Wanted: A New Approach to Funding Treatments for Drug-Defying Germs

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SPEAKERS

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Maggie Fox 00:01
Hello and welcome to One World, One Health where we take a look at some of the biggest problems facing our world. I'm Maggie Fox. This podcast is brought to you by the One Health Trust with bite-sized insights into ways to help address challenges, such as infectious diseases, climate change, and pollution. We take a One Health approach that recognizes that everything on this planet — the animals, plants, and people, and the climate and environment — are all linked.

Infectious diseases are big killers, even in the 21st century. Viruses, fungal infections, and most of all, bacteria kill millions of people every yea. Scientists develop drugs to fight them but bacteria, especially, can develop resistance, meaning the drugs no longer kill them. These antibiotic-resistant bacteria directly kill more than 900,000 people every year. Things get worse when it includes drug-resistant viruses and fungi.

The formal name for these drug-defying powers is antimicrobial resistance or AMR. It's a major topic of discussion this year for the World Health Organization (WHO), and it'll take top billing at the United Nations General Assembly (UNGA).

To set the tone for all the discussion, the Lancet has published a series of four papers reviewing the problem and laying out some of the solutions. In this episode, we're chatting with Dr. Ursula Theuretzbacher, who founded the Center for Anti-Infective Agents in Vienna, Austria. She's helped write one of those Lancet papers suggesting what's needed to fight drug-resistant bacteria.

Ursula, thank you so much for joining us.

Ursula Theuretzbacher 01:47
Yeah, thank you for inviting me.

Maggie Fox 01:50
There's a long list of what the world needs to fight these drug-resistant bacteria. Right at the top of that list are new antibiotics. How are we doing on that?

Ursula Theuretzbacher 02:00
Yeah, we have a long list of things to do. Antibiotics are one of the things that are necessary because resistance is a global problem. It affects patients differently depending on where they live and their socioeconomic environment. So just an example, in low-income countries, the infection rate is much higher than anywhere else, and the priority will be to reduce the infection rate. In high-income countries with lower infection rates, new antibiotics are indeed a priority. In middle-income countries, both scenarios will apply.

New antibiotics, in general, are important to address this global resistance problem. If you ask what our pipeline looks like, and what antibiotics we can expect in the future? The answer would be: soon — the clinical pipeline might be one to eight years. These are modified versions of older antibiotic classes and are very specific to resistance mechanisms, but resistance mechanisms are distributed differently in different countries.

New antibiotics — modified version of old antibiotic classes, are effective in a very different way, depending on geography, healthcare systems, and many other challenges. They're a good solution for the short term to address specific resistance issues, but they're not good for the global resistance problem.

Maggie Fox 03:45
So what else do we need?

Ursula Theuretzbacher 03:49
It's not simple! We need to improve healthcare systems in low-resource countries, and we must improve sanitation, access to clean water, and access to old antibiotics. These are the basic measures that we need to take. In high-income countries, we are in a much better position. So, we have different problems.

Maggie Fox 04:14
Are there lots of new antibiotics in the works? Are companies jumping on the wagon here?

Ursula Theuretzbacher 04:19
Yeah, companies are usually profit-oriented, and that's the norm. They have internal competition in very highly profitable areas. For instance, cancer is a profitable field, and if they must internally argue about where to invest, antibiotics always lose. That's a reason why companies have lost interest in this field. In addition to this, it's also very difficult to find new good antibiotics. So having a great investment and return on investment is not comparable to other fields, which is the main issue.

Maggie Fox 05:00
Should governments get involved?

Ursula Theuretzbacher 05:02
Yes, I think we have to accept that there is no money in antibiotics like there is no money in other fields that have been very successful, such as new drugs in the tuberculosis field. There is not much money to make in developing new tuberculosis drugs, but they still have (developed). They are successful with advocacy, getting funds, and discovering new antibiotics.

So, I think we need many different activities, such as finding good collaborations, partnerships, and private-public partnerships that provide support for infrastructure that's needed, scientific support, and knowledge support, because that's the main reason why we have lost much expertise. The public and the government could help a lot with this. We need a nonprofit thinking in this field.

Maggie Fox 05:58
What do you mean by private-public partnerships?

Ursula Theuretzbacher 06:01
That could be a nonprofit organization working together with small companies or contract esearch organizations (CRO), suppliers of services, to achieve good results. This usually costs much less money than working with for-profit companies. That's just an example of finding and supporting clinical trials networks, and discovery campaigns, providing scientific expertise, and funds.

I think it's also the problem of the funders. They are not always directing their funds toward the most priority fields. These fields are usually in high-income countries. So, their funds are directed to countries that have fewer resistance problems than other countries with low-income settings where these funds are needed more urgently.

Maggie Fox 07:02
Ursula, so, what you're saying is that the companies are looking to where there are the biggest profits, and they're helping the people who need help the least.

Ursula Theuretzbacher 07:11
Yeah, companies are directing their efforts toward high-income countries. That means countries that can afford high prices, have healthcare systems, andcan support more expensive patient-centric and pathogen-focused approaches.

That's where the money and profit can be achieved, and there is no profit in countries with the highest resistance burden. That's why governments, funders, and philanthropic organizations should improve the global reach and support activities other than drug discovery . It's such a multi-faceted problem that

we need a lot of global health knowledge and help funders have a global view. Because it's not that they don't want to do it, they just don't have the expertise and global health perspective.

Maggie Fox 08:10
Isn’t it hard to make this argument in a world where drugs are developed under a capitalistic system?

Ursula Theuretzbacher 08:17
I think it's difficult to get out of this capitalistic model. It can only work if you have the basic thinking that there is no money to make. That means you must switch completely to a nonprofit system. That's also usually much less costly than in the for-profit system. And it can be done. We have seen that for neglected diseases and tropical diseases, where these models are quite successful. Look to the tuberculosis field. Some models work mainly with collaborations,partnerships, public-private partnerships at a much lower cost. I think that's possible and supported by a lot of government engagement.

I think it could work.

Maggie Fox 09:04
So, what else do we need, Ursula? Howabout quick and easy tests to determine what people are infected in the first place? Isn't that one of the big problems — doctors are treating based on symptoms and not based on what people have?

Ursula Theuretzbacher 09:18
That's the very usual case that we don't know which bacteria are causing this infection. So, diagnostics is a very important tool, but it needs to be fast. If you must wait forever for a result, then it's less helpful. On the other hand, even in great countries with the best diagnostic infrastructure, we know that these results are not always translated into therapeutic decisions. So having the diagnostic available doesn't necessarily mean better treatments. There are also some situations where you don't get a result even with a good diagnositic tools, where you still need to treat empirically and hope to just use the best antibiotics in this case. So, diagnostics are very important, but they are just one puzzle piece in the whole story.

Maggi Fox 10:13
Can vaccines play a role?

Ursula Theuretzbacher 10:15
Vaccines are very important in prevention strategies. As I said before, reducing infection rates is important. We have seen some really good vaccines with a great impact, such as the pneumococcal and the Haemophilus influenzae type B vaccines. So, rolling out these and improving coverage is important. We also have fields that have an indirect effect on antibiotic use, where we would need improved vaccines. So, these will be tuberculosis, malaria, and typhoid fever, where we already have vaccines, but we still need much better vaccines. Then we also have the challenge of bringing these vaccines, to the

countries and people who need them most. So, scaling up rollouts and all this is a very specific challenge.

Maggie Fox 11:11
Can you tell us a little bit about the Center for Anti-Infective Agents? What are you doing there? How did you come to establish it?

Ursula Theuretzbacher 11:19
Yeah, I founded it in 1988, as an independent scientific consulting institute with global collaborations with NGOs in many different fields of antibiotic research and development. The previous years, I've focused mainly on big collaborations funded by governments and on evaluating different scientific strategies for funders.

I've been working with WHO and different governments on many interesting and diverse projects. It gives (me) a more global view of the field, not from one institution or one company. I've seen so many different approaches and strategies. This, for me, is very interesting.

Maggie Fox 12:04
You've been at this a long time, why has the world taken so long to respond to this threat? Are you finally getting some energy behind it?

Ursula Theuretzbacher 12:16
I'm not sure if we can be optimistic, because we have been talking for such a long time about this issue. But the world always takes a long time to respond to any threats. Now, we have so many crises going on, that it's difficult to catch the attention of politicians who must deal with climate crises, biodiversity crises, and wars. I think we are always making little progress, step by step, but it will be a long way to solve some of the most urgent problems of resistance.

Maggie Fox 12:57
It sounds like there is a lot to do and I'm glad people have their eyes on it. Ursula, thank you so much for taking the time to join us.

Ursula Theuretzbacher 13:05
Yeah, it was a pleasure. Thank you very much.

Maggie Fox 13:10
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