

Can Vaccines Help Slow the Spread of Superbugs

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SPEAKERS

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Maggie Fox 00:00

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.

Drug defying superbugs are everywhere on every continent, infecting people in operating rooms, in the streets, in their homes, and in their food. They directly kill more than a million people a year and contribute to the deaths of close to 5 million people a year. What if those infections could be prevented? Well, they can both with better infection control measures, but also with vaccines. Vaccines can protect people from getting infected in the first place and from spreading germs. And people who don't get sick are far less likely to take antibiotics at all, let alone to use them inappropriately.

The One Health Trust has a new report out showing just how well a good vaccine program can work to prevent the spread of drug-resistant bacteria and viruses. One example, vaccinating babies against typhoid could prevent more than 53 million cases of drug-resistant typhoid fever in low- and middle-income countries over 10 years. In this episode, we're chatting with Dr. Erta Kalanxhi, lead author of the report and Fellow and Director of Partnerships at the One Health Trust. Erta, thanks so much for joining us.

Erta Kalanxhi 01:45

Thanks, Maggie. It's so nice to be here today.

Maggie Fox 01:48

Were you surprised by your findings that vaccines can work so well to help prevent the spread of these bad germs?

Erta Kalanxhi 01:57

So, we are not entirely surprised because we have been working on this for quite some time. At One Health Trust, we have been doing a lot of projects that either try to collect evidence on this connection between vaccines and drug resistance or projects that bring awareness to the connection. So, in that regard, we're not surprised but we are happy to be able to actually quantify this connection and share it with others — with other stakeholders, other actors that are involved.

Maggie Fox 02:29

What is some of the things you highlight in the report?

Erta Kalanxhi 02:31

So, some of the things that we talk about in the report include these additional benefits or this value of vaccines, which has been understood but poorly quantified previously. So, there's been a lot of evidence coming up in recent years that show that in addition to preventing infections in the first place, they have some additional impact that has not been well quantified before such as, for example, the incidence of secondary infections, the reduction in drug use, and in addition to these health benefits that vaccines have, we also have really important impact in the economy because by preventing infections that are resistant to current treatment, vaccines actually save us a lot of money.

That's because drug-resistant infections take longer to treat, complicate the treatments, (and) are more complex. And so, they provide this financial burden to both the patients, their families, but also to the healthcare system. Vaccinations can have a huge impact, especially in the infant population or in children. So, in addition to preventing infections that you can treat easily, these drug-resistant infections, which can be more dangerous for children under five, they can be avoided as well by vaccines.

And we tried to bring this point forward because it's important to also understand the impact that vaccination has for vulnerable populations. So, for example, if you have a neonate, or a preterm infant that has to stay in a hospital for treatment, and they contract a drug-resistant infection there, it is harder to treat this group of the population than others. So, this is, we're trying to make a point that vaccination is very important, and especially in vulnerable populations, such as young children, the elderly, and others.

Maggie Fox 04:18

Are you worried about the effect that the COVID pandemic has had on vaccination rates?

Erta Kalanxhi 04:25

Yes, although that is starting to get better now. What we have seen, and we show this also in the data that we compiled in the report is that COVID-19 led to a significant decline in vaccination coverage rates. So, I have to also emphasize that we've been talking about low- and middle-income countries in the report. And so, those were the ones that were also quite affected by the COVID-19 pandemic.

So, imagine healthcare systems that are already stretched or being overburdened, and this happened all over the world, but in these countries, the effects were even greater. So, what happened is that a lot of the resources had to be diverted to deal or to respond to the COVID-19 pandemic. And there were

many routine health care services, such as immunization, that were not prioritized. And so, these disruptions lead to a decline in infant immunization, for example. And those are effects that can be seen a few years later.

And they have been seen because you can see an increase in vaccine preventable diseases in many countries. And that's because of these missed opportunities for vaccination, which happened because people were afraid to go to the hospital, many were being isolated at home, or healthcare services couldn't get to people. So, immunization workers couldn't get to where they were supposed to get. There were shortages, (and) hospitals were closed. I mean, there are a variety of factors that contributed to this. So, it's worrisome, but you can see that the rates are starting to go back up. However, I do wonder about this vaccine hesitancy in the adult population.

Maggie Fox 06:07

Yeah, you've got to be worried about this growing mistrust of vaccines, which is looking global.

Erta Kalanxhi 06:12

Yes. So, I think vaccines have never been in the spotlight as in recent years, because many people think of vaccines that are for children, because the majority of vaccines usually are administered within up to three years of life. But now we had adults getting vaccinated. And there are many issues that came up and a lot of hesitancy and distrust. What I think it's important to remember is that vaccination has been a tool that has saved lives, millions of lives, for many years.

So, it's important to remember the benefits and weigh them against these uncertainties that were presented by the COVID-19 pandemic, because vaccinations are also different. So, the vaccine for COVID-19 is not the same as the vaccines that administer to infants. And so, it's important for the public to be aware of these differences when they make decisions for themselves and for their family.

Maggie Fox 07:06

What do you mean by the differences — it's different from the childhood vaccines? What do you mean by that?

Erta Kalanxhi 07:11

Well, the COVID-19 vaccine that we have available right now, they don't necessarily prevent, you know, contracting the disease, but they're not effective in that way. But they reduce the severity of disease, and sometimes, the symptoms are reduced because of that. And so, transmission is less.

But overall, just having a COVID-19 vaccine does not guarantee you never ever contracting COVID whereas there are some other vaccines that children take in their first two to three years of life that are supposed to be effective for a very long time.

Maggie Fox 07:44

Oh, you're talking like the difference between COVID vaccine and the measles vaccine, for instance, which absolutely protects you from even catching measles in the first place?

Erta Kalanxhi 07:53

Exactly. So, you have many diseases that before either lead to children's death or paralysis and a lot of morbidity and mortality. That these diseases are now under control in many countries, and that's solely because of the — the vaccination.

Maggie Fox 08:10

Can we talk a little bit about the mechanism by which vaccines help reduce the use of antibiotics and antivirals?

Erta Kalanxhi 08:18

So, thank you for asking that question because I think that's exactly what sort of explains the relationship between vaccination and drug resistance. That's the point that we try to make in the report. So, the obvious impact of vaccination is that vaccines will reduce the incidence of infections. But we also have secondary infections that are avoided. We have the avoidance of both infections that are susceptible, but also not susceptible to drugs, so resistant infections.

And so, another impact or impact of vaccines is the reduction in the need for treatment in the first place. When you don't get sick, you don't need to take antibiotics. And in some cases, even when you don't get sick with the flu, for example, or a viral disease, you avoid antibiotics, which often are given to people because they get the secondary infections. So, for example, if you get the flu vaccine, the chances are that you also are not going to get treated with antibiotics because often when someone gets the flu, they also get other infections like upper respiratory infections, for example, which are of a bacterial origin.

And so, people are treated with antibiotics after the flu because of that. In other cases, and in some countries, like the ones we include in our report, because of lack of diagnostics, antibiotics are administered for viral infections that appear to have the same symptoms as a bacterial infection. So, that's a very important point, for example, high fever, febrile illnesses, the flu, the people that present with the flu when they don't have the right tests or tools to determine if it's the flu or if it is another condition then they often get prescribed antibiotics.

Getting vaccines in the first place avoid you taking drugs, but also taking them inappropriately or unnecessarily if I may say.

Maggie Fox 10:10

----- does vaccination cost more? Or does it end up saving money over the long run?

Erta Kalanxhi 10:17

Vaccination is very cost effective, and it does end up saving a lot of money in the long run. What's also good is that it's a short-term solution for problems that can be long-term for people. It's a tool that is already available.

So, that is one of the reasons why we urge policymakers to consider this additional value of vaccination in treating drug-resistant infections and all the other associated costs that come with them because they are going to save a lot of lives and money at the end.

Maggie Fox 10:49

What are some of the most useful vaccines?

Erta Kalanxhi 10:51

You have a lot of vaccines that are part of the immunization program, and we know them because we've got them, our children have got them. And there are some of these infant vaccines that are actually, that have also been demonstrated to have an impact on drug resistance. And to mention some of them — we have the measles vaccine, we have the pneumococcal conjugate vaccine, we have the haemophilus influenza vaccine, and a very important one is also the typhoid vaccine.

The typhoid vaccine is a vaccine that is not included in the routine immunization program for many countries, but it is very effective at reducing cases and deaths from typhoid and drug-resistant typhoid, especially in populations under five. Now, while this may not be a problem in rich countries, when you have in countries with low resources that have weak sanitation, and hygiene infrastructure, this is very important because it's a vaccine that is going to make a tremendous impact.

Maggie Fox 11:54

Erta, thank you so much for joining us.

Erta Kalanxhi 11:56

Thank you, Maggie, for having me.

Maggie Fox 11:58

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