

## Erta Kalanxhi

Good morning. Good afternoon. Good evening, everyone. Welcome and thank you for joining us today. Welcome to CDDEP's seminar series on global health.

My name is Erta Kalanxhi, and I'll be moderating this webinar today. We are having a discussion on AMR surveillance in Africa. We're very honored to have with us speakers that are working hard to bring some insights and quantify the burden that AMR has in the region.

I'd like to welcome Dr. Pascael Ondo, Director of Science and New Initiatives at the African Society for Laboratory Medicine, Dr. Yewande Alimi, AMR and One Health Program Coordinator at Africa Centers for Disease Control and Prevention, Deepak Batra, Head of Public Health and Government Solutions in the Middle East and Africa for IQVIA and Dr. Geetanjali Kapoor, fellow at CDDEP. We'll open the session today with a brief introduction by Dr. Ramanan Lakshminarayan, Director of CDDEP.

## Ramanan Laxminarayan

Hi, everyone. It's a real pleasure to be here. Let me start by saying that it's the 10th year of CDDEP and AMR is one of the core areas in which we work. One of the things that we're most proud of is really this work that we do on AMR in Africa. CDDEP has had a long engagement with AMR in Africa.

We started the Global Antibiotic Resistance Partnership back in 2009 to take this question of AMR to many countries and to have them address how important AMR really was. The continuation of this, in the context of the Fleming Fund - the project that will be described now - is a great effort to be able to shed light on the burden of AMR in Africa, something that we have very little understanding of.

Because we don't have an understanding of AMR in Africa, AMR has been deprioritized or is not prioritized in Africa. Now, if we have to set up lab systems to be able to make labs function in a way that there's real time information, that could take a very long time. In the meantime, efforts to unlock data that already exists in labs, and in the literature, could have a significant impact on informing us about the burden of AMR, which at the end of the day is what we're trying to do.

Another related piece of work that we do is use this data also to inform treatment guidelines in Africa. In fact, we do this work with the Africa CDC. There's many aspects of this work that CDDEP does on AMR in Africa, which again, goes back to where we started with. I'll hand back now to Erta to open up the panel to discuss what we're doing collectively between ASLM Africa, CDC, IQVIA, CDDEP, and a number of other partners. Thank you.

## Erta Kalanxhi

Thank you, Ramanan. We'll start the session today with some questions. We'll start with Dr. Pascal Ondo, and we have some questions about the Fleming Fund. Regional Grant One is one of the initiatives that aims to address this knowledge gap on the AMR burden in several African countries.

Could you please give us a brief overview of the work that has been done so far? And if possible, share some of the findings with us in the audience.

## Pascale Ondo

Yeah, thank you very much Erta. If you will allow me, I will share my screen and project some of the slides.

We are working in round two of the Fleming Fund. We are working with the MAAP consortium disease mapping AMR and AMU partnership together with the African CDC and IQVA, CDDEP, InSTEDD, WAHO and ECSA, which are our strategic partners.

The goal and expected outcome of the MAAP project was really based on the following problem: the AMR data for large scale and our users are very scarce in Africa. The reason is either because the data are not generated or are not reported. Part of the activity was to understand what is going on. There was also an observation at the beginning of this partnership that AMR and AMU data may exist, but they are not exploited. We know as a fact that a lot of the data is paper based, and therefore is not yet ready to depart of large scale analysis and some of our objective was really to digitize all this precious data that is around.

The objective was to collect, digitize and analyze retrospective data on AMR and antimicrobial use or antimicrobial consumption. The core of this analysis is, of course, the prevalence and the level of AMR and some observations on antimicrobial use. But while doing so, because the laboratory network is the vehicle to generate AMR data, we had collected a lot of information on the status of the AMR surveillance network in Africa. That's the piece that I would like to highlight now.

The first question is, how large is the National Laboratory network in those countries that you see highlighted here in yellow, where we have been investigating?

This is how the laboratory network looks: it's a pyramidal shape and at the top, at the reference level, we have the reference and then the clinical diagnostic happens at an intermediate level, and then you have those laboratories that are really at community level and cannot do antibiotic susceptibility testing and they refer to their samples. We looked at the size of the laboratory network in all those 14 countries and some of the networks are very large. We look at Nigeria, there's more than 3000 laboratories, and some are very small, but it doesn't mean a lot at this point. What we are trying to understand is which from those laboratories in the network are designated or are mandated to do that dialogic testing. Then we apply a questionnaire and we try to understand what's going on.

This is a profile of what happened. We started from 50,000 laboratories in 14 countries and out of these, the AMR Collaborating Coordinating Committee tells us 665 out of these 50,000 are supposed to do bacteriology testing. We then apply the questionnaire to those bacteriology laboratories. At the end, we see that 391 came back with information, and that's the laboratories for which we will have the results in the next slides.

We can see that only a few laboratories in the network, 1.3%, perform antibiotic susceptibility testing. All in all, it's quite a few laboratories at the level of a country.

We can see that even among those that are supposed to do bacteriology testing from the National Public Health Authority, then 20% of those actually do not do the bacteriology testing for various reasons. When we look at the profile of those laboratories, out of the one that were selected for the analysis, we see that there were 70 reference labs, 161 at the intermediate level, 108 within a district, and 52 were not assigned, which is in itself a problem that the laboratory cannot understand what is its role in the network.

Most of those laboratories were coming from our government. We could see that 62 of them perform less than 1000 antibiotic susceptibility testing in the index year of 2018. In fact, there are few laboratories doing testing and when they are doing it, there is a very low level of testing being done.

This is a complicated figure, but it shows you how we scored the laboratories. It shows you, for the 14 countries, how these scores are spread out in each country. We see quite a large spread in several countries. It might tell us that there's a lack of programmatic investment in those laboratories because they are a little bit all over the place in terms of their capacity. Then we see here a tendency where when the network is a little bit smaller, it seems that the capacity overall is a bit higher.

We see that there are laboratories with a high score and low score. What happens with the ones with a high score is that most of the time they are not reference level, they are designated to do surveillance, and they are high throughput laboratories. Ones with low scores are the ones at lower level, they are not designated, and they do not do a lot of antibiotic susceptibility testing. When we think that capacity is present at some point at reference level, what should happen would be that a laboratory with the capacity should pull the one with the low score.

What could be the areas of improvement to strengthen the laboratory, the AMR surveillance network? We noticed that improving access to antibiotic susceptibility testing at lower tiers, just like what happens in high income countries, will be something important. Electronic reporting of results and automation of the testing is also a way forward. Then look at the situation of biosafety cabinets for those laboratories and advance overall quality of the testing at all of the tiers of the network. For the human resources, increase the number of specialist microbiologists, especially at intermediate tiers.

That's in a nutshell what we found for the laboratory network. Thank you very much.

Erta Kalanxhi

Thank you, Pascal, for this very unique insight into the network and their capacity to conduct AST. As you outlined for us, there are quite a few challenges but in this context, they also could represent opportunities for improvement. How do you see how the Fleming Fund Regional Grant findings could benefit the countries and their partners?

Pascale Ondoa

Thank you Erta. I think that there is already quite some funding that the Fleming Fund puts in countries and individual grantees spot on, and particularly the effort to increase external quality assessments in the countries making sure that there's some quality of the testing. I think there could be a little bit more

effort in terms of improving the number of laboratories that have accreditation and the laboratories that implement quality management systems. That's an area for improvement.

Something that I still do not see completely addressed is the research and development that we need to have so that antibiotic susceptibility testing can be done in a simpler way and in a more affordable way, also at the clinical level. As long as those data don't come from the clinical side, we will not have a solid surveillance system.

Erta Kalanxhi

Thank you very much for your insights. I think we will continue with Dr. Yewande Alimi.

The first of the two questions is that in the last few years, there has been an increasing number of initiatives to assess AMR burden in Africa, Fleming Fund being one of them. What would you consider significant achievements and barriers to the implementation of some of these initiatives? We'd be happy to hear your input on this.

Yewande Alimi

Thanks very much. One of the key achievements that we can see on the continent is the increased partner funding to support many of our AMR activities, particularly AMR surveillance. One of them, like Pascale already presented on, is the Fleming Fund Regional Grant.

Fleming fund also has other regional grants, two of which, Africa CDC and ASLM are working, are leading. Apart from that, we also have the AMR Multi Partner Trust Fund, the likes of the US CDC World Bank investing heavily in our countries to support surveillance activities. Beyond that, we're starting to see very high level political commitment.

As of five years ago, Africa did not have any political commitment towards AMR apart from what we knew at the global level. But last year, we had the Africa Command position, which was endorsed by the African Union Heads of States and Government, and one of their priorities was to heavily invest in antimicrobial resistance activities and controlling antimicrobial resistance across our member states.

Similarly, last year during the World Antimicrobial Awareness Week, we also had the regional directors of the African Union organizations, the Regional Tripartite organizations, as well as UNEP make a political commitment to supporting our member states in addressing antimicrobial resistance using a One Health approach.

The single greatest achievement that we can highlight is the country's interest and ownership. More and more we're starting to see more countries lead, more country-owned and more country-founded AMR.

AMR in the countries have prioritized existing leads. They're taking the driver's seat in driving what their own agenda is. More than ever we're starting to see good political backing. It goes without saying that this will ensure that we have sustainable interventions and initiatives. One of the things that I like about your question is talking about the challenges. I know Pascale touched a bit on it in her presentation, and on some of the interventions she has made.

There are several challenges that we can highlight for this conversation, but a few of them that I would really like to talk about and for us to take a good reflection on is we've seen sort of a difference in terms of the advancements across sectors. We see very good investments, good infrastructure, and good testing capacity in the human health sector, but when you compare it to the animal health sector, it's completely different. We know that there's no way for us to fully address antimicrobial resistance without using the One Health approach.

When we talk about the environmental health sector and even the plant health sector, we are definitely missing them in the bigger picture when it comes to AMR surveillance and quantifying the burdens across our countries. Beyond that, the question is so what can we then do when it comes to these challenges?

There are several other barriers, like we've not seen good demand by clinicians for diagnostic testing. COVID for one has definitely affected our supply chain for AST. It has also affected our human resources as we have seen, with several of our experts who have been working in the AMR space being pulled into the COVID-19 response. Several countries have highlighted barriers around things like transporting specimens.

I am sure that Pascale also highlighted it, but the absence of the standardized protocols and quality assurance criteria definitely gives us very poor AMR data, despite the investments that we are making. I think some of those are the key barriers that we have experienced when it comes to quantifying AMR data on the continent.

Erta Kalanxhi

Thank you so much for that. Actually, this is a good time to mention the One Health approach to AMR because our next question is about that.

The African Union established the Task Force on antimicrobial resistance in 2018. It included representation from human, animal, and agriculture sectors. What did you consider as investment priorities to enhance collaboration between the sectors?

Yewande Alimi

Thanks very much for that. The African Union Task Force on AMR, which is the political body on Task Force of the African Union addressing AMR, like you've rightly said, under the leadership of the African Union Commission.

One of the things that we have prioritized, that goes without saying, is we absolutely need to invest in physical and human resources. We need infrastructures, we need things in place, we need trained experts to do the testing, we need epidemiologists to understand and analyze the data, but most importantly, we need that connection between data and policy. We might be putting all of this really nice data together, but what does it mean for the countries and how does it translate to policies and interventions?

Beyond that, we heavily need to consider investments around improving laboratory initiatives that are not just microbiological, but looking at things like the genomic capacity, the genomic technical capacity, and infrastructure to help us produce quality AMR data across and within sectors in our members states.

One of the things that we are doing with the Africa CDC, you might be aware, is our Africa Pathogen Genomic Institute, which really focuses on strengthening the capacity of our member states for genomics and bioinformatics. One of the things beyond outbreaks, because that team has really done a fantastic job with COVID-19, is that now we are able to do genomic analyses for the various variants in the continent. One of the things that we are trying to see is, how can we then get more investment to translate those best practices or those lessons learned into AMR? We also need investments. One of the things I said and I'm really passionate about is how we use our data.

Many times we are advocating for countries to start to test, to collect, to analyze data, and to submit data to regional platforms such as the Africa CDC, as well as WHO class initiatives. Many countries keep asking us so what does this mean? How are they able to translate AMR data to things like developing infection prevention and control SOPs? How is it able to translate to the treatment guidelines? How will they be able to develop initiatives that will control AMR in their own country, in their own context?

We also need investment. One of our priorities is advocating for increased domestic financing, in addition to external financial support relevant to all sectors. We want to start seeing investment, not just in our human health sector. We want to see investments around testing in animal health sectors as well as food plants and environmental testing sites that perform bacteriology.

Finally, we really advocate strongly, and you must have seen it for most of the work that we are doing now, for local production, and local and context specific innovations. We really need to invest heavily in innovations across sectors.

COVID has clearly shown us that we have the capacity as a continent to locally manufacture PPE: for example, alcohol based on drugs which are relevant to infection prevention and control and biosecurity. Similarly, as you must know from the work that we are doing at Africa CDC, is also advocating for local productions of vaccines. We want to support countries and invest heavily into research.

As a continent, we're looking to develop antimicrobials, particularly antibiotics, addressing things in local or context specific ways, such as waste management tools, and looking at safe effective alternatives to antimicrobials. That's one of the things that we are particular about: exploring safe and effective alternatives to antimicrobials, both in the human sector as well as in the agriculture sector. Over to you.

Erta Kalanxhi

Yewande, thank you so much for your insights. This has been a very interesting discussion so far, and I can see that there is a lot going on in the chat at the moment, I can see a lot of interaction. Thank you to everybody that has joined us.

I'd also like to remind that at the end of the session, we are going to have some time for questions from the audience. Make sure to enter them in the Q&A section of the Zoom platform.

I would like to ask some questions to Deepak Batra from IQVIA, who is responsible for data collection in some of the projects that CDDEP is also involved in. So far, we'll be talking about surveillance and the capacity to conduct AST, to basically look at AMR. But data collection is a critical component of surveillance and for the Fleming Fund project, data collection has taken place at the same time in several countries. We wanted to know if you could share some of the challenges that you've encountered in the field when it comes to data collection.

## Deepak Batra

Thanks Erta and thanks to the CDDEP team for inviting me and congratulations, first of all, for your 10 years. If you could allow me, I'll probably pull up a few slides that I have on this topic.

IQVIA does a lot of data collection, not only software and project, but as you mentioned for a lot of these things. We do a lot of data collection, especially when it comes to medicine consumption, and there are challenges when it comes to Africa. In fact, I will not even say Africa, but most of the lower middle income countries. We know that when it comes to these kinds of data sources or assets, when it comes to medicine consumption, even labs can be clubbed in the same bucket.

Data sources are fragmented, which leads to very limited collaboration and intersectoral discourse on data partnerships. There is a lack of that and in most of the countries, the data governance models are lacking. Every time you get into these discussions, there are challenges related to data sharing the agreements, what we can share, and where we can take the data. It almost happens on each and every of this project and obviously those are challenges which also came when we started Fleming fund.

Once again, it wasn't unusual. It wasn't anything great, but I think these are some of the systemic challenges when we talk about data collection and especially data collection in countries such as Africa or low middle income, where we see these challenges of data sources not being standardized. There's a lot of coding and bridging which is required.

What you collect from the field, you actually have to work on that data so much to actually make it ready for analysis and consumption by the policymakers, which takes a lot of effort. A lot of times, the data is incomplete as well. While you will have data for a particular month, but then a particular month will once again be missing or certain commodities will be there and certain commodities will be missing. We once again encountered some of these challenges when we were doing data collection for Fleming Fund as well.

A lot of these also stem from the fact that most of the activities when it comes to data collection, especially in Africa and low income countries, are still ad hoc. We don't do routine data collection. We don't set up mechanisms for data collection, which once again gets us into a loop on every project that we start, like Fleming Fund when we started, to go through the whole approval processes and ethical concerns. The accuracy of the data is always under the standard when it comes to these kinds of things because once again, you are doing one time data collection exercises. There are no validation and checks in place at times.

We know that the private sector plays a major, major partner when it comes to medicine consumption, when it comes to lab testing and when it comes to AMR as well. But participation from the private

sector, we face this in Fleming Fund as well, was a major challenge. It is difficult to engage them and you can understand, some of this information for them is business.

They are sometimes uncomfortable sharing a lot of this information around how many lab tests they are doing or how many medicines they are selling. On those kinds of things, they have their own individual approval processes as well.

A lot of private sector organizations or private sector labs, pharmacies are realizing that this data for them is commercial. They are able to make commercial use of this data, so why just provide it free of cost for global health initiatives? That's one of the challenges that we face.

We faced another specific challenge in this Fleming Fund project. You would have seen when Pascale was presenting, that our initial objective was to not only collect data on antimicrobial consumption, but also on the utilization which actually requires us to link the data to individual patients, which we were not able to do in most of the countries because obtaining patient level data on medicine consumption or antibiotic consumption does become a big challenge.

I think the real challenge, in my perspective, is that to have an effective surveillance mechanism, it cannot be covered by doing these one time exercises. It is a great solution to obviously get some data. As Ramanan was saying, there's a lot of data which hides below in the lab records or paper records or in literature. We are able to extract it but routine data collection is what's needed for longer term improvement.

One time exercises have a lot of challenges, as they are subjected to sampling errors and they cannot reflect the changes in volume or prices or over time changes that you would want to follow. They are subject to error well, when it comes to medicines especially while estimating the dispensing data at an outlet level is never the same. If you're connecting at one time, you go back to the same outlet or same lab one year down the line the data would look very different. If you're not collecting it on a routine basis, then you do not have a very uniform baseline.

That is what we have always proposed, as IQVIA and also as someone who has collected data and experienced data collection for the last almost five decades, we have always advocated that countries should set up mechanisms for medical consumption data on a more routine basis. It cannot be a one time exercise, it cannot be just retrospective data collection. It has to be an ongoing effort, which has to happen on a monthly basis or quarterly basis or with a regular frequency. That will set up databases or data assets which are more uniform in nature, which would provide much more certainty when it comes to results and and a much, much better data quality. Before I close, it's not impossible.

An organization like IQVIA has done that for the last 50 years across all these countries, when it comes to prescription data, so it is very much possible. You will see on this slide that we are not just doing it in the developed world, but there's a lot of low middle income countries or developing countries there. These kinds of data assets, routine data assets, are set up and these data collected. In fact, even in Africa IQVIA has done that over the last 20 years or so in a lot of countries.

There are obviously a lot of missing countries when it comes to Africa. We are advocating that Africa has these data assets to choose from a global health perspective on a regular basis. Global health stakeholders have to come together and also co-invest with private sector organizations to set up these data assets and set up these antimicrobial consumption utilization data assets in these countries.

We have a lot of challenges and there are no quick fixes to solving these challenges, Erta, in my view. It has to be a longer term solution of setting up these routine data assets. Thank you.

Erta Kalanxhi

Thank you very much and it's impressive to see the last two slides as well, to see how far you are reaching with your activities.

When it comes to operations in different countries around the world, and the antimicrobial consumption data, how do operations in Africa compare to the rest of the world, or how do they compare?

Deepak Batra

I would say it all comes down to, as I think Yewande was also telling, political commitment and some sort of a governance model needs to be there when it comes to data.

As you would have seen on a couple of other slides, IQVIA does this for a living almost in a lot of countries and a lot of developed countries. Where we see the differences is that the countries have set up a lot of standardized data collection platforms and there is willingness to share. This willingness to share is not as mandated in the public sector and also sometimes there's willingness to share in the private sector as well. For example, in the UK there is a mandate in place for sharing data when it comes to antibiotic consumption. This is something which has been happening. There is a granular level of prescription level data coverage.

They have data when it comes to antimicrobial utilization as well. I think those are the kinds of things for which Yewande and Africa CDC are right now leading efforts, which I'm sure in time will bear fruit.

It's all about having the right kind of political commitment, right kind of governance models, and right kind of buying for the private sector. You have to incentivize the private sector to share this kind of data and that is where these kinds of things will catch up over time and make sure that even Africa has the kind of data assets like the ones which are already available in a lot of other developed countries. Thank you.

Erta Kalanxhi

Thank you Deepak. Thank you very much for a lot of insights into antimicrobial consumption data collection all over the world. Now, we are going to focus a little bit on one of the later stages, which involves data analysis.

I have a few questions for Dr. Geetanjali Kapoor, who is a fellow at CDDEP, who has been leading CDDEP work on the Fleming Fund project. When it comes to data analysis, what are some of the issues that you've encountered when you analyze data from such different sources?

Geetanjali Kapoor

Right, so I would like to just share my screen if that could just be possible.

In fact, that's what we are seeing right now as we are analyzing the data. So this is just trying to make it a little interesting to show how we are getting the data from several sources.

You see these couple of buckets put here with the different Legos and just consider that one bucket means one lab. We are getting data from so many different laboratories, and every lab is pretty unique. Some labs are giving us a lot of data, some are giving us less data in terms of quantity, and even the quality of the data is very, very variable because we know some of the labs are referral or they have more in-house capacity in terms of testing and staff speciality, while the others may not have. There is a lot of heterogeneity.

Apart from that, we've not been able to, in Fleming and for most of the projects, sample all the labs. We have to go over just a bit out of the entire population of labs. The representativeness has to be considered.

When we get this kind of heterogeneity in the data and we are trying to then finally find out the AMR estimates that are our output, how do we harmonize this disaggregated data? That is the most important issue which we have faced and I will come to how we did that. Apart from this harmonization, we've also had challenges in finding out the best way to estimate the confidence intervals around that estimate which we have found out. These were a couple of issues and you can see on the left hand side, I've just kind of labeled a few of these issues, which resulted in our having data that needs a lot of harmonization.

Going a step further, we definitely had to circumvent these issues. As long as harmonization was concerned, we followed the best possible evidence, which is also there by CLSI. We have some exclusion criteria: for example, information which was incomplete had to be completely excluded and filtered out. Wherever the data points were too little, like 10 results for a particular bug-drug combination, we couldn't consider it because it would skew the results in the end.

These kinds of inclusion and exclusion criteria have to be considered, and that's what was meant by harmonization of the data. Even when we came to the estimate for the AMR conventionally - I mean this is more statistical but conventionally - the researchers used the normal Wilson method. This is not possible to use in our setup, especially when you have such heterogeneous data.

Our researchers at CDDEP developed a different kind of CI estimation method and Erta you were one of the researchers for that along with Dr. Klein and Gilbert. We developed a different method, which is a more robust way of estimating the CI's around that estimate. I hope that answers this particular question.

Erta Kalanxhi

Thank you Geeta for sharing this insight with us.

Going on to my second question, lack of financial support is probably one of the major barriers when it comes to setting up routine AMR surveillance in countries, which Deepak also touched upon. Are there any feasible interventions, like low hanging fruits, that can be easier to apply and utilize that would really help the countries with having an overview of what's going on with AMR in their country or region?

## Geetanjali Kapoor

Even Yewande had mentioned that and Dr. Ramanan and Pascale. I think everybody has alluded to the fact that we do need a lot of investments as we are trying to strengthen AMR surveillance and that's a long way to go. Moving to my next slide, this is just to show that AMR surveillance is part of our spectrum of various activities.

When we say how do you want to strengthen AMR surveillance, there are lots of events that happen before that. The patient comes to the hospital, he starts his therapy, the samples go to the lab, and once the results are out, he gets targeted therapy that's the stewardship. Then, of course, rest of the results help in the surveillance and setting up empirical guidelines and other public health interventions.

If we need to strengthen surveillance, apart from finances, we can also focus on other low hanging fruits. We need to have a choice of the labs, like which of the labs you want to target and from where you want to collect the data for AMR surveillance. In Fleming we've tried our best to pick up the labs which are most representative, but, as Deepak also mentioned, these are one time exercises so we need to have this going.

Another area where we can focus on strengthening surveillance is just scaling up the workforce. This is also a part of the health system strengthening building blocks from the WHO. They also emphasize that the workforce is a very important building block of the health systems. That undoubtedly is an area which is a low hanging fruit.

Teaching and retraining the workforce is really important, especially in the low middle income countries and that doesn't mean just Africa but even in the other Asian countries. This is also possible with the reference labs: they have this capacity and they can mentor the low level labs. We can get support from the pharma or the biopharma companies, CSOs and other organizations they can be involved in this mentoring. Another area where we can strengthen surveillance is set up surveillance standards.

So far, what we are doing in Fleming is we are following the WHO global priority pathogen list. But honestly, I think the best way forward is that the region or the country should have its own standards, which are the high priority bacteria and antimicrobials relevant to that particular region. You then do the surveillance specially for those groups of critical pathogens, instead of just a global. We need to also establish that, which can come from good clinical interactions with physicians and understand the local epidemiology.

Information Systems of course, is something which would mean investments if you want to make it electronic. Even with paper based records, there should be emphasis on good record keeping and being sure that all the essential parameters are filled out. When we get these data collection formats from the labs and from the pharmacies, we see lots of information missing. As a result, we have to filter out a lot of information. Unfortunately, this is wasted data.

If within the hospital and pharmacies they ensure that they get all the critical information in the lab and pertaining to the patient's diagnosis and antimicrobial usage, it can be such a wealthy piece of information for us to triangulate and to see what are the potential drivers. These are just ways to strengthen surveillance and then, of course, leadership and governance. I may not go much into detail, but Yewande really spoke in detail about that. I think Africa is very lucky that way because it has this Africa Union, which brings together all the different countries under the One Health umbrella. We also need to coordinate with the other sectors, which is another way to strengthen.

I did see a couple of questions around how to triangulate with the other sectors, so that's the way to go. If you say financing, yes financing is needed. That's not to say that we don't need financing, financing would help us in automating the labs, bringing up more genomic studies, and upgrading the paper based and manual record keeping to electronic.

These are the ways we can actually strengthen. These are basic principles of epidemiology that need to be addressed. That's it from my side on this particular question.

Erta Kalanxhi

Thank you very much, Geeta. That was a very nice slide to end the discussion. We have time to answer some questions. There's one that sort of fits in with what you just mentioned Geeta.

It's a question on the utilization of point of care or rapid diagnostic testing for AMR in the continent. What is the extent of that?

This question is open to all of the speakers. If any of you could answer, that'd be great.

Geetanjali Kapoor

In terms of point of care, that's just not in Africa. It's all over the world that now there has been a lot of emphasis on POCTs just because it brings up a quick way. It's a way towards diagnostic stewardship and to strengthen that so you collect the sample faster, you send it quickly for testing, you have results early, and you can follow the targeted therapy.

To what extent it is there, Fleming Fund Regional Grant has not taken this particular objective as part of our study. I do know that there have been a couple of other programs in Africa which are trying to see the amount of usage of POCTs in the continent. Unfortunately, we cannot give you figures for that, but there are others.

This is a new area, we know that. POCTs utilization is not something which used to happen in the past, it was pretty restricted to maybe just typhoid and HIV. But now it's there for even COVID. That needs another study or program to pull out the data for utilization.

Erta Kalanxhi

Thank you, Geeta. Pascale, did you have any comment?

## Pascale Ondo

Whether they are point of care or simple tests to do antibiotic susceptibility testing, I do not think so. I think that there's a gap in research and development in that area. I think to diagnose some of the infection, yes.

But this really brings an important point that from the WHO, there is now the Essential Diagnostic List, which is supposed to be a tool that will now help countries to regulate or prioritize what kind of diagnostic they have to put at each tier of the laboratory system. I think that's an opportunity to now look at what is available from a technology point of view and what is useful in a setting that is sophisticated or at the community level to really push towards a technology that can help for the bacteriology testing and AST.

## Erta Kalanxhi

Thank you. The next question is about the connection between lab data and clinical outcome data, with regards to AMR. One of our members of the audience is asking if there are any initiatives that connect these two: lab data and clinical outcome in AMR.

Geeta mentioned in the discussion that this was lacking when it comes to the Fleming Fund project.

## Geetanjali Kapoor

Oh, we did do that and it was part of the Fleming Fund Regional Grant. In fact, it was a very important element of our objective: trying to bring out the clinical profile of the patients as well as their lab profile, triangulate it, and then try to see that when you say this is the resistance rate, also sub stratified across different kinds of populations, so that was definitely an aim.

Of course, this is not a platform where we can reveal the final results, but in general, what we have been seeing, and we did a retrospective study in Fleming, is that there is incomplete information on the clinical parameters in most of the countries. In some of them we have been getting, especially on the diagnosis and on their antimicrobial usage before the samples were sent for testing. That is going to be some wealthy information for us to finally analyze and present forward.

The limitations of our study is that there are no standardized formats existing today in just not Africa, but even in LMICs. We would be giving recommendations that the hospitals and the surveillance teams should emphasize that these things are filled out at the clinical level so we don't have to go back and collect this data again and again.

## Erta Kalanxhi

If I may, I can continue with another question. One of the audience members is asking if there was any data that was captured during the Fleming Fund Regional Grant project that captured stewardship initiatives, so AMS.

## Pascale Ondo

In the MAAP consortium, I can't remember that we captured this kind of data because that was not directly related to the outcome. Deepak and Geeta, maybe you collected that in other initiatives.

## Deepak Batra

It wasn't collected as part of the Fleming Fund Grant, but I think some part of our eligibility questionnaire does at least hint towards the kind of linkages that are there in the lab data and some of the other data assets and how are these reported back. There is some sort of data but no, there was no comprehensive data collected on the stewardship activities.

As far as I know, there is no real database which exists or an exhaustive or comprehensive data collection has been done on the stewardship activities.

## Geetanjali Kapoor

Yeah, I agree with both what Pascale and Deepak said. We did have a question in our questionnaire, which does say, antibiotics prescribed after the sample was collected.

That question was, in a way, trying to find out the stewardship act, whether the targeted therapy and de-escalation happened. But we are not getting any information for that. There are various challenges while the data could not be collected: it may be existing in the records or it was not collected. Hence, it would not be something which we would be able to highlight upon.

## Erta Kalanxhi

Thank you. I have a question that I believe is directed for you Yewande and it's on the ownership and leadership that is needed to to achieve some progress with AMR surveillance.

The question is, what about efforts in mobilizing internal resources to support national action plans for surveillance?

I think Yewande, the connection is not very good. I think the screen has frozen. We can perhaps attempt a different question, I don't know if we have an answer for this.

From the ARM AST data collected in the African continent, is it possible to kind of estimate the proportion of One Health type of data, so some data that also includes veterinary and agriculture?

## Pascale Ondo

One of the starting points - it was really a decision from the Fleming fund- was realizing that we are collecting historical data, and the One Health Initiative took a while to be implemented. It was agreed and recognized that data from animal health and the environment was not going to be that much so that we would focus our attention on that. We recognize that now, since 2018, a lot of efforts have been

made, but we consider that there would have not been enough data from the other sectors to collect. That was a collective decision that we took at the beginning.

Now it's probably very different, especially with animal health data. There's a lot of laboratories that are really coming to get that capacity. I think it's a lot better now.

The real question is how is that data being used? I think it's not enough just to generate data. Are those data now transformed into actionable reports and what are the public health actions that are being taken based on those data? I think that that's probably still a gap as far as I can understand.

## Erta Kalanxhi

And just to hold on to that, when it comes to the availability of data, is there any data on the quality of medicines? It's another question. Does this data exist?

## Deepak Batra

Once again, I'm not sure if there's data on the quality of medicines. WHO frequently publishes reports, which they do not through any kind of routine exercises.

When you say quality, if you're talking about counterfeiting or if you're talking about or substandard medicines, there is no data but there is obviously a lot of evidence which WHO has published over the last few years. I think there has been a report as well, which obviously points out that it has been the case in a lot of countries, including Africa, especially when it comes to some of the Western African countries. There have been a lot of cases which have been well publicized and well published, but I don't think there is formal data.

Once again, I think the solution to this is implementing technology such as traceability, track and trace. I think these are the technologies which we'll be able to generate data when it comes to even quality. Just doing one time random checks and random services will provide you evidence it exists but will not give us the routine data to establish these things.

## Pascale Ondo

Just a quick one, Deepak. I think technology will be a good way to trace that, but I think that's the means to an end. I think having the mechanisms to roll the responsibility to people that are accountable to indeed collect the data and take a decision and action when they see no conformities or fraud is missing. That's really an issue of the whole governance and coordination of who is doing what and of course the technology comes in support.

But what we are missing is really that the authorities see what are the problems and they appoint people to do with the budgets for them to be allowed to to enforce the regulation that is being proposed.

Erta Kalanxhi

Thank you so much. Since we are on this topic of data collection, there was one question about WHONET and how that has impacted AMR data collection. Specifically, they ask what are the challenges with using WHONET for AMR data collection?

Geetanjali Kapoor

It was actually very beneficial to use WHONET as the data collection tool for Fleming Fund. We deliberately decided that we should use WHONET, we did not want to reinvent the wheel. It's a standardized tool and it's there in the global domain and it's publicly available.

It was our effort not to digitize the data through the use of WHONET, but to indirectly build the capacity of the teams for collecting the data because they were outsourced from those particular countries and from IQVIA. It was also a way to digitize and build local capacity on WHONET. I wouldn't call it challenging but yeah, it was more of a benefit.

We do hope we leave behind that kind of capacity and you know, the programs can sustain afterwards. I see Dr. John Sterling is also there. I do acknowledge that he's been a great partner to efforts of MAAP and just very, very approachable all times from our front CAPTURAs side, that's a sister consortium along with MAAP under the Fleming Fund.

Erta Kalanxhi

Thank you and I think we have just we are we we have reached our time limit for today. We have one more question for you Yewande, I believe. I want to re-ask this question about any efforts to support countries with national action plans on AMR surveillance?

Yewande Alimi

As a matter of fact, one of our priorities as the Africa Union is to support our member states. I'm developing and actually implementing the national action plans.

This we have been doing very much in collaboration with the Tripartite organization, the regional tripartite on the continent, to support our countries. Our AU-IBAR, that is the Interafrican Bureau of Animal Resources based in Nairobi, which is the Africa union organization that focuses on agriculture and animal health, has actually been supporting a few countries like Somalia and Sudan in developing the national action plans.

One of the things that we are really strongly advocating for beyond just developing national action plans is working with countries at every point to support priority activities or objectives of the national action plans. Be it infection prevention and control, be it antimicrobial stewardship, be it biosecurity as well as legislation, which touches a bit on the counterfeit medicines and questions that you raised earlier. Those are the things that we are doing to support our member states on that.

I know that recently the WHO has put out a costing tool towards the effects, which is one that we are hoping to support our countries with. We know that you might develop a plan, but until you are able to figure out how the money comes in to implement the things that you have stated in your action plan, that plan is just a plan. We are working very closely with countries to go beyond just developing those plans but actually implementing them and tailoring them to their context. Over to you.

Erta Kalanxhi

Thank you very much and it's time to wrap up for today, but not without saying thank you first. It was a huge pleasure to have you all here and I think we've all learned a lot. It's been a very informative session. Thanks again for taking your time, everybody's so busy.

Thank you to everybody for joining in and all your insightful questions. We are going to have another webinar, our eighth one in the 10 one webinar series, and that's going to be about the global oxygen crisis in relation to the pandemic. Thank you very much and wish everybody a good day. Take care.