Germs and Disease

You wake up feeling tired. Your nose is stuffy. Your throat is sore. You have a cold. A cold is one kind of disease. A disease is any condition that interferes with the normal or proper functioning of the body or mind. Diseases such as colds are called communicable diseases. A communicable disease is a disease that can be spread to a person from another person, an animal, or an object.

Communicable diseases are caused by germs. Germs are organisms that are so small they can only be seen through a microscope. The environment is filled with many types of germs. Germs that cause diseases are called pathogens. An infection is a condition that happens when pathogens enter the body, multiply, and cause harm. When the body cannot fight off an infection, a disease develops. Figure 13.1 shows some kinds of pathogens and lists the diseases they cause.
What Are Communicable Diseases?

Guide to Reading

- **Building Vocabulary**
  - disease (p. 402)
  - communicable disease (p. 402)
  - germs (p. 402)
  - pathogens (p. 402)
  - infection (p. 402)
  - viruses (p. 403)
  - bacteria (p. 403)
  - fungi (p. 403)
  - protozoa (p. 404)

- **Focusing on the Main Ideas**
  - Identify types of germs that can cause disease.
  - Describe what an infection is.
  - Explain how germs are spread.
  - Access information on a communicable disease.

- **Reading Strategy**
  - Organizing Information: As you read this lesson, make a list of different ways that pathogens are spread.

- **Quick Write**
  - How do people catch colds? Write down one or two sentences that explain your answer.

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![Figure 13.1: Pathogens and the Diseases They Cause](image)

Communicable diseases are all caused by pathogens. According to the chart, what common diseases do fungi cause?

- **Pathogens**
  - Viruses
  - Bacteria
  - Fungi
  - Protozoa

- **Diseases**
  - Colds, chicken pox, influenza, measles, mononucleosis, mumps, hepatitis, herpes, HIV, yellow fever, polio, rabies, viral pneumonia
  - Pink eye, whooping cough, strep throat, tuberculosis, Lyme disease, most foodborne illnesses, diphtheria, bacterial pneumonia, cholera
  - Athlete's foot, ringworm
  - Dysentery, malaria, trichomoniasis

Kinds of Pathogens

There are four basic kinds of pathogens: viruses, bacteria, fungi, and protozoa. Viruses (vyr-uh-suhz) are the smallest and simplest pathogens. Viruses are not alive. They are usually made of genetic material and protein. Viruses cause upper respiratory infections and many other types of diseases.

Bacteria are simple one-celled organisms. Bacteria exist in every environment on earth. Most kinds of bacteria are not only harmless but actually helpful. Helpful bacteria live in your digestive system and help break down food. Other bacteria live on your skin and prevent harmful bacteria from infecting you. Harmful bacteria cause diseases such as strep throat and pneumonia.

Fungi (fuhn-ji) are organisms that are more complex than bacteria but cannot make their own food. Molds, yeast, and mushrooms are examples of fungi. Fungi thrive in warm, moist environments. Most fungi are harmless, but some can cause disease. For instance, a fungus causes athlete's foot.
Protozoa (proh-tuh-ZOH-uh) are one-celled organisms that are more complex than bacteria. Although many protozoa are harmless, some can cause serious diseases. For example, one type of protozoa causes malaria. This disease can be transferred to people through mosquito bites.

**Reading Check** Identify What are four kinds of pathogens?

**How Pathogens Spread**

Communicable diseases spread when a person gets infected by pathogens from another person, an animal, or an object. Once you know how pathogens spread, you can help keep yourself and others safe from them. Most pathogens are spread in one of the following ways.

**Direct contact with others**

Some pathogens spread directly from one person to another. For example, a person with pinkeye might wipe his or her eye with a hand. If that hand touches your hand, and you touch your eye, you could get pinkeye. Washing your hands often with soap helps stop the spread of these pathogens.

**Indirect contact with others**

Some pathogens can spread from person to person without direct contact. When you have a cold or sore throat and you sneeze or cough, you can send pathogens into the air. Anyone breathing this air can become infected with the pathogen. Using tissues to cover your mouth and nose when you sneeze or cough can keep these pathogens from spreading.

Pathogens can also spread when people share drinking glasses, eating utensils, and other personal items. If you have a cold and drink from a cup, the cold viruses can be passed to others who take a sip from that cup. Always wash glasses, cups, and eating utensils with warm, soapy water before using them. Never share eating utensils, cups, drinking glasses, or personal items, such as toothbrushes or razors, with others.

**Contact with someone else's blood**

Some pathogens, such as the human immunodeficiency virus (HIV), which causes Acquired Immunodeficiency Syndrome (AIDS), can spread when blood from an infected person comes in contact with someone else's blood. This can happen when someone injects drugs using a needle that someone else has used. Unclean needles and tools used for tattooing and piercing can also spread pathogens. In some cases, pathogens can spread when the blood...
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Sexual contact

Some pathogens are spread through sexual contact. You will learn more about these pathogens and the diseases they cause in Lessons 5 and 6.

Contact with contaminated food and water

Rare meat may taste good, but it may not be healthy for you. Undercooked meat may still contain bacteria that can make you sick. Illnesses people get from pathogens in food are called foodborne illnesses. To prevent foodborne illnesses, you must carefully prepare food before you eat it. You should properly store food that can spoil, such as dairy products and meat. Always wash fruits and vegetables. Handle meat, poultry, eggs, and fish carefully, and cook these foods thoroughly. Cleaning up is also very important. First, wash all knives and surfaces that meat, poultry, and fish have touched. Then mix one tablespoon of bleach into one gallon of warm water. Use it to wipe down all knives and cutting boards to kill germs. Even tap water can become contaminated in times of emergency.
Some pathogens are spread through contaminated water. Never drink water directly from lakes and rivers. Most towns and cities must purify their water to make it safe to drink.

**Contact with animals or insects**

Animals and insects can spread pathogens. For example, animals that carry the rabies virus can infect other animals and humans if they bite them. A deer tick's bite can spread the virus that causes Lyme disease. Mosquitoes infected with the West Nile virus can spread that virus to birds, horses, and humans.

**Reading Check** Explain What are six ways that communicable diseases can be spread?

Mosquitoes can infect humans with the West Nile virus. Controlling mosquito populations is one way to help control the spread of the West Nile virus. **What other ways can communities help prevent the spread of diseases spread by animals?**

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### Lesson 1 Review

**After You Read**

*Review this lesson for new terms, major headings, and Reading Checks.*

#### What I Learned

1. **Vocabulary** Define **communicable disease** and **pathogen**. Write a sentence using both terms.

2. **Identify** What is an infection?

3. **Give Examples** What are three kinds of pathogens? Give an example of a disease caused by each kind.

4. **Explain** Why is it important to clean kitchen cutting boards carefully?

#### Thinking Critically

5. **Analyze** How does keeping insect populations down help keep people healthy?

6. **Apply** Aaron wants a drink of water. He finds a plastic cup on the table but does not know if it has been used or not. Should Aaron use the cup? Explain your answer.

#### Applying Health Skills

7. **Goal Setting** List three ways that you can prevent the spread of pathogens. Use the goal-setting steps to create a plan, and write a paragraph describing the results.