

# Paul Epstein

Long before climate change was a hot-button topic, Paul Epstein was arguing that warmer temperatures can widen the spread of infectious diseases, disrupt ecosystems and topple economies.

He's not a climatologist, an ecologist or an epidemiologist. But Paul Epstein can explain exactly how burning fossil fuels in your backyard can trigger an infectious disease outbreak thousands of miles away.

Epstein, a physician trained in tropical diseases, has made it his life's goal to study the acute consequences of climate change on public health.

The warming climate—due primarily to heat-trapping gases from the combustion of fossil fuels—can increase weather swings, causing heat waves, floods, droughts and hurricanes which Epstein says we're already seeing. And these weather extremes and warmer temperatures, he says, enable pests such as malaria-carrying mosquitoes to expand their range.

Curbing global warming is the key to controlling the 30 infectious diseases that have emerged in the past 30 years, Epstein says. "The way we develop energy is not sustainable and it's having multiple impacts on our health, on our ecological systems and ultimately on economic stability."

As associate director of Harvard University's Center for Health and the Global Environment, Epstein has brought together insurers, national and global agencies, and scientists from multiple disciplines not usually known for their cooperation to study the issue.

The impact on economies in particular caught the attention of insurers, prompting Swiss Re, a global reinsurance company, to collaborate with the United Nations Development Program and academic scholars in examining the effects of climate change. The report, which Epstein coauthored, went out to Swiss Re's clients and members of the US Congress and is used in classes at Columbia and Harvard Universities.

"Paul has enormous drive and energy to work on these issues," says Eric Chivian, the Harvard center's founding director and winner of the 1985 Nobel Peace Prize for his work on nuclear disarmament. "He's able to make connections that many people are not able to make."

Convincing skeptics that climate can feed disease outbreaks proved challenging from the start. But the idea gained support, in part owing to Epstein's skill at weaving dry information into a compelling story.

"When Paul speaks, people listen," says Virginia Burkett, a wetlands researcher at the US Geological Survey.

Despite his lofty goals, Epstein still makes time to see patients and flies to meetings all over the globe—England, Iceland, Germany and Mozambique this summer alone.

At 62, the packed schedule can be tiring, Epstein says, but he has no intention of slowing down. He still rides his bicycle to work—doing so even during the August heat wave—and has a reputation for trouncing younger colleagues at basketball, a game he played growing up in New York City's Greenwich Village.

Even then, Epstein knew he wanted to be a doctor, seeing it as an opportunity to save people and to travel. As a young doctor in

Cambridge, Massachusetts, Epstein became intrigued with the idea of practicing medicine in Mozambique, at the time a newly independent country that was attracting doctors and teachers from all over the world.

In 1978, he moved there with his wife, who is a nurse, and their children, then three and seven years old. The couple helped set up clinics in Beira, Mozambique's second largest city, to treat malaria, cholera, tuberculosis and other diseases as part of the American Friends Service Committee, a Quaker-run service organization.

In the two years the family spent there, some of them fell ill with malaria. The experience might have sent others running back to the States, but Epstein was nonchalant. "It was treatable, so we're fine," he says. "Overall I think [living in Mozambique] was a fabulous, positive experience."

The Portuguese Epstein learned then still serves him well, helping him treat the large number of Portuguese-speaking patients in Cambridge, to which the family returned in 1980.

In the late 1980s he established HIV services and a travel clinic at the hospital. "That was a pivotal time, digesting what I had done in Mozambique, thinking about the environment and ecological systems and how they were related to human health," he says.

As he began studying the relationships between these disparate elements, his focus shifted from the clinic toward more interdisciplinary projects. At the 1992 Earth Summit, a United Nations-sponsored meeting in Rio de Janeiro, Epstein suggested that warmer ocean temperatures enhanced large blooms of plankton harboring cholera bacteria, triggering the 1991 cholera outbreak in Peru (*Biosystems* 31, 209–221; 1993). The disease eventually spread to Mexico, killing 4,000 people and damaging the economies of several countries. Though thousands of journalists covered the summit, only the *Wall Street Journal* gave it any attention.

"That was a time when health and global environmental concerns really were not recognized at all," Epstein says.

Despite strident skepticism about his theories, he continued his work, linking climate change to allergies, asthma and a range of diseases, including those caused by hantavirus and the West Nile virus.

Most recently, Epstein reported in June that if global carbon dioxide levels increase as predicted, ragweed pollen production will spike by as much as 55%, triggering allergies (*Environ. Health Perspect.* 114, 865–869; 2006). "The direct impact of carbon dioxide on plants is having this unexpected side effect for public health," he says.

But critics say Epstein tends to glaze over complex relationships.

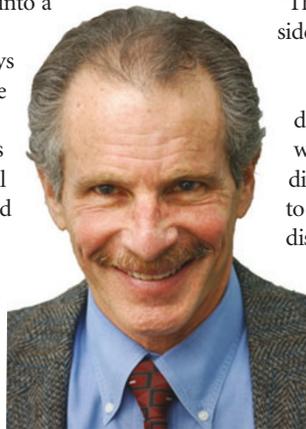
"Yes, there's climate change; yes, it could have an impact on these diseases because they're temperature sensitive," says Duane Gubler, who was director of the US Centers for Disease Control and Prevention's division of vector-borne diseases until 2004. "But it is an oversimplification to simply say that increased temperature is going to equate to increased disease incidence."

Gubler, who is now director of the University of Hawaii's Asia-Pacific Institute of Tropical Medicine and Infectious Diseases, disagrees with Epstein so strongly that he says he hasn't picked up *Scientific American* since the magazine in 2000 ran an article written by Epstein.

The skepticism doesn't faze Epstein.

"There's always been criticism of anyone who associates anything with climate," he says. The threat to human health and ecosystems is "sad and scary," and it can be difficult to talk about, he adds. "I do believe that systems have resilience and they can recover, but we've got to back off."

Alisa Opar, Cambridge, Massachusetts



"The way we develop energy is not sustainable and it's having multiple impacts on our health."