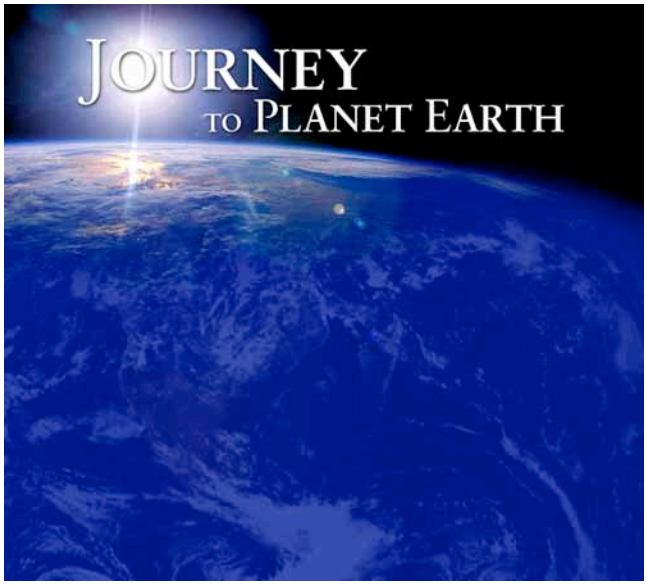

Journey to Planet Earth

Transcript for Episode 06:
Hot Zones

Abridged Version

Journey to Planet Earth is produced by

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(Matt Damon On-Camera)

Hi, I'm Matt Damon and welcome to *Journey To Planet Earth*. In this episode we explore the link between environmental change and the spread of infectious disease. We will visit a world where billions of people are without clean drinking water or proper sanitation services.

But we'll also see that travel, commerce, and tourism have put newly emerging diseases on our very own doorstep. I think you'll find it a timely and important investigation -- so please join me now -- as our journey begins.

(Opening Montage)

In the 1970s, new vaccines and antibiotics seemed to be winning the war against infectious diseases. Most scientists were confident that the major contagious killers were retreating. HIV AIDS put an end to all that. In the last thirty years, there has been a dramatic upsurge of infectious diseases all over the world. Not just AIDS but insect and waterborne diseases too. Malaria, cholera, and dengue fever are spreading fast. National boundaries, even the well-policed ones, are porous. Can we keep global pandemics away from our shores? In the United States, West Nile Virus is already rampant. Will the west be any safer from these diseases than it was from HIV? Join us now as Journey To Planet Earth investigates how environmental change is fostering the tide of contagion which threatens to engulf us all.

(Fishing Village)

Our journey begins here, along the shores of East Africa's Lake Victoria. Shared by Tanzania, Uganda, and Kenya this is one of the world's largest fresh water lakes. Its fertile waters sustain more than thirty million people.

But this region is located in one of Africa's unhealthiest environments. Lake Victoria is the malaria capital of the world. Thirty five hundred children live in the village of Kombewa. Over six hundred will never see their fifth birthday. The towns along Lake Victoria are located on the equator; the weather is hot and steamy -- the perfect breeding ground for the deadly Anopheles mosquito -- the only carrier of malaria

Doctors Jose Stoute and Alfred Odindo are studying malaria's affect on the most vulnerable -- young children.

In this region, 20% of children under the age of five die of malaria.

Jose Stoute

> The reality is that it doesn't have to be that way. Malaria is a curable disease, and most of the fatalities occur due to the lack of adequate drug supplies and adequate health care facilities.

Reality here is harsh.

(Bus Station)

Local bus stations are jammed. Most are escaping from severe economic pressures. They bring with them all their possessions -- very little is left behind -- including the lethal malaria parasite. The most popular destination is only six hours away.

(Nairobi)

Once a small trading post in the middle of the grasslands, Nairobi is now a metropolis of over 2 million people. At first glance Kenya's capital seems like a prospering modern city.

(Kibera)

Nairobi is ringed with impoverished shantytowns like Kibera. Over two hundred and fifty thousand migrants are crowded into less than two square miles. With no sanitation facilities Kibera suffers from a variety of deadly infectious diseases.

Yet, until recently, Nairobi was malaria free. Today, it's hit the city with a vengeance – thousands of children are infected -- and the epicenter is Kibera.

Medical researchers Amy Korman and Juma Makasa are investigating the outbreak.

The research team suspected that the massive migration from the countryside was linked to the spread of malaria.

(Research Team)

And that is exactly what researchers discovered. The Anopheles mosquito was present in Nairobi because the environment was changing. Typical of many newly arrived slum dwellers, Paulina Karugo grows vegetables on a small plot of land behind her home. But in the process, she and hundreds of others have unknowingly created the perfect breeding ground for the Anopheles mosquito -- a hot zone of infection.

The implications of what was discovered in Nairobi are significant – there is a definitive link between the spread of infectious disease and manmade changes to the environment. It's happening in Kenya and its happening in some of the most remote places on the planet.

(Iquitos)

This is the port city of Iquitos. Built in the heyday of the rubber boom it still remains the center of commerce on the upper Amazon River. But those living in its sprawling shantytowns have become victims of another mosquito borne disease – Dengue fever. Ten years ago it posed no threat. Today, Dengue has reached epidemic proportions -- five percent of its victims will die. Once again, research shows that cities can create their own ecology of disease -- making them ripe for colonization by mosquitoes.

In Iquitos, collectors search for the mosquitoes (aedes aegypti). Anything that holds water is a potential breeding ground. In the hundreds of old tires, basins and wells of the shantytowns, aedes aegypti has found its ideal environment. Its larvae thrive in these stagnant waters. Epidemics in Iquitos would have once seemed remote from the developed world. But this city has become a favorite destination of eco-tourists. And with daily flights to the U.S. and Europe – no disease outbreak stays local for long.

Travel, commerce, and tourism have put places like Iquitos and Nairobi on the doorstep of the West. In the United States and Europe, they eradicated malaria and most other insect born diseases in the 1950's. That doesn't mean they are gone for good.

(Kennedy Airport)

At New York's Kennedy airport, they are alert to the problem. Every day, over three hundred flights arrive from other parts of the world, carrying not just people but plants and animals too. All of them are inspected. Each year the United States spends 350 million dollars to protect its borders from infectious diseases.

Despite all of the precautions it's simply impossible to stop every disease from entering the United States.

(New York City)

During the summer of 1999 New York City became a hot zone for a rare and deadly virus. A mosquito borne disease from a remote part of Africa crossed the Atlantic and forged a foothold in America. In early August thousands of crows started dropping out of the sky. Three weeks later an 80-year old women died of encephalitis. Within weeks another 56 cases were reported -- seven people died. Health officials were puzzled -- then alarmed.

(Laboratory)

Attention quickly shifted to high security laboratories that study toxic diseases like Anthrax and Ebola. Scientists started dissecting dead birds -- looking for clues that could confirm their suspicion -- that the virus that affected birds was also lethal to humans. Eventually the disease was isolated -- it was something never before found in the Western Hemisphere -- West Nile Virus.

Michael Turrell

> No one knows how it got here, though personally, I believe it arrived here in an infected mosquito hitching a ride in an airplane. If we want to be able to have the freedom to travel around the world, this is one of the side effects.

(Mosquito)

Health authorities believe that West Nile could be a harbinger of things to come -- it re-enforces the fact that disease knows no borders.

Yet there is a global health issue even greater than insect-borne diseases looming for the 21st century. It revolves around the most basic human need -- water -- clean water.

Peter Gleick

There are 1.1 billion people worldwide that don't have access to basic clean drinking water, and 2-1/2 billion people worldwide that don't have access to the sanitation services that we take for granted. And the direct implication of this failure to provide basic human needs for water are water-related diseases.

(Peru)

And that's exactly what happened 4,000 miles and a world away from New York City.

Once a small Spanish colonial port on the Pacific, Peru's capital -- Lima -- has become a bustling, overcrowded metropolis of nearly 9 million people. In the wealthier parts of town water is piped in from the mountains. Its abundance makes it hard to believe that the city is located in one of the driest deserts in the world. In the slums sprawling across the arid landscape that surrounds Lima, the lack of water is a brutal reality. Their hardships are almost unimaginable. Most live with no electricity. Their huts are made of sticks, straw matting and salvaged bits of corrugated steel. Sanitation is non-existent -- disease is rampant. The life expectancy of a child born is these slums is ten years less than those living in the developed world.

Robert Gilman, a public health specialist, knows that water is at the heart of the community's problems.

Robert Gilman

Water is crucial. You need for drinking. You need it for washing. Washing means cleanliness. Cleanliness means diarrhea. If you don't have cleanliness, you get diarrhea and you get other diseases, so this is a major risk factor for these individuals for disease.

This raises an urgent question: can impoverished cities provide adequate sanitation systems to cope with growing populations? The answer is, they can.

(Villa El Salvador)

One of Lima's largest shantytowns, Villa El Salvador looked like this thirty years ago. An urban invasion of the desert -- a village without electricity or water. Today Villa El Salvador is a thriving community. Praised by the United Nations, it's an example of what can happen when the poor organize to develop their own infrastructure. Villa El Salvador has paved streets and electricity. It established a small manufacturing sector which provides employment opportunities -- and a chance to escape the chains of grinding poverty. Communal health centers and kitchens cater to those in need. And above all else Villa El Salvador has a sewage system and clean running water. Its success has also shown the way to other, younger shanty towns like Ventanilla, which is just beginning to improve it's infrastructure.

Robert Gilman

> This is a major advance for this community. This sewer and running water mean that there will be probably 70 percent less episodes of diarrhea, and obviously, this translates into much lower mortality rates and morbidity rates for the community.

Today, unclean water is the dominant factor in places suffering from poverty, overcrowding, and the spread of infectious disease

(Bangladesh Visualization)

Nowhere is this more evident than in one of the poorest countries on Earth—Bangladesh.

Located in South Asia, it is virtually surrounded by India, with the Bay of Bengal to the south and the world's highest mountain range looming to the north -- the Himalayas. Here over 135 million people live in a country the size of New York State.

(Dhaka Streets)

This is a place whose fragile infrastructure is squeezed hard by the dispossessed and poor. Clean water and sanitation are rare commodities -- disease is rampant -- especially for children. There's an ancient superstition that a black circle painted on a child's face will ward off disease -- sometimes even death. It's a commonly practiced custom.

(Hospital wards)

Yet, over nine percent of children born in Bangladesh die before the age of five. Just after the rainy season the country suffers from major outbreaks of Cholera. This is when hospitals look more like battlefields littered with casualties of war.

Cholera is transmitted when infected human waste contaminates the water supply -- epidemics in Bangladesh are annual events -- tied to the seasonal ebb and flow of water.

(Countryside)

In the rural countryside -- in the thousands of small villages -- nearly everything revolves around water. Here, the daily fabric of life hasn't changed in decades. But there is one other constant -- most of the land is just a few feet above sea level.

(Monsoon floods)

For two months each year monsoons sweep across the Bay of Bengal and flood much of Bangladesh -- tens of millions are left homeless.

(Post Monsoon Ponds)

When the waters recede -- nearly every river and pond is tainted with the deadly cholera bacterium.

(Tube Wells)

To ease the problem of cholera, the government drilled five million wells to provide clean drinking water for 97 percent of the rural population. This simple act may have saved millions of lives -- but it also resulted in an unforeseen public health disaster.

(Arsenic victim)

Not long ago, rural health workers reported signs of a mysterious ailment. Villagers were developing skin lesions -- nausea and hemorrhaging often followed. These are the signs of arsenic poisoning -- a slow acting but fatal disease. Shastri is 27, she probably won't live to thirty.

(Pumps)

It turns out that much of Bangladesh's underground water supply contains naturally occurring arsenic. With almost 70 million at risk, the people of Bangladesh now face the largest mass poisoning in history. Lack of clean water leaves people with very few choices. It's one of the world's biggest killers.

Peter Gleick

> The estimate is that there are 250 million cases of water-related diseases a year. Three to five million people die a year, 20 or 30,000 perhaps a day, from water-related diseases that we know how to prevent, that are easy to prevent and to cure, but that we failed to prevent.

This has become part of a global problem -- a problem that is not limited to the countries of the developing world.

(Chesapeake Bay)

The Chesapeake Bay is North America's largest estuary. With over 11,000 miles of shoreline and fed by 48 major rivers, it supports nearly 300 species of fish. The people of Crisfield, Maryland have been working the bay for over three hundred years. Today Crisfield's watermen are suffering a serious decline in their catch. The bay is showing the affects of sewage, pesticides and industrial effluents that have been seeping into the Chesapeake for decades. Several years ago watermen like Jack Howard began to notice grotesque lesions in the fish and crabs they were catching.

There was worse to come. Not long after the fish started getting sick, so did the watermen.

Jack Howard

> And we started get sick ourselves - and the symptoms we had was diarrhea, memory loss and it got to the point that we were so sick sometimes -- and the stomach cramps were so violent that you...you just couldn't do anything.

The first suspect was a toxic algae called Pfiesteria. Further research showed that the problem was much more complex. Many microorganisms were involved -- not just Pfiesteria.

And just as the invasion of West Nile virus has raised the alarm in the richer countries of the world about the threat of new insect-born diseases -- the still puzzling sickness of the Chesapeake is just one more warning about the growing problem of waterborne diseases.

Though there are no easy answers -- no quick fixes -- fortunately there are those who are working hard to ease the burden. In the end, the health of those living in places like the Chesapeake Bay and New York City cannot be separated from the well being of those living in Peru, Kenya, and Bangladesh. This presents us with enormous challenges -- requiring new ideas -- new attitudes -- new hope. Planet Earth, this is our home. This is where our journey of discovery must begin.

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