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00:03:26.910 --> 00:03:54.210

Alison Boland-Reeves, New Voices, NASEM: Hello, everyone, and welcome. I see folks are coming into the room. We're going to go ahead and get started. Welcome to the third installment of the new voices. One Health Webinar series focused on climate change threats to human health and health system. Resilience My name is Alison Bowen Reid. I'm the program manager for the new Voices program at the National Academies of Sciences, engineering and Medicine. And we're very happy that you're here with us today.

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00:03:54.220 --> 00:03:59.039

Alison Boland-Reeves, New Voices, NASEM: before we jump into the session. I'm going to tell you a little bit about the new Voices program.

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00:03:59.650 --> 00:04:19.609

Alison Boland-Reeves, New Voices, NASEM: the new Voices program is a membership based program at the National Academies that focuses on bringing in diverse early and mid career expertise to our work. you could see our 40 cohort members here on the screen, who have joined in 2 cohorts since 2,018, and we anticipate bringing in a third cohort of members. Later this year.

4

00:04:19.680 --> 00:04:43.670

Alison Boland-Reeves, New Voices, NASEM: our cohort members represent the diversity of early and mid career scientists engineers and medicine professionals in the United States and they bring young science, engineering and medicine perspectives that are under represented at National Academies. the program is funded in part by the Gordon and Betty Moore Foundation, the rudder foundation, the Doris Duke Foundation, and how we feel

5

00:04:44.510 --> 00:05:00.889

Alison Boland-Reeves, New Voices, NASEM: new voices. Members are impacting the science policy ecosystem by helping to diversify national academies work connecting with the broad network of their peers, introducing new ideas through webinars like this one and representing us young scientists. Internationally.

6

00:05:01.310 --> 00:05:20.969

Alison Boland-Reeves, New Voices, NASEM: this webinar was organized by new voices, members and engages speakers from their network to bring new ideas to cross-cutting conversations on environmental, human and plant. Well, being, the QR code on your screen, and the link in your chat will let you sign up for our mailing list to hear about other new voices, announcements, and Webinar series coming soon.

7

00:05:21.090 --> 00:05:28.019

Alison Boland-Reeves, New Voices, NASEM: Now, it's my pleasure to turn it over to your moderator, Dr. Megan Lane. Fall, one of our current new voices, cohort members.

8

00:05:28.480 --> 00:05:40.649

Dr. Meghan Lane-Fall: Thank you, Allison, welcome everyone to the new voices. One Health Webinar Series. This series features topics and speakers exploring the linkages among and between environmental, human and plant well-being.

9

00:05:40.660 --> 00:06:08.020

Dr. Meghan Lane-Fall: As Allison mentioned. The focus of this third of 3 webinars is climate change, threats to human health and health system. Resilience. The goal of this webinar is to catalyze discussion about climate change and health and to highlight cross sectoral insights that can be used to affect change at multiple levels. My name is Megan Lanefall. I'm a physician, scientist, and faculty member at the University of Pennsylvania, member of the 2,023 new voices, cohort and moderator for today's session.

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00:06:08.380 --> 00:06:12.389

Dr. Meghan Lane-Fall: Our speakers bring a variety of perspectives on climate change and human health.

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00:06:12.510 --> 00:06:25.390

Dr. Meghan Lane-Fall: The plan for this webinar is prepared. Presentations by our speakers, followed by a moderated question and answer period. We have received several questions already. Thank you, but we invite you to ask additional questions. As our speakers present

12

00:06:25.820 --> 00:06:36.059

Dr. Meghan Lane-Fall: as we transition to presentations, I will be introducing our illustrious speakers with just a short bio more extensive bios, with all their accomplishments, are available on our event. Web Page.

13

00:06:36.080 --> 00:06:40.830

Dr. Meghan Lane-Fall: I'll be introducing our speakers with professional titles than using first themes in the Q. And A. Period.

14

00:06:41.330 --> 00:06:51.870

Dr. Meghan Lane-Fall: Our first presenter today is Dr. Megan Mcgregor, who will discuss health system resilience. Dr. Gadgil is an associate professor of medicine at the University of California at San Francisco.

15

00:06:51.900 --> 00:06:56.269

Dr. Meghan Lane-Fall: You Csf. And adjunct professor at Uc. Berkeley School public health.

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00:06:56.430 --> 00:07:15.430

Dr. Meghan Lane-Fall: She is also the director of Innovation at the better lab, which is a human-centered design. Research and practice venture at Ucsf with a focus on vulnerable populations. Dr. Gadgil co-directs the Ucsf. Climate, health and Sustainability, education Initiative, and is the Uc. Berkeley Faculty co-lead for the University of California Center for Climate Health equity.

17

00:07:15.540 --> 00:07:26.330

Dr. Meghan Lane-Fall: Dr. Gadgil's research interests include health system, resilience in response to climate change and environmental health, vulnerabilities, chronic disease and South Asian and Latin American populations

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00:07:26.390 --> 00:07:35.099

Dr. Meghan Lane-Fall: and the innovative applications of human center design to understand and address complex system level challenges that cross disciplines. Dr. Gadgil. The virtual floor is yours.

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00:07:37.360 --> 00:07:54.979

Dr. Meghana Gadgil: Thank you so much for that warm introduction, Megan. Hello, everybody. Thank you so much for having me. I'm really honored to be here today. I'm going to talk about a topic that affects every single one of us here, which is health system, resilience and climate change. Climate change is fundamentally the largest global health threat of this century, and it is a public health emergency.

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00:07:54.980 --> 00:08:14.650

Dr. Meghana Gadgil: And briefly, today the outline of my remarks are as follows, I'll talk about the cloud, the health impacts of climate change, how health systems are impacted, and outline of some ideas for solutions, and a discussion of what I believe is essential for any meaningful progress at the pace required for us to make progress, which is a paradigm shift. And how we think about health systems and building resilience.

21

00:08:14.870 --> 00:08:42.840

Dr. Meghana Gadgil: So climate change impacts on health. More than hundreds of I mean, a conservative estimate is a hundred millions of people. I've been impacted by climate change globally. More frequent and dangerous weather patterns have both first and second order effects and the health consequences of wildfires, hurricanes, floods, droughts, are also causing other problems like failed crops, disease, political unrest, and those can then precipitate displacement both within and outside of political boundaries.

22

00:08:42.960 --> 00:08:53.329

Dr. Meghana Gadgil: Between 2,030 and 2,050. Climate change is expected to cause approximately 250,000 additional deaths annually from malnutrition, malaria, diarrhea, and heat stress.

23

00:08:53.410 --> 00:09:03.460

Dr. Meghana Gadgil: An example of the stressors that impact health directly from climate change include extreme temperatures like heat and cold, which are currently estimated to kill some 5 million people annually.

24

00:09:03.570 --> 00:09:15.770

Dr. Meghana Gadgil: Air pollution from wildfires creates new and worsened existing respiratory and cardiovascular illness. Pm. 2.5 or fine particular matter resulted in nearly 2 million deaths in 2,019 alone.

25

00:09:16.020 --> 00:09:24.190

Dr. Meghana Gadgil: Floods can, of course, result in drowning and injuries, but can also lead to waterboard disease and landslides can, of course, cause a lot of devastation.

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00:09:24.360 --> 00:09:31.879

Dr. Meghana Gadgil: Hurricanes and cyclones have become more frequent and intense, leaving a trail of death, destruction, and displacement in their way.

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00:09:32.240 --> 00:10:02.090

Dr. Meghana Gadgil: Climate-sensitive diseases are some of the best illustrations of the intertwined relationships between environment human health and health systems we see. For now, for instance, there's a shop rise in malaria, dengue, and many food born and waterborne diseases due to the expanding geographic range of both pathogens and vectors. We have changes in seasonality, rising temperature and precipitation, deforestation and air pollution, all of which contribute endemic infectious diseases and novel disease outbreaks will likely worsen as well.

28

00:10:03.190 --> 00:10:21.159

Dr. Meghana Gadgil: and we can't ignore the mental health impacts from these profound disruptions. We know that anxiety, depression Ptsd interpersonal violence, mood, and anxiety disorders this orientation, the breakdown of social cohesion that damaged interpersonal relationships are only some of the consequences we see from climate health impacts.

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00:10:21.350 --> 00:10:22.130

Dr. Meghana Gadgil: Okay.

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00:10:22.400 --> 00:10:37.799

Dr. Meghana Gadgil: All of these also have economic and social consequences that directly and indirectly impact the health of individuals, families, and communities. Displacement is a major one. Each year since 2,008, more than 20 million people have been forced to move, due to weather-related events globally.

31

00:10:37.800 --> 00:10:59.300

Dr. Meghana Gadgil: In extreme cases entire populations will be need to move, and are even moving now from climate, vulnerable areas due to destruction or changes in viable livelihoods. The internal displacement, monitoring center calculated that disasters like floods, drought, cyclones, hurricanes triggered over 60. That's almost 6 million people of the internal displacement just in 2,021,

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00:10:59.410 --> 00:11:13.730

Dr. Meghana Gadgil: and the World Bank predicts internal climate migrants may total 216 million by 2,050. All of these things can also precipitate political and rest and conflict. and this can be conflict over resources as well like water or arable land.

33

00:11:13.770 --> 00:11:25.389

Dr. Meghana Gadgil: And fundamentally, we can't talk about climate change without talking about equity. Climate change amplifies disparities and access to, and the quality of care among, racial, ethnic, gender and socioeconomic lines. 3

34

00:11:25.450 --> 00:11:42.059

Dr. Meghana Gadgil: poor people and people of color tend to be at the greatest risk of health harms from climate change and are typically contributing the least to greenhouse gas emissions. And as the years go on, the greater, we have a greater likelihood that each of these events and disasters will overlap and spur cascading failures.

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00:11:42.560 --> 00:12:03.909

Dr. Meghana Gadgil: So what about the impact on health systems? Well, health systems both contribute to climate change. We'll talk about that momentarily, but also play a really vital role in climate resilience. Climate change fundamentally threatens the ability of health systems to deliver safe, effective, and efficient care. And the 3 things that I want to talk about briefly are access quality and the financial viability of health systems.

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00:12:04.200 --> 00:12:21.600

Dr. Meghana Gadgil: the intensification of extreme weather. Events can cause profound health system, disruptions, hospital evacuations, facility, damage, and closures. Power outages. Here in California, where I am in one instance, a few years ago California wildfires resulted in simultaneous power outages to 250 hospitals.

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00:12:21.790 --> 00:12:29.360

Dr. Meghana Gadgil: Transportation disruptions for roads and transit systems can also be profoundly impactful for health systems. Ask, can be the displacement of health professionals.

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00:12:29.490 --> 00:12:42.899

Dr. Meghana Gadgil: The implications of this is that impaired health care, access can impact large numbers of the population. And this is both physical and financial access. You get worse patient outcomes typically and the health care workforce becomes less stable.

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00:12:43.110 --> 00:12:50.209

Dr. Meghana Gadgil: This ultimately generates greater vulnerability to further stressors. In addition to compromising access to care.

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00:12:50.380 --> 00:13:08.700

Dr. Meghana Gadgil: climate can also compromise the quality of care that health systems are able to provide. When one hospital or health system closes or is unable to accommodate patients due to damage. Others are stretched beyond capacity. Robust data show that hospital overcrowding is associated with decreased care, quality, and increased morbidity and mortality

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00:13:08.700 --> 00:13:24.140

Dr. Meghana Gadgil: supply chain disruptions can reduce the availability of critical medicines or devices. For instance, in 2,017 hurricane Maria damaged a key. Iv. Fluids, a failure manufacturing facility in Puerto Rico, and resulted in dire shortages all over the Us. And territories.

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00:13:25.060 --> 00:13:34.629

Dr. Meghana Gadgil: the quality of care can also be compromised when you have educational gaps for health professionals who are unable to get the training they need in order to continue caring for patients.

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00:13:35.510 --> 00:14:03.870

Dr. Meghana Gadgil: Frontline clinicians feel the physical and mental toll of climate change quite acutely, and this, disrupted to their lives, makes their jobs harder and has resulted in burnout globally. We know that nurses, doctors, and other health professionals are leaving bedside medicine, a process that had occurred before Covid, but appears to be accelerating in the last few years many people are leaving the bedside altogether, and others are seeking new opportunities outside of their local communities, resulting in uneven access and poor care quality.

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00:14:03.990 --> 00:14:12.299

Dr. Meghana Gadgil: This brain drain impacts low and middle income countries and parts of the United States or wealthier countries where maybe rural areas have a positive of the clinicians needed.

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00:14:12.720 --> 00:14:18.120

Dr. Meghana Gadgil: With health system, disruption work. The workforce really needs to rapidly adapt to different circumstances

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00:14:18.670 --> 00:14:23.809

and the final element of health systems and climate change is the cost and financial viability calculation.

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00:14:23.880 --> 00:14:52.649

Dr. Meghana Gadgil: More patients need care due to climate change. Do the factors we just discussed? You can have new climate sensitive conditions, or an exacerbation of existing ones. Injuries and harm from natural disasters, of course generate more need for care, and all of this pushes up health care costs. Meanwhile health systems are in a position where they have to absorb both the immediate impacts of climate disasters which may be cascading and overlapping, while also caring for longer term sicker patients who might have new or exacerbated chronic disease.

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00:14:53.110 --> 00:15:07.910

Dr. Meghana Gadgil: And finally, the health system impacts can magnify the inequities we discussed about climate change magnifies the same problems of access and quality and even cost that already affect patients unevenly across the United States and the world.

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00:15:08.200 --> 00:15:28.369

Dr. Meghana Gadgil: So let's talk about health system, resilience, health system, resilience refers to the capacity of a health system to respond, adapt, and recover from shocks and stresses while continuing to provide essential services. It's a comprehensive approach that ostensibly should encompass multiple dimensions, including infrastructure workforce financing, governance information systems 200

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00:15:28.370 --> 00:15:39.769

Dr. Meghana Gadgil: and a a resilient health system is not only capable of managing emergencies, but is also able to plan and address ongoing. Health care needs promoting the health, being the health and well being of their communities.

51

00:15:40.030 --> 00:15:53.859

Dr. Meghana Gadgil: However, there's some worrisome data on this. I won't get into too deeply. But a recent survey of global cities showed that 67%, 2 thirds expected climate change to seriously compromise their public health assets and infrastructure.

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00:15:54.170 --> 00:16:04.350

Dr. Meghana Gadgil: Climate vulnerability can be framed as a component of 3 different elements. Exposure, sensitivity, and the ability to adapt and health systems help mitigate all 3.

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00:16:04.490 --> 00:16:14.339

Dr. Meghana Gadgil: A better integration of climate, information and health system. Planning is essential to ensure that health systems can be resilient, and that they can serve their populations for years and decades to come.

54

00:16:14.400 --> 00:16:23.210

Dr. Meghana Gadgil: So what do solutions look like? I'll give a quick overview. The first is, of course, do no harm. So I'm going to talk about decarbonization of the health system

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00:16:23.230 --> 00:16:38.710

Dr. Meghana Gadgil: to keep our global temperature rise below 2 degrees above pre-industrial baseline. We need to reduce global health gas emissions, global health greenhouse gas emissions by 50%. This decade alone, which means the 7.6% reduction per year. Pretty ambitious and aggressive.

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00:16:38.750 --> 00:16:43.219

Dr. Meghana Gadgil: and decarbonization is, of course, an efforts to reduce these Ghg emissions

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00:16:43.270 --> 00:17:00.189

Dr. Meghana Gadgil: in the Us. Our health systems make about 11% of all national greenhouse gas emissions and pollution from health care and associated energy use contributes to a additional 400,000 Dallas, which is similar to the burden from preventable medical errors

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00:17:00.430 --> 00:17:10.909

Dr. Meghana Gadgil: and hospitals are a major driver of health sector energy use. A decade. Old survey showed that us hospitals ranked second in major fuel intensity among all commercial buildings in the Us. One.

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00:17:11.160 --> 00:17:20.880

Dr. Meghana Gadgil: But hospitals typically have slim operating margins. A 2,018 data set showed that the margins are roughly around 1.7 for non-profit hospitals. So what does that mean?

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00:17:20.880 --> 00:17:42.020

Dr. Meghana Gadgil: Well, decarbonization and energy efficiency can reduce costs, air pollution, associated disease, burden and come back. Climate change. For since you can have low carbon or net 0 buildings, low carbon electricity or 0 carbon electricity, energy efficiency steps and renewable power purchase agreements. But all of these require upfront investments which is really challenging for small overall systems.

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00:17:42.030 --> 00:17:57.060

Dr. Meghana Gadgil: There's been a number of interesting ideas floated to help address this. A Medicare Green Loan Fund, for instance, for those at highest financial risk with the lowest available investment capital Medicare could potentially also incentivize decarbonization by tying reimbursements to lower operational carbon intensity.

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Dr. Meghana Gadgil: The Cleveland Clinic, as another example, has developed something called a revolving read fund where they'd set aside 7.5 million dollars that pay for energy savings, and then the as the savings they generate are reinvested.

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00:18:07.760 --> 00:18:13.389

Dr. Meghana Gadgil: But all of these need some upfront capital and a lot of incentive structure to make that possible.

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00:18:14.300 --> 00:18:39.570

Dr. Meghana Gadgil: Another part of the solution we need to think about is the workforce I talked before about how we're experiencing problems with the workforce that have been magnified and made more serious with the covid pandemic. And there is a clear and urgent need for a climate ready workforce. Certainly a part of that is training and education. We need to teach our clinicians to be aware of how climate change may influence their ability to deliver care from disaster. Related mental health to extreme heat

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00:18:39.730 --> 00:18:47.819

Dr. Meghana Gadgil: and clinical training can place a greater emphasis potentially on developing a breadth of skills that allow for better adaptability in the face of disaster.

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00:18:48.150 --> 00:19:05.270

Dr. Meghana Gadgil: But fundamentally, we need to think about how climate change will affect the overall number of clinicians required, and what types of conditions we need and where we need them. The proportion within a specialty as well as their geographic distribution, developing new medical or nursing or training schools is not going to be enough.

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00:19:05.270 --> 00:19:20.689

Dr. Meghana Gadgil: We need to really think about investing in primary and community level care, because that is the fundamental way we get and keep a population healthy and going back to that calculus of individual vulnerability, keeping a population healthy is going to make them less vulnerable to climate threats as they come.

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00:19:21.860 --> 00:19:30.319

Dr. Meghana Gadgil: Moreover, as we invest in primary and community care, it makes secondary and tertiary level health systems more able to absorb major threats as they occur.

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00:19:31.070 --> 00:19:50.900

Dr. Meghana Gadgil: Another cross cutting solution is technology data and innovation technology and data already play a vital role in our health systems. And they are an important tool for health system, resilience, telehealth, digital health records, data, analytics are essential to improve the efficiency and effectiveness of health care. Delivery as well as to give us real time data that can make our systems better.

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00:19:51.080 --> 00:20:00.600

Dr. Meghana Gadgil: These enable remote consultations, monitoring of patients and rapid information sharing. And we need to be able to make timely decision making to reduce the burden on health care facilities.

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00:20:00.760 --> 00:20:06.710

Dr. Meghana Gadgil: embracing digital solutions, can really enhance our ability to adapt and respond to unexpected challenges.

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00:20:07.480 --> 00:20:29.060

Dr. Meghana Gadgil: Another element of a solution is going to be operationalizing. Existing climate and health plans. 50 of 101 country surveyed develop national health and climate change, strategies or plans, but only 9% had adequate financing, pre covid, domestic and external financing was insufficient even to meet the UN sustainable development goals, and the picture is in some ways more dire. Now.

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Dr. Meghana Gadgil: while global climate funds do exist, like the Global environment Facility, the Adaptation fund, the Greek Climate fund and donors funding is still quite limited for issues related to the health sector in climate.

74

00:20:40.460 --> 00:20:58.189

Dr. Meghana Gadgil: In the United States 5 of climate resilience investments went to the health sector in 2,016. But they haven't been significant gains since, and this lack of investment has really allowed preventable morbidity and mortality to occur. An example is that in the past decade heat related deaths have doubled in Arizona, and most of them were preventable.

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00:20:59.190 --> 00:21:22.210

Dr. Meghana Gadgil: We also need to start developing and iterating multi scale plans. This includes developing something like a national strategic climate preparedness plan that can support resource, limited local public health departments. We need to develop coordinated resilience, planning and emergency preparedness and stockpiling of essential supplies are part of this. But there's going to be an important multi sectoral collaboration that has to occur.

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00:21:22.840 --> 00:21:45.230

Dr. Meghana Gadgil: We also need to better understand climate risks. We're not totally equipped to understand all the dimensions in which climate change will impact our health systems. We need to establish and fund real time surveillance of climate-related health risks, including weather patterns like heat, wildfire, smoke, or drought, related dust, but also diseases like Lyme or Vibrio, and others that have new range or locations due to climate change.

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00:21:45.280 --> 00:22:03.729

Dr. Meghana Gadgil: We can use existing data. For instance, we have NASA remote sensing Hhs has a national standardized health data. Cdc has our national environmental tracking network. And there is already one which spans 11 different agencies, which is the Us. Global change research programs, interagency cross kind of group on climate change and human health. Quite a basel.

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00:22:03.950 --> 00:22:07.229

Dr. Meghana Gadgil: But that is just a start. It doesn't really cover everything we need to do.

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00:22:07.490 --> 00:22:20.809

Dr. Meghana Gadgil: the big steps we need to do are focused on understanding who is vulnerable. Again, exposure, sensitivity, and adaptability, and all 3 are modifiable risks. And then how can we modify each of those at multiple scales and timelines?

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00:22:21.000 --> 00:22:26.440

Dr. Meghana Gadgil: Governance and collaboration have to be part of our solution both at the regional, national and international scales

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00:22:26.510 --> 00:22:38.730

Dr. Meghana Gadgil: mit

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00:22:38.900 --> 00:22:53.619

Dr. Meghana Gadgil: system level constraints, container responses. Every day we see regulations that are slow to adapt, a lack of integration of public health functions and primary care supply chain challenges, ineffective decision making administrative and management challenges ineffective collaboration and coordination.

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00:22:54.650 --> 00:23:10.439

Dr. Meghana Gadgil: So let me pause there. That was a quick overview of potential solutions. And there are many and many people, many, much, much better than me, are working on a lot of these challenges. But I want to challenge us to think differently. One of my favorite quotes is from Albert Einstein. We cannot solve our problems, using the same thinking we use when we created them.

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00:23:10.480 --> 00:23:14.810

Dr. Meghana Gadgil: So I want to invite everyone here to think differently about what constitutes a health system.

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00:23:14.840 --> 00:23:27.050

Dr. Meghana Gadgil: Multiple climate hazards can occur simultaneously. But non-climactic risks also interact which compounds the risk for all sectors. And we're only really as healthy as the environment in which we live. And I know Dr. Webb will be elaborating on that shortly.

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00:23:27.140 --> 00:23:39.409

Dr. Meghana Gadgil: So when we think about climate vulnerability, we should also be thinking about health systems as food systems, housing, transportation building codes, access to utilities. Indoor air quality standards, Internet and phone access.

87

00:23:39.430 --> 00:23:50.360

Dr. Meghana Gadgil: An example is the center for Medicare and Medicaid has something called the Accountable Health Communities Model, which is a good start where they look at health, related social needs, like housing, insecurity and utilities access.

88

00:23:50.450 --> 00:24:06.520

Dr. Meghana Gadgil: Another big area that I invite everyone to discuss with me is thinking about how to bridge the no Due G. We know how to do a lot of things that really would make a difference as we think about health system resilience, but we don't quite know how to do that. The add up the adoption of this has not been as successful as we wish.

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00:24:06.720 --> 00:24:24.969

Dr. Meghana Gadgil: and I know a lot of us feel frustration about what we know will work and isn't being done. But a key aspect of health system. Resilience will be the adoption and diffusion of innovations, and this can significantly improve the efficiency, quality, and responsiveness of our health systems. But the successful implementation of innovations is not straightforward

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00:24:25.060 --> 00:24:47.500

Dr. Meghana Gadgil: mit Ctl. And, for instance, in medicine, where I practice, I have seen over the years that practitioners often disregard the breath and severity of the effects of climate change on performance or the sustainability of a health system and the ability to ensure health security. Why, they're incredibly bright caring motivated people. But our systems don't facilitate that understanding. The process of diffusion where new ideas, technologies, and practices spread through a system, 150

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00:24:47.500 --> 00:25:01.459

Dr. Meghana Gadgil: plays a vital role. And I'm going to evoke my beloved Everett Rogers. Here the diffusion of innovations. What qualities make an innovation spread? Right? It's iteration and evolution. So the products and behaviors become a better fit for the needs of the people

92

00:25:01.490 --> 00:25:16.590

Dr. Meghana Gadgil: mit Ctl and the organizations that you're trying to change. The people don't change the innovations do, and that, I think, should drive how we think about implementing and iterating on our solutions. There are 5 qualities that determine the success of an innovation. And I want to work with people across different cross cutting 100

93

00:25:16.690 --> 00:25:21.449

Dr. Meghana Gadgil: sectors and disciplines to help develop solutions that address all 5 of these points

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00:25:21.490 --> 00:25:37.320

Dr. Meghana Gadgil: Mit.

95

00:25:37.790 --> 00:25:49.999

Dr. Meghana Gadgil: Is it trialable? Can people try it out on a limited basis that allow for minimum uncertainty, for a potential adopter about observability? If an individual can see the innovation quickly. We're more likely to adopt

96

00:25:50.970 --> 00:25:53.969

Dr. Meghana Gadgil: here to appear conversations and peer networks. I'll close with this

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00:25:54.410 --> 00:26:10.400

Dr. Meghana Gadgil: in personal marketing methods like advertising and media stories actually are very good at spreading information about new innovations. But it's actually conversations and relationships that spread adoption. It involves the management of risk, uncertainty and having relationships through the people we know and trust

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00:26:10.510 --> 00:26:13.299

Dr. Meghana Gadgil: really helps adoption occur much more quickly.

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00:26:13.720 --> 00:26:18.950

Dr. Meghana Gadgil: We need credible reassurances that our attempts won't change. what what result in harm

100

00:26:19.410 --> 00:26:27.990

Dr. Meghana Gadgil: and quick example of that, of course, is the adoption of telehealth during the covid pandemic, which emerged as a valuable tool and was rapidly adopted and fit all of the criteria I discussed.

101

00:26:28.530 --> 00:26:40.940

Dr. Meghana Gadgil: So I'm going to close quickly by saying we need to think about health system resilience aggressively across different sectors and disciplines, and I would love to work with a lot of different people here to think about how to solve those problems in the coming years. Thank you so much.

102

00:26:42.530 --> 00:26:51.110

Dr. Meghan Lane-Fall: Meghan. thank you so much for your comments. Our second speaker is Dr. Hassan Mahmood, who will discuss health, care, resilience, but using a systems approach.

103

00:26:51.200 --> 00:27:00.599

Dr. Meghan Lane-Fall: Dr. Mahmood is the George T. A. Bell professor in infrastructure in the Department of Civil and Environmental Engineering and Director of the Structural Laboratory at the Colorado State University.

104

00:27:00.690 --> 00:27:16.370

Dr. Meghan Lane-Fall: Dr. Mahmood's research program has 3 major thrusts, including assessing community resilience and socio-technical recovery, following extreme events, quantifying building damage to extreme hazards, and evaluating and proposing repairs and inspection intervals for deteriorated infrastructure.

105

00:27:16.370 --> 00:27:32.409

Dr. Meghan Lane-Fall: He is a prolific author and presenter who has chaired and served on numerous technical committees his research has received media coverage through citations and interviews and

numerous venues, including major climate change. The economist and Cnn. Dr. Mahmood. The virtual floor is yours.

106

00:27:33.660 --> 00:27:37.269

Dr. Hussam Mahmoud: Thank you so much for the kind introduction and

107

00:27:37.380 --> 00:27:44.069

Dr. Hussam Mahmoud: thanks for the kind of impetition and and thanks a lot, Megan. A full lay background for this presentation.

108

00:27:44.670 --> 00:28:00.929

Dr. Hussam Mahmoud: So essentially, I'm gonna show in pictures of my that talked about to some great extent, and maybe you provide some additional thoughts on how one might be able to go about in looking at system resilience filter systems using system of systems. Type of analysis.

109

00:28:01.130 --> 00:28:10.830

Dr. Hussam Mahmoud: Michael. But it's been working in this area for the past, maybe 8 years or so. And so I'm gonna show share with you some of the work we've done. So I'll start with some motivations and why we're doing this.

110

00:28:10.880 --> 00:28:24.350

Dr. Hussam Mahmoud: Then I'd discuss maybe major elements for main elements of the socio-physical interactions that we try to capture with our models, and may be able to meet this for collaborating and capacity building with which we would be very happy to

111

00:28:24.420 --> 00:28:26.839

Dr. Hussam Mahmoud: to to to do with the with you.

112

00:28:27.360 --> 00:28:50.980

Dr. Hussam Mahmoud: So essentially healthcare systems are incredibly important. So hops for a healthy communities that are really important. The net importance has been recognized by many, many organizations, including Unicef, the the new Strategic Plan nest in a Sf. And and and of course, the National Academy of of of of engineering, and as them in general and many other organizations.

113

00:28:50.980 --> 00:29:18.850

Dr. Hussam Mahmoud: And so it's really important to maintain the functionality even without natural disasters, but also, of course, more so. When you have a measurements, you'll see at the bottom left here. I'm highlighting healthcare system, the sustainable development Goals for healthcare, but also for education. I'll I'll I'll mention education as soon as for for a specific reason that I want to show you and and so and and so that's why it's highlighted here. incidentally, I'm actually in Rwanda right now in Tigabi.

114

00:29:19.360 --> 00:29:48.100

Dr. Hussam Mahmoud: speaking at at a municipal conference on sustainable development to go to the missions that that come in lines with with this discussion. so essentially, when we, when we have an event that the hits communities will go from something that looks unfortunately, bad, as you can see in this picture, to hopefully time to a couple of the community in a way, and that recovery that we try to achieve. by looking, for example, at how the community transforms over time

115

00:29:48.100 --> 00:30:14.849

Dr. Hussam Mahmoud: doesn't just involve healthcare system, it involves it with everything else. So in the process of trying to a couple of healthcare system, I have to be considering other systems in my community that go beyond the healthcare system. And so one might think of recovery or the community as essentially, a couple of different metrics that could vary from associate metrics, population, dislocation, and and other elements that you try to.

116

00:30:14.850 --> 00:30:37.949

Dr. Hussam Mahmoud: So a couple, but also economic related metrics employment rate to maybe business interruption. We want to bring businesses back. Maybe it'll kill. We'll pay a recovery of infrastructure all functionality. But the underlying mechanism of this recovery is us understanding how damage is. in situated initially, what causes damage in the community. So best environment damage is really to be here.

117

00:30:38.520 --> 00:31:04.829

Dr. Hussam Mahmoud: So the whole idea, and that there's a reason why I'm showing you this T on the right hand side is that the event that hits, and probably many you have seen this before. But essentially, you'll try to a couple, and if you're doing some work, maybe to some sort of adaptation. You can a couple of festival. And if you're doing things, maybe ahead of time, you could actually minimize the disruption and and look up even faster. So that's kind of the idea. How can we capture this recovery process? It's really important.

118

00:31:04.950 --> 00:31:17.260

Dr. Hussam Mahmoud: So we try to do this with what we call socio physical models. And these so see physical models allows us to understand the not just the the recovery from a perspective, but also from a global phone, full functionality perspective.

119

00:31:17.460 --> 00:31:45.439

Dr. Hussam Mahmoud: physical systems are so complex because as making a a rightfully said that they're very complex, that includes so many elements starting from the bail, and the later on the supplier to the physical health care of the physical hospital itself, to the patient and the patient demand and the patient requirements. What are, what are the injuries that we're trying to treat? Even if there's no injuries, maybe service that we try to provide for different patients. What would it include and what we, what it would it look like?

120

00:31:45.860 --> 00:32:14.280

Dr. Hussam Mahmoud: And how can you transfer? Take the patients from? let's say, the homes where they have been injured, or do work, or or wherever to the hospital that they're supposed to go to, and so that includes the hospital toation connection. And of course you need to understand. What do you have? Influences, availability? What? What is the travel time? if the stock in in traffic? And unfortunately, let's say the the meeting, then. that's a very unfortunate situation. So you really have to understand

121

00:32:14.340 --> 00:32:39.999

Dr. Hussam Mahmoud: the the the elements of how this complexity enter X, even the waiting time of the hospital. If you bring the patient to the hospital very quickly, because the transportation network has not been impacted. But they're waiting for ever to get treated. Then this could be also a a result in the really bad consequences. And so without so many elements to have killed population that that that requires us to look into it from a system perspective.

122

00:32:40.990 --> 00:33:05.900

Dr. Hussam Mahmoud: And so we started by by actually looking at at Asian-based analysis and modeling. And how can we actually look at health care and other systems as a network? So here I I mentioned before that education is an important element, because in some of this work that we've done, we try to look closely at the interdependencies between healthcare and education system. But in the process of looking at the interdependency, we'll look at the built environment, which is also constantly

123

00:33:05.900 --> 00:33:13.520

Dr. Hussam Mahmoud: its own network and the interaction of people which you can see on the file right with every single

124

00:33:13.520 --> 00:33:35.019

Dr. Hussam Mahmoud: sector or every single network in the community. So it is really important to block people into the process of doing this analysis. And by people I don't really mean people that acquire the service I mean. in in this modeling approach, for example, you have to include the physicians and doctors and nurses and staff.

125

00:33:35.020 --> 00:33:41.600

Dr. Hussam Mahmoud: and of course, people that that that use use this hospitals.

126

00:33:41.600 --> 00:34:06.090

Dr. Hussam Mahmoud: Also, we have to know well the doctors and the nurses, and the staff, and and the people who are injured? Who do they live, and can they come to the hospital or not similar with with the education, and which is, I'm not going to level it too much on. But we have to include the teachers and the students and the temporary teachers and the staff. What do they let? So it becomes? I I acknowledged, the fact that it becomes a complicated model. But it's really important to look at it this way, to be able to make decisions that are based on

127

00:34:06.310 --> 00:34:10.579

Dr. Hussam Mahmoud: and analysis, that that that capture this level of complexity?

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00:34:10.630 --> 00:34:18.319

Dr. Hussam Mahmoud: so in looking at the health care and the education in this case and the built, the environment and the best environment includes power network. What on it work

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00:34:18.380 --> 00:34:45.910

Dr. Hussam Mahmoud: telecommunication? And so on. We have to really start to, to to understand how kind of how can we interact them together. In this particular interaction between health care and education. We, as I mentioned, we looked at the school districts, for example, for the decision system. We looked at the schools. We looked at the telecommunication with to model and and and non medical supplies and natural gas, and we looked at the power and the transportation, and so on, can see how how heavily involved this issue based model is. And

130

00:34:46.136 --> 00:34:49.530

if I want to zoom in a little bit and look at the efficient system.

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00:34:49.530 --> 00:35:04.699

Dr. Hussam Mahmoud: So the health care system, right? So you can see how it. This approach, what we call success. 3 analysis, Cap shows really what we'll what we're interested in looking in in terms of health care functionality, which in in this case.

132

00:35:04.700 --> 00:35:30.729

Dr. Hussam Mahmoud: the quantity aspect of it is measured by the availability of staff, the bits, how many steps that it's all available. Remember, we talked about the quality. The quality is important which we can overlay it on top of the the quantity which is the staff bit and come up with a with a more general way of under fine resilience. But I'm not going to talk about the quality because of the time. But I just mentioned here that the staff, the business, are controlled by the personnel availability. As I mentioned.

133

00:35:30.730 --> 00:35:49.379

Dr. Hussam Mahmoud: controlled by space availability. accessibility is a building. We talked about space accessibility, supportive infrastructure working space for Zoomtown access where it can access. Wow! Water with water, and so on. So all these elements are all we do in the critical and understanding

134

00:35:49.970 --> 00:36:09.700

Dr. Hussam Mahmoud: availability of staff events, and so other things that are really critical, that that we included in the model. We need to understand that the the how the patients are distributed. So we need to understand what is the probability of patient. I going to hospital J, for example. that's that's very important for us, and so that requires us to understand

135

00:36:09.700 --> 00:36:37.210

Dr. Hussam Mahmoud: what is the regular location distribution to begin with, and what happens in an event? What kind of civility level in terms of injury, look like, and how these injuries impact our ability to our decision in terms of deciding which patient is going to go well which it depends on the staff bits which depends on infrastructure, which depends on personnel. So you can see how it will get linked together, and we have to look at normal operating condition, but also emergency operating condition in in this case.

136

00:36:37.220 --> 00:37:02.820

Dr. Hussam Mahmoud: we also have to not just decide who's going to go way, or based on our with wish for thinking. We have to also understand how hospitals and to act together. They all agree. Agreements between hospitals, and sometimes hospital can transfer patients, staff transfer medical supplies, and so on. So our analysis, this complex analysis framework takes into account all these also hospital interactions

137

00:37:02.820 --> 00:37:07.499

Dr. Hussam Mahmoud: and and the transfer process, which is very, very complicated as well.

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00:37:08.080 --> 00:37:33.020

Dr. Hussam Mahmoud: And so if you look at this whole entire process it's also important to acknowledge the Cease Socio physical model that that allows us to capture the staff and the personnel, and so on. It's also included. That also includes Associated Physical assessment of recovery, because we not only need to understand Google's way and and the level of functionality, but as we'll pay the system.

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00:37:33.350 --> 00:37:35.879

Dr. Hussam Mahmoud: which

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00:37:35.950 --> 00:38:00.729

Dr. Hussam Mahmoud: it is is is a very intensive process on its own. we have to understand how the process over time also allows us to, not just the hospitals, but also the physical infrastructure system allows us to cover the system over time, and that repair processes. And then self is complicated process. So in this particular analysis, I'm just showing that we we pay a couple of stage that's different than the functionality recovery that I spoke about.

141

00:38:00.730 --> 00:38:23.409

Dr. Hussam Mahmoud: but that will pay recovery before that comes the assessment and planning stage, which I'm not talking about, but that we pay a couple of these on involved project that allows you to understand how many repale clues that you have and and what you can see on the right hand side. And this figure that we show that how the opioid coups are, we started with a minimum number that went to to some sort of a a maximum number. Then you get help

142

00:38:23.410 --> 00:38:52.820

Dr. Hussam Mahmoud: from the outside to you, reaching the ultimate capacity of your vehicles, and at a specific point in time, people who came from the outside will leave. That's why it get no app, the drop in the in, the in, in the in the cools that you have for the pale, and then you'll keep going with your maximum call and tell you a couple, and the time which you drop and and and go back to your maximum repair and and and and not having to actually get the any more help. It depends on the community's decision, and what

143

00:38:52.820 --> 00:39:18.380

Dr. Hussam Mahmoud: you know and and ability of people to help, and so on. But in the process of doing this repair recovery at a given time that allows us to understand what is the functionality at a given time, we can actually optimize the whole process. We can optimize the detail so that we can get the number of step to bits based on the appeal of everything based on the appeal, the homes for people who woke up the hospitals, for example, such that they did. That's a it's a level that actually allows us to to to maximize

144

00:39:18.380 --> 00:39:29.560

Dr. Hussam Mahmoud: the turn on investment. And by return on a business I mean people's help, because that's the most important investment to you. So we use dynamic optimization process that allows us to do it. The

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00:39:29.710 --> 00:39:34.170

Dr. Hussam Mahmoud: in a way that maximizes the the the output, which is the functionality.

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00:39:34.200 --> 00:39:57.149

Dr. Hussam Mahmoud: And I finally, kind of want to show you an example that shows how this whole thing works together. And in this case, what we've we've we've we've been working on other hazards with this particular cases was actually a seismic event. And you can see how we're covering the buildings and the power and the water. these these curves bottom left shows you the functionality end, which is

147

00:39:57.150 --> 00:40:19.079

Dr. Hussam Mahmoud: again the quality and the quantity, the quantity being the step, the bits, and the quality being within time at the hospital and other things. You can see how the total functionality, which is a combination of both, and the step to bits alone now recovering, and everything else is recovering, and we'll able to calculate the distribution of patients well in our community among the 22 hospitals, and should be coming

148

00:40:19.080 --> 00:40:43.079

Dr. Hussam Mahmoud: Tennessee. So these models, in my personal opinion, all key to understanding how the entire system behaves, and how you can actually recover from extreme events and provide the most the best service to the public. Finally, my last slide is just opportunities for collaboration. This is just a blog for what we're doing within the new voices, since this is this, webinar is sponsored by new voices.

149

00:40:43.080 --> 00:41:01.870

Dr. Hussam Mahmoud: We've been doing really exciting work on heat waves and the healthcare systems in the Us. and also we will be hosting the global young Academy. international conference which will be next year, and there'll be element of health and and other really pressing issues for the ecosystem that would be in our

150

00:41:01.870 --> 00:41:08.639

Dr. Hussam Mahmoud: I will conference next to you. Thank you so much again for listening, and thanks for the kind invitation again. to do with it

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00:41:10.340 --> 00:41:18.210

Dr. Meghan Lane-Fall: some. Thank you so much for your remarks. Our final speaker of the webinar is Dr. Kennery Webb, who will discuss the human health ecosystem.

152

00:41:18.240 --> 00:41:41.410

Dr. Meghan Lane-Fall: Dr. Webb is the founder of health and harmony and international nonprofit dedicated to reversing global heating and understanding that rainforests are essential for a survival of humanity. She is also a co-founder of Alamos, a hot in the starry, a non governmental organization that has worked with indigenous communities in Indonesian Borneo for more than 15 years to reverse illegal logging and deforestation for more than

153

00:41:41.660 --> 00:41:50.339

Dr. Meghan Lane-Fall: more than 50 years. I said that already her debut book is called Guardians of the Trees, a journey of hope through healing the planet Dr. Web. The virtual floor is yours.

154

00:42:07.920 --> 00:42:11.109

Dr. Kinari Webb: Dr. Webb. If you're speaking, we can't hear you

155

00:42:12.180 --> 00:42:26.289

Dr. Kinari Webb: the tricks of mute. You'd think you'd figure I'd have figured it out by now. No problem at all. Thank you. Just greetings from the Chatenya Allen. All on a land here in the Bay Area, and I'm honored to be here and get to talk to you all.

156

00:42:27.400 --> 00:42:42.669

Dr. Kinari Webb: So I first went to Indonesian Borneo to study orangutans. 30 years ago I spent a year living in the rainforest, and in that time it was like basically a one year silent retreat, and that time of getting to know the on this of all.

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00:42:42.820 --> 00:42:52.080

Dr. Kinari Webb: It was very often interrupted by this terrible sound of chainsaws cutting down 22 story tall trees.

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00:42:53.220 --> 00:43:08.640

Dr. Kinari Webb: but I and I was horrified, but I got slowly to know many of these loggers. And I was even more horrified because what I discovered was that they loved the forest, and they wanted the for us to be there for their future, and they understood how important it was.

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00:43:08.900 --> 00:43:11.439

Dr. Kinari Webb: They were often logging to pay for health care

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00:43:11.670 --> 00:43:20.769

Dr. Kinari Webb: in one region where we work. in 90% of households, admitted logging to pay for health care.

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00:43:20.830 --> 00:43:28.010

Dr. Kinari Webb: and even when they didn't want to. But this was in that area where community said they often had to travel

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00:43:28.280 --> 00:43:37.289

Dr. Kinari Webb: up to 5 h just even to get birth control. And women were desperate to get birth control. Given that the maternal mortality rate was so high.

163

00:43:37.850 --> 00:43:51.909

Dr. Kinari Webb: So these were these horrible catch 22 s. That communities were in when they understood that if the forest was heavily logged, or they lost the forest or burned, which often happens when you log too much.

164

00:43:51.920 --> 00:44:06.460

Dr. Kinari Webb: they would have less water for themselves for their rice fields. Diseases would increase. They would have just, you know, less access to the medicines from the forest. They and that local temperatures would increase.

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00:44:06.480 --> 00:44:13.080

Dr. Kinari Webb: What's interesting is that now we know that that is true on a global level as well. And

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00:44:13.210 --> 00:44:25.099

Dr. Kinari Webb: if you look at the forest of the planet. They are as a physician, I think often about, you know human well, being, and it's a the well being of our bodies.

167

00:44:25.150 --> 00:44:33.969

Dr. Kinari Webb: And it's not so good. If you lose a limb that's terrible. You definitely don't want that to happen. But if you lose your heart in your lungs you won't make it.

168

00:44:34.660 --> 00:44:46.819

Dr. Kinari Webb: And the rainforests of the earth are only 2% of the surface of the earth, but they contain 50% of the world's species. They're absolutely essential for cycling of water all over the planet.

169

00:44:47.030 --> 00:45:11.780

Dr. Kinari Webb: and they contain vast amounts of carbon. In Indonesia the carbon stored in the forest is equal to 9 times global emissions, so vast amounts of carbon. And when they're logged or they burn that carbon is all released into the atmosphere, but also standing for us are essential, because they absorb a third of the Co. 2 that we admit every year.

170

00:45:12.760 --> 00:45:38.439

Dr. Kinari Webb: And yet you had the situation where people were in some cases logging to pay for health care and wanting to protect the forest, but not being able to. So I ended up going to medical school. I started health and harmony. I then returned to Indonesia. I partnered with whole amazing crew of Indonesians, including Hotland Number single. We founded an Indonesian nonprofit, as well called Alamsey Hadla study.

171

00:45:38.810 --> 00:45:51.110

Dr. Kinari Webb: We had dramatic results, which I'll tell you about, and then we decided to replicate. in other places. Health and harmony is now working in Madagascar and in Brazil, and we're about to start in the Congo Basin as well.

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00:45:52.090 --> 00:45:57.840

Dr. Kinari Webb: So we now are working in 8.8 million hectares of forest. That's the size of the Uk.

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00:45:58.200 --> 00:46:26.020

Dr. Kinari Webb: And the situation is somewhat different in different places. But what we found in Indonesia, and in Madagascar is, the communities are often in this horrible situation, where they are degrading for us, even though they don't want to. In Brazil the situation is a little different, indigenous, and local communities are living within the forest and protecting it from outsiders, but often the lack of access to health care means that they end up.

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00:46:26.020 --> 00:46:34.779

Dr. Kinari Webb: sometimes making deals with logging companies, or they simply have to leave their land. And then that makes it vulnerable to outsiders.

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00:46:36.140 --> 00:46:46.889

Dr. Kinari Webb: So what is our approach, we, we have a principle that we call radical listening, which is that local communities, a 100% are the experts in understanding what the solutions are.

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00:46:47.160 --> 00:46:55.720

Dr. Kinari Webb: and that means that they might call a laugh, that we call it radical, because it's not just asking communities what the solutions are that is then

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00:46:55.980 --> 00:47:02.480

Dr. Kinari Webb: implementing those solutions, and not just the broad picture of the solutions, but the details of the solutions.

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00:47:03.190 --> 00:47:15.770

Dr. Kinari Webb: We view this work as reciprocity, which is to say, rainforest communities have the capacity to and or are fully protecting their ecosystems that are central for the health of the whole planet.

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00:47:15.870 --> 00:47:19.060

Dr. Kinari Webb: They should have gratitude sent to them. For this.

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00:47:20.270 --> 00:47:27.469

Dr. Kinari Webb: We also match local solutions with the highest quality resources from outside. That outside may be.

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00:47:27.480 --> 00:47:33.089

Dr. Kinari Webb: you know, a few hours away it may be another island, or it may be halfway around the world.

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00:47:33.790 --> 00:47:45.110

Dr. Kinari Webb: And then we also do this thing which was designed by the communities. But where you get increased health care discounts with the increased ecosystem protection, so that there's

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00:47:45.240 --> 00:47:56.689

Dr. Kinari Webb: a community-wide incentive to further protect the forest. But you. Everyone always has access to care, and everyone can always pay with non cash payment options if they want

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00:47:57.130 --> 00:48:03.629

Dr. Kinari Webb: radical listening is also not a one and done. It's an iterative design process with a long-term commitment to communities.

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00:48:03.970 --> 00:48:17.159

Dr. Kinari Webb: This is kind of what radical listening looks like. This is a meeting in Madagascar. many women together asking, what are the solutions? And then fully implementing those and then getting constant feedback on how things are going.

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00:48:18.470 --> 00:48:26.720

Dr. Kinari Webb: What we have found is that everywhere we've done this in the world is that the solutions tend to fall into 3 major categories.

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00:48:26.880 --> 00:48:36.550

Dr. Kinari Webb: although they're very locally specific. But health care access is a critical component of protecting ecosystems, livelihoods, and education.

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00:48:36.560 --> 00:48:40.969

Dr. Kinari Webb: And that's education, not just for children, but also for adults.

189

00:48:41.600 --> 00:48:59.120

Dr. Kinari Webb: And they are always intersectional, which is to say, all these 3 things are completely intertwined, and that you can't really separate them. One woman in Madagascar said to me, like, I cannot tell you if health or eating is more important. We would die if we don't have either one of them.

190

00:49:01.070 --> 00:49:15.360

Dr. Kinari Webb: So the health care solutions that communities design are very like, I said, very locally specific in some places, like in Madagascar. It's tiny, tiny, mobile clinics, because there's basically no transportation. So we must go to communities

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00:49:15.640 --> 00:49:41.270

Dr. Kinari Webb: in Indonesia. It started with more mobile clinics, ended up more localized clinics as transportation improved. in in Brazil. It's like these boats go up way. Way. It's 7 days into the forest providing. And then they're very specific about what things they need access to immunizations, more health care. We do telemedicine as well as Megan I was talking about.

192

00:49:42.190 --> 00:50:07.389

Dr. Kinari Webb: So this increased forest protection increased discounts for forest protection. is also a way that whole communities can kind of get a few cheaters to Come on board and find an alternative livelihood that is not destructive of the future of the whole community. And so you can get variable discounts. and people. It's a prior. They they design this and they love it so.

193

00:50:07.670 --> 00:50:27.019

Dr. Kinari Webb: And then. But it must be equitable. So everyone must always have access to care. So one of the ways that we do that is You can pay with non cash payment options. We've discovered that free health care is tends to be less valued, so you do have to pay for it, but you can pay for it with more seedlings. If your community is logging, or less, if it's not.

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00:50:27.910 --> 00:50:31.659

Dr. Kinari Webb: And again, just that way of understanding that it's all intertwined

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00:50:32.550 --> 00:50:56.720

Dr. Kinari Webb: alternative livelihoods. So again, very locally specific. But some of the things that communities have asked for organic farming training. They've asked for very specific rice techniques and

specific seed access for rice. people have asked for chainsaw buyback programs so that loggers can help shift to alternative livelihoods. Small businesses.

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00:50:56.720 --> 00:51:09.789

Dr. Kinari Webb: agro, forestry, animal husbandry, assistance with irrigation is sometimes a real problem, many factories in Brazil for processing forest products so they can sell them at a higher price.

197

00:51:09.950 --> 00:51:23.360

Dr. Kinari Webb: So you, this is some of the training in Madagascar. The first time we did this training, 900 people showed up for the first training because they had designed it. And so, of course they wanted to be part of it. It's right away

198

00:51:24.450 --> 00:51:46.919

Dr. Kinari Webb: in Indonesia. After 10 years we did a study with Stanford that was published in Pnas to look at the impact of our work. What we found is there was a 90% drop in illegal logging households. We invested 5 million dollars over the first 10 years. That included building basically a huge medical center, because that was really the major need in that area.

199

00:51:47.240 --> 00:51:50.370

Dr. Kinari Webb: and that was 2 million dollars. So the rest of it was 3.

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00:51:50.430 --> 00:51:55.800

Dr. Kinari Webb: But in return the communities returned 65 million dollars in

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00:51:55.840 --> 00:51:59.400

Dr. Kinari Webb: averted carbon loss. Compared to other national parks.

202

00:51:59.420 --> 00:52:12.369

Dr. Kinari Webb: There was an across the board. Improvements in health, including a 67% drop in infant mortality. I was just there, and I was stunned to see how the actual number of

203

00:52:12.550 --> 00:52:23.419

Dr. Kinari Webb: beds occupied on any given night is much lower than wh. To the standards, in fact, like a hundred like dramatically less than we would expect

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00:52:23.670 --> 00:52:30.920

Dr. Kinari Webb: we should expect, like a hundred 20 beds occupied per night in this in the whole region. And it's like 20,

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00:52:31.080 --> 00:52:35.180

Dr. Kinari Webb: right? So it looks like actually across the board improvements in how

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00:52:35.240 --> 00:52:39.019

Dr. Kinari Webb: that has all these other ecosystem benefits?

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00:52:39.280 --> 00:52:49.319

Dr. Kinari Webb: as well as What economic? Well, being for the communities? How's it going in Madagascar? Well, we're working in a place that's actually the last Lowland rainforest. It's

208

00:52:50.130 --> 00:53:07.409

Dr. Kinari Webb: kind of horrific. You can see it on the left. just how little for us there's left, and you can see the above ground carbon stock on the right. Just how had been steadily decreasing. But now you can see, since we started, there's been a stabilization of the loss of forest, and we're even starting to see an increase with the reforestation that we're doing

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00:53:08.250 --> 00:53:17.650

Dr. Kinari Webb: so. Key lessons. Learned solutions are intersectional. and they tend to include access to health care, regenerative livelihoods, and education

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00:53:17.800 --> 00:53:33.850

Dr. Kinari Webb: in any given region. The solutions are the same in every meeting. I didn't really talk about that, but when we have multiple meetings in one area, each community will, or each meeting will, come to the same conclusions about what the solutions are which tells me these really are the right solutions.

211

00:53:34.220 --> 00:53:48.209

Dr. Kinari Webb: These are the most efficient, and the key programs have changed, and communities are ready to do them because they designed them. It creates this profound sense of ownership. Every time I'm in in Asia people come up to me in the region where we work. And say.

212

00:53:48.900 --> 00:53:56.609

Dr. Kinari Webb: you know, when I design this program, I did such a good job. This you did. And it is work really working.

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00:53:57.170 --> 00:54:10.500

Dr. Kinari Webb: And people are 100% ready to get involved in solutions that they design. and the positive incentives for forest protection seem to really work as well as long as there is equal access.

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00:54:11.920 --> 00:54:26.959

Dr. Kinari Webb: And then I just wanted 2 tiny little things to tell you about the fact that we've been meeting with the Ministry of Health, and they are interested in potentially scaling this across all of Indonesia, having resources flow from the global north and then being distributed to rainforest communities.

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00:54:27.080 --> 00:54:34.789

Dr. Kinari Webb: And then we're also creating kind of platform to be able to make this all visible and to get funds directly to communities.

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00:54:35.110 --> 00:54:39.060

Dr. Kinari Webb: So thank you very much for listening, and I look forward to some questions.

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00:54:39.930 --> 00:54:51.019

Dr. Meghan Lane-Fall: Henry, thank you for your remarks, and thank you again to Megan, and has some for their insights on climate change, health, and resilience. I'll invite the panelists to turn their cameras on and join me for Q. A.

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00:54:51.050 --> 00:54:56.240

Dr. Meghan Lane-Fall: I'm going to start with a question for a panelist, and then I'll ask questions submitted by the Webinar attendees.

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00:54:56.420 --> 00:55:13.540

Dr. Meghan Lane-Fall: So first I'll say one of the goals of the new Voices program is to create dialogue across sectors. I heard some common concepts in your presentations, including using design principles and acknowledging complexity and the systems impacted by climate change and the solutions that we that we generate to address some of those challenges.

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00:55:13.650 --> 00:55:33.789

Dr. Meghan Lane-Fall: I'd like each of you briefly to speak to one idea from your area of focus that you want to share with someone who is outside your usual professional networks. Keny, I'm gonna start with you because you are encapsulated everything really nicely in that in that sort of sum upside. But if there's someone that you don't normally talk to on a day to day basis, what's what's one? Take away that you want them to hear from you

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00:55:34.260 --> 00:55:44.860

Dr. Kinari Webb: the most efficient, the most effective, and the fastest way to combat climate change is to address forest loss, and the experts in how to do that are the rainforest communities

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00:55:45.120 --> 00:55:52.109

Dr. Meghan Lane-Fall: excellent! That was very nicely encapsulated. Thank you. Megan, I'm going to go to you. What's your one? Take away.

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00:55:52.510 --> 00:55:55.129

Dr. Meghana Gadgil: That's a tough one. I'll say that

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00:55:55.550 --> 00:56:24.629

Dr. Meghana Gadgil: thinking about health systems as a integrated whole that includes everything from food systems and education all the way to you know how we manage our building codes and prevention is really critical in thinking about health system resilience. We can't just talk about whether the hospital has generators. That's important. But an emphasis on keeping people well means they're less vulnerable

to climate change. And that's really important to think broadly. And that's challenging with the silos we have across those sectors.

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00:56:24.720 --> 00:56:27.080

Dr. Meghan Lane-Fall: Thank you and has some. How about you?

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00:56:28.480 --> 00:56:46.230

Dr. Hussam Mahmoud: yeah. So I I I'll just through it. But I said that coming up with solutions not all optimal requires this big picture thinking and the ability to really capture all the elements that go into this complex system behavior.

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00:56:46.360 --> 00:57:07.760

Dr. Hussam Mahmoud: we'll recognize that to make a decision, we're not asking communities to go and use this you know. Very good to. In fact, we're working right now with the World Health Organization on developing guidelines based on this complex model. We're working, for example, with the World Bank on developing a simplified version of this really complex model. So ultimately, we'll provide, you know.

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00:57:07.760 --> 00:57:19.870

Dr. Hussam Mahmoud: tools that people can use, not simpler. But in order for us to go there, you have to understand how the system behaves, so I'll I'll I'll I'll keep pushing for that system level analysis. because I strongly believe in.

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00:57:20.290 --> 00:57:21.470

Dr. Meghan Lane-Fall: Thank you.

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00:57:21.580 --> 00:57:28.010

Dr. Meghan Lane-Fall: Now we have a couple of questions from someone named to Punch and Amalik and I'm going to ask one of them about

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00:57:28.060 --> 00:57:32.300

Dr. Meghan Lane-Fall: what type of training and preparedness should be developed among citizens

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00:57:32.490 --> 00:57:56.029

Dr. Meghan Lane-Fall: that can be a leveraged or access during a climate emergency. So the idea here is when there are emergencies. For example, COVID-19 people worked remotely with care, providers to provide information that helped the care. Providers understand where they were and what they needed, what sort of basic training, so to speak, for the populace, for the population? What does every person need to know.

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00:57:56.110 --> 00:57:57.669

Dr. Meghan Lane-Fall: to be able to

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00:57:57.920 --> 00:58:02.699

Dr. Meghan Lane-Fall: feed into responses system responses to climate emergencies.

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00:58:05.560 --> 00:58:09.539

Dr. Meghan Lane-Fall: And I'll open that up to whoever feels like they. they have a response.

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00:58:10.230 --> 00:58:14.890

Dr. Meghana Gadgil: I'm happy to take a first step, but I think probably I should answer,

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00:58:15.060 --> 00:58:41.339

Dr. Meghana Gadgil: I'd say that actually, I can't say that there's a universal solution, because the impact of climate change is so different in different regions. But I will say the same way. We prepare for earthquakes in California, for instance, right if we know that wildfires, or or poor air quality, or something that is likely to be a high risk in a given area then preparing for those eventualities by you know, making sure that you can get access to clean air or

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00:58:41.340 --> 00:59:03.699

Dr. Meghana Gadgil: or temperature management and then supporting those who have problems accessing those types of solutions, be it filters or being able to leave their homes for a cooling center, having those strategies in place is really critical. And it's really important also to understand who is vulnerable. In which context, for what condition? And so having that sort of nuance emergency plan for the climate risk region by region would be pretty important.

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00:59:07.960 --> 00:59:14.010

Dr. Hussam Mahmoud: Yeah. And I'll I'll I'll just say, you know, developing education

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00:59:14.120 --> 00:59:17.670

Dr. Hussam Mahmoud: protocols or the efficient materials for the public based on

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00:59:17.800 --> 00:59:30.110

Dr. Hussam Mahmoud: potentially what models can you? For example, you know, it's really important in the case of you know, in the case. you know, specific hazards to be able to minimize injuries or minimize

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00:59:30.110 --> 00:59:54.809

Dr. Hussam Mahmoud: loss of life in a certain way. And you know the ability and and and not only that. Actually, you know, how do you actually transport yourself? In which case to What hospital? Because in in some of these natural extreme events, we have to align the public in some cases in transporting themselves or or towards transporting others. So there's a lot of training material that goes into how to protect yourself from injuries. How do you actually transport yourself?

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00:59:55.000 --> 01:00:20.899

Dr. Hussam Mahmoud: So communication is key education material is key. And and I agree with man. It's not. We cannot, you know, provide something that would work for everything, because hazards are very different, and and the elements needed are very different. But you can provide guidelines that allows the public to minimize the potential injuries or or loss of life, but at the same time maximize how fast they can get medical attention.

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01:00:21.040 --> 01:00:32.380

Dr. Hussam Mahmoud: and the models that we've been developing could allow you to reflect on these different on zoom level that you can pull to actually achieve that.

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01:00:35.340 --> 01:00:43.070

Dr. Kinari Webb: So I'm gonna answer this from a little different perspective. So I'm gonna answer it from the perspective of the communities where we work

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01:00:43.580 --> 01:00:54.170

Dr. Kinari Webb: and and we've dealt with climate emergencies in all 3 places, those climate emergency. I I actually consider the pandemic also a climate emergency, really

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01:00:54.180 --> 01:00:56.340

Dr. Kinari Webb: or

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01:00:56.460 --> 01:01:05.569

Dr. Kinari Webb: I should say, like shocks to the system, right? Which the system is unstable and because it's really stressed to the edge.

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01:01:05.810 --> 01:01:18.150

Dr. Kinari Webb: And and then also in Madagascar. We've been having multiple cyclones. it's really problematic in the region where we are. We actually, last year we had 3 cyclones hit one right after the other.

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01:01:18.410 --> 01:01:38.430

Dr. Kinari Webb: and and what we found was that radical. This thing was just as important in the middle of a disaster as it was in in sort of more stable times, and that it was most efficient and most effective to take a few hours and sit down with as many people as you could get and say, Okay, what are the solutions? Right?

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01:01:38.650 --> 01:01:50.709

Dr. Kinari Webb: And and then to implement those? And it it it worked much better than W. When outsiders, whether they, you know, just be from a different village or not? Right? We're

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01:01:50.930 --> 01:01:55.110

Dr. Kinari Webb: saying that they knew the solutions. Yeah.

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01:01:55.350 --> 01:01:56.940

Dr. Meghan Lane-Fall: that makes sense. So maybe

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01:01:56.980 --> 01:02:02.789

Dr. Meghan Lane-Fall: priming people to to participate in that and and sort of underscore the importance of that dialogue.

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01:02:02.810 --> 01:02:07.590

Dr. Kinari Webb: Yeah. And I mean, maybe even if I'm just imagining this now. But maybe even if we like.

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01:02:07.710 --> 01:02:21.639

Dr. Kinari Webb: everywhere we had systems in place where you already know who to pull together, and it doesn't have to be in person right like what in the middle of the pandemic, when we couldn't gather in person in Brazil, we actually did radical listening by a short wave radio.

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01:02:21.640 --> 01:02:40.199

Dr. Kinari Webb: And we got as many people as we could get on the short way radio. And then I asked people, and they were, these are very, very remote areas, right? So. And they. They were very clear about exactly what the solutions were, and they need to be able to be evacuated if someone got Covid. And they needed these things, and they need to be able to stop that and that and get vaccines that you know. So we just did exactly what they said, and it worked

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01:02:40.380 --> 01:03:08.870

Dr. Meghan Lane-Fall: outstanding. So on that note, we're reaching the top of the hour. I'm going to draw us to a close. I wish that I could get to the rest of the questions. I'm hoping that we can continue the conversation on social media. We are hoping that this catalyzed. Some thought maybe got you thinking in different ways. This is not the end, but it's just part of a conversation where we try to build bridges across disciplines to really deal with the challenge that is affecting all of our lives and our futures. So thank you for joining us, and we

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01:03:08.870 --> 01:03:10.979

Dr. Meghan Lane-Fall: wish you a great day. Thanks.