## The AMR Exchange: Global Voices, Share Solutions

## Transcript

Episode 1. AMR uncovered: what it is, why it matters, and how we fight back

This podcast series accompanies the Fleming Fund Fellowship scheme, part of the Fleming Fund Initiative, a scheme in which professional colleagues from Kenya, Uganda, Zambia, and Malawi undertake a fellowship that offers expert mentorship and training that will enable fellows to respond to the antimicrobial resistance crisis within their respective countries by enhancing antimicrobial resistance surveillance and stewardship. University of Edinburgh, the host institution for the Fleming Fund Fellowship scheme provides comprehensive training, mentorship, and collaborative research opportunities to fellows. The fellows are all professionals from the human health, animal health, or environmental sectors, and they all have the remit to tackle antimicrobial resistance. In each episode, we focus on an aspect of the Fleming Fund fellowship scheme. We speak to the fellows, we hear about their roles, and understand how antimicrobial resistance is affecting their patients, the farmers they work with, and how they approach and address antimicrobial resistance on both a day to day basis and also at the policy level. We hear about their training and how this is being utilised. We hear from the alumni fellows, those who have already undertaken a fellowship. We learn about the impact their fellowships have made and how they respond to antimicrobial resistance, and we also hear about the collaborative research that's already underway. My name is Nadia MacArthur. My name is Emily O'Reilly, and we're your host for this series, and we welcome you to join us. Hello, and welcome to the opening podcast of this series. Hello and welcome. We're finally recording, aren't we? Yeah, I know. It's exciting. I feel like we finally started. We've been talking to so many people involved in the Fleming Fund Fellowship scheme, including the fellows, and it's great to finally start sharing what's been happening. Absolutely. Everyone's been so busy, but it's really important for us to introduce the Fleming Fund Fellowship scheme. And share with as wide an audience as possible everything that's going on. We need to document and communicate the amazing progress and impact that the Fleming fellows are having. This is very much your area of expertise, isn't it? Yes, indeed, communicating what the fellows are doing in their

countries, the efforts they're making on tackling AMR. Well, you know how experts say that AMR is a silent pandemic. Well, we're communicating all over the world to create global awareness and calling for urgent attention for this critical issue. So while sharing the work of the fellows, I'm learning more each day, but tell me what is AMR and where does AMR come from? That's a big question, Nadia. I think it would be good to start with the term AMR. Already in this podcast, we're jumping to using the term AMR. AMR stands for antimicrobial resistance. So if we take the antimicrobial part first, you're listening to this and you're not sure what an antimicrobial is and what that term refers to, if I said the word antibiotic, I'm sure that you know what an antibiotic is straightaway, something you've heard of. What an antibiotic is, is a medicine that you take for bacterial infections. But bacteria aren't the only microbes that cause infections. Have viruses, parasites, fungus. These can all cause infections. And the medicines that you use to combat these infections are termed antivirals, antiparasitics or antatics, ant fungals, and collectively, we call these antimicrobials. Resistance part, well, put simply, this means that the drugs that we would normally use to treat these types of infections don't work effectively anymore. And they don't work because the bacteria, the viruses, the parasites, et cetera, have become resistant to them. So if we focus on the antibiotics, it means that if you have a bacterial infection, it no longer responds to one or possibly more type of antibiotic. This means that the infection is much harder to treat, and it might not even be possible to treat that infection, and as a result, people are dying from infections that were previously treatable. So you can imagine how impactful this is. Millions of people are treated with antibiotics every year. Many animals and people use other antimicrobials. If these stop working, well. Okay, so we have a much clearer idea now, and I also understand that it's a growing issue. I actually read in the World Health Organisation has described AMR as one of the greatest threats to global health. Is this really the case? Why aren't people talking about this? I know the WHO or the World Health Organisation does indeed describe AMR as one of the biggest threats to global health. You'll hear AMR described as silent pandemic because you said earlier, Mm. Because it's quietly causing a major health crisis. No one's talking about it in contrast to a pandemic such as the COVID 19 pandemic. Exactly. But the numbers speak for themselves. In 2019, it was estimated that at least 1.27 million deaths per year were directly attributable to AMR. And by 2050, this could be 10 million deaths every year. It really goes to show how important antimicrobials are. We've gotten so used to going to the doctors with an infection and getting a prescription for antibiotics. Yes, absolutely. And then getting better because they've worked. Just to give you an idea, I thought I would share part of a conversation with our listeners that I had with doctor Paul Oko, who is a Fleming fund fellow from

Kenya. Paul is a vet, and he heads the Veterinary Investigation lab in Nakuru. And he also speaks and communicates with local farmers very regularly. And we spoke about his observations around AMR. My name is Paul Ako from Director of Veterinary Services in Kenya. I work in the National Veterinary Laboratory in Nakuru. I had a veterinary investigation lab, and basically what I do is management of the resources. Of course, sometime I have to also get my hands wet and put my boots on to respond to cases of the cuts. So you go out into the field as well. Yes, I do once in a while. MR is a wicked problem. I like that. I like it as well. You know, it's a complex thing. So the challenge around MMR for me came out very clearly after years of working in the lab, 14 years working in the lab, looking at the antibiograms that used to work when you started year one and looking at how they are changing. They are phenotypic antibiograms. But you could see there's a problem because, you know, resistant patterns are changing and bacteria that used to respond to, you know, commonly used antibiotics, antibiotics that used to work were no longer working. And so that, for me, triggered interest in, you know, this resistance thing. And, you know, it's not just in mastitis. We also have it for the worms, where you have hemonus that does not respond to treatment using a commonly found an anti aromantics in the market. Have your conversations with farmers and producers changed over that period as well? Do you think there's more awareness that things are not working that used to work? Yes, but more like a desperation because people are saying, this is not working. And sometimes they may not be really aware about the phenomenon. People are mostly thinking, is it that the doctors are not doing the right thing, or is it that we are underdosing? There's a lot of that still out there. So I think I would call that a grey area still in this AR conversation. My goodness, when you hear directly that the antibiotics are just not working and you hear from a vet, impact is becoming clear. It's not just numbers from the World Health Organisation. So what can we do about AMR and why does Paul describe it as a wicked problem? Let me try and answer that first question, Nadia. What we need to do is come back to what's causing the resistance in microorganisms such as bacteria. Briefly said earlier that bacteria become resistant, but you need to look closely at why they're becoming resistant and how the resistance emerges and how it spreads, and so more bacteria become resistant. Put simply, it comes down to natural selection. Bacteria, as in this example, undergo mutation, or they can acquire resistant genes from other bacteria. And this enables these bacteria to survive exposure to antibiotic drugs that would normally kill them. And these bacteria with their newly acquired resistance can then continue to multiply. So you can understand over time and from an evolutionary perspective that the use of antibiotics selects for resistant bacteria, and these resistant bacteria are then able to multiply, and then we have a drug resistant infection. Okay, I can really see how

resistance can develop, but what can we do? Why is it a wicked problem? To be honest, these key principles about exposure to antimicrobials and selection are important because they actually also inform many of the actions and many of the policies that are aimed at tackling AMR, such as how can we reduce antimicrobial usage? How can we refine our usage? How can we reduce the selection pressure that is being exerted on the bacteria? Why is it a wicked problem? You're avoiding my question? I know I am. I think I'm avoiding it because it's a wicked problem. A wicked problem is a problem that has no clear solution. So it's a challenging problem. It's complex, it's multidimensional. So you would imagine as such that the solutions are not going to be quite as simple. So AMR is quite often, as Paul stated, described as a wicked problem. And another example would be climate change, for example. So these are challenging problems that are multifactorial, and the solutions to this problem, this wicked problem is not going to be straightforward. So this is a global issue and can affect everyone in all countries. Resistant bacteria do not respect borders. Exactly. AMR affects all countries, regardless of whether they're a high income country or a low income country. We have to work collectively and collaboratively. And with this in mind, that leads us back to the Fleming Fund Fellowship and why it's important. Well, the University of Edinburgh provides via the Fleming Fund Fellowship scheme expert training, mentorship, and support for professionals from East Africa to enhance their technical, analytical, and leadership skills, to equip them to tackle AMR in their home countries. And this is important because lower and middle income countries are disproportionately affected by antimicrobial resistance for a range of reasons. Yes, exactly. And we'll be hearing from the fellows from Zambia, Malawi, Kenya and Uganda, and we're going to hear more about these reasons and the challenges they have in tackling AMR. But first, I think it would be timely to hear from Professor Til Bachman, who is a professor of Molecular Diagnostics and infection here at the University of Edinburgh, and he is also the co director of the Fleming Fund Fellowship scheme. So let's hear from Till about what the Fleming Fellowship scheme is and how exactly it works. The Fleming Fund Fellowship scheme is a part of the bigger Fleming Fund initiative, which is funded by the UK Department of Health and Social Care. It has essentially three elements. One is the country grant. There's a regional grant, country grant, and the fellowship scheme. Overall, the aim is to increase the capacity and antimicrobial resistance diagnostics and surveillance in a one health context. One Health means human, animal, and the environment, including plants increasingly. So we are part of the fellowship scheme, and Edinburgh University is the one of many host institutions for the Flaming Fellowship scheme, and I'm one of the co directors. The other co director is Adrian Mwang. We are hosting four countries or fellows from four countries at this current

phase, and this is for Kenya, Malawi, Zambia, and Uganda. So together, we are hosting 40 fellows from these four countries. And what happens is that every fellow gets one mentor, and they are paired with one mentor who has a similar background and expertise, like the research area or the activity the fellow has. Fellows are proposed by so called beneficiary institutions in the home country. So we as Edinburgh, we don't have an influence on which beneficiary institutions are taking part. Are only then part of the select committee for the fellows. So it's really in country driven. The countries themselves decide who's participating as an institution and are suggesting the fellows professional fellows and practitioners and also policy fellows. So policy fellows may come from government institutions, from government departments, and the practitioners, they are coming from hospitals, animal health facilities, environmental monitoring institutions. So it's all very, let's say, high profile, absolutely. And from government institutions or healthcare providers. What do the fellows themselves do during the fellowship? Yeah. First of all, the fellowship takes up 20% of their time. So they are all remain in their current positions, which is really important as a setup of the scheme because after the fellowship, they can just pick up where they basically left before. There is no interruption. And during the time of the fellowship, they are continuously also involved with their in country activities. So the 20% of their time they're dedicating on training activities. The training activities are either online provided through Edinburgh, or they are provided through other means through literature, which is guided through, let's say, the mentors, or we have set up dedicated training provision during that time. So we have onsite training, hands on training. The fellows do individual research projects. These individual research projects are, as I mentioned, supported by a mentor and by the whole Fleming team in Edinburgh. And they do a collaborative project. Both projects are obviously in the area of antimicrobial resistance. And yeah, they perform these or they do these investigations for these research projects. I spoke to many of the fellows when they visited us here in Edinburgh to undertake their training. Here, I speak to two of the professional fellows. Firstly, Malumi Nakamba, a Zambian professional fellow who is a research scientist at the Central Veterinary Research Institute, and I then spoke with doctor Darius Swache, who is from the Ministry of Health, one Health platform, who works in Kurdu Referral Hospital in Uganda. I asked them both about AMR in their home countries and how it affects their day to day work. But I first opened by asking Malumi why she wanted to undertake a Fleming Fund fellowship. I wanted a deeper understanding about AMR. Before this, I just had an insight of what AMR is because of the flaming fund grant. So when this opportunity came, I thought it was a great opportunity for me to deepen my understanding on AMR. My country, we don't have much of diagnostic services, especially in different regions. We have about ten

provinces in my country and each province has a provincial lab there. But you realise that the capacity there is not much in terms of diagnostic services. We don't do much of microbiology, so the skills that I gain here, I'm also going to actually train others there and it will be very helpful in terms of diagnostic even samples are brought to those labs for diagnosis. But because you don't have reagents, you don't have you basically don't have reagents to do that. You don't have the equipment to do that. So you find that that won't be done. And most of the times you find that they have to transport samples to Lusaka to have those diagnostic services to be done for them. And how long does that take? It takes quite a long time. You know, you find that if you're coming from southern part of the country, it will take you several hours for you to transport those samples to come there. So you what the government is doing right now is that they are trying to upgrade the infrastructure. They are also trying to build they are trying to buy equipment. So when they build those equipment, we need to train people on how to do diagnosis of that. So I am here to gain that knowledge and skills. Then I go back to my country. I also train others on in terms of diagnosis. My name is Darius Swachi. I'm a physician based in Uganda. I work in one of the tertiary hospitals in the country located in the capital, that's Kampala, and my main department is in the field of infectious disease and emergency medicine. Experience of work in the emergency department in a setting where there's a high burden of infectious disease really brings the impact of air ma to light and that's how I ended up in filing F. The fellowship offers many opportunities from trainings of learning from the different specialties, different specialists. I was particularly interested in the field of data analysis because I realised data is a very key pillar in the health system. We can't do much if we don't have data. Everyone will ask where evidence is evidence. You need to have the evidence to show that AMR is a big thing. And to me that was one of the key areas that I really wanted to pick up from the fellowship, and I'm glad I took part in it because you had some sessions on data analysis, but also offers a chance for the fellows to interact with each other and the chance to work in collaborative projects. I've had the chance to work with people in the field of veterinarian medicine. Others are policy fellows, others work in the environment. In a hospital setting, you don't get these opportunities. So you don't know what really happens. At best you can know what happens in the community outreach, but you're interfacing with many people. So you do not know what society in the animals, what's society in the environment or in the national level. So that information, you don't really know, like in your own silo there. But the fellowship and the one health approach opens our minds to know that we don't we shouldn't work in silos in our own individual capacities. It should be rather a joint effort. Everyone has a role to play as long as it applies to health, whether it's animal health, human health,

environmental health, and so on. Everyone has a role to play, but how do you bring all those together would be the key. The One Health approach is a very nice model. It helps the mentors and also the fellows to embrace aspects of what happens in either dimension, not just to think that something is only applied to human, but also to remember that it will have an impact, whether direct or indirect will have an impact in the animal will have an impact in the environment, all the same resulting in potentially increasing or decreasing MR, which is why we're here in the first place. It's really good to hear from the fellows and to hear exactly what they're hoping to get out of the fellowship, and importantly, the challenges they're facing in their home countries. So Daris is emphasising the one health aspect. That's an important aspect to the Fleming Fund fellowship scheme, isn't it? It is, yeah, and I think it would be a good time to hear from Till again because in this segment, he explains the importance of One House for the Fleming Fund fellowship scheme and how it relates to the background of the fellows. All projects and the backgrounds of these fellows are in the One Health context. So most of the fellows are coming from the background of human health and animal health, but we strive to really enhance, and the Fleming fund in itself is trying to enhance the One Health aspect. So adding environmental fellows. However, there are not so many, and so we're happier for every environmental fellow because that gives us really the one health perspective, and I'm very keen to really enhance that. Till and the fellows are all talking about one Health. So why is one health so important? Why specifically in the context of AMR? Well, one house or a one House approach is terminology that is used widely when discussing AMR and quite rightly so, as you say. What I will say is, though, when I qualified as a vet 17 years ago, it was actually a term I had not heard before, but now I hear it every day when I'm talking to people from the human health sector, people who work in animal house. Everyone's discussing AMR and one House. And when I think back to the start of this podcast, when we were discussing AMR and antimicrobial usage, we were talking about antimicrobial usage. We were talking about reducing and refining the usage. And that's quite rightly discussed. That's a key pillar in tackling AMR. But we also need to think about how antimicrobials are manufactured and how they're also excreted from the animals and the people who receive them. And it's when we start to think about that aspect that we can then start to consider the environmental aspects of that part of AMR much more clearly. We heard from doctor Steven Chena, a vet from the Arua District Veterinary Office, who gave this example, which I think highlights the one health connection between animals, humans, and the environment. Many farmers are not aware and they don't understand clearly the dangers of using antimicrobials in animal production. At the end, these drugs end in the food chain and much of this special food animals is consumed by people. We find that is the

same person who is affected, but at another level. For instance, if these resistant antimicrobes get into the food, then you may end up in a hospital facing the same challenge, and the drugs may not work so broadly. Most farmers, some elites understand, but many of our rural farmers don't understand the danger of AMR. Stephen really highlights that connectedness between people, the animals that they farm, and how both are treated. I think that's a really good example. And the AMR has to be tackled collectively. When I've been speaking to the fellows, this is a key theme across so many conversations that the Fleming Fellowship scheme actually offers the opportunity to network, and they can speak and communicate and share ideas and information with people not only from their own countries, but also neighbouring ones as well. I think we should hear from Till again on the importance of this. Absolutely, I asked Till about this in February, back when the fellows were visiting for their training. I certainly think that one health aspect is just so important, and having had discussions with fellows, it's been great to see them connecting with each other and establishing collaborations and relationships but they would have otherwise had limited opportunities to make in their own roles in their own jobs. So that's wonderful. And in the context of AMR, how can those one health collaborations and research collaborations develop in a fruitful way, both within the respective countries and more broadly? That is a very, very good question, but it's also a very difficult question. So how can One Health projects being taken forward? So the fellows are actually coming from really excellent backgrounds, and many of them are involved with One Health activities already. Many of the countries have One Health Coordinating committees where AMR is part of that. So they are aware of the context. They are actively engaged So bringing together on their side, respective side, the different expertise, take the different perspectives on AMR, so the one health perspective with one health and One Health is their representative of a transdisciplinary or interdisciplinary approach, all of these approaches have a challenge, different languages, different sources of funding, different ways of implementation of interventions, and different research questions, and different motivation. So I think what we do with this programme is also, and we very specifically enhance that, is to deliver a sense for mutual understanding in these different disciplines in order to then address the gaps. Collaboration is so important within the country, between the countries. It's multifaceted and such a big part in approaching AMR. I spoke to two professional fellows from the Idola Teaching Hospital in Zambia. This is the second biggest teaching hospital in Zambia. I firstly spoke to Elijah Chenane, a biomedical scientist who describes the importance of collaborations and why they are so critical in addressing AMR. I then spoke to doctor Tish Sinoe, who's already using his collaborative network that he has acquired from

the fellowship within his country, his region, and here in Edinburgh. We may have all the technical skills we may need, but if we don't know how to bring people together, how to negotiate, collaborate, we may not solve anything. Because when we look at the problems that we currently have right now, they may not need individuals alone, but they may need the right individuals brought together in one room and being able to work together. I think that's one aspect that we've lacked. I'm glad that the fellowship offers that aspect of collaboration. It shows you how much power we hold when we work together, even with the communities as professionals, as policymakers, where you learn that skill of putting your differences aside Of course, at the end of the fellowship, I may not have all the skills in the world, but I may have access to people with those skills. If I can bring them together in one room, for me, that's a success, and we can make better solutions based on such strategic planning. So I'm symptom ian and I'm a training physician from Copper Belt N teaching hospitals just bordering the Congo DRC and other countries. So coming from such a background, I think it does give me a different perspective. So I show the fellowship has made me realise the importance of quality leadership. And that's one of the takeaways that I gained from this fellowship and serving in the antimicrobial stewardship committee which I chair back home and also serving in the Medicines and therapeutics committee which I also chair, and also being a training physician who mentors others. I think leadership and communication is one of the takeaways that are blend. We cannot achieve much if we don't provide quality leadership, and we should understand that you are really a leader in your own area of specialisation. We are all leaders, so we just need to provide the best leadership in our areas of specialisation that we can provide. And together bringing all the leadership skills that we can bring to the table through the spirit of collaboration, which is also another takeaway that I've gotten from the fellowship and building better networks, we will be able to achieve more. So I feel the fellowship has opened up those areas for me and they have been able to enter circles which I was not able to enter again influence even big, big people whom if I am to apply for a meeting with them, it would take me six months. So the fellowship has really opened a lot of doors for us in those circles. And lastly, the networking aspect, I think it has made me realise you really don't need to know that much. You just need to know the right people, and if you know the right people, you can bring them together and you can come up with a better solution. Utilise the existing expertise in your country and via the network. I mean, you definitely see yourself using this network moving forward after the fellowship? I have already started using the networks, not just from within my country, but even from within the region. Now, at least I can safely say, I've got friends in Uganda, I've got friends in Kenya, whom I can contact if I need any help or any assistance and Edimb

is more like home. So I've got more friends in Edim B than I have back home. So I feel the networks have built are quite enough for me to be able to foster change and hopefully fight A back home. One of the other key themes highlighted by the fillers as being integral to combating AMR is data. Here, Till details more on the importance of data and its central role in combating AMR. The overarching aspect is diagnostics and surveillance. So knowing which antibiotics are used, what is the antimicrobial resistance epidemiology? How are these tests done or how are these data generated, and once we have data, what to do with the data. So data analysis, data handling, and how these data are then processed into meaningful information so decisions can be made based on them. So feeding them into national action plans, preparing them to inform policymakers and as a whole, making sense out of the data. This point from Till is clearly evident when discussing data with the fellows. I spoke to Wilfred Apira, who is a vet that works for the Ugandan National Drug Authority. One of his roles is to compile data and submit it to the WOAH, which is the Ward Organisation for Animal Health. Here, he highlights specifically the importance of accurate data to enable the correct decisions to be made. I've been the one compiling the country data consumption data at the level of input for the country, which we submit to World Organisation of Animal Health annually because we have been having a lot of challenges in the accuracy of the data we report. So every year we may be having queries that may come to explain. So I needed to gain skills also on data analysis because when we compile this data, the tool is given to us by World Organisation of Animal Health. So I needed to gain skills also of analysing data because whatever we do, we compile the data to inform decision making, to inform policy. We write annual reports that we submit to our partners like the Ministry of Agriculture, animal industry and Fisheries. So I needed to gain skills in data analysis to improve my reporting skills. The challenge that we have in data collection, we don't have a platform where data is kept and stored well, we are trying to build in our system, the National Drug Authority, there is an MI system. We have the National Drug Management Information System. We are upgrading that system because the original MI system was not capturing some of the variables that we require, especially at the port of entry. The data that we compile to inform public and change behaviour of people, and then also influence policy. This was also an area I discussed further with doctor Gathera Masera from the National Veterinary Reference Laboratory, which is part of the Veterinary Medicines Directorate in Kenya. He describes more about his role and how he uses data and how it informs policy making. He then describes some of the practical challenges around inputting and utilising data, and importantly, how his training with the Fleming Fund fellowship scheme can improve this further. At the National Veterinary Reference Laboratory, I'm in charge of the pathology laboratory, but I also

have other roles. I act as the deputy to the quality manager for laboratory quality management. I'm also involved in the management of our laboratory information management system and the One Health surveillance system, which is how we collect and store the data all the diagnostic data from the So in regards to the laboratory information management system, it's just picking up any issues that the users might have and sending them to the correct person and also ensuring that the transmission of data between different systems is happening, but also the quality of the data because we've had some issues about data quality in the past, and we're trying to put systems in place. This is AMR data. This is all data. But AR data is quite sensitive to inaccuracy. If you put something wrong in a column or in a row, it's just invalid that row becomes invalid. Because we are a public facing institution. We are giving results to the farmers. That's the easy part because it just give the farmer the result and they'll go away and implement whatever they need to do together with the veterinarian. But when it comes to collecting the data and analysing it so that you have a holistic picture, if you have the wrong data, you get wrong conclusions. What do you think can be done to address those challenges and overcome them? One of the things that came up is sometimes people don't know the importance of putting the correct thing. They just want to click a box or do a drop down and just move on with their day, not knowing that down the line all the data has to be collected and analysed and used for something. One of the things that we've tried to do is to eliminate free text from our liens. Free text was giving us horrible outcomes because when you go to analyse using whatever software you're using to analyse, every different spelling of Ascaria is taken as a variable. Yeah, I could totally see that how that would happen. Yeah. Initially, a lot of our entries were free text. You could just type in your own interpretation of whatever the spelling is. If you miss a C or a H, it goes into the database. We've tried to eliminate a lot of free text and replace it with drop downs so that all the data is uniform. The problem with that is that we had to go back for all the old data and delete it and redo it. It was hectic. Yeah. Yeah. Sometimes just make better systems for them that are easy to use and that are eliminating human error, but also to inform them that whatever data they're generating in the labs is actually going to be used for decision making in the future, so that they take some responsibility in how they do their data entries. And because you're working with veterinary animal health data and human data as well regarding AMR, how does that come together? So in Kenya, we have developed a system known as the One Health AMAs surveillance system that gets data from the human health side and animal health side into a single location, known as the Central data warehouse. From the central data warehouse, there's a separate system that has dashboards that allows you to visualise the data on one Health using a one Health

lens. The goal of this system was to allow people with different responsibilities to look at the data that is relevant to them and make decisions based on that, data that is already analysed and summarised so that it's easier to consume, graphs, badgets and that kind of thing. Think people are using that in their clinical day to day work, or do you think it's people in research, or is it both? Is everyone using this data, or do you think it could be used more? So the target was really the policymakers, people making decisions on a national and county level. We don't have a system where clinicians can look at an antibiogram and make a decision based on that. As we are right now in the animal health sector, all our results are piecemeal results. You did an AST, these are the results. There is no higher level of explanation about trends, for instance. And just finally, why did you apply for the fellowship? I applied for the fellowship because I was sitting where I'm sitting, I was seeing, where is this data going. You know, is it going to the right person? Yeah. I needed a vehicle to allow me to do this, to look at the data and say, this is what the data is telling us and how we can make decisions based on it. And moving forward, probably make this a continuous thing so that moving forward, we're using data to make policy decisions. In this first episode, we've introduced AMR, we've introduced the Fleming Fund fellowship scheme. We've heard from the fellows. We've also heard from one of the co directors, Professor Till Bachman. Nadia, what's next in Episode two? In our next episode, we will talk to Professor Adrian Mwangi, the other co director, who will share more with us about the AMR challenges within the region and the research underway aimed at addressing AMR. Later on, I'm going to be talking with the alumni. These are the phase one fellows and learning more about how the training and research undertaken with the Fleming Fund Fellowship scheme has impacted the AMR landscape in their countries. Brilliant. Of course, we're also going to be hearing from the, the current phase two fellows who are really midway with the individual and collaborative projects. I want to hear more about how those projects are going and how their training that they've already undertaken with Fleming Fund Fellowship scheme is impacting their work and their research within their own home countries. I do hope you can join us again. This project is funded by the Department of Health and Social Care's Elling Fund using UK Aid. The views expressed in its publication are those of the authors and not necessarily those of the UK Department of Health and Social Care or its management agents in McDonald.