Terms of Reference for Request for Proposals

First Fleming Fund Country Grant to Pakistan

1. Overview of this grant

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

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

This grant will be competitively tendered. It will last up to 18 months, and will be to the value of £1.5-3 million, including all capital and recurrent costs, overheads and management costs. One of the outputs (Output 1.1), due within 9 months of the grant starting, will be to develop a costed operational plan for a national and sub-national AMR and AMU surveillance system, with consensus from the provinces.

It is the intention that parts of this plan could then be further funded by the Fleming Fund, to run concurrently with this Country Grant. Subject to performance and ongoing reviews, this could be implemented by the same Grantee(s). This tentative phase of funding would last up to October 2021, to the value of £4-8 million.

The Grantee (or Lead Grantee in the case of a consortium) 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 in its current form and will be expected to enter into sub-granting arrangements with partners on the same back-to-back terms.

The Grantee will need to work in close coordination with the Multisector Antimicrobial Resistance Control (AMRC) Steering Committee, as well as Mott MacDonald and other national stakeholders. The Grantee will also be required to harmonise efforts on this Country Grant with other types of grants under the Fleming Fund Grants Programme, namely Regional Grants and the Fleming Fellowship Scheme.

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, also known as 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 antibiotic 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 antibiotic-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 antibiotic-resistant infections. A Global Action Plan on Antimicrobial Resistance (AMR) has been developed by the

World Health Organization which acts as the blueprint for a multi-stakeholder global response to averting a global health crisis caused by AMR.[1]

The Fleming Fund comprises a number of workstreams. 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 'One Health' approach. Through funding to the Tripartite Alliance, the Fleming Fund has contributed to the development of National Action Plans 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 Fleming Fellowship Scheme, as these will target capacity gaps identified in National Action Plans. 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 UK Department of Health and Social Care 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.

The geographic focus of the Fleming Fund Grants Programme is 20-24 LMICs from Sub-Saharan Africa, and South and South East Asia. It will provide financial support over a five-year period from 2017 to 2021 to participating countries via three funding channels:

- Country Grants
- Fleming Fellowship Scheme Grants
- Regional Grants

Resources may also be available to conduct operational research on selected topics within these funding channels. These studies will provide an opportunity to better examine implementation 'blockages' or undertake more detailed case study analysis in themes of interest (e.g. value-for-money) for programme learning and adaption purposes.

The Fleming Fund will be independently evaluated and Itad, a specialist evaluation firm, has been appointed by the UK Department of Health and Social Care 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 who do routine antimicrobial drug sensitivity tests.
- Routine AMR testing in healthcare delivery is not practised, or 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.

[1] http://www.who.int/antimicrobial-resistance/global-action-plan/en/

- 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 often unwilling to integrate.
- There are weak One Health structures and 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 from basic surveillance of pathogens 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; and, therefore, improved data quality.
- Strengthened One Health workforce with a range of relevant skills for AMR surveillance.
- Stronger AMR surveillance systems and processes at country and regional levels.
- Stronger demand for AMR data at regional, country, subnational and facility levels.
- Better knowledge of country level patterns of practice and use of antimicrobials across sectors.

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

- Increase in quality and quantity of AMR data collected.
- AMR data shared in country to support evidence-based policy and practice.
- AMR data shared internationally to improve and inform the global response.

The RFPs for Country Grants have been designed to ensure that investments and activities contribute directly to outputs. The Grantee is expected to adhere to and demonstrate this alignment in the application.

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 work closely with national governments to ensure that country plans and aspirations, as laid out in their National Action Plans, are implemented; we will consult and work hand-in-hand with national governments to agree the approach and ensure sustainability. Grants and RFPs will conform to national priorities outlined in the National Action Plan and as articulated during Country Assessment visits. Unless there are good reasons 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[2] and FAO[3] 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.

A clear preference will be given when evaluating proposals to those bidders who can demonstrate that they have:

- Specifically examined the technical, institutional, political and other barriers that restrict the usage of AMR evidence in policy and implementation;
- Included in their bids real-time feedback mechanisms to determine if the laboratory inputs and outputs are being used by decision makers to improve AMR resistance policy and practices;
- demonstrated they have a realistic budget for preventive maintenance for key laboratory and scientific equipment and / or other specific mechanisms to ensure sustainability of the investments made.

2.5 Fleming Fund activities in Pakistan to date

This is the first Fleming Fund Country Grant to be released in Pakistan. In preparation for this grant, Mott MacDonald carried out a Scoping Visit in April 2018, which was followed by Positioning Activities in June-July 2018. This allowed us to better understand the design of surveillance systems and to conduct laboratory assessments, in order to better understand the priority areas to be supported through this RFP.

These activities culminated in identification of the main gaps and needs for strengthening AMR and AMU surveillance in humans and animals, and informed agreement with the Government of Pakistan about grant objectives and outputs.

[2] OIE Standards, Guideline and Resolution on Antimicrobial resistance and the use of antimicrobial agents;
[3] The FAO Action Plan on Antimicrobial Resistance, 2016-2020.

3. The current AMR situation in Pakistan

3.1 National AMR landscape

Momentum on AMR has gathered speed in Pakistan since 2016 as demonstrated by the development of a National AMR Framework, AMR National Action Plan, and a Multi-Sector AMR Steering Committee. AMR surveillance is listed as one of the seven priority areas of the National Action Plan.

The Ministry of National Health Services Regulation and Coordination (MoNHSRC) is the designated lead entity to coordinate a multi-sector One Health AMR response and report to GLASS on behalf of the Government of Pakistan. However, in decentralised Pakistan, the provinces also have key responsibilities for resourcing and managing AMR surveillance capabilities and use of AMR surveillance data.

The National Institute of Health (NIH), which sits under the MoNHSRC, is the designated national reference laboratory for AMR in the human health sector. The National Veterinary Laboratory (NVL) for Livestock and the National Reference Laboratory for Poultry Diseases, under the Ministry of National Food Security and Research (MNFSR), are the designated national reference laboratories for the animal health sector.

AMR surveillance is at a nascent stage in Pakistan. There are a handful of laboratories reporting AMR data to NIH, and some limited data has been collected within the animal health sector through one-off projects. To take national AMR surveillance forward, there is need to consolidate, detail and cost surveillance activities, implement across an evolving network of laboratories, and roll out population-based active sampling for the animal health sector.

Pakistan has several public and private laboratories that have the potential to be built up to perform AMR diagnostic and surveillance testing. Microbiological skills are also present in the country and there are well resourced teaching institutions.

At the same time, there are considerable coordination efforts required to move towards a One Health approach. Formal coordination mechanisms, leadership, standardisation and shared reporting are required across the both the human and animal health sectors for convergence. Similar efforts are required between federal and provincial governments within the human and animal health sectors to meet the NAP's AMR objectives. In animal health, the two separate streams of livestock and poultry diagnostics are coordinated separately and require a more coordinated approach to AMR surveillance in the animal health sector.

To perform AMR diagnostic and surveillance testing for GLASS reporting, resources will be required to equip and refurbish designated public-sector laboratories; to develop a sustainable supply chain of required diagnostic supplies; to develop sample transportation systems; to build networks across public and private sectors for data reporting; and to improve human resource capacity and quality assurance systems. There are also opportunities to improve the use of AMR data; the improve the linkages between policy and practice at the federal and provincial levels; and to improve capability for AMU stewardship across federal-provincial functions.

3.2 AMR surveillance – human health

There is currently a nascent network of AMR surveillance in the human health sector. NIH serves as the national reference laboratory, coordinating the NEQAS program, and providing training and support to other laboratories in Pakistan. However, its diagnostic capacity for AMR testing, data collation and analysis require further support. The network is complemented by four relatively high-capability, provincial, public sector teaching hospital laboratories – with samples from inpatients, outpatients and from referrals across the province – and two private sector laboratories. The data, generated by their respective microbiology departments, are shared first to NIH and subsequently to GLASS. These laboratories have also received some level of internal quality assurance and laboratory standardisation training.

Accordingly, the five participating public sector AMR reporting sites are:

1. National Institute of Health (NIH), Islamabad
2. Sheikh Zayed Medical Complex, Lahore

3. Mayo Hospital, Lahore
4. Civil Hospital, Karachi
5. Jinnah Postgraduate Medical Centre, Karachi

Additionally, the Provincial Departments of Health (DoH) are in the process of setting up referral laboratories at smaller tertiary/secondary hospitals to process samples from district hospitals. None of these laboratories are currently functional for AMR surveillance work. Referral laboratories have also been identified for the Gilgit-Baltistan and Azad Kashmir regions. An expanded network of sentinel sites across the country is yet to be fully identified in the human health sector.

There are a number of large private hospitals that perform high volume testing for microbiology/antimicrobial sensitivity testing (AST). At least two of these, the Aga Khan University Hospital and the Shaukat Khanum Memorial Hospital, also have well developed networks of sentinel sites across a number of districts. Parastatal organisations also reportedly have good capability for microbiology/AST. The private and parastatals sectors are not effectively connected into a national surveillance network, presenting missed opportunities for AMR surveillance.

In order to come to a fully functional and representative surveillance network, there are opportunities to strengthen the following areas:

- More sentinel sites from less represented geographical areas, as well as inclusion of private laboratories where appropriate.
- A further strengthening of the external quality assurance (EQA) programme and mentoring support across national and sub-national laboratories.
- A fully functional reporting system across the identified network of laboratories allowing the reporting of information to the NIH for collation, analysis and feedback.
- Systematic, ongoing surveillance of antimicrobial use (AMU) and use of this data to mitigate AMR.
- Improved capacity in data analysis and use of the data to inform clinical and public health decisions, as well as policy development in the field of AMU.
- Coordination across federal and provincial levels for coherent national surveillance, reporting, and the use of the data and results for decision making.

3.3 AMR surveillance – animal health

The Ministry of National Food Security and Research (MNFSR) is responsible for animal health coordination and houses different federal administrative units contributing to animal health. These include the Pakistan Agricultural Research Council (PARC), the National Agricultural Research Centre (NARC), and the Animal Sciences Research Institute (ASRI). Importantly, livestock and poultry diagnostic laboratories are managed separately. The National Veterinary Laboratory (NVL) and the National Reference Laboratory for Poultry Diseases (NRLPD) are the designated national reference laboratories for animal health. The NVL serves as the animal health focal point for AMR, and coordinates with NRLPD.

In the provinces, it is the Departments of Livestock (DoL) that have responsibility for AMR surveillance activities. Livestock is the focus, with poultry a nested function within these departments. Each province has a vertical network of provincial, divisional and district laboratories with a vertical reporting chain and better capacities at the provincial laboratories. The DoLs are responsible for resourcing and monitoring these facilities.

There is a need for strengthening central coordination within the MNFSR across livestock and poultry work streams, as well as across federal-provincial levels, for joined up working on AMR in the animal health sector. There currently is no structured, national surveillance programme for AMR in livestock or poultry in Pakistan. However, limited data has been collected in recent years from specific subpopulations of livestock, poultry, and meat at the federal and provincial levels through funding by partners and government.

A draft PC-1 proposal entitled 'Establishment of National Antimicrobial Resistance (AMR) Surveillance System in Veterinary Sector of Pakistan' has been developed by the MNFSR for the livestock sector, to be undertaken through federal-provincial efforts, but requires detailing of sampling and commitment of resources. Similar planning is yet to be formalized for the poultry sector, however NRLPD has managed a well-coordinated national programme for avian influenza (and other pathogens) and provides reference laboratory support to provincial laboratories.

One or two laboratories in each province and region have been identified by MNFSR as focal points for AMR surveillance and have been agreed with the provincial DoLs. Directors of the Provincial DoL laboratories are the designated provincial focal persons for AMR in animal health sector.

Both public and private disease diagnosis laboratories for poultry and/or livestock exist in Pakistan. Generally, disease diagnosis is a free service to farmers at the public laboratories. At the federal level, NVL and NRLPD serve as both reference and referral laboratories for diagnostic testing and disease surveillance purposes, however, both have limited roles as diagnostic laboratories. They have been identified by the government as the national AMR reference laboratories for livestock and poultry, respectively.

The provincial laboratories identified primarily have a diagnostic function but also provide limited referral and reference services to district laboratories within their respective provinces. Since devolution, there is no explicit hierarchical administrative relationship between the federal and provincial laboratories.

There are also several private laboratories in Pakistan, particularly in the poultry sector. Private laboratories may be either for-profit, serving any client, or may be 'internal' and provide diagnostic services only to those farms that form part of a large poultry production company.

In order to come to a fully functional surveillance network, there are opportunities to strengthen the following areas:

- Expansion to active population-based prospective sampling of healthy poultry and livestock, representative of the underlying population and production systems.
- More sentinel sites to ensure a more representative sample from the Pakistan population.
- Development of a detailed surveillance plan, with initial efforts focussed on identification of the relative occurrence of specified bacteria known to be of significance to AMR in humans, and subsequent efforts focussed on answering more precise questions around AMR prevalence, trends, risk factors, and source attribution.
- A further strengthening of the EQA program and mentoring support across national and sub-national laboratories to ensure the entering of high quality data into national and international databases.
- A fully functional reporting system across the identified network of laboratories allowing the reporting of information to NIH for collation, analysis and feedback.
- Systematic, ongoing surveillance of antimicrobial use (AMU) and the use of this data to mitigate AMR.
- Improved capacity in data analysis and use to inform clinical and public health decisions, as well as policy development in the field of AMU.
- Coordination across national and sub-national levels for coherent national surveillance, reporting, and use of data and results for decision making.

4. Scope of this Country Grant

4.1 Grant objectives and outputs

Objectives and outputs for this Country Grant are summarised as follows. Section 7 provides more detail. It is expected that applicants will respond to this RFP by developing and proposing costed activities, and by proposing appropriate indicators (see Section 9). All inputs must be permitted under the list of Eligible Funding Items (see Annex 1).

Table 1. Summary of Grant Objectives and Outputs.

Objective/Output
Objective 1: Developed workplan for AMR and AMU surveillance in Pakistan
• Output 1.1: Develop a costed operational workplan for AMR and AMU surveillance based on a One Health approach
Objective 2: Strengthened One Health approaches to information sharing on AMR and AMU
• Output 2.1: Improved governance and coordination for AMR and AMU surveillance established and functioning at the MoNHSRC, MNFSR and provincial government level
• Output 2.2: AMR and AMU findings are disseminated to policy-makers, media, and industry through two information-sharing events
• Output 2.3: AMR reporting on WHONET is strengthened
Objective 3: Strengthened AMR and AMU surveillance in the human health sector
• Output 3.1: NIH has been strengthened to enable it to function as a national AMR reference laboratory for human health
• Output 3.2: National External Quality Assurance System (NEQAS) and proficiency testing programmes are expanded and strengthened, across public and private sector laboratories
• Output 3.3: Improved understanding of AMU and AMC by key stakeholders in the human health sector
Objective 4: Strengthened AMR and AMU surveillance in the animal health sector
• Output 4.1: NVL and NRLPD have been strengthened to enable it to function as a national AMR reference laboratory for animal health
• Output 4.2: Active field-based AMR surveillance is undertaken in poultry and livestock across representative geographical areas.
• Output 4.3: Improved understanding of AMU and AMC by key stakeholders in the animal health sector

4.2 Identified laboratories for support

In the context of this RFP, the following terminology will be used:

- **National reference laboratory**: The national level coordinating laboratory that provides confirmatory testing, training, and support activities to the other laboratories, and takes the lead on national surveillance design, methods and reporting.
- **Provincial reference laboratory**: The provincial level coordinating laboratory that provides confirmatory testing, training, and mentoring activities to other provincial laboratories. There can be 1-3 per province, depending on criteria that will be developed with NIH.
- **Referral laboratory**: A laboratory to which other laboratories send samples for tests which are not available at the initial laboratory.
- **Sentinel site laboratory**: the laboratory performing initial testing on samples from sentinel sites
- **Sentinel site**: Site where samples are collected for referral to a laboratory for testing. Sentinel sites may include locations such as clinics, abattoirs, farms, and live animal/bird markets.

4.2.1 Public sector laboratories

During July 2018, the Fleming Fund team facilitated a review of public sector laboratories that could benefit from refurbishment and equipment for AMR reporting. The review was confined to those public-sector laboratories that are presently reporting on AMR and could benefit from improving their capabilities to allow full GLASS reporting. this review included the national reference laboratories for human health and animal health, as well as those provincial public-sector laboratories that largely satisfied the criteria required to perform as provincial reference laboratories. In total, six human health public sector laboratories and nine animal health laboratories were identified.

For this Country Grant, it is proposed that only three laboratories are supported. The remaining labs (and potential some other public provincial-regional laboratories) could then be supported during a later phase, pending the successful completion of Output 1.1 (which comprises a more detailed and costed operational plan) by the end of month 9.

A summary of these reviews will be provided to the successful applicant to this RFP.

4.2.2 Private sector laboratories

Private sector AMR reporting sites will need to be identified and included in the costed national AMR surveillance plan, which is one of the first outputs to be supported through this Fleming Fund Country Grant.

Private sector laboratories should be included in the plan (Output 1.1) for capability development through training, distribution of standard operating procedures (SOPs), and ATCC strains, in order to effectively harness them for AMR reporting through public-private partnership arrangements. They will not, however, receive refurbishment and equipment support.

4.2.3 Identified laboratories

Table 2. Laboratories identified for the Pakistan Country Grant, and a potential future round of Fleming funding

Sector	Pakistan Country Grant	Potential future round
Human health	Support for refurbishment, equipment, consumables and training to the national reference laboratory: 1. National Institute of Health, Islamabad Additionally: Support for reporting, training and ATCC strains to those public laboratories already performing AMR testing.	Pending the successful completion of Output 1.1, there may be opportunities to continue support to the laboratory listed to the left, as well as to fund additional support to other laboratories as outlined below, which are expected to form part of the wider surveillance network once finalised. Support for refurbishment, equipment, consumables and training to five provincial public sector reference laboratories currently reporting on GLASS: 1. Sheikh Zayed Medical Complex, Lahore, Punjab 2. Mayo Hospital, Lahore, Punjab 3. Jinnah Postgraduate Medical Centre, Karachi, Sindh 4. Civil Hospital Karachi, Sindh 5. Khyber Pakhtunkhwa Medical University, Peshawar, Kyhber Pakhtunkhwa Additionally: Support to a few selected referral and sentinel laboratories covering under-represented geographies from the consolidated national surveillance plan. This will require further discussion and coordination with Government of Pakistan, Mott MacDonald and partners.

Animal health (livestock and poultry)	Support for refurbishment, equipment, consumables and training: 1. National Veterinary Laboratory, Ministry of National Food Security and Research, Islamabad 2. National Reference Laboratory for Poultry Diseases, PARC:NARC:ASI, Islamabad Additionally, support for AMR reporting, training and ATCC strains to public sector laboratories identified in this RFP.	Pending the successful completion of Output 1.1, there may be opportunities to continue support to the laboratories listed to the left, as well as to fund additional support to other laboratories as outlined below, which are expected to form part of the wider surveillance network once finalised. Support for refurbishment, equipment, consumables and training to seven provincial reference/referral laboratories: 1. Disease Diagnostic Laboratory, Livestock and Dairy Development Department, Lahore, Punjab 2. Poultry Research Institute, Directorate of Poultry Research Institute, Rawalpindi, Punjab 3. Central Veterinary Diagnostic Laboratory, Directorate of Veterinary Research and Diagnosis, Tando Jam, Sindh 4. Poultry Research Institute (Pathology Division), Directorate of Poultry Production and Research, Karachi, Sindh 5. Sindh Institute of Animal Health, Karachi, Sindh 6. Veterinary Research Institute, Directorate of Livestock and Dairy Development, Peshawar, Khyber Pakhtunkhwa 7. Disease Investigation Laboratory, Livestock and Dairy Development Department, Quetta, Balochistan

Annex 3 includes some potential outputs that relate to a future Fleming grant. These would need to be revisited in light Output 1.1 and a costed operational plan, but provides a basis for what the Fleming Fund could support in the future.

4.3 Duration of the grant

This Country Grant is expected to last 18 months.

Output 1.1, which includes a costed operational workplan, will need to be completed by 9 months. This will then inform the decision on how the Fleming Fund could continue to support Pakistan further.

Assuming there is agreement on the costed operational workplan (Output 1.1), it could be possible to provide further support, to last until October 2021. This could then cover the laboratories identified in Table 2 (for the future round of funding). This would be subject to review and approval by Mott MacDonald and the UK Department of Health and Social Care.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	...	Until Oct 2021	
Country Grant (Output 1.1 only)	Costed operational workplan										
Country Grant (except Output 1.1)											
Future phase/grant (depending on Output 1.1)				Potential future funding							

4.4 Funding envelope

Grant applications are expected to be in the range of £1.5-3 million, including all capital and recurrent costs, overheads and management costs.

In the case that there is a future funding round, the tentative range is £4-8 million.

The Fleming Fund wishes to see value for money (VfM) in the form of maximum outputs for the grant money invested. The Guidance Notes for the Grant Application Form provides different dimensions that should be considered as part of a VfM approach – economy, efficiency and effectiveness – and an indication of how we may assess VfM.

4.5 Procurement

4.5.1 Laboratory equipment and consumables

An indicative procurement list for laboratory equipment and consumables for Pakistan was compiled following site assessments of some public-sector laboratories during the Positioning Activities Visit. The procurement list will be included as part of the Application Pack for information purposes only. The Grantee should not budget for the cost of laboratory and consumables at this stage.

During the Country Grant, the Grantee will need to work with selected laboratories to finalise detailed specifications for equipment and consumables. In consultation with the Grantee, International Procurement Agency (Mott MacDonald's procurement partner) and the UK Department of Health and Social Care, Mott MacDonald will make a decision on the most suitable and sustainable method of procurement.

In the event that equipment and consumables are not procured by the Grantee, it will still have the following roles to play:

- to assist with the import and delivery of equipment and consumables to recipient sites;
- to work closely with suppliers to ensure that delivery of items is sequenced appropriately;
- to maintain an asset register of all items that are defined as assets by the programme;
- to regularly monitor the items that have been procured by Fleming Fund Grants Programme throughout the course of the grant to ensure: i) items are being used as intended; and ii) items are being maintained appropriately; and
- to report any misuse or misappropriation of assets to Mott MacDonald.

4.5.2 Renovation of laboratories

The listed laboratories will require refurbishment to some extent under this Fleming Fund Country Grant. The Grantee will need to undertake the renovation works and procurement of necessary goods (excluding laboratory equipment) that are required for the renovation of the laboratories (e.g. benches, air-conditioning units, flooring, generators etc.).

For this grant, all applicants should insert a budget of GBP £500,000, which will serve as a placeholder until detailed assessments can be undertaken by the Grantee to ascertain a more detailed budget. The Grantee should undertake relevant detailed site assessments for refurbishment at the beginning of the Grant, after which a detailed budget will subsequently be agreed with Mott MacDonald. All applicants should make sure that sufficient personnel costs are included for the design work required for renovation and management of renovation of laboratories, both of which

would need to be coordinated very closely with the government. Grantees should also explain how they will manage the renovation of laboratories and provide detail of any experience undertaking renovation work.

For all items procured under renovations, the Grantee will be responsible for:

- maintaining an asset register of all items that are defined as assets by the programme;
- regularly monitoring the items that have been procured by Fleming Fund Grants Programme throughout the course of the grant to ensure: i) items are being used for intended use; and ii) items are being maintained appropriately; and
- reporting any misuse or misappropriation of assets to the Management Agent.

As with the laboratory equipment and consumables, the detailed procurement plan and budget would need to be reviewed by Mott MacDonald, and the choice of procurement route will be subject to assessment by the International Procurement Agency.

5. Key partnerships, alignment and coordination

The Country Grant must be delivered in a way which supports the national effort, and which takes account of current capacity levels, absorptive capacity, alignment with others, and the particular challenges – cultural, political and linguistic – of working in Pakistan. The Grantee must also ensure that all inputs complement and build on work done to date and avoid duplication and development of parallel systems.

MoNHSRC, as the secretariat for the National AMRC Steering Committee, has expressed its desire for efforts to be coordinated and the Grantee is expected to be an active and supportive member of this arrangement, facilitating national leadership and ownership of the programme. The mechanism for coordinating the multiple donor inputs is not yet established, and therefore the Grantee must be prepared to work in a dynamic and evolving environment and be mindful of the need to coordinate with all parties at every opportunity.

In the human health sector, the delivery approach and inputs must be closely aligned with the National Action Plan's surveillance priorities, the Integrated Disease Surveillance & Response (IDSR) Strategic Framework of the MoNHSRC, and recommendations of the Joint External Evaluation (JEE) of the International Health Regulations (IHR).

In the animal health sector, the delivery approach and inputs must be closely aligned with the National Action Plan's surveillance priorities, draft animal health surveillance Planning Commission application form 1 (PC-1) developed by MNFSR, as well as best practice lessons learnt from past experiences in the control of avian influenza.

There must be close alignment with inputs being provided by WHO, US CDC, FAO, and other development partners where relevant. Allocation of grant resources should also support the national effort in a transparent way, by sharing resource allocation in a workplan with the NIH, to allow tracking of development partners.

A copy of a Scoping Report, compiled by Mott MacDonald earlier this year, will be provided to the successful applicant, which maps the AMR landscape and includes contributions already being made by major AMR partners.

Much of the success of this grant, in particular Objective 1, depends upon the ability and prior demonstrated experience of the Grantee to bring together stakeholders from multiple sectors and federal-provincial levels. The Grantee will also need to build and make use of partnerships with several AMR stakeholders beyond those in government and the UN, to include private sector, industry, training and research institutions, academia, media and partner-supported relevant programmes.

6. Complementing other grants from the Fleming Fund Grants Programme

The Country Grant is expected to work effectively and synergistically with other components of the Fleming Fund Grants Programme.

The 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 maximising the sharing of AMR data and learning at the regional and global levels.

The Fleming Fellowship Scheme is part of the broader Fleming Fund Grants Programme and is also managed by Mott MacDonald. Fellowships will be for approximately 18 months duration, providing structured learning, mentoring and skills development. Rather than duplicate basic training, the Fellowships will focus on building advanced skills and leadership to promote the application of best practice.

The scheme will contribute to the sustainability of AMR control by providing a network of skilled staff in Beneficiary Institutions, identified organisations that add strategic value to achieving the Fleming Fund's aims in the country, such as AMR coordinating platforms and reference laboratories.

Skill development in Pakistan will mostly comprise on-the-job activities, to allow Fellows to play a meaningful role in the evolving initiatives for AMR control. Activities will include mentoring, participation in collaborative projects and specialised training that will support the Fellows within their workplace. These institutions will also support Fellows' workplaces to allow Fellows to implement what they have learned.

Following selection, each Fellow will be matched with a Host Institution from a prequalified pool of institutions. Each Fellow, together with their Beneficiary and Host Institutions, will develop a budgeted work plan which will be agreed and funded by the Fleming Fund through the Host Institution. We expect this process to run in parallel with the selection of the Grantee for the Country Grant, which will enable the Grantee and the Host Institutions to align their work programmes.

7. Detailed Objectives and Outputs

7.1 Objective 1: Developed workplan for AMR and AMU surveillance in Pakistan

Output 1.1: **Develop a costed operational workplan for AMR and AMU surveillance based on a One Health approach**

We expect this output will have been achieved by the end of the first nine months (quarter 3), in order to allow the potential for additional funding to be considered. To the extent possible, this should be considered as a national plan for AMR/AMU surveillance with consensus of provinces.

The Grantee is expected to support the Government of Pakistan by providing technical assistance and to consolidate existing planning efforts with special consideration to the strategic priorities endorsed in the Pakistan National Action Plan for AMR. Planning for surveillance should consider the 'priority pathogen' sample types, bacteria and antibiotics outlined in GLASS. Other features of the plan should include: details of sentinel networks and sampling strategy, detailed costs, a clear delineation of federal and provincial roles/responsibilities along with those of other key organisations and stakeholders, and an M&E framework for tracking implementation and achievements. This plan should consider the inclusion of environmental surveillance too.

Guidance can be sought from the roadmap produced by the London School of Hygiene and Tropical Medicine,[4] WHO, FAO and the Fleming Fund.

This output will require the assessment of the selected sentinel laboratories, including procurement requirements. The Fleming Fund lab assessment tools will be provided to support this process and to ensure a consistent approach.

7.2 Objective 2: Strengthened One Health approaches to information sharing on AMR and AMU

Output 2.1: Improved governance and coordination for AMR and AMU surveillance established and functioning at the MoNHSRC, MNFSR and provincial government level

By the end of the grant, we expect:

- PARC to provide collated and analysed AMR and AMU data across poultry and livestock sectors to NIH and other relevant stakeholders and decision-makers.
- NIH to provide collated and analysed AMR and AMU data to relevant stakeholders and decision-makers.
- The establishment of a national and provincial committees on AMR and AMU surveillance, including, if appropriate, members from the private sector.
- NIH to be supported in convening the national AMRC Steering Committee meetings and technical working group(s) meetings.
- Production of quarterly data summaries and/or narrative interpretation of key AMR and AMU findings, across both human and animal sectors.

Output 2.2: AMR and AMU findings are disseminated to policy-makers, media, and industry through two information-sharing events

By the end of the grant, we expect:

- Delivery of a symposium to policy-makers, from both the human and animal health sectors, focussing on what is known about AMR and AMU, potential policy-relevant solutions, as well as areas for future work.
- Delivery of an event to media and industry, highlighting what is known about AMR and AMU, and their potential role in combatting AMR.

Output 2.3: AMR reporting on WHONET is strengthened

WHONET is already in use at NIH. However, laboratories providing AMR data to NIH face IT issues, and so far have limitations in using WHONET.

For reporting to improve, training, IT support, and possibly new regulations or national guidelines will need to be established. AMR reporting will also require linkage development with ongoing disease surveillance structures and reporting systems in place at national and provincial levels.

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

- An increased number of human health laboratories using WHONET for data entry and analysis, and reporting to higher levels of the system.
- Data from animal health laboratories entered and stored using WHONET or a format compatible with WHONET.

[4] http://amr.lshtm.ac.uk/wp-content/uploads/sites/12/2016/11/AMR-Surveillance-Protocol.pdf

- Development of data storage and management systems for animal health laboratories for epidemiological information and surveillance cohort data that can be linked to bacteriological data (currently not fully available using WHONET)

7.3 Objective 3: Strengthened AMR and AMU surveillance in the human health sector

Output 3.1: NIH has been strengthened to enable it to function as a national AMR reference laboratory for human health

At NIH, capability has been developed to function as national AMR reference laboratory, with the view to perform antimicrobial susceptibility testing for all GLASS priority pathogen-drug combinations.

Inputs provided by the Grantee during the implementation phase should align with those being provided by other partners or through the Government of Pakistan. Applicants, in their proposals, should identify strategies to ensure sustainability of NIH's AMR reference laboratory role beyond the life of the grant – to include consideration for staff, equipment and systems.

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

- The NIH can test for all GLASS priority pathogen-drug combinations, and those that are prioritised in Output 1.1.
- NIH's bacteriology section and biorepository have adequate infrastructure, equipment and training to function as a national reference laboratory.
- NIH receives training in advanced techniques for pathogen identification and antibiotic resistance mechanisms characterisation, including phenotypic and genotypic methods, with practical training also.
- NIH delivers quality support services in bacteriology to other laboratories.
- A repository of ATCC reference strains (or equivalent) of bacteria is developed at the NIH for cataloguing and distribution to priority laboratories.
- Agreed processes for handling dangerous pathogens are in place and implemented.
- NIH will be able to launch indigenous training program (short hands-on training workshops) for AST and reporting for human health sector laboratories at provincial and district level staff

Output 3.2: National External Quality Assurance System (NEQAS) and proficiency testing programmes are expanded and strengthened, across public and private sector laboratories

NEQAS programmes are important for ensuring high quality results, and to ensure comparability of data which are standardised. Currently, the human health sector has a NEQAS programme that is coordinated by NIH, in which laboratories can participate twice yearly on a voluntary basis.

By the end of this grant, it is expected that:

- There will be expansion of the NEQAS programme at NIH
- The NEQAS programme at NIH has been strengthened according to international standards, to be used at the laboratories identified in Table 2
- The NEQAS programme at NIH becomes mandatory for all laboratories submitting data to the national AMR surveillance system.
- Standard Operating Procedures (SOPs) and methods relevant to culture, identification, and antimicrobial susceptibility testing of organisms specified in the national AMR surveillance plan are developed/consolidated and distributed to participating public and private sector laboratories.
- Results from the NEQAS are analysed, with timely feedback to the participating laboratories to improve their testing.

Output 3.3: Improved understanding of AMU and AMC by key stakeholders in the human health sector

A comprehensive AMU surveillance system should include collection of data from a number of sources including: official and unofficial data on drug manufacture, importation, and distribution; end-user behaviour (why, how much, how often, etc.) related to antibiotic use and consumption. The initial focus should be on collecting data from sentinel sites potentially included in the second grant (page 9).

There will be a Fleming Fellowship to support capacity building in AMU surveillance. The Grantee should be prepared to work alongside them to ensure no duplication of work.

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

- An operational plan is developed for AMU surveillance (part of Output 1.1), as a national plan for AMU surveillance with consensus of provinces.
- Linkages to be made with existing research and academic entities, and the private sector, where appropriate.
- AMU data from selected sites is collected and provided to relevant national and provincial stewardship entities or professional associations to facilitate discussions on rational use of antimicrobials.
- There is improved capacity for Pakistan to collect AMC data at a national and/or provincial level.
- Undertake analyses that make use of both AMU and AMR data from specific areas to improve the understanding of AMR and provide evidence for policy making.

7.4 Objective 4: Strengthened AMR and AMU surveillance in the animal health sector

Output 4.1: NVL and NRLPD have been strengthened to enable it to function as a national AMR reference laboratory for animal health

NVL and NRLPD have been identified as the AMR national reference laboratories for the animal health sector.

The Grantee is expected to support and enhance these laboratories in their role, aligning with other partners and the Government of Pakistan. Prospective applicants, in their proposals, should identify strategies to ensure sustainability of reference laboratories role beyond the life of the grant – to include consideration for staff, equipment, and systems.

Based on our needs assessment, the zoonotic bacteria and antibiotics that should be the focus of AMR surveillance for the animal health sector in Pakistan should be as follows, pending agreement with the government:

- *Enterobacteriaceae*, carbapenem-resistant, ESBL-producing *E-Coli*
- *Enterococcus faecium*, vancomycin-resistant (also include *E. faecalis*)
- *Salmonella* spp., fluoroquinolone-resistant
- *Campylobacter* spp., fluoroquinolone-resistant

By the end of the grant, it is expected that the following will have been achieved:

- NVL and NRLPD can test for all priority pathogen-drug combinations.
- NVL and NRLPD bacteriology sections and biorepository has adequate infrastructure (including power and distilled water supply), equipment, IT and staff to function as a national reference laboratory.
- NVL and NRLPD receive training in advanced techniques for pathogen identification and antibiotic resistance mechanisms, with practical training also.
- Agreed processes for handling dangerous pathogens are in place and implemented.

Output 4.2: Active field-based AMR surveillance is undertaken in poultry and livestock across representative geographical areas.

In order to generate a representative understanding of AMR in the animal health sector in Pakistan, active epidemiological surveillance of production farms and markets is required, as opposed to relying only on sick birds and livestock referred to diagnostic laboratories.

Poultry and livestock populations are proposed as the entry point for AMR surveillance. This should be done as a minimum of four sampling periods per year, based on active field-based sampling of live poultry and livestock in high density production areas, with representative sampling coming from different geographical areas.

The plan should be iterative and can be expanded over time to sampling animal-derived food products and environmental sampling, as well as inclusion of other laboratories in the future once the operational workplan is developed (Output 1.1).

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

- Sampling framework and methods are integrated into the national costed operational workplan (Output 1.1), which will include identification of relevant sampling sites.
- Sampling is undertaken without adverse effects on the animal.

Output 4.3: Improved understanding of AMU and AMC by key stakeholders in the animal health sector

A comprehensive AMU surveillance system should include collection of data from a number of sources including: official and unofficial data on drug manufacture, importation, and distribution; end-user behaviour (why, how much, how often, etc.) related to antibiotic use and consumption.

It is proposed that there should be a Fleming Fellowship to support with AMU surveillance. The Grantee should be prepared to work alongside them to ensure no duplication of work.

Further guidance on AMU and AMC in the animal health sector are available from the OIE website.[5]

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

- An operational plan is developed for AMU surveillance (Output 1.1).
- Linkages to be made with existing research and academic entities, and the private sector, where appropriate.
- AMU data is collected and provided to relevant national and provincial stewardship entities or professional associations to facilitate discussions on rational use of antimicrobials.
- There is improved capacity for Pakistan to collect AMC data at a national and/or provincial level for OIE reporting.
- Undertake analyses that make use of both AMU and AMR data from specific areas to improve the understanding of AMR and provide data for policy making.

8. Grantee Roles and Responsibilities

The main role of the Grantee, or Lead Grantee in the case of a consortium, will be to plan and deliver the outputs as listed above, contributing to the Country Grant objectives. 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 achieve agreed results.

The Grantee is responsible for financial management and controls for the grant as a whole (including the contributions of sub-grantees if applicable) and for reporting to Mott MacDonald. Reporting of financial expenditure against budgeted activities is a requirement of the Country Grant and the Grantee(s) will need to show evidence of sufficient capabilities to undertake these responsibilities.

[5] http://www.oie.int/scientific-expertise/veterinary-products/antimicrobials/

The Grantee is also responsible for monitoring and reporting on all activities under the grant as a whole (including the contributions of sub-grantees if applicable).

9. 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, Mott MacDonald recognises that, for much of this first grant, given the early stage of organised AMR surveillance in Pakistan, these indicators may not yet be applicable. Therefore, applicants are expected to select from the standard indicator set only where appropriate. Where it is too early to select and use indicators because results attainment is at the 'process' (and not 'output') level of results delivery, completion of activities (i.e. mapped by objectives) against agreed targets and time will be monitored.

In summary, while the completion and level of attainment for *all* activities requires monitoring, the type/level of activity will determine the monitoring method. When developing the application, applicants should:

- Select from the proposed indicators for activities, where appropriate, or,
- Identify targets and timeframe completion for 'process' type activities (i.e. where indicators provided are not applicable /too advanced);

A mix of these options is also appropriate depending on application content. In the revised and updated workplan to be submitted to Mott MacDonald at the end of the inception phase, prior to implementation, the Grantee will be expected to revisit/confirm the monitoring plan which will then be agreed with Mott MacDonald.

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 core principles described in Section 2.3, and practical implications for this will be discussed with the successful applicant. No further action is required at this stage.

10. Application requirements

10.1 Grant Eligibility Criteria

Potential grant applicants must satisfy the following eligibility criteria before applications will be assessed in detail. Applicants:

- Must demonstrate that they are competent organisations responding to this call for proposals
- Must have an appropriate track-record in supporting laboratory capacity development, surveillance, capacity building, One Health.
- Must have experience of programme implementation in Pakistan, ideally with linkages within Pakistan's human health and animal health systems and across different geographies.
- Must demonstrate that they are registered to work within the country, including the provision of essential documents such as articles of incorporation.
- Must be prepared to accept the Grant Agreement terms.
- Must be able to provide the same information and assurances for all sub-grantees, where the application is from a consortium.
- Should be able to provide all information required for due diligence checks, including clear evidence of financial standing and systems of financial management and control.
- Should be able to provide evidence of suitability in the form of references from clients and donors for previous work undertaken within the last three years.
- Can be a single organisation or consortia, though the latter must clearly identify a Lead Grantee with the appropriate governance and coordination mechanisms to manage sub-grantees.
- Can be:
    - Independent institutes – such as a university or research institutes
    - UN agencies
    - Non-governmental organisations (NGOs)
    - Private companies
    - Government-owned enterprises or institutions, provided they can establish that they are (i) legally and financially autonomous, (ii) operate under commercial law, and (iii) are not dependent agencies of national governments

10.2 How to apply

Prospective grantees must register interest to receive the **Application Pack** by emailing flemingfundSEA@mottmac.com by the dates outlined in the 'Key dates' section below (Section 10.5) Please include the organisations name, the name, phone number and email address of the main focal point.

Soon after publication of the RFP, there will be an **Applicant Information Session (AIS)** in Islamabad for prospective applicants. The details of the venue will be shared with applicants who have registered their interest.

Ahead of the event, an example Application Pack will be shared and will include the application form, budget and monitoring template, Guidance Notes, and the grant agreement template. Following the AIS, the **official Application Pack** will be sent out to prospective Grantees who have registered.

To apply, please complete the **application form and budget and monitoring template** that will be provided, in line with the Guidance Notes, by the deadline outlined in Section 10.5.

Note the key requirements set out at the beginning of the Country Grant application form:

- Your submission should be returned by the deadline indicated in the RFP.

- 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.
- Applicants should observe the word limit indicated for each question. Additional words outside the limit will be disregarded.
- All documents included as part of the proposal must be submitted 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 authorised to represent your organisation for the submission of this proposal.

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

10.3 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).

In particular we are looking for a Grantee / Grantees who can demonstrate its:

- 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.
- ability to operate effectively in Pakistan, including required country registrations, and alongside stakeholders from federal and provincial government and other relevant organisations involved in AMR, including the private sector.
- gender balance, in terms of knowledge, skills and ability

10.4 Restrictions/limitations

Any conflict of interest, or potential conflict of interest, should be declared to Mott MacDonald when applicants are registering their interest to apply for the grant. If a conflict of interest, or potential conflict of interest, arises after that point the prospective grantee must clearly declare this in their proposal.

10.5 Key dates

- Publication of RFP: **4 October 2018**
- Deadline for registering interest to attend Applicant Information Session: **11 October 2018** 17.00 PKT (GMT+5)
- Applicant Information Session: **Friday, 19 October 2018 – Time and Venue TBC**, Islamabad
- Deadline for registering to apply for Grant: **22 October 2018** 17.00 PKT (GMT+5)
- Application submission deadline: **23 November 2018** 17.00 PKT (GMT+5)
- Anticipated start date of grant: **February 2019**

10.6 Contact details and support information

Any questions on the Request for Proposals should be sent to flemingfundSEA@mottmac.com. Mott MacDonald will endeavour to respond to queries within three working days.

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 contacted 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.

Annex 2 Tentative Fleming Fellowships in Pakistan

Sector	Fellowship	Beneficiary Institution	Understanding AMR	Surveillance expertise	Diagnostic expertise	Lab quality management systems	Data collection, analysis and use	OH Technical working group	Collaborative project
Human	AMR Surveillance	NIH	Keep up to date with all the available information on AMR and AMU in Pakistan Understand the likely AMR mechanisms in Pakistan	Contribute to designing future targeted AMR surveillance			Collate and analyse existing AMR data (outbreak investigations) Analyse AMR surveillance data Understand data biases Interpret AMR results in consultation with microbiologist and AMU data	Discuss AMR and AMU results from human and animals Present overall understanding of AMR in Pakistan	To be discussed at the time of agreeing on the Fellowship workplans
Human	Laboratory	NIH	Keep up to date with all the available information on AMR and AMU in Pakistan Understand the likely AMR mechanisms in Pakistan		Phenotypic testing for resistance (ESBL, acquired AmpC (pAmpC) and/or carbapenem resistance)	Improve quality of culture, identification and AST in surveillance site laboratories		Discuss AMR and AMU results from humans and animals Present AMR results from humans (with AMR Surveillance Fellow)	To be discussed at the time of agreeing on the Fellowship workplans
Human	AMU Surveillance	NIH	Keep up to date with all the available information on AMR and AMU in Pakistan Understand the likely AMR mechanisms in Pakistan				Conduct survey of prescribing practices. Analyse and interpret AMU surveillance results Work with clinicians to modify prescribing practices to reduce potential for AMR	Discuss AMR and AMU results from human and animals Present AMU results from humans so that AMR results are related to AMU patterns	To be discussed at the time of agreeing on the Fellowship workplans

Sector	Fellowship	Beneficiary Institution	Understanding AMR	Surveillance expertise	Diagnostic expertise	Lab quality management systems	Data collection, analysis and use	OH Technical working group	Collaborative project
Animal	Laboratory	NVL, Islamabad	Keep up to date with all the available information on AMR and AMU in Pakistan Understand the likely AMR mechanisms in Pakistan		Phenotypic testing for resistance (ESBL, acquired AmpC (pAmpC) and/or carbapenem resistance) Minimum Inhibitory Concentration testing for antibiotic resistance	Improve quality of culture, identification and AST in regional laboratories		Discuss AMR and AMU results from human and animals Present AMR results from animals (with Surveillance Fellow)	To be discussed at the time of agreeing on the Fellowship workplans
Animal	AMR Surveillance	NRLPD, Islamabad	Keep up to date with all the available information on AMR and AMU in Pakistan Understand the likely AMR mechanisms in Pakistan	Contribute to designing future targeted AMR surveillance			Collate and analyse existing AMR data (clinical cases) Analyse AMR surveillance data Understand data biases Interpret AMR results in consultation with microbiologist and AMU data	Discuss AMR and AMU results from human and animals Present AMR results from animals (with Lab Fellow)	To be discussed at the time of agreeing on the Fellowship workplans

Sector	Fellowship	Beneficiary Institution	Understanding AMR	Surveillance expertise	Diagnostic expertise	Lab quality management systems	Data collection, analysis and use	OH Technical working group	Collaborative project
Animal	AMU Surveillance	NRLPD, Islamabad	Keep up to date with all the available information on AMR and AMU in Pakistan Understand the likely AMR mechanisms in Pakistan				Analyse national veterinary antibiotic records and support reporting AMC data to OIE. Analyse AMU data that is currently stored in paper records, including antibiotics used by private pharmacies. AMU data will be transferred from paper records to an electronic database for data analysis. An outcome of the Fellowship will be recommendations on the design of an electronic database for recording antibiotic prescription data.	Discuss AMR and AMU results from human and animals Present AMC and AMU results from animals	

Annex 3 Example outputs for a future funding round for the Fleming Fund

The following outputs are example outputs that could be considered, once the costed operational workplan is produced (Output 1.1 of this Country Grant). It is assumed that the laboratories listed in Section 4.2 will form part of the wider network, once finalised.

Each [identified and approved] provincial human health laboratory has been sustainably strengthened to perform antimicrobial susceptibility testing for priority GLASS pathogen-drug combinations

Establishment of a safe biorepository system at NIH

Establishment of a safe and reliable transportation system for samples between NIH and sites participating in the national AMR surveillance programme

[Identified and approved] Private sector laboratories receive guidance and training, and actively participate and contribute to the national AMR surveillance system.

Each [identified and approved] provincial animal health laboratory has been sustainably strengthened to perform antimicrobial susceptibility testing for priority GLASS pathogen-drug combinations

Establishment of a safe and reliable transportation system for samples between NVL and NRLPD and sites participating in the national AMR surveillance programme