

# Terms of Reference for Request for Proposals for Fleming Fund Country Grant to Zimbabwe

## 1 Overview of this grant

This is a Request for Proposals (RFP) for the first Country Grant to address gaps in surveillance of antimicrobial-resistant bacteria in Zimbabwe. It has been created in response to a Request for Support from the Minister of Health, on behalf of the Government of Zimbabwe. The grant will be funded by the UK Department of Health and Social Care (DHSC), under its Fleming Fund Grants Programme, which is managed by Mott MacDonald, the Management Agent.

This first Fleming Fund Country Grant for Zimbabwe will focus on putting in place the foundations for antimicrobial resistance (AMR) and antimicrobial use (AMU) surveillance in the human and animal health sectors, as well as some aspects of AMR surveillance in the environment. It will facilitate a stronger One Health (OH) approach to surveillance, bringing together multi-sectoral stakeholders to share surveillance data and gain a better understanding of AMR and AMU.

This grant will align with the National Action Plan (NAP) for antimicrobial resistance and with the investments made by other donors and stakeholders in this area. In both the human and animal health sectors, the grant will invest in the improvement of AMR and AMU data collection, management, analysis and use in multi-sectoral decision making, as well as in the reinforcement of both reference and surveillance site laboratories. In addition, the grant will further develop and support the coordination with ministries as well as between technical institutions involved in AMR/AMU surveillance.

The grantee will be responsible to Mott MacDonald for all aspects of the grant, including the management of any partners, their performance, technical delivery and financial accountability. The grantee will be expected to sign the Grant Agreement and will be expected to enter into sub-granting arrangements with partners, if any, on the same back-to-back terms.

The grantee will need to work in close coordination with the AMR Core Group (AMRCG), as well as Mott MacDonald and other national stakeholders. The grantee will also be required to harmonize efforts on this Country Grant with other types of grants under the Fleming Fund Grants Programme, namely Regional Grants and the Fleming Fellowship Scheme.

This grant is expected to last 20 months ending no later than September 2021. Grant applications should be in the region of GBP 4 million, including all capital and recurrent costs, overheads and management costs.

## 2 Overview of the Fleming Fund

### 2.1 Introduction

The UK Government has established the Fleming Fund to respond to the global threat of drug-resistant infections due to bacterial Antimicrobial Resistance (AMR). The Fleming Fund will be a critical tool in achieving the resolution of the 68th World Health Assembly, 2015 (WHA A68/20), and in realising the ‘Political Declaration of the High-Level Meeting of the United Nations General Assembly (UNGA) on Antimicrobial Resistance, 2016’. These recognise that urgent cross-sectoral rationalisation of antimicrobial use, and prevention and control of infections in humans, animals, food, agriculture, and aquaculture sectors, are key to tackling AMR and call for: innovative research and development; affordable and accessible antimicrobial medicines and vaccines; improved surveillance and monitoring; increased governance on antimicrobial use; and increased international cooperation to control and prevent AMR.

The Fleming Fund aims to address critical gaps in surveillance of antimicrobial-resistant bacteria in low- and middle-income countries (LMICs) in Asia and Sub-Saharan Africa. Countries in these areas are set to bear the highest burden of drug resistant infections. A Global Action Plan on Antimicrobial Resistance (GAP-AMR) has been developed by the World Health Organization (WHO), which acts as the blueprint for a multi-stakeholder global response to averting a global health crisis caused by AMR.<sup>1</sup> The Fleming Fund comprises a number of workstreams (see [www.flemingfund.org](http://www.flemingfund.org) for more information). One workstream provides support to the Tripartite Alliance – the Food and Agriculture Organization (FAO), the World Organisation for Animal Health (OIE) and the World Health Organization (WHO) – as part of the OH approach. Through funding to the Tripartite Alliance, the Fleming Fund has contributed to the development of National Action Plans (NAPs) in Sub-Saharan Africa, South and South East Asia, and to the building of the evidence base and guidance for AMR surveillance. This work will be critical for the overall success of the Fleming Fund Grant Programme and underpins the delivery of the portfolio of Country and Regional Grants and the Fleming Fellowship Scheme, as these will target capacity gaps identified in NAPs. The Fleming Fund also funds initiatives in academic institutions to develop guidance on the development of AMR surveillance systems.

The Fleming Fund Grants Programme is the largest stream of financial support available through the wider Fleming Fund. The DHSC has appointed Mott MacDonald as the Fleming Fund Management Agent for the Fleming Fund Grants Programme. Mott MacDonald is a global company with expertise in multi-sectoral international development and fund management. On behalf of the UK Government, Mott MacDonald is responsible for funding allocation and oversight of all investments made across the whole portfolio of grants in different activities and in different countries.

The aim of the Fleming Fund Grants Programme is to improve the ability of recipient countries to diagnose drug-resistant infections, with an emphasis on bacterial infections, and to improve data and surveillance to inform policy and practice at national and international levels. The overall goal is to avert the human and economic burden of AMR.

---

<sup>1</sup> <http://www.who.int/antimicrobial-resistance/global-action-plan/en/>

The Fleming Fund Grants Programme focuses on 20-24 LMICs from Sub-Saharan Africa, and South and South East Asia. It is expected to provide financial support until the year 2021, to participating countries via three funding channels:

- Country Grants
- Fleming Fellowship Scheme Grants
- Regional Grants

The Fleming Fund will be independently evaluated by Itad, a specialist evaluation firm appointed by DHSC for this purpose.

## 2.2 Problem statement to be addressed by the Fleming Fund

The main issues to be addressed by Fleming Fund Country Grants are outlined below:

- There are too few trained microbiologists to undertake the volume of testing required for representative surveillance on AMR.
- There are few health facilities that routinely undertake bacterial culture; still fewer facilities that meet the requirements for accreditation, or which do routine antimicrobial susceptibility testing.
- There is no culture of surveillance for AMR in healthcare delivery and there are barriers to developing it.
- There is little perceived use of surveillance data on any level, including low demand for the data from policy makers.
- There is a lack of knowledge on the use and consumption of antimicrobial agents across One Health sectors.
- There is a lack of antimicrobial stewardship.
- Logistical challenges are significant: transporting samples in a safe and secure manner under challenging transport conditions; ensuring a quality assured and sustained supply chain for reagents and consumables; and ensuring appropriate servicing of equipment are a few examples.
- Surveillance systems (national, regional and global) that do exist are often vertical in nature, are not linked, and are not integrated.
- There are weak One Health structures and there is poor inter-sectoral collaboration.
- There is a heterogeneous picture across countries and regions in terms of starting points, political will, capability, and donor interest and engagement.
- There are poorly defined and applied quality assurance standards in laboratory testing.
- There is lack of understanding on transmission patterns and drivers such as inappropriate use of antimicrobial drugs across all sectors.

## 2.3 Fleming Fund investment areas and outputs

To address the problems above, the Fleming Fund Grants Programme invests in:

- Laboratory infrastructure enhancement.
- Human resource strengthening and workforce reforms.
- Surveillance systems strengthening.
- Building foundations for AMR surveillance data use.
- Promoting rational use of antimicrobial medicines.

Investment in these areas is expected to achieve the following outputs:

- Improved laboratory skills and conditions for bacterial identification and Antimicrobial Susceptibility Testing (AST); and, therefore, improved data quality.
- A Strengthened One Health workforce with a range of relevant skills for AMR surveillance.
- Stronger AMR surveillance systems and processes at country and regional levels.
- Higher demand for AMR data at regional, country, subnational and facility levels.
- Better knowledge of country level patterns of prescribing practice and use of antimicrobials (particularly for bacterial infection) across sectors.

Fleming Fund outputs are expected to contribute to the following country outputs:

- Increase in quality and quantity of AMR and AMU data collected.
- AMR and AMU data shared in country to support evidence-based policy and practice
- AMR and AMU data shared internationally to improve and inform the global response, in particular via the WHO Global Antimicrobial Resistance Surveillance System (GLASS) for human health AMR data.

The RFPs for Country Grants have been designed to ensure that investments and activities contribute directly to outputs. Grantees are expected to adhere to and demonstrate this alignment and contribution to outputs in their applications.

## 2.4 Core principles within the Fleming Fund Grants Programme

The Fleming Fund is built on four core principles. Grantees are expected to demonstrate how they will align with these principles while implementing the grant.

- 1) Country Ownership:** The Fleming Fund Grants Programme will be implemented in line with national plans and aspirations, as laid out in the National Action Plan. Unless there are good reasons not to do so, Fleming Fund grants will chiefly invest in public sector laboratories and surveillance systems, thereby supporting national public health systems.
- 2) One Health:** The Fleming Fund recognises that the problem of AMR is a great danger to human health and cannot be controlled without a One Health approach. A specific set of One Health investment parameters has also been developed and is summarised below. This approach is

aligned with key documents and guidelines from OIE<sup>2</sup> and FAO<sup>3</sup> as well as the Global Action Plan.

- a. ***Collaborative multi-sectoral governance of AMR:*** Leadership and resourcing of AMR surveillance and mitigation measures in all sectors that contribute to the emergence of AMR.
  - b. ***Integrated AMR and antimicrobial use and consumption surveillance in all sectors:*** Surveillance in humans, livestock, aquaculture, crops, food and the environment to produce information that is interpreted by multi-sectoral teams to help understand factors associated with AMR emergence within and between sectors.
  - c. ***AMR mitigation policies and programmes prioritised across multiple sectors:*** Evidence-based policies and programmes for AMR mitigation measures that are prioritised across the relevant sectors, based on information generated through AMR and AMU/C surveillance in all sectors.
- 3) Alignment of Approach:** The Fleming Fund Grants Programme will seek to invest in areas which complement and build on work done to date, rather than create new systems. Grant applicants will need to demonstrate that they understand other actors' work in the field of improved laboratory capacity (both within and outside the sphere of AMR surveillance), improved disease surveillance, and the One Health approach. The Fleming Fund Grants Programme will assess grants for duplication of efforts and/or the development of parallel systems. To the extent possible, prospective Grantees will need to demonstrate how their proposals add value to existing and planned investments and systems.
- 4) Sustainability:** The Fleming Fund Grants Programme will focus assistance on national systems with a view to long-term sustainability. Investment size and scope should, as far as possible, be aligned with national government spending so that systems created with Fleming Fund grants are sustainable within the public health system. We also recognise that the public good of conducting AMR surveillance means medium- to long-term support, and it is expected that countries that demonstrate good performance will have access to additional funds to provide ongoing support.

## 2.5 Fleming Fellowship Scheme

The Fleming Fellowship Scheme is part of the broader Fleming Fund Grants Programme and is managed by Mott MacDonald. Fellowships provide funding to support on-the-job training over an 18 to 20-month programme of structured learning, mentoring and skills development for four to eight Fellows in each investment country. The Fellowships do not duplicate basic training, rather they focus on building advanced skills and leadership to promote the application of best practice in identified

---

<sup>2</sup> OIE Standards, Guideline and Resolution on Antimicrobial resistance and the use of antimicrobial agents;

<sup>3</sup> The FAO Action Plan on Antimicrobial Resistance, 2016-2020.

'Beneficiary Institutions', while promoting the One Health principle. Beneficiary Institutions are organisations such as AMR reference laboratories national epidemiology units in the human and animal health sectors, hospitals and/or national drug administration agencies that add strategic value and complementarity to achieve the Fleming Fund's aims in the country. They are also institutions most likely to derive sustainable benefit from the Fellowship activities.

The initial focus of the Professional Fellowship Scheme is on strengthening the quality of laboratory diagnostic data and the analysis and use of AMR and AMU surveillance data in Beneficiary Institutions. Fellows in each country are supported by mentors who provide the expertise required to support the needs of the Fellows as well as to help them to improve the sustainability of AMR programmes in their institution. The data they generate will be applied to deliver evidence-based approaches to tackling AMR, for example to improve antimicrobial stewardship.

Priority areas to be supported through the Fellowship Scheme are discussed by a Mott MacDonald scoping team together with the national AMR committee in each country and reviewed with the Beneficiary Institutions to which they are assigned. A template is provided for each Fellowship terms of reference which is adapted to the Beneficiary Institutional needs. One, or at most two, expert Host Institutions are matched with all the Fellowships in a specific country. The Host Institution is drawn from a preselected pool, and after attending an initial workshop with the Fellows and Beneficiary Institution, the Host Institution develops a budgeted work plan. Once workplans and budgets have been agreed by Mott MacDonald, Fellows are formally accepted, and their Fellowship activities expensed through the Host Institution.

## 2.6 Fleming Fund activities in Zimbabwe to date

To develop the Country Grant for Zimbabwe under the Fleming Fund Grants Programme, Mott MacDonald carried out visits to the country in May 2019 to discuss the programme with the Government of Zimbabwe and other stakeholders. During these visits, Mott MacDonald met senior government officials, external development partners, technical experts, and visited select AMR surveillance sites and laboratories in the human health, animal health and environment sectors, in order to understand the current AMR and AMU situation in the country, the programmes that are being implemented, and the laboratory infrastructure and capacities for supporting AMR surveillance.

The discussions identified major gaps and priorities for strengthening AMR and AMU surveillance which will be supported by the Fleming Fund Country Grant for Zimbabwe.

## 3 Current situation of AMR in Zimbabwe

### 3.1 National Action Plan for AMR

Zimbabwe launched their approved One Health Antimicrobial Resistance National Action Plan 2017-2021 in 2017. This was developed by a multisectoral AMR Core Group with the support of WHO and FAO. The NAP has five strategic objectives:

1. Education, training and awareness: To raise awareness and educate the population, professionals and policy makers on AMR

2. Surveillance: Improve detection and understanding of AMR and AMU patterns and trends through surveillance
3. Infection prevention and control, good animal husbandry and biosecurity: Reduce the need for antimicrobials by improving IPC, animal health and management practices including biosecurity, WASH and immunisation
4. Rational use of antimicrobials: Improve controlled access and optimise the use of antimicrobials in humans and animals
5. Sustainable Investment into AMR interventions and research into new antimicrobials and alternatives to antimicrobials

The strategy states the importance of effective multisectoral working: The Secretary for Health in the Ministry of Health and Childcare (MoHCC) is responsible for leading national AMR activities, and the AMR Core Group is responsible for reporting to the Permanent Secretaries from the Ministries involved. The NAP outlines the actions to be taken in the human and animal health as well as food and environmental surveillance activities. Operational activities, timeframes, indicators and responsibilities are clearly stated in the NAP, and although it is costed, is unlikely that the budget allocations match the aspirations, thus limiting implementation to date.

AMR surveillance plans are being drafted, with support from WHO and FAO, and five Technical Working Groups (TWGs) have been designated, however, they are yet to establish Terms of Reference (ToRs) or regular meetings to support implementation of the NAP.

### 3.2 One Health

Zimbabwe recognises that the control of AMR requires close cooperation between the sectors and has adopted a 'One Health' approach as a guiding principle for working together to address AMR issues. An example is their current piloting of the Tricycle protocol which involves the Ministries of Agriculture, Health and Environment.

AMR governance structures in Zimbabwe were formed after a consultative process that involved stakeholders from various ministries, civil society organizations (CSOs), academia and non-governmental organizations (NGOs), and this is reflected in the composition of the AMR Core Group which draws its 18 members from ministries, multilaterals, civil society and academic institutions.

### 3.3 AMR Surveillance Capacity in Human Health.

In Zimbabwe, the MoHCC manages the AMR surveillance system for human health. This is based in the Directorate of Epidemiology and Disease Control (EDC), and has been developed with support from the WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (AGISAR) for the Tricycle and related projects. The sites participating in the AGISAR project include the National Microbiology Reference Laboratory (NMRL) and all provincial laboratories. These sites actively send surveillance data on bacterial isolates and AST data on a weekly and quarterly basis to the NMRL in Harare. However, the majority of sites use a paper-based reporting system, and laboratories are therefore required to track delivery of the paper report by telephone. All these sites are included in this Country Grant (see table 2 below), and we expect the Grant to support development of an IT solution to improve data reporting and tracking.

There is also an ongoing active surveillance system for notifiable diseases in the National Health Information System (NHIS), which could be improved to assist collection of AMR data, as at present, surveillance data collected for AGISAR and notifiable diseases (NHIS) are not electronically linked. Although some laboratories have an internal LIMS or use WHONET, there is no linkage to any relevant clinical information via HMIS, and there is no system for data sharing in real time.

### **3.4 AMR Laboratory Capacity in Human Health.**

Surveillance data is in turn limited by the lack of laboratory capacity. The Government of Zimbabwe has developed an integrated tiered laboratory network consisting of seventy-eight laboratories, which operate at five core levels within the health system, organized along a referral chain system. However, according to the NAP, only 25 percent of the human public health laboratories have the necessary staffing, equipment and reagents to perform culture and susceptibility testing on human samples. This limits the diagnostic capabilities of health care professionals treating patients and the availability of antimicrobial resistance data to guide clinical practice and policy making. The site assessments by the Fleming Fund Management Agent team confirmed the challenges faced by the laboratories, which hinder safe and successful AMR surveillance. For example, all laboratories visited, including NMRL, use human blood to produce blood agar. At the provincial laboratories, none of the equipment is maintained according to predetermined maintenance schedules and are only partially functional. Where maintenance contracts are in place, servicing is not being conducted because of lack of continued funding, and there is limited in-country expertise to maintain and service the equipment. In general, laboratory infrastructure is in a poor state of repair, and space allocated for bacteriology is limited, congested and poorly organized. Electricity and water supply are irregular, and they do not have dedicated generators. There is also poor waste management at all laboratories: for example, liquid waste is often poured down the sink without proper disinfection.

Overall, there is a shortage of human resources, equipment and reagents across the system, limiting the generation of data, and its application at the local and national levels.

### **3.5 AMR Surveillance Capacity in Animal Health**

The Department of Veterinary Services (DVS), under the Ministry of Agriculture (MoA), comprises of three divisions: Tsetse and Trypanosomiasis Control, Field Veterinary Services, and Veterinary Technical Services. The latter is composed of four units: Diagnostics & Research (which includes the Central Veterinary Laboratory, CVL), Laboratories, Veterinary Public Health, and Epidemiology.

The Epidemiology Unit and CVL are responsible for managing the laboratory information management system (SILAB). In addition, WHONET was installed at CVL and the provincial laboratories of Mutare and Bulawayo for the Tricycle project but is not being widely used. For routine samples (i.e. non-Tricycle samples), staff from Mutare and Bulawayo laboratories enter data into excel spread sheets from paper records while at Masvingo laboratory staff only use paper records due to lack of on-site computers.

There are six epidemiologists at the Epidemiology Unit, an additional two in the Field Veterinary Services division and one in each province. The data managed by the Epidemiology Unit is not linked to laboratory data, likewise the computers at provincial laboratories are not linked to the Epidemiology Unit. The Epidemiology Unit reports weekly and quarterly to the Division of Veterinary Technical Services and the Ministry of Agriculture. Regular reports are also sent to OIE and other stakeholders. Bacteriology information reported from the CVL includes the number of resistant bacteria and other pathogens.

The Poultry Unit, under the Division of Veterinary Technical Services, submits a significant number of samples to the CVL including post mortem samples, and samples for risk analysis for imports, regulatory services, and poultry disease monitoring such as Newcastle Disease, Avian Influenza, *E. coli*, Infectious coryza and *Salmonella* spp. The Veterinary Public Health (VPH) unit manages slaughter places and there is good traceability, however transportation challenges hinder regular submission of samples from slaughter sites.

Although there is currently no national AMR or AMU surveillance system in the animal health sector, data has been generated via the Tricycle pilot project, which required collaboration between the Ministries of Agriculture, Health and Environment. Surveillance was carried out in Harare and focused on *Salmonella* and *E. coli* from broilers and layers, with additional environmental sampling and linkage to carriage and blood culture isolates from hospitals (although data from the latter was limited). Additionally, from September 2018 to March 2019 the FAO supported a study on broiler farmers' behaviour in 6 districts (25 farmers purposively selected in each district) in order to gain baseline information on their practices regarding health practices. Questions explored farmers' knowledge and attitudes on livestock practices, AMU, and biosecurity.

### 3.6 Laboratory Capacity in Animal Health

The Central Veterinary Laboratory (CVL), which is the national veterinary reference laboratory, is included in the Diagnostics & Research Unit, under the Division of Veterinary Technical Services, and heads a network of laboratories composed of three provincial laboratories, a quarantine station and five private laboratories. The CVL is in charge of accrediting provincial and private laboratories. The CVL develops SOPs based on ISO guidelines and provides these to the provincial laboratories. CVL has a quality manager and a safety officer who are responsible for training veterinarians based in provincial laboratories to act as their onsite counterparts. Other support provided by the CVL includes: administrative, IT, procurement and supply of reagents. CVL is currently participating in an External Quality Assessment (EQA) programme with the Zimbabwe National Quality Assurance Programme (ZINQAP) and sends specimens every quarter.

Diagnostic capacities available at the CVL include: molecular biology, bacteriology, pathology, virology, serology, food safety, parasitology. Routine bacteriology (culture, identification and AST) is regularly carried out at the CVL including identification and serotyping of *Salmonella* spp. However, AMR work is not done as part of surveillance but rather for projects, particularly in collaboration with the University of Zimbabwe, and occasional diagnostic requests (mastitis, post-mortems) from farmers or veterinarians. In its role as a reference laboratory, the CVL receives samples from other laboratories for confirmatory testing, and from industry for food or water quality controls. Samples submitted for bacteriology are processed at subsidized costs except those from commercial farmers who request

molecular analysis. Samples submitted for diagnosis of mastitis or notifiable diseases are tested free of charge.

Procurement of supplies and reagents is a challenge for government institutions at the moment. The CVL supplies consumables to provincial laboratories, however, the system is time consuming and provincial laboratories regularly experience stock-outs. The country has been facing power shortages affecting electricity supply to the laboratories which do not always have adequate back-up systems. A common feature of all sentinel sites visited was poor biosecurity and biosafety, poorly maintained equipment, and weak infrastructure. Due to irregular servicing of equipment, most were either broken down or partially functional. Poor waste management is an issue with most liquid waste ending up down the drain while solid waste is transported miles away from the laboratories to the municipal incinerators; autoclaves are not always dedicated to waste management. The CVL however has a functional incinerator.

### 3.7 AMR Surveillance and Laboratory Capacity in Environment and Food Safety

The Environmental Management Agency (EMA) laboratory is responsible for monitoring river water quality in Zimbabwe but it also processes soil and food samples as needed. Tests carried out include bacterial identification and residue testing, and they are also involved in the Tricycle project. Most of the samples they process are water samples sent by agents from provincial or governmental agencies (around 300 samples/month), in addition to samples from private clients. However, the sample transportation system is inadequate and limits national agencies' ability to submit samples regularly. Up to 40 samples can be processed daily during cholera outbreaks. The EMA is ISO 17025 compliant and is enrolled in an External Quality Assessment scheme lead by the Southern African Development Accreditation Agency (SADAA). Infrastructure and equipment are relatively well maintained and in good condition. There is an in-house quality officer, and technical staff are adequately trained in bacterial identification but are yet to be trained to perform AST; at the moment, they send samples to NMRL if additional testing is needed.

The Government Analyst Laboratory (GAL), which falls under MoHCC, is responsible for food control, quality of drinking water, toxicology, and control of industrial products. GAL mainly does chemical testing, but it also has a microbiology unit with basic equipment and 7 staff. They test an average of 50 samples per week (approximately 25% coming from private companies) and perform identification and AST for *E. coli* only. Isolates are sent to the NMRL if further testing is required.

### 3.8 Rational use of antimicrobials

The Medicines Control Authority of Zimbabwe (MCAZ) is in charge of drug control and regulations for veterinary and human medicines. Staff are part of the AMR Core Group, and MCAZ is actively participating in the TWG on rational use of antibiotics.

For veterinary drugs, MCAZ is responsible for licensing sellers, and government and private veterinarians. To date, they have only occasionally collected data on AMU, although they do report

data on AMC to the OIE. Since 2017, AMC data has been reported yearly but it has proven challenging because of the lack of a centralised system. Data collected and reports include finished products only: imports of raw material are not counted due to the absence of legislation mandating local manufacturers to report their imports. Medicated feed is available to farmers and antimicrobials are readily available over the counter.

In human health, a public entity called the National Pharmaceutical Company (NPC) is responsible for the procurement and distribution of drugs for public facilities. MCAZ is responsible for licensing private drug providers, for checking that the products procured by NPC are on the national list of essential medicines, and for pre- and post-registration monitoring. In terms of AMU and AMC, MCAZ have some data on imports and from manufacturers but they do not collect pharmacy or dispensing data. At present, data is manually extracted from logbooks, although an e-system including the private sector is under development. Illegally imported antimicrobials are reported to be circulating into the country, and despite the existence of some legislation, there is limited enforcement.

## 4 Scope of the Fleming Fund Zimbabwe Country Grant

The Fleming Fund Country Grant in Zimbabwe aims to strengthen surveillance systems for AMR and AMU in the areas of human health, animal health and, to some extent, in the areas of food control and the environment.

This support will include:

- Strengthened governance systems to support AMR and AMU surveillance using a One-Health approach, including support for information-sharing between sectors and evidence-informed decision-making.
- Capacity building for national reference laboratories and some sentinel laboratories (see Table 1). According to the needs identified, this support may include laboratory equipment, reagents and consumables and infrastructure improvements (renovation, repurposing and/or expansion, support for utilities, etc.).
- Capacity building and improvement of best practices for staff working in the sites listed in Table 1.

For human health, the Country Grant is intended to support / improve implementation of the WHO GLASS Programme and Grantees should refer to the roadmap for GLASS participation produced by the London School of Hygiene and Tropical Medicine. See

<https://amr.lshtm.ac.uk/wp-content/uploads/sites/12/2016/11/AMR-Surveillance-Protocol.pdf>

Surveillance site and laboratory needs assessments were conducted for some of the sites listed in Table 1 during country visits by the Management Agent. These sites are indicated in Table 1.

Table 1: List of selected laboratory surveillance sites for Zimbabwe Country Grant

No.	Site	Location	Sector
-----	------	----------	--------

1	National Microbiology Reference Laboratory	Harare	Human
2	Harare Central Hospital	Harare	Human
3	Parerenytwa Central Hospital	Harare	Human
4	Beatrice Central Hospital	Harare	Human
5	Mutare Provincial Laboratory	Mutare	Human
6	Masvingo Provincial Laboratory	Masvingo	Human
7	Mpilo Provincial Laboratory	Bulawayo	Human
8	Central Veterinary Laboratory	Harare	Animal
9	Animal Science Laboratory (University of Zimbabwe)	Harare	Animal
10	Mutare Provincial Veterinary Laboratory	Mutare	Animal
11	Masvingo Provincial Veterinary Laboratory	Masvingo	Animal
12	Bulawayo Provincial Veterinary Laboratory	Bulawayo	Animal
13	Environmental Management Agency Laboratory	Harare	Environment
14	Government Analyst Laboratory	Harare	Food

#### 4.1 Grant Objectives and Outputs

The four objectives and related specific outputs proposed for the initial Fleming Fund Country Grant to Zimbabwe are listed in the Table 2 below. Applicants are expected to respond to this RFP by developing and proposing activities that are costed and which demonstrate appropriate indicators for grant implementation. Reflection back to the NAP is encouraged.

An inception phase will be initiated upon lead grantee appointment. The duration of this phase will be determined during grant agreement, but will not exceed six months, and a final implementation plan will be agreed upon at the end of the inception phase. All proposals should include the full implementation plan, as the inception phase is for refinement, not development of, the full implementation plan.

Sustainability is key to the success of this Country Grant. The current NAP, although costed, contains no formal financial commitment from the Government of Zimbabwe. The Grantee will be expected to undertake a sustainability assessment of the Fleming Fund Country Grant investment, and the proposal should include strategies for engaging with the Zimbabwe government to build consensus for sustainably supporting investment made beyond this Country Grant.

During the inception phase, the grantee will:

Initiate, facilitate or complete work on the attainment of the Country Grant outputs as outlined below, in collaboration with, or by providing support to, the AMR Core Group

Collaborate with the Fleming Fellows and their Host Institutions to understand the Fellowship workplans.

Update or complete the surveillance site needs assessments in all surveillance sites covered by the Grant, using the tools and methodology provided by the Management Agent

Finalise the procurement plans for a) equipment and renovation needs for the surveillance sites and b) consumables and reagents to conduct safe and secure quality bacterial identification and susceptibility testing

All activities proposed should correspond to the list of eligible expenses in Annex 1.

**Table 2: Objectives and Outputs of the Zimbabwe Country Grant**

<i>Objective 1: Strengthened One Health governance structure for AMR, AMU and AMC surveillance to coordinate, manage and monitor AMR activities</i>
Output 1.1: The AMR Core Group is supported to effectively organise, coordinate and oversee implementation of AMR surveillance in Zimbabwe
Output 1.2: <b>The relevant</b> Technical Working Groups are supported to strengthen the AMR surveillance system
Output 1.3: A cost evaluation is completed to analyse the cost drivers for establishing AMR surveillance in Zimbabwe and identify lessons for continuity of AMR surveillance programmes.
Output 1.4: <b>Conduct a situational analysis to better understand the role (or potential role) of the private sector in provision of bacteriology services, and how data generated in the private sector can be integrated into the country surveillance system.</b>
Output 1.5: The AMRCC / TWGs are supported to develop an AMC / AMU surveillance strategy
<i>Objective 2: Surveillance sites and laboratories are strengthened across sectors to support the national surveillance system</i>
Output 2.1: Improved biosafety and biosecurity at all Fleming Fund supported sites
Output 2.2: Improved capacity at all Fleming Fund supported sites for bacterial culture, identification and <b>antimicrobial susceptibility testing</b> for relevant bacterial pathogens
Output 2.3: Improved Quality Management Systems at all Fleming Fund supported sites
Output 2.4: Improved capacity of the National Microbiology Reference Laboratory (NMRL) to function as a reference laboratory and coordination centre for human health AMR surveillance.
Output 2.5: The Central Veterinary Laboratory (CVL) is functional as the National Reference Laboratory for AMR surveillance in Animal Health
Output 2.6: A sustainable specimen transportation system is developed and functional

<i>Objective 3: Increased capacity for data management across sectors to support the national surveillance system</i>
Output 3.1: NMRL and sentinel sites are strengthened for data co-ordination, storage and analysis for AMR surveillance
Output 3.2: A national database is maintained, and AMR surveillance data is analysed and reported for the Animal Health sector
<i>Objective 4: Sector specific AMR surveillance strengthened in the human health, animal, food and environment sectors</i>
Output 4.1: Clinical and microbiology staff engage to strengthen AMR / AMU clinical and laboratory interface
Output 4.2: <b>AMR surveillance system in animals is developed and implemented to generate data on bacterial resistance.</b>
Output 4.3: The Environmental Health laboratory contributes data to the surveillance system
Output 4.4: The food safety laboratory contributes data to the surveillance system

## 4.2 Duration of the grant

This grant is expected to last 20 months ending no later than September 2021.

## 4.3 Funding Envelope

Grant applications should be in the region of £4 million, including all capital and recurrent costs, overheads and management costs.

Mott MacDonald is responsible for driving Value for Money (VfM) on behalf of the UK Department of Health throughout the Grant Programme and will carefully consider how the proposal addresses efficiency, effectiveness, economy and equity in delivering the Request for Proposal (RFP) outputs in relation to the proposed costs. The Guidance Notes for the Grant Application Form provide more information on different dimensions to be considered as part of a VfM approach.

## 4.4 Procurement

An indicative procurement plan for laboratory equipment, reagents and consumables was compiled during the site assessments conducted by the Management Agent for some sites in Table 1, above. The assessments will be provided to the Grantee to assist with development of their initial procurement plan to ensure early start up.

All human health laboratory sites assessed by the Management Agent, applicants should include a placeholder amount of £100,000 per site in the total budget. For animal health, environmental and government analyst laboratory sites, applicants should include a placeholder budget of £50,000 per site.

Highly preferential rates have been secured by the Fleming Fund for the purchase of key laboratory instruments, namely blood culture analysers (BACTEC or BacT/Alert), automated antimicrobial susceptibility testing platforms (Vitek II or BD Phoenix), and MALDI TOF mass spectrometers (Bruker or Vitek MS).

To take advantage of these rates, these instruments will be procured centrally by the Management Agent's procurement partner, International Procurement Agency (IPA), who will also co-ordinate delivery.

Blood culture analysers will be supplied to laboratories providing clinical services, with the final number determined by the laboratory assessments. Each automated AST platform will be supplied bundled together with a mass spectrometry instruments, with the necessary databases and linkage software. A maximum of two of these bundles (i.e. two AST platforms linked with two mass spectrometers) will be supplied for use in the AMR reference laboratories (animal health and human health). If the reference laboratories do not have sufficient specimen throughput, or do not have the required infrastructure, the instruments may be deployed, with the approval of the Management Agent, to alternative sites.

These items will be paid for directly by the Fleming Fund via a grant to IPA. The costs include the instruments, delivery, import duties (up to 15%), installation, basic training, software and first year service contracts.

Reagent costs and subsequent service contracts will come from the Country Grant budget and should be factored in to this application. All other laboratory equipment and costs will also come from the Country Grant budget and should also be factored in.

Country suppliers (Biomérieux or Beckton Dickinson) have been preselected by the Management Agent, however, purchase and delivery will be co-ordinated by IPA, and the Grantee will need to work with IPA to confirm readiness for delivery. Purchase of additional instruments, if required, should also be done via IPA, with the approval of the Management Agent, to secure the highly preferential prices offered to the Fleming Fund

During the inception phase, the grantee will work in consultation with the Management Agent, the Management Agent's procurement supplier (International Procurement Agency) and the UK Department of Health and Social Care, to determine the most suitable method of procurement for laboratory equipment, and to develop reliable stock management and supply systems for consumable and reagents.

The lead grantee will also be expected to:

1. assist with the importation and delivery of equipment and consumables to recipient sites;
2. work closely with the procurement partner (whether IPA or an alternative organization) to ensure the appropriate delivery sequence of items;
3. maintain an asset register of all items defined as assets by the Programme;
4. regularly monitor the items that have been procured by the Fleming Fund Grants Programme to ensure:
  - a) items are being used for the intended purpose;
  - b) items are being maintained appropriately; and
  - c) to report any misuse or misappropriation of assets to the Management Agent.

## 5 Grantee Role and Responsibilities

The main role of the grantee will be to plan and execute outputs and deliver the objectives listed above. The Grant is designed as an AMR laboratory capacity building and systems strengthening intervention. The Grantee is responsible for providing, either through in-house resources alone, or through a partnership or consortium, the expert technical assistance and high-quality support needed to strengthen the selected reference and surveillance sites' capability and capacity to generate and share AMR surveillance data on both a national and international basis.

## 6 Key measures of success

Country Grants will eventually be expected to generate results that can be tracked using a standard set of indicators that will monitor progress and achievements within and across Country Grants. A copy of the full list of indicators will be shared in the Application Pack.

However, for the first Country Grant, it is important to note that:

- (i) Applicants are not expected to select from and use these indicators for this first Country Grant. While it is possible that some of the formal indicators may trigger towards later stages of the grant award, the likelihood of this will be reviewed and discussed by Mott MacDonald with the successful applicant.
- (ii) For the purposes of this first grant, process level indicators will be used to track progress against the work plan. The grantee is expected to utilise the indicators proposed above or to propose alternative SMART indicators in line with the outputs summarised above.<sup>4</sup> These will then be negotiated and agreed with Mott MacDonald as the Management Agent.
- (iii) No Country Grant will be expected to use all the Fleming Fund indicators. Instead a relevant sub-set of indicators will be proposed by the grantee for joint agreement with Mott MacDonald.
- (iv) The Fleming Fund will be independently evaluated by ITAD, a specialist evaluation firm, who have been appointed by the UK Department of Health and Social Care for this purpose. In addition to measuring grant performance against the objectives and outputs stated above, the grant will also be monitored on the implementation of, and adherence to, the Fleming Fund grant principles described above. All grants are subject to review and evaluation by the evaluators, and full co-operation with the evaluators by all grantees is expected.

## 7 Key partnerships, alignment and coordination

---

<sup>4</sup> SMART indicators refer to indicators that are specific, measurable, achievable, relevant, and time bound.

The Country Grant must be delivered in alignment with the AMR National Action Plan for Zimbabwe and should support the national effort and take into account the current capacity levels, future absorptive capacity, and alignment with other AMR related initiatives including those undertaken by multilateral agencies such as FAO and WHO. In addition, the Grantee will need to build strong collaboration and coordination with local academic and research institutions at different levels for technical and other support.

## 8 Complementing other grants from the Fleming Fund Grants Programme

This first Country Grant is expected to work effectively and synergistically with other grants under the Fleming Fund Grants Programme at the regional level. This relates to both the Fleming Fellowship Scheme and the Regional Grants. For details see [www.flemingfund.org](http://www.flemingfund.org)

It is anticipated that Zimbabwe will receive several Fleming Fellowships, for animal health and human health. Successful applicants will receive specialized training in AMR and AMU data management and analysis, laboratory quality management, and in advanced laboratory technical skills.

Upon completion, Fellows are expected to become technical leaders in AMR and AMU surveillance in Zimbabwe, and it is hoped that they will play a role as mentors and active trainers in capacity building activities that will be implemented through this Country Grant. Therefore, once established, the Grantee is expected to work in collaboration with Fleming Fellows and potentially their Host Institutions (who provide remote support to the Fleming Fellows).

In addition, Regional Grants will focus on strengthening networking and data sharing on AMR at the regional level. The grantee is expected to liaise, through Mott MacDonald, with such grants for maximizing the sharing of AMR data and learning at the regional and global levels.

## 9 Application requirements

### 9.1 Grantee Eligibility Criteria

Lead grantee applicants must satisfy the following eligibility criteria before applications can be assessed:

- Eligible lead grantee organizations are: National institutes (such as universities or research institutes); Non-Governmental Organizations; UN Agencies; Private companies.
- Can be a single organization or consortium; if a consortium, lead grantee applicant must evidence it has the appropriate governance, coordination mechanisms, and documented track record to manage sub-grantees.
- Must demonstrate that they are registered to work within the country, including the submission of essential documents such as; current business registration certificate or equivalent, articles of incorporation, current tax clearance certificate, social security certificate, and annual audited statements for the past three years.
- Lead grantee applicant must demonstrate they are competent and sufficiently experienced in successfully supporting laboratory capacity development, disease surveillance, capacity building, and One Health in LMICS.

- Lead grantee applicant must demonstrate that they are fully functional in English.
- Lead grantee applicant must be able to provide all information required to demonstrate that adequate and tested financial management controls and levels of authority are in place and are adhered to.
- Lead grantee must demonstrate that they are able to hold a Foreign Currency Account for receiving foreign currency. Fleming Fund grant payments are made in GBP.
- In line with UK Government financial transparency requirements any for-profit organisations will be asked to declare profit levels.
- References from clients for previous work undertaken within the last five years are welcome

## 9.2 How to apply

Prospective lead grantees must register their interest to apply by emailing [flemingfundESA@mottmac.com](mailto:flemingfundESA@mottmac.com) to receive an invitation to the Applicant Information Session, and an example of the Application Pack.

The Applicant Information Session (AIS) will be organized in Harare on 21<sup>st</sup> October 2019. The details of the venue will be shared with applicants registering their interest.

Ahead of the AIS, an example Application Pack will be shared and will include the application form, budget and milestones template and Guidance Notes. Following the AIS, the official Application Pack will be sent out to prospective Grantees who have registered their interest to apply for the grant.

To apply, please complete the application form and budget and monitoring template provided, in line with the Guidance Notes, by the deadline indicated in Section 9.5.

Note the key requirements set out at the beginning of the Country Grant Application Form:

- When submitting the application document, press “Reply All” from the official Application Pack automated email that you received with the application documents attached. Do not send it to us from a new email, and do not modify the Subject-line. Only “Reply All” emails will register the documents in our system.
- Keep file sizes as low as possible - there is a 9MB size limit to each individual email that can be received by the grant submission software. You can submit documents by sending multiple emails attaching submission documents to each one. Please follow the instruction (above) using “Reply All” to the original email.
- The submission deadline is: 28<sup>th</sup> November 2019, 17:00 CAT (+2GMT).
- Applicants should observe the word limit. Additional words outside the limit will be disregarded. All documents included as part of the proposal must be submitted by separate e-mail in Word, Excel, and PDF format (body font: Calibri 11pt). Do not send through as zipped files. You should include a covering letter, signed by the person authorized to represent your organization for the submission of this proposal.
- Your application is conditional upon your acceptance of the grant agreement (format will be shared in the application pack).

Proposals that do not satisfy these criteria may not be accepted.

### 9.3 Evaluation criteria

The Application Pack will include the application form, indicating the scoring and weighting for each section of the application. The Application Pack will also contain Guidance Notes explaining what we are looking for in terms of a good quality response for each question, including approach to Value for Money (VfM).

We will be assessing the application on the following key areas:

- Technical capacity to address the different aspects of AMR covered by this Country Grant.
- Ability and preparedness to bring stakeholders together in an effective and productive working arrangement, promoting a One Health approach.

### 9.4 Restrictions/limitations

Any potential conflict of interest known at the time of registration should be flagged to the Management Agent at that time. If a potential conflict of interest arises after that point in time, the prospective lead grantee must clearly disclose this in the proposal.

### 9.5 Key dates

Publication of RFP: 14 October 2019

Deadline for registering interest to attend the Applicant Information Session: 18 October 2019

Applicant Information Session: 21 October 2019

Deadline for registering to apply for Grant: 24 October 2019

Application deadline: 28 November 2019, 17:00 CAT (+2GMT).

Anticipated start date of grant: 28 February 2020

### 9.6 Contact details and support information

Any questions on the Request for Proposals should be sent to [flemingfundESA@mottmac.com](mailto:flemingfundESA@mottmac.com). The Management Agent will endeavor to respond to queries within 72 hours.

## 10 Objectives and Outputs

### Objective 1: Strengthened One Health governance structure for AMR, AMU and AMC surveillance to coordinate, manage and monitor AMR activities

#### Output 1.1: The AMR Core Group is supported to effectively organise, coordinate and oversee implementation of AMR surveillance in Zimbabwe

The governance structure was established in 2016 and is mandated by the NAP to oversee implementation activities through the technical working groups (TWGs). The AMR Core Group is the

main arm of the governance structure responsible for co-ordination and implementation of AMR activities. It is comprised of 18 technical experts and supported by a 12-member advisory committee made up of policy makers. The AMR Core Group should be supported to understand and respond to the outputs from surveillance activities so that it can function effectively as the One Health AMR Co-ordinating Body.

To date the AMR Core Group has met only irregularly; it needs support to establish regular meetings and to function more effectively as a coordinating and advisory body.

***By the end of the grant we expect that the following will have been achieved:***

- AMR Core Group has the capacity to fulfil its function as the technical lead of AMR in Zimbabwe as mandated in the NAP
  - Quarterly meetings have been held to discuss results provided by TWGs in the light of other sources of information
  - Communication channels between AMR Core Group members and TWG members and other stakeholders have been established and are functional
  - AMR Core Group members have received adequate training to understand results of AMR and AMU surveillance, to review technical reports and documents, to oversee implementation of the NAP and recommend policies relevant to AMR containment.
- AMR Core Group provides the AMR advisory committee with evidence-based recommendations on future surveillance priorities, programmes and policies to reduce the burden of AMR.
- AMR Core Group provides policy and guideline documents to central and provincial levels for use in AMR/AMU/AMC surveillance
- The AMR Core Group has overseen a review of current legislation relative to AMR and AMU with the objective of identifying gaps and providing advice on legislative needs to allow NAP implementation.
- A national multisectoral AMR conference is held

**Output 1.2: The relevant Technical Working Groups are supported to strengthen the AMR surveillance systems**

The TWGs are multi-sectoral groups coordinated by the AMR Core Group and mandated by the NAP. The TWGs are tasked with building sustained partnerships to facilitate and oversee implementation, monitoring and evaluation, and information sharing and liaison with relevant stakeholders. The TWGs involved in AMR/AMU surveillance need to be supported to strengthen their capacities to fulfil the above tasks effectively.

***By the end of the grant we expect that the following outcomes will have been achieved:***

- TWGs hold quarterly meetings to discuss results and interpretation of data generated through AMU and AMR surveillance and provide recommendations to the AMR Core Group on measures to tackle AMR issues.
- ToRs have been established and approved by the necessary stakeholders, and include data management and sharing within and between sectors

- The Surveillance and Research TWG has technical and practical capacity to oversee development and implementation of the surveillance strategies, workplans and budgets.
- Results from the AMR and AMU surveillance in animal, environment and human health and other sources of information on AMR, AMU and AMC have been interpreted in the context of other AMR and AMU information and shared with the AMR Core Group and the multisectoral TWG
- TWGs have adequate cross sectoral representation: e.g. the animal health sector contributes results from AMR and AMU surveillance in animals and other sources of information on AMR and AMU in animals to their TWGs
- Opportunities are identified for intersectoral collaboration e.g. for training, equipment and reagent supply chains etc to improve value for money and sustainability

**Output 1.3: A cost evaluation is completed to analyse the cost drivers for establishing AMR surveillance in Zimbabwe and identify lessons for continuity of AMR surveillance programmes.**

The Fleming Fund Country Grant investment is intended to provide funds to generate data to support Zimbabwe's response to AMR. Long term sustainability, both for laboratory systems and for the surveillance programme, will be a significant challenge for Zimbabwe and will depend on the success of the programme, and on demonstration of the value to the country of the investment. The Grantee should therefore undertake a cost appraisal to inform future policy and programming. This should address: actual costs of laboratory improvements (including building human capacity) compared with estimates, identifying examples of good practice, identifying efficiencies and cost savings, in particular estimating potential impact on other expenditures e.g. savings in hospital drug budgets resulting from better use of antimicrobials. Additional factors which could be examined include the cost benefit of preventative maintenance of equipment to preserve long term function, and potential economic impacts of reducing use of antimicrobials in agriculture. The evaluation should be shared with the relevant TWGs and with the AMR Core Group to advocate for better use of scarce financial resources, through gains in efficiency that can be invested back into AMR prevention and control.

***By the end of the grant, we expect that the following will have been achieved:***

- A cost evaluation analysing the cost drivers and impact of investing in control of AMR, including surveillance, has been completed and shared with the relevant TWGs and the AMR core group

**Output 1.4: Conduct a situational analysis to better understand the role (or potential role) of the private sector in provision of bacteriology services, and how data generated in the private sector can be integrated into the country surveillance system.**

Currently there are several private/not-for-profit laboratories understood to be providing clinical laboratory services, including for bacterial culture. These laboratories may be located in private hospitals, or as standalone entities. The overall contribution and coverage are not known, as AMR data is not routinely reported. The Grantee should engage with private/not-for-profit laboratories currently providing capacity support to understand the provision of services.

By the end of inception, the Grantee is expected to produce:

- A comprehensive situational analysis of the current AMR related role, contractual agreements and capacity of private/not-for-profit laboratories to contribute to the public health AMR surveillance system;
- Evidence-based recommendations to ensure inclusion of private/not-for-profit laboratory AMR surveillance data in the public health surveillance system.

Please note that in general, the Fleming Fund cannot provide capital support to private sector laboratories (e.g. refurbishment, equipment, reagents), although other support can be considered e.g. installation of WHONET or other software to allow reporting, inclusion in training for surveillance relevant activities etc.

#### Output 1.5: The AMRCC / TWGs are supported to develop an AMC / AMU surveillance strategy

At the moment, there is no AMC or AMU surveillance strategy in place in Zimbabwe. The Grantee should support the MoHCC, MCAZ and other relevant entities in the health sector for the development and implementation of a national strategy and operational plan for AMC and AMU surveillance. In the animal health sector, the AMU TWG will advise the lead grantee and the AMR core group on the best mechanism for collecting information on antimicrobial use in veterinary medicine. Currently, MCAZ reports AMC data to OIE but has not yet gathered data on AMU.

#### ***By the end of the grant we expect that the following will have been achieved:***

- A national strategy for AMU and AMC surveillance has been developed incorporating medical and agricultural use. The strategy should be costed and include indicative funding sources
- AMC surveillance is being conducted at the national level as per the strategy
- AMU data has been obtained from agreed human and animal health sites, including in the poultry sector, to inform improvements in the surveillance strategy as well as policy / regulatory changes
- MACZ disseminates results to care providers, policy makers, TWG and AMR surveillance and programme managers at county and national level.
- A sustainable plan is in place for continuing AMC and AMU surveillance beyond the end of the grant.

## **Objective 2: Surveillance sites and laboratories are strengthened across sectors to support the national surveillance system.**

#### **Output 2.1: Improved biosafety and biosecurity at all Fleming Fund supported sites.**

All sites listed in table 1 should be supported to improve biosafety and biosecurity, to ensure the safety of laboratory staff and protection of the public. The level of support required will vary depending on the baseline level of the site, but all laboratories should be equipped, and staff trained, to function at Biosafety Level 2.

***By the end of the grant we expect that the following will have been achieved:***

- The laboratories are equipped with appropriate safety equipment and staff are wearing personal protective equipment while conducting testing.
- Biosafety cabinets are operational, maintained and being used by staff appropriately.
- Functioning biosafety and biosecurity systems are in place.
- The NMRL has a long-term strategy for dealing with biosafety level 3 pathogens.

In the interests of value for money, we anticipate that some activities within this output will be combined across sectors

**Output 2.2: Improved capacity at all Fleming Fund supported sites for bacterial culture, identification and antimicrobial susceptibility testing for relevant bacterial pathogens.**

Across all the laboratories, there is a general shortage of equipment, reagents and basic bacterial skills.

All sites in table 1 should be supported to develop basic capacity for bacterial culture, identification and AST, for the specimen types and pathogens of AMR importance in their sector.

Depending on existing capacity, sites may require upgrading of the laboratory infrastructure, purchase, installation and maintenance of equipment, improvements in the supply of reagents and consumables, and training of human resources capacity in areas related to the AMR surveillance programme. Sites not already assessed by the Management Agent should be evaluated using the tool which will be provided, to enable ready approval of procurement plans.

The Grantee will also need to work with the reference laboratories, surveillance sites, the AMR Core Group and other relevant bodies within the health sector to develop reliable supply chains for reagents and consumables across the surveillance system to reduce stockouts and wastage.

***By the end of the grant, we expect the following to have been achieved***

- Sites have the necessary staff capacity, equipment and reagents to perform culture, bacterial identification and susceptibility testing on relevant samples. For human health, the initial focus should be on developing a blood culture service in line with the LSHTM roadmap.
- The bacteriology laboratories have undergone basic renovation to ensure safe, reliable practice. This includes ensuring that critical instruments have a reliable power supply including surge protection, reliable back-up power and UPS.
- All equipment identified by the assessments and agreed with the Management Agent have been purchased and installed, with maintenance /s service contracts and staff training, and a sustainability plan to ensure ongoing maintenance and training post FF grant.
- Stock management systems are in place to ensure reliable supply of reagents and consumables for surveillance activities. This includes a plan for sustainability beyond the end of the Fleming Fund grant
- Staff are trained, and are demonstrating competency in specimen processing, bacterial identification, AST, and reporting, with adequate documentation of quality control processes.
- Each laboratory has a functioning IT platform to enable efficient data entry for AMR surveillance with laboratory results accurately matched to demographic details.

- All surveillance sites are producing high quality surveillance data suitable for reporting to the national surveillance system.

### **Output 2.3: Improved quality management systems at all Fleming Fund supported sites.**

All sites listed in table 1 should be supported to implement or improve their current quality management systems (QMS) for bacterial culture, identification and antimicrobial susceptibility testing. Staff should be adequately trained, instruments should have the required IQC and EQC procedures, and appropriate QC organisms should be available on site and used to monitor the quality of work. All laboratories should be participating in relevant EQA schemes provided by the NMRL and / or other accredited providers.

#### ***By the end of the grant we expect that the following will have been achieved:***

- Quality management systems are in place in all reference and surveillance site laboratories.
- Reference strains for IQC are available and being used, and the resulting IQC data incorporated into reporting systems
- All sentinel laboratories are participating in an EQA scheme: this should include confirmatory testing by the NMRL for 5-10% of routine isolates from all sentinel sites.
- Laboratories are working towards accreditation and are demonstrating progress in the relevant accreditation scheme e.g. enrolment on SLMPTA/SLIPTA.
- The quality and completeness of both laboratory and clinical / specimen data is monitored and shows improvement over the course of the grant.
- Quality relevant SOPs and policies, and staff training, and development plans are in place.

As above, in the interests of value for money, we anticipate that some activities within this output will be combined across sectors depending on existing capacity.

### **Output 2.4: Improved capacity of the National Microbiology Reference Laboratory (NMRL) to function as a reference laboratory and coordination centre for human health AMR surveillance.**

The NMRL is the official national reference centre for AMR surveillance in Zimbabwe. NMRL is already coordinating the quality assurance program of Zimbabwe (ZINQAP), and the WHO-AGISAR project relevant to microbiology services. However, these projects are short term and the laboratory will need additional support to develop its role as a reference laboratory and coordinating centre for quality assurance.

In addition to the basic support outlined for all laboratories in Outputs 2.1, 2.2 and 2.3, the NMRL will need to develop capacity to perform confirmatory testing for ID/AST for referred isolates, perform advanced phenotyping methods such as testing for ESBL and carbapenemase production, and MIC testing. In the long term, the NMRL should be able to support sentinel sites in their surveillance activities, for example, developing bench aids and SOPs, and providing a bacteriology / AST, EQA service, including supporting sentinel sites to undertake corrective actions on poor performance.

The NMRL will also need to develop an inventoried biorepository system, and data management capacity to utilize epidemiological data on WHONET.

The Grantee will need to support the NMRL to develop these functions, with due consideration to the long-term use of NMRL beyond the life of the grant.

***By the end of the grant we expect that the following will have been achieved:***

- The NMRL has the capacity to do confirmatory testing and quality control of samples and provides an EQA programme.
- The NMRL is supporting all sentinel surveillance sites with training and mentorship in bacterial identification, AST, data entry, analysis and reporting.
- An inventoried biorepository is established with associated SOPs and policies for use.

**Output 2.5: The Central Veterinary Laboratory (CVL) is functional as the National Reference Laboratory for AMR surveillance in Animal Health**

Bacteriology activities at the CVL currently include: culture, identification and AST but these are limited to *Salmonella spp* and *E.coli*. There is need to improve capacity in bacterial identification, AST and confirmatory testing for these two pathogens, and where possible this capacity should be extended to *Campylobacter* and *Enterococcus spp*. The laboratory has got a LIMS (SILAB) and WHONET was installed during the AGISAR-Tricycle project. The data systems are currently managed by the CVL and the epidemiology unit (Division of Technical Veterinary Services). Data linkage at CVL with provincial laboratories is however non-existent.

CVL will need to strengthen its data management capacity, quality control management, procurement and supply chain and should be capacitated to provide bacteriology EQA services to the three provincial laboratories. Currently, CVL provides reagents and consumables to the provincial laboratories, and is responsible for providing them with harmonised SOPs and guidelines. However, these SOPs and guidelines may need revision and provincial laboratories will need refresher trainings.

CVL will require some minor renovations, equipment installation, staff training and support for supply chain management to enable it to efficiently execute its core mandate as a NRL. The grantee will support the CVL with the following, with due consideration to the long-term use of the CVL beyond the life of the grant:

***By the end of the grant we expect that the following will have been achieved:***

- The CVL is supported with appropriate renovation, refurbishment, as defined further to a needs assessment carried out using the tool developed by the Management Agent. This includes a reliable power supply (and backup system) protected from power fluctuations (UPS) Maintenance contract are in place, and a plan is in place to ensure their sustainability beyond the life of the grant.
- The CVL has the capacity and capability to provide administrative, data management, laboratory diagnostics and IT support to provincial laboratories as well as external quality control services.
- The CVL currently participates in international proficiency testing (PTs), enrolment into External quality assurance system (EQAS) should be continued and/or started for additional pathogens or procedures.

- Quality management systems are in place
- A stock management system to be developed at CVL to ensure reliable supply of reagents and consumables for CVL and the three provincial laboratories which are supplied by CVL.
- An EQAS scheme is provided to provincial laboratories and surveillance sites
- The CVL maintains a secure national biorepository of a selection of isolates; ToRs will be developed to determine which isolates will be selected for storage, how the biorepository will be accessed and used by partners. Relevant SOPs (and subsequent training) for use and access will be developed and shared with relevant stakeholders and staff. This also includes procurement of necessary equipment for storage and inventory.
- SOPs for culture, identification and AST of all bacteria species to be included in the AMR surveillance programme are developed and disseminated to the surveillance sites. Appropriate trainings are delivered to laboratory staff to ensure they are able to provide reliable and good quality results and disseminate trainings to staff from surveillance sites.
- The CVL is able to perform advanced phenotyping (confirmation of mechanism, MIC testing) for isolates with equivocal or unusual AST profiles. Confirmatory testing and AST are carried out on a predetermined proportion of isolates, sent by the laboratories in the surveillance network as part of EQA.

#### **Output 2.6: A sustainable specimen transportation system is developed and functional**

A transportation system, in which samples can be shipped between the reference laboratories and surveillance sites in a secure and reliable manner without significant delays, is a critical part of a properly functioning AMR surveillance system. In Zimbabwe, bacteriology laboratory samples are often shipped between sites using the HIV and TB transport networks. However, there is no or minimal sample tracking and the biosafety and biosecurity aspect of this mode of transportation has not been assessed. The Grantee should provide support to identify strategies to improve transportation of samples between the sentinel laboratories and reference laboratories. This can utilise the current system provided samples can be tracked, and biosafety / biosecurity for both samples and isolates is ensured. Long term funding mechanisms for an integrated transport system embedded in the Integrated Disease Surveillance and Response (IDSR), will need to be included in the sustainability plan.

#### ***By the end of the grant we expect that the following will have been achieved:***

- A sustainable, safe transportation system to transport specimens and samples has been developed, including sample tracking.
- Staff at all selected sentinel laboratory sites are trained in safe sample handling, labelling, packaging and documentation following appropriate international regulations and guidelines.
- Increased number of samples from all sites are being transported to the reference laboratories.
- A sustainability plan put in place to integrate specimen transport systems into the Integrated Disease Surveillance and Response (IDSR).

### Objective 3: Increased capacity for data management to support the surveillance system.

Output 3.1. NMRL and sentinel sites are strengthened for data co-ordination, storage and analysis for AMR surveillance for human health.

According to the NAP, the central data repository will be housed physically at the NMRL, with human resources based at the directorate of Epidemiology and Disease Control, (EDC) of the MoHCC. Currently, there is no central national data repository although information (including AMR data) recorded in the WHONET systems is stored at the NHIS/EDC, and can be accessed, in a limited form, on request. Agreement on the co-ordination role of CVL is also needed, and its capacity strengthened as required.

The Grantee will need to work with NMRL, the AMRCG and NHIS/EDC to ensure that data can be collected, validated and backed up centrally, and that it is available in a format that can be analysed appropriately: for example, by site, by pathogen etc. The Grantee will also need to assist NHIS/EDC to develop regular reporting structures for the aggregated data and encourage analysis and action on the critical findings.

***By the end of the grant we expect that the following will have been achieved:***

- All sites are recording data electronically and are capturing both laboratory and clinical data
- Appropriate software (WHONET/LIMS) is installed and in use at NMRL and the surveillance sites.
- All sites are receiving IT support to maintain LIMS/WHONET as necessary, with a plan for how this is to be continued after the end of the grant.
- A national data repository is established, with the capacity to handle all data from sites.
- Data quality checks are being carried out at site and national level.
- NMRL can monitor and report timeliness and quality of data recording.
- NMRL demonstrates the capacity to analyse the data aggregated from the system and generate clinically useful reports and analyse and interpret national AMR surveillance data.
- Clinical and laboratory staff at all sites have been trained in analysis of their own data.
- All surveillance sites show an increase in the quantity and quality of the data reported over the lifetime of the grant.

Output 3.2: A national database is maintained, and AMR surveillance data is analysed and reported for the Animal Health sector

The CVL currently has SILAB and WHONET while other laboratories have different levels of needs. Surveillance sites require support to set up a LIMS that links to the CVL. The database needs to be customised, installed in each of the surveillance sites and staff trained to enter data (laboratory results and demographic/epidemiology data). Computers, printers, back-up systems and UPS may need to be purchased as per the needs for all the sentinel laboratories and the CVL.

All quality data, whether it is collected as part of active surveillance or routine diagnostic activities (passive surveillance) should be entered into the LIMS. A system for transferring data from laboratories to CVL needs to be agreed. Means of simply transferring data from the current LIMS into

WHONET need to be designed and implemented, if this is considered useful by the grantee AND national stakeholders.

***By the end of the grant we expect that the following will have been achieved:***

- Data management, analysis and sharing practices, and responsibilities need to be determined and agreed by CVL and the epidemiology unit (Division of Veterinary Technical Services).
- ToRs are developed to guide data management, data use and sharing within and between all relevant stakeholders.
- Each laboratory is capable of maintaining an accurate database of all results produced and regularly sends quality checked data to CVL and/or the epidemiology unit (Division of Veterinary Technical Services).
- CVL and/or the epidemiology unit (Division of Veterinary Technical Services) collate and check data received from the surveillance laboratories.
- Data is regularly backed up, at surveillance sites, CVL and epidemiology unit. This includes providing the means to back up and store data safely.
- Adequate data analysis software is installed and subsequent training in data analysis is provided to epidemiologists responsible for this part of surveillance activities.
- Data generated through passive and active AMR surveillance in poultry are analysed by national epidemiologists, with the grantee's support
- Quarterly reports on results and interpretation of AMR data analysis are produced and shared with relevant stakeholders (TWGs, AMR core team)
- Quarterly meetings with all contributors to AMR, AMC and AMU surveillance to share and discuss results and issues related to data supply, quality, and other related issues

## **Objective 4: Sector specific AMR surveillance strengthened in the human health, animal, food and environment sectors**

### **Output 4.1: Clinical and microbiology staff engage to strengthen AMR/AMU clinical and laboratory interface**

It is important for Grantees to recognise that the programme is not simply a data gathering exercise but is intended to improve provision of bacteriology diagnostic services to benefit patient care, promote better use of antimicrobials, and create a demand for laboratory services. Ongoing engagement with clinical staff will be necessary across all sites to ensure appropriate sampling of patients, collection of basic patient data, and appropriate response to culture results. This is critical for establishing a sustainable, passive surveillance programme. Laboratories will need to report results in a timely manner to inform patient care, and clinical staff should also be responding to culture results appropriately. Use of the clinical microbiology laboratories should be integrated into standard good clinical care of patients: as guidance, patients being treated for sepsis (i.e. receiving intravenous antimicrobials) should have at least one set of blood cultures taken, plus additional samples as per presenting syndrome, and specimen forms should have basic data regarding clinical presentation and antimicrobial treatment. The value of negative samples in terms of antimicrobial stewardship should

also be appreciated. Again, Grantees should refer to the LSHTM roadmap for guidance on the approach to sampling and the basic clinical data which should be collected.

***By the end of the grant we expect that the following will have been achieved:***

- Increased number of good quality blood culture samples sent to the laboratory, with minimum contamination rates and relevant clinical data recorded on the request form.
- Results are shared with the clinicians and pharmacists in a timely manner.
- Clinicians and laboratory staff at the surveillance sites demonstrate an improved understanding of how to incorporate bacteriology results into their practice.
- Data generated at the site is analysed locally and being used to inform hospital level decisions on training, stewardship and drug policies. This may be via Medicines Control Authority of Zimbabwe (MCAZ), the directorate of laboratory services (DLS), Antimicrobial Stewardship Committees and other relevant organization.
- Data generated at the sites is reported in a timely manner to the national surveillance system

**Output 4.2: AMR surveillance system in animals is developed and implemented to generate data on bacterial resistance.**

Several surveillance programmes for animal diseases are currently in place in Zimbabwe but non include AMR surveillance. Indeed, the AMR surveillance plan is still in draft form, supported by FAO. The Grantee will provide technical assistance to national stakeholders (surveillance TWG and/or epidemiology unit (Division of Veterinary Technical Services) to support development of a stepwise AMR surveillance strategy in the animal health sector. Additionally, a detailed protocol for surveillance in poultry should be developed and implemented. This should make reference to available guidelines (e.g. OIE, FAO, or the Massey Poultry guidelines which can be supplied by the Management Agent). The Grantee is expected to assist national stakeholders in surveillance design in a manner that will enable staff to further customise surveillance and understand biases/confounders/limitations to be taken into account during analysis. The grantee is to budget for the implementation of the poultry surveillance protocol (i.e. for sample collection, processing and data analysis).

***By the end of the grant we expect that the following will have been achieved:***

- Current animal health surveillance programmes are assessed with regards to their cost-effectiveness, feasibility, strengths and weaknesses in order to identify, at least: (i) surveillance programmes into which AMR could easily and epidemiologically meaningfully be included, (ii) how AMR surveillance can be the most cost-effectively and sustainably developed.
- An AMR surveillance strategy is developed for terrestrial animals. If possible, this will draw on information gathered through an economic and assessment of animal health surveillance already in place in Zimbabwe
- A population-based AMR surveillance protocol for broiler and layer poultry, including sampling strategy, sampling frame, target populations, etc. is developed and agreed by national stakeholders.

- Staff are trained on sample collection (collection, labelling, transport, relevant biosafety and biosecurity measures), sample processing and data entry (software system to be determined in previous output).
- Appropriate isolates (as defined in 3.1) are forwarded from surveillance laboratories to CVL for confirmation and/or archiving.
- The minimum required number of samples (as decided during surveillance strategy design) are brought to the laboratories for testing.
- Quality data on AMR from all sites involved in the surveillance with demographic and epidemiological information should be entered in an electronic database
- Key implementation challenges and successes shared with the Surveillance TWG and AMR Core Group to help improve future surveillance protocols

#### **Output 4.3: The Environmental Health laboratory contributes data to the surveillance system.**

The laboratory monitors for bacterial contamination of water. The laboratory participated in the AGISAR-Tricycle project and technical staff have the skills to carry out bacteria culture and identification, but they should be supported to develop the capacity to perform AST and refer the samples to the NMRL. The Environmental Management Agency (EMA) processes about 40 samples daily and 300 samples monthly.

The laboratory is in a good state and will require only minor renovations and some equipment may need replacement or repairs/servicing. The laboratory is enrolled in an EQA program and has an in-house quality control officer. The laboratory has a good data management system but is heavily reliant on paper records which may be prone to human error. An assessment of current practices should be undertaken to identify needs before setting up a fit-for purpose electronic system.

#### ***By the end of the grant we expect that the following will have been achieved:***

- An AMR surveillance strategy for environment is developed and agreed among stakeholders. This should be a costed implementation plan for a surveillance protocol to be piloted during (and funded by) the Country Grant.
- The laboratory is supported as per Objective 2 to perform safe culture, identification and AST for *E.coli*, *Enterococcus*, and *Salmonella spp*, with QC support from the NMRL for confirmatory testing.
- Data on environmental AMR testing is analysed and the results and interpretation are shared with stakeholders.

#### **Output 4.4: The food safety laboratory contributes data to the national AMR surveillance system**

The Government Analyst Laboratory in Harare tests food samples of animal origin such as beef, chicken, pork and milk as well as environmental samples such as waste water. Samples are submitted by farmers, private companies and department of environment (MoHCC). The laboratory collaborates closely with the NMRL.

The Grantee should undertake minor refurbishment to ensure a dedicated bench space in the main laboratory to enhance bacteriology work and enable incorporation of the data produced by the

laboratory into the national surveillance system, and provide training for QMS, biosafety and security, and bacteriology as per Outputs 2.1, 2.2 and 2.3. The NMRL should provide QC support and confirmatory testing as per output 2.4.

***By the end of the grant we expect that the following will have been achieved:***

- Renovated a dedicated bench space for bacteriology work in the main laboratory
- AMR data from food sampling are integrated into the national AMR surveillance.

## Annex 1: Eligible Funding Items

### Laboratory Infrastructure Enhancement

- Infrastructure: renovation, redecoration, electricity and water supply, environmental controls, waste and waste disposal.
- Equipment: appropriate equipment for the level of capability; biosafety and biosecurity equipment; automated culture and identification platforms; IT equipment.
- Reagents, durables & consumables: appropriate media, reagents, culture plates, etc; glassware; sample collection consumables.
- Transport and logistics: vehicles or contracted services for transport of goods, and people; safe and secure transport of specimens and samples; logistical support for surveys.

### Human Resource Strengthening and Workforce Reforms

- Training: clinical, veterinary, agricultural and One Health surveillance protocols; biosafety and biosecurity; microbiology, laboratory science and laboratory management; epidemiology and surveillance; genomics; IT training.
- Long-term support: ongoing and refresher training according to the competency and capabilities framework; Fleming Fellowship Scheme.

### Surveillance System Strengthening

- Governance: support for AMR Coordination Committees & working groups; operational planning; cross-sectorial meetings and strategy reviews; evaluation(s).
- Quality assurance and control: site visits and audits, laboratory twinning / mentoring.
- Data: transfer and storage; safety and security; analysis software and training.
- Recurrent costs: utilities, maintenance of equipment, upkeep of laboratory space, small maintenance, personnel costs.

### Building Foundations for Surveillance Data Use

- Support to build demand for AMR data: general awareness among prescribers, dispensers and agricultural consumers (i.e. farm workers, agribusiness); publication charges; workforce training.
- Evidence based strategy, policy and practice change: data / information sharing conferences, meetings and initiatives; conference attendance; IT platforms for data sharing and awareness / transparency.

### Rational use of Antimicrobial Medicines

- AMU/C surveillance: development of strategies for AMU/C surveillance; use of AMU data for appropriate prescribing / informing stewardship programmes.