

One World, One Health Podcast
Episode 11, Season 1 – Transcript
Guest: Paula Prist

Deforestation and Disease Spread

Maggie Fox 00:01

Hello and welcome to One World, One Health with the latest ideas to improve the health of our planet and its people. I'm Maggie Fox. Planet Earth faces many challenges: pollution, climate change, and new and re-emerging infectious diseases. This podcast is brought to you by the One Health Trust with bite-sized insights into ways to help. Forests are the lungs of the planet and destroying them hurts the health of everything, including people. Not only do damaged forests produce less oxygen, but their destruction pours damaging carbon into the atmosphere. Plus, the lack of healthy balance can help new diseases emerge. In this episode, we're chatting with Dr. Paula Prist, Senior Research Scientist at the Eco Health Alliance. She's studying deforestation and the effects it has on the plants and animals that make up the forests, the people who live in and around them, and on the world as a whole. Paula, thanks so much for chatting with us.

Paula Prist 01:05

Thank you.

Maggie Fox 01:06

Paula, can you tell us why forests are important to human health?

Paula Prist 01:10

Yes, so forests are important for human health in several aspects. Some of them are really basic. So for example, the forest they provide the food, water (clean water), and medicines that we rely on today to survive. So without these forest areas, we don't have our basic needs. However, they also provide other services, which we call ecosystem service like disease regulation services. So we say that when we have a forest area that is conserved, we have a low chance of getting infected with some zoonotic diseases.

Maggie Fox 01:53

And when you talk about a zoonotic disease, you mean a disease that moves from animals to people? Is that right?

Paula Prist 01:59

Exactly, and also it is a disease that can be transmitted from humans to animals too, and this is important, because sometimes we can infect threatened species such as gorillas and chimpanzees that are in the wild. So it's the two pathways.

Maggie Fox 02:16

So what's an example of diseases that people might give to a gorilla or a chimpanzee?

Paula Prist 02:21

COVID, for example.

Maggie Fox 02:22

That's not good. And what are some of the diseases that move from animals into people?

Paula Prist 02:27

We have several. Currently, 70% of the emerging infectious disease come from this zoonotic pathway. So we have hantavirus, yellow fever, malaria...

Maggie Fox 02:41

Paula, people sometimes think of the jungle as a place where diseases come from. And as you've just said, they can be right about that. Can you tell us a little bit about some of the zoonotic diseases that you're studying, these diseases that move from animals to humans? And can you tell us about how human destruction of forests makes it more likely that these diseases will move from animals to people.

Paula Prist 03:04

So we have a different process that happens when people destroy the environment. The first one is that when we deforest, for example, we change the entire community composition of these areas. So when we clean a forest area, we kill off some species that are not able to survive in this new environment that is created, like an open space, a crop field, or an urban area. And at the same time that we are killing some species that are very specialized, the way we call it, we are also allowing other species to survive in this new environment, because they not only like this new environment, but they also don't have any competition. So they have a lot of food, a lot of space, and a lot to thrive. So we changed all the community's composition in a place that had high biodiversity, and now we have a low number of species. And now we are seeing that all these species, or most of these species, that can survive in this new degraded environment can transmit diseases, and they can achieve high abundance. It's crazy, it's 300% more than inside forest areas.

Maggie Fox 04:25

Can you give us an example of a species that became more abundant and it's harmful?

Paula Prist 04:30

For example, rodents. We have a study with hantavirus in Brazil, where we saw that when you deforest, and it's not only about deforesting, but when you change the composition of that area, so when you deforest but you still keep a small amount of forest in the landscape, you increase by 350% the abundance of two rodents that can transmit hantavirus.

Maggie Fox 04:30

Can we talk a little bit about hantavirus because it was once a mysterious virus, right, but we understand a bit more about it now?

Paula Prist 05:04

The virus symptoms are really similar to COVID. It is transmitted by rodents, these native rodents that normally live in the forest, but they are what we call generalist rodents. So when we degrade the environment, they really like this new environment. So they can achieve really high abundance and they carry the virus and they get infected when they encounter other rodents. So the higher the abundance of these rodents, the higher the chance that they get infected.

Maggie Fox 05:32

And it can kill people, right?

Paula Prist 05:34

It can kill 50% of infected people, it has a huge lethality rate.

Maggie Fox 05:39

So I didn't realize hantavirus was a problem in Brazil. We've heard about it in the southwestern US and in the western US and in Korea. But how big a problem is it in Brazil right now?

Paula Prist 05:51

So it's not huge, because we do have a low number of cases. However, 50% of the people that get infected, they end up dying. And we say that is not huge, because for sure, we have a lot of cases that are not being reported, because we have symptoms that are really similar to COVID. So we are assuming that a lot of people that get infected, they just have these mild symptoms. They think they have a flu, but by the end, they probably have hantavirus. A study happened in a city close to São Paulo about 20 years ago. Despite the number of cases being like 20 cases per year, this study showed that 20% of the local population, they had antibodies for hantavirus, which means that they had contact with the virus. Some of them probably get sick, mild symptoms, some of them didn't feel anything. So the reality is that we have no idea of the real number of cases that we are facing.

Maggie Fox 06:51

So, the picture you're painting is that there was a healthy forest with lots of different species of animals living in it. And once people started destroying it, some of these other species, like rats, could survive better, and they're spreading disease to the people who live nearby.

Paula Prist 07:06

Exactly. In fact, it's not just the rats that transmit diseases, but we are killing other rats that don't transmit diseases. So the rats that can transmit disease, they don't have any competition, and they just achieve high abundance. And we also have another component, that is, people getting inside and close to this spread and animals. So when we have an intact forest, normally we don't have a lot of people going inside. And we don't have any chance of these people encountering these animals that can transmit diseases. However, when we have a more deforested area, we have people go inside all the time to do whatever they need to do. Like if it's a sugarcane field, they're working on the sugarcane field. But we also have a high abundance of rodents that can transmit diseases. So we have the perfect combination of people and high abundance of animals that can transmit diseases, which make this destruction of the habitat perfect for disease transmission.

Maggie Fox 08:10

So Paula, is the answer just staying away from the forests? Or is there a way to maintain a healthy balance?

Paula Prist 08:17

If we have a very protected area, we have what we call disease regulation services, where you can live in harmony with all the animals that live there, because the abundance of the animals that transmit diseases will be really low. And the prevalence of the virus or other pathogens that these animals they carry will also be really low. So the transmission is going to be really, really, really low.

Maggie Fox 08:48

So you live in harmony with the animals, you keep the biodiversity, and it allows people to use the forest in a healthy way.

Paula Prist 08:56

Exactly, especially because when you live away from the forest, we are always going to allow other animals to live in this new environment that we are creating. If it's a city, when we put cities in the place of forests, we have other diseases that emerge. For example, dengue, and chikungunya, and Zika through the *Aedes aegypti* mosquito that is a complete urban mosquito. So every time we change the landscape, every time we change the forest to another use, we are going to change the animals that live there. And normally, from what we are seeing, every time we change, these new animals, they can and they do transmit diseases, so we have a higher chance of being healthy if we keep the forest intact.

Maggie Fox 09:54

Paula, if the average person, not a researcher, wants to help, what can they do?

Paula Prist 09:58

I think the most important thing to help in conserving forests, which is 100% important to our health, is voting for the right politicians. So we can do a lot of things individually, we can try to choose what we eat, we can see if what we are consuming has a good supply chain, etc. However, this is a very small scale. So I think we need to have a very conscious vote and make sure that we are voting for the environment too, because other generations won't have the chance to have a healthy environment if we don't do that right now.

Maggie Fox 10:39

Paula, thank you so much for spending some time with us.

Paula Prist 10:42

Thank you for the invite, I hope I could answer the questions the way I should for people to understand.

Maggie Fox 10:48

I think you're helping people understand, so we thank you for that. Listeners can share this podcast which is brought to you by the One Health Trust by email, Twitter, or your favorite social media platform. And let us know what else you'd like to hear about at owoh@onehealthtrust.org. Thanks for listening!