

GEH Podcast- Climate Change and Cancer

Narrator: When Hurricane Maria struck Puerto Rico in 2017, the island plunged into a health crisis. [The cancer care community](#) was among those affected. Loss of telephone and internet service left cancer patients unsure about treatment schedules. Oncologists, referring physicians, and patients all struggled to connect, while cancer clinics did what they could to provide treatment.

Interrupted medical care was reportedly the [main cause](#) of a high death rate in Puerto Rico in the months following Maria. Research indicates that climate change is making [extreme weather events](#) more likely, which also means a growing risk to health. People with cancer are uniquely vulnerable to climate hazards given the variety of physical, mental, and socioeconomic hardships they encounter.

In this episode, we talk with former NIH Climate and Health Scholar Leticia Nogueira, a scientific director with the American Cancer Society. She describes the connections between climate change and cancer, and what can be done to improve cancer outcomes.

Personal experience drew Dr. Nogueira to this field. In 2017, she was the director of several health registries at the Texas State Health Department when Hurricane Harvey devastated Houston.

Nogueira: Harvey behaved completely different than any other hurricane that had hit Houston before. And I was able to see firsthand the impact that a climate-driven storm had on the community. That's when climate change and cancer collided for me, because can you imagine trying to get your cancer treatment, or having all of the financial and mental and physical symptoms that comes with cancer diagnosis and treatment, and then going through something like Harvey? So that's really when the light went, 'Oh, well, this is what I need to work on.'

Narrator: As she dove into the topic, Dr. Nogueira discovered how the causes and effects of climate change are inextricably tied to cancer outcomes. For instance, the fossil fuel burning that contributes to a warming climate *also* produces toxic air pollution.

Nogueira: We have, for example, PM 2.5, which is particulate matter that is smaller than 2.5 micrometers, the very tiny pollution that goes way inside your lungs. Breathing this type of pollution is associated with several different types of cancer.

Narrator: Extreme weather events can also cause greater exposure to toxic chemicals in the environment. In one study, researchers funded by the NIEHS Superfund Research Program [looked at chemical exposures](#) among Houston residents about a month after the hurricane, and then a year later. Shortly after the storm, residents experienced higher exposures to certain chemicals that may cause cancer. Those included volatile organic compounds and polycyclic aromatic hydrocarbons.

Nogueira: The Houston Ship Channel is a petrochemical area. There's a lot of oil refineries and other industries in the area. When a climate-driven disaster hits, the environmental hazards, the carcinogens, can leak into communities. When Hurricane Harvey hit, many of the communities were contaminated. But of course, this type of infrastructure is everywhere around the globe, leaking carcinogens in communities, contaminating the air, the water, the soil.

And also, we know that polluting infrastructure is more likely to be developed near communities that have been targeted for marginalization, that have been disenfranchised, and might not have the political power to oppose that development.

Narrator: Climate-driven disasters also pose a threat to people already diagnosed with cancer. For example, flooding can impede travel for clinicians and patients alike, with dire implications.

In one study, Dr. Nogueira and colleagues found that [hurricanes were associated with lower overall survival](#) among patients receiving radiation treatment for advanced lung cancer. Lapses in treatment could be responsible for the finding, says Dr. Nogueira. Consider the following scenario.

Nogueira: So you are undergoing cancer treatment, receiving radiation for lung cancer, and then the facility where you're receiving treatment is impacted by a hurricane. And radiation is especially vulnerable to this type of climate-driven disaster because you have to have reliable electricity, radiation treatment requires a specialized team, and the team has to have access to the facility, and, of course, the patient has to have access to the facility daily to receive the treatment. And for these very aggressive tumors, if you miss even a couple of days, there might be an impact on long-term survival.

Narrator: Unfortunately, climate-driven disasters can affect cancer survival post-treatment as well. In a separate study, Dr. Nogueira and team found a connection between wildfires and increased risk of death among patients [recovering from lung cancer surgery](#).

Nogueira: So, imagine, it's a very involved, very serious surgery. You are doing well, you're discharged from the hospital, you go home, and then there is a wildfire near your house. In addition to inhaling the smoke, which we know is not healthy, you would have all of the mental health distress associated with potentially having to evacuate. And there might be disruptions in care there as well. So, we also see an association with people recovering from lung cancer surgery have worse overall survival if they've been exposed to a wildfire.

Narrator: Additionally, climate change can affect cancer outcomes by crippling medical supply chains, with potentially life-threatening consequences. When Hurricane Maria hit Puerto Rico, factories that made intravenous fluid bags sustained major damage. The supply interruption [magnified an IV bag shortage](#) already affecting U.S. hospitals. The crisis highlighted the ripple effect of climate hazards on health.

Nogueira: Climate-driven disasters can disrupt access to care, even when they hit far away from where care is being delivered, which is what happened with Hurricane Maria and the IV fluid bags. As more and more places throughout the globe are getting impacted by climate-driven disasters, the chances that there's going to be disruptions to the supply chain continue to increase.

Narrator: Now you may be wondering, what can be done to improve cancer care in the face of climate-related disasters? Dr. Nogueira has some ideas, starting at the patient level.

Nogueira: We need to understand that when people are going through cancer treatment, or they receive the news of a cancer diagnosis, there's a lot that the person, the caregiver, the loved ones, the family have to deal with. The last thing that we want to do is to put the burden on the individual to prepare and respond to a climate-driven disaster. We want to make it as easy as possible for the health system to be prepared to attend to their needs.

Narrator: Every cancer patient should discuss plans for continued treatment during disasters with their oncologist or other health worker. An important step for health practitioners is to identify the most vulnerable patients. Patients could be pre-registered at special needs shelters and moved there when disaster is imminent.

Nogueira: We can be proactive about transferring treatment to special needs shelters. These are shelters that have their own generators, that have medical personnel on site, and can better attend to the needs of these patients to communicate about the hazards of high temperatures, increased pollution, contact with floodwaters, what to do to avoid these types of contact, and also how to recognize early symptoms that might be associated with detrimental health consequences of climate change and disasters.

Narrator: Permanent treatment centers can also take measures to ensure climate resilience. For example, health care facilities traditionally used diesel generators for emergency backup power. But in 2023, the Centers for Medicare and Medicaid Services [declared](#) that facilities using *microgrids* can be reimbursed for health care services provided. Microgrids are small electrical grids that can run independently of a main grid on renewable energy like solar.

To see real progress in cancer care resilience, however, experts should be sharing lessons from disasters they have experienced, says Dr. Nogueira. Preparedness efforts should also be highly coordinated and widely implemented.

Nogueira: As of right now, there is no champion for emergency preparedness within the cancer community, right, not a funding agency, not an accreditation institution, that really has prioritized this. The hope is that more and more researchers throughout the globe get involved in this type of research so we can better understand the vulnerabilities of these communities, and then design interventions to better protect and address these vulnerabilities as the climate continues to change.

I think that we've all been touched by cancer, right? It's a disease that doesn't really spare any family. We've all recognized the impact that it can have in our lives. If there's an increased awareness or recognition of how some of these hazards are impacting the cancer community, that in itself would be motivation for us to do better.

Narrator: And, by committing ourselves to improving cancer outcomes in the face of climate change, we end up protecting the planet as well, says Dr. Nogueira.

Nogueira: Having worked on this for a while now, I see how so many of the solutions to better protect the patient also have climate co-benefits. And conversely, so many of the solutions for climate then reduce cancer risk and improve cancer outcomes. So that win-win part is what makes me hopeful. So many times, the right thing to do is the thing that helps the climate and helps the patient.

Narrator: The National Institute of Environmental Health Sciences funds research to better understand the health effects of climate change. You can learn more about the institute's research by visiting our website at www.niehs.nih.gov/GEH. Thanks again to Dr. Leticia Nogueira for joining us today. You've been listening to Environmental Health Chat, brought to you by the Global Environmental Health program at the National Institute of Environmental Health Sciences.

