Zoe Haseman:	The urgent need for us to tackle the climate crisis.
Jens Nielsen:	Yeah so it's really a crucial decay
Zoe Haseman:	Impacts of climate change and the risks that these pose to our society,
Jens Nielsen:	We need specific plans and actions to drive the CO2 emissions down in the short term.
Zoe Haseman:	The climate crisis is the world most critical challenge right now.
Jens Nielsen:	Hello and welcome to the Sparks Podcast series. I'm Jens Nielsen.
Zoe Haseman:	And I'm Zoe Haseman.
Jens Nielsen:	And we'll be your host throughout this special edition podcast series brought to you by the World Climate Foundation and Jacobs come with us as we take you on a journey around the world to explore how different countries are tackling their climate challenges, sparking ideas and inspiration. From clean energy innovations in Scotland to sustainable buildings in Dubai, we'll be interviewing global green leaders financiers and entrepreneurs about the policies, investments, and innovations that are accelerating our progress toward a resilient and sustainable world. Our podcast hopes to educate and inspire, sparking real conversations with the intention to collaborate, act, commit to real change.
Zoe Haseman:	Climate change affects critical elements for our environment and health by intensifying existing health threats and supporting the emergence of new global health problems. Climate changes, exacerbating respiratory and cardiovascular diseases, injuries related to environmental changes as well as food and water safety, security and changes in infectious disease patterns. The World Health Organization estimates that between 2030 and 2050 climate change will cause 250,000 additional deaths per year, and will increase costs to help by two to four billion dollars per year by 2030. In addition, climate change is a major contributor to complex emergencies that are more frequent now than ever.
Jens Nielsen:	In this episode we speak with Dr. Nino Kharaishvili global solutions director at Jacobs and Ms Andrea Rezzonico deputy to the CEO and deputy director of the Converging Risks Lab at the council on strategic risks about health and climate intersection and how it impacts the Global One Health initiative in our common ecosystem. We'll be exploring geographical areas around the globe and examine population categories that are the most affected by the climate change and complex emergencies. We'll also be this discussing some actions that policy makers and leaders around the world need to take to build population resilience towards adverse effects coming from the climate change. Andrea and Nino welcome thank you for joining us.

Ms Andrea Rezzo...:   Thank you for having us.

Jens Nielsen: So let me start with you Nino, can you explain what the global initiative One Health is and how the health of people is interconnected to the ecosystem?

Dr. Nino Khara...:   Thank you. Yes, of course. I would love to explain that. So according to the Centers for Disease Control and Prevention, the One Health approach recognizes that human health is very closely connected to the health of animals in our shared environment. One Health terminology is not new. It has been around since 19th century, believe or not. However, the current approach to one health is strengthened by numerous lessons learned and examples where health and wellbeing of one component in an ecosystem is impact it by another. Simply put the human population has experienced a tremendous growth in the past decades, which means that we have expanded in new geographical spaces and have increased our contact with flora and fauna.

A matter of fact, 75% of human infectious diseases are zoonotic, which means that they can infect both human and animal population and when we increase our contact with animals and their environment, it increases chances of disease transmission. So in short the health of ecosystem cannot be separated from the health of all humans, all animals, plants, and their living environment. So changes in one component affect all participants in the ecosystem. That's a basic explanation of One Health.

Jens Nielsen: And just a follow up question on that now with the COVID 19, has the One Health concept become more important in terms of future pandemic preparedness?

Dr. Nino Khara...:   Definitely the COVID 19 infection and the whole pandemic, how it's unfolding in front of our eyes has improved the awareness of stakeholders and population around the world to understand One Health concept and use it a little bit more frequently in their practices, especially when it comes to the healthcare stakeholders and policy makers and decision makers in the governments around the world.

Jens Nielsen: Thank you.

Zoe Haseman: So Nino what are some... Can you give some specific examples of climate changes' impact on human health and what's the medical community seen as a result of these?

Dr. Nino Khara...:   Thank you, Zoe. That's actually a very good question and you brought some examples and statistics in your introduction that are pretty eye opening to people I'm assuming, but I would like to add maybe few more examples and I would love to start with infectious diseases and particularly with vector born illnesses that are transmitted by mosquitoes ticks and like et cetera, organisms like that. So prevalence, severity and seasonality of vector, born diseases are

very much influenced by the temperature and precipitation patterns. So just to bring more concrete example, let's talk about Rift Valley fever, which is an acute viral hemorrhagic fever first identified in 1900, and it was investigation in a sheep farm in Kenya that discovered this particular virus. However, the same virus that was affecting the sheep in Kenya was later discovered in humans as well. So [inaudible] Rift Valley fever virus is transmitted from animals to humans by different species of mosquitoes.

And this is one of the transmission modes. And most people with RVF have no symptoms or mild illnesses. However, around 10% of population can develop more severe symptoms, including viral encephalitis and that can be life threatening. You'd ask me like, what does it have to do with climate change, right, but let me link those two together. Research and recent research shows and focusing and modeling that the outbreaks of RVF increased outbreaks. Were linked with increased rainfall during the rainy season, which promotes and supports the growth of mosquito population and therefore increase the likelihood of disease transmission. So changes in weather pattern is directly linked to human health and in this case to increase of infectious diseases, and we can bring many examples like this from infectious diseases, but I don't want to neglect the other components in human health that are affected by climate change.

And I want to mention extreme high temperatures, extreme high air temperatures are contributing directly to death from cardiovascular and respiratory diseases, especially among elderly population. Also pollen and other allergens are more active so to speak in a higher extreme temperatures, and this can trigger asthma and other respiratory illnesses that affect 300 million people around the globe. And obviously aggravates the disease burden, also natural disasters, right?

Maybe you'll be asking me what natural disasters have to do directly with the health population, but every year, these natural disasters, which by the way, have tripled in occurrence since 1960s, they cause around 60,000 deaths on a yearly basis. And most lean developing countries, this a staggering number to me and floods and extreme precipitation also impact food and clean water supplies and this directly impact societal and environmental factors of populations. So therefore also increasing the likelihood of waterborne diseases, foodborne diseases, and et cetera. So the laundry list of health conditions can be listed here. I obviously don't want to bother everybody with listing all of this, but there are many, many negative impacts of climate change directly on human health, as well as indirect factors that can cause or aggravate underlying conditions, health conditions in population.

Zoe Haseman: Thanks, Nina. That was quite a staggering report on some of those implications

Jens Nielsen: Andrea you're working on climate change impact on national security issues and geopolitical impact. Can you elaborate on those connections and what it means?

Ms Andrea Rezzo...: Sure so climate security issues for the sake of this conversation, we can break them down into three buckets. So the first is the direct impacts on people and infrastructure. The second is kind of the indirect impacts translating into risks within states themselves and then the third is indirect states between states. So the geopolitical angle is where that kind of ties in. So in that first bucket, just quite briefly, as we've seen, as recently as this month, we've had deadly flooding and widespread infrastructure damage in New York city because of a hurricane. Entire towns and inundated in Europe because of intense precipitation events, wildfires burning entire areas across Europe, Turkey, the US, Canada, Australia. Then we have those indirect risks within states. So climate impacts, as Nino mentioned on food and water resources, climate impacts intersecting with migration patterns from for example, rural to urban zones, sea level rising and more densely populated urban coastal zones in countries leading to disease outbreaks as Nino referenced.

An example I can think of right now is Nigeria, rapid rates of urbanization along the coast, particularly in Lagos and which is vulnerable to sea level rise and flooding, which can lead to health risks in the state and then climate change, desertification and instability are pushing people out of the Northern part of the country and combining with ethnic nationalist, tensions and clashes. So then when we arrived to that last bucket, which is the indirect risk between states that's, as I mentioned, where the geopolitical angle comes in.

The Arctic right now is an incredibly popular example when it comes to this bucket. You have higher temperatures melting ice at such rapid rates now that it's making a zone completely navigable when it never has been. So you have open shipping lanes now. You have access to critical mineral deposit, oil and gas reserves, permafrost melt, nuclear powered vessels, traversing this area. So essentially geopolitical competition is all converging in this one part of the globe it's high stake and it's the setting for great power rivalries. So in that sense, in the climate security arena, we frequently say that climate change is a threat multiplier. So bringing this all together as global temperatures rise, these extreme events will be increasingly layered over other vulnerabilities and as they intersect with other risk, right? So this has currently and will continue to produce cascading or simultaneous crises, or in other words, complex emergencies. This is an overlooked yet incredibly critical angle, in my opinion, and an nexus that, that we're struggling to address.

Zoe Haseman: Thanks, Andrea. So you mentioned complex events with situations as complex emergencies. How do we start to unravel them, like with all the different multiple stakeholders at government level, at an international level, how do you start to actually even think about what a solution could be with something as complex as that?

Ms Andrea Rezzo...: Sure. It's a great question and it is quite a complicated multifaceted issue, right? So to set the scene, we have to understand what could make up a complex emergencies. The coming decades will be characterized by significant disruptors, as we've already mentioned. So climate change, biological hazards, natural disasters, technological changes. These growing geopolitical tensions, an increase in fragility amongst different states, persistent economic shocks. The list is endless, but that's a good list of what risk we are currently facing in which we will continue to. So these issues obviously do not exist independently of each other, right? They will intersect and lead to cascading effects that entire systems. We have arguably been living through a complex emergency, including climate and health issues these past 18 months, this past year several parts of the world experienced hurricanes, monsoons, typhoons, droughts, wildfires, catastrophic flooding, layered over a pandemic and subsequent economic downturn.

This strained governments and political stability across the world and to bring it down to specific examples we saw an extreme winter storm in Texas, knock out a vulnerable electric grid during a pandemic. A super typhoon in the Philippines at the end of 2020 propelled the evacuation of over one million people during a pandemic. Historic wildfires across the Western United States and Canada, Turkey all during a global health crisis. To add to this and to kind of break it down further when I say cascading in regards to complex emergencies, sometimes one crisis in many instances actually leads to or exacerbates another. For example, for the sake of this conversation in terms of health and climate, in 2020 huge wildfires swept across the Western United States, including some of the worst ever in California and the state of Washington. Harvard university recently released a study in the journal Science Advances that stated that something like 20% of COVID case in counties of those states were directly linked to elevated levels of wildfire smoke.

So you have that correlation we're already seeing it. Another example right now of a real time complex emergency is in Haiti they were grappling with a pandemic as we all were, but then they experience a disastrous earthquake and then a few days later, a tropical storm that hampered recovery efforts to address that earthquake and during all of this, you also have an incredibly destabilizing assassination. So you have a health crisis plus a climate event, plus a natural disaster and then you add governance fragility and that is a complex emergency. These disruptors, as we're seeing are already converging. You can layer an infectious disease issue as Nino mentioned over all of these and questions and arrive in terms of preparedness state resources, when we're confronted with in the future, perhaps a deadlier pathogen or a more severe outbreak and in my opinion, right now, responses are quite frankly not great, but anticipating and preparing for these kind of complex and simultaneous emergencies are critical as we move forward into the 21st century.

Jens Nielsen: Thank you. I'll put this question to both of you. What are governments doing to address the issue of climate change impact on human health?

Dr. Nino Khara...: Thank you, Andrea. That was a very interesting explanation and just exploring how complex emergencies can impact and worsen health population, because unfortunately we cannot have health pandemic, like COVID 19 in isolation, right? It affects so many things and just some other things happening at the same time. It worsens the pandemic management and it's just eye opening. How quickly things go down goes south. But let's turn on a positive note, right? I want to maybe just because I'm in United States, I want to maybe announce some of the things that are happening here in the government. So research has been showing that climate change effects, human population and health of population for a very long time and I'm very proud that Biden's administration recently established a federal office under the Department of Health and Human Services to address the health consequences of climate change and their disproportionate effects on poor communities specifically on disadvantage communities.

The office is called the Climate Change and Health Equity, a great linkage that brings two seemingly different, but very related issues together and it will be the first office and specifically at understanding how planet warming, greenhouse gas emissions from burning fossil fuel also affect human health. A great move on administration side and I'm really looking for were to see the offices activities in the future. They have some seed funding that they are receiving from the government, from the Congress and so hopefully they will contribute to much better practices being established in the United States and, steer the population to the better health.

Also, I don't want to fail to mention the Race To Zero global initiative and it's a very critical initiative. The global campaign that rallies support from businesses, cities, regions from different investors and that is to create a healthy, resilient and zero carbon recovery pathways and various cities and businesses are part of this alliance and collectively these actors now cover almost two 25% of global missions and objectivity and I want to quote this to "build the momentum around the shift to a decarbonized economy ahead of COP26, where governments must strengthen their contributions to the Paris agreement and this will send governments resounding signal that businesses, cities, regions, stakeholders are United in meeting the Paris goal to create a more inclusive and resilient economy." This is very critical in my, in my mind, and we need to promote the initiatives like that and see more of this in potentially in more developing countries, because that's very critical. I just wanted to mention a few of those activities and initiative that are very critical to creating the positive impact at the end of the day.

Ms Andrea Rezzo...: So building on Nino's examples clearly as she stated, there's so many governments and organizations and initiatives that are trying to address these issues. The Council on Strategic Risks we recently released a report that both assesses kind of bringing in the health aspect here and climate that assesses the current state of bio surveillance in the world and offers some recommendations and in that report, we really break down the regions and the initiatives and for

example, to discuss a region, I don't think is given enough kudos for it's move to try to establish an early warning system, some of which incorporate disease and climate change exacerbated natural disasters is Latin America. There's growing signs of cooperation across nations in this region and indications that many of the states here, as well as in other parts of the world, seek to a build out kind of a pathogen early warning alongside systems for other types of disasters that we know are made worse by climate change impacts.

I'll give one example in Mexico, they have something that's called the Centro Virtual de Operaciones en Emergencias y Desastres in known as CVOED and they run a software system that provides real time support and communication capabilities to areas experiencing crisis, emergencies and or natural disasters. So they collect and monitor information from multiple sources in order to detect and respond to those hazards that pose public health risk and so this system is pretty ideal because it provides tools pre, during and post a crisis such as emergency documents and plans, real time notification and messaging, social network support. Because as we know, we are all so much more connected on in, in this kind of technological way kind of infrastructure blueprints and healthcare necessities for populations.

So there's a mix set of capabilities around in the world, in this region across and within nations but I do think we're moving in the right direction and we should continue to bolster state capabilities and cooperation kind of connectivity across these types of efforts could help nations in this, in Latin America, in other regions to be best prepared for navigating these complex and intertwined crises that we know are very much likely to continue to occur throughout this century.

Zoe Haseman: Sure. Do you think the, I mean, I'm assuming it has, but it would be good to confirm, has the pandemic really accelerated that sort of level of preparedness, the example that you just gave Andrew with Mexico? Was that something that was in the works and planned in operation prior to the pandemic, or did the pandemic really sort of speed up a sort of regional response to that?

Ms Andrea Rezzo...: So that center in of itself was an existence pre pandemic, but seeing the pandemic has certainly affected a lot of the initiatives and kind of data sharing capabilities in the region, I would say in a positive way, in that its really jump started more than anything information sharing across different countries, especially in South America. I know Chile, Argentina, Columbia recently kind of also, I believe created, are trying to create a vaccine sharing passport and that they could all kind of be in a collective centralized system. So I do think that COVID has accelerated the process of these kinds of systems.

Dr. Nino Khara...: I want to add maybe onto that Zoe, that COVID 19 pandemic is a very unique event and we haven't seen anything at this scale in a very, very long time. However, I also to emphasize the public health people who work in the field, and we knew that there was sort of somewhere sometime coming because there's certain practices in globally that we collectively humans are engaged in

like deforestation like food shortages and looking for the alternative supplies for food and just globalization in itself is contributing to spread of zoonotic pathogens and unfortunately we knew this was coming, but I don't think anyone would imagine the massive scale that this would unfold into and I think that COVID pandemic has many negative effects, but if we can find a silver lining.

And one silver lining is the rising, the awareness, why it is important to look at the pandemic, not a standalone event, but as a complex emergency, which affects many different aspects of our lives and it's a type of the health adverse event that we need to be prepared for forecast and we need to put a lot of actions into helping the nations around the world to be a little bit more resilient, because one thing pathogens don't do, they don't have passports and they don't stay in their own countries. They travel everywhere and they affect everybody. So if one country is affected, then the other countries affected as well, same with the climate change. So those, I see that very similar.

Zoe Haseman: For sure. So another question for you, both Nina, you mentioned this in one of your earlier answers, you alluded to this a little bit, many studies are showing that climate change is disproportionately affecting disadvantaged individuals, meaning that it does actually matter where you live in your level of income, how are healthcare systems addressing health equity issues in relation to climate change?

Ms Andrea Rezzo...:   I can take the first part of that question, maybe leave the second to Nino. So as we've discussed throughout this conversation is, as we all know the entire world is, and will continue to be impacted by climate change and as Nino just said, I couldn't agree more with everything she was saying about. There's no borders when it comes to pathogens or climate change impacts. It just doesn't work the like that, but these issues certainly disproportionately affect vulnerable and minority populations like indigenous people, women, children in the politically and or economically disenfranchised. I believe just today or yesterday, president Biden released his administration's goal to address extreme heat due to climate change in the US and there's a section that highlights the fact that black and Latino neighborhoods in urban areas are much more at risk to heat, urban heat island effects than non-black and non-Latino neighborhoods and zones.

Adding kind of expanding that to a global perspective, economic and political inequality can both be a driver and an outcome of climate security risks. So those that experience, the brunt of these risks on a global scale are often the poorest and most vulnerable members of society, including women, children, the elderly as Nino highlighted. I believe a recent UN brief from last year noted that the intersection of high levels of poverty and high levels of exposure to climate related hazards leaded to a higher risk of conflict as well. So this has local implications, but also regional and global security implications as vulnerabilities among these populations expand over time. So at the minimum, we think that indigenous leaders, women and disenfranchised individuals in groups must be actively incorporated into governance processes and local

prevention mechanisms to minimize both ecological disruption and the impacts of climate change as well as these disturbances, whether they be economic health related or you know, of across the board, those impacts to their lives.

Dr. Nino Khara...:   And maybe I will add to that, Andrea, and thanks for nice segue. Climate change definitely affects human health and affects the social determinants of health and I wanted to outline those. That's an ability to access clean air, clean water, food, and shelter and those factors are critical to all people obviously, but disadvantaged communities are already struggling to securing this social environmental factors. So it's not surprising to say that for example, elderly population with preexisting health conditions, children, people in developing countries, or in some geographically disadvantaged areas like coastal regions or high mountains regions, they are most vulnerable in conditions created by climate change and most likely will suffer from the negative consequences, health consequences. I wanted to bring, what are the healthcare systems doing to address health equity issues, maybe not directly, but anticipating those climate events or adverse health events as we call it and prepare for it is a one way to deal with or decreasing inequalities and improve the health outcomes.

So for example, CDC has this initiative and it's a leading public health institution in United States has the initiative called BRACE, which stands for building resilience against climate effect and this is a framework that is giving tools and equipping public health officials in a state level or community level to develop the strategies and programs to help communities prepare for the health effects of the climate change. It is a very easy framework. It has five steps and focusing climate event and assessing vulnerabilities. Then moving to projecting disease burden because different climate events or natural disasters have a different impact on health and then assessing public health interventions needed to alleviate the burden and then obviously implementing and measuring the quality and impact of those interventions to health of communities.

And to Andrea's point, I cannot agree more that incorporating representatives of local communities when public health officials are making changes or designing interventions to support communities and at the local level is absolutely critical because we need to create this common trust and the information exchange back and forth between the community and the health officials, but just a few things that can be done. There are lots of tools out there WHO has created a lot of tools. UN generally has a lot of different tools to deal with the climate change and it effects. It's just sometimes I wonder how much people have access to this information and how much that is distilled down to manageable activities, because we have to deal, as public health officials need to deal with a lot of different events, health events, and I don't want this to be overlooked and than the continues rising the awareness of climate change impact of health on health is very important.

Jens Nielsen: Thanks. Here's another question to both of you. How can governments act in collaboration with the private sector to address climate change impact on human health?

Dr. Nino Khara...:   Sure I think it's just a continuation of my previous answers, so to speak because we all have responsibilities right, as Andrea and I have been saying climate change is not the one person issue. It is not even a one country issue or problem. We are collectively in this. So climate change affects all of us, therefore collective actions are needed and I believe that all of us ranging from individuals to governments have the responsibility to reverse the outcomes of climate change. So it is very critical for governments in my humble opinion to partner with private industries and private sector to address the climates change.

Government should engage with private sector to mobilize resources, mobilize knowledge, bring innovation for addressing climate change and promoting green growth and also quite a lot of times, companies do have cutting edge innovations and different digital tools that can actually help with some of the activities that the governments want to take and some of the lessons learned also can be incorporated into various policies that the governments can create and issue because creating environment for all of us to incorporate sustainable and greener practices are really critical and that is the role of the government in, in my humble opinion.

Zoe Haseman: So in addition to the government's actions and activity, the World Health Organization is also doing a lot and they've made some recommendations on creating climate resilient healthcare system to protect those most vulnerable communities. So Nino, what are some of those key areas that healthcare systems can improve to meet these goals?

Dr. Nino Khara...:   Sure. Thank you Zoe. Climate change has direct impact on human health, and we've been saying this and that can be caused from injuries and illness from extreme weather events. As one can imagine, increased disease burden threatens the capacity of health systems to manage and protect population health. So it is of critical importance that we create climate resilient health systems and that's what WHO operational framework aims to fulfill and just to maybe expand a little bit, the framework is one of the tools that was created by WHO and it sort of covers multiple different components, starting from leadership and governance to create the enabling environment in a country to promote the green practices to then the other components are educating health workforce and giving them the tools to deal and prepare for the climate events and outcomes of this events and also they promote health research and health climate research,

As well as promotes the vulnerability assessments and understanding and forecasting, what events might be happening in the community, which in turn improves the preparedness in a long run. When you have information it's easier

to prepare for those events and also create the programs that are climate specific or climate informed, so to speak and as well as maybe secure the funding that will help the communities to deal with aftermaths of the natural disasters, climate events and et cetera.

Zoe Haseman: So you mentioned funding there, and I think that was one of the things that was going through my mind as you were speaking. Are we seeing governments create enough financing funding to be able to deliver some of these things, you know, critical infrastructure systems, healthcare that's needed across the globe.

Dr. Nino Khara...:   So Zoe, I will answer that and maybe Andrea, you can add some thoughts as well. I have rarely seen the funding earmarked as climate resilience or climate, or rather climate change impact on health something like that. However, if you think about, there are some indirect outcomes, like for example, improving infrastructure and making them climate resilience. Improving, preparedness for different kinds of events including the natural disasters. So maybe it doesn't say in a title climate change, but the impact or the activities are linked directly and indirectly to the climate events and the other activities that can cause harm to health population.

Ms Andrea Rezzo...:   So from a complex emergency perspective, and also tying back the question of how can governments act in collaboration with the private sector to address climate changes impact. Crisis response capabilities are already an integral part of maintaining security across the globe and these capabilities are beneficial to a state. They contribute to a nation's public image. They lead to stronger international alliances and just essentially the prevention of even greater instabilities and so considering the pressures that we mentioned, like climate exacerbated events and natural disasters, higher risks of diseases and pathogens, we know that nations will be increasingly required to handle these compounding crises. Right? So first I think being open to learning from past experiences, including through that kind of international partnership is incredibly important. An example that comes to mind, Japan has really stepped forward as a complex emergency leader following its catastrophic triple disaster in 2011, that had implications across all including health and economics and energy and all of these kind of implications and their triple disaster in 2011, consisted of an earthquake, a tsunami, a nuclear reactor meltdown.

And so the government's response of course includes both successes and failures. As you know, as most recently, I believe as this year, they've decided that they're going to release some of the water from those reactors, but these can serve as lessons for other countries experiencing multiple emergencies at once, including from climate and health issues and so high level disaster preparedness already form a part of key alliances and so I think bolstering that is incredibly important and directing funding to that is essential and to bring in the private sector, maybe investment to this government and private sector stakeholders could strengthen this information sharing and channels, and kind of springboard are discussions regarding complex emergencies across all

regions, especially those, again, really hammering this point home though, to include that climate aspect and how it affects human health and the risks and so ideally this would provide a blueprint of how nations could in the future prepare for these intersecting and simultaneous crises in the future.

And kind of a last part of this and echoing Nino's reference to private sector resources is a recommendation I think, and a call for more investment that relates to harnessing technology, especially the private sector's ability to collect and condense data to things like bio surveillance or kind of a global pathogen early warning system, as well as climate forecasting. So the former could detect in at the minimum be able to communicate the impact of biological threats and in terms of climate impacts, we've already seen how powerful it is to input data into visually simulating maps and charts where flooding is going to be a risk, extreme heat, forecasting what an area could look like under hot bolt temperatures, how the ecology can change. So essentially incorporating information technology into this approach. And this has already happened successfully. There has been a lot of innovation in this field. So just building off of that will just require closer collaboration, but it's incredibly possible and I think it's an incredibly powerful tool as well.

Zoe Haseman: Right and keep ice.

Jens Nielsen: So in summary and the light of the COP26 coming up, are you optimistic that the healthcare sector can meet de carbonization targets and take the necessary steps to ensure that climate mitigation takes place and reverse the course of action?

Dr. Nino Khara...: Sure. I'll start with that. Well, there are a few campaigns in roadmaps for healthcare decarbonization. We mentioned some of the tools as well in our conversation and just to remind listeners healthcare operations contribute to 4.4% of net global emissions and even if countries can meet their Paris agreement commitments, it would cut projected healthcare emissions growth by 70%, which is not enough and it's kind of ironic that healthcare systems are contributing to the adverse event that causes or harms population sort of oxymoron me, but that's why it is critical for healthcare sector to adopt up the mindset for decarbonization set goals and embark on very long route for cutting emissions and transitioning to more greener and sustainable ways of operations. And I'm sure a lot of companies and a lot of governments are trying to do that, but we need to collectively have that mindset that this is happening and we need to help each other help companies and health healthcare sector to meet those very ambitious goals in a long run.

Ms Andrea Rezzo...: So I'd say following up on that, expanding that perspective from just kind of a global viewpoint, looking down at this point in time, to be quite honest, reversing, the course may be out of reach, but I am optimistic about mitigating against the most severe impact. Serious adaptation will be required to mitigate climate impacts that have been locked in, and we must take those seriously and

develop interconnected systems. So as this discussion has really highlighted kind of that climate and those health systems that are made to respond to these complex situations. We're at a very interesting point in time where we can both curb our greenhouse gas emissions while bolstering our existing response capabilities, to be able to address some of the inevitable impacts that we are already seeing. So because it is essentially a guarantee that these complex emergencies, we're just going to continue to see them.

So stakeholders around the world, I think should maybe shift their threat perception and preparedness efforts towards this multifaceted complex converging crises. Many of which have been locked in from past policy and governance decisions. So we have the foresight, I think, to anticipate these emergencies right now and all governments and, and institutions and sectors and organizations have the opportunity to improve in this area. So we can really mitigate the risk and minimize their impact and incorporating this complex risk lens into our national global, regional emergency responses, I believe is a big part of that.

Jens Nielsen: And on that note, Nino and Andrea, thank you so much for joining us today and giving us your expert views and for opening our eyes to just how much climate change is impacting everyone's health and lives across the world. And thank you to our listeners for joining us. We hope you enjoyed the podcast. If you have any questions or comments or would like to get in touch with us, you can find our details on the podcast landing page. Be sure to join us in the next episode, as we continue our journey to Singapore, to discuss [inaudible] sparking real conversations with the intention to collaborate, act, commit to real change, see you soon.