History of a Lethal Disease

Name: _____ **Date:** _____

SCRIPT

It's a frightening disease.

Each year, between 300 and 500 million people become infected with the disease. Over one million of them die.

Most of them children … under the age of five … living in Africa.

It's malaria … a disease that has been around at least since man has … and probably a lot longer.

If you have it, at first you might think that you have the flu.

The symptoms are pretty much the same: fever, chills, headache, tiredness, sweating, nausea and vomiting.

And the symptoms may go away after a few days … only to return again and again.

As the parasites causing the infection grow and invade more and more of the body, the symptoms worsen.

And, if the parasites that infect the victim are *Plasmodium falciparum*, things get pretty serious pretty fast. This form of the parasite is responsible for about half the cases of malaria in the world.

Victims of this kind of parasite can suffer a whole array of symptoms: bleeding problems, shock, liver or kidney failure, and coma. If they don't get treatment quickly, they can die.

Even with treatment, about 20 percent will still die.

And treatments are limited.

In the past, there were some very reliable options. As early as the 1600s, natives of Peru used the bark of the Chinchona tree to cure this fever. The bark worked because it contained quinine, a substance that disrupted the parasite's reproductive cycle.

Jesuit missionaries brought word of this remarkable cure to many other countries where malaria was epidemic, including Italy and other countries in Europe. Demand for quinine soared.

Quinine figured into America's history in many ways.

Some say, that, without the quinine, it never would have been possible to build the Panama Canal. Malaria was a leading cause of death among workers building the canal. Without the help of quinine and other insect control measures, the human cost of building the canal would have been too high.

Two important breakthroughs in the fight against malaria happened in the 1940s.

The first was the discovery that DDT (dichloro-diphenyl-trichloroethane) could be an extremely effective pesticide when used against mosquitoes.

The second was the development of a synthetic form of quinine, called chloroquine. It was very effective, had few side effects, and, most importantly, was very inexpensive.

With these two tools, it looked as if malaria might be headed for extinction.

But … not for long. Too many people were using DDT for too many other purposes. As a result, it was accumulating in the environment and causing illness and death for animals such as falcons and salmon. And people feared that DDT would eventually cause illness and death for humans.

In 1972, it became illegal to use DDT in the US. Other countries soon followed in prohibiting the use of DDT.

The other leg of the solution was soon knocked out as well. The plasmodia that cause malaria have a short life cycle. That means that it doesn't take them long to develop a resistance to threats from disease fighters such as chloroquine. Before long, chloroquine was no longer effective in treating malaria, especially the most deadly kind. The parasites had mutated and chloroquine no longer killed them.

Malaria came charging back, even in countries like Sri Lanka and Taiwan, where it had previously been in sharp decline. And

© 2010 Maryland Public Television. All rights reserved. mpt

it remains a threat today to almost half the world's population.

Part of the upturn in this lethal disease was due to poverty. Developing countries –especially in sub-Saharan Africa – did not have the resources to provide their people with needed medical care and preventive measures such as bed netting.

But, there are many other environmental factors that are increasing the threat of malaria and other diseases carried by animals and insects.

Animals and insects live in habitats that are suited for them. They prefer a specific range of temperatures, a specific range of precipitation, and a specific geography.

It doesn't matter where these conditions occur. Insects and other animals will leave a place that no longer gives them the right temperature range or the right geographic feature such as a forest.

And they will expand their ranges to include areas that now feature their "must-haves."

When they move to these "other" areas vector animals and insects (those that carry diseases) bring their diseases with them.

A whole population—the existing residents of that "other" area—gets exposed to these illnesses.

And this population hasn't had a chance to build immunity to the new diseases they have to face.

To them, their new neighbors are a deadly group.

That's what's happening now with malaria. It's been getting hotter in certain areas of the world, if only by a small fraction of a degree.

But that small fraction is enough for the mosquitoes to expand their habitats.

The lethal disease of malaria is on the move.

As are other vector-borne illnesses … diseases such as Lyme Disease, yellow fever, West Nile virus, and even dengue fever.

Our climate is changing … and so is the risk that more and more people will get new and deadly diseases carried by insects and animals moving into new homes.

My notes:

© 2010 Maryland Public Television. All rights reserved. mpt