

Transcript of “Kristie Ebi, Professor at the Center for Health and the Global Environment at the University of Washington in Seattle.”

Clear Skies Ahead: Conversations about Careers in Meteorology and Beyond

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Kelly Savoie:

Hello, Clear Skies Ahead listeners. This is Kelly Savoie and I'm hoping you can take a moment of your time to rate and review our show wherever you listen to podcasts. We have produced over 60 episodes and you can help us reach even more individuals that will benefit from the diverse experiences shared by our guests. Thanks so much for listening. I hope you enjoy this new episode.

Kelly Savoie:

Welcome to the American Meteorological Society's podcast series, Clear Skies Ahead: Conversations about Careers in Meteorology and Beyond. I'm Kelly Savoie and I'm here with Rex Horner and we'll be your hosts. We're excited to give you the opportunity to step into the shoes of an expert working in weather, water and climate sciences.

Rex Horner:

We're happy to introduce today's guest, **Kristie Ebi, professor at the Center for Health and the Global Environment at the University of Washington in Seattle**. Welcome, Kristie, we're honored to have you and thanks very much for joining us today on the podcast.

Kris Ebi:

Thank you for the invitation. I look forward to this.

Kelly Savoie:

Kris, can you tell us a little bit about when you became interested in science and how it influenced your educational path?

Kris Ebi:

My dad was an engineer so I grew up in a house with an engineer, and I was always interested in science. He provided all kinds of opportunities for us to explore the outdoors, to understand how systems worked, to look at what happens when you take apart a radio, when you have extra parts leftover when you put it back together.

Rex Horner:

When did you first start pursuing this interest in your education? Was it in grade school, high school? Did it influence your choice of colleges?

Kris Ebi:

Yes. The educational programs that I was in pre-college... We didn't have much opportunity for electives, but when I could I took extra math classes and I took extra science classes, particularly in high school. I did then make choices on where I went to university based on how strong their science programs were.

Kelly Savoie:

Did you know right when you were starting to look at colleges what you might want to major in in the sciences? Were you interested in atmospheric science right away or was there another science that you were interested in initially?

Kris Ebi:

From the beginning I was more interested in the human aspects. I was interested in human health and various ways that one can promote and protect human health. Lots of math classes, for example. I took lots of classes in biochemistry and toxicology and different ways to inform how we go about as a scientific enterprise to really promote the health of human beings.

Rex Horner:

Did you find that starting at undergraduate level there was in the field an existing area of study on this intersection of weather and climate and human health, or when did you able to access that more directly? Was it in undergraduate thesis or at later time?

Kris Ebi:

That's a good question. I've had a long and storied career. I think the best description of it would be nonlinear. As an undergraduate, I majored in biochemistry really studying those aspects that affect how our bodies function, for example. I worked for a couple of years at a pharmaceutical company. I then went and got a master's degree in toxicology to further go down that path of better understanding the mechanisms that inform our bodies in terms of how our health evolves based on our exposures internal and external. I worked then for one of the automotive companies, and during that time was introduced to epidemiology and realized at that moment with all the past courses I had taken, all the courses in toxicology, that this was really the field where I could apply what I had learned in a way that had the most interest for me.

Rex Horner:

A quick question for you first. We have a lot of mixed responses to the math component of atmospheric science and across STEM. Were you passionate about the math or did you find that it was just necessary and so you felt the need... You knew that you had to master it. What's your personal take on math and its role?

Kris Ebi:

I really liked math until I got into some pretty intense math courses in college where the theory was primary. I wanted to be much more practical and be able to apply things, same was true with physics. I really enjoyed the physics, but it was physics that I could apply to something. So initially I did it because I enjoyed it, it was fun, I did relatively well at it, but it started getting into these more theoretical parts like, "Yeah, I'm not really interested in that part."

Rex Horner:

I also want to ask returning to your undergraduate career before you found your job in the pharmaceutical industry, were there any opportunities you pursued outside of your coursework, extracurricular opportunities that helped you find that first job in your profession at the time?

Kris Ebi:

There were a few opportunities. They didn't really have much to do with getting that first job, but I was involved in, as an undergraduate, research in a professor's laboratory.

Rex Horner:

Did that broaden your horizons in a different way outside of securing a job?

Kris Ebi:

Yes, they did. It was a real opportunity to see how research is done to start getting the vision of how broad and how deep the scientific enterprise is. There are so many important questions that need to be answered and we all have a role to play in finding what those questions are and applying our skills, our knowledge or talents to be able to answer those questions, seeing that they all contribute to advancing the state of understanding.

Kelly Savoie:

You've mentioned a few of your initial positions working for a pharmaceutical company and an automotive company, so how did these careers lead up to your position now at the University of Washington and how did you get more interested in atmospheric sciences?

Kris Ebi:

As I said, my career is best described as nonlinear. I find it somewhat amusing when students ask how I got to where I am because they'd like to do what I do and ask what path they should take. I like to point out that we all make the best decisions we can at each moment in our life and those decisions lead us to where we are today, so I wouldn't describe this as an active planning in advance process. It was working in a position, understanding, for example, when I was at the pharmaceutical, "I don't really want to... I don't want to do that for the rest of my life." At that moment I went back to graduate school. Each choice informs, and as I went through my career and did a variety of different activities, at one moment I was at a essentially a private research institute.

Kris Ebi:

They decided to start looking at climate change and health. It was the time when the very first studies had been done in climate change and health, the field was incredibly small. One of my colleagues likes to say that all of us sort of met in a phone booth. It's a bit of an exaggeration but not as much as one would like. I've been involved in climate change and health for 25 years, and when you're involved in climate change and health you need to think about the weather, you need to think about climate variability and you need to think about climate change. I've been working in the space since the 1990s.

Rex Horner:

In the current day, the 2020s, does the community still fit in a phone booth or is it a bit bigger?

Kris Ebi:

The community has quite enlarged which is a great thing. There is a lot of interest from students into going into this field, and the major constraint we face is lack of funding. Every research field says they don't have funding. I, so far, have published three papers about funding in climate change and health and the numbers are relatively shocking. When you look, for example, at the National Institutes of Health that funds most of the health research in the United States, for the last more than decade their funding has been running at 0.02 to 0.04% of the budget. Very, very little amount of money.

Kris Ebi:

When you look at internationally, the tremendous amount of money that's going into adaptation funding, not as much as we need but several billion dollars have gone into adaptation funding. In the last couple of years, only 0.5% has gone to health. You look at research funding in other countries, it's the same problem. The European Union is starting to change that. There's some big private foundations like the Wellcome Trust that is coming into the space. I see a huge interest, my classes have grown enormously over the last five years. It's still a challenge for this field to be a career choice. It's great that it's a much larger field because we need these people to start answering the urgent and immediate questions.

Rex Horner:

Speaking of your classes and your students and the growth in the field, we introduced you as a professor at University of Washington in Seattle. I'd like to know what you see as your responsibilities in your role, whether it be mentorship or within the administration of the college, and what a typical day on the job is like to help someone get an idea of what it's like to walk in your shoes.

Kris Ebi:

There's no typical day so I'll just put that one aside. I was recruited to the university to start the Center for Health and the Global Environment and to build a program here at the University of Washington. As I just mentioned, very significant growth in the number of students. I had an undergraduate class the first year... I think I had 40 or so students. This year, I had 125 and that was because the room size was 125. I would've had more.

Kelly Savoie:

Oh, wow.

Kris Ebi:

The graduate class, we started with about eight and this year we were at 60. Again, it was a limit on the class size. I view part of my role here at the university as to provide these survey courses. Climate change and health is a huge field and we have a very long research agenda. None of it has been adequately addressed because of the lack of funding and so I want students to understand their future is going to look very different than what their parents did, in part because of our changing climate but also because of our changing choices in terms of our development pathway, and to get them more prepared for a different future and to help them find the place where they're interested and engaging with them, that when they go into their future careers that they take with them a base of knowledge and that they find ways to work on what their passionate about because every contribution matters. I'm not here to push anybody down any particular pathway. They all have important pathways in front of them.

Kelly Savoie:

It sounds like advising is definitely one of the things you enjoy. Is there anything else about the job that you enjoy the most?

Kris Ebi:

I mentor a lot of students along with the advising. I work with a lot of students on various research projects. The students are not just within the School of Public Health, that I have advisees in, for example, the athletics department and the school that deals with policy issues and engineering who come and want to work with someone around some aspect related to climate change and health from the engineering, think about water and sanitation systems. So I have an opportunity to work with students in lots of different ways and spend a significant portion of my life trying to bring in funding to help support students to do even more research. There's a lot that I do in terms of working with the students. I also try to create opportunities for the faculty because of connections I've had throughout my career to see if there's ways that we can help address some of the big questions that are out there, as I'm approached by various groups to do some research myself. Then, of course, I'm in a university. We have admin stuff we have to do too.

Rex Horner:

Kris, you have a wide breadth and depth of knowledge in this field that you work in, public health, climate and weather, environment. What do you see as some of the biggest challenges that you and your colleagues face going forward?

Kris Ebi:

As I mentioned before, particularly around weather, climate variability, climate change and health, it's funding, that I get requests from around the world from ministries of health, departments of health. They need information to be able to proactively adapt to our future climate. All the weather and climate extremes we've seen just in the last couple of months, that affects health. These groups have to address that. There's also non-governmental organizations in health that also want to contribute so the space so part of what I need to do is make sure I get more students graduated with an understanding who can go into these fields and have skills to do the research along with doing the advocacy to make sure that we do get the funding we need because we know today Americans are dying because of climate change and that has not been part of the public health policy agenda. That really needs to be put higher on the agenda.

Kelly Savoie:

Yeah. As you mentioned, your research has been focused on health risks of climate variability and change. Could you give us an idea what some of those risks are and what needs to be done to mitigate them?

Kris Ebi:

It's a long list. I encourage people to go and look at, for example, the National Climate Assessment. There's a chapter on human health, the last one. It's the fourth National Climate Assessment. There's broad categories. The first is extreme weather and climate events and that includes heatwaves. I live in Seattle. We can talk about the heat dome if you'd like to talk about the heat dome. Flooding is a big issue across much of the US, hurricanes, all of those events significantly affect health and wellbeing. It's great news that there's been advances in reducing those risks. They still exist. Another big category around infectious diseases. We think about vector-borne diseases, for example dengue fever, Zika virus,

that are prevalent in the Caribbean are moving into the US and being prepared for those infectious diseases. There's many more infectious disease, Lyme disease, for example, is already a problem in the US that is being affected by our changing climate.

Kris Ebi:

Probably the biggest health risk of a changing climate is going to be undernutrition worldwide, and that's because of both our changing climate and because of higher concentrations of carbon dioxide. There's lots of work that needs to be done in that space, particularly the changes in the nutrient density of our food with higher concentrations of carbon dioxide. This affects everybody, particularly children are going to be at risk, including children here in the US because we've got such a high prevalence of hunger among children. There's other issues, migration, all the issues associated with migration we're seeing today right now in Europe and that also affects health. You hear of all the people who are not getting enough to eat both in Ukraine, but then the struggles for other countries to help feed the millions of people who are streaming in. We have quite a lot of issues we need to address and we certainly need a bigger research community to be able to do that.

Kelly Savoie:

Yeah. I was going to say that, like you said, there's a lot going on. Sometimes you get discouraged hearing it and wonder, "Is it possible to make changes and to fix these problems?" I think it probably is but, as you said, with not enough funding it's difficult to get these plans in place to help mitigate the problems and the risks.

Kris Ebi:

A couple of comments. I thought you were going a little different place with that question. I often get asked, "How do you not get discouraged?" I like to say I'm a cautious optimist about what we can do to change. Note historically, humans have made huge changes when confronted with issues. We know that change is costly. To remind everybody there's lots of talk about transformation, particularly with the Working Group III report coming out on what we need to do to mitigate our greenhouse gas emissions, and the transition is not something in the future. The transition is happening right now.

Kris Ebi:

I was really struck recently. I was in an underground parking garage for one of our local markets walking back to my car with my groceries and it sounded like wind chimes. I stopped and was trying to figure out how I would hear wind chimes in a concrete bunker parking garage and realized I did not hear any internal combustion engines, that those were all the electric vehicles because they all have to make a little tinkling noise at low speed. When there's a bunch of them playing, it sounded like wind chimes and I thought, "This is what it sounds like and this is what my grandchildren are going to grow up listening to in their underground parking garage."

Rex Horner:

That's a really wonderful story you shared, Kris. I hope you continue your cautious optimism well into the next stage of your career going forward after the 25 years thus far. One of the things you've done in your career that you've mentioned before is you've been contacted by other countries to help them assess their vulnerabilities to climate change. How did this work enter your portfolio and how do you achieve your goals with these projects?

Kris Ebi:

I had the privilege of starting to work with the World Health Organization almost 25 years ago. They have a brilliant team that works on climate change and health, really small but really dedicated. I have had the opportunity over the years to work both with the headquarters in Geneva and with all of the regional offices, and that has led me to contact the ministries of health and other contacts within countries. I've spent a significant portion of my life in low and middle income countries and it has been a real privilege working with these countries to help them understand the risk from a changing climate. One element that's important to keep in mind is when I go into a country, I'm coming in because I've got expertise in climate change and health but I'm not the expert for the country because the country has its own particular content.

Kris Ebi:

It has its strengths, it has its weaknesses and they're the ones who are best placed to understand what it is that they need to do. I'm just there to provide technical support and guidance, "This is what other countries have done, here's the process other countries have used. By the way, if you've got a dengue control program here's what you need to think about, changing the geographic range, changing the seasonality, changing the intensity of transmission." The experts on dengue fever in the country will say, "Well, under those conditions we need to do dah, dah, dah, dah." Then they undertake what needs to be done, I'm just there as a temporary technical expert as they gain the expertise they need so that they can make the appropriate choices for their country going forward.

Rex Horner:

In a word, it is empowerment and education that is the core of your mission as well as you said temporary technical support with your presence and your networking communication with the ministries that you work with and the individuals that can affect these policies. As a follow-up, have you had a chance to return to any of these countries or see the results of your work years afterward and be encouraged in that respect as well?

Kris Ebi:

It's a good question. I'm going to back up for a minute on your summary to add another piece of it. Because I've worked so long as this interface between meteorology, climatology and health, that in many countries I've come in and had meetings with whatever the department of meteorology is, hydromet services and with people from the ministry of health to do the translation because we all now are speaking English, but scientifically we can use the same word and mean something differently. A story I hope the listeners might appreciate is NOAA organized a workshop, I think it was in the late 1990s, to bring together the nascent research community on climate change and health in the US with some key meteorologists to make sure that there was a better understanding of meteorology within this research group.

Kris Ebi:

We spent a lot of time putting together the agenda for the meeting. We ended up organizing it so the first speaker would talk about vector-borne diseases and come from the perspective of thinking about mosquitoes and ticks and why we really want to understand how weather can affect the mosquitoes, the ticks, how climate can affect the geographic range. The organizing committee is standing around a couple minutes before the meeting is going to start and a very well-known, very experienced meteorologist came up holding the agenda and said, "I'm so glad you health people are going to start

out by talking about something that we know about in meteorology. Disease is borne on the wind because a vector is mosquito and a vector is the wind direction." For years we all had thoughts of a mosquito and an arrow and saying they're both vectors. There is a lot of work we have to do to be able to communicate more effectively with each other and to not just assume that we understand what other people from other disciplines are saying.

Kris Ebi:

Onto the second part of your question, yes. I've had the privilege of going back to countries many times and it is very gratifying to see what has happened in those countries, how much they've progressed, the work I've done with... Some of the researchers around the world are now some of the leading researchers in climate change and health, give keynote addresses and we had opportunities in the early days to talk with each other and to share some of our knowledge so big changes have come about from the work I've done through the World Health Organization and others, and I'm very grateful for that.

Kelly Savoie:

Kris, before I go on to my next question I want to go back to when you were talking about health risks and climate change, climate variability, because I'm intrigued. You mentioned something about the Seattle heat dome. What is that?

Kris Ebi:

In June of last year there were excessively high temperatures in Oregon, Washington and British Columbia. It was described as a heat dome. I'll let the meteorologists explain heat domes. It's not my domain of expertise. Our temperatures were 10 degrees Fahrenheit or more higher than the last heatwave. They were really massively high temperatures. What happened here is completely typical of a place that's unprepared for those kinds of events. What happens in a heatwave is mortality starts increasing within about 24 hours, and so the first 24 hours doesn't look too bad. The first 24 hours just here in Seattle, there was like... We're doing okay. We did have a heatwave early warning system, there was lots of notice the temperatures were going to be high and as we got closer the city and the county scrambled to put together some cooling centers, they tried to set something up very quickly and they worked very hard at it. It's just really hard to do the coordination you need to have happen within just a day or two.

Kris Ebi:

Overall, as a result of those three, four days in Oregon, Washington and British Columbia the current estimate is more than a thousand excess deaths. More than a thousand people died who would not have died because of the heat dome. We had a 69-fold increase in hospitalizations, stories of EMTs burning their knees on pavements trying to work on people who had collapsed. It was very difficult strain in the middle of COVID on our healthcare. I'm speaking only on the health side, that's my expertise. Our wheat crop was affected. It was the middle of the cherry season and a large proportion of the cherry crop was lost. We're one of three states that has regulation for protecting outdoor workers from the heat, and it was also low tide so there's reports that with the very high temperatures and the low tide in the Salish Sea there was about a million mussels and clams that were cooked. That's food security and livelihood for coastal tribes so significant impacts.

Kris Ebi:

Heat is an all of society issue and we saw all of it here. We'll be prepared next time, and, frankly, everywhere has to be prepared because there's nothing special about getting these really high temperatures here in the Pacific Northwest. These are happening around the world. There was a detection and attribution study for this event that concluded based on a comprehensive analysis it was virtually impossible that event would've happened without climate change.

Kelly Savoie:

Wow. Well, it definitely sounds like environmental health, the risks, all these things are going to be happening in the future unless we do something about it. For student listeners, job seekers who are really interested in this topic and this area of expertise, what types of positions are available in environmental health and how is the future job outlook?

Kris Ebi:

The job outlook is very, very rosy. I talk extensively about the no funding, and yet when you look at Portland, Oregon, for example, they had part of one person to work on their heat plan. They're going to increase the number of people I've heard recently. We're seeing that cities around the US... For example in Phoenix they now have a heat officer. He's a very well-known researcher, Dave Hondula, in the heat risk of a changing climate. He's going to help the city really run their early warning system. That highlights there's job opportunities starting now within city governments, within organizations that help support cities undertake the actions they need to take. There may be no research at some point. There's going to have to be research in this area, serious and dedicated investment in the scientific enterprise so there's going to be research opportunities. Then outside the US there's more interest from ministries of health making sure that they're prepared for climate change. I see that there's lots of interest in having people trained in climate change and health to be able to support the transition we're undergoing to a more resilient and sustainable future.

Rex Horner:

I look forward to all of your future graduates at your school and elsewhere as they work to achieve the goals that you have outlined and given us insight into. Kristie Ebi, professor at the Center for Health and Global Environment at the University of Washington in Seattle, thanks so much for joining us, Kris, and sharing your work experiences with us today.

Kris Ebi:

Thank you very much. I appreciate the opportunity.

Kelly Savoie:

Well, that's our show for today. Please join us next time, rain or shine.

Rex Horner:

Clear Skies Ahead: Conversations about Careers in Meteorology and Beyond is a podcast by the American Meteorological Society. Our show is produced by Brandon Crose and edited by Peter Trepke. Technical direction is provided by Peter Killelea. Our theme music is composed and performed by Steve Savoie and the show is hosted by Rex Horner and Kelly Savoie. You can learn more about the show online at www.ametsoc.org/clearskies and can contact us at skypodcast@ametsoc.org if you have any feedback or would like to become a future guest.