationship management responsibilities across the team so that each grant has a single named GAMRIF contact. GAMRIF has also streamlined reporting requirements and meetings with partners to remove unnecessary bureaucracy.

When organising the kick-off event for the UK-China project, GAMRIF partnered with MRC to maximise value for money and increase efficiencies in terms of cross-project learning and network strengthening. Working jointly, we brought grantees from a previous MRC AMR funding round (at the end of their project cycle), a new MRC AMR funding round and the GAMRIF UK-China grantees together to share experiences, best practice and lessons learned from working across the 2 countries on AMR product development. This led to a much richer event in terms of opportunities for cross-pollination and knowledge translation than had it been a GAMRIF-specific event without the other 2 sets of researchers.

Where appropriate, GAMRIF has aligned with the UK Vaccine Network to take a joint approach to cross-cutting issues with shared UKRI partners (Innovate UK and BBSRC). This has meant that UKRI has had to respond to a single rather than multiple commissions on due diligence and safeguarding.

In terms of travel and time efficiencies, GAMRIF has leveraged the 'One HMG' network overseas or, taken advantage of others' pre-existing plans, to deliver on meeting commitments or event attendance without having to undertake additional team travel. This included sending an in-country based Public Health England colleague to a key meeting in Zambia, advocating with partners via senior-level delegations overseas including at the World Health Assembly, and lobbying for online rather than face-to-face meetings even before COVID-19.

Finally, there has been increasing global interest in the new UK antibiotic reimbursement project and the GAMRIF team has proactively kept up with developments from the National Institute for Health and Care Excellence /NHS England/DHSC project team to inform interested stakeholders at relevant events overseas. For example, the project lead attended a GARDP Stewardship and Access workshop in July 2019 and made appropriate linkages with the interested SMEs in attendance.

Effectiveness

The relationship between the intended and actual results of public spending i.e. outcomes

Over the last year, based on advice from stakeholders, GAMRIF made the decision not to target traditional research outputs (as these can lead to perverse incentives). But, instead to dedicate increased focus to encourage a wider range of project outputs and tangible innovation development. We have also undertaken a significant overhaul of our logical framework and project Theory of Change, scrutinising each indicator to ensure ambition balanced with deliverability. This is further detailed in Section 12 (Monitoring).

Other effectiveness measures include:

- the InnoVet-AMR Governance Steering Committee (DHSC and IDRC) approved a proposal to maximise the use of the remaining budget to ensure effective project delivery and considered project views on support needed. This resulted in additional consultant hours being procured from commercialisation, gender and intellectual property experts. In responding directly to the grantees' feedback on proposed 'wrap around' support and tailoring the offer accordingly, there will likely be increased uptake and improved products
- the uncommitted funds from the UK-Argentina WP have been transformed into a 'pan-programme integration project' where outputs are designed to be greater than the sum of what would be achieved if each of the 5 projects had been commissioned separately to do the work (see case study 2). The integration project will provide relevant, practical tools and recommendations on a transition to sustainable animal farming practices in developing economies that are increasingly reliant on income from industrial farming and meat exports
- the UK-China kick-off event referenced above was also a clear demonstration of a more effective event. By bringing together scientists funded by GAMRIF (1 research call) and MRC (2 research calls), the organising team was able to facilitate much richer exchanges between a larger and more diverse group of projects than a GAMRIF-only event

GAMRIF is now contributing to the CARB-X accelerator network which provides world-class expertise and 'wrap-around' support to GAMRIF-funded product developers for a much lower cost than if we were contracting the services individually. Developers can access bespoke support designed to reduce the chance of project failure for reasons other than the core science

GAMRIF brokered a relationship between the Clinton Health Access Initiative (CHAI) and CARB-X, leveraging an existing DFID-funded grant to pilot CHAI support to a small number of GAMRIF-supported product developers

Equity

The extent to which services are available to and reach all people that they are intended to – spending fairly. Some people may receive differing levels of service for reasons other than differences in their levels of need

The GAMRIF model seeks to ensure that research competitions are as equitable and accessible as possible.

While the 2 bilateral calls were only open to UK-based scientists (working with research partners in either China or Argentina), where possible, GAMRIF has also addressed equity considerations. This has included advocating strongly for, and achieving better gender representation on panels at the UK-China kick-off event in December 2019 and ensuring that the event was jointly chaired by a male and a female scientist of renown. It has also included advocating for references to be made to gender equity by the UK-Argentina applicants in their ODA justification. In both bilateral calls, GAMRIF has emphasised the importance of equitable partnerships between countries, both on paper (in the grant applications) and in practice (with the actual research and associated communications and outreach activities). With this approach, the UK-based scientists are reminded of the importance of working on a joint and equal basis with their Chinese or Argentinean counterparts rather than seeing the UK partners as the default grant lead.

GAMRIF has also pushed for the use of a geographic equity 'lens' with new CARB-X projects where they may be proposing both ODA and non-ODA specific outcomes. Through this work, GAMRIF has encouraged and influenced the outcome of project design where product developers have proposed working with partners based in LMICs. This supports equitable and meaningful partnerships rather than perfunctory. Consequently, product developers score higher on their ODA justification if they can clearly demonstrate equitable partnerships and knowledge exchange or capacity building.

The GAMRIF partnership on InnoVet-AMR has brought significant benefits from the opportunity to learn from IDRC, an organisation that has a well-established process for integrating gender and other equity lenses into its programming. The InnoVet Performance Monitoring Framework contains a specific indicator to measure gender considerations that are integrated into the funded projects (see the Diversity and Sustainability Section for further detail). IDRC provides sex-disaggregated data to track the proportion of female to male stakeholders funded or involved.

Recommendations for finance

- 2.1 Ensure GAMRIF transparency information is published in a timely manner, particularly as agreements are amended, and continue to increase partner awareness of IATI standards and available resources to encourage and support partners to publish their data on Aidstream.
- 2.2 Closely monitor spend profile with CARB-X to better forecast product developer expenditure given on-going onboarding of developers; review historical trends to better assess forecasts.
- 2.3 Work closely with delivery partners to ensure their forecasts for 2020 and 2020/21 are accurate and reflect any slippages, underspends or extensions required as a result of COVID-19, to help manage against the revised 2020 spending target and ensure that 2020/21 budgets can be fully utilised.

3. External Engagement

Delivery assessment for reporting year

RAG rating for 2019/20: Green

RAG rating for 2017/19: Amber/Green

RAG trend: Improvement

Evidence of use and success of the communication strategy

GAMRIF's previous annual review noted that the fund did not have sufficient visibility across the research community it serves. This suggested the approach to 'amplify and support' was falling short. More public information and active branding would benefit GAMRIF through increasing visibility, with achievements properly shared and attributed to the GAMRIF-led funding. Consequently, there were 3 relevant recommendations from the previous annual review to improve external engagement (see 2017/19 Key recommendations in the introductory section). One recommendation focussed on developing public interest stories from research results and this is ongoing. The other 2 recommendations are completed through several communications outputs this year, as detailed below.

The GAMRIF team has published a [gov.uk landing page](#) and finalised GAMRIF's logo. This has been presented to the delivery partners along with a communications guideline, which provides guidance for delivery partners on acknowledging GAMRIF-led funding to ensure GAMRIF leadership in previously underinvested areas of AMR R&D is recognised by the key audiences. The team has also finalised GAMRIF's internal communication strategy, which contains an evaluation plan for communication activities. This strategy will help GAMRIF ensure activities are achieving the objectives and are aligned with GAMRIF's key messages and tailored for key audiences.

The previous recommendation 4.iii continues to be progressed by the team. This will be ongoing for the duration of the fund and are considered in the GAMRIF communications strategy. Continued advocacy for donor investment is provided through the Head of Global AMR Strategy and Delivery role crossover with the Global AMR Diplomacy team, as well as through GAMRIF funding arrangements (e.g. bringing other CARB-X funders in on projects to benefit LMICs).

GAMRIF continues to engage through various platforms such as Twitter and gov.uk press releases with key audiences, including the research community and the public. Although

GAMRIF was restricted from posting on social media during the pre-election period in the UK (6 November to 12 December 2019), the team gained a considerable amount of engagement and impressions on other communications. For example, a tweet promoting the Lytica Therapeutics press release and successful funding announcement from CARB-X has gained nearly 4,000 impressions, which illustrates GAMRIF's potential for strong engagement and outreach.

The team will implement the communications strategy to continue to tactically identify opportunities, amplify partner communications and ensure GAMRIF's achievements are made public. Moreover, the team will be implementing the communication evaluation framework as set out in the internal communication strategy to ensure we are effectively reaching our target audiences. This will build the GAMRIF brand and increase visibility across the global research and AMR communities.

Overview of the communications activities

Annex 2 provides an overview of communications and media activities from this year.

During the reporting period the key communication activities included the following items:

- the InnoVet-AMR projects were launched on 10 June 2019, with a joint press release by partners at IDRC, and profiles for each project published on the InnoVet-AMR website. A panel event was held with several experts including Prof Peter Borriello (CEO of the UK Veterinary Medicines Directorate) and Dr Cyril Gay (Senior National Program Leader, Animal Health and Safety, Agricultural Research Service, United States Department of Agriculture)
- following this launch event, a report from the Wilton Park Workshop was released on the InnoVet-AMR website (see case study 5). This provides expert scientific prioritisation work that set the scope for InnoVet-AMR. This prioritisation work is now public to help inform other programmes and to support open data
- the UK-Argentina project launch included a joint public communications initiative from DHSC in the UK and CONICET in Argentina. Each organisation collaborated to develop unique press releases, which were published at the time of the launch event. During the meeting, CONICET led the development of video interviews covering the workshop with interviews with the researchers
- the UK-China programme was launched in Beijing, China alongside several partners. This event took place during the pre-election period (2019 UK election), which limited DHSC engagement as well as online engagement from researchers in attendance. Originally, the team planned to produce retrospective communications in January 2020. However, during this month COVID-19 was spreading in China with the country

on lockdown and redirecting the conversation to an AMR event the prior month would have been inappropriate and potentially created communication risks

The pre-election period also meant that GAMRIF was unable to engage in communications campaigns during the annual World Antibiotic Awareness week (18-22 November 2019). While this meant the team were unable to share the excellent video clips with researchers recorded at the InnoVet-AMR and UK-Argentina launch event, these materials are held by the GAMRIF team and can be used for future outreach campaigns.

Case study 5: Animal health experts from around the world set the direction of GAMRIF's InnoVet-AMR programme (WP3)

The two-day workshop identified the key actions needed to reduce antimicrobial use in food-producing animals in LMICs

GAMRIF's InnoVet-AMR programme was directly shaped by a two-day workshop hosted by DHSC and Canada's International Development Research Centre. 63 experts from 22 countries contributed, from academia, industry and the public sector. Key findings include:

The social sciences (and beyond) are vital in ensuring that interventions are applicable, adopted and effective. We must understand the key drivers of adoption of new interventions.

The impact of gender in farming and in AMR reduction strategies is important but overlooked. For example, women often hold the knowledge of animal and family health and prioritise spending on this, as well as being responsible for animal sanitation and feeding.

Focus on reducing non-prudent antimicrobial use, rather than general use. Antimicrobials play an important role in reducing the burden of disease and access remains an issue in LMICs.

Improve education/training on husbandry practices, production systems, vaccination awareness, disease treatment decision-making and prudent antimicrobial use. Mobile technology is ideal in this regard.

Consider the context in which the interventions will be used, for applicability, cost-effectiveness and sustainability.

More evidence is needed to inform research priorities, interventions and policy. Local baseline data on antimicrobial use and AMR in different production systems is required.

Improved frameworks for stewardship/regulation are needed. Although medicine access is limited in certain contexts, antibiotics are often readily available without prescription, professional advice and at a low cost.

The [full report](#) can be found online.

Evidence of external engagement

The GAMRIF team had a busy year for external engagement activity, presenting, networking and learning from partners and other stakeholders. For a comprehensive list of different engagements, see Annex 3.

As an overview, engagements included activities with partners, across the R&D community as well as more widely with an intersection with international AMR diplomacy.

Activities with partners

GAMRIF attended events complementary to work packages, with a wide range of stakeholders. This included kick-off meetings, as illustrated before. There are also wider meetings with partners that complement GAMRIF's work packages. For example, InnoVet-AMR has a sister programme, the Livestock Vaccines Innovation Fund, which is also managed by IDRC. There was an event in London, UK that 2 members of the GAMRIF team joined. This research is further along in the delivery cycle, so provided GAMRIF with lessons learned as well as possible future directions for the programme.

GAMRIF also attended [GARDP's Stewardship and Access workshop](#), which was organised with Medicines Patent Pool and WHO. This workshop aimed to define a roadmap to foster access and appropriate use of antibiotics for all those who need them. GAMRIF represented viewpoints for R&D in LMICs, and also helped to shape the workshop including broadening out the attendee list, bringing CHAI into the conversations.

Activities across the R&D community

This was a strong area for GAMRIF engagement this year. Several engagements allowed GAMRIF to input into processes and mechanisms related to AMR R&D financing. For example, GAMRIF participated in a Wellcome Trust roundtable to review progress made on R&D funding since the AMR review was published in 2016. GAMRIF also attended the first [workshop](#) convened by the Global AMR R&D Hub, to ensure that GAMRIF and DHSC's priorities were represented. This hub develops and investigates opportunities and barriers for investments and new and innovative financing mechanisms for AMR R&D using a One Health approach. The global community continues to look at mechanisms to

build a sustainable AMR R&D pipeline, and GAMRIF's input encourages relevant R&D for LMICs, while representing DHSC's priorities.

GAMRIF currently has a small portion of funding from the portfolio (8%) dedicated to environmental research. However, there is great interest to expand work in this area in the future. GAMRIF attended the 5th International Symposium on the Environmental Dimension of Antibiotic Resistance (IDAR5) in Hong Kong. This gave GAMRIF a key opportunity to connect with key stakeholders in this area as well as learn about current research to shape thinking for future scientific priorities.

Activities across international AMR diplomacy

The GAMRIF team leader also oversees the UK's Global AMR Diplomacy team and the office of the UK Special Envoy on AMR. Where appropriate, this allows the alignment of R&D priorities with policy priorities, which is critical to leverage additional funding and gaining global political support. This has included representation at high-level global meetings leading to GAMRIF activities being referenced. This included the World Health Assembly, an AMR One Health Ministerial Conference (alongside the DHSC Minister for Innovation), during activities that were a part of the UN sustainability agenda and finally G20 health working group and ministerial meetings.

GAMRIF has also acted as an international voice to promote UK leadership in R&D, such as on the UK Antibiotic Reimbursement Pilot (e.g. where we have connected SMEs who met at overseas events with the UK policy team).

Additional opportunities were also leveraged during numerous high-level conversations led by ministers and senior officials including Prof. Dame Sally Davies in her previous role as Chief Medical Officer for England and now as UK Special Envoy on AMR. GAMRIF also worked closely with Prof. Dame Davies' private office to ensure that GAMRIF is represented in her public engagements. For example, she made a specific reference to GAMRIF in the keynote speech at an investor conference on AMR.

Recommendations for External Engagement

- 3.1 Implement the GAMRIF communications strategy to build the GAMRIF brand and monitor the effectiveness of communications. In doing so, utilise video material that was collected in this reporting period, but was unable to be used at opportune times due to UK pre-election period.
- 3.2 Develop opportunities for knowledge translation and cross-learning across partners through virtual or in-person events if and when possible.

- 3.3 GAMRIF has developed an innovative One Health R&D portfolio with unique learnings. The teams could consider writing a GAMRIF-led journal publication on processes and learnings.

4. Theory of Change

Delivery assessment for reporting year

RAG rating for 2019/20: Green

RAG rating for 2017/19: Green

RAG trend: ↔ Stable

Evidence to show if the Theory of Change (ToC) and assumptions remains accurate

Changes to the ToC

The ToC is available in Annex 4. There were 3 recommendations from the previous annual review relevant to the ToC, with 2 completed and 1 in progress (see 2017/19 Key recommendations in the introductory section). This progressing recommendation suggested a novel approach for measuring advancing Technology Readiness Levels (TRL) across the One Health portfolio, which has been a challenge.

TRLs are systems commonly used to describe how far along the R&D process a product is, for example, if it is an idea, a prototype, or a product on the market. Product advancement (veterinary products, drug discovery, diagnostic tests) can be measured using existing 'traditional' TRL systems, such as drug discovery classification for CARB-X. However, other GAMRIF projects, including policy guidance/interventions, technologies such as an app, and a clinical algorithm, do not fit as neatly within existing TRL systems. GAMRIF developed an early methodology that adapts traditional TRLs, and this categorisation system will continue to be refined as a novel piece of thinking for monitoring progress across a varied innovation pipeline.

The behaviour change outcome in the ToC was also adjusted to include research evidence for national policy, in addition to the existing outcome to use research to inform economic incentives. Furthermore, the ToC has been clarified as it was originally suggested that GAMRIF will generate findings to influence on clinical practice through trial roll-outs, whereas in reality the design of the programme means it may influence clinical practice through pilot implementation programmes. This is being progressed most notably through FIND's work to develop and pilot clinical algorithms and decision-making tools. This outcome has not seen substantial evidence for change as of yet but may be reflected in later implementation years.

Progress towards the ToC

The programme is on track with activities within the ToC as detailed in earlier sections; however, this is based on the early stage and limited current results. It is too early in implementation to fully assess whether outputs are likely to translate into outcomes but there is early promising evidence. Notable current progress towards ToC outcomes included:

International focus and funding in tackling AMR in LMICs is increased

In line with the original mandate to leverage funding from other international donors, GAMRIF has increased global funding towards projects that benefit LMICs. Over £50m has now been leveraged from other donors for ODA-eligible AMR R&D projects. This is funding that GAMRIF has directly leveraged as co-funding for AMR R&D (for example with China, Argentina and IDRC), or has directed towards LMIC-relevant projects (for example with CARB-X co-funding). GAMRIF has also intentionally built a wide footprint of international partners and actively uses this network to drive attention, resources and political will for LMIC-focused AMR R&D. Finally, it is worth noting that other investors (including private) have invested c.US\$7m in GAMRIF-funded PDs under CARB-X, which may indicate improving sustainability in the R&D pipeline. This is not necessarily specific to LMIC-relevant R&D.

Innovative solutions are tested and moved up the TRL level through the pipeline

This year GAMRIF had an active portfolio of 58 projects. This includes innovations that has the potential to move through the R&D pipeline. As expected, some projects have not progressed, which in itself shows that a new idea is scientifically tested and ruled out. Transparency initiatives will support these results being made public for other researchers' knowledge. Other projects have had considerable success, such as GARDP's zoliflodacin entering into Phase III trials. This is an example of GAMRIF funding being used for something that is perceived as risky or underinvested for other funders. This will require greater monitoring as the science advances.

Improved supply of appropriate and affordable products/tools for combating AMR are available to LMICs

GAMRIF expects any successful products to be well stewarded and accessible to patients in LMICs. GAMRIF has worked across HMG and external partners to ensure products will be accompanied by appropriate stewardship and access (S&A) plans/activities should they reach market authorisation. For example, GAMRIF continued engaging with a working group to inform a S&A guidance document for CARB-X PDs and lobbied a wider group of external experts to be included. This was also an area of focus for GAMRIF agreeing the new funding with GARDP. These actions should lead to better access policies that can have real-world impact for resource-poor settings. However, in many ways this will only

become clear in the coming years, potentially past GAMRIF funding, when and if products reach market authorisation. Uptake is also critical, which is why social sciences have been integrated in some work packages (WP3 and WP4).

In the year ahead, research will continue to progress making knowledge public as per the ToC, despite delays caused by COVID-19. Some activities can move forward regardless of COVID-19 without impact, for example scoping studies under InnoVet-AMR to gather fundamental data to better target future R&D initiatives in LMIC regions. Other plans could be more impacted, such as those reliant on in-country activities (e.g. in-country pilots with FIND in Zambia, Burkina Faso, and Senegal).

ToC assumptions

The ToC includes several assumptions, which remain critical for success. There have been no changes to the assumptions in the ToC, however there are key assumptions that still hold true. Assumptions for activities to progress to outputs and their continued importance are outlined below:

Global institutional leadership on agenda and funding

This remains of critical importance, and while GAMRIF external international diplomatic engagement inputs into this work, other leaders are required to maintain momentum. Shifting priorities to COVID-19 could provide both opportunities and threats.

Additional funding committed and invested from new donors

It is projected to take US\$2bn for a drug to reach market. Other funds continue to be invested from donors such as BARDA, the BMGF, Wellcome Trust, and the German Federal Ministry of Education and Research (BMBF). The majority of funds are not earmarked for LMICs.

Researchers develop access, affordability and stewardship plans

As discussed, this work is ongoing across GAMRIF projects and the focus on this is increased where possible, noting the importance of this assumption for affordable access in LMICs.

Research is reliable and sufficient to progress TRLs

The highest quality research proposals were funded through GAMRIF, according to expert scientific panels. However, this assumption remains important but recognises that some products won't progress, while others have already progressed TRLs.

Evidence found is appropriately shared and addressed across the field

This is also an important assumption for individual projects to be best informed and also to ensure that funding is programmed into the most promising novel ideas. As results progress, GAMRIF needs to encourage open-access publications across the portfolio but relies on other funders and research organisations doing the same.

Assumptions for outputs to progress to outcomes and their continued importance

Methods developed are realistically feasible and affordable for LMICs

This is of critical importance to ensure products will be implemented and used. This is why GAMRIF encouraged LMIC-led projects, or partnerships between High Income Countries and LMICs. This is a mechanism to ensure that products will ultimately be effective for intended contexts. This assumption requires constant learning along the full funding lifetime.

LMICs remain stable and engaged and ensure tools and advancements are utilised

The launch meeting in Argentina showed strong local engagement and motivation for implementing research and sharing findings. This assumption is however facing a critical threat as COVID-19 will impact stability and local priorities in many key countries. This will require close monitoring in the coming year.

Recommendations for the Theory of Change

- 4.1 Enhance and test an innovative approach to measure TRLs through end-to-end pipeline development that is comparable across a broad portfolio of innovation types.
- 4.2 Review research outcomes in line with GAMRIF's ToC to assess progress towards the intended impact. This mapping exercise could focus on a selection of GAMRIF grants, instead of the full portfolio.
- 4.3 GAMRIF's original mandate was to invest in neglected areas of AMR R&D. Consider drawing out specific outcomes/outputs that show progress in this area and including this within the ToC.

5. Monitoring, evaluation and learning

Delivery assessment for reporting year

RAG rating for 2019/20: Amber/Green

RAG rating for 2017/19: N/A

RAG trend: N/A

Evidence of evaluation

A formal interim evaluation is a key priority for 2020/21. In Q3 of 2019/20, the team worked with the GHS PMO and Monitoring and Evaluation Officer to draft an interim evaluation protocol, in preparation for an interim evaluation during the course of 2020. There are now plans to do an interim evaluation later in 2020/21. Evaluation questions may focus on topics such as:

- whether the design and structure of GAMRIF is the best way to identify and fund research and product development in neglected R&D areas
- whether the use of multiple delivery partners is the best way to deliver GAMRIF outputs
- whether the project is on track with the ToC

The early interim evaluation protocol will be reviewed and refined with the evaluator, including with advice received by GAMRIF from the external reviewer for this current annual review, who is a member of DFID's evaluation cadre and provided M&E recommendations for the future of the programme.

The interim evaluation will enable GAMRIF and GHS to review progress and delivery mechanisms to date, look at impact of early progress, and learn for future iterations of the programme. This is increasingly important as GHS embarks on a comprehensive spending review in 2020, and results will help inform future programming. Learnings should also be valuable for the research community, the general public to showcase accountability, and for other funders (particularly those with One Health and/or R&D portfolios).

Evidence of monitoring

Monitoring approaches

GAMRIF regularly undertakes monitoring across all projects. The frequency of monitoring activities differs depending on original agreements with delivery partners during funding/grant agreement negotiations. Formal reporting takes place at most on a quarterly basis, with the least frequent being a yearly basis (in line with the model developed for PDPs more widely), with ad hoc informal updates. In cases where projects have faced extra risks, the monitoring frequency has increased. For example, in response to delays with knock-on impacts on the overall UK-China WP timeline, Innovate UK suggested quarterly reports to provide closer monitoring. This has been a useful way to ensure all parties are aware of risks and mitigations.

Portfolio-level monitoring takes place in 2 ways. First, at the end of the reporting year, the GAMRIF team leads an indicator data collection exercise in order to assess progress against the LogFrame (see Section 2 for results). The LogFrame is also available in Annex 5 This process uses largely routine monitoring with data collection from partners if needed. This year, data collection focussed on additional research outputs, as well as updates to safeguarding and transparency initiatives. This was done in accordance with the principles from the Paris Declaration on Aid Effectiveness 2005 and Accra Agenda 2008.

The second aspect to portfolio monitoring is maintaining a live and comprehensive portfolio database of all research projects. This is internal to the GAMRIF team and summarises key data about each project, such as budget, location, project partners, thematic and scientific categorisations, among other descriptive factors. This was generated during this reporting year and allows the team to consolidate portfolio-level data as needed, and present and share with stakeholders.

Monitoring is also tied to financial disbursements, which are typically released as work is completed (payment on actuals). In cases where payments are made in advance, a report is submitted prior to payment requests to evidence progress and funding need. This acts as a financial control and ensures continued progress reporting. Dedicated financial meetings are also used when required, largely on the higher risk work packages during this reporting period (e.g. WP1 and WP2). In particular, the team keeps in close contact with finance teams at CARB-X to monitor changes as projects enter the portfolio on a rolling basis.

Changes to the LogFrame

During this reporting year, GAMRIF reviewed the LogFrame to verify that indicators are appropriate for the work packages as well as the data already collected for regular

tracking. This was verified with all delivery partners, with minor adjustments made as needed. The GAMRIF team also held an internal deep-dive session during an away-day to scrutinise the LogFrame.

From this session, a major change was made to the LogFrame. Previously, the GAMRIF team expected to quantify research results through the number of peer-reviewed publications and presentations (which referred to formal academic outputs) and case studies. However, previous targets were not based on best-practice. After delivery partner feedback and further consultation with M&E colleagues in UKRI and GHR, GAMRIF agreed that targets may be harmful as they were not agreed at the start of grants/funding agreements and may also distract from ultimate product development aims. GAMRIF has a key objective for tangible product development and applied research; measuring success through the number of peer-reviewed articles is not necessarily synonymous with this aim. Therefore, indicators on case studies or peer-reviewed publications/presentations were consolidated into indicators to simply measure a wide range of research outputs (see Indicators 2.2. and 3.2). This entire process was done alongside the UKVN project in GHS and is aligned with data collected by the National Institute for Health Research to be wide ranging and representative of numerous knowledge translation and product development outcomes. As shown in this annual review, case studies are still being developed to show impact but without targets.

Other changes to the LogFrame included:

- adjusted indicators to ensure they are SMART (Specific, Measurable, Achievable, Relevant, Time-bound), and are aligned with the ToC
- some targets were adjusted based on experience from the 2017-19 annual review depending on what would be possible to measure and to be properly ambitious (e.g. indicator 1.3 was adjusted from measuring the number of research organisations engaged to measuring individual researchers)
- the 2017-19 annual review reported on the percentage of actual spend across bilateral initiatives, compared to the original profile. This was useful for yearly budget management across delivery models, and so similar indicators are now being measured for global initiatives under output 3 and PDPs under output 4

Evidence of learning

Learning Across the GAMRIF Portfolio

Several efforts and initiatives were undertaken to ensure learnings were integrated and shared across GAMRIF projects and more widely. Some notable activities are summarised below.

Learnings from the InnoVet-AMR project launch were translated into following launch events in Argentina and China during the reporting period. Case study questions to guide researcher video interviews, developed for InnoVet-AMR, were adapted for use at following launches. These were also shared across the GHS team to help standardise communications.

A major undertaking this year was developing a proposal for re-investing underspend from the research budget across the InnoVet-AMR project back into the programme, with a focus on activities to enhance research capacities. GAMRIF translated innovative aspects of the CARB-X Global Accelerator Network model in this thinking, and this will advance skills in this programme, making private sector expertise available to academic researchers (see case study 6 below).

Case study 6: ‘Wrap around’ support for InnoVet-AMR researchers (WP3)

GAMRIF funds capacity building activities to support researchers’ progress through the AMR R&D pipeline

GAMRIF funds 11 InnoVet-AMR research projects in early discovery, with some near to reaching a proof of concept. There are many pitfalls in progressing a product through the research pipeline. To help our researchers jump these hurdles, the InnoVet-AMR Governance Steering Committee approved a proposal for re-investing underspend (CAD\$967k) to provide ‘wrap around’ support for researchers to accelerate quality R&D.

This investment will provide researchers with capacity building support for niche areas such as commercialisation, quality assurance and regulatory engagement support. These activities will be delivered through a series of webinars and individualised virtual training sessions (due to the COVID-19 pandemic) from industry experts later in 2020/21. The ‘wrap around’ support also complements the ongoing expert technical support on gender and regulatory processes standards.

Investment into this ‘wrap-around’ support will provide the researchers with the tools to progress through the R&D pipeline and we hope to equip them with the industry knowledge to help them advance through commercialisation hurdles. This investment will build critical knowledge across the InnoVet-AMR researchers that will arm them with private sector skills needed to advance a product into the market.

A seminal report was also released in October 2018 on Vaccines for AMR by the Boston Consulting Group under a Wellcome Trust initiative. This study aimed to help prioritise vaccine R&D investments for priority pathogens. Evidence from this report has been applied to GAMRIF project selection and prioritisation with vaccine research projects in the CARB-X portfolio in this reporting period and will be of use in future funding decisions.

The Global AMR Diplomacy and GAMRIF teams continue to learn and influence each other. One area of interest includes environmental research, which has been an area gaining increasing attention across global policy discussions and is now of interest in future GAMRIF portfolio planning. A second key area of interest is ongoing market incentive discussions, where international diplomacy conversations have encouraged global action to support pipeline stability and to strengthen the likelihood of future success for GAMRIF-funded products entering a volatile market. This is an area in which CARB-X is highly engaged, given both the political conversations in the US on the anti-infectives pipeline as well as recent bankruptcy of SMEs (i.e. Achaogen and Melinta).

The GAMRIF team conducted an internal due diligence assessment on GARDP in its standing as a new legal entity, before entering into a new grant agreement. This was the first due diligence assessment led out of the GAMRIF team. The team drew on the know-how and expertise from the GHS in-house commercial advisor. This built team capacity for these assessments and offered strong value for money compared to outsourcing.

Finally, the GAMRIF team engaged in an ICAI review on learning that was released in September 2019, through providing a written summary of learning across the GAMRIF programme plus an interview. This review highlighted that DHSC works closely to learn from other government departments (e.g. DFID and Defra), while other departments may learn from DHSC on niche areas of expertise.

Team Member Learning and Development

Across the GAMRIF project, team members participated in individual learning and development opportunities, with learnings directly applicable to their work on GAMRIF. Individuals also shared knowledge from these courses with the wider GHS team and DHSC. The following opportunities were leveraged by GAMRIF team members:

- 'Leading and Managing with Confidence' (Delivered by KPMG on behalf of Civil Service Learning, focused on building leadership skills across the Civil Service)
- PRINCE2 foundation certification, to improve team project management capability
- Government Communication Service training on strategic communications, which directly fed back into the GAMRIF Communications Strategy
- 'Antimicrobial Resistance (AMR): A Multidisciplinary Approach'. This is a cross-disciplinary course offered by the London School of Hygiene and Tropical Medicine, and this is being fed back not only across GAMRIF but the entire GHS programme to advance AMR knowledge across a variety of disciplines

- job shadowing at the FIND headquarters in Geneva to gain a better understanding of the PDP model and ways of working as well as a more technical appreciation of the GAMRIF and Fleming Fund supported projects

Recommendations for monitoring, evaluation and learning

5.1 Complete an interim review of the GAMRIF programme in 2020/21.

6. Diversity and sustainability

GAMRIF-wide diversity

Across GAMRIF, the team has actively encouraged female representation and support in our events. For example, by ensuring that panels at the UK-China event (3-5 December 2019) were balanced on the basis of gender, and between UK and Chinese representation. At the request of GAMRIF, the event was co-chaired by Professor Rosanna Peeling, who is a member of the GAMRIF Expert Advisory Board (EAB) and was also instrumental in setting up the UK-China programme.

We have proactively advocated for and supported equal partnerships, for example GAMRIF ensured equal participation and input into the WP4 (UK-Argentina) policy integration proposal from the Argentina-based researchers, alongside their UK-based colleagues. As a part of this proposal, an ODA statement was developed stating that the design and execution of the projects would integrate gender equality as far as possible, including researcher participation as well as in the results (e.g. influence of gender on livestock management).

The GAMRIF Project Lead attended a disability inclusion session at the DFID-led 'UK Aid Cross-Government Supply Partner Conference' (4 September 2019). Content from the event was also presented back to wider GHS personnel to support team learning.

Access to affordable, quality medicines for all is fundamental to GAMRIF. As previously mentioned, this was incorporated into activities in the GARDP funding agreement as well as the accompanying Theory of Change.

Best Practices in InnoVet-AMR

The InnoVet-AMR programme has a particularly strong focus on gender equity as IDRC provides organisational leadership in this area. As a result, gender considerations have been integrated into funded projects in the following ways:

- 7 out of 11 possible projects reported women in leadership positions
- 1 project employs a gender researcher on the team
- 15 female graduate and 15 male graduate students will contribute to the funded projects, i.e., equal gender representation
- targeted gender capacity building was provided in the InnoVet-AMR Inception workshop, and expert support will be ongoing for projects

Sustainability

The GAMRIF team has taken several actions to minimise carbon emissions and impact on the environment. These include:

- only printing what is necessary, and then only using recycled paper
- increasing recycling of products in the DHSC offices (including paper, cartridges and coffee pods) and taking coffee pods to recycling centres
- avoiding single-use plastics in the office
- supporting team home-working arrangement. Since mid-March 2020, all team members have worked from home, significantly reducing travel to offices
- choosing to attend some meetings virtually (e.g CARB-X AdBoard in December 2019 and Joint Oversight Committee (JOC) meeting in March 2020), reducing air travel and carbon emissions
- combining meetings strategically and maximising the use of in-country HMG personnel who can attend international meetings on behalf of GAMRIF. For example, the Zambia-based PHE Senior Public Health Advisor represented GAMRIF at the One Health Surveillance Platform for AMR launch event in Lusaka, helping GAMRIF reduce its carbon footprint and make cost-savings
- using public transport whenever possible to attend meetings or international events
- requiring newer partners to minimise carbon emissions and impact on the environment through advanced funding agreement clauses. These require partners to conserve resources, reduce waste and phase out ozone-depleting, environment-damaging substances. It encourages recycled packaging and environmentally friendly equipment and materials (e.g. materials should not contain chlorofluorocarbons, halons or other damaging substances). Furthermore, these new funding agreement clauses request partners to reduce the fuel emissions from staff and activities wherever possible
- all IDRC projects have also been reviewed by the Canadian Centre for Veterinary Biologics at the Canadian Food Inspection Agency to identify potential risks the projects may pose to the environment. The InnoVet-AMR team monitors the projects to ensure that the research team comply with the Canadian Environmental Assessment Agency and follow the recommendations to reduce negative environmental impact

- in the future, the GAMRIF team intends to use new levers (e.g. equipment purchasing requests) to improve environmental sustainability among partners that do not have environmental requirements within agreements

7. Overall Project Delivery and Recommendations

Overall assessment RAG rating for 2019/20

Activity areas	RAG rating 2019/20	RAG trend (2017-19 to 2019-20)
Project Management	Green/ Amber	No change
Finance	Green/ Amber	Improved
Theory of Change	Green	No change
External Engagement	Green	Improved
Overall Delivery Confidence rating:	Green/ Amber	No change

Summary of Recommendations

Project Management

- 7.1 GAMRIF should increase risk management practices and partner communications during 2020/21 to mitigate likely impacts of COVID-19 on financial and technical delivery.
- 7.2 Consider opportunities to enhance GAMRIF risk management procedures, looking at best practices for looking at opportunities as well as threats. Share best-practices across the GHS programme for wider learning.
- 7.3 New funding agreements/grant agreements should require open access publications to enforce best practice for accessing information across the global research community.

Finance

- 7.4 Ensure GAMRIF transparency information is published in a timely manner, particularly as agreements are amended, and continue to increase partner awareness of IATI standards and available resources to encourage and support partners to publish their data on AidStream.
- 7.5 Closely monitor spend profile with CARB-X to better forecast product developer expenditure given on-going onboarding of developers; review historical trends to better assess forecasts.
- 7.6 Work closely with delivery partners to ensure their forecasts for 2020 and 2020/21 are accurate and reflect any slippages, underspends or extensions required as a result of COVID-19, to help manage against the revised 2020 spending target and ensure that 2020/21 budgets can be fully utilised.

External Engagement

- 7.7 Implement the GAMRIF communications strategy to build the GAMRIF brand and monitor the effectiveness of communications. In doing so, utilise video material that was collected in this reporting period, but was unable to be used at opportune times due to UK pre-election period.
- 7.8 Develop opportunities for knowledge translation and cross-learning across partners through virtual or in-person events if and when possible.
- 7.9 GAMRIF has developed an innovative One Health R&D portfolio with unique learnings. The team could consider writing a GAMRIF-led journal publication on processes and learnings.

Theory of Change

- 7.10 Enhance and test an innovative approach to measure TRLs through end-to-end pipeline development that is comparable across a broad portfolio of innovation types.
- 7.11 Review research outcomes in line with GAMRIF's ToC to assess progress towards the intended impact. This mapping exercise could focus on a selection of GAMRIF grants, instead of the full portfolio.

- 7.12 GAMRIF's original mandate was to invest in neglected areas of AMR R&D. Consider drawing out specific outcomes/outputs that show progress in this area and including this within the theory of change.

Monitoring, Evaluation and Learning

- 7.13 Complete an interim review of the GAMRIF programme in 2020/21.

Annex 1: Selected output examples from GAMRIF-funded projects

The below shows a selection of project outputs. This is not a comprehensive list. Details differ per work packages for many reasons, such as the nature of reporting, the stage of the project or commercial nature of the R&D.

UK-China

1. Project 104987 presented a poster ('The Evaluation of Novel XF-Drugs: Potent Antibacterial Drugs with Twin Mechanisms of Action' by Board-Davies et al) at the EUROBIOFILMS Congress held in September 2019 in Glasgow, UK.
2. The commercial partner in China for project 104991 created further employment opportunities as the technology was embedded in Chinese hospitals. UKRI China have been developing this success into one of its tranche of cross-portfolio case studies for high quality impact.
3. Project 104986 was awarded £30k by Innovation Fund, sponsored by the Future Food Beacon of Excellence, University of Nottingham, to perform metagenomic analysis on FARMWATCH samples.

UK-Argentina

1. Dr Peers Davies (project BB/T00472X/1) recorded a ['Meet the Researcher' case study](#) video interview, which was uploaded to YouTube. Dr Davies talked about the GAMRIF workshop in Argentina, his work, and the importance of a One Health approach and international collaboration for tackling antimicrobial resistance in the environment.
2. Project BB/T00472X/1: An "Antimicrobials, One Animal Health and Production" seminar was held at the Laboratory of the National Service of Agrifood Health and Quality (Senasa) in Buenos Aires. Presentations addressed the impact of AMR on the environment, animal production, public health and regional economies, highlighting the importance of AMR surveillance programs and the way AMR affects national production. A discussion table analysed the perspectives of different actors working on AMR and assessed the possible options for better and coordinated efforts.
3. BBC Points West interviewed Dr Kristen Reyher (BB/T004592/1) and Prof Matthew Avison (Chair, Bristol AMR) at the Colston Research Society Symposium on AMR. The footage was broadcast during World Antibiotic Awareness Week 2019, and

highlighted AMR research being undertaken by the Bristol AMR interdisciplinary network.

4. Project BB/T004592/1: "Milk Quality in One Health" meeting. The Latin American Mastitis Research Network (RELIM) is a non-profit professional network of milk quality and bovine mastitis control specialists from all the countries of Latin America. It improves knowledge exchange around intramammary infections, to ultimately produce quality milk by environmentally sustainable standards. Members include milk production industry professionals, dairy processors, researchers, milk quality consultants, veterinary students and graduate students. The University of La Plata presented the different strains of the FARMS-SAFE project during the annual meeting in La Plata in November 2019.
5. Project BB/T004592/1: Initial engagement with the Food Safety Specialist of the Pan-American Center for Foot and Mouth Disease and Veterinary Public Health, PANAFTOSA-PAHO/WHO. It is intended to work closely to boost the AMR information in Argentina jointly with Senasa across the Americas.

CARB-X

1. Following a successful Post-award Advisory Board (PAB) meeting in September 2019 in which the outcome of the Option 1 portion of the Integrated Biotherapeutics project was reviewed favorably, the project transitioned from Option 1 to Option 2 in November 2019. This project is developing the first entirely toxoid-based multivalent vaccine candidate for prevention of recurrent *S. aureus* skin infection.
2. Kevin Outterson, the executive director of CARB-X, was interviewed for an article in the New York Times ('Crisis Looms in Antibiotics as Drug Makers Go Bankrupt') published in December 2019.
3. Erin Duffy, Chief of Research and Development of CARB-X, spoke at the Institut Pasteur International Course on Antibiotics and Resistance (ICARE) in October 2019. The objective of the course was to train the next generation of scientists in the study of bacterial resistance to antibiotics and the finding of new drugs, building an international cadre of collaborative, well networked, and highly trained specialists.
4. A Perspective in Nature Communications ('Designing development programs for non-traditional antibacterial agents') discussing the regulatory path for new types of medicines developed to address AMR; co-author Kevin Outterson acknowledges GAMRIF financial support.

InnoVet-UK

1. A social media campaign to highlight the work of InnoVet-AMR projects was carried out for World Antibiotic Awareness Week 2019, including videos of interviews from inception event. According to statistics collected by the IDRC communications team, the potential reach of the Twitter and Facebook campaigns was up to 55k people.
2. At least 11 project profiles were posted on the InnoVet-AMR webpage (part of communications activities to boost program engagement and share results and lessons learned).
3. 109047: Publication in the journal Pathogens (article titled 'Characterization and Protective Activity of Monoclonal Antibodies Directed against Streptococcus suis Serotype 2 Capsular Polysaccharide Obtained Using a Glycoconjugate', by Goyette-Desjardins et al).
4. An InnoVet-AMR-supported researcher at the Universite Laval (Dr Sylvain Moineau, project 109049) was awarded the 2019 prix Marie-Victorin – Sciences naturelles et genie. This is the highest distinction awarded by the Government of Quebec and is given for an outstanding research career in the natural sciences and engineering.
5. An InnoVet-AMR-supported researcher at the University of Alberta (Dr Todd Lowary, PI on project 109047) was recognised with a significant award, the Arthur C. Cope Scholar Award by the American Chemical Society. This is given in recognition of contributions to cutting-edge organic chemistry.
6. 109056: Dr Nguyen is a member of the AMR Agricultural sub-committee under the National Steering Committee on AMR of Ministry of Agriculture and Rural Development of Vietnam.

BactiVac

1. BVNCP2-09: The Principal Investigator is the acting chairperson of a local NGO (One Heart Gambia) and raises public health awareness. Importance of the medical treatment of GAS (group A streptococcus) pharyngitis is being continuously emphasized especially as the local population perceive this more as a spiritual issue. Volunteers, including some patients and parents, developed and acted a short play to emphasize the bacterial basis (versus spiritual) of pharyngitis and the need for penicillin treatment to prevent RHD.
2. BVNCP2-09: An article was published in the journal Clinical Microbiology and Infection (article titled 'Updating emm-typing for Streptococcus pyogenes', by Frost et al).

3. Project BVNCP2-07 are continuously engaged with the local director of the Nicaraguan Ministry of Health in León, who is highly supportive of their work and has provided resources to assist with the study. This project is planning to present their final results to the national Ministry of Health and all local directors with his assistance. On conclusion of the project, they will discuss next steps and resources to potentially scale up the Group B Streptococcus screening program in the country, developing liaisons with the Nicaraguan Society of Obstetricians and Gynecologists.
4. BVNCP2-03: An oral presentation was given at the UK Clinical Vaccine Network Conference hosted by St George's University Vaccine Institute in London.
5. BactiVac & IVVN Network Workshop on Mucosal Vaccines For Tilapia, Aquacultural Biotechnology Division, Biotechnology Center of Ho Chi Minh City, Vietnam. GAMRIF-funded PI chaired and gave an overview of BactiVac, the IVVN and the project; and another PI also spoke. 62 participants attended the workshop, which was open to fish producers, vaccine companies and academics specialising in vaccine development and fish health from South East Asia. 32 scientists were invited from Vietnam, and 30 from Bangladesh, Malaysia, Indonesia and Thailand, plus projects partners. The purpose of the workshop was to discuss how to disseminate results, transfer technologies, decide on strategies for follow-on funding and how to promote this work to obtain maximum impact.

FIND

1. A 27-page report on FIND Strategy for Regulatory and Registration Compliance Point of Care in vitro diagnostics for infection due to *Neisseria gonorrhoeae* was completed.
2. GAMRIF-funded results contributed to a publication in the Journal of the International AIDS Society 'Diagnosing sexually transmitted infections in resource-constrained settings: challenges and ways forward', by Wi et al.
3. The FIND team presented on their work on interoperability, including the One Health Surveillance system developed in collaboration with Zambia National Public Health Institute, at the Global Digital Development Summit 2019.
4. The FIND team presented their work on using interoperability for One Health Surveillance system in Zambia and Senegal at the ACORN project kick-off in Thailand in 2019. The ACORN project is funded by the Wellcome Trust and is led by Cambodia Oxford Medical Research Unit.
5. The dengue module project received local newspaper coverage in Burkina Faso, with the article pointing out that empirical prescribing of antibiotics is a problem that can contribute to antimicrobial resistance. <https://lefaso.net/spip.php?article93417>

6. Invited speaker and participant at WHO's technical working group on computable guidelines.
7. 72nd World Health Assembly (WHA) side event "Transforming primary healthcare in the digital age" bringing expert presentations and a panel discussion on the impact and sustainability of clinical decision support tools. The event attracted over 60 participants from academia, industry, not-for-profit organisations and development agencies.
8. Invited to present a summary of current modelling work and R&D activities at the London School of Hygiene and Tropical Medicine meeting "From Global to Local: addressing the threat of AMR to STI control" in January 2020.
9. Academic publication in the Journal of Antimicrobial Chemotherapy 'In vitro activity of the ketolide cethromycin in multidrug-resistant clinical Neisseria gonorrhoeae isolates and international reference strains' by Jacobsson et al.
10. Academic publication in Antimicrobial Agents and Chemotherapy, titled "High in vitro susceptibility to the first-in-class spiropyrimidinetrione zoliflodacin among consecutive clinical Neisseria gonorrhoeae isolates from Thailand (2018) and South Africa (2015-2017)" by Jacobsson et al.

GARDP

1. Publication in the Journal of Antimicrobial Chemotherapy "In vitro antimicrobial combination testing of and evolution of resistance to the first-in-class spiropyrimidinetrione zoliflodacin combined with six therapeutically relevant antimicrobials for Neisseria gonorrhoeae", by Foerster et al.
2. LSHTM event (From global to local: addressing the threat of AMR to STI control). Title was 'Zoliflodacin project and antibiotic stewardship framework: access and conserving treatment. What is being done and what is needed'.
3. [Pre-conference workshop hosted by GARDP](#), part of the Global Health Security conference, Sydney, Australia.

Annex 2: Key external engagements

April 2019

- Two members of the GAMRIF team attended a workshop for the Livestock Vaccines Innovation Fund (LVIF) led by IDRC in London, UK networking with LVIF grantees and learning from their experiences ahead of the launch of the sister project, InnoVet-AMR, funded by GAMRIF and IDRC

May 2019

- the Head of Global AMR attended a roundtable convened by the Wellcome Trust in London, UK to discuss the concept of an AMR scorecard and review progress made on R&D funding since the publication of the AMR Review, chaired by Lord O'Neill
- the Head of Global AMR supported the Chief Medical Officer and DHSC ministers at the World Health Assembly in Geneva, ensuring that GAMRIF activities were referenced during side events including the annual ministerial Alliance of Champions breakfast meeting, the GARDP reception and bilateral meetings with other WHO member states
- the GAMRIF Project Lead represented the Fund at a two-day workshop convened by the Global AMR R&D Hub in Geneva, Switzerland to develop recommendations for follow-up by the Hub. The workshop focused on the opportunities and barriers for investments and new and innovative financing mechanisms for AMR R&D using a 'One Health' approach
- the Head of Global AMR was invited to present at the AMED (Japan Agency for Medical Research and Development) symposium on AMR in Tokyo, Japan and also held meetings with Japanese government and industry stakeholders on AMR R&D. Discussion topics included the work of GARDP and the GAMRIF operating model

June 2019

- the Head of Global AMR was invited to join a panel discussion at an event on tackling antimicrobial resistance organised by the British Embassy, Berlin as part of the German Foreign Office-coordinated week of activities on the UN sustainability agenda. The intervention covered the challenges and opportunities of an early-stage AMR R&D portfolio to address the needs of people in LMICs

- a UK delegation headed by the DHSC Minister for Innovation travelled to the second AMR One Health Ministerial Conference in the Netherlands. The Head of Global AMR attended on behalf of GAMRIF and joined discussion and learning sessions including on market access and product pipeline sustainability
- the GAMRIF Project Lead and the Head of Global AMR attended the InnoVet-AMR kick-off event in Ottawa, Canada with the latter presenting the GAMRIF portfolio and UK approach to AMR R&D for LMICs
- the GAMRIF Science and Research Coordinator represented the Fund at the 5th International Symposium on the Environmental Dimension of Antibiotic Resistance (IDAR5) in Hong Kong

July 2019

- the GAMRIF Project Lead helped shape and attended the GARDP-led event in Geneva, Switzerland on Stewardship and Access for antibiotics, bringing in CHAI as an additional stakeholder to address sustainability and market access issues

August 2019

- in preparation for the 6th World One Health Congress (due to be held in Edinburgh, UK in summer 2020), the GAMRIF Science and Research Coordinator was invited to join the Scientific Programme Committee on AMR to help shape the AMR track. The conference will now take place virtually in November 2020
- the Head of Global AMR attended the Medical Research Foundation National PhD Training Programme in AMR annual conference in Bristol, UK to promote GAMRIF work to PhD students, along with colleagues from UKRI

September 2019

- the Science and Research Coordinator was invited to join the Bloomsbury SET (Science, Economics, Technology) Programme Advisory Council on the basis of the expertise gained working on GAMRIF. The first face-to-face meeting was held in November 2019

October 2019

- the Head of Global AMR joined the UK delegation to Japan, attending the third and final G20 health working group as well as the G20 health ministerial meeting, covering issues related to GAMRIF in the negotiating brief (including the importance of sustainable R&D funding for AMR, focus on LMIC-specific issues, stewardship and access)
- along with a number of teleconference meetings during the year, GAMRIF was also represented at the annual two-day meeting of the Global AMR R&D Hub Board and Stakeholder Group. The Head of Global AMR represented the UK and updated fellow Board members on GAMRIF progress as well as possible future plans for R&D funding
- the GAMRIF Project Lead joined the UK delegation for the kick-off event of the UK-Argentina partnership in Buenos Aires, Argentina, presenting an overview of the whole GAMRIF portfolio and key principles to the UK and Argentinean grantees

November 2019

- the Deputy Director for Global Health Security and the Head of Global AMR joined the UK Special Envoy at an investor conference on AMR convened by the British Society for Antimicrobial Chemotherapy and the European Bank for Reconstruction and Development in London. In her keynote speech, Dame Sally Davies made specific reference to GAMRIF
- the GAMRIF Science and Research Coordinator provided additional support to the UK Vaccine Network team in preparing for their 2020 annual conference. Through her involvement, the stakeholder list was expanded including an invitation and presentation slot for the BactiVac Network

December 2019

- the Head of Global AMR joined the UK delegation for the kick-off event of the UK-China partnership and joint meeting with the MRC and their grantees in Beijing, China. The GAMRIF portfolio and operating principles were presented as part of a keynote intervention, reaching a wide range of UK- and China-based stakeholders
- the Head of Global AMR participated in the JPIAMR-organised AMR Hackathon in Stockholm, Sweden taking the learning from GAMRIF implementation into conversations with other participants as teams worked together to design innovative AMR projects over 48 hours. During the trip, meetings were also held with ReAct Europe, the Uppsala Antibiotic Center and Lif, the Swedish pharmaceutical industry body

January 2020

- the Project Lead and Project Officer represented GAMRIF at the LSHTM-organised conference on AMR and Sexually Transmitted Infections in London, UK also attended by GAMRIF-supported delivery partners GARDP and FIND

February 2020

- ahead of the CARB-X Joint Oversight Committee in Washington D.C., US, the Global AMR Lead undertook scoping meetings with UN organisations in New York City on possible future collaborations and led a 'lunch and learn' session for staff at the UK Mission to the UN, covering the GAMRIF portfolio

March 2020

- finally, just before lockdown, the Head of Global AMR attended the second health working group of the Saudi G20 presidency in Jeddah, Saudi Arabia, having worked closely with Saudi Arabia to develop a side event on the fragility of the AMR R&D pipeline. The roundtable discussions centred around interventions made by the Wellcome Trust and the Global AMR R&D Hub Secretariat and was designed to help other G20 countries in their reflections on market failure and the second 'valley of death' faced by AMR researchers and product developers, including those supported by GAMRIF

Annex 3: Communications outputs in 2019/20

Table 10: Press releases, announcements and publicly available documents referred to in the annual review

Subject and date	Description	Location
InnoVet-AMR announcement 10 June 2019	InnoVet AMR projects announcement	InnoVet AMR projects announcement
Wilton Park Workshop report 14 June 2019	The report on the Wilton Park workshop that convened experts from the Global South and North to explore solutions to reduce the use of antimicrobials in food-producing animals in LMICs	Wilton Park Workshop report
UK-Argentina announcement by GOV.UK 2 October 2019	GOV.UK news story on the launch of the 'Tools to tackle AMR in the environment' programme	UK-Argentina announcement by GOV.UK
UK-Argentina announcement by CONICET 7 October 2019	CONICET announcement on the launch of the 'Tools to tackle AMR in the environment' programme	UK-Argentina announcement by CONICET
Press release from GARDP on (additional) £3.5m 28 October 2019	GARDP press release on the additional £3.5 million of funding from GAMRIF to develop new treatments for gonorrhoea	Press release from GARDP on (additional) £3.5m
Announcement on (additional) funding to FIND 19 November 2019	GOV.UK news story on the additional funding from DFID and DHSC for FIND	FIND funding announcement

Video interviews for the GAMRIF project



During the UK-Argentina meeting, CONICET led the development of video interviews with the researchers. A summary of that coverage is available on CONICET's website ([UK-Argentina interviews](#)).

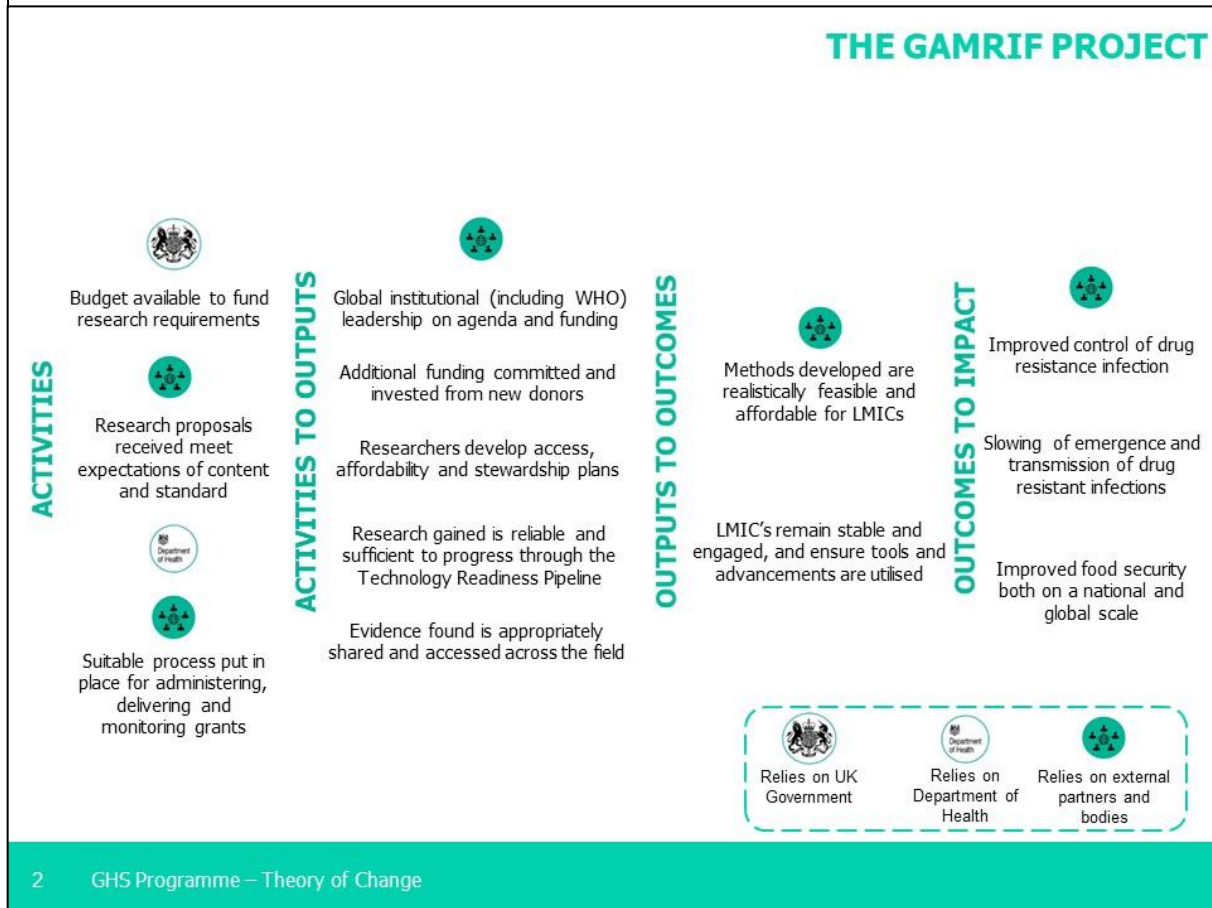
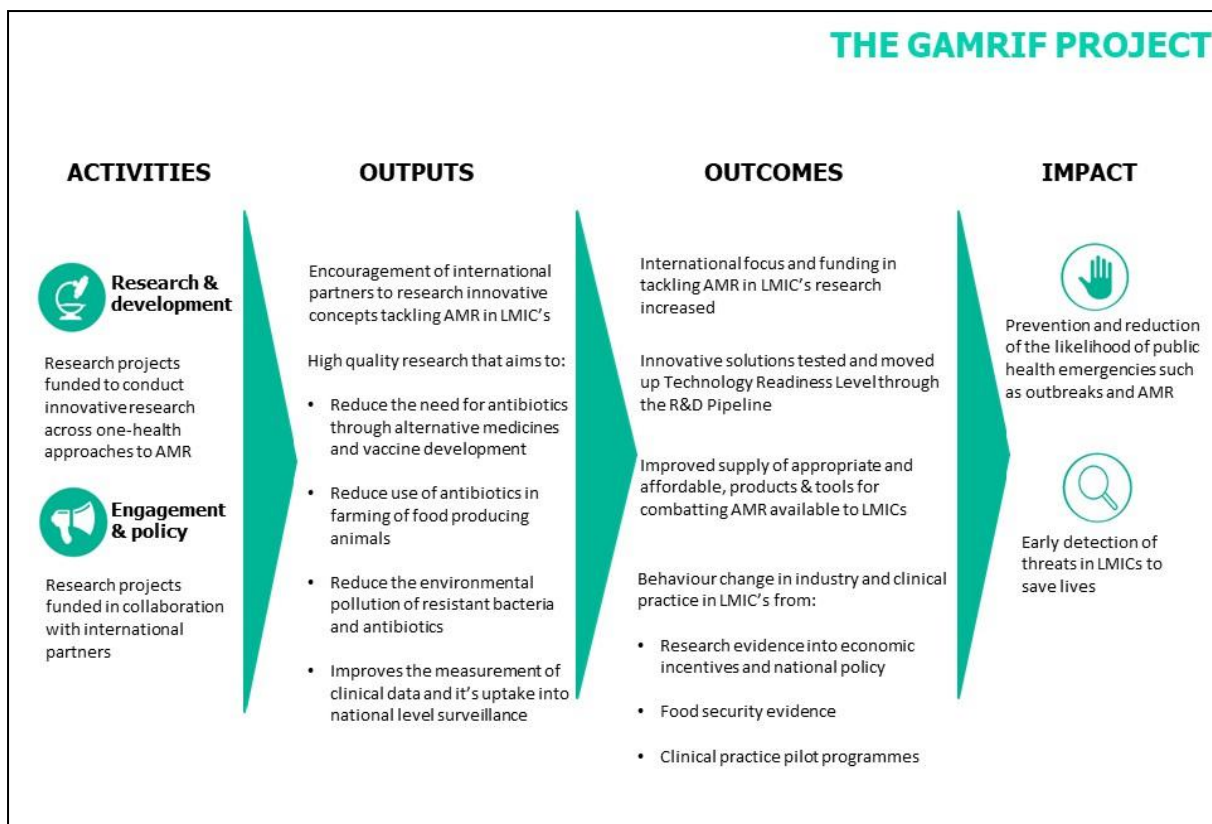


Video interviews with various delegates were also carried out at the UK-China AMR Conference, and this footage can be used for social media or public exhibition.



Videos including interviews with the researchers of the InnoVet-AMR projects are available on the IDRC website ([Interviews with InnoVet-AMR researchers](#)).

Annex 4: GAMRIF Theory of Change



Slide 1 – Theory of change

ACTIVITIES

- Research & development: Research projects funded to conduct innovative research across one-health approaches to AMR
- Engagement & policy: Research projects funded in collaboration with international partners

OUTPUTS

- Encouragement of international partners to research innovative concepts tackling AMR in LMICs
- High quality research that aims to:
 - Reduce the need for antibiotics through alternative medicines and vaccine development
 - Reduce use of antibiotics in farming of food-producing animals
 - Reduce the environmental pollution of resistant bacteria and antibiotics
 - Improves the measurement of clinical data and its uptake into national level surveillance

OUTCOMES

- International focus and funding in tackling AMR in LMICs research increased
- Innovative solutions tested and moved up Technology Readiness Level through the R&D Pipeline
- Improved supply of appropriate and affordable, products and tools for combatting AMR available to LMICs
- Behaviour change in industry and clinical practice in LMICs from:

- Research evidence into economic incentives and national policy
- Food security evidence
- Clinical practice pilot programmes

IMPACT

- Prevention and reduction of the likelihood of public health emergencies such as outbreaks and AMR: Early detection of threats in LMICs to save lives.

Slide 2 – Assumptions

ACTIVITIES

- Budget available to fund research requirements (Relies on UK Government)
- Research proposals received meet expectations of content and standard (Relies on external partners and bodies)
- Suitable process put in place for administering, delivering and monitoring grants (Relies on Department of Health, and relies on external partners and bodies)

ACTIVITIES TO OUTPUTS (all rely on external partners and bodies)

- Global institutional (including WHO) leadership on agenda and funding
- Additional funding committed and invested from new donors
- Researchers develop access, affordability and stewardship plans
- Research gained is reliable and sufficient to progress through the Technology Readiness Pipeline
- Evidence found is appropriately shared and accessed across the field

OUTPUTS TO OUTCOMES (all rely on external partners and bodies)

- Methods developed are realistically feasible and affordable for LMICs
- LMICs remain stable and engaged, and ensure tools and advancements are utilised

OUTCOMES TO IMPACT (all rely on external partners and bodies)

- Improved control of drug resistance infection
- Slowing of emergence and transmission of drug resistant infections
- Improved food security both on a national and global scale

Annex 5: GAMRIF LogFrame

Impact

People in LMICs have improved ability to tackle the development and consequences of drug-resistant infections.

Assumptions

1. Research is inherently risky, and not all projects will achieve the intended results- in fact, the majority of funded projects are unlikely to achieve commercialisation. Funding numerous early-stage research initiatives will result in enough successful research that will, in time, contribute to the intended impact.
2. GAMRIF only funds innovations to a certain point in the pipeline, and there are several additional factors (e.g. commercial influences, behaviour change to influence uptake, external pressures, etc) that will influence actual production, access and use of innovations to achieve the intended impact.
3. Even if GAMRIF funds projects that are eventually commercialized, the process including clinical trials can take years and may not be able to be measured in the GAMRIF lifespan.

Impact Indicator 1		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
There are new innovations for antimicrobial resistance (AMR) available that can effectively combat drug-resistant infections.	Planned	0	n/a	n/a	n/a	n/a	n/a	≥ 1 innovation	Antimicrobial Resistance Benchmark from the Access to Medicines Foundation, Pew Charitable Trusts Antibiotic Resistance Project

Impact Indicator 2		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Novel innovations to combat drug-resistant bacterial infections are shown to have been piloted specifically in LMICs	Planned	0	n/a	n/a	n/a	n/a	n/a	≥ 5 case studies of country implementation	DHSC and Partner press releases, ongoing partner reporting

Outcome

There is increased likelihood of technologies and solutions across the One Health2 spectrum that will help combat AMR, which are accessible, affordable and taken up in LMICs.

Assumptions

1. A high number of proposals will be successful enough to be able to advance Technology Readiness Levels (TRLs), as opposed to negative results.
2. Advanced TRL levels will lead to innovations that will eventually become accessible in LMICs.
3. High quality proposals will be achieved across human, animal and environmental health to achieve a reasonable 'One Health' representations (most risky for environmental projects).
4. Researchers and delivery partners will be involved in communications of their projects, and will publicize results during the GAMRIF lifespan.
5. Policy makers will find communications interesting and relevant.

Outcome Indicator 1		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number of projects funded within the GAMRIF portfolio that have increased their Technology Readiness Level (TRL) within the timespan of GAMRIF	Planned	0 innovations	n/a	n/a	2 innovations in the GAMRIF portfolio	10 innovations in the GAMRIF portfolio	10 innovations in the GAMRIF portfolio	25 total innovations in the GAMRIF portfolio	Ongoing partner reporting

Outcome Indicator 2		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
There are funded research projects that address issues in AMR through a focus on topics within human, animal and environmental health	Planned	0 human 0 animal 0 environm'l	n/a	≥ 18 human ≥ 10 animal ≥ 5 environm'l	≥ 12 human ≥ 5 animal 0 environm'l	n/a	n/a	≥ 32 human total ≥ 15 animal total ≥ 5 environm'l total 75% of research projects have produced a plan for stewardship and access	Ongoing partner reporting

Outcome Indicator 3		Baseline (start 2016/17)	Year 1 end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Findings are clearly communicated to global policy makers, for the benefit of LMICs, through non-academic forms of dissemination (e.g. utilizing the forms of communication established by the Fleming Fund and the UK Science and Innovation Network).	Planned	0 communications	NA	≥ 1 communication	≥ 2 communications	≥ 2 communications	≥ 2 communications	≥ 7 communications total	DHSC and Partner press releases, public reports, Fleming Fund, UK Science and Innovation Network

Output 1

Foster international partnerships to increase attention and leverage funding towards AMR research and innovations for the benefit of people in LMICs.

Assumptions of output 1

1. Increased international partnerships and funding will be sufficient to effectively direct resources in a way that will be of benefit to LMICs for tackling AMR.
2. Knowledge sharing will contribute to improved innovations in the AMR field, and will be something of benefit to LMIC researchers.
3. Increased funding will lead to an increased chance of successful AMR innovations used by LMICs.

Output Indicator 1.1		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The amount of resources, both funding and in-kind, leveraged for AMR research and development with a benefit for people in LMICs	Planned	£30 million (approx. due to forex conversions)	n/a	£11 million (approx. due to forex conversions) Leverage in-kind resources from donors and partner organizations	£5 million Leverage in-kind resources from donors and partner organizations	£4 million Leverage in-kind resources from donors and partner organizations	n/a	£50 million (approx. due to forex conversions) plus in-kind leverage	Partner and DHSC press releases

Output Indicator 1.2		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Number of international-facing partnerships held between GAMRIF and other strategic partners that bring attention towards 'One Health' research and innovation in AMR globally, and political leverage for the UK.	Planned	0 partnerships 1 bilateral MOU signed	1 new partnership	5 new partnerships Partnerships are formed with a diverse number of government and non-profit organizations. 1 Bilateral MOU signed	n/a	n/a	n/a	7 partnerships total	MOUs and grant agreements between the Global AMR Innovation Fund and external partners, informal partners

Output Indicator 1.3		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Global meetings, discussions and other knowledge sharing opportunities are held and directly supported by GAMRIF, which bring together researchers from LMIC organizations	Planned	0 LMIC researchers engaged	≥ 20 LMIC researchers engaged GAMRIF supports 1 international meeting with participants from LMIC research organizations	≥ 30 LMIC researchers engaged GAMRIF supports 2 international meetings with participants from LMIC research organizations	≥ 40 LMIC researchers engaged GAMRIF supports 2 international meetings with participants from LMIC research organizations	≥ 30 LMIC researchers engaged GAMRIF supports two 2 meetings with participants from LMIC research organizations	≥ 30 LMIC researchers engaged GAMRIF supports 2 international meetings with participants from LMIC research organizations	≥ 150 LMIC researchers engaged on separate occasions through knowledge sharing opportunities that are directly supported by GAMRIF	Partner reports

Output 2

Enhance bilateral research partnerships that will support AMR research.

Assumptions of output 2

1. Continued funding to bilateral research projects over concurrent years will support positive results.
2. Case studies will serve as indicators of successful projects, which have the potential to be scaled up for wider implementation and impact in other contexts.
3. Disbursed funding will enable innovative research to occur, which may not have happened otherwise.
4. Bilateral partnerships (and cross-cultural research) are an effective mechanism to leverage funding, increase attention for AMR, and to achieve research results.

Output Indicator 2.1		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number of bilateral research projects between researchers from the UK and a bilateral partner that receive funding towards an agreed upon project	Planned	0	n/a	14 projects	19 projects (14 ongoing, 5 new)	19 projects (continued)	19 projects (continued)	19 projects receive GARMIF funding over three years	Ongoing partner reporting

Output Indicator 2.2		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number and range of knowledge translation outputs produced by funded projects	Planned	No products by funded projects	n/a	n/a	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Ongoing partner reporting, research fish outputs, partner publications

Output Indicator 2.3		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Successful research competitions are ran and as a result GAMRIF funding for bilateral partnerships is allocated to selected projects	Planned	0% of bilateral funding disbursed	0.56% of bilateral funding disbursed Two or more delivery partners selected	7.26% of bilateral funding disbursed to selected research projects Individual research competitions from each bilateral delivery partner have been completed, with projects selected.	29.70% of bilateral funding disbursed to selected research projects	32.94% of bilateral funding disbursed to selected research projects	27.36% of bilateral funding disbursed to selected research projects	100% of bilateral funding disbursed to selected research projects	Ongoing financial monitoring, MOUs and/or grant agreements with delivery partners, Ongoing partner reporting

Output 3

Support global initiatives (GI) that foster innovation in AMR research and product development, to develop knowledge and research that have benefit for LMICs.

Assumptions of output 3

1. Global initiatives will draw in a range of research proposals that may lead to effective AMR innovations for LMICs.
2. Case studies will serve as indicators of successful projects, which have the potential to be scaled up for wider implementation and impact in other contexts.
3. Academic publications and presentations will serve as effective tools for knowledge translation in the research community to share research successes (and failures), and may broaden the impact of funding to additional funding audience.
4. Publications and presentations will be accepted in academic papers and conferences, and will be developed in the lifespan of GAMRIF.
5. Real-world testing of vaccines, antibiotics or therapeutics will be able to be advanced down the commercialization pipeline, and will overcome market risks to become accessible.
6. Real-world testing will occur in the lifespan of GAMRIF.

Output Indicator 3.1		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number of research projects within global initiatives that receive funding towards an agreed upon project	Planned	No products by funded projects	n/a	21 projects	16 new projects	8 new projects 3 human/animal vaccines and alternatives to antibiotics are advanced to real-world testing, which includes clinical trials in humans and the development phase in animals.	n/a 3 human/animal vaccines and alternatives to antibiotics are advanced to real-world testing, which includes clinical trials in humans and the development phase in animals.	45 projects funded 4 innovations human/animal vaccines and alternatives to antibiotics are advanced to real-world testing, which includes clinical trials in humans and the development phase in animals.	Ongoing partner reporting, partner publications

Output Indicator 3.2		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number and range of knowledge translation outputs produced by funded projects	Planned	No products by funded projects	n/a	n/a Two research competitions are run, that provides pump-priming funding.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Increasing number of knowledge translation products are produced. A variety of products are products to reach different audiences.	Ongoing partner reporting, partner publications

Output Indicator 3.3		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Successful research competitions are ran and as a result GAMRIF funding for global initiative partnerships is allocated to selected projects	Planned	0% of global initiative funding disbursed	n/a	4.92% of global initiative funding disbursed	32.71% of global initiative funding disbursed	35.93% of global initiative funding disbursed	26.45% of global initiative funding disbursed	100% of global initiative funding disbursed to selected research projects	Ongoing financial monitoring, MOUs and/or grant agreements with delivery partners, Ongoing partner reporting

Output Indicator 3.4		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number of research projects that have participated in training, capacity building or mentorship as a part of carrying out their research program	Planned	0 research projects	n/a	n/a	15 projects participate in training, capacity building or mentorship	10 projects participate in training, capacity building or mentorship	10 projects participate in training, capacity building or mentorship	≥ 35 projects have participated in training, capacity building or mentorship	Ongoing partner reporting

Output 4

Support product development partnerships (PDPs) to develop affordable innovations that will reach commercialization.

Assumptions of output 4

1. The products being funded through PDPs are effective when implemented in a real-world setting.
2. Piloted products will be able to be effectively scaled up to additional countries and communities.
3. Study reports will lead to a broader implementation and awareness of the respective products, and will share methods and approaches that will advance other innovations in global health.
4. Products will be able to reach the market and be widely accessible in LMICs.

Output Indicator 4.1		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number of pilot implementations of GAMRIF funded AMR innovations in selected LMIC trial sites	Planned	0 pilots	n/a	3 pilot sites finalized	3 new pilot sites finalized	n/a	n/a	≥ 6 pilots underway or completed	Ongoing partner reporting

Output Indicator 4.2		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
The number of published reports that share results from product development towards a global audience.	Planned	0 reports	n/a	1 report 3 diagnostic TPPs published	2 new reports	2 new reports	n/a	6 study reports in total on new products for AMR	Ongoing partner reporting

Output Indicator 4.3		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Funded innovations achieve milestones that advance the product down the commercial pipeline	Planned	0 new products achieving milestones	n/a	2 new products achieve new milestones	2 new products achieve new milestones	n/a	n/a	4 products show to have achieved milestones in the commercialization pipeline	Ongoing partner reporting

Output Indicator 4.4		Baseline (start 2016/17)	Year 1 (end 2017/18 financial year)	Year 2 (end 2018/19 financial year)	Year 3 (end 2019/20 financial year)	Year 4 (end 2020/21 financial year)	Year 5 (end 2021/22 financial year)	Target (end 2022 calendar year)	Source
Successful research competitions are ran and as a result GAMRIF funding for PDPs is allocated to selected projects	Planned	0% of PDP funding disbursed	n/a	18.35% of PDP funding disbursed	66.97% of PDP funding disbursed	14.68% of PDP funding disbursed	0% of PDP funding disbursed	100% of PDP funding disbursed to selected research projects	Ongoing financial monitoring, MOUs and/or grant agreements with delivery partners, Ongoing partner reporting

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Global Health Group; International Directorate; Global Health Security Programme;
Global Antimicrobial Resistance Innovation Fund (GAMRIF)

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