

US EPA ARCHIVE DOCUMENT

# Expedition to Southeast Asia to Learn About Public Health and Infectious Disease

## Part 1. Introduction.

*Narrator:* Better hurry—your ferry is leaving! Boats are one of the best ways to get around Southeast Asia, where many countries are surrounded by water and millions of people live along the ocean or in low-lying river deltas.

This tropical setting is ideal for a beach vacation. But the climate and geography here also make Southeast Asia one of the many places around the world that are susceptible to several different kinds of infectious diseases.

## Part 2. The Climate Connection.

*Narrator:* Infectious diseases are caused by tiny organisms, such as bacteria, viruses, and parasites. These diseases can be transmitted to people in different ways: from one person to another; by insects such as mosquitoes; or through contaminated food and water.

Many of the organisms that transmit infectious diseases need certain climate conditions. For example, some harmful bacteria can only survive in warm areas. And some parasites such as malaria are transmitted to humans by mosquitoes that thrive in hot, humid places.

As the climate changes around the world, many places will become warmer and experience more rainfall. These conditions are ideal for the spread of certain diseases.

## Part 3. What Is a Vector?

*Narrator:* A vector is any kind of animal that carries and transmits disease to humans or other animals. Vectors include insects like mosquitoes, flies, ticks, lice, and fleas.

Malaria and West Nile virus are examples of diseases that are spread to humans by mosquitoes, while Lyme disease is spread by ticks.

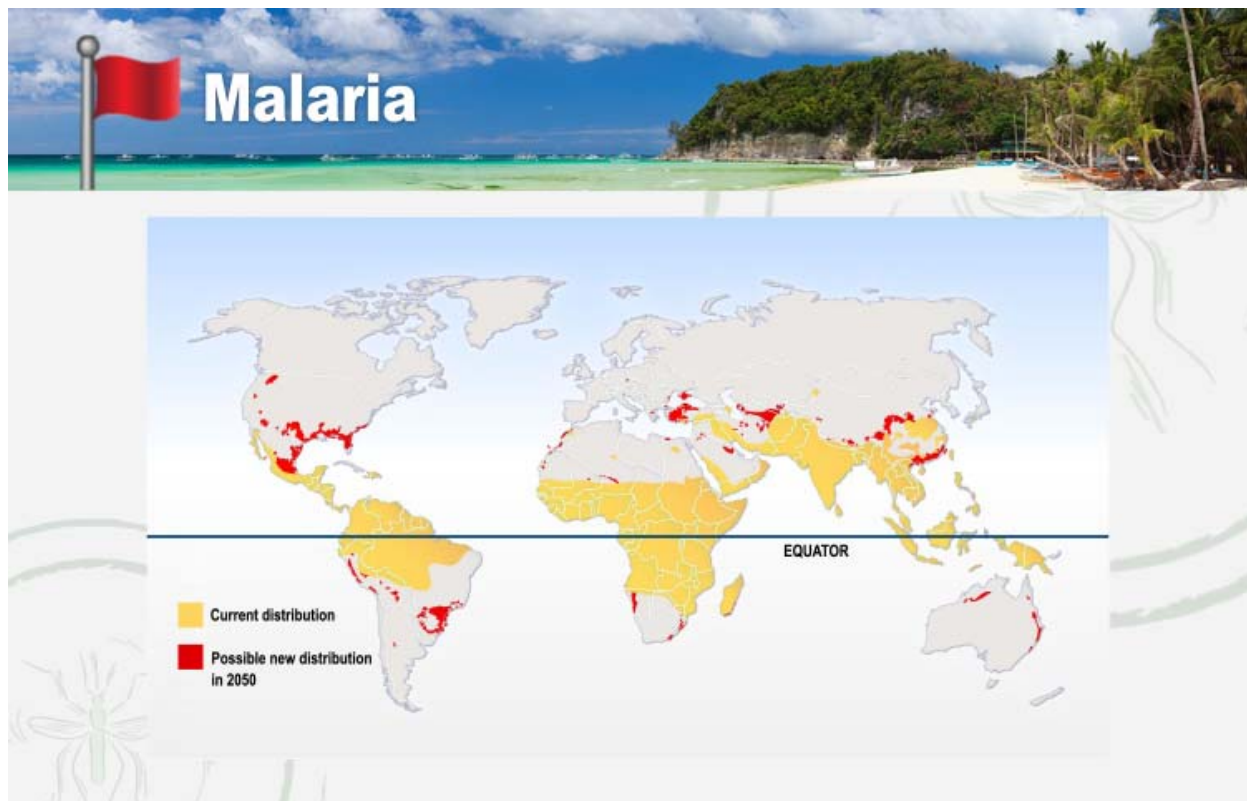
## Part 4. Perfect Places for Mosquitoes.

*Narrator:* We already know that climate change is causing increased temperatures in many areas of the world. But did you know that we're also seeing more heavy rainstorms and more intense tropical storms, such as hurricanes?

These storms can cause flooding that leave behind pools of standing water—perfect breeding grounds for mosquitoes, which need a warm climate and shallow water for reproducing and laying their eggs.

Climate change can also lead to more severe droughts in some parts of the world. As lakes and rivers dry up, they leave behind shallow puddles of water where mosquitoes can thrive.

Part 5. Malaria.




*Narrator:* Take a look at the areas shaded in yellow on this map. Yellow shows the parts of the world where people can get malaria today.

Do you see how most of the yellow areas like Southeast Asia lie near the equator? That's because these areas have hot, humid climates, which is exactly what mosquitoes that carry malaria need to thrive.


Now take a look at the red areas. Red shows new places that could be affected by malaria in 2050 because of the higher temperatures that are expected due to climate change.

Part 6. Test Your Knowledge!



# Test Your Knowledge!

**Reported Cases of Lyme Disease — United States, 2008**



The climate and habitat conditions in the Northeast and upper Midwest are currently ideal for Lyme disease.

**Question**

As temperatures get warmer in the United States, which direction do you think Lyme disease might spread?

**Choose the correct answer:**

North       East  
 South       West

*Narrator:* The climate and habitat conditions in the Northeast and upper Midwest are currently ideal for Lyme disease. As temperatures get warmer in the United States, which direction do you think Lyme disease might spread?

*The text on the screen asks:* “As temperatures get warmer in the United States, which direction do you think Lyme disease might spread?” You have four choices:

- A. North
- B. South
- C. East
- D. West

*Answer:* The correct answer is A. As temperatures rise, areas that were once too cold for Lyme disease will become warmer. That means the range with ideal conditions for ticks and Lyme disease will move to the north.

Part 7. Waterborne Disease.

*Narrator:* We just talked about diseases that are spread by vectors. Now let’s consider waterborne diseases, which are caused by bacteria or other organisms that live in contaminated water.

Climate change will lead to heavier storms and higher sea level, which means more flooding that can wash bacteria and other organisms into drinking water supplies. Southeast Asia is especially at risk because much of this region is at or near sea level.

Climate change will also lead to higher water temperatures, which allow for faster growth of bacteria and other organisms that cause waterborne disease.

Cholera and dysentery are two examples of waterborne diseases. These are serious illnesses that cause many people to die each year, especially the very young and very old.

#### Part 8. Waterborne Disease and Drought.

*Narrator:* While increased rainfall can lead to more cases of waterborne disease, too little water can have the same effect.

The changing weather patterns in some parts of the world will cause more frequent and severe droughts, which could dry up some sources of drinking water. When water is scarce, people might resort to drinking water from unclean sources. They are also less likely to use water to practice good hygiene, such as hand washing, which helps prevent the spread of disease.

#### Part 9. Test Your Knowledge.

*Narrator:* Ready to test your knowledge about climate change and disease? Many countries in Southeast Asia already struggle with disease outbreaks because their natural environment allows vector-borne and waterborne illnesses to spread easily. Which of the following actions could help countries in Southeast Asia and elsewhere prepare effectively to fight the diseases we have discussed?"

*The text on the screen asks:* "Which of the following actions could help countries in Southeast Asia and elsewhere in the world prepare to effectively fight the diseases we have discussed?" You have four choices:

- A. Improve access to health care.
- B. Improve water management.
- C. Improve systems for tracking the spread of disease.
- D. All of the above.

*Answer:* The correct answer is D. Yes, there are lots of steps countries can take to adapt to the increased risk of disease and other effects of climate change. Improving health care will help prevent and slow the spread of disease. Improving water management will reduce the risk of waterborne disease due to contamination. And tracking the spread of disease will help us predict where disease will spread next, so that we can educate and send resources to the people who live in areas where outbreaks are likely to occur.

#### Part 10. What Have You Learned?

*Narrator:* Alright, let's get back on the boat. Your journey to Southeast Asia is over. What have you learned?

*Onscreen text:* Infectious diseases can be transmitted by vectors or through contaminated food and water.

*Narrator:* Infectious diseases are caused by bacteria, viruses, and parasites. They can be transmitted by vectors, such as mosquitoes, or through contaminated food and water.

*Onscreen text:* Hot, humid, and low-lying areas are especially at risk.

*Narrator:* Hot, humid, and low-lying areas are especially at risk because many diseases thrive in these conditions.

*Onscreen text:* Many impacts of climate change could increase the spread of disease.

*Narrator:* Many impacts of climate change could increase the spread of disease, including rising temperatures, increased rainfall, rising sea level, flooding, and drought.

*Onscreen text:* People can take steps to prevent and slow the spread of disease.

*Narrator:* There are many steps people can take to prevent and slow the spread of disease, such as improving health care, water management, tracking systems, and education.

#### Part 11. Congratulations!

*Narrator:* Congratulations! You've earned a passport stamp for learning about how climate change affects public health and infectious diseases.

*Onscreen code:* 284197