Before laying eggs, female mosquitoes use straw-like mouths to slurp up blood from animals.

As they feed, some mosquitoes let out small amounts of the victim's blood to cool themselves.

MEET THE WORLD'S DEADLIEST CREATURE

This killer is small enough to swat with your hand! What makes mosquitoes so deadly? And how can they be stopped?

AS YOU READ, think about how scientists are working to solve problems caused by mosquitoes.

Our planet is filled with fearsome creatures. Car-sized hippos have jaws strong enough to shatter bones. Scorpions use piercing tails to inject victims with deadly venom. Pythons strangle their prey with ropelike bodies.

But which animal on Earth is the deadliest to humans? It's actually none of those creatures. It's the mosquito!

You might think of these buzzing insects as just an annoying part of spring and summer. In the U.S., their bites are usually no worse than an itchy red bump that fades in a few days or weeks.

However, in many areas of the world, mosquito bites are a serious concern. They commonly spread dangerous diseases, like malaria. Mild malaria cases cause headaches, fevers, and chills. Without treatment, the disease can be deadly. Each year, malaria and other diseases spread by mosquitoes kill more than 750,000 people. Sadly, most of those who die are kids.

Scientists have come up with many ways to protect humans from mosquitoes. But lately, the methods haven't been working

Look for These STEM Words!

infect: to spread a disease or a disease-causing substance or organism to others

parasite: an organism that lives on or inside other organisms, often harming them

adapt: to become better able to survive because of changes in a species' body or behavior over many generations

vaccine: a substance usually injected into a person or animal that helps protect against a disease

IANDAGNALL COMPUTING/ALAMY STOCK PHOTO (MOSQUITO); SHUTTERSTOCK.COM (SMALL MOSQUITOES)

very well. Disease-causing mosquitoes are now thriving in parts of the world they haven't been found in before.

"In the U.S., mosquitoes are showing up earlier each year and staying longer," says Russanne Low. She's a scientist who studies mosquitoes. Low is one of many people working to spread the news about the dangers of mosquitoes—and share ideas for how people can help.

Meet the Mosquito

There are more than 110 *trillion* mosquitoes on Earth. That's almost 16,000 for every person! They live on every continent except Antarctica.

Mosquitoes are famous bloodsuckers. So you might be surprised that the insects' main food source is nectar, a sweet liquid from plants. There are more than 3,500 mosquito species. Different species feed on blood from different animals. Only a small portion of species feed on human blood.

Male mosquitoes don't bite at all. That's the job of female mosquitoes—just before they lay eggs. When temperatures rise above 50°F (10°C), female mosquitoes lay eggs in watery areas, like ponds, puddles, or rain-filled flowerpots. But before they do, the insects need a blood meal. They search for an animal, like a human, and use their tube-shaped mouth like a straw to suck up blood.

This is where the problem begins.

When a mosquito bites, it injects saliva into its victim. If the mosquito has recently bitten a person **infected** with a disease like malaria, that spit can contain a tiny germ that causes the disease. When this germ enters a person's blood, they become infected too.

That's how, bite by itchy bite, millions of people come down with malaria each year. Millions more are infected with other deadly diseases, such as dengue (DENG-gee) and West Nile virus.

An Ancient Battle

Humans' battle with mosquitoes isn't new (*see Malaria-Stopping Strategies, below*). As long as we have walked on Earth, mosquitoes have been biting us—and infecting us with diseases. For most of that time, people thought the illnesses were caused by warm, moist air. That made sense because the diseases were most common near swamps, where mosquitoes like to breed.

In the late 1800s, scientists discovered the tiny **parasite** that causes malaria and learned it was spread by mosquitoes. Researchers went on to develop drugs to help treat the disease. They also created insecticides, chemicals that can kill mosquitoes. Thanks to these innovations, malaria was mostly gone from the U.S. by the 1950s.

But the fight against malaria has continued in much of Africa and other places with tropical climates, where mosquitoes lay eggs year-round. In these areas, people spray their homes with insecticides. They sleep under mosquito nets to prevent the insects from biting them at night.

Over time, the efforts helped. Malaria remained a major killer in Africa, but by 2019, deaths from the disease dropped to the lowest number in history.

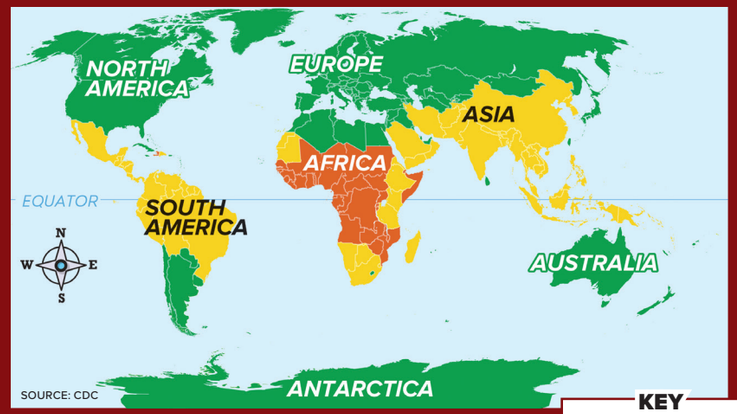
Mosquitoes Fight Back

Unfortunately, in recent years, malaria deaths have gone up again. Why? Scientists are finding some mosquito-fighting strategies are no longer working very well. The reason: Mosquitoes have **adapted**.

Here's how that happened: Over time, the chemicals in insecticides have killed many mosquitoes—but not all of them. Some survived, passing down their insecticide-beating

MALARIA AROUND THE WORLD

Malaria is most common in areas that are close to the equator. Warm temperatures there allow mosquitoes to reproduce year-round.



? *On which continent are people at the greatest risk of getting malaria?*

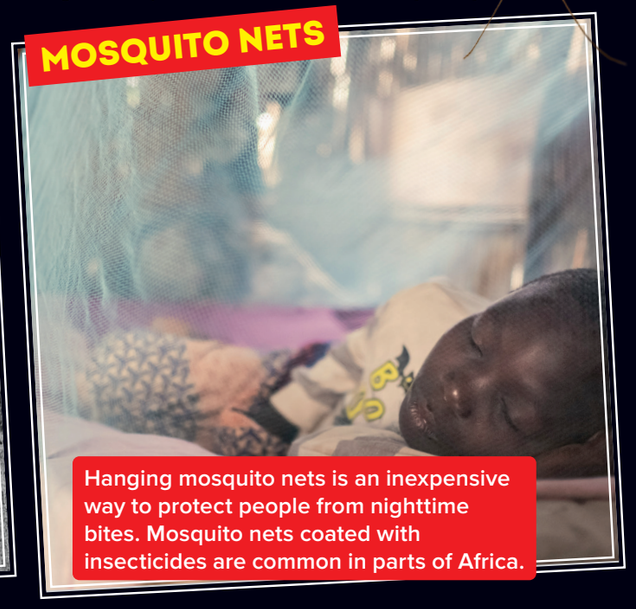
MALARIA-STOPPING STRATEGIES

Here are some old and new ways humans have used to fight mosquitos and the disease they carry.

INSECTICIDES

Since 1939, humans have used chemical sprays to kill insects like mosquitoes. Unfortunately, many insecticides also harm wildlife like fish and birds.

MOSQUITO NETS



Hanging mosquito nets is an inexpensive way to protect people from nighttime bites. Mosquito nets coated with insecticides are common in parts of Africa.

REDUCING MOSQUITO NUMBERS

Scientists are using drones to release male mosquitoes that can't reproduce. They're testing whether this could lower the number of mosquitoes.

VACCINES

Scientists have created two malaria vaccines—the latest in 2023. The shots have been shown to reduce serious disease, especially in kids.

HOW YOU CAN HELP

DUMP OUT WATER

Dump out standing water near your home. Mosquitoes could lay thousands of eggs there!

LOOK FOR LARVAE

Send pics of mosquito larvae to NASA's GLOBE Mosquito Habitat Mapper app. Scientists use that data to track mosquito species.

BE A FRIEND TO MOSQUITO-EATERS

Birds are a major predator of insects. You can create a bird-friendly area by growing native plants near your home.

What other ways can you help stop mosquitoes?

from the insects at night. But scientists suspect that some mosquitoes there have adapted to bite in the daytime. "It's a constant cycle," says Low. "We have a solution, then they adapt to it."

There's another problem. Dangerous mosquitoes are moving around the world. Since 2012, a type of mosquito from South Asia has been spreading malaria in African cities. And for the first time in many years, mosquitoes have infected people in parts of Europe with dengue.

In the U.S., several dangerous mosquito species are thriving. They are originally from other areas of the world and are more aggressive than native species. The insects feed more often and bite quickly, making them hard to shoo away in time. These mosquitoes can spread diseases like malaria.

Scientists expect these problems to get worse because of climate change. As temperatures warm, mosquitoes can survive year-round in places that were once too cold for them. That means more parasites and germs that cause diseases.

traits to their young. Over time, more and more mosquitoes carried traits that protected them from insecticides. As a result, these chemicals are no longer as effective against mosquitoes.

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Taking Action

Luckily, scientists are hard at work developing solutions. Eric Ochomo is an entomologist, or insect scientist, in the East African country of Kenya. Malaria is a constant threat there. He's testing out new and improved tools to fight mosquitoes.

One tool is an indoor device that sends out a chemical into the air. The chemical confuses mosquitoes so they don't bite. Ochomo is also testing an outdoor device that lures the insects with sweet liquid, then kills them with poison. Using several strategies is important, Ochomo says. That makes it less likely that mosquitoes will adapt.

Other researchers are breeding male mosquitoes that can't reproduce. In the wild, these mosquitoes could help lower the mosquito population since they can't reproduce. And in late 2023, a new malaria **vaccine** was introduced in parts of Africa. Scientists expect the shot to reduce malaria deaths, especially in kids.

There are ways people like you can help *(see How You Can Help, left)*. Ochomo hopes more kids become scientists when they grow up, so they can help protect humans from mosquitoes.

"There are a lot of problems we still don't know how to solve," he says. "We need all the brains we can get!"

—Maggie Mead

Do It! Get your STEM teaching kit at: scholastic.com/superstem

OBSERVE Mosquito habitat | INTERPRET Malaria map | ANALYZE Disease data

SHUTTERSTOCK.COM (MOSQUITOES); JUDITH BICKING/ALAMY STOCK PHOTO (WATER); IRD/VECTOPOLE SUD/PATRICK LANDMANN/SCIENCE SOURCE (LARVAE); DONALD M. JONES/MINDEN PICTURES (BIRD); ILLUSTRATION BY KATIE FRANCIS

KILLER CREATURES

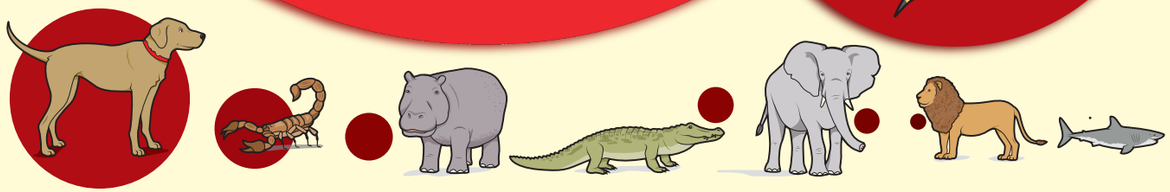
This infographic shows about how many people die after contact with different animals each year. Not all deaths are reported, so experts often have to estimate, or make an educated guess about a number.

Estimated Human Deaths Caused by Select Animals Per Year

750,000
Mosquito*

200,000
Freshwater Snail*

138,000
Snake



25,000	5,000	1,750	1,000	500	200	5
Dog*	Scorpion	Hippo	Crocodile	Elephant	Lion	Shark

SOURCE: ENCYCLOPEDIA BRITANNICA

**MOST OR ALL OF THE DEATHS CAUSED BY THIS ANIMAL ARE BECAUSE OF DISEASES IT SPREADS.*

Are the deadliest animals the ones you expected? Why or why not?