Dr. Renee Salas:
For so many of my patients harmed by climate change, I often feel like I'm putting a Band-Aid on a bullet wound, as I may be able to improve their symptoms, but then I send them back out my doors without having gone upstream to the root of the problem. The climate crisis is both a meta problem, meaning it underlies other problems, and as a threat multiplier, meaning it makes existing problems worse. Thus, climate change touches everything and is creating headwinds to successfully tackle our nation's most pressing health challenges today, including the COVID-19 pandemic.

Ellen Kelsay:
That was Dr. Renee Salas, lead author of *The Lancet Countdown on Health and Climate Change: U.S. Brief*, testifying at the House Oversight Committee hearing on the devastating health impacts of climate change. Dr. Salas is a Yerby Fellow at the Center for Climate Health and the Global Environment at the Harvard T.H. Chan School of Public Health. She is also a practicing emergency medicine physician in the Department of Emergency Medicine at Massachusetts General Hospital and Harvard Medical School. For her dedicated work on climate change and health, Dr. Salas was elected to the National Academy of Medicine in 2021.

I'm Ellen Kelsey, and this is a Business Group on Health podcast, conversations with experts on the most relevant health and well-being issues facing employers.

Today, Dr. Salas and I discuss why we must apply a climate change lens to everything we do to improve health and well-being. Today's episode is sponsored by Spring Health, the emotional wellness provider that makes mental health services more accessible. Spring Health does this by combining clinically proven technology with high-touch care navigation so that every employee has fast and easy access to the care they need.

Welcome, Renee. We're thrilled to have you join us today.

Dr. Renee Salas:
Thank you. It's a pleasure to be here.

Ellen Kelsay:
We have been increasingly seeing the topic of climate change emerge in many of our conversations at the Business Group, relative to health and well-being, and we could think of no other individual to join us today for this conversation who's an expert on that topic and who really does fully understand the intersection of climate change with health. Again, just delighted to be speaking with you and for our audience, you are a physician and you are still a practicing physician in emergency medicine. I'm curious what led you to climate change and how did this become a passion of yours?

Dr. Renee Salas:
Yes, I wear a lot of hats, but my journey started out as an emergency medicine physician, and that's really a theme that has continued throughout my work. I want to start off with a story, because I think that's really what captures why I'm doing what I'm doing. There was a young girl who came to the emergency department for her third visit for an asthma attack that week, and I had this conversation with her mom and she was just beside herself. She said, you know, I am doing everything that the doctors have told me to do and she just keeps getting worse. What am I missing? For me, what really resonated in my mind is I asked myself the same question of what are we missing? I looked through her chart and she had been doing all the right things and people had been recommending all the evidence guidelines, and in the emergency department and I'm pulling patients out one at a time only to see many more behind them. There's this analogy where there's two doctors standing on the side of a river, pulling these patients out. Then all of a sudden one leaves and starts to walk upstream and the other one is like, where are you going, help me. That person says, well, I need to go upstream and figure what is causing these patients to fall into the river in the first place and stop it there. I realized as I'm seeing my patients that I'm missing a diagnosis, so we have a diagnosis that we anchor on. This girl had an asthma attack, but yet there's these things called secondary diagnosis that I may not focus on as

much in the emergency department, because we're really focused on what that patient came in for, but really, secondary diagnosis are just things that make it harder for me as a doctor to either manage or prevent whatever that primary thing is.

When I looked at this patient, I realized the pollen levels were enormously high and it was driven higher because of climate change. She also lived next to a highway and there was a lot of air pollutants that are caused by burning the fossil fuels that were causing her to not be able to manage her disease. Once we make that diagnosis of climate change, then we realize we have to walk upstream in order to get to treat that issue. So it's not as easy as me writing a prescription, but it's equally important. In short, I spend my day running up and down the river, but it's all interconnected because climate change is a diagnosis.

Ellen Kelsay:
I'm curious, and that's a really good and enlightening personal example of that child who came in with asthma three times in a week, has that changed how you practice or the questions that you ask now to get a better handle of, well, what is their living situation, what might be going on at the home beyond just kind of the presenting case and the medical data that's right in front of you?

Dr. Renee Salas:
Completely, and I think in a perfect world, I'd love to sit and do detailed histories with my patients. Unfortunately, usually the pace of an emergency department shift doesn't allow that enormous detail, but I think more and more people are recognizing this and doing this in the office. For example, primary care doctors are uniquely served to be able to address some of this. But, a hundred percent. Oftentimes I feel like I'm just putting a Band-Aid on a bullet wound and then sending the patient back out into the very environment that's making it impossible for them to manage their disease and for me to help them. So the only way that I can truly embrace my commitment as a doctor, which is to improve health, prevent harm, and advance equity, is to act on these upstream problems like climate change.

Ellen Kelsay:
You also refer to climate change as a threat multiplier. What do you mean when you use that phrase and can you give us some examples?

Dr. Renee Salas:
Yes, really climate change is sometimes what we call a meta problem. I mean it underlies other problems, but it also is that term a threat multiplier, which all it means is that it makes existing problems worse. That's really the take home point. The reality though of that is that climate change really touches everything that's important to us. That's so true in my job and I see that first and foremost. Let's talk about a concrete example. We know that structural racism led to redlining, so that caused blacks to live in certain neighborhoods and those neighborhoods tend to have a lot more concrete and man-made material. Any of us who've ever stood on a really hot day and we've stood in a park under a tree or we stood in the middle of a parking lot with nothing but cement, know there's a really stark difference between those two temperatures. In fact, it can be 15 to 20 degrees difference between what we call these urban heat islands and really vegetated places with shade. Climate change then is making these situations for people who live in these areas much worse. There's this existing problem, but now we have even more intense heat because heat waves are becoming more frequent, they're more intense, and they're lasting longer. That has widespread implications for health.

Ellen Kelsay:
Oh, for sure. You mentioned extreme heat. I know there have been many various instances of climate change that have really risen to the forefront and are, I think, underscoring and driving home this connection between climate change and health, and certainly that is one that is very obvious. Can you give us an overview of really the state of climate change in the U.S. and globally, and in addition to extreme heat, what else are you seeing that's concerning?

Dr. Renee Salas:
The most stark example for extreme heat is what happened out in the Pacific Northwest in June of last year. This was an unprecedented heat wave and climate scientists actually deemed that it would've been virtually impossible without climate change. It was 116 degrees Fahrenheit in Portland, Oregon. That would be hot for where I live, let alone for an area that is historically much cooler. You're right, as these events become more pronounced, it's knocking any rose-colored glasses that people may still have on about the fact that climate change is here and now, and we are the faces of it. It's not polar bears and icebergs. As far as the states, when we think about climate change, we compare the temperature of the earth now compared to what it was back before the industrial revolution, when we started burning fossil fuels. It is now about 1.1 degree Celsius warmer. The goal of the Paris Agreement, countries came together to say, let's act on this. Our goal of that is to try to keep temperatures to well below 2 degrees Celsius, and the ultimate goal, from my standpoint, is obviously to not go anywhere above where we are right now, because we're already seeing health impacts at 1.1 degree Celsius. But 1.5 has sort of been thrown around as this ideal number, again, not ideal from a health standpoint, but that we can maybe have a chance to try to keep temperatures below that. But right now we're on track to actually hit that potentially in the next two decades. So really the time to act is not now, because we have to cut our emissions in half by 2030 and then get to zero by 2050. I think about it like a patient is crashing in front of me and we have to do everything we can and that's where we are right now.

Ellen Kelsay:
I know also in preparing for this conversation and speaking with you previously, the effect of wildfires, as an example, and the Dixie fire, and you spoke about the effects of that fire and the smoke then that cascaded across the entirety of the country all the way over to Maine and what that did to the air quality in places like New York City and that patients were presenting, in other parts of the country, with persistent cough and respiratory issues related to perhaps the wildfires that happened on the other side of the country. I think sometimes people see these events as being localized to a community or a certain region of the country, and they're not necessarily connecting the dots to say that there's a cascading effect that may be invisible to them, but does actually manifest itself in real health issues to people, as I said, on the other side of the country and in the example you provided earlier, which was so fascinating to me and really hits home. I hadn't connected the dots quite as directly as you did in that very example.

Dr. Renee Salas:
Our fates are bound together in this and it, I think, can help people see that when we are able to point out examples, like what you just highlighted, where what is happening halfway across the country may seem distant, but we are bound together and it's an indicator of a far greater problem. Even the Northeast here, I was seeing a haze from the fires, and I have a lot of friends and family that live out West and had been getting updates. Obviously, the pictures there almost looked apocalyptic at points with the hazy orangish sky. These types of things, again, sort of off the rose-colored glasses and give us a foreshadowing of what's to come, in increased intensity if we don't act now. All is not lost. We still have an ability to do something. I don't want people to turn off the podcast because they don't want to get depressed. There's things we can do and the time is now. In some regard maybe we need these examples to really make it clear to us what's at stake, and what's at stake is our health, the health of our loved ones, and having a society that is thriving in a way that we all are joined to gather in a common vision for.

Ellen Kelsay:
I'm glad you said that. We will get to this in the conversation. We close on notes of optimism and things that people can actually do to improve the situation, so we will get to that. It is not all doom and gloom and there is hope, glad that you said that and hopefully people are still listening because we're going to get to that in a little bit. We talked about some of the more obvious health effects of climate change, whether it be extreme heat or the wildfire example, but there are so many less obvious examples and effects of climate change on health. I wonder if you could maybe walk us through some of those. I know there's water quality, there's a supply of food and crops. Give our audience a flavor of some of the items that are just as important, but maybe a little less obvious.

Dr. Renee Salas:
How much time do you have? How long is this podcast? It's really broad and I'll just break it down initially into ways I think about it and then give a few examples. Again, we could talk about this all day, and trust me, I have, but now is not the time. First off is, just to what you said, there are really direct impacts, but then there are these sort of indirect insidious impacts that are less clear, but I think these connections are so important because the reality is that climate change is affecting everyone's health in some way. Again, it can be as minor as you had a cough for a couple days because you had poor air quality because of wildfire smoke that traveled across the country. That's minor. But it is all the way to individuals who have really severe illnesses and are hospitalized and even die as a result of climate change.

There's actually a study where the science is really evolving to where we're able to see exactly to what degree climate change contributed to health outcomes. This study actually found that a third of heat-related deaths in cities across the U.S. in the 1990s and early 2000s are attributable directly to climate change. That means that this heat was extreme enough that it actually led to deaths that wouldn't have happened if climate change wasn't happening. People are already making these connections and people are already having really severe impacts. But then as we think about the insidious ones, I think about it in exposure. Obviously depending on where you live, there's different ways that climate change is harming your health. Drought is another extreme event, but it actually is contributing to this disease called valley fever, which is a fungus that can cause illness. Food impacts, actually crops, are less nutritious because of climate change. Which for most individuals may not impact their day to day, but as we think about those across the world, again, we're all bound together in this common fate, for some of those that's really important. We think about water impacts, that actually the diseases that can cause vomiting or diarrhea, that nearly all of them are sensitive in some way to climate change, and that sensitivity just means that climate change is impacting how they are presenting themselves. There's vector borne diseases. Ticks and mosquitoes are obviously the way in which they're living in environments and where they're living is very different, so longer seasons or new locations, which means that diseases that they transmit, whether we're thinking about Lyme disease or West Nile, those are also going to be different. Then thinking about the social impacts. These extreme events displace people and for health care that has significant implications, because I can't imagine someone who would have a harder time improving their health than someone who's torn away from their home doctor and their home health care system.

Then there's sort of two other buckets I just want to touch on and that's that the health care system is actually disrupted because of climate change. Thinking about power outages or supply chain disruptions. One example is intravenous sailing, which is literally water in a bag, right? If we think about all the things we need in medicine, it’s probably one of the most simplest, but over 50% of that was produced in Puerto Rico. After Hurricane Maria, which has been shown to be more intense because of climate change, because climate change is making hurricanes wetter and slower and more intense, that they had shortages. I literally was handing patients cans of Gatorade in my emergency department here in Boston, Massachusetts, if you didn't meet certain criteria. And then the last sort of bucket is what is air pollution, and that's just really trying to step back and realize that the burning of fossil fuels is also creating air pollution, in addition to driving climate change. But then that's a good thing in the sense that if we can transition away from fossil fuels, that actually improves air pollution in the short term and will begin to improve health now.

Ellen Kelsay:
Wow, the magnitude and extent is unreal. I know you just scratched the surface there and you didn't even mention mental health, which I wanted to ask you about. We know that there's a direct impact on mental health. Can you share a few words about that?

Dr. Renee Salas:
Yes, I think there's no doubt that mental health is impacted. If I put my researcher hat on, again like we talked about, I wear many hats, it is a harder thing to really be able to quantify. Our current understanding is like an iceberg and I, again, acknowledge the irony of that visual. What we see is, I think, just what's above the

surface, but I think the true connections to the mental health burdens is that largest mass that's underneath. But already research has shown links between higher temperatures and worse mental health, including increased suicide. More work needs to be done to really tease that out, and so oftentimes we find these associations and then have to dig into them more and digging into them more is really important because it helps us figure out what we can do about it. If we can figure out how these things are linked, then we can figure out how we can intervene.

Ellen Kelsay:
I would imagine the answer to my next question is going to be everybody, but who is affected by climate change, and if you had to speak in terms of buckets of populations, who perhaps is more acutely affected by climate change, knowing that probably none of us are able to avoid the effects. We're all going to feel it. We all do feel it, but who in particular are the groups of people that we should be especially concerned about?

Dr. Renee Salas:
Well, you answered it for me. Yes, I will say everyone's health is impacted to some degree and obviously there's a continuum along which people reside in those impacts, but just like I have yet to meet anyone that I cannot connect climate change to something that's important to them or connect it to their health, the same thing is that vulnerability really is also a spectrum. So I like to think about it in three buckets. You'll notice three is another theme of mine. I think the first bucket is recognizing that some people are more exposed. If you are a construction worker that works outside, then of course you're going to be much more exposed to the elements, like hotter temperatures, than someone who works inside in an air-conditioned office, or I guess more likely these days, an air-conditioned home.

Then there's also the fact that people are more susceptible. Now, all that means is that some people are just more at risk and that can be because you're young, so children are more vulnerable to certain aspects of climate change, especially we'll use heat as another example, but so are the elderly. As we age, our ability to sort of regulate our body temperature is altered. Those who have other medical problems, can make people more exposed, if you have existing heart, lung, kidney issues, for example. Then medications that we take, again tying back to mental health, there's certain medications that help treat depression or other issues, but those also can have implications for regulating your temperature. There's that sort of category around susceptibility, and then there's also the ability to adapt. So those who have less resources are not able to protect themselves as well and I think that's true for so many issues facing communities across the U.S., but it's especially born true here in climate change. The statistic that we reported on last year and it said 91% of people in the U.S. have access to air conditioning. We focused on that because we really dove in to realize that access does not actually mean that people's health is protected from heat, because you may not have money in order to run the air conditioner. I don't know about you, but for me my air conditioning bill makes for very high electricity bills. Not everyone is able to protect themselves in the same way.

Ellen Kelsay:
Well let's transition to the optimism and the things we can do portion of the conversation. At a high level, what recommendations have you or others proposed that can address the impacts of climate change on health?

Dr. Renee Salas:
First and foremost, we have to get fully upstream and get to the root cause. The burning of fossil fuels was essential for us to build our society to where we are now, but we have healthier, safer solutions now. We need to equitably move to those, because it will create better air quality for all of us, especially for those who live closer to the sources, which tend to be those who are already more vulnerable. We need to make sure that we address sort of these aspects throughout every part of our society. We have the solutions and the technologies we need. We just need the will to do it. That's the ultimate prescription for health from a climate change standpoint, because it gets to the root cause and it prevents the issues at the very start. We also recognize that we are already experiencing health harms from climate change today, and there is going to be continued warming. Even if we were able to snap my fingers and stop all the missions right now, which trust me I wish I could, of course then I'd have to go find something else to work on, but we have to think about the optimal ways in order to protect individuals and populations. That's really work that colleagues and myself from across the country and world are working on, because we want to find ways that in your doctor's office you can learn how to protect your health and your doctor can work with you to do that. We also need to do that for communities from a public health standpoint. Whether we're trying to prepare our health care systems or our public health systems for climate change or the next pandemic, it's again, all interconnected and we can create these resilient ways to protect health that make us safer for any challenge in the future.

Ellen Kelsay:
You just mentioned your colleagues here in the U.S. and around the world, and I know you were recently, just this past Fall, at the Glasgow Climate Change Conference. I would love to hear your thoughts on that conference and how did you feel leaving it?

Dr. Renee Salas:
I often say one word resolute, or I guess another term determined. We need to treat this like a crashing patient. Again, that's my analogy, because it's tied fundamentally to how I approach things and my skills and framework from the emergency department really resonates through this work. From my standpoint obviously, we need to do everything across the entire continuum of action now, because again, we have this decade in order to act and it's an enormous responsibility, but I think opportunity and what we do or don't do in this next decade, people are going to write about it in the history books. We have an opportunity for them to look back on what happened now and really say that we all stepped up together, hand in hand and marched forward. From a health standpoint, that is what inspired me most leaving COP26, is the health community is rising to the occasion. I often say we are a sleeping giant and we are awakening. There's been parts that have been active, but the full body is awakening. So this is just the beginning from a health standpoint, because we will not rest until we can optimally protect the health of our patients and our communities, and we are just getting started.

Ellen Kelsay:
That's encouraging; that's great. Well let's bring it home. What are the things that all of us, each and every single one of us, can do to make a difference?

Dr. Renee Salas:
Well, I have to channel a colleague that I've had the honor and privilege of working with and that's Katharine Hayhoe, who is a climate scientist. She says talk about it and I agree completely. I take it a step further, don't just talk about climate change, but talk about how climate change impacts your health and the health of your loved ones. That's what brings it home, right? I think we have seen on a scale that at least a generation hasn't witnessed in regards to how health is central to a thriving and functioning society. We have an opportunity to ensure that health can be protected in society going forward by acting on climate change. So, make it personal and make that connection to health. Talk about it with your loved ones, talk about it with those in decision-making roles that can actually begin to have some of that influence to make these bigger, widespread changes that we need. It's very important for us to make personal decisions, but we will never achieve the scale of change that we need to tackle this in time without broad transformative change. We can do it and I have no

doubt that we can also step forward and we will, and we're seeing that happening, but we have to talk about why climate change is personal.

Ellen Kelsay:
That's great. You know our audience largely are employers and their industry partners who are working day in and day out to improve the health and well-being of their employees and their families and many of them work for large corporations that operate here in the U.S. and around the world. They've got corporate goals around environmental sustainability, perhaps reducing their carbon footprint. They've got corporate social responsibility goals, but are there goals that you would recommend corporations and employers and their partners have around climate change specific to health and well-being and maybe even the programs that they offer to their employees and family members?

Dr. Renee Salas:
That's a great question. I think I will start out with a framework of how to think about this. I'm a photographer in my spare time, clearly not professionally, but I love the concept up of a lens and how you add a lens to your camera and then as you look around at the world, you see everything through that. Adding a climate lens means that you look and understand how climate change is impacting that issue or factor now and then how will it increasingly impact that in the future? I say, again, we can't optimally prepare for what we don't fully understand and that's really a driving force for a lot of my work and how can we create that evidence and data in order to guide our path forward? With a climate lens, I think from an employer standpoint one key thing that could be possible is really understanding that vicious cycle. We all have carbon footprints, right? We all have ways in which we're contributing to climate change. Making that connection, that contribution to climate change is creating a vicious cycle that is then harming your employees, the very individuals that you are developing programs to try to help protect. Then how can we stop that vicious cycle and actually by transitioning away from fossil fuels and embracing renewable technologies and other aspects are actually protecting the health of your employees. Then I think to your other question in regards to the actual programs, I'll throw out there sort of three ideas, but I think all of this is for framed around that initial concept I already talked about in regards to talking about climate change and how it impacts health. In addition to talking about it, could you provide information to your employees that's based off the latest science about how climate change is harming their health. I think that's where really recognizing how diverse the ways in which climate change harms health here in the U.S. really means that it may be a really tailored discussion, because there are different ways that individuals in Nebraska's health are impacted versus those in Washington and versus those in Maine. That is another drive of some forthcoming work we're doing to try to make that easy for people to get the latest science and understand what they can do to protect their health and the health of their employees. So providing that information. Second, is you can even go a step further and not just information, but actually sending out guidelines or providing materials that may help employees protect their health. For example, if wildfire smoke, I think is a key one that is really visible to so many, depending on where you live, but as we talked about, impacts people across the country. Air filtration systems in a house, for example, can help at least ensure that when people are home, that they can have better air quality. Unfortunately, we're all used to wearing masks now, for the most part, but masks can also help if people have to go out during high particulate matter, which is that particular type of air pollution that wild wildfires can produce. That can actually help make sure that your employees are not experiencing some of the health harms that can come from wildfire smoke. Obviously, you can move your way through all those different exposures we talked about, and more, to think about particular ways. I think that, first off, really makes that connection clear to health before climate change, but in addition, it also protects your employees, which is, I think, fundamentally what is a driver of these programs.

The third possibility, and again, I'm brainstorming here with you, is creating opportunities for people to connect within your institution around climate change. I think you brought up the really important aspect of the mental health burdens of climate change. I think there is nothing that is more therapeutic for climate anxiety than action and action can be as simple as talking about it or finding small projects that employees, especially with leadership and even as a corporation or as an institution can do, because if we are trying to

push a boulder up the hill, we all have a role to play. Our voices are all important and we have to elevate voices that not heard. So echoing your voice, but also doing something. If we're all doing a small piece, then suddenly together, we've pushed that boulder up the hill.

Ellen Kelsay:
Those are such great examples. What I love about them is that they are all practical and they're feasible. They're not these massive efforts that feel unattainable and just almost overwhelming, right? Those are things that should be, I don't want to say easy, but they're not insurmountable. And they are very action oriented and do, I think, give organizations and individuals within those organizations who are responsible for health and well-being, something actionable to apply within their work. So, thank you. That was really, really helpful. I'm impressed at your photography. You do wear many hats. I didn't know photographer was one of them. I knew about all the professional hats you wear, but I love that lens analogy as well. Thanks for sharing that.

Well, Dr. Salas, thank you so much for joining us today, sharing your knowledge. Clearly, your work and advocacy in this space is critically important and we are so grateful for you sharing your knowledge and time with us today. Again, just applaud the work and there's a lot to be done, but a lot of hope, as you said, and progress that we can all look forward to achieving together. Thank you.

Dr. Renee Salas:
It was my pleasure. I really enjoyed the conversation, and as I said, we are all in this together and we can learn from one another. That's why I love these conversations, because I learned things and thought about things in a new way, just thinking about how to best frame it for this audience. I think my take home would be, climate change is a prescription for improved health and equity and we can push the boulder up the hill. We have the tools we need, we just need the political will and that comes by all of us demanding it. So these small steps that we take really are building towards that bigger momentum of us truly seeing that we can do this, that we have to do it together, and we will be successful. We can look back on this moment and reflect and say, wow, look what we did and we've left a better world for our children.

Ellen Kelsay:
That fills us with a lot of hope and promise for the future. Thank you.

Dr. Renee Salas:
My pleasure. Thank you.

Ellen Kelsay:
I've been speaking with Dr. Renee Salas, the lead author of *The Lancet Countdown on Health and Climate Change: U.S. Brief*. She also founded and leads its working group of over 70 U.S. organizations, institutions, and centers working at the nexus of climate change and health. You can read the 2021 brief at https://www.lancetcountdownus.org/2021-lancet-countdown-us-brief/. She is also the author of an interactive resource showing climate changes effects on human health and health care delivery, which can be found on the *New England Journal of Medicine's* website.

I'm Ellen Kelsey. This podcast is produced by Business Group on Health, with Connected Social Media. If you like what you heard, please consider sharing and leave us a review.