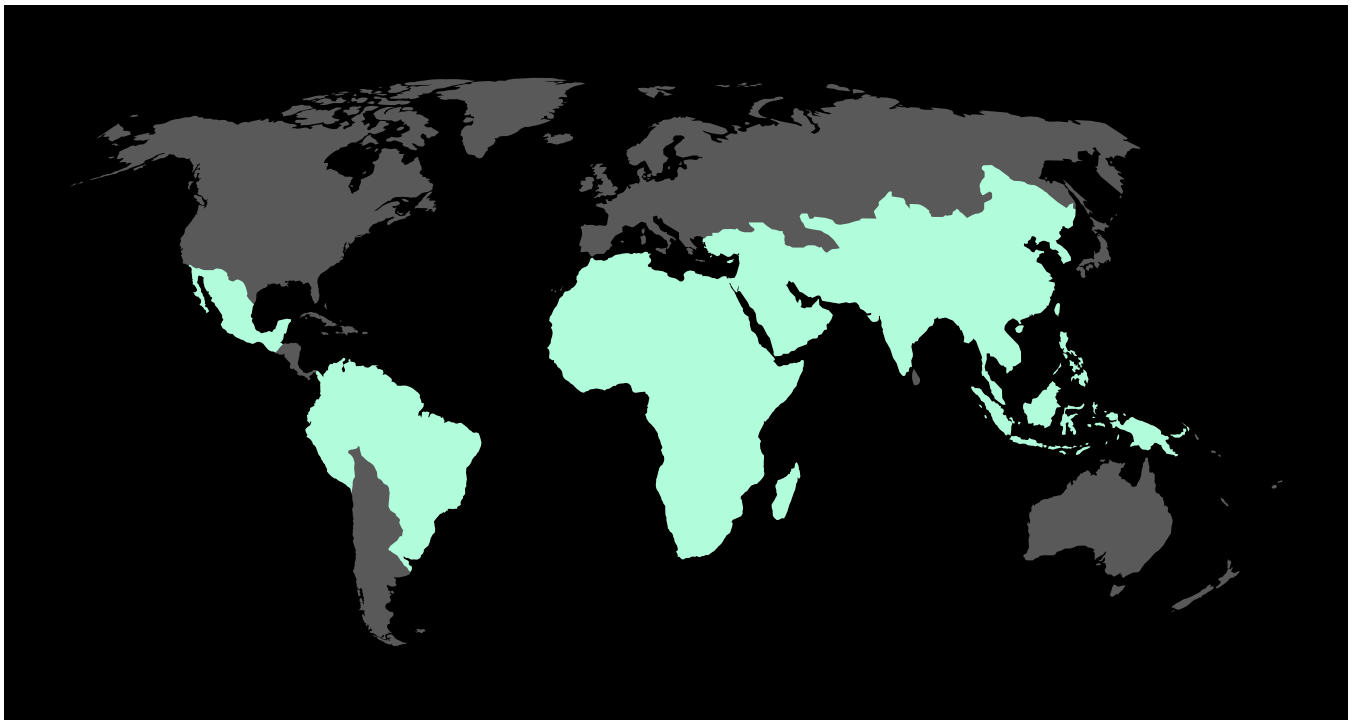


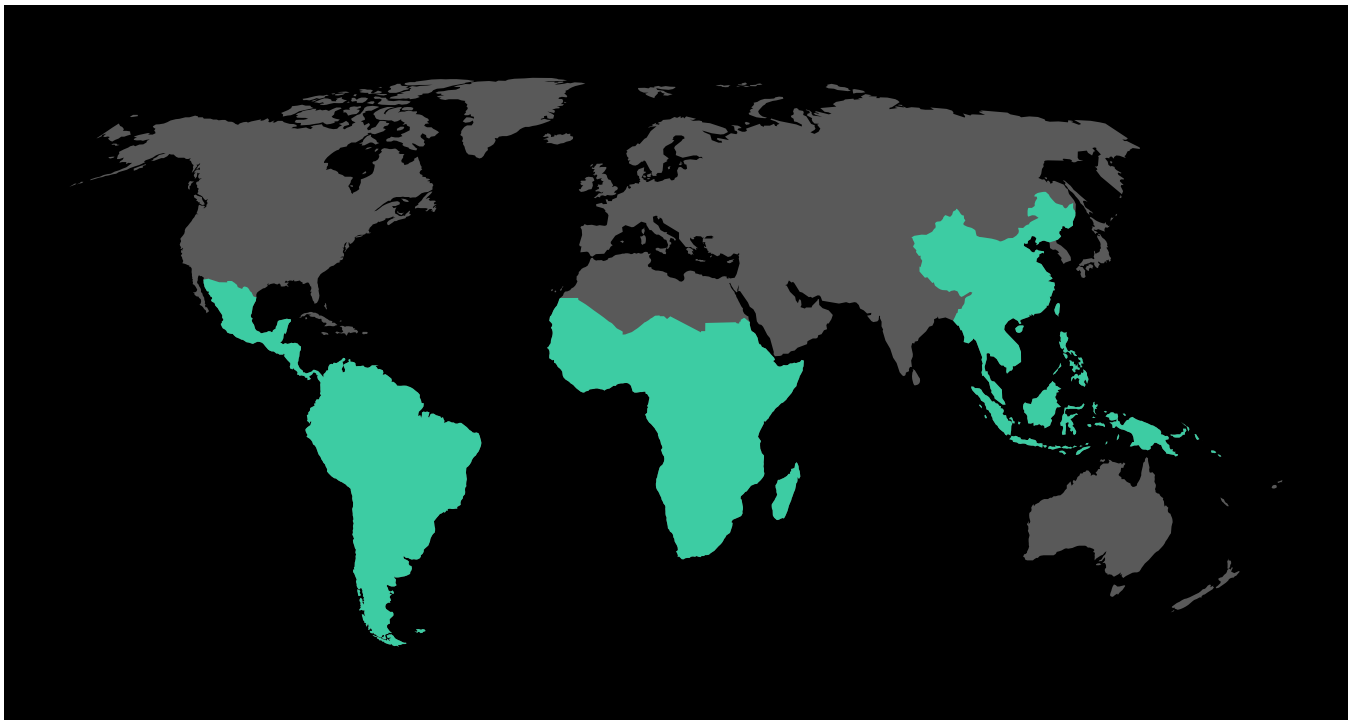
Rotavirus

Virtually every child in the world becomes infected with rotavirus (bottom left)—the most common cause of severe diarrhea among children—and most eventually develop natural immunity against the virus. Despite a newly introduced vaccine, the virus kills half a million children a year, mostly in the developing world.

Investigator Stephen C. Harrison (top left) and his colleagues took the first detailed molecular snapshots of rotavirus as it is caught in the grasp of an immune system molecule with the capacity to destroy it. The pictures revealed that the antibodies interfere with a protein on the virus's surface that helps it invade healthy cells. The researchers hope these pictures will help them develop a new generation of rotavirus vaccines that are easier to store and administer.

This interactive map shows the global distribution of rotavirus-related deaths between 2000 and 2004. It is based on the most recently available data from official sources. For more precise statistics, please visit: http://www.cdc.gov/ncidod/eid/vol12no02/05-0006-G2.htm

Photo credit: Top: Paul Fetters Bottom: Bryon Skinner/CDC



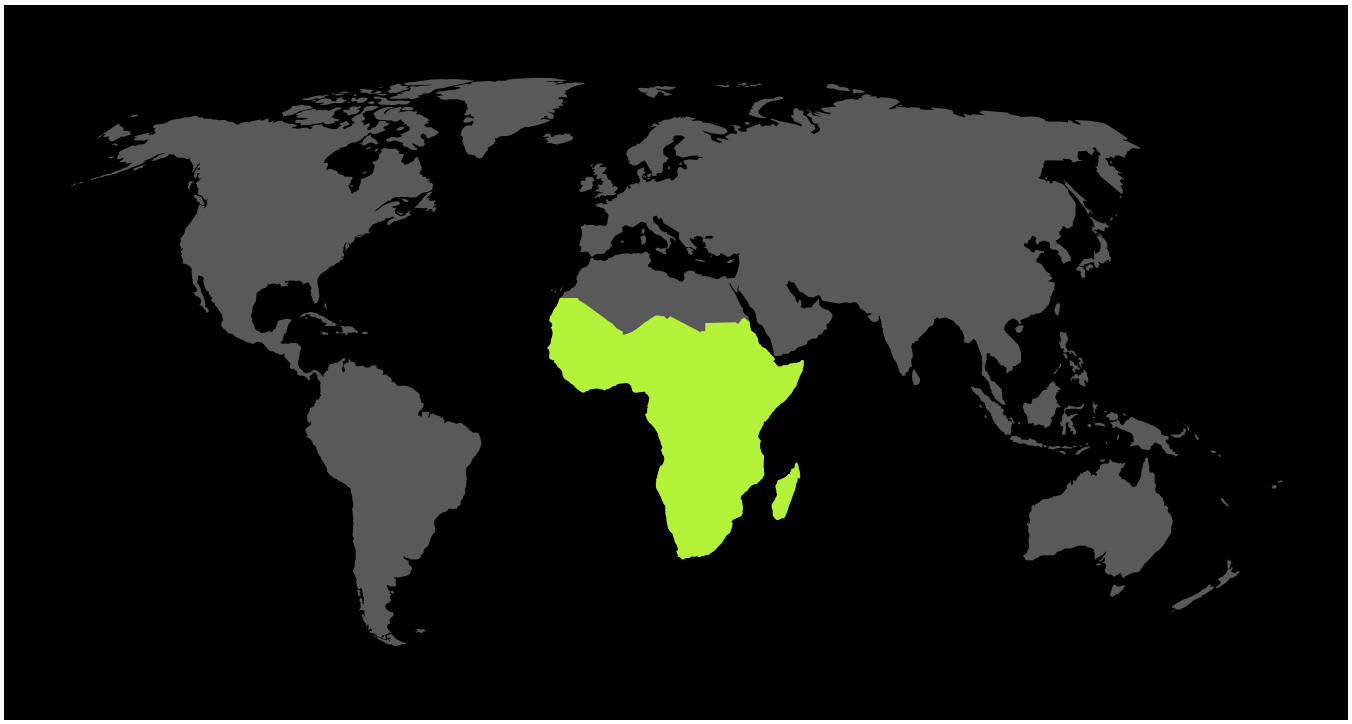
Hookworm

Walking barefoot can be dangerous in tropical or subtropical climates, where hookworms (bottom left) are common. While the infection is usually mild, the hookworm parasite can cause serious health problems for children, pregnant women, and people who are malnourished, with consequences that include congestive heart failure and permanent growth retardation. Worldwide, 1.3 billion people are thought to be infected.

Investigator David J. Mangelsdorf (top left) and his colleagues identified two hormones that cause worms of all types to go into a type of hibernation where they don't eat or reproduce. Knowing how these hormones work could lead to drugs that stop hookworms and other parasitic worms that infect humans or interfere with agriculture.

The largest numbers of hookworm cases occur in impoverished rural areas of sub-Saharan Africa, Latin America, Southeast Asia and China, as indicated in this map. For more information, please visit: http://www.who.int/vaccine_research/diseases/soa_parasitic/en/index2.html

Photo credit: Top: Charles Ford Bottom: CDC Public Health Image Library



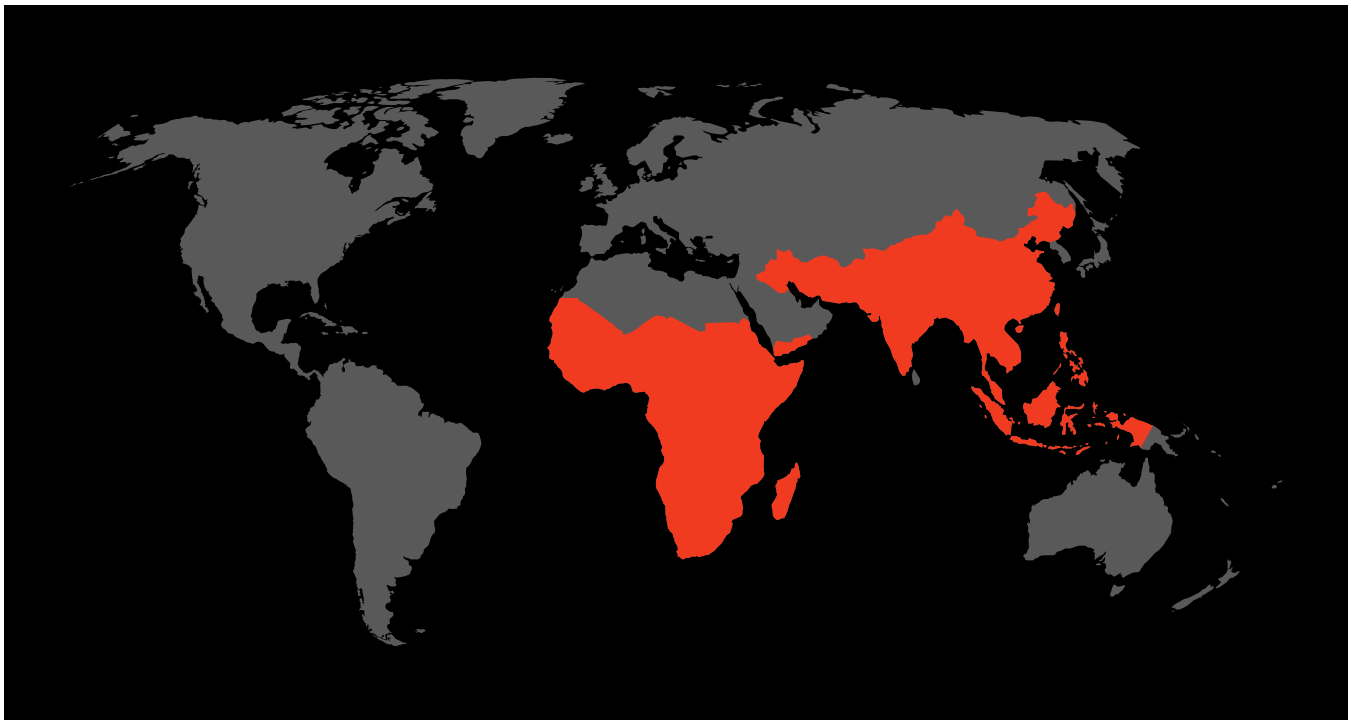
African Sleeping Sickness

The bite of a tsetse fly can be deadly. That's how the parasite *Trypanosoma brucei* (bottom left) jumps from the fly to the human bloodstream, where it makes its way to the brain. The subsequent infection, called African sleeping sickness, triggers confusion, disrupted sleep, and other neurological symptoms.

International Research Scholar Miguel Navarro (top left) and his colleagues study how *T. brucei* evades the immune system by constantly shifting its surface coating. They found that a drug used to help transplant patients, rapamycin, also kills *T. brucei*. While rapamycin alone wouldn't be a good treatment—it suppresses the immune system—it could improve existing treatments for African sleeping sickness.

African sleeping sickness occurs only in sub-Saharan Africa in regions where disease-transmitting tsetse flies live. For more information, please visit: http://www.who.int/mediacentre/factsheets/fs259/en/

Photo credit: Top: David Rolls Bottom: Miguel Navarro



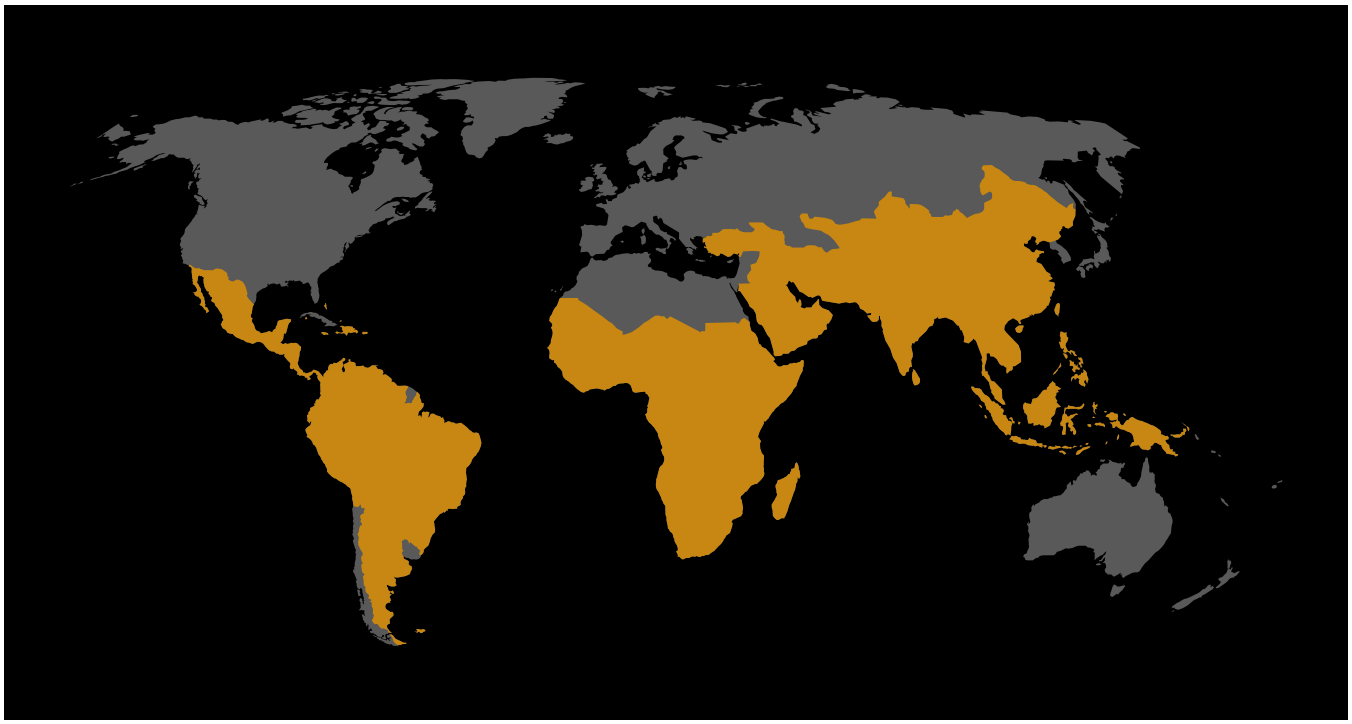
Cholera

Dirty drinking water and contaminated food can lead directly to cholera (bottom left). But the disease, which causes severe diarrhea and death if untreated, also appears to be governed by the weather.

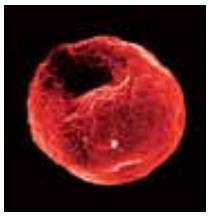
Investigator Mercedes Pascual (top left), who works at the intersection of climate modeling and infectious disease, has tied El Niño weather patterns to serious cholera outbreaks in Peru and Bangladesh. Now she is trying to develop a way to predict disease outbreaks by looking at both the local climate and immunity patterns in the population. By better understanding this link, public health officials could get needed treatments and personnel to an area before an outbreak begins.

This map shows countries reporting cholera outbreaks between 2006 and 2008.
For more precise statistics, please visit: http://gamapserver.who.int/mapLibrary/Files/Maps/Global_ChoeraCases_ITHRiskMap.png

Photo credit: Top: Mark Bialek/AP, ©HHMI Bottom: Janice Carr/CDC



Malaria



More than 40 percent of the world's population lives under the constant threat of malaria: Between 350 and 500 million cases occur worldwide each year. In the developing world, malaria is commonly treated with drugs to kill the parasite plus aspirin to alleviate the accompanying fever.

But treating malaria with aspirin may be hurting patients. International Research Scholar Simon Foote (top left) and his colleagues discovered that blood platelets (bottom left) can track down and kill malaria parasites. But they also learned that aspirin stops platelets in their tracks, by preventing them from attacking malaria parasites. If proven correct, the finding could be important for malaria treatment worldwide.

Shaded regions indicate the global range of malaria incidence. For more precise statistics, please visit: http://apps.who.int/malaria/wmr2008/

Photo credit: Top: David Rolls Bottom: Ross Waller/Alan Cowman