

Gravest Challenge of the 21st Century May Be Disease

Overcrowding and Lack of Sanitary Conditions Could Contribute to Future Global Pandemic

By ALEXA DANNER
May 30, 2009—

<http://abcnews.go.com/print?id=7715902>

[Earthquakes and hurricanes](#) can devastate an entire country in just moments. [Global warming](#) could gradually raise sea levels, wreaking havoc on the climate and on people's way of life.

And with these [potential disasters](#) may come an even more insidious menace, one that could silently sneak up on a population and has the potential to kill thousands, even millions of people in a single strike: disease.

"One of the real challenges we may face in the future is a new disease that sweeps across the planet -- because we're all so tightly connected together," says Thomas Homer Dixon, a political science professor and author of "The Upside of Down."

Watch "Earth 2100," a two-hour television event, Tuesday, June 2, at 9 p.m. ET.

The stage has already been set for life-threatening illnesses to pass effortlessly across international borders, without discriminating between old and young, male or female. Our modern lifestyles and high volume of global air travel enable rapid and efficient [dissemination of germs](#) and viruses. Now a [changing climate](#) may be contributing to the spread of disease as well.

Illnesses like malaria, dengue fever and the lesser-known Chickengunya, a mosquito-transmitted virus, have already reached beyond the tropical regions where they are normally confined into more temperate zones. In today's world, it is difficult to predict the journey a contagious illness will take or how many people may become sick. [Swine flu](#), thought to have originated in Mexico, has [infected people across the world](#).

"People can be persistently infected with certain types of viruses and bacteria and show no signs of disease," says Dr. Ian Lipkin, professor of epidemiology and neurology at Columbia University. "But they can also be capable of transmitting infection with terrible consequences to people who've not seen it before."

In developing countries, overcrowding in large cities, underfunded health-care systems and lack of sanitary conditions set the stage for disease to fester. Each year, millions of people die from diseases related to

unclean water, such as cholera and guinea worm. These deaths are largely preventable, but if drastic measures aren't taken to clean up the world's water supplies, the problem will only get worse.

Diseases Ravage Crops and Food Supply

Population size also plays a role. As the number of people on the planet grows, so does incidence of overcrowding and poverty, which are directly linked to rising rates of infectious disease.

"When people are hungry and malnourished, they are clearly more susceptible to infections," says Dr. Anthony Fauci, head of the National Institute of Allergy and Infectious Diseases.

But diseases don't just affect people. They can also ravage crops and food supplies, wiping out the means of survival for entire population. And our reliance on a system of agriculture that requires food to travel great distances before ending up on our dinner plates renders us extremely vulnerable to diseases caused by food contamination.

"Any contamination which is present in meats or poultry, fish or vegetables or fruits, winds up being distributed to tens of thousands of people," says Dr. Lipkin. "We are very vulnerable through our food

distribution networks to the emergence of new or known pathogens."

And what about pathogens that are spread intentionally? The threat of bioterrorism looms large in the 21st century. Scientists say that infectious agents such as anthrax or small pox could be disseminated easily -- and cheaply -- if they got into the wrong hands, causing massive outbreaks of disease.

One of the compounding worries is that our widespread use of antibiotics has degraded our natural ability to fend off certain bacteria and also made possible the evolution of medicine-resistant bugs.

"Some of the simple antibiotics we've had for treatment of common infections no longer work," says Dr. Lipkin. "We've been slow to respond to this challenge."

All of these factors make it possible for some sort of global pandemic to sweep the globe, an event that could potentially kill millions of people, devastate economies and cause worldwide panic. And scientists warn that unless we act to address some or all of the risk factors, such a pandemic could occur in the 21st century.

The good news? New diseases are constantly emerging, and so far, modern medicine has been able

to keep up.

"Infectious diseases have been around forever, and they will continue to be around," says Dr. Fauci.

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