

CURALINK

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thecurafoundation.org

Welcome to CuraLink—a newsletter for innovators building a healthier future for all.

Dear Cura Community,

Welcome back to CuraLink, a newsletter and interview series featuring the most pressing issues in human health, unmet medical needs and the emerging innovations and technologies directed to address them.

Last month, we learned how to fight the world's greatest killer—cardiovascular disease. We were honored to speak with interventional cardiologist, cardiovascular researcher and educator, [Dr. C Michael Gibson](#). For tips to keep your heart healthy, access the issue at bit.ly/CuraLink-21.

In the last issue of CuraLink this year and following the convening of global leaders at the 2023 United Nations Climate Change Conference (COP28) in Dubai, we examine the effects of climate change on our health. Climate change can often feel abstract or distant from our daily lives. But data shows that it not only wreaks havoc on our natural environment, it also jeopardizes our health. This month, physician and environmental scientist, [Dr. Lisa Patel](#), shares the insidious health effects of climate change as well as the crucial tactics to address them. Together, Dr. Patel says, we can create a safer, cleaner and more connected world.

As we enter this holiday season, we would like to wish all of you a wonderful holiday and a healthy, joyous and peaceful 2024! We are grateful to each of our community members and thank you for your continued engagement and support.



Robin L. Smith, MD

*Founder, President and Chairman,
Cura Foundation*

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A conversation with Dr. Lisa Patel

Often, medical professionals can fall into a specific mode of thinking and focus primarily on alleviating acute physical or mental symptoms. Dr. Lisa Patel, however, takes a broader perspective: She views her patients within complex frameworks of social and environmental determinants of health. The factor that trumps others in shaping health and well-being? It may surprise you: climate change.

According to Dr. Patel and decades of mounting evidence, our changing planet and rising carbon emissions jeopardize the global population's well-being. Dr. Lisa Patel is currently the executive director of the Medical Society Consortium on Climate and Health and maintains a clinical practice as a pediatric hospitalist caring for newborns, premature infants and children requiring hospitalization. She has witnessed the dire effects of climate change on hundreds of real patients and offers unparalleled insight into navigating the new era of climate medicine.



Lisa Patel, MD, MESC, Clinical Associate Professor of Pediatrics, Stanford Medicine Children's Health and Executive Director, Medical Society Consortium on Climate and Health

What sparked your interest in environmental science?

It started with Carl Sagan and his movie "Contact." I saw it the summer before I started college. I read his books where he wrote about how special, small and fragile our Earth is. It made me want to protect our world. So I studied ecology and evolution in college.

Beyond studying the issues, I wanted to improve them. That's how I got involved in environmental science and working for the Environmental Protection Agency (EPA).

What inspired you to pursue medicine after focusing on the environment?

While I was at the EPA, I worked on a project on childhood asthma in New York and Mumbai. Each megacity has a high rate of childhood asthma and was sharing lessons learned. I went to visit a hospital in Mumbai. There were so many children suffering from asthma attacks that healthcare providers had to rent a nearby gymnasium to house them. It was crazy. There was no reason why children should be struggling to breathe because we've polluted the air.

From there, it was a long path through medicine. The 2019 youth climate movement made it clear where I needed to focus my time, which was in transitioning toward renewables away from fossil fuels, which drive 8 million premature deaths per year. Fossil fuels cause the formation and exacerbation of asthma in children as well as other negative health effects.

How has climate change affected the health of your patients?

A few years ago during the wildfire season in California, there were high winds. So one night during a 24-hour shift, the power was cut to prevent another wildfire from igniting.

This hadn't happened before, and we were not prepared. We learned which parts of the hospital retained power and which didn't. All of the mothers who had just given birth in our laboring rooms were in a blackout. Fortunately, the generators kicked on to ensure that the neonatal intensive care unit (NICU) had power.

Later, in 2020, the smoke across the area was so heavy that you could smell it in the NICU. No matter where we are, we can't keep our children safe from toxic pollution.

Throughout my career, I've cared for infants, athletes and outdoor workers experiencing the health effects of heat. With babies, there's a higher risk of dehydration. Either parents will give infants some water because they think they're thirsty or over-bundle them in the heat. I've cared for infants who've been severely dehydrated as a result.

For athletes, especially in areas unfamiliar with extreme heat, just a slight temperature rise can tip them over and cause heat stress, heat illness and a condition called rhabdomyolysis, where muscle breaks down. I cared for a teenage outdoor worker who was hauling bricks in 108°F. He came in with kidney damage. We were able to reverse it quickly because he was 16. But we know that outdoor workers, in particular, have a risk of chronic kidney damage down the line from worsening heat.

Last year, we experienced a heat dome here in California, where it reached 116°F. I had two of the worst shifts of my career involving children with respiratory complaints, deliveries where the infant was in distress and new mothers experienced heat-related issues.

Have these trends changed significantly since you initially trained in medicine?

Wildfires have always been part of the landscape in parts of the western U.S. But the frequency and severity are on an upward trajectory. We used to have wildfires every few years. Now, it's annual. We used to be able to contain them. Because of drought driven by climate change, places have become so dry that these fires burn uncontained for weeks. That throws off extremely toxic wildfire smoke, which we estimate is up to 10 times more toxic than the typical air pollution we breathe from burning fossil fuels.

How does your work as a clinician inform your work in fighting climate change and vice versa?

Studies show that 50 to 70% of patients' health outcomes are not determined by what happens within the clinic or hospital walls. They're determined by social and structural determinants of health.

"Climate change will be the single greatest determinant of health for a child born today."

It's important for every single physician to not only do their clinical work but also engage in improving social and structural determinants of health, including climate change. Fighting climate change is part of our oath to do no harm and protect our patients.

Not only is climate change a threat in and of itself, but it's also a health threat multiplier. It stands to make the existing threats people deal with far worse, like poverty, racism, interpersonal violence, food insecurity, housing insecurity and mental health issues. On hotter days, for example, we see more suicide attempts and interpersonal violence. Worsening heat makes people without secure housing more vulnerable.

How dangerous is climate change when it comes to human health?

Ten thousand years ago, our planet was very cold. Greenhouse gases allowed Earth to warm and our civilization evolved to survive in this temperature "sweet spot." By burning fossil fuels, we've pumped so much carbon dioxide and other warming gases into the atmosphere that we have destabilized our planet.

"Climate change will leave no human life phase or organ unaffected."

We are living out a natural experiment. We've never seen such a steep rise of carbon dioxide across human civilization. This leads to what Katharine Hayhoe calls "global weirding." Places are dealing with brand-new threats. You see hurricanes in Southern California and blanketed wildfire smoke in New York. We also see threats worsening in places that are not adapted to them. For example, in Miami, sometimes the sewage overflows and spreads in the local waters due to sea level rise and flooding.

What are the most harmful health effects of climate change?

Allergy season and air pollution: Plants are thriving when they're not supposed to, making allergy seasons longer and worse. Meanwhile, burning fossil fuels releases air pollution from fine particles called PM 2.5. Breathing these tiny particles sets off an inflammatory cascade, which leads to a higher risk of premature death, stroke, heart disease and lung diseases like asthma. It can also cause preterm birth and low-birth-weight infants, as well as Alzheimer's.

Heat: Scientists have asked: "What are the temperature limits that humans can survive?" There are places on this planet, in South Asia and the Middle East, where we have reached those temperatures (~115°F) just this past year. That should alarm us. With extreme heat, we see heat illness, heat stroke and kidney damage. It can result in troubled breathing, pulmonary issues like chronic obstructive pulmonary disease and asthma exacerbations as well as preterm birth and low-birth-weight infants.

Water quality: Flooding events are overwhelming our municipal systems. They cannot clean all the water that goes out, which causes various enteric diseases to spread. In Jackson, Mississippi, for example, there has been chronic underinvestment in public infrastructure because of systemic racism. Add on big flood events and you have an entire city that doesn't have access to potable drinking water. This is a moral injustice.

Vector-borne disease: For the first time, we've seen an endemic spread of malaria and Lyme disease in places like Texas and Florida. As places warm, mosquito habitats spread along with vector-borne diseases.

Mental health effects and degradation of living conditions: Mental health is a big one. We are attaching new words to understand what we're living through right now. Solastalgia is the sense of being homesick while being at home which means sadness for



Dr. Patel at Protect Our Health event in Washington, D.C.

this known beautiful world that we're losing. Eco-anxiety is the sense that we can't control these larger systemic forces that are destroying a livable world. We're all feeling these things by watching the news and seeing the places that we love change.

Then consider those who live through climate disasters. I worked with a school psychologist in Sonoma who said that local kids have been displaced many times because of fires. Some will cry when they see smoke in the sky because they're so traumatized from those events.

Scientists have studied children who went through Hurricane Katrina and found higher rates of depression and PTSD years after the event. Being displaced from your home and your community being torn apart is devastating. It's a hard thing for families to recover from particularly if the surrounding ecosystem that they're in isn't resilient in handling these stressors.

Take Lake Charles, Louisiana, for example. It was hit with one hurricane, then a chemical plant exploded and a second hurricane came through. We can expect that places will be hit with one climate disaster after another. Places won't even have a chance to recover.

When cities undergo these massive events, like floods or hurricanes, the trash and waste disposal system shuts down, potable drinking water becomes scarce and homes become infected with mold. We have to invest a lot of money to help people rebuild their homes. But often, there is systemic racism affecting who gets loans for their businesses or homes. When people get displaced, where will they move?

Food: At the Medical Society Consortium, we wrote a letter advocating for better food and farm policy that included 40 health organizations. The Farm Bill will come up for negotiation in the spring of 2024. Health organizations have typically not weighed in aside from commenting on the Supplemental Nutrition Assistance Program, which is very important.

Clinicians need to advocate to ensure nutritional access in the future, which depends on the rate of climate change. So we put forward recommendations for making more plant-forward foods (fruits, vegetables, legumes and seeds) cheaper and more accessible and moving away from our crop subsidy system that is polluting the environment and is bad for our health. This includes soy, wheat and corn that are heavily subsidized and used to produce processed foods.

The agricultural sector is responsible for about 11% of our emissions. We won't solve the climate crisis by reforming the agricultural sector alone. But we also won't solve the climate crisis without reforming it.

Risks for Children: Overall, children are especially vulnerable to these effects. Infants cannot thermoregulate as well as older individuals. They are at a higher risk for mortality if they're born during a heatwave, for example. Kids can be more sensitive to air pollution as well, as there is really rapid lung development in the first five years of life. Children also have less adaptive capacity.



In addition to her advocacy work in climate medicine, Dr. Patel maintains a practice as a pediatric hospitalist caring for newborns, premature infants and children requiring hospitalization

Does the medical community fully appreciate the role of climate change in human health? Is that awareness changing?

It's changing fast. Compared to five years ago, we see more health systems and health professionals concerned and taking action. It's still the minority, but I'm really excited by the people involved and the changes occurring at the system level.

More medical schools are offering curricula on climate change like the [Climate Resources for Health Education](#), thanks to the work of medical students who went lecture by lecture to integrate that information. There's a planetary health report card that [Medical Students for a Sustainable Future](#) created. Institutions can compete with each other to see who is offering the most rigorous content. We're seeing increasing numbers of medical schools sign up for it. Eventually, we'll get to a place where all medical schools offer this curriculum.

In March 2023, the [U.S. Department of Health and Human Services](#) announced the Health Sector Climate Pledge to prioritize sustainability, which now has signatories from 1,150 hospitals representing more than 15% of hospitals in the U.S. It's the beginning of a movement, where sustainability won't be "extra credit" anymore. Every hospital should include this as part of its mission to do no harm.

Medical societies are passing internal policies and lobbying against climate change. The American Medical Association recently passed a policy statement and is spending more resources working on climate change. The American Academy of Pediatrics and the American College of Physicians have also been amazing leaders in the space. All of this gives me a lot of hope.

How is climate change challenging our healthcare systems? How should they adapt?

Natural disasters and extreme heat can drive a lot of people into healthcare systems. Hospital systems and cities tend to have emergency procedures for threats that they are familiar with. New York, for example, created emergency response protocols after the September 11 attacks in 2001. They've integrated climate change into those protocols, particularly around heat. In California, we have emergency preparedness and infrastructure around earthquakes. We now need to build climate change

threats into people's thinking in terms of preparedness. Health systems need to prepare for blackouts and brownouts as it gets hotter and grids become overtaxed by air conditioning demand. Installing solar for backup will improve the resilience of hospitals and clinics.

In terms of patient interactions, we quickly need to build people's understanding and capacity to address climate change. We can't do that in one visit. Right now, climate change typically gets discussed only if a clinician is passionate about it. All clinicians should include periodic nuggets of information integrated into our screening tools and patient education materials.

What inspired you to become the executive director of the [Medical Society Consortium on Climate and Health](#)? What are the Consortium's primary objectives and how has it grown?

In 2016, the new administration that came to power in the U.S. was proposing policies that threatened children's health—taking away health insurance, reducing people's access to the Supplemental Nutrition Assistance Program and not addressing gun violence in a serious way. As a pediatrician and a mother, I wanted to fight for the country that I wanted for my kids and all the kids that I treat. I started learning skills in advocacy through the American Academy of Pediatrics, then found a group of passionate doctors and medical students to work with on climate change in 2019. With that group, we were able to do a number of exciting things, like helping our healthcare center commit to sustainability goals and introducing board certification materials on climate change for pediatrics. Now as executive director, I meet many people who want to make a difference.

Having been through that emotional journey myself, I want to make it as easy as possible. I don't want anyone to struggle to find their place. Because the solutions are simple. We have resources and infrastructure. We just need people to join us.

What progress has the climate movement made?

I've been studying environmental science for 25 years. Decades ago, climate change was presented as a problem for the polar bears—distant species in distant places. Now, more people understand that this is a personal issue jeopardizing our health. When we understand climate change that way, much more will get done.

It's been hard watching these heat events and wildfires happen and people suffering. But these events show people that they can't escape the health threats of climate change. If there is a silver lining to these terrible events, it may build more public momentum for creating a healthier and more sustainable world.

We've seen data suggesting the world is heading towards multiple ecological tipping points. Do we still have time to prevent crossing those thresholds? If so, what do we need to do?

There might be some tipping points that we have crossed, and we can't undo that. But that doesn't mean that we can't prevent crossing others. Every 10th of a degree of warming that we prevent is a lesser catastrophe than we would have encountered.

We can feel a lot of gloom and doom, but we should focus on the world that we're creating by switching to cleaner forms of technology. We're creating a world that is more beautiful, clean, connected, sustainable, healthy and just. If we think too much about the tipping points and the catastrophes, we'll talk ourselves out of our capacity to do something big and important.

Often, education and outreach focus on changing individuals' actions. But the stakeholders who can shift climate mitigation at scale are typically large industries and governments. Is environmental responsibility being misplaced? If so, how can we motivate large stakeholders to change course?

Historically, the fossil fuel industry has funded campaigns to put responsibility on the individual and take attention away from the true systems responsible. Driving a gas-powered car or eating meat doesn't disqualify you from talking about climate change.

We've set up systems that make it nearly impossible to live a carbon-free reality. People should take whatever individual actions they can, but what's more important is to talk about the issue. Tell others in your life that you're concerned about it and here's what you're doing about it.

The most powerful climate action is voting. Talk to your representatives about how important climate change is to you and to your health. It is especially powerful when health professionals discuss why climate change matters to our health. It makes climate change less of a political issue and puts it in the realm where it belongs, which is health.

What are the most pivotal actions that our readers can take?

Electrify your home: I would draw people's attention to [Rewiring America](#). There are resources built into the Inflation Reduction Act like tax credits to electrify your home, install heat pumps or switch to an induction cooktop, which save energy and reduce indoor air pollution.

Minimize your food waste: About 35% of the food we produce in this country gets wasted. It contributes to methane gas, which



Dr. Lisa Patel with fellow climate and health advocates during the Medical Society Consortium on Climate and Health Annual Meeting in Washington, D.C. in March 2023. Dr. Patel is the executive director of the Consortium.

is about 20 times more potent a warming gas compared to carbon dioxide. So take containers to restaurants for leftovers and be thoughtful about what you buy.

Transportation: The amount of gas we burn in five-minute car trips is remarkable. Switching to walking or riding bicycles is hugely helpful.

The health effects of climate change often weigh on marginalized populations least responsible for the problem. How can stakeholders foster environmental justice and equity in climate change mitigation efforts?

Ultimately, we need to listen and not lead. Marginalized communities should be setting the agenda while we provide the tools. For example, we worked with community organizations in Stockton, California, which has some of the worst air pollution in the country. The group was deciding how to spend millions of dollars from the state government to help redress historic injustices. They asked us for help finding related data, and we gave it to them. That is how these partnerships should work.

We should give environmental justice organizations the tools they need to advocate for themselves. In spaces where they feel like their voice isn't being heard, we help carry their message to decision makers. Because of traditional power structures, there are times when our voice is more resonant. We always honor their requests and interests in moving the agenda forward.

We also have a climate health inequity fellowship for doctors of color at the Consortium, who can work alongside environmental justice organizations in their communities as a trusted voice.

What does a climate-resilient community look like?

A climate-resilient community is a place with affordable housing, where people across a variety of incomes live together. You can walk or take public transport to school, work or the grocery store. You bump into other people that you know along the way.

There are places where community members can gather in case it is a hot or smoky day—green spaces, libraries and community centers where people can stay safe if their homes aren't. It's a power-resilient place fueled by clean, renewable energy. There are community sources of solar energy that keep local clinics and hospitals powered. Houses also have backup energy sources so their food doesn't go to waste if their power gets cut. There is access to clean drinking water, clean air to breathe and healthy food to eat. It's a safer, cleaner and more connected world.

As we look toward the next decade, what is your ultimate hope for the climate health movement?

My hope is that climate change is not something addressed by a minority of people. It should be a charge that everyone feels, whether you devote 1 or 100% of your time to the cause. Everyone should understand how climate change is threatening our health, justice and survival and ultimately become part of the solution through their jobs or lives.

This interview has been edited for length and clarity.



A Modest Proposal To Save Mothers' Lives

[The Atlantic](#), November 2023

The U.S. is facing a surging maternal mortality rate, with over half of maternal deaths occurring after delivery. Pregnant women are not as young as they once were, and pregnancy and childbirth can present grave dangers, particularly when a woman already has underlying health conditions. Doctor of physical therapy, Rebeca Segraves, has developed an approach called "enhanced recovery after delivery" (ERAD), which encourages an evaluation for every woman after childbirth. ERAD includes assessments of body mechanics, cardiopulmonary function, gait retraining, infant lifting and lowering techniques and incision-protection training. Dr. Segraves believes these interventions could be lifesaving for new mothers, as warning signs of major postpartum killers, such as preeclampsia, stroke, hemorrhage and infection, may not appear until a woman returns home.



Why Some Seniors Are Choosing Pot Over Pills

[The New York Times](#), November 2023

Seniors are becoming some of the fastest-growing cannabis users in the U.S. Studies suggest that some are turning to the drug for the first time to help them sleep better, dampen pain or treat anxiety. Cannabis use in people 65 and older in the past year rose from only about 0.4% in 2007 to more than 8% in 2022. Although cannabis is now permitted for medical use in 38 states and D.C., it is not federally legal so there is a lack of research on its benefits, potential harms and proper dosage. There are grass-roots efforts among seniors to teach one another how to use cannabis but doctors don't have enough to guide them on what it may be helpful for and who may be at risk for adverse effects.



Apple Has Plans To Eventually, Maybe Revolutionize Health Care

[Bloomberg](#), November 2023

Apple is working on devices for health monitoring and disease prevention, but employees are divided over whether they should serve healthy or sick people. Avolonte Health, a startup established by Apple in 2011, aimed to revolutionize diabetes care by developing a noninvasive blood sugar monitor. However, since then, Apple's efforts and strategy in health care have been short-circuited by philosophical disagreements, a culture of conservatism and technological realities. These included Avolonte's glucose monitor, a blood pressure cuff that didn't need to inflate and an experiment with in-person clinics for its employees. Some of these are still in development while the clinics have proven to be too costly to commercialize. Apple has helped bring health tracking into the mainstream with its Apple Watch and plans to turn its forthcoming Vision Pro headset into a health and fitness device as well.



Doubts Abound About a New Alzheimer's Blood Test

[KFF Health News](#), October 2023

Quest Diagnostics has introduced the AD-Detect[®] blood test, which measures elevated levels of amyloid-beta proteins, a signature characteristic of Alzheimer's disease. The test is targeted at people aged 50 and older who suspect their memory and thinking might be impaired and those with a family history of Alzheimer's or genetic risks. However, Alzheimer's researchers and clinicians are concerned about the test's validity, as it has a high chance of false-positive results because cognitive symptoms prompting a test might be due to other causes, such as mini-strokes, sleep apnea, thyroid problems, vitamin B12 deficiency or medication interactions. Therefore, the Alzheimer's Association does not endorse its use by consumers.



Unvaccinated and Vulnerable: Children Drive Surge in Deadly Outbreaks

[The New York Times](#), November 2023

Over 60 million children worldwide have not received a single dose of standard childhood vaccines due to disruptions during the COVID-19 pandemic, and an additional 85 million are under-immunized. Outbreaks of measles are seen in 47 countries; 12 countries report a circulating polio virus and Nigeria is facing the largest diphtheria outbreak in its history. Many "zero-dose children," most of which are in Nigeria, Ethiopia, India, the Democratic Republic of Congo and Pakistan, have now aged out of routine immunization programs, accounting for nearly half of all child deaths from vaccine-preventable illnesses. UNICEF is urging to implement catch-up vaccinations to reach these children and asking Gavi, the organization that helps fund vaccination in low- and middle-income countries, to purchase \$350 million of vaccines.



Weight-Loss Drug Wegovy Slashes Risk of Death in Some People with Heart Disease

[Scientific American](#), November 2023

A new trial by Novo Nordisk has shown that semaglutide, a drug used in Ozempic and Wegovy, can lower the risk of heart attack, stroke and death from cardiovascular disease by 20%. The drug, a GLP-1 receptor agonist, regulates appetite hormones by lowering blood sugar and slowing the stomach's emptying rate causing people to feel full longer and avoid eating. The study, known as Semaglutide Effects on Cardiovascular Outcomes in People with Overweight or Obesity (SELECT), involved over 17,000 people with cardiovascular disease but not diabetes, and the results were published in [The New England Journal of Medicine](#).

Updates & Events

- On November 16, *The New England Journal of Medicine* presented Fossil Fuel Pollution and Climate Change. The editors of *NEJM* discussed the broad range of health impacts of fossil fuel and climate change and how physicians and healthcare leaders can help safeguard their patients' health. The event recording can be viewed at events.nejm.org/events/625
- For the first time, the 2023 United Nations Climate Change Conference (COP28) that took place from November 30 to December 12 in Dubai, United Arab Emirates, featured Health Day. The event convened on December 3 with participation from stakeholders including ministers, climate and health professionals, civil society organizations, youth representatives and business leaders to bring the climate-health agenda into the mainstream. To learn more about COP28, please visit cop28.com
- How Anchor Institutions Improve Patient, Community and Workforce Health presented by *The New England Journal of Medicine Catalyst* took place on December 6. Healthcare leaders discussed why and how to develop an anchor mission and become an anchor institution in your community to go beyond sick care and address the drivers of wellness. Watch the event at events.catalyst.nejm.org/events/how-anchor-institutions-improve-patient-community-and-workforce-health
- In 2023, AARP and Social Innovation Summit partnered to present Longevity Plus, a conversation series with renowned experts and industry leaders to help you understand how longevity is changing and what it means for the most important questions facing businesses and organizations. Topics included Life Expectancy in Flux, Advances in Life-Extending Measures and Resilience. The fourth webinar in the series, Empowered Futures: Longevity and Disability, took place on December 7. To view the webinars, please visit aarp.org/pri/topics/aging-experience/longevity/longevity-plus-webinar-series
- The J.P. Morgan 42nd Annual Healthcare Conference will take place on January 8-11, 2024, in San Francisco, California. This annual meeting is the largest and most informative healthcare investment symposium in the industry connecting global industry leaders, emerging fast-growth companies, innovative technology creators and members of the investment community. Learn more at bit.ly/JPMorgan_2024



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