## In September 1994, a violent disease erupted among a group of racehorses in a small town in Australia. The first victim was a female horse that was last seen eating grass beneath a fruit tree. One of her caretakers noticed that the horse didn't appear to be well and brought the

Three people worked to save the animal—the horse's trainer, an assistant, and a veterinarian.<sup>2</sup> Nevertheless, the horse died two days later, leaving the cause of her death uncertain. Had she been bitten by a snake or eaten something poisonous?

animal back to her stable<sup>1</sup> for observation. Within hours, the horse's health declined rapidly.

Within two weeks, most of the other horses in the stable became ill as well. All had high fevers, difficulty breathing, facial swelling, and blood coming from their noses and mouths. Despite efforts by the veterinarian, 12 more animals died. Meanwhile the trainer and his assistant also became ill, and within days, the trainer was dead too. Laboratory analysis finally discovered the root of the problem: the horses and men had been infected by a previously unknown virus, which doctors eventually labeled Hendra. This virus had originated in bats that lived in the tree where the first horse had been eating grass. The virus passed from the bats to the horse, which then transmitted the virus to other horses and to people—with disastrous results.

Infectious disease is all around us. Diseasecausing agents, such as viruses, usually have specific targets. Some viruses only affect humans. Other viruses live in or affect only animals. Problems start when animal viruses are able to infect people as well, a process known as zoonosis. When an animal virus passes to a human, the results can be deadly. Often our immune systems are not accustomed to these viruses and are unable to stop them before they harm us.

In the last three decades, more than 30 zoonotic diseases—the kind that live only in animals but somehow pass to people—have emerged around the globe. HIV is an example; it evolved from a virus originally carried by African monkeys and later chimps. Today, conservative estimates suggest that HIV has infected more than 40 million people, though this number may be higher. SARS, a type of flu which jumped from chickens to humans, is another type of zoonotic disease.



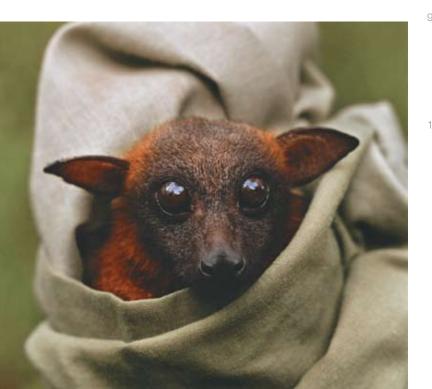
Hendra survivor Ray Unwin still suffers from the aftereffects of the disease. "I can't get the tiredness out of my body," he says.

<sup>&</sup>lt;sup>1</sup> A **stable** is a building where horses are kept.

<sup>&</sup>lt;sup>2</sup> A **veterinarian** is an animal doctor.

But how do these viruses—like Hendra, SARS, and HIV—pass from animals to humans? Contact is crucial. Human destruction of animal habitats,<sup>3</sup> for example, is forcing wild animals to move closer to the places people live—putting humans at risk for exposure to animal viruses. The closer humans are to animals, the greater the risk of being bitten, scratched, or exposed to animal waste, which can enable a virus to pass from an animal to a human. Raising animals (for example, on a farm) or keeping certain kinds of wild animals (like monkeys) as pets 70 increases the risk of exposure. Eating animals that are diseased can also result in a virus being transmitted.

The factor that is probably most responsible for the spread of zoonotic diseases worldwide is international travel. In 1999, for example, a deadly disease—one that had never been seen before in the Western Hemisphere—appeared in the United States. There were several incidences that year of both birds and people becoming sick and dying in New York City, and doctors couldn't explain why. Subsequently, they discovered that the deaths had been caused by the same thing: the West Nile virus, found typically in birds and transmitted by mosquitoes that live in parts of Northern Africa. Somehow, this virus—





Scientist Eric Leroy studies another very serious disease, Ebola. At his lab in Gabon, his research points to fruit bats as carriers of the disease.

probably carried by an infected mosquito or bird on a plane or ship—arrived in the U.S. Now birds and mosquitoes native to North

America are carriers of this virus as well.

West Nile cannot be transmitted from person to person. But zoonotic diseases, which can be spread by a handshake or sneeze, create medical emergencies: they can potentially circle the world and kill millions of people before science can find a way to control them.

Today, researchers are working to create vaccines for many of these zoonotic diseases in the hope of controlling their impact on humans. Other specialists are trying to make communities more aware of disease prevention and treatment, and to help people understand that we are all—humans, animals, and insects—in this together.

 Hendra was eventually traced to fruit bats, like this little red flying fox, living in a nearby tree.

<sup>&</sup>lt;sup>3</sup> An animal's or plant's **habitat** is the natural environment where it normally lives and grows.