

# ScienceNews*for*Students

## ANIMALS HEALTH

### Explainer: Animals' role in human disease

Wildlife, livestock and pets are the source of most germs that can sicken people

BY AMANDA LEIGH MASCARELLI AUG 15, 2013 — 9:43 AM EST



Swine flu gets its name from the fact that the infection initially developed in pigs and then spread among people, beginning with farm families and butchers. Pigs also became a host for Nipah — a killer disease initially carried by bats.

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Nearly 75 percent of new, or emerging, infectious diseases in people were first spread by animals. Indeed, half of all germs known to cause human disease come from other animals. Some sources were birds, bats and other types of wildlife. Livestock and pet animals have spread many other diseases. Scientists refer to the infections that people pick up from animals as being zoonotic (ZOO-oh-NOT-ik).

The germs and other infectious agents that cause these diseases are known as pathogens. Most are microbes such as viruses or bacteria; others include fungi — even teeny-tiny worms and ticks.

In zoonotic diseases, animals serve as a pathogen's *host*. Over time, some long-term hosts no longer become sickened. When a virus commonly lives inside an animal without harming it, that host is now called a *reservoir*. For instance, birds — especially ducks — have evolved into a natural reservoir for flu viruses.

Pathogens move among hosts continuously, explains Jonathan Epstein. A veterinary epidemiologist, he's a scientist who studies the spread of disease in animals. (He works at EcoHealth Alliance in New York City.) Many pathogens will encounter a human host. If that person's immune system had never yet encountered the microbe, it will have built up no immunity to fight the germ. That lucky pathogen can now survive and spread to others.

Understanding how pathogens spread between species can help scientists not only combat current disease outbreaks, but also prevent or lessen future ones.

For instance, Epstein specializes in viruses whose reservoir is bats. He has been on the trail of numerous viruses that have spilled over into people from these mammals. Among them: Nipah.

This viral disease started in Southeast Asia during the late 1990s. Workers at a massive pig farm began noticing troubling symptoms. Their pigs came down with a loud, barking cough and behaved strangely. They twitched and developed muscle spasms. Some pigs died. Tragically, farm workers also started getting sick. In severe cases, people entered a coma and died.

No virus can survive long outside a living organism. So Epstein teamed up with other experts to hunt the reservoir animal that had allowed Nipah to enter pigs.

It turned out to be a bat species. It normally stays away from people, living in the nearby rainforest. But when farmers planted an orchard of mango trees close to their piggens, bats came by to dine on the juicy fruit. Those bats shed germy saliva, urine and feces onto the piggens below them.

From 1998 to 1999, Nipah sickened more than 250 people. More than four out of every 10 of these people died. One million pigs were killed and disposed of to stop the disease's spread.

It is important not to blame wildlife for diseases, says Kristine Smith, a wildlife veterinarian who works for EcoHealth Alliance. Instead, she argues, people must become aware of the risks of being in close proximity to animals and adjust their behavior accordingly.

## Power Words

**bacterium** (plural: bacteria) A single-celled organism. Considered primitive, bacteria lack some of the organized structure seen in other types of cells — especially those that make up plants and animals.

**emerging infectious disease** A disease that suddenly has begun infecting increasing numbers of people or other organisms and could increase dramatically — especially in the near future.

**epidemiologist** Like health detectives, these researchers figure out what causes a particular illness and how to limit its spread.

**infection** The successful invasion of a disease-causing microorganism into the body, where it multiplies, possibly causing serious injury to tissues (such as the skin, lungs, gut or brain).

**infectious** A germ or other pathogen that can be transmitted to people and other organisms through the environment.

**immunity** The state of being immune to, or having resistance to, a particular infectious germ.

**influenza (or flu)** A contagious respiratory illness caused by any of several groups of viruses. Symptoms can include headache, fever, cough, sore throat and body aches. The severity of these illnesses can range from mild to severe, sometimes resulting in death.

**outbreak** The sudden emergence of disease in a population of people or animals.

**pathogen** A microorganism, or germ, or other infectious agent that causes disease or illness. Pathogens include viruses, bacteria, fungi and other life-forms, such as teeny-tiny worms.

**reservoir** A large store of something. Lakes are reservoirs that hold water. People who study infections refer to the environment in which germs can survive safely (such as the bodies of birds or pigs) as living reservoirs.

**virus** A tiny molecule made of a protein shell that encloses genetic information. A virus can survive and multiply only in the living cells of a host, such as people.

**zoonosis** Any disease that originates in nonhuman animals that can be transferred to people.

## Readability Score:

7.9

## Further Reading

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