

Fleming Fellows Symposium: Importance of our values

November 2024

Fellowship Scheme

Introduction



Eileen Chappell
Fellowship Scheme Coordinator

The fifth Fleming Fellows Symposium was the second to take place in 2024 and we welcomed our new phase 2 fellows, our alumni, and the Africa Leadership – AMS (ALF-A) leadership fellows from the Commonwealth Pharmacy Association. To start this new phase of the Fellowship Scheme we reflected on how the Fleming Fund core values of country ownership, sustainability, alignment, and One Health are integral to the fellows' work, and to the phase 2 strategic shift on gender and equity.

Nine sessions were held over two days with 24 speakers from various sectors and professions including fellows and contributors from the wider Fleming Fund programme and a feedback survey was conducted during the proceedings.

Penny Walker-Robertson, Deputy Director of Global Health Security at the Department of Health and Social Care opened the symposium, reflecting on the Fleming Fund's evolution from inception, to phase 1 and onto phase 2, with continuous dedication to learning and adaptation. Following the recent United Nations General Assembly High-Level Meeting on Antimicrobial Resistance (AMR), Penny noted how the fellows will be an important resource for their country's response to the political declaration, acknowledging all the Fleming Fund fellows for supporting the global response to AMR.

Dr Toby Leslie, the Global Technical Lead from Mott MacDonald, started the symposium sessions on how the principle of 'alignment' shaped the design of the phase 1 programme. He showed how the different Fleming Fund grant streams are designed to be synergistic, presenting examples from high-level strategies to country and sector initiatives.

This was followed by a presentation and discussion on gender in the context of AMR from the Fleming Fund-supported gender and equity grant (GearUp) programme by Rosie Steege, Lead Gender & Equity Specialist at the Liverpool School of Tropical Medicine. Rosie explored biological sex, gender, and intersectional inequities and their far-reaching effect on vulnerability to and impact of drug-resistant illness, citing examples from their work.

The first One Health session looked at data use for action from AMR surveillance data: from generation to informed use, onward to contextualised policies, and the role of mentors in supporting data quality improvement and use. Day one closed with an excellent and comprehensive summary by Prof Sabiha Essack, Professor in Pharmaceutical Sciences at the University of KwaZulu-Natal and Fleming Fund Expert Advisory Group member. Sabiha highlighted the importance of digital platforms to facilitate data management and exchange, emphasising the need for communication to enable uptake and action.

Day two's session on sustainability discussed the benefits of in-country co-mentors and how this contributes to the sustainability of the Fleming Fellowship Scheme. The second One Health session summarised Antimicrobial Stewardship elements across the Fellowship Scheme. Professor Glenn Browning of the Asia-Pacific Centre for Animal Health at the Melbourne Veterinary School shared challenges faced by fellows and suggested improvements for their countries.

Prof William Gaze, Professor of Microbiology at the European Centre for Environment and Human Health, University of Exeter Medical School, and member of the Fleming Fund Technical Advisory Group, also showcased cutting-edge research and proposed a more nuanced understanding of the role of the environment in AMR.

In her closing remarks, Milena von und zur Mühlen, Policy and Programme Manager for the Fleming Fund, UK Department of Health and Social Care, expressed her gratitude for the work presented by the fellows and mentors.

Day one

08:05-08:15	Opening remarks – Penny Walker-Robertson, Deputy Director, Global Health Security, Department of Health Social Care (DHSC)
08:15-08:30	Alignment: Fleming Fund phase 1 Speakers: Dr Toby Leslie, Global Technical Lead, Mott MacDonald
08:40-09:10	Gender & Equity: Exploring gender in the context of AMR Speaker: Rosie Steege, Gender & Equity Lead, GearUp Fleming Fund Regional Grant Chair: Terri Collins, Health Specialist, Mott MacDonald
09:10-09:50	One Health: Data to action (panel session) Chair: Catriona Waddington, Fleming Fund Expert Advisory Group chair Panel Members: Aaron Aboderin, AMR Technical Working Group chair and phase 2 Policy fellow, Nigeria. Tochi Joy Okwor, AMRCC Chair & Phase 2 Policy Fellow, Nigeria. Antonino Do Karmo, Phase 1 Policy Fellow, Timor Leste. Mauricio Coppo, Host Institution mentor, University of Melbourne.
09:50-10:00	Closing remarks – Prof Sabiha Essack, Fleming Fund Expert Advisory Group member

Opening Remarks



Presenter: Penny Walker-Robertson
Deputy Director, Global Health Security,
Department of Health and Social Care

Penny Walker-Robertson observed that it was amazing to see how the Fleming Fund has blossomed since she took part in its design in 2015. A key feature of the programme has been a commitment to continuous learning and adaptation; fellows have played an important role in this. The programme context has thus shifted over time. For example, we have seen the emergence of more mature surveillance systems, along with the opportunities for new technologies, and initiatives such as the International Health Regulations and UN Global Health Security agenda. Despite these changes, the Fleming Fund continues to centre on the need for quality data and evidence that translates into positive action on AMR.

Penny thanked fellows for being leaders and champions in the field of AMR, not only for the Fleming Fund but also for country commitments made at the recent UN General Assembly High-Level Meeting on AMR in New York. Delivering on these commitments will need the fellows' skills and leadership as Fleming Fund champions, continuing to access the support required to make a positive difference.



Alignment: Fleming Fund phase 1



Presenter: Dr Toby Leslie
Global Technical Lead, Mott MacDonald

In this session, Toby Leslie explained how the principle of alignment is one of the Fleming Fund's five core values, and how this has shaped the programme's different grant streams over time.

For the Fleming Fund, alignment refers to:

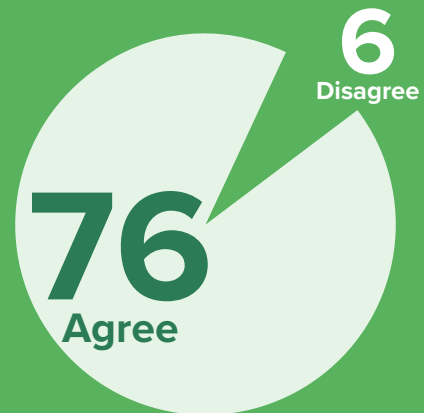
- Alignment with high-level strategies, such as the Global Action Plan on AMR, as well as the guidelines, and the associated Global Antimicrobial Resistance and Use Surveillance System (GLASS) reporting frameworks.
- Alignment with country-level strategies and National Action Plans and, where appropriate, institutional guidelines.
- Alignment across One Health sectors and initiatives (e.g. the FAO InFARM system).

The Fleming Fund focuses on improving AMR surveillance and data use for enhanced AMR policy and practice across One Health sectors in up to 25 low-and middle-income countries. The Fleming Fund grants programme leverages three funding streams to achieve this ambition: Country Grants, Regional Grants, and the Fellowship Scheme. Given the scale of this endeavour, and the multiple levels, sectors, and systems covered by the funding streams, the principle of alignment is crucial. It can also be challenging, especially for planning. The aim is always to maximise complementarities and efficiencies, without creating bottlenecks.

Learning from experience: By the end of the first programme phase, there was still room for greater alignment between the three funding streams. The design of the second phase thus centred around the systematic development of coherent Country Investment Strategies (CIS). These were underpinned by each country's AMR National Action Plans (NAPs), as well as other key policies, strategies, and stakeholder consultations. For each Fleming Fund-supported country, the CIS now provides a framework for medium-term and long-term results, aligned with National Action Plans.

Feedback on the sustainability of the Fellowship scheme's impact*

'I think Fleming Fellowships are sustainable.'



"Sustainability is contingent on domestic funding which is not immediately available."

"Sustainability depends on the priority the government gives to AMR."

"Connection built during fellowships can be continued post-fellowship."

"Unless we get local mentors, it is unsustainable."

"It is sustainable because fellows are empowered to work as technical experts and champions for the growing crisis in their regions."

"Fellows can be empowered to start local fellowship programmes for graduates."

"Probably not sustainable when LMICs don't have the funds to support this initiative."

"Fellows are equipped to act as leaders in their region to maintain momentum."

"Agree, if we align our fellowships."

"The strong relationships built within and between cohorts during the fellowship can generate the momentum, shared impetus and visions, and partnership needed for sustainability."

"Fellowships are sustainable when fellows grow to become mentors who extend their support to non-Fleming sites."

"To increase sustainability, beneficiary institutes can be encouraged to develop sustainability plans to ensure maintenance of skills and expertise."

**results obtained from the breaktime survey*

Gender and Equity: Exploring gender in the context of AMR

Chair:



Terri Collins,
Senior Health
Specialist,
Mott MacDonald

Presenter:



Rosie Steege,
GEAR up Lead
Gender & Equity
Specialist, Liverpool
School of
Tropical Medicine



Panellists:



Abriti Arjyal,
GearUp Nepal,
Research Manager,
Herd International



Susan Okioma,
GEAR up Kenya,
Gender Technical
Adviser,
LVCT Health



Tahmina Ahmed
GEAR up
Bangladesh, Senior
Research Associate,
Brac University

In this session, Rosie Steege, from GEAR up presented on the Fleming Fund value of gender and equity. Rosie's introductory presentation was followed by a panel session with three other members of the GearUp team.

Biological sex, gender, and intersectional inequities have implications for AMR due to differences in susceptibility and exposure to infection; health-seeking behaviours and occupational hazards; decision-making power; and access to and use of antimicrobials. These factors may ultimately determine the impact of drug-resistant illness, socially and economically.

“GEAR up seeks to catalyse action on gender and equity within AMR through supporting Fleming Fund country grantees to mainstream gender and equity within routine AMR systems and structures. We aim to increase awareness, and contribute to the knowledge, on structural inequities driving and shaping the AMR response. We also seek to facilitate South-South exchange through building a global community of practice to guide and inspire further action and global knowledge sharing.”

Source: [About us: Our vision - gearupaction.org](https://www.gearupaction.org)

GEAR up's technical support to the Fleming Fund programme includes:

- Analysing existing Fleming Fund data by sex/age.
- Mainstreaming gender and equity stratifiers into surveillance structures.
- Supporting gender and equity reviews of AMR National Action Plans.
- Building communities of practice to support global knowledge sharing and inspire action.
- Understanding the social and structural processes that create intersectional gender and social inequities through research.
- Developing specific case studies, tools, and resources on gender, equity, and AMR.

The tip of the iceberg

Regarding differences in vulnerability to and impact of AMR, it is important to understand that the data generated through diagnostics and surveillance may only reveal the 'tip of the iceberg' rather than the true reality. To better understand the gender and equity implications of AMR, we need to think more broadly about the types of social science research required, and the stakeholders to engage for an effective response.

Panel Discussion: Key Points

Abriti Arjyal

How does a One Health lens apply to gender and equity?

- A One Health approach requires us to think about the interconnectedness of the health of humans, animals, and the environment, and the impact of gender roles on susceptibility to and impact of infectious diseases, including zoonotic diseases.
- For example, a recent study among poultry farmers in Nepal showed that knowledge and practices around prudent use of antimicrobials varied significantly by gender, educational level, poultry type, and location – with men and those with higher education demonstrating better knowledge and safer practices. Studies of this nature can help us to identify target audiences better and improve educational messages.

Susan Okioma

What actions are you taking in Kenya and Uganda to address gender, equity, and AMR?

- In East Africa, the GearUp team provide technical assistance to incorporate equity themes in AMR surveillance work and community awareness. Most recently, the team has contributed to mainstreaming gender and equity into Uganda's new National Action Plan on AMR. The team's approach was based on applying a structured framework that can be used for gender and equity reviews of the National AMR Action Plans in other countries.

Tahmina Ahmed

Why is it important to disaggregate data by gender for AMR surveillance, interventions, and policies?

- Disaggregating or 'segregating' data by gender and other social stratifiers can help researchers and policymakers identify hidden vulnerabilities within populations. It can also support more robust antimicrobial use (AMU) analysis to explore the effects of cross-cutting inequities, such as gender, poverty, age, and occupation. This, in turn, can help us identify 'at risk' populations, design more targeted interventions and policies for women and men and monitor the progress of these interventions for effectiveness.

Q&A with the GearUp team:

How do gender and equity issues apply to AMR in disasters or emergency response?

In disaster and emergency response contexts, many of the complex social processes of inequity that influence exposure, access to treatment, and antibiotic use are particularly exaggerated. For example, access to health systems and safe water and sanitation are often constrained in disaster contexts, which can create exposures for those most likely to be responsible for collecting water or those working as frontline health workers.

Women and gender minorities are often more at risk of sexual and gender-based violence in disaster contexts, which affects exposure to and spread of sexually transmitted infections, including resistant infections. Disaster contexts can also lead to significant refugee populations, and those living in refugee camps often have low access to healthcare and a high risk of infection due to living conditions.

How are you inputting to countries' AMR National Action Plans?

GEAR up seeks to inform countries' National Action Plans on equity and gender issues relating to AMR and policy making. This involves engaging with stakeholders to raise awareness around equity and gender dimensions of AMR, reviewing existing National Action Plans or AMR strategies for engagement with equity and gender issues and building on windows of opportunity to incorporate equity considerations and policies or actions that strive for equity within the AMR space.

Please do get in touch if you have identified an opportunity to input into the development of a National Action Plan of strategy in your country.

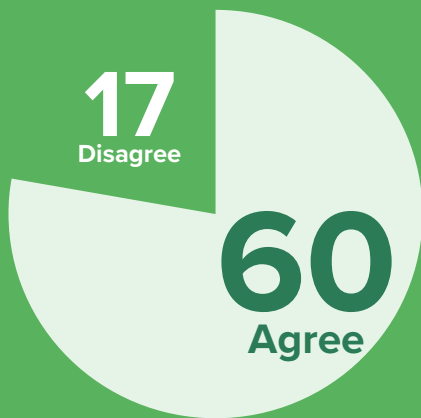
Resources for more information:

- [WHO Guidance on addressing gender inequalities in NAPs.](#)
- [More about GEAR up.](#)
- [Key GEAR up tools and resources.](#)
- **Join GearUp Community of Practice:**



Feedback on local mentorship*

In my learning (or work) to date, I have considered the relationship between gender and AMR



"Policies effect different genders differently, and so we should be able to address that during policy development and programme rollout."

"I have only looked at gender inequality in terms of leadership roles in AMR."

"I have not found the correlation between gender equity and AMR in animal health sector."

"I think women are more susceptible to AMR during pregnancy."

"It allows disaggregation and more granular responses to AMR."

"I just never thought of it."

"The relationship between gender and AMR in our setting is related to females attending health facilities and getting medication more than men do."

"There is no relationship."

"Societal structure influence how and where people need to use antibiotics."

"Women who work in the field managing livestock are important in AMR."

"Women and children are most affected by pandemics."

"Without a gender lens, we cannot truly know where inequalities lie and who the most vulnerable groups are."

"I've not come across AMR and gender being discussed before."

"Different genders have different roles, thus impacting AMR transmission. Women are subjected to the handling of animals and animal products, thus increasing their exposure to resistant pathogens."

"Exposure to risks, healthcare behaviour, biological factors, and access to care differs between men and women."

**results obtained from the breaktime survey*

One Health: Data in Action (panel)

Chair:



Catriona Waddington,
Chair of Fleming Fund
Expert Advisory Group

Presenters:



Aaron Oladipo Aboderin,
AMR Technical
Working Group chair
and phase 2 Policy
Fellow, Nigeria



Antonino Do Karmo,
phase 1 Policy Fellow,
Timor Leste



Tochi Joy Okwor,
AMRCC chair &
phase 2 Policy Fellow,
Nigeria



Mauricio Coppo,
Host Institution
mentor, University of
Melbourne

This panel session focused on the Fleming Fund value of One Health with an emphasis on the process of turning data into action. Panellists shared examples of the types of data being produced in the human and animal health sectors, how it is being used, and what difference the data is making. Read the summary of their presentations below.



Presentation one, Aaron Oladipo Aboderin

In Nigeria, AMR surveillance data is being actively used at the facility, national and international levels. For example, at the facility level, reviews of AMR data have been used to detect disease outbreaks and improve diagnostic antimicrobial stewardship (AMS). At the national level, surveillance data has informed treatment guidelines and training of students. It has also contributed to African representation in GLASS reporting.

While there is good donor collaboration to improve data generation, there remains scope to improve capacity, data management and transmission, and the development of more localised treatment guidelines. Strategic use of technology could improve efficiencies and cost savings.

Presentation two, Tochi Joy Okwor

A review of data from three sentinel sites in Nigeria has been used to improve surveillance and AMS practice.

surveillance data from the sites was used to identify drug-resistant strains, and support whole genome sequencing, as well as retrospective quality control and outbreak identification. These data reviews assisted quality improvement by spotlighting issues of low testing rates and surveillance coverage. These issues have largely been addressed through improved training and surveillance protocols, and efforts to improve system integration.

A key lesson is that, even when surveillance data is weak, it can lead to positive change through focused efforts. However, many data quality challenges require a systems lens with a focus on the questions of 'who', 'what', and 'how' (e.g. Who needs to be targeted? What information needs to be exchanged? How can we make blood culture tests cheaper?)

Presentation three, Antonino Do Karmo

Antonino led a study to investigate low adherence to antibiotic treatment guidelines across five referral hospitals in Timor Leste. Findings showed that clinicians frequently prescribe empirically, without definitive microbiological pathogen identification and susceptibility testing, because they cannot depend on timely and reliable laboratory services.



This important study showed the value of understanding the factors in low uptake of diagnostic services and adherence to treatment guidelines in specific local contexts. Studies of this nature are needed for designing targeted mitigating action and context-relevant policies and strategies.

Presentation four, Mauricio Coppo

Mauricio described his experience as a mentor supporting animal health and other One Health fellows over two phases of the programme. In this presentation, he showed the benefits of continuity of support for data generation and use in the veterinary sectors of Bhutan and Timor Leste.

In Bhutan, support provided to animal health surveillance and policy fellows has helped to progressively improve the quality of AMU and antimicrobial consumption data generated, and its use for improved treatment guidelines tailored to different species. It also helped to improve the quality of reporting to the World Organisation for Animal Health (WOAH) ANIMUSE platform and led to a recent journal publication.

In Timor Leste, longer-term support to Fleming fellows has helped generate a critical mass of quality data for improved syndromic management in the animal health sector. This, in turn, has led to improved treatment guidelines for veterinarians and para-veterinarians.



Closing Remarks



Presenter: Prof Sabiha Essack,
Professor in Pharmaceutical Sciences
at the University of KwaZulu-Natal and
member of the Fleming Fund Expert
Advisory Group.

Prof Sabiha Essack praised the quality of the presentations and participation on day one of the symposium. She spotlighted the session on alignment, emphasising that this value is foundational for the Fleming Fund's support of human capital development and surveillance for action. She observed that gender and equity is an important Fleming Fund value because the burden of AMR can be exacerbated by gender-related social structures, norms, and health-seeking behaviours, as well as differences in vulnerability to drug-resistant pathogens. She commended the presentations on Data in Action for showcasing how fellows are the strategic drivers and champions for translating data into policy and practice across One Health sectors.



Day Two – Thursday 7 November

08:05-08:40	Sustainability: Role of local mentors (panel session) Chair: Patrick Mubangizi, Africa Regional Director – Fleming Fund, Mott MacDonald Panel Members: <ul style="list-style-type: none"> • Edna Kathure Kubar, Africa Leadership Fellowship-AMS (ALF-A) fellow, Kenya • Ini Adebisi, Phase 1 fellow & in-country ALF-A mentor, Nigeria • Jennifer Bonnah, Phase 1 fellow & Fleming Fellowships local mentor, Ghana • Mary Nkansa, Phase 1 fellow & Fleming Fellowships local mentor, Ghana
08:40-09:00	One Health: AMS across and beyond the Fellowship scheme Speaker: Prof Glenn Browning, Host Institute mentor, University of Melbourne
09:10-09:35	One Health: Environment and AMR Speaker: Prof William Gaze, Fleming Fund Technical Advisory Group member, University of Exeter
9:35-9:55	Country ownership: Stories of change Chair: Dr Toby Leslie, Global Technical Lead, Mott MacDonald Speakers: <ul style="list-style-type: none"> • Damilola Abiodun-Adewusi, Phase 1 Surveillance fellow, Nigeria • Sonam Wangda, Phase 1 Policy fellow, Bhutan • Chikhulupiliro Gloria Chimwaza, Phase 1 Surveillance fellow, Malawi
9:55-10:00	Closing remarks – Milena von und zur Muhlen, Policy and Programme Manager, The Fleming Fund, DHSC

Sustainability: The Role of Local Mentors (panel)

Chair:



Patrick Mubangizi,
Fleming Fund,
Mott MacDonald

Presenters:



Edna Kathure Kubar,
ALF-A Fellow, Kenya



Jennifer Bonnah,
phase 1 Fellow and
Fleming Fellowships
local mentor, Ghana



Ini Adebisi,
phase 1 Fellow and
in-country ALF-A
mentor, Nigeria



Mary Nkansa,
phase 1 Fellow and
Fleming Fellowships
local mentor, Ghana

Sustainability is an important core value of the Fleming Fund. This session included Fleming fellows and a fellow from the ALF-A programme of the Commonwealth Pharmacists Association. The panellists described how their experience as mentors and mentees has contributed to programme sustainability and their insights on how local mentors can support new fellows.

Presentation one, Edna Kathure Kubar

Edna was an ALF-A fellow who benefited from in-country mentorship. She summed up her experience as a mentee in three words: priceless, inspiring, and motivating. As a result of this experience, she has expanded her professional networks; benefitted from meeting leaders in her field; gained fresh insights on day-to-day tasks; had opportunities to participate in workshops and conferences; and gained access to new learning resources and guidelines.

How local mentors can support new fellows: Mentors should harness the ‘snowball effect’, that is, they should help mentees become future mentors to create a chain of succession/association. To do this, mentors should delegate tasks to new fellows to apply learning and build practical mentoring skills. Edna suggested these tasks might include organising workshops and participation in symposia and conferences to expand networks and build confidence.

Presentation two, Ini Adebisi

Ini was a phase 1 Fleming fellow who now volunteers as an ALF-A mentor in Nigeria. She received virtual training for her role as an ALF-A mentor. She works toward a structured plan based on her mentee’s self-assessment. Key features of her mentor role include monthly virtual meetings and in-person meetings; sharing of tools and resources; coaching and encouragement; and identification of opportunities for her mentee to participate in conferences and workshops. Ini sees her relationship with her mentee as mutually beneficial – for example, her mentor

role helps her to refresh her knowledge, apply her experience, and enhance her own networks and leadership skills.

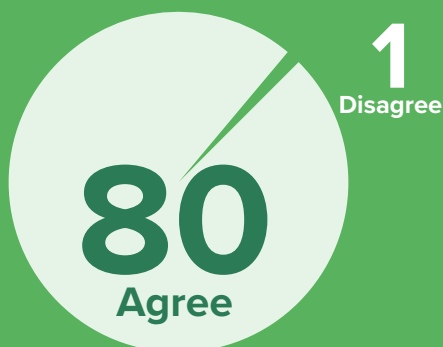
How local mentors can support new fellows: Local mentors can boost the self-confidence of fellows as they work to support them in achieving their outlined goals. Ini suggested an important benefit of local mentors is that they share the same context as their mentees. They can, therefore, bring practical knowledge, skills, and experience to working effectively, often in resource-limited settings. Local mentors can also help connect fellows to local and international resources and networks, thus enhancing collaboration.

Presentation three, Jennifer Bonnah

Jennifer is a pharmacist based at the Food & Drugs Authority in Ghana. She was a phase 1 Fleming fellow and is now a local AMU/C co-mentor for a phase 2 fellow. Her role as a mentor includes supporting her mentee to engage with the multisectoral Ghana AMR

Feedback on local mentorship*

In-country/local mentorship is important.



For those who agreed that local mentorship is important, the three most popular reasons were: the shared context, exposure to a wider local network/ relevant stakeholders, and sustainability (with regards to the phase 1 fellows mentoring the phase 2 fellows).

See some of the responses below:

“A shared understanding of local context and challenges.”

“Can help support in a way that better aligns with the local need.”

“Helps fellows connect to further in-country networks and to build robust relationships with relevant partners to promote sustainability.”

“It contributes to the core values: Sustainability and Country Ownership.”

“Reduced language barrier in some context.”

“This is nuanced. I would say in-country mentorship is important, but it depends on whether there is the expertise in-country.”

“In person meetings go a long way with helping fellows with their planned activities.”

“I believe that mentorship should come from multiple sources to provide different perspectives. Local mentorship can encompass specific local knowledge which is useful to the AMR challenge.”

“If mentors happen to be previous Fleming fellows, then it’s very likely that they will understand the core AMS principles.”

“Local mentors can be instrumental in exploring intersectionality and specific factors that are ingrained in local context.”

“Local mentors can build trust and rapport more easily with local stakeholders.”

“Mentorship involving previous local fellows will help consolidate what has been done and what needs to be done in the future.”

“Sustainability.”

**results obtained from the breaktime survey*

National Platform; promoting 'working smarter' for a good work-life balance amidst competing demands and providing guidance on prioritising learning opportunities to achieve goals.

How local mentors can support new fellows: Local mentors should assist new fellows in applying follow-up learning to their professional experience and local situation. They should also draw on their experience to help mentees avoid pitfalls. The relationship should be seen as a partnership that supports the joint learning of both the mentee and the mentor.

Presentation four, Mary Nkansa

Mary is based at the Aquatic Animal Health Unit of the Fisheries Commission of Ghana. She was a Fleming fellow in phase 1 and is now a co-mentor for phase 2. She aims to enhance the skills of her mentee to support both institutional development and the promotion of national food and nutritional security. Her mentor role includes guiding achieving learning objectives; regular interactions to track progress and provide feedback; sharing of technical expertise, practical experience, and best practice; fostering of independent thinking and open communication; and building shared networks.

How local mentors can support new fellows: Local mentors can leverage their personal fellowship experience to support their mentee's applied learning in local contexts. Mary emphasised that the local mentor must establish trust and support their mentee to navigate challenges with a strategic focus and apply the fellowship's core values in their projects.

One Health: Antimicrobial Stewardship across and beyond the Fellowship Scheme



Presenter: Prof Glenn Browning,
Asia-Pacific Centre for Animal Health,
Melbourne Veterinary School

In this session, Professor Glenn Browning focuses on the Fleming Fund's core value of One Health and explores the role of antimicrobial stewardship in the animal health sector. Read on for a summary of his presentation below.

Although antimicrobial stewardship is well established in human medicine, it is still a relatively new approach for animal health and veterinary medicine. In the animal health sector, the emphasis tends to be on modifying behaviour by supporting practitioners to make the best

decisions about antimicrobial use. There is often a preference for 'nudging' over imposing regulations.

In low and middle income countries, animal health practitioners often lack the information and resources they need to guide appropriate antimicrobial use. There is, therefore, a tendency to treat empirically and widespread overuse of broad-spectrum antimicrobials. The information and resources needed to improve antimicrobial stewardship in the animal health sector differ between countries and animal industries. Feedback from Fleming Fund fellows suggests the following inputs are needed for better treatment decisions in the animal health sectors of their countries:

- **Improved access to diagnostic services:** This includes better training for necropsies; rapid detection of common viral and bacterial pathogens; improved availability of antimicrobial susceptibility testing; and better analysis of susceptibility patterns.
- **Better use of non-antimicrobial disease control measures:** This includes better use of vaccination and biosecurity measures, with decisions supported by reliable cost-effectiveness data.
- **Accessible and reliable antimicrobial use guidance:** This should include information for the animal health

Questions

Q: How can we help farmers to understand the dangers of irrational antimicrobial use?

A: One of the important ways to have an impact is to make the message personal, with emphasis on how irrational use of antibiotics endangers farmers and their families. The personal message often has greater effect than a focus on the more abstract idea of public health.

Q: Is there anything planned around a pilot toolkit for improving antimicrobial stewardship in animal health services, maybe starting from veterinary practices and other community-based approaches?

A: We do have some resources on our webpage that could be used as a [start](https://vetantibiotics.science.unimelb.edu.au/about/resources/)

sector on Antimicrobial Importance Ratings based on up-to-date country-specific evidence and supply-side guidance tailored to specific end users.

Some key challenges for antimicrobial stewardship in the animal health sector include:

- Poor resourcing of the animal health sector, including lack of animal health diagnostic services and field staff to provide advice.
- Limited regulatory control of veterinary drugs, resulting in animal owners accessing antimicrobials without professional advice, little monitoring of informal use and limited enforcement of regulations.

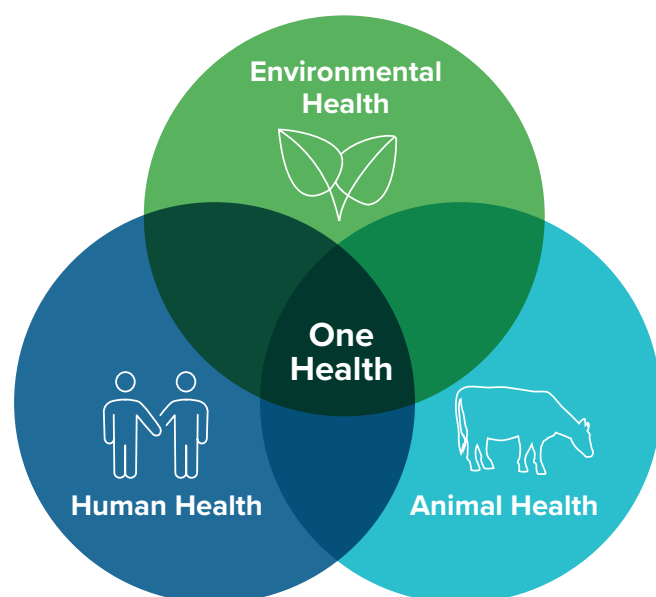
Animal health fellows are now playing a leading role in addressing these challenges through:

- Improved monitoring of AMR in key bacterial pathogens.
- Awareness raising and training of key partners and stakeholders on antimicrobial use issues, including the need for professional oversight.
- Better monitoring of vendors.
- Enhanced regulatory processes for antimicrobials in the animal health sector.

One Health: AMR and the environment



Presenter: Prof William Gaze,
Professor of Microbiology, European
Centre for Environment and Human
Health, University of Exeter Medical
School. Member of the Fleming Fund
Technical Advisory Group



The traditional Venn diagram of One Health

Our penultimate session continued with the core value of One Health. In this session, Professor William Gaze gave us a flavour of some of cutting-edge research taking place in the field of AMR and the environment. Read a summary of his presentation below.

The traditional Venn diagram of One Health implies an equivalence in AMR transmission across the human, animal and environment sectors. There is now scope for refining this idea with recent research pointing to the need for a more nuanced understanding of the role of the environment.

AMR is a natural, evolutionary phenomenon that has been present in the environment for millennia. We should, therefore, regard the environment as a reservoir of AMR in which “simultaneous pandemics” of resistant genes continuously emerge.

In the environment sector, we need to consider both the longer-term emergence of resistance and more acute episodes of AMR transmission e.g. through contaminated water and poor sanitation. It is when these acute episodes result in rapid transmission of resistant microbes to animals and humans that we become most concerned. An understanding of these processes helps to explain why episodes of AMR may not always show a strong correspondence to antibiotic use or sites of known origin.

What does the research say?

- There is a growing body of genomic research on the mechanisms of AMR transmission through microbiomes in the environment. This research points to the need for better methodologies and targets for environmental surveillance. A focus on pathogens showing resistance to critically important antibiotics (e.g. WHO’s Tricycle protocol) remains a good place to start.
- There is increasing attention being given to the relationship between climate change and AMR. We know, for example, that temperature changes, flooding and drought have implications for concentrations of antimicrobials in the environment. Practices that contribute to changes in carbon and nitrogen cycling in our environment are also exacerbating climate change. Those interested in this topic are invited to join the [Climate-AMR Network: https://forms.office.com/e/aJcaz7MtMY](https://forms.office.com/e/aJcaz7MtMY)

“The environment... is an immense source of novel bacterial resistance genes that have evolved over millions or billions of years, some of which over time become mobile and emerge in previously susceptible human and animal pathogens via horizontal gene transfer, which are then disseminated globally in multiple pandemics.”

Useful resources:

- [Frontiers 2017: Emerging Issues of Environmental Concern.](#)
- [AMR, One Health and the environment.](#)

One Health: AMR and the environment

Chair:



Chair: Dr Toby Leslie
Global Technical Lead, Mott MacDonald

Presenters:



Chikhulupiliro Gloria Chimwaza
Director for stewardship and antimicrobial use and consumption surveillance, Ministry of Health, Malawi; phase 1 Surveillance Fellow



Sonam Wangda
Chief Programme officer for the Health Financing Division, Bhutan; phase 1 Policy Fellow



Damilola Abiodun-Adewusi
AMR Focal Point, National agency for Food and Drug Administration and Control, Nigeria; phase 1 Surveillance Fellow

In this final session, we focused on the Fleming Fund value of Country Ownership. Panellists Chikhu (Malawian fellow), Sonam (Bhutanese fellow), and Damilola (Nigerian fellow), shared their stories of change. See a summary of what they shared below.

Presentation one, Chikhulupiliro (Chikhu) Gloria Chimwaza

Chikhu was the first Clinical Pharmacist in the Ministry of Health in Malawi. She was appointed to coordinate AMC efforts in the Antimicrobial Resistance National Coordinating Centre (AMRNCC). Her Fleming Fund fellowship proved to be an important and timely opportunity.



Chikhu explained that through her fellowship, she developed competencies in diagnostic tools and technologies; policy and economic analysis; genomic applications; practical research; collaborative One Health learning; stakeholder engagement, and networking.

Her successes included: participating in One Health research; co-developing the One Health AMR surveillance strategy for Malawi; leading the development of Malawi's AMS guidance for human health facilities; co-organising and presenting at an AMS symposium; becoming lead editor of the Malawi standard treatment guideline; and leading on the adoption of the AWaRe categorization for Malawi's Essential Medicines List.

In her current position, she is responsible for coordinating AMS and AMU/C surveillance at the AMRNCC. She also supports Fleming Fund country grant implementation and volunteers as a local mentor for new Fleming fellows and ALF-A fellows in Malawi.



Presentation two, Sonam Wangda

Sonam described the distinctive experience of being a policy fellow in the small country of Bhutan, where the Government of Bhutan is also the Fleming Fund Country Grantee. With support from his Host Institution, the Doherty Institute in Australia, he worked collaboratively with country cohorts of 14 phase 1 Fleming fellows across the human and animal health sectors.

Together, the phase 1 fellows in Bhutan worked with the government to: strengthen laboratory infrastructure with the introduction of new diagnostic equipment; implement the National External Quality Assurance Scheme for maintaining laboratory standards; train laboratory personnel in AMR diagnostics and quality management and conduct sample shipment and biorepository training.

They have also improved laboratory-based surveillance and point prevalence surveys across human and animal health sectors and established Antimicrobial Stewardship Units at major hospitals. Working collaboratively, the phase 1 fellows have rolled out national antibiotic guidelines to reduce misuse and led campaigns targeting healthcare professionals, medical students, and the public on responsible antimicrobial use. Finally, they have also established an Inter-ministerial Committee for One Health and the National AMR Technical Committee that is successfully improving collaboration across human, animal, and food sectors.

These successes have also been captured in several journal publications covering findings from the point prevalence survey; AMC in the livestock sector; knowledge, attitudes, and practices in community pharmacies; and trends in antimicrobial consumption in Bhutan.

Presentation three, Damilola Abiodun-Adewusi

Damilola began by explaining how her interest in AMR began with a personal bereavement due to a drug-resistant infection.

Highlights of her many fellowship successes included: providing peer training to colleagues; production of short public education videos on AMU and AMR; becoming a member of the AMRCC and AMR technical working groups; and reviewing the National AMS Assessment tool.

She has also proudly contributed to the AMR National Action Plan, National One-Health AMS Plan, National Guidelines for Use of Antimicrobial Drugs in Animals, and the Residues Surveillance Strategy for Nigeria. She has published articles in peer-reviewed journals and is a regular reviewer of journal publications on AMR.

Damilola described how the Fleming Fund fellowship has advanced her skills in AMU/C surveillance, enhanced her expertise in tackling public health challenges in Nigeria, and provided her with valuable opportunities for networking and collaboration with local and global experts. She is now fully empowered to contribute significantly to national efforts in combating AMR and to become a leader in her field.

Closing Remarks



Speaker: Milena von und zur Mühlen,
Policy and Programme Manager,
Department of Health and Social Care

Milena von und zur Mühlen closed the Symposium on behalf of the UK's Department of Health and Social Care. She was extremely impressed by the incredible work of fellows and mentors, during the fellowships and beyond. She thanked the team at Mott McDonald for their work in putting together the Symposium event and highlighting the many achievements of the Fleming Fellowship Scheme.

Milena explained that what came across clearly were the very real challenges and incredible opportunities of working with the Fleming Fund values. These range from ensuring we have enough data to better understand the role of gender in AMR to learning how we can best support country ownership, alignment, and sustainability, to harnessing the added value of a One Health approach. She encouraged everyone to take what they have learnt from the Symposium and incorporate the values shared into the ongoing work of tackling AMR.

Milena commended the incredible depth of knowledge and dedication shown by the fellows and their mentors throughout this event. This gives her hope that, in our work together, we are shifting the dial in the right direction and creating real change in the AMR space. She looks forward to hearing more about the work of the Fleming Fellows in the months and years to come.

