

# Scientists concerned about effects of global warming on infectious diseases

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As the Earth's temperatures continue to rise, we can expect a significant change in infectious disease patterns around the globe. Just exactly what those changes will be remains unclear, but scientists agree they will not be for the good.

"Environmental changes have always been associated with the appearance of new diseases or the arrival of old diseases in new places. With more changes, we can expect more surprises," says Stephen Morse of Columbia University, speaking May 22, 2007, at the 107th General Meeting of the American Society for Microbiology in Toronto.

In its April 2007 report on the impacts of climate change, the Intergovernmental Panel on Climate Change (IPCC) warned that rising temperatures may result in "the altered spatial distribution of some infectious disease vectors," and will have "mixed effects, such as the decrease or increase of the range and transmission potential of malaria in Africa."

"Diseases carried by insects and ticks are likely to be affected by environmental changes because these creatures are themselves very sensitive to vegetation type, temperature, humidity etc. However, the direction of change – whether the diseases will increase or decrease – is much more difficult to predict, because disease transmission involves many factors, some of which will increase and some decrease with environmental change. A combination of historical disease records and present-day ground-based surveillance, remotely sensed (satellite) and

other data, and good predictive models is needed to describe the past, explain the present and predict the future of vector-borne infectious diseases," says David Rogers of Oxford University, also speaking at the meeting.

One impact of rising global temperatures, though, can be fairly accurately predicted, says Morse. In the mountains of endemic areas, malaria is not transmitted above a certain altitude because temperatures are too cold to support mosquitoes. As temperatures rise, this malaria line will rise as well.

"One of the first indicators of rising global temperatures could be malaria climbing mountains," says Morse.

Another change could be the flu season. Influenza is a year-round event in the tropics. If the tropical airmass around the Earth's equator expands, as new areas lose their seasons they may also begin to see influenza year-round.

And extreme weather events will also lead to more disease, unless we are prepared. As the frequency, intensity, and duration of extreme weather events change, water supplies become more at risk, according Joan Rose of Michigan State University.

"Hurricanes, typhoons, tornados and just high intensity storms have exacerbated an aging drinking and wastewater infrastructure, enhanced the mixing of untreated sewage and water supplies, re-suspended pathogens from sediments and displaced large populations to temporary shelters. We are at greater risk than ever before of infectious disease associated with increasing extreme weather events," says Rose.

There will also be indirect effects of climate change on infectious disease as well. For instance, says Morse, the effect of global warming

on agriculture could lead to significant changes in disease transmission and distribution.

"If agriculture in a particular area begins to fail due drought, more people will move into cities," says Morse. High population densities, especially in developing countries, are associated with an increased transmission of a variety of diseases including HIV, tuberculosis, respiratory diseases (such as influenza) and sexually transmitted diseases.

"I'm worried about climate change and agree that something needs to be done," says Morse. "Otherwise, we can hope our luck will hold out."

Source: American Society for Microbiology

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