

The Story Of... Malaria – and other Deadly Tropical Germs

The role that germs have played in history, is not confined to those that originated in the temperate parts of the world. As anyone who has ever travelled into the tropics will know, this region is also plagued by infection.

The viruses found in the cooler parts of the planet have evolved to benefit from seasonal variations in temperature. Influenza is one such virus, which thrives during the winter, when humans are forced together into confined spaces. Tropical diseases are luckier: they thrive year-'round in the heat and humidity of their region. These diseases exist at a fairly constant level, and are therefore known as endemic.

A virus such as influenza is one of the simplest biological organisms on earth – it's little more than a strain of DNA. The parasites responsible for endemic tropical germs, however, are far more complex – they are tiny animals which are born and multiply inside the metabolic system of another creature. Parasites responsible for some of the nastiest diseases of the tropical world include trypanosomiasis (sleeping sickness), schistosomiasis (blood flukes), parasitic worms and, most deadly of all, malaria.

Malaria-carrying mosquitos require temperatures of more than 68 degrees Fahrenheit, which is why malaria-carrying mosquitoes are only found in tropical parts of the world. Endemic throughout tropical Africa and other parts of the tropical world, particularly Papua New Guinea – malaria is responsible for more deaths every year than any other infectious disease. Malaria kills one African child every thirty seconds and accounts for over a million deaths a year around the world.

Malarial mosquitoes inject tiny parasites into the blood of their victim. The parasites head for the liver, where they multiply and then explode into the blood. As they invade healthy red blood cells they generate a sticky glue on the outer surface which forces the blood to stick to the sides of capillaries and arteries. Instead of a healthy flow of fresh oxygen-carrying blood around the body, malaria causes anemia and organ malfunction through iron and oxygen deprivation. In the most serious cases – if it affects the blood supply to vital organs of the body, like the liver, heart or brain – the disease can be fatal. 'Cerebral malaria' is the name given to the most serious manifestation of the disease, where patients slip into coma because the blood supplying their brain has become too sticky.

The name 'malaria', meaning bad air, was coined during the colonial era to describe a disease that struck without warning and without discrimination. This single disease was the most serious obstacle to European conquest of the tropical world, responsible for thousands of settler deaths throughout the eighteenth and nineteenth centuries.

Yet, mysteriously, the immigrants' African neighbors seemed to survive. Cattle and horses imported from Europe also seemed to drop dead as soon as they entered the Tropics. So what allowed African cattle, as well as their owners, to survive these tropical germs?

The answer was simple evolution.

Over centuries of exposure to parasitic infections like malaria and sleeping sickness, tropical Africans and the livestock they bred had developed degrees of resistance – and even immunity in some cases.

The African way of life was designed to avoid mosquito-borne infection. Africans made their homes in high, dry areas when they could, away from the natural habitat of the mosquito. Also, African communities remained fairly small, which limited the level of disease transmission.

Unfortunately, the arrival of colonizing Europeans, with their steam trains, machine guns and dreams of industrial wealth, wreaked terrible damage on these centuries-old mechanisms of survival. Torn from their villages, forced to live and work together in massive numbers and in unsanitary conditions, tropical Africans fell ill as never before. The scourge of malaria throughout Africa today is, in part, the consequence of the destruction of a way of life which had existed for thousands of years.

Today, malaria is holding back progress on the continent of Africa. Besides killing millions of children under five, higher rates of transmission mean that adults now also become sick and suffer debilitation. This cripples economic productivity and traps the population in a cycle of poverty. In spite of a literacy rate of 80%, the tropical nation of Zambia has 10% child mortality and one of the poorest economies in the world – it's no coincidence that most Zambians are infected by malaria at least five times a year.

But there is hope. Malaria is treatable – and even eradicable. New drugs offer the hope of cheap vaccination for the most vulnerable in society, while education programs aim to rid the tropical world of the scourge of mosquitoes. Simple measures, such as the use of insecticide-treated bed nets, can have a dramatic effect. In the 1950s, the World Health Organization instituted a global malaria eradication program, and succeeded in ridding the disease from large parts of the tropical world.

Most significantly, the islands of Singapore and Thailand were liberated from the disease and have since seen massive economic benefits. Today, Singapore is among the richest nations in the world, proving that the obstacle of tropical germs is not insurmountable.