Erta Kalanxhi

Okay, I think we're ready to start. All right. Welcome everyone, welcome to CDDEP's conversation series on global health.

My name is Erta Kalanxhi and I will be moderating this webinar today. I just want to make sure everybody can hear me so one of the panelists can tell me if everything is working perfectly. Great. This is the first of our webinar series that we are organizing in relation to celebrating 10 years at CDDEP and the webinar today is the first session in connection with the release of The State of The World's Antibiotics in 2021.

We are delighted to have here with us today distinguished experts in the field of AMR and we are really looking forward to some good conversations on the progress and the challenges that lay ahead with regard to AMR globally. So towards the end of the session, we will answer some of your questions. If you are following us on Zoom, please enter your questions in the Q&A section and if you are following us live on Facebook please enter your questions as comments under the live feed.

Joining us today, we have Professor Otto Cars, founder and strategic advisor of ReAct and a senior expert at the Public Health Agency of Sweden, we have Professor Abdoulaye Djimdé, president of the African Association for Research and Control and an associate professor at the University of Bamako, we have Professor Dame Sally Davies, UK's Special Envoy on AMR and a Master of Trinity College at Cambridge University. Finally, we have Professor Ramanan Laxminarayan, director at CDDEP, who will start the discussion today by introducing the State of the World's Antibiotics report. Over to you Ramanan.

Ramanan Laxminarayan

Thanks Erta, welcome to all of you. So Erta I think the live Facebook feed is not working yet and you might want to turn that on.

Thanks everyone for your patience, this is the first of the 10 webinars that we have planned to commemorate the 10th anniversary of CDDEP's founding and we naturally thought we should start with the topic that CDDEP is best known for, which is antimicrobial resistance. So we really appreciate all of you joining us for this important landmark for us. There will be other webinars that cover other topics over the course of the next 10 months but this particular one is to launch a report called "The State of The World's Antibiotics."

The last time we did this report was back in 2015, when things were very different with AMR. In 2015 there had been some progress on AMR, notably Europe and the United States had already made progress in terms of national action plans, many other countries had as part of work with the Global Antibiotic Resistance Partnership and other partners including ReAct, which is represented by Otto Cars here today, had already made some progress on AMR, but by and large the world had not moved in a

collective way. It was only in 2016 that there was a UN General Assembly and a high-level meeting which was focused on AMR, the fourth time ever that a health topic was featured at that particular gathering and it really helped provide a significant impetus to this important problem and the solution by making sure that all countries agreed that this was something that the world could solve only if done collectively.

Since 2016, it's now been five years, and not quite because this was 2016 in September, so we're about four and a half years…some countries have made a lot of progress but many countries have lagged behind. We have not tracked AMR in a global way, in a systematic way over this period of time. It was something that some of us had argued for at the time of the 2016 UN declaration that there should be targets on antibiotic resistance, on consumption but many countries were reluctant to be held accountable for specific targets. But we think now that five years later, the lack of progress on this issue has made it important for us to again argue that without measurable targets, it would be hard to make progress on AMR so that's number one. Number two is that this idea of One Health, the idea that human, animal, and environmental health are all related to each other has received a lot of attention now in the context of COVID, because now we realize that COVID could have come from animals and been transmitted to humans, and so in the public consciousness, this idea of zoonotic disease and One Health is now very prominent and this again is an idea which, in the context of AMR, has not really achieved the correct response from countries that it really should have.

In presenting this report, we hope to bring attention back to the One Health nature of antimicrobial resistance and I'll present a few slides to show you exactly why we think that this is really the way to go but one of the things that this report does is really provide an exhaustive presentation of dashboards for many countries on antimicrobial consumption, on the resistance,and also on drivers and correlates of antimicrobial resistance, so that's the second point. The third point is really something that will be discussed in the context of the panel which is on global governance.

As part of the 2016 UN General Assembly and the High-Level Meeting, there was another panel that was set up which was then to spawn another set of panels but all this in five years has really reached nowhere. There is a Global Leaders Group now for AMR which we welcome, it's co-chaired by two prominent women prime ministers in the world and it's something which we hopefully will see a lot of action on but for now we have not really seen much there yet. In the meantime, countries are still struggling to get out of COVID and they will be ill-prepared to really deal with antimicrobial resistance.

COVID itself has provided a context for AMR to get worse which is that with a lot of people crowding into hospitals, a lot of the infections, the secondary bacterial infections in COVID patients, are actually caused by bacterial pathogens, so again in many ways, AMR is making COVID worse and it's quite visible to people who are studying this. So I'm just going to go through a brief synopsis of the report and then we'll start the panel discussion, but again I thank you all for joining and it really is a pleasure to show this work on behalf of the many collaborators who have worked on it. It's been about two or three years of very intense work and we're really proud to be able to share this with you today.

This is essentially The State of The World's Antibiotics in 2020 as things stand. So all of this work has come out in various forms but it's really being summarized here for the purpose of this audience. Now there's a significant amount of variability in per capita antibiotic use across the world. Panel A on the top left is showing the defined daily doses, consumption per capita in high income countries, and the right side is showing the same information in low and middle income countries and you can see that particularly of penicillins but even cephalosporins, there's an increasing amount of consumption. There's not much of a difference anymore between what's happening in the LMICs and what is happening in the high-income countries. Meanwhile if you look at resistance, which is down here ,which is in high-income countries and here in low and middle income countries, you see that resistance is actually higher in low and middle income countries, particularly in contexts where people will not be able to afford second-line antibiotics. Regardless of which antibiotic you think of and what bacterial pathogen you're referring to we see fairly high levels of resistance.

I would pay attention to the y-axis. This is 80 percent, out here, 100 percent and you can see that levels of resistance in low and middle countries are extraordinarily high, exceeding 20 percent in many instances and going as far as 80 percent. Now we compute what is called a drug resistance index, which in very layman's terms is a way to communicate the problem of resistance to a lay audience that doesn't understand biological [terms] like Acinetobacter baumannii or Klebsiella pneumonia or Staphylococcus aureus, so just like a stock market index is a weighted average of the price of multiple stocks that are on the index, in this case, the drug resistance index is the weighted average of resistance in a particular country weighted by how frequently that antibiotic is being used to deal with that particular pathogen. We've now been doing this for about 10 years. We see that there's a significant variation in the drug resistance index. Keep in mind - the higher the drug resistance index, the worse the problem of resistance and it is also a combination of having high levels of drug-resistant pathogens and also not having newer antibiotics that could deal with those drug-resistant pathogens.

So in some cases, if countries are using more advanced antibiotics also, they could have a lower DRI and you can see that the DRI is particularly high in India, Thailand, Ecuador, Venezuela, also in South Africa. Turkey is a significant per capita consumer of antibiotics. We have confidence intervals here based on how much data we have for this and you can see that some of the countries which are doing much better are countries like Sweden, which Otto can speak more to, and Canada, Norway, [and] Finland which have managed to keep resistance down through a combination of optimal use of antibiotics, but also preventing unnecessary use of antibiotics. Meanwhile, between 2000 and 2015, we're now updating this for more recent years, antibiotic consumption has gone up in many parts of the world.

You look at French West Africa, it's gone up four times; Dr. Djimdé, you can speak to this. Antibiotic use in China has gone up about 50%. Remember, all of this is per capita numbers, sorry DDTs per 1000 people, so these are strikingly large increases in per capita consumption and obviously correlated with income, but not really with any sort of disease and you could see this for Brazil and Saudi Arabia as well.

The World Health Organization uses three categories for antibiotics which are Access, Watch and Reserve. Access antibiotics should be available freely, Watch antibiotics should only be used in the

context of a stewardship program, and Reserve antibiotics really should not be used at all. But what we see is that the consumption of Access and Watch antibiotics has increased but particularly the Watch and in some cases, the Reserve antibiotics have also increased. So in the high income countries, the increase has not been so much, so that's all in the blue, but the greatest increase which are in the yellow and the red has really happened in Latin America, some across Africa, and then also in Oceania. So you see that as a global sort of a phenomenon.

We've done a lot of studies on vaccination as a possibility to reduce the incidence of AMR. And we think that vaccination really should be scaled up for routine issues like pneumococcal pneumonia and even rotavirus, because vaccination both leads to fewer infections, and less antibiotic consumption but, more directly, also leads to lower disease burden and less transmission, all of which leads to lives saved. So we see that that is going to be a major focus for the world to make sure that new vaccines are introduced.

Last but not least, it's really also about using the antibiotics that we have appropriately and some of the work that's presented in the report is based on global work that we've done along with partners on how to have stewardship programs function, even in low resource settings. So we've got manuals on how to do this and we've got checklists, and it's possible to have, even in low resource settings, programs to be able to use antibiotics appropriately. It all comes down to the same two things which is to reduce the need for antibiotics, which is through vaccination, water, and sanitation, and infection control, and reducing the use of antibiotics through stewardship programs.

If you look at global antibiotic consumption and animals, which is the other piece of where our attention has really been, for the first time earlier this year, we were able to quantify the amount of antibiotics that were used in aquaculture, which although only a small proportion of the overall antibiotic consumption, is still significant. And you can see that humans are at the very bottom, then cattle and chickens and pigs and fish and you can see that all of it has been going up. But you could see that the total consumption outside of humans is much bigger than the consumption within humans. So this is a natural sequitur for the fact that the world is demanding more animal protein but if we raise that animal protein using only antibiotics as really growth promoters, we are really headed for trouble.

In work that was published in Science about a year back from us and collaborators, what we also saw for the first time, which had been done at a global scale, was that antimicrobial resistance is also increasing in animals. We saw an increase across chickens, pigs, and less so in cattle, but certainly chickens and pigs which is where the bulk of the antibiotics was really used. Now, you might ask, are we concerned about this primarily because of a transfer to humans, I would say partly but I would also remind the audience that these animals, whether they’re chickens or pigs, are sources of livelihood for most people around the planet. Anyone who's poor is really dependent on these animals for their sustenance and if those animals were to get sick with drug-resistant bacteria and were to die, then it represents an economic loss for many people of poor countries but also the poor in wealthier countries. So we should be concerned about antimicrobial resistance, even if it's happening outside of humans, because it represents an economic loss.

We have looked at ways of reducing antibiotics in food animals by 2030. We've looked at the business-as-usual scenario under which consumption goes up significantly but it can be reduced through regulations by people consuming less meat, not necessarily becoming vegetarian, but certainly just consuming less meat. Maybe a user fee on antibiotics, or a combination of these measures and the best of these combinations can curtail this increase by as much as 80%, and this was again the work that was published in Science, and it shows that it is possible to address this problem provided we do it quickly.

Last but not least, we also see that new antibiotic development has improved between 2013 and 2019, you can see that all the bars on the right side are certainly looking a little healthier than the bars on the left side, particularly the drugs that have been approved and the ones for which applications have been filed, but this is still not sufficient. Many of these are still not for the priority pathogens that the World Health Organization has laid out and we still have a lot of work ahead of us. Colleagues at entities like GARDP and CARB-X are working hard to be able to fund with public monies, private companies to be able to develop new antibiotics, but this still remains a project for the next 10 or 15 years and we still have a long way to go.

Now I'm going to show you a couple of examples of the dashboards, they are a little small to read. So you might just go to our website and download the report so you can see it.

For India, for instance, we have policy indicators - are they enrolled in GLASS, do they have AMR surveillance in humans, they have a national action plan. And in India's instance, there is no AMU surveillance in animals, but there is AMR surveillance. We are looking at resistance indicators on a few key patterns like MRSA, Carbapenem-resistant Enterobacteriaceae, ESBLs. And then we've computed DRI for some countries, but not all. We have information on animal resistance, again on used indicators in humans and also in animals, and then public health indicators because we think these are all correlates of antibiotic consumption and [in the] work we published in The Lancet two years ago, we found that these were important drivers in predicting resistance, how good the vaccination program was, how strong the health spending was, and so forth.

And right at the bottom are these expenditures, which are on government health expenditures, what proportion is out of pocket, and so forth. What we urge the countries to do is to adopt this kind of a broader dashboard look to track progress on AMR rather than just looking at percentage resistance which is a very, very narrow indicator. AMR by its very definition is a complex problem, which is multisectorial, involves a lot of work and sectors outside of the health sector, and there is really no way to tackle this problem unless we deal with it in a multisectorial way and that requires tracking a lot of indicators, which are going to be diverse and widespread, but this is where we really need to make progress. And we can see the same sort of indicators for high income countries like Italy, for instance, Croatia, which is an upper-middle-income country, and what we see is that resistance is a problem in most countries, but a bigger problem today in LMICs driven by increasing antibiotic consumption in some of these countries.

Increasing antibiotic consumption itself is not a problem, in fact, we argue always that increasing access to antibiotics amongst people who previously did not have access is an important goal. You have to remember that even in a country like India, about 150,000 children die every year because of lack of access to just penicillin. So on the one hand, we have a lack of access to a simple drug that costs literally pennies and on the other hand, we have resistance because of people buying extremely expensive antibiotics that they absolutely do not need.

How we solve this problem…it's not gonna be an easy problem to solve because it requires both making the penicillin available, but also curtailing access to newer antibiotics that may not necessarily be needed. But then that also has incentive problems from the side of pharmaceutical companies that are trying to develop these drugs. But all said, AMR is really going to be the global health challenge that is always in the background, and probably increasing after COVID has receded. But we have to keep in mind that this is not a problem that we can push away just for the vaccine, it's not just going to be solved with one vaccine. And this is really why it's going to take years of work to get them.

So we have data also on China and a number of other countries, the references are all in the report. And I would encourage you to go to resistancemap.org which has a lot of this data, but also to the CDDEP website, to download the report and share the report. So with that, I'll stop here and thank you all again for joining. Over to you, Erta.

Erta Kalanxhi

Thank you, Ramanan. Thank you for that very nice presentation. We are now planning on heading over to our speakers. We have a few questions for them.

And we'll start with Professor Otto Cars. So, Professor Cars, you've been involved in pushing for global coordination on AMR for a long time, how optimistic are you that that will actually happen?

Otto Cars

Well, thank you very much. First of all, congratulations on your 10 year anniversary and thank you for letting me participate in this webinar. Well for sure at times, I've been really frustrated about the slower pace of how this has been moving and Ramanan already alluded a little bit to the history but we can go even back to 2001 when it was the first WHO strategy on antimicrobial resistance, but there was no funding or implementation plan and in fact, the same is happening now.

We had the Global Action Plan in 2015, which really created a much greater momentum, but still, what countries are facing is funding for capacity building and it's not yet strongly integrated in the international policies. It shouldn't be in the background, Ramanan, it should be upfront in the foreground. We really need to make the issue of the COVID-19, before the next virus pandemic because we have an ongoing pandemic [of] antibiotic-resistant bacteria. So I think we need to reflect on why AMR has been so low on the agenda for many years.

I think there are at least three major factors, first AMR is not a disease, so we like burden data for sure, this is a critical barrier. Secondly and connected to the first, there is no civil society movement to work on this. I mean, maybe it's coming, because there is a recent UK study on interviewing oncologists that foresee that much of chemotherapy will be unviable for the coming years because of antibiotic resistance and ReAct also recently published a study on a survey on international pediatricians and they say that 50% of deaths that they see are due to antibiotic resistance, that's a major cause of death in the United States, so we need to voice up the problem much more.

The third factor is overreliance on the pharmaceutical industry to continuously deliver new antibiotics. I believe that this misperception has delayed political momentum for years. We need to overcome these barriers in understanding, we need to voice up clearly to the policymakers. So I mean over the years there have been numerous declarations promising global action, commitment, collaboration, and so forth and the latest and most important one alluded to by Ramanan is the political declaration from 2016.

But we have certainly come down to a point where we just have the governments and agencies, and the international community must deliver on these commitments and create a common vision to preserve this global resource and secure sustainable access to effective antibiotics. So during COVID-19, we missed an opportunity for a second High-Level Meeting at the UN, but I think no doubt that the momentum on AMR is still here. I hear that there are 500 people listening to this webinar, that's a good crowd.

We have a special division at the WHO on AMR which is new, and again, the newly formed Global Leaders Group. So back to your question, am I optimistic that global coordination will really happen? I will borrow an answer from a Swedish Health actor Hans Rosling [who said] that it's never too late to give up, so let's do it some other time. Thank you.

Can't hear you.

Erta Kalanxhi

My apologies, I was going to say that you have partially answered my second question, but it's an important one. So I'm gonna say it again.

How can we better communicate the challenges on AMR in One Health manner, provided the context of the COVID-19 pandemic?

Otto Cars

I think absolutely that we need to realize that COVID-19 offers great opportunities to reset the agenda for antibiotic resistance if we're working together to strengthen the narrative, because this pandemic has

clearly led to an unprecedented understanding of global risk from weak public health infrastructure including sanitation and infection control, as well as functioning research agenda globally and supply chains and so forth.

So I think there are three ways that we can work up this and to really use the opportunity of the challenge and make antibiotic resistance much more understood.

First, get more data again. Secondly, describe the pandemic dimensions of the spread of antibiotic resistance and thirdly, apply a system's perspective. Today we get real data, daily data on the deaths of COVID-19 and number of infections of COVID-19 -- what about antibiotic resistance? We're far away from that, so we really need to have a more swift and encompassing surveillance system. Burden data is lacking in many countries as also alluded in the report, such as Africa, there is nothing, there is no guidance, there's no surveillance available to guide the prescribers.

So this essential gap needs to be filled and secondly, I think again, describing antibiotic resistance as pandemics, we can see as waves of MRSA, we have the ESBL, and the carbapenems, so I think that language could really be used to move antibiotic resistance into all the discussions on pandemic preparedness. And then, lastly, the system's perspective, I think the narrative is not there yet and moving up the problem in a system's perspective or transformation of systems need to be sustainable in health, agriculture, and environments, as a way to describe it to policymakers. And if you could put up my first slide, I'll just show one example of how you could describe the real sort of fundamental pillars.

This is just one example and I think many of you are using the same. Antibiotics are critical pillars for all health systems, basic medicine, specialized care, modern medicine, cancer treatment and transplantations and so forth. This is something that needs to be conveyed all the time. If you go to the next one and look up on how these are taken up in the country, we have the national action plan, but the National Action Plan needs to be very well coordinated and integrated. All these four pillars: Prevention, Data Generation, Awareness and Behavioural Change, and Access and Conservation, they need to move hand in hand because if you have a surveillance system, you can generate some data on resistance.

They need to be used for treatment guidelines, for procurement and so forth, it all needs to be integrated in a systems way and I think you could see the same thing developed also in other areas of the One Health perspective. So this is how I see it, this is a critical point in how we need to address this. Thank you very much.

Erta Kalanxhi

Thank you very much. We're now going to move over to our next speaker, Professor Djimdé. So, Professor Djimdé, we have a question that is more related to the African countries' context.

So AMR is a growing challenge in Africa, what kind of institutions and resources will countries in Africa

need in order to feasibly develop and address this problem?

Abdoulaye Djimdé

Okay, thank you. I think I'm speaking on behalf of the African Association for Research and Control of AMR, which is a sort of civil society organization, a scientific society with membership in about 30 African countries from Morocco to South Africa. We actually constituted to fill some of the gaps that Prof. Otto mentioned in his remarks.

The current situation is that each of the countries are ramping up with national action plans and naming a national focal point on AMR. But in the majority of these countries, these action plans still need to be signed off by the relevant authorities before they can actually benefit from resources and actually start being implemented. So I think the problem is these, in our view, the focal points, the stage where they are in the hierarchy of the government is such that their efficacy is going to be problematic, at least not to the level that we would like to see this important problem to be [at].

So I think quite a bit of uplifting of the national focal points that we would see happening in Africa given the magnitude of the problem and the growing nature of the problem. We would like to see increased political will and the governance of AMR to be brought up to at least the Minister of Health level, or even higher, the Prime Minister or the President's Office level, such as the HIV Commissions that we see around and the COVID Commissions that we see around. I think that will be important to be able to really tackle this problem in Africa. At this stage where you have the national focal point, somebody down there and swamped with many responsibilities is going to be difficult to deal with in effectively coordinating the national action plan on AMR.

I think part of the problem is the lack of data in Africa. In report after report, you will see very little hard data coming from African countries due to the disposition of political decision-makers. So we do need to come up with data that is crafted in a manner that the politicians can understand it and the communities can understand it and from there, frame messages that would resonate with the communities and the political leaders. AMR is recognized as a major problem, as a pandemic, like Prof. Otto was saying ,and dealt with at such a level.

There again is something our association is trying to tackle because we realized by being on the ground, we realized that there's actually quite a bit of data on AMR, but it has not been published in the peer-reviewed literature. So it’s great literature, quite a bit of theses in the form of Ph.D. theses or master level theses, reports from various NGOs that are around that, if they were to be made public in some form, either in publications or in some sort of repository or made more visible and user-friendly manner ,can fill the gap of data, so that's some of the things that we would like to do and are trying in our pan-African association.

The next thing that I would flag is training in terms of building the human capacity to deal with various

aspects of AMR. There is a lack of experts in many fields, especially this field that is fairly newly recognized in its own right. There are very [few] experts, so we think that we need to tackle the human capacity resource development in a big way. In that sense, we have a collaboration with the University Of Science, Techniques and Technologies in Bamako, Mali and African colleagues, we are launching a Master's degree in the science of AMR, which we think is going to train the needed human resources that would be manning those AMR committees that we are calling for. Moving down the road, actually bringing the AMR issue to the bench at university level -- college students, medical students, pharmacy students, to actually have them grow with an increased awareness of the problem, so that when they become professionals, they can be more sensitive to the issue and push the agenda forward.

Erta Kalanxhi

Thank you very much. These are some very interesting points, especially the one on publication, the gap in publication, that's not something that I had considered before. We are running short [on] time, but we have one more question to ask you and if you could be brief that would be very much appreciated.

We will get back to speaking again, we have questions coming in from the audience and we're encouraging them to write continuously, so we'll go through some interesting ones. So very briefly, how can innovations in molecular epidemiology help us in tackling AMR?

Abdoulaye Djimdé

Yeah, this is also an important question and there is an increasing development of capacity in terms of sequencing, regenerating genetic data, analyzing genetic data, and this is going to be very useful. The AMR field has to jump on a train with the rest of the initiatives that are promoting the use of genetics in general in infectious diseases, and in a way it can help in better tracing the genetic development and selection and spread of AMR and putting us in a situation where we can actually be proactive. The current situation is, we are being reactive. We wait until the resistance is in the clinic and people are dying before doing anything about it. If we use molecular biology and genetics, we can actually pinpoint the problem before it even reaches that level and preemptively act on it, as a few examples have been demonstrated.

Erta Kalanxhi

Thank you very much. Thank you very much for your insights. I see that we have been joined by Dame Sally and we have some questions for her.

Dame Sally Davies

Hello. Let me say how sorry I am to join late, I was at a meeting of the G7 countries talking as the UK's

president about AMR so we've got to focus on it, so that's good news. And then before you ask me a question, happy birthday CDDEP, you have done a great job till now you're coming of age and we want you to do even better.

Erta Kalanxhi

Thank you very much. I guess Ramanan is taking this “happy birthday” quite personally. So yes, we have a few questions for you. You played a significant role in the 2016 UN General Assembly meeting that called for global action on AMR. What do you see as concrete improvements in AMR global governance since then?

Dame Sally Davies

Thank you. Otto and Ramanan also played significant roles and it was an exciting moment. Frankly, we have lost momentum since then. It took far too long to set up the inter-agency coordination group. And then they recommended the Global Leaders Group, and it took far too long to set that up. The first meeting was last week and I'm honored to be a part of that.

But the first meeting was mainly about introductions and what could be done. We need a plan. I think the chair, Her Excellency, Mia Mottley, the Prime Minister of Barbados is really fired up and I think she’ll be good, women get things done, I’m hopeful we’ll do things.

But you know what we're also missing. If you look at climate change, you see the IPCC. We haven't yet got that independent panel for AMR. The global leader's group is on One Health and I think that's important because we've got to go forward, One Health together. But looking at the problems in each particular area, and because it's a macro economic issue, I am pleased that the World Bans said that they will apply the AMR lens, but I'd like to see that really gaining energy and traction and happening much more. We're doing quite a lot of work with investors out of Britain and activists investing and getting AMR into what's called ESG, economic, social and governance issues, but we've got more to do.

I hope we can use the G7, the G20, and the platforms that are there, using the momentum that COVID has given us, but frankly, we lost it and we're gonna have to work hard to get it back as we need it.

Erta Kalanxhi

Thank you. Thank you for that. So, are we getting any closer to setting global targets on AMR so that the world has a sense of whether progress has been made?

Dame Sally Davies

Well, targets…there's always a lot of debate. I think they're really useful as long as they are achievable and stretching and moving forward. The best place for them is clearly in the national action plans and we know 135 countries have finished those, we have targets in our national action plan and we're really trying.

But we can't just leave it to countries, we've got to act collectively and I think it's a really complex area. That's again, let me go back to the IPCC, how climate change people use the evidence to help set the targets; we need a mechanism where we can have independently recommended targets and maybe the Global Leaders Group, then also the UN to buy into, we need to use mechanisms that are very similar. Again, I suppose why I'd argue for doing it maybe that way because the targets have got to impact on the problem and that means people and the food chain.

So they've got to be targets that inform policymaking, innovation, and they can't just be limited to antibiotics, we've got vaccines, we've got other therapies, we've got infection prevention and control. So where would I start? I think we start with voluntary targets and commitments to phasing out antibiotics for growth promotion. We've managed in Britain to reduce our use of antibiotics in the food chain by 42% between 2011 and 2018 just by targets and voluntary action, we've managed to reduce our human needs too, so I think we can do that.

But don't forget the role of investors and the role of consumers. McDonald's, Tescos, and Costco as examples responded to consumers. So we've got to try and use not just target some government and actors, but actually other ways by putting in targets that are more creative.

Erta Kalanxhi

Thank you. One last question, what is your reaction to the dashboard approach to track AMR in a One Health framework?

Dame Sally Davies

Well, I have always liked dashboards, so I think it's fantastic. I think if you look at what's happened in COVID, you can see that dashboards that are available, accessible, and shown to the public, and the politicians have demonstrated the urgency of the issue. So I think we need to think about the best way of displaying limited bits regularly, whether they're going badly or well, we're going to need history as well so we can show the changes, going back to 2010 is a great idea, because we've got to build that narrative and perspective is really important.

I've been doing a big piece of work which has been led by our Office of National Statistics on a health index for the country to put beside GDP. And in fact, it's now up for consultation and discussion. And I've

learned from these experts about how if you do it, really evidence-based, you can get all sorts of people buying into it, and then watching how COVID has become the noisy, acute pandemic. We need to think through AMR as a silent pandemic, how do we do it. But it also feeds into investments in WASH, in IPC and in vaccines, it's all part of what we're trying to do.

And underpinning doing it is a question of capacity and capability. So our Fleming Fund, which you will know, working in a number of countries, 24 countries, has actually supported 14 countries to enroll in GLASS and I think that's a great start. And I love what Zambia is doing, where they've got a real-time stewardship and data collection app on phones which other countries are now picking up, which allows us to get data to feed in, but actually allows them to think about what they are doing, so yes the dashboard: great.

Erta Kalanxhi

Thank you very much. I think we are ready to address some of the questions from the audience and I believe Ramanan has answered some of them. But we'll start with one question that was directed to everyone.

We've been talking about the global context so far. This question is taking us back to where AMR is quite prevalent, and that's in the community. So stewardship programs in the community have shown to be effective yet they're not very highly funded. What is the issue? Do we need a better business case? That was a question from the audience.

Ramanan Laxminarayan

I could take that question only to say that it's absolutely right that stewardship is not very well funded in hospitals and also in the community for the simple reasons that Otto mentioned, which is that unlike COVID…imagine that COVID had just been like the normal flu and no one was testing for it and people were just getting infected and dying. There would be no attention on COVID, there would be no vaccines for COVID, nobody would know anything about COVID. It is only because we recognize it as a separate disease that we test and track it that there is all the money that comes into it, and that we're solving the problem.

We have essentially this problem with AMR which is unlike COVID invisible and without that visibility, you will never get the attention or the funding in. I mean, is it hard to think of what the world has spent on COVID right now, 160+ vaccine candidates, that level of attention and research could easily solve many of the problems that we have. In fact, the ask of the world for AMR is a fraction of what has been spent on COVID. But without the numbers and the attention, it's not going to be possible to get that money which is why we will have to work collectively to shine the spotlight on the numbers. It is going to be really important to show who is suffering -- without that funding, at all levels [it] is going to be limited.

Erta Kalanxhi

Thank you. I'll move on to another question, if that's okay. So one of the participants is asking, is the concern regarding the use of antibiotics in animals only on the negative economic consequences that it has or is there evidence that this contributes to AMR in the environment that can potentially have an effect on humans?

Ramanan Laxminarayan

We've addressed that already, the answer is already in the box.

Erta Kalanxhi

Okay, another one is asking if we could give any examples of where good stewardships have led to a fall in the percentage of the number of resistant cases?

Ramanan Laxminarayan

Yeah here again, I think I would point, Otto, please go ahead.

Otto Cars

For sure, I agree with the previous question. I think it's absolutely correct that we need some more data, I mean we have the GLASS but it is moving slowly. We need some point prevalence approaches, I think the AMR community could go together, put some protocols for measuring antibiotic use in a very simple way in the community, not the least in the low and middle income countries, and then go to global funders to get this done…I think that's absolutely key.

I think yes, there are some countries that have shown bending curves on antibiotic resistance and in Europe, in the Scandinavian countries and otherwise, it can be done. And there is also a very great argument for getting funding from the government, that it can show a decrease in antibiotic use, leads to a decrease in resistance and community pathogens as well as decreasing costs. So we need to really get more data on the ground in a coordinated way, in parallel to when GLASS is moving along, slowly.

Dame Sally Davies

I'll just come in because stewardship is about ensuring access when they're needed, and not using them when they're not. And I wanted to pick up on Otto's point. I wish I could remember the exact figure but when I wrote as a chief medical officer to all our community, physicians and general practitioners, well, no, I wrote up to the top 25% prescribers, randomized half of them and they reduced use by 3%, we actually saved millions of pounds as well as reducing the risk of antimicrobial resistance.

There are financial arguments for doing it, I mean, we went on year after year writing the same letter, because we saved so much money that the National Health Service thought it was a great idea. So there is an advantage to doing it as well, but the final bit about stewardship I'll just lob in is about the quality of the drugs as well. Thank you.

Erta Kalanxhi

So this brings us to a question that is relevant to this last comment. New antibiotics are expensive, one of the participants asked. Using them is difficult due to the enormous costs, are the National Action Plans in development going to tackle the cost of new drugs as well?

Otto Cars

Can I go first on this? I think this is a really critical issue because the word is solidarity. We have seen some solidarity in COVID-19 but it's not perfect, as we all know, national vaccines. We badly need new antibiotics and as Ramanan alluded to in the report, the low and middle income countries are worst off with the resistance and they have the greater need.

But we need to find a system where research and development is moving much stronger globally in coordination but also where the end product is made accessible and affordable for everyone in need. This is the only way to look upon the equation and then we need to look upon other areas in medicine where this has happened and by pricing or dealing with them in an equitable way. So access is absolutely key.

Dame Sally Davies

I think there are a number of issues. One, we don't have enough innovative new drugs, so we need to look at how to make those happen. The next issue, is how are they costed? And I do think we've got to make sure that they are accessible to the people who need them wherever in the world. Somehow we've got to balance this, paying more in the rich countries to pull new drugs through, but making them accessible. And I think that this is going to be difficult, but it's doable.

But until we have new drugs we're gonna have a problem. And at the moment, there's another issue, for instance, the drug, that I should remember and everyone else will, but Achaogem is producing, they went bankrupt, they were bought up by Cipla. That drug is now only available in the United States.

Cipla say it's too expensive to register it in Europe. So it's not just the low income countries that are not getting access to those drugs, whether it's cost or availability. There's something wrong with our systems globally about registration, access and cost as well.

Abdoulaye Djimdé

Okay, so what I was going to say is a bit along those lines because we need to strike the right balance between the cost of the R&D and and how to make sure that we don't deter the pharmaceutical companies investing in new drugs. Yet we need to make the drugs that are available, accessible. I think to be able to balance all these we need to, as a community, come up with creative ways of funding R&D, maybe bringing in public money to support the pharmaceutical industry to help them in research and development. One other aspect one would probably consider is paying more attention to looking into developing anti-infective agents from local pharmacopeias from traditional medicine, herbal medicines, that are in my view being overlooked or less exploited into researching for new anti-infective agents.

Erta Kalanxhi

Very good. I don't know, I think we maybe have time for one more question. And one of them, it's a difficult question that [has] been covered sort of, but I feel like I have to repeat it again.

What would be the estimated cost of AMR in Africa? Is there any number, can anyone quantify this in some sort of way?

Ramanan Laxminarayan

We are working on this, which is just the burden of AMR. I think before we put it on cost, the first step is really on trying to figure out the numbers of infections that are caused by AMR in different countries in the world. And the reason for that is it gives us first a sense of a ballpark figure of how many infections there are before we even get to mortality or anything beyond that, and even that first step is something which is taking up a lot of time to do.

I have to say that, so just to also catch on to [the question], communicating that scale of the problem is also important for national level policymakers because they're not paying attention to webinars like this one, they are looking at the problem within their country which they don't see and they also perhaps see that, AMR is too difficult, there are hundred things they need to do to fix things to make it really happen. I also think that's a really important point that you have to communicate the solvability of a problem. COVID was solvable with vaccines, so it was straightforward, it was solvable with masks.

Now, they might be hard to implement, but it was only two or three things that people really had to do. We have to do this, we have to say, there are three things to really do, I think Otto pointed to a couple of these, Sally and Djimdé did as well, which are, we've got to really nail down three or four things, removing antibiotics for growth promotion, improving infection control, improving vaccination, and three or four things are all that we really should focus on and I hope that's what we've tried to do on this

report as well, rather than boil the ocean to be able to solve AMR.

Erta Kalanxhi

Well, we have sort of reached the end of our session, so I think we will have to end the webinar here. But first, before that, we would like to thank you very much, say a very big thank you to our speakers, who took their valuable time and gave their insights into this very important global issue.

The report is available for download on our website. And I would also invite you to visit our website for future webinars in this series in the next coming months. So thank you very much for your attendance. Have a great day and we hope to see you next time.
