Explainer: Animals’ Role in Human Disease

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

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While we may not readily think of our pets or farm animals as being dangerous, animals play a significant role in human disease. In this informational text, Amanda Leigh Mascarelli discusses how humans are impacted by animals infected with a virus or bacteria. As you read, take notes on how scientists prevent viruses from spreading further after an outbreak is identified.

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 pigpens, bats came by to dine on the juicy fruit. Those bats shed germy saliva, urine, and feces onto the pigpens 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.

4. a sudden and uncontrollable muscle movement
5. nearness in space to something
Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which statement identifies the central idea of the text?
   A. It is safer to avoid all contact with animals than to risk contracting a virus.
   B. Animals help the humans they come into contact with build an immunity to diseases.
   C. Diseases that seriously harm animals have little to no effect on humans.
   D. Humans can contract dangerous diseases after coming into contact with infected animals.

2. PART B: Which quote from the text best supports the answer to Part A?
   A. “Some sources were birds, bats, and other types of wildlife. Livestock and pet animals have spread many other diseases.” (Paragraph 1)
   B. “In zoonotic diseases, animals serve as a pathogen’s host. Over time, some long-term hosts no longer become sickened.” (Paragraph 3)
   C. “Some pigs died. Tragically, farm workers also started getting sick. In severe cases, people entered a coma and died.” (Paragraph 7)
   D. “It is important not to blame wildlife for diseases, says Kristine Smith, a wildlife veterinarian who works for EcoHealth Alliance.” (Paragraph 11)

3. How does paragraph 11 contribute to the development of ideas in the text?
   A. It advises readers on what to do with their knowledge about infected animals.
   B. It discourages readers from coming in contact with certain animals.
   C. It puts the blame on humans for contracting diseases from infected animals.
   D. It tells readers what they should do if they contract a disease from an infected animal.

4. What is the relationship between studying animal diseases and protecting humans?
   A. By studying animals, scientists can learn about the sources of certain diseases and prevent them from spreading further.
   B. By studying animals, scientists can determine which species humans are no longer allowed to come in contact with.
   C. By studying animals, scientists can cure the infected animals so that they no longer spread diseases to humans.
   D. By studying animals, scientists can learn how they develop their immunity to certain viruses and apply it to humans.
5. How does the author’s discussion of the shared virus between the pigs and the bats help us understand animals’ role in human disease?
Discussion Questions

Directions: Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.

1. Do you or someone you know have a pet? Have you ever worried about coming in contact with germs from them? What do you do to limit the risk of contracting anything dangerous from pets or other animals?

2. In the context of the text, how can contact with animals negatively impact humans? In what ways does contact or working with animals benefit humans?

3. In the text, the author emphasizes the importance of studying animal diseases to help humans. What are some other examples in which scientists have to study something harmful to better protect people from it?