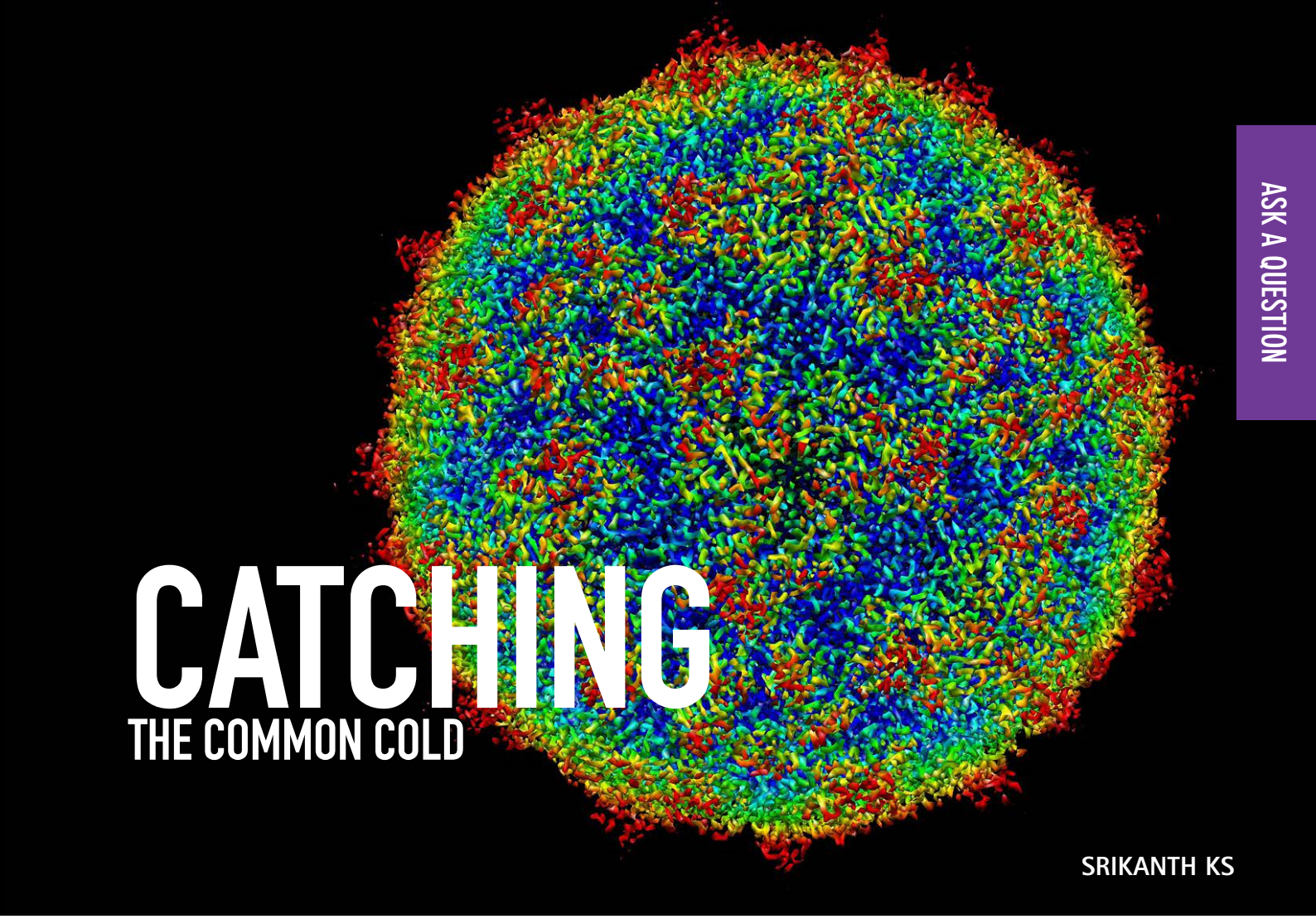


CATCHING
THE COMMON COLD

SRIKANTH KS

The common cold is the most common cause of human illness. What causes it? How does it spread? Why do we keep catching colds? And how serious is a cold?

"The only way to treat the common cold is with contempt."—Sir William Osler, a Canadian physician and one of the founding professors of Johns Hopkins Hospital, US.

Who does not know or remember what it is like to suffer from the common cold? Adults typically suffer from 2-3 colds a year. Children usually catch 6-10 colds a year. This number may go up to 12 colds a year in school-going children. Some estimates suggest that colds cause 40% of all time-offs from work and 30% of time-offs from school. But what causes colds and how do we catch them?

What causes a cold?

It may come as a surprise to learn that the 'common cold' is a term used to refer to infections caused by more than 200 different strains of viruses (see **Box 1**).

About 20-30% of these infections are caused by strains that are yet to be identified. Other colds are caused mainly by rhinoviruses, human coronaviruses (HCoVs), respiratory syncytial viruses (RSVs), and parainfluenza viruses (PIVs). The most common culprits, however, are rhinoviruses (see **Box 2**).

How do we catch a cold?

We know by experience that colds are highly contagious. They spread, directly or indirectly, from one person to another (see **Activity Sheet I: Colds & Social Interactions** and **Teacher's Guide: Activity Sheet I**). You can catch the virus from anyone infected with a cold virus—even if they do not show any symptoms of a cold.

An infected person sheds the virus when they exhale, talk, cough, or sneeze (see **Activity Sheet II: Colds & Uncovered Sneezes**). The viruses shed from an infected person's body can

Box 1. How do we know that the common cold is caused by viruses?

In ancient times, colds were believed to be caused by evil spirits, an imbalance of the four 'humors' (blood, phlegm, black bile, and yellow bile), or by the body getting too chilled.

By the 1890's, it was known that diseases like cholera and dysentery were caused by bacteria. This led to the hypothesis that colds too may be caused by bacteria. Experiments showed the presence of many different bacteria in the nose swabs and sputum samples of patients of the common cold. However, the same types were seen in comparable abundance in the swabs and sputum samples of healthy individuals.

In 1914, the German bacteriologist Walther Kruse collected nasal secretions from a colleague suffering from the common cold and passed it through a very fine filter. The filter was so fine that it would hold back bacteria. He used the filtrate to inoculate a tiny sample of 12 healthy volunteers. One third of these volunteers developed symptoms of a cold within three days. He repeated this experiment with a larger sample and got similar results. These results led him to conclude that the common cold was caused by a virus. In 1920, a group of microbiologists at the medical school of Columbia University obtained the same results from similar experiments with chimpanzees and human volunteers. This convinced the scientific community that colds were caused by viruses.

These early experiments were refined at the Harvard Hospital, Salisbury, England. In 1946, after World War II had ended, this war-time hospital was turned into the Common Cold Research Unit. For the next 43 years, this unit conducted many lab experiments and clinical trials to study the transmission of colds in humans. These trials led to the identification of many (~100) different strains of cold viruses.

Box 2. What do we know about rhinoviruses?

We know that rhinoviruses can infect only humans, gibbons, and chimpanzees. The first human rhinovirus was identified in 1953 by the American scientist and epidemiologist Winston Price. Price isolated this virus from the nasal passage samples that he had collected from a cluster of nurses at Johns Hopkins University who had developed a cold. Price named the virus JH after Johns Hopkins and cultured it in monkey kidney cells. Since then, several other types of rhinoviruses have been discovered.

Studies show that these viruses thrive at temperatures of 32-35° C and their infectivity drops by as much as 90% at 37° C. This could be why these viruses typically tend to infect cells of the nose (more exposed, cooler, and closer to temperatures of 32-35° C) and how these viruses get their name—the word 'rhino' in Greek is pronounced as 'rhy-noz' and means 'nose'.

Human rhinoviruses consist of a single strand of ribonucleic acid (RNA) enclosed within an icosahedral protein capsid.

A typical rhinovirus is only 30 nanometres or 0.000003 millimetres in size. This is so small that we can only see these viruses under a very powerful microscope, like an electron microscope. Viewed under such a microscope, the virus looks very much like a football, with many pentagonal parts attached to each other (see **Fig. 1**). But while a football is smooth on the outside, the outer surface of a rhinovirus is covered with lots of knob-like outgrowths. Remember these knobs—they play an important role in our story!

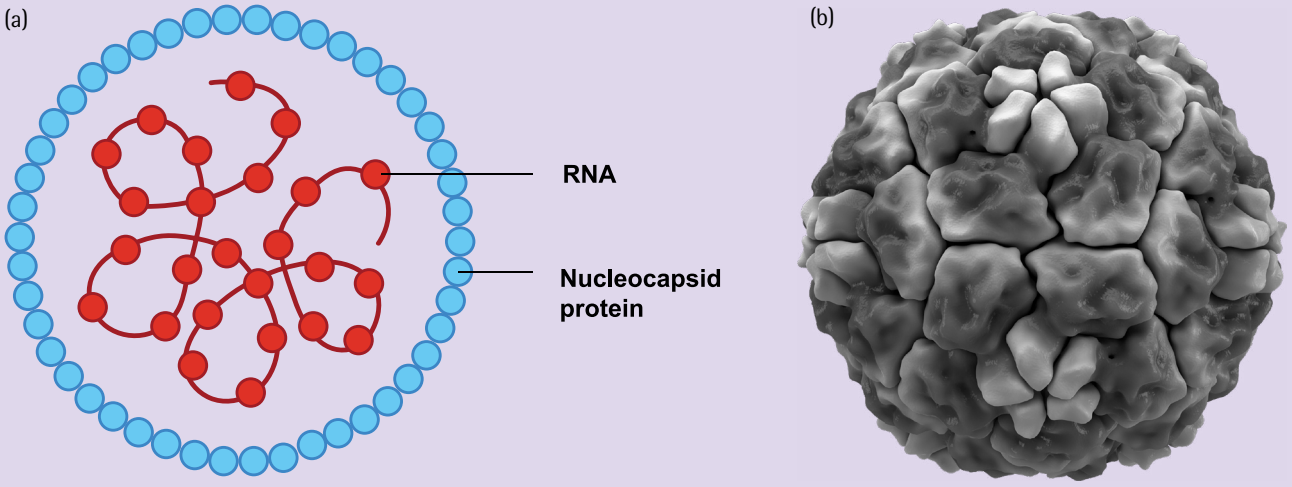


Fig. 1. Rhinoviruses. (a) Inner structure. **(b)** External view.

Credits: (a) Adapted from an image by Shubhangi Kandwal & Darren Fayne. (2023). Genetic conservation across SARS-CoV-2 non-structural proteins—Insights into possible targets for treatment of future viral outbreaks. URL: https://www.sciencedirect.com/science/article/pii/S004268222300034X#fig3. License: CC BY 4.0 DEED. (b) Thomas Splettstoesser. URL: https://commons.wikimedia.org/wiki/File:Rhinovirus_isosurface.png. License: CC BY-SA 4.0 DEED.

remain infective for 4-5 hours. The colder the environment, the longer the viruses remain infective. A healthy person can encounter the virus in four ways (see **Fig. 2**):

- One way you can encounter the virus is when you touch your eyes, nose, or mouth immediately after touching surfaces (like doorknobs, towels, plates, toys, or telephones) that an infected person has touched. This is called **fomite transmission**.
- You can also encounter the virus if you are in direct physical contact with an infected person. This happens, for example, if you kiss or hug an infected person or touch your eyes, nose, or mouth immediately after shaking hands with an infected person. This is called **contact transmission.**
- Some of the viral load shed by an infected person is in the form of tiny particles that we call aerosols. These remain suspended in the air, much like the spray from an air freshener. You encounter the virus when you breathe in this air. This is called **aerosol transmission**.
- Other viruses are shed as droplets. Droplets are larger than aerosols, remain suspended in the air for shorter periods, and travel shorter distances. You encounter the virus when it makes physical contact with your nose, eyes, or mouth. This is called **droplet transmission.**

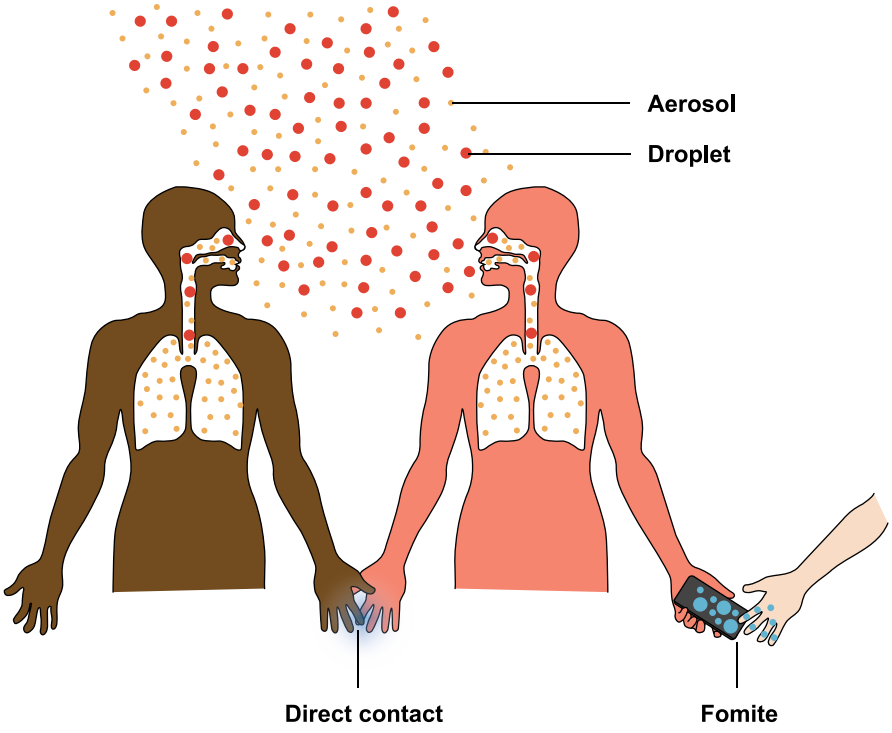


Fig. 2. Modes of transmission.

Credits: Adapted from Leung, N.H.L. Transmissibility and transmission of respiratory viruses. Nat Rev Microbiol 19, 528–545 (2021). https://doi.org/10.1038/s41579-021-00535-6. URL: https://www.nature.com/articles/s41579-021-00535-6/figures/1. License: Copyright owned by the rights owners (credits).

What are the symptoms of a cold?

A cold is mainly an infection of the upper respiratory tract (see **Fig. 3**). Typically, you develop symptoms of this infection within 1-3 days of exposure to a cold virus (see **Box 3**). However, how soon these symptoms appear can vary depending on the incubation period of the virus (the time between when you are exposed to the virus and when you begin to feel sick). This can be as short as 8-12 hours for rhinoviruses and longer for other cold viruses.

Once symptoms appear, a cold typically progresses in three stages:

- Stage 1 (early): This includes symptoms seen in days 1-3 after exposure to a cold virus. In about 50% of people who develop a cold, the first symptom they experience is a tickle or soreness in their throats. Other symptoms include feeling chilled, hoarseness, a stuffy nose, a runny nose, sneezing, and a mild hacking cough. Their mucus remains clear. This is also the stage at which infected people are most contagious.
- Stage 2 (active): This includes symptoms seen in days 4-7 after exposure to the cold virus. Symptoms of the early stage typically worsen. Infected people may experience other symptoms like (occasional) headaches, (mild) body aches, sluggishness, watery eyes, and (low-grade) fever (more common in children). Their mucus may change to a white, yellow, or green colour.
- Stage 3 (late): This includes symptoms seen in days 8-12 after exposure to the cold virus. Most people start to recover from the cold and most symptoms start to wind down during this period.

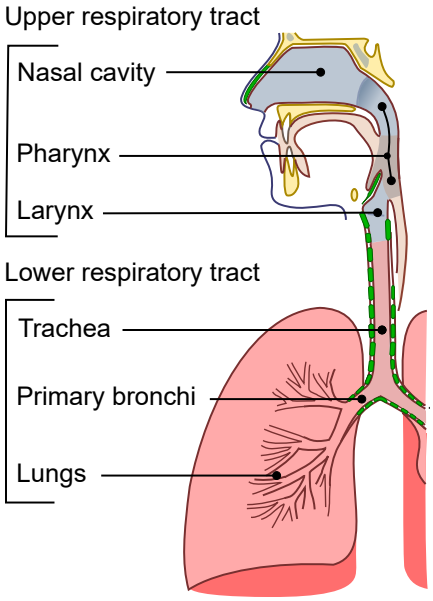


Fig. 3. The upper respiratory tract includes the nose, throat, voice box, and sinuses.

Credits: Lord Akryl, Jmarchn, Wikimedia Commons. URL: https://commons.wikimedia.org/wiki/File:Illu_conducting_passages.svg. License: CC-BY.

Box 3. How do we develop an infection?

A cold virus can enter the body through the eyes, nose, and mouth. Since these are connected to each other and the airways, once the virus reaches any of these sites, it can travel to the others.

Our eyes, nose, mouth, and airways are lined by mucous membranes. The cells lining these membranes have special molecules, called receptors, on their outer surface. These receptors are known by strange-sounding names like ICAM-1 and LDL. When a cold virus contacts one of these cells, it uses its knoblike appendages to hold onto its receptors. This is very similar to two people shaking hands when they meet. Except that the virus refuses to release the cell's hand! Normally, these receptors are used to ingest macromolecules or fluids. Since the virus is attached to one of these receptors, the cell mistakes it for a macromolecule or fluid and ingests it.

Once the virus is within the cell, it uses the cell's enzymes, nucleotides, and energy (ATP) for replication of the viral genome. Other cellular enzymes, amino acids, and more energy is used to produce and fold the proteins that form the football-like capsid of the virus. Non-structural viral proteins use some more of the cellular energy to assemble new viral particles. This process is so efficient that lakhs of new viruses are produced and assembled within 5-8 hours.

When the host cell runs out of energy and resources, the newly-formed viruses break out from it (see **Fig. 4**). This process is called cell lysis. It is somewhat like a stranger entering your house and fooling you into believing that they are a member of your family. They use all your resources and energy to meet their demands while you starve to death.

The newly released viruses quickly attack neighbouring cells and the process is repeated. This is how you develop an infection. This is why, for example, you experience irritation in the throat and nose. The multiplying virus kills thousands of cells in the mucosal lining. The exposed parts feel raw and are sensitive. Similarly, the thick nasal discharge or phlegm (pronounced flem) that you produce when you have a cold contains the remains of the cells killed by the virus as well as lakhs and lakhs of copies of the virus. These new viral particles can infect other people.

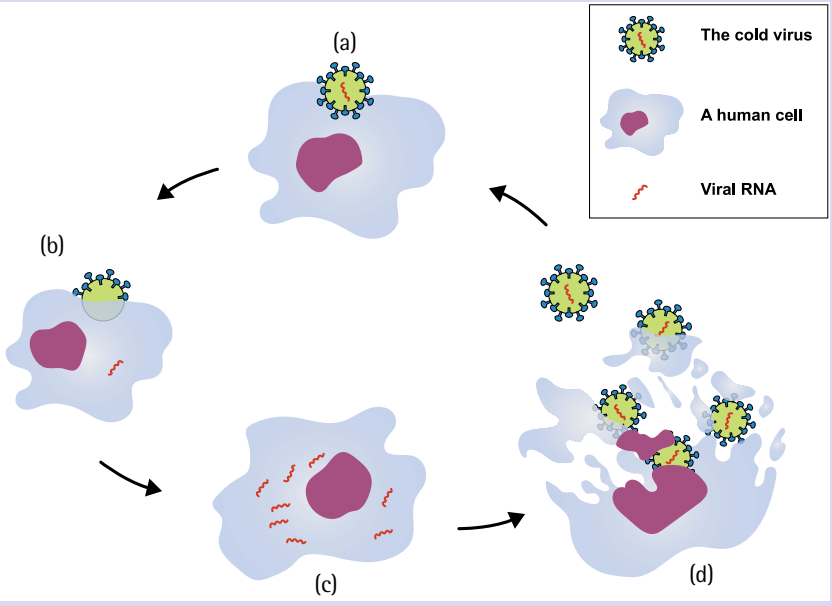


Fig. 4. A typical lytic cycle. (a) The virus attaches itself to a receptor on the cell membrane. (b) The virus penetrates the cell membrane and the viral RNA is released into the cytosol. (c) The viral RNA replicates using host cell machinery. (d) Host cell machinery is used to produce viral proteins and assemble new viral particles. The new particles are released from the cell. The host cell is destroyed in the process.

Credits: Adapted from an image on SchoolWorkHelper by St. Rosemary Institution. URL: https://schoolworkhelper.net/viral-replication-lytic-cycle/. License: Copyright owned by the rights owners (credits).

Not all infected people experience all these stages (see **Fig. 5**). Also, the severity and persistence of symptoms at each stage of infection can vary depending on the strain of the virus and the immunity of the infected person. For example, about 25% of adults who are infected with a cold virus may show no symptoms. But they can still spread the infection. While the infection lasts 7-10 days in most adults, it may persist for about two weeks in 25% of them. Some adults may experience a persistent cough for an average of 18 days and even up to two months post-infection. Others may also develop secondary infections (see **Table I**). In general, children (especially infants and those at the preschool stage) show more intense symptoms (fever is common during the first 3 days) and these symptoms may last longer (14 days rather than 5-7 days) than those in adults (see **Activity Sheet III: Observing Your Colds**).

How serious is a cold?

A cold is a mild infection in adults. Many of the symptoms that we associate with it may have less to do with cold viruses and more to do with the immune response that these viruses trigger in your body. It is because of this immune response that a cold rarely causes death or serious illness in adults and resolves without medication in a few days.

However, in immunocompromised people (like those who have undergone a bone marrow transplant or are undergoing chemotherapy), cold viruses may meet with much less resistance. Such people could develop serious illnesses or die. Death could occur either due to the virus itself or due to the complications that arise along with colds. These complications can be of different kinds. For example, some cold viruses (like the influenza virus) can cause severe inflammation in the lungs. Other cold viruses (like adenoviruses) can spread to and cause damage to other parts of the body (like the gastrointestinal tract or liver). And some cold viruses (like rhinoviruses)

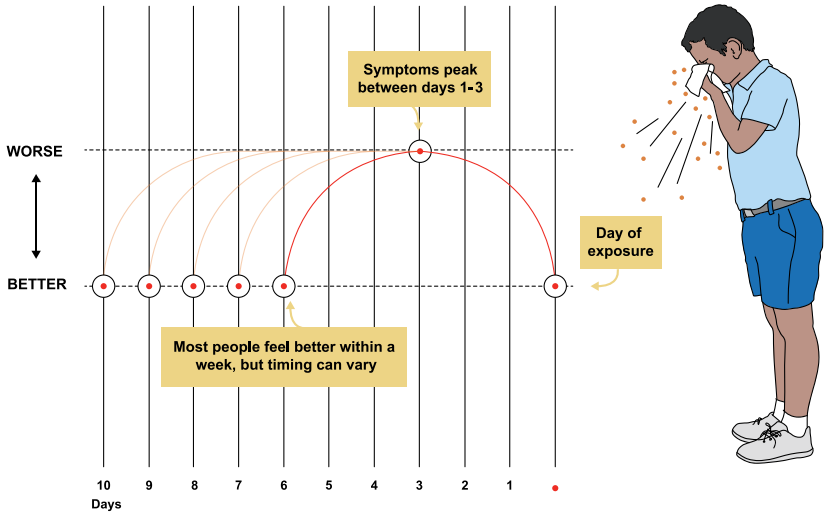


Fig. 5. The general timeline of a cold.

Credits: Adapted from an image by GoodRx, Inc. URL: https://www.goodrx.com/conditions/cold-symptoms/common-cold-stages-timeline. License: Copyright owned by the rights owners (credits).

Table I. Conditions that can occur along with colds.

Complications	Symptoms	Cause
Middle ear infections	A building up of fluid in the space behind the eardrum leads to earaches	Bacteria or viruses
Sinusitis	Swelling and pain in the air-filled spaces (sinuses) in the skull above the eyes and around the nose	Bacteria or viruses
Asthma	Wheezing	
Other illnesses	Illnesses of the lungs, like bronchitis or pneumonia	Bacteria or viruses

can more effectively prime the lungs of immunocompromised people in ways that increase the chances of their catching bacterial pneumonia.

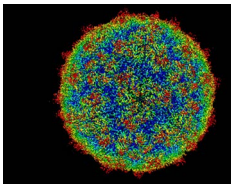
But if our immune system is so effective in protecting us against colds, why do we keep catching colds? On the one hand, cold viruses like RSVs, PIVs, and HCoVs do not produce lasting immunity after infection. This means that such viruses can reinfect you. On the other hand, cold viruses like rhinoviruses, adenoviruses, and influenza viruses can produce lasting immunity, but this immunity is specific to the variant of the virus that you are infected with. Since these viruses have many different variants, you can catch a cold every time you encounter a new variant.

Parting thoughts

What if you catch a cold? There are currently no antivirals that protect us against cold viruses. Antibiotics are not useful in treating colds and should be taken only if you develop a secondary bacterial infection. Medicines like paracetamol, aspirin, antihistamines, or decongestants only provide temporary relief from the symptoms of a cold.

What can help with a cold is to get plenty of rest and drink plenty of fluids. You can also reduce the risk of spreading the infection to others by covering your nose and mouth while sneezing and coughing, frequently washing your hands with soap and water, and minimising the time you spend with others in closed and poorly ventilated spaces.

Key takeaways



- The 'common cold' is a term used for upper respiratory tract infections caused by more than 200 strains of viruses.
- An infected person sheds cold viruses when they exhale, talk, cough, or sneeze. The virus is transmitted to healthy people by aerosols, droplets, contact and fomites. It enters the human body through the nose, mouth, and eyes.
- A cold typically progresses in three stages—early, active, and late. The severity and persistence of symptoms at each stage can vary.
- Colds typically last 7-10 days in most adults. However, the infection or certain symptoms can persist beyond this period in some cases. Some people develop secondary infections.
- Colds rarely cause serious illness or death. They tend to resolve without medication in a few days. Exceptions to this are seen in people with compromised immune responses.
- There are currently no antivirals against cold viruses. Medications prescribed for a cold offer relief from its symptoms. Rest and staying hydrated can aid recovery.

Notes:

1. This article was first published in i wonder..., June 2016, pp. 18-25. The original draft can be found here: https://publications.azimpremjiuniversity.edu.in/1406/. The version included here has been reviewed and modified for school teachers. It features a more detailed version of the first part (causes of infection) of the original draft. It also includes new material, three activity sheets, and one teacher's guide.
2. Credits for the image used in the background of the article title: Human Rhinovirus C15A, jrvalverde, Pixabay. URL: https://pixabay.com/illustrations/human-rhinovirus-c15a-human-virus-1750028/. License: CC0.

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Srikanth KS is an independent research consultant. His primary area of interest is in host-pathogen interactions. He can be contacted at: sriikis@gmail.com.

Ask A Question

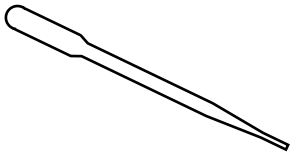
ACTIVITY SHEET I : COLDS & SOCIAL INTERACTIONS

Aim:

How do interactions with other people spread cold viruses?

You will need:

A tube



A transfer pipette

What to do:

1. Your teacher will invite you to choose a tube. Pick a tube at random. Make note of the number marked on your tube.
2. You will engage in four interactions. The first three interactions will be with three different classmates. The last interaction will be with your teacher. Record the tube numbers of each of your partners.
3. In each interaction, pipette out a small volume of the transparent liquid from your tube. Wait till your partner has done the same. Then transfer 2-3 drops of the liquid from your pipette to your partner's tube. Allow your partner to transfer 2-3 drops of the liquid from their pipette to your tube. After each such interaction, observe the colour of the liquid in your tube. Record any change in it.
4. After the third interaction, form a circle with all your classmates. Your teacher will pipette a couple of drops of a liquid from their tube into your tube. Observe the colour of the liquid in your tube. Record any change in it.

Interactions	Your tube number	Your partner's tube number	Any change in the colour of the liquid in your tube
I			
II			
III			
IV		Teacher	

Observe the tubes:

By the end of the fourth interaction, how many students in your class:

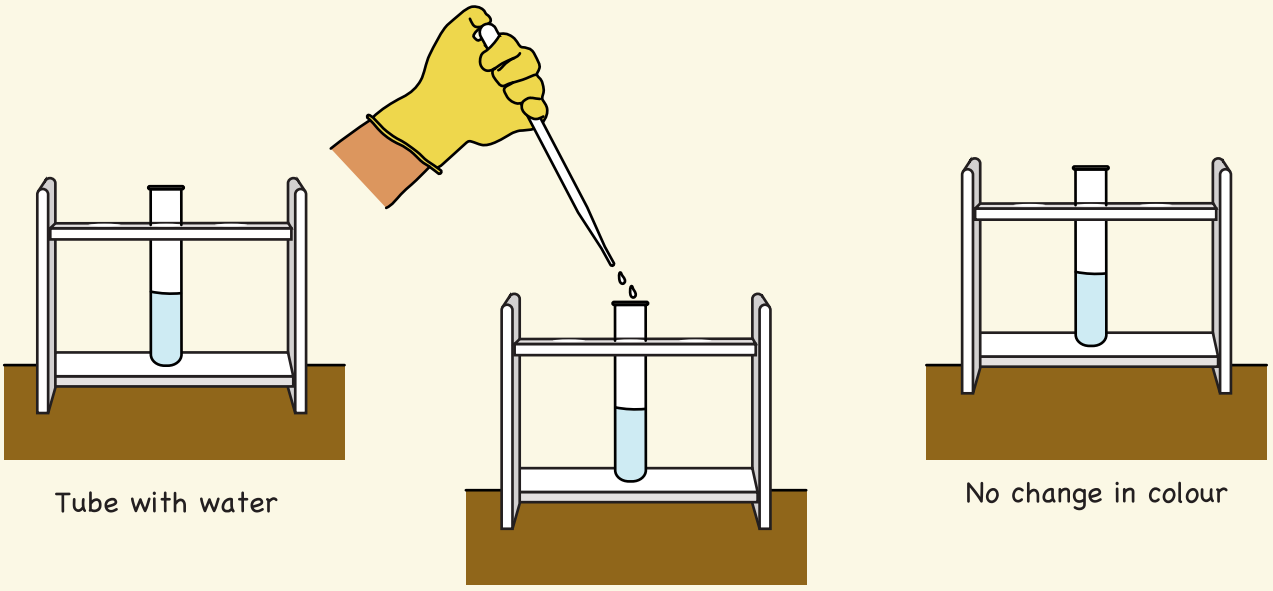
- Continue to have colourless liquid in their tubes?
- Have coloured liquid in their tubes? What colour is the liquid in these tubes? How would you explain the difference in colour?

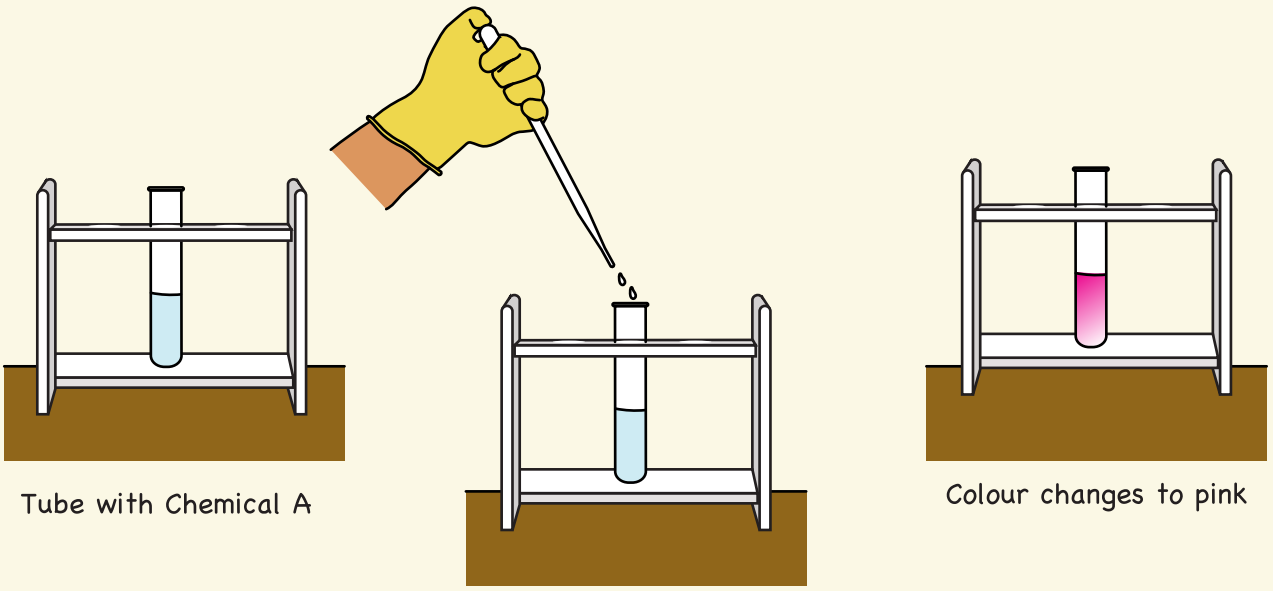
Record:

Number of tubes with colourless liquid	Number of tubes with colourful liquid	Total number of tubes

Observe the class demonstration:

1. Your teacher added a certain chemical (let us call it Chemical A) to some of the tubes in the class before the first interaction.
2. Your teacher added another chemical (let us call it Chemical B) to all the tubes in your class after the third interaction.
3. When Chemical A reacts with Chemical B, it produces a pink-coloured substance.





Can you infer?

Based on the demonstration,

- What is Chemical A:
- What is Chemical B:
- Can you guess how many tubes had Chemical A before the first interaction?

Number of tubes	After Round III	Before Round I	
		Your guess	Actual
With Chemical A			
Without Chemical A			

Imagine:

Imagine that the tubes are your bodies and that Chemical A is sample of cold viruses. As you have seen through this activity, the cold virus spreads through social interactions. You just engaged in three interactions with your classmates. These interactions could be of different kinds:

1. You could be in a closed room with an infected person and breathe in the same air.
2. You could have a conversation with an infected person.
3. You could shake hands with or hug an infected person.
4. You could borrow an infected person's pen or touch a surface that they have just touched.

Think about and discuss:

- How quickly does a cold spread from one or two people to many others through these everyday interactions? Go back to the results of the activity. What is the likelihood of your catching a cold if just one person in your class has a cold?
- Often, we identify people suffering from a cold by their symptoms. But some people can carry the cold virus and not show any symptoms. They can also continue to spread the infection. Can you tell which of your classmates transferred Chemical A to you? How likely is it that you were one of the first few people to have Chemical A in your tube?
- Say you had a cold and did not want to spread it, what would you do? What kind of precautions would reduce the risk of someone catching a cold from you?

Contributed by:
Chitra Ravi, who works at Azim Premji University, Bengaluru.

ACTIVITY SHEET I: COLDS & SOCIAL INTERACTIONS

Aim:

How do interactions with other people spread cold viruses?

You will need:

- Tubes of equal volume (one tube per student)
- Plastic transfer pipettes (one pipette per student and one extra one for you)
- Water
- 1M NaOH solution
- 1% phenolphthalein (in 50% ethanol)
- Gloves and safety glasses
- Chits of paper
- Pen

What to do:

1. Label the tubes with numbers corresponding to the number of students in class. Place these on a stand.
2. Label small chits of paper with the same numbers as on the tubes. Put these chits into a box.
3. Use a transfer pipette to transfer 3 ml of water to 90% of the tubes and 3 ml of 1M NaOH to 10% of the tubes.
4. Invite each of your students to pick up a tube. They can choose any tube of their choice. Wait till every student has a tube in their hands.
5. Let each student know that they will be engaging in three interactions with three different partners. Ask them to record the tube numbers of their partners in each round.
6. In Round I, shake the box with the chits of paper and select two chits of paper. Read the numbers on the chits out loud. Invite the students who have tubes with these numbers to pair up. Repeat this process till all the students in class are paired up.
7. Each pair gets to engage in their first interaction. During the interaction, each student pipettes a small volume of liquid out from their tube. They put 2-3 drops of this solution into their partner's tube. Any excess liquid in the pipette can be returned to their own tube.
8. In Round II, invite each student to choose a partner for themselves. Students can take turns to do this. Each student can choose a partner among those students who have not yet been paired. Wait till all the students are paired.
9. Invite students to repeat Step 7 with their Round II partners.
10. In Round III, invite each student to choose another partner, preferably someone they have not interacted with in Rounds I and II.
11. Invite students to repeat Step 7 with their Round III partners.
12. After Round III, ask students to stand in a circle so that they can all see each other's tubes. Use a pipette to add 2 drops each of the 1% phenolphthalein into each of the tubes. Wear safety glasses and gloves as a precaution.

Ask students to observe and record:

Draw this table on the class board and invite one of your students to fill out the empty fields.

Percentage of tubes with colourless liquid	Percentage of tubes with colourful liquid

- What colour is the liquid in their tube at the end of this activity?
- How many students in the class continue to have a colourless liquid in their tubes?
- How many students in the class have a coloured liquid in their tubes? What colour is the liquid in these tubes? How would they explain this difference in colour?

Demonstrate:

- Take two tubes and put them on a stand in such a way that all the students in the class can see them. Use a transfer pipette to transfer 3 ml of water to one of these tubes and 3 ml of 1M NaOH to the other tube. Now add a few drops of phenolphthalein to both tubes. Keep the bottles of NaOH and Phenolphthalein on the table in such a way that students can see the labels on the two bottles. Ask students to observe the colour of the liquids in the two tubes. Ask if this demonstration helps explain the difference in colour that they see in their own tubes.
- Wait till students have inferred that the pink-coloured tubes in class have NaOH. Confirm that you added the NaOH to some tubes at the beginning of the activity. Invite them to use the results they see after Round III to guess what percentage of tubes had NaOH before Round I. Draw this table on the class board and invite one of your students to fill out the empty fields.

Percentage of tubes	After Round III	Before Round I	
		Your guess	Actual
With NaOH			
Without NaOH			

Share this passage with your students:

Imagine that the tubes are your bodies and that NaOH is sample of viruses. The cold spreads through interactions. Each of you engaged in three interactions. These interactions could be of different kinds:

- You could be in a closed room with an infected person and breathe in the same air.
- You could have a conversation with an infected person.
- You could shake hands or hug an infected person.
- You could borrow their pen or touch a surface they have just touched.

Ask students to think about and discuss:

- How quickly the infection spreads from one or two people to many others through these everyday interactions? Go back to the results of the activity. What is the likelihood of a student in your class catching a cold if just one other student in their class is infected?
- Often, we identify people suffering from a cold by their symptoms. But some people can carry the cold virus and not show any symptoms. They can also continue to spread the infection. Can any of your students tell which of their partners they got NaOH from?
- Say a student in your class had a cold and did not want to spread it, what would they do? What kind of precautions would reduce the risk of someone catching a cold from them?

Contributed by:
Chitra Ravi, who works at Azim Premji University, Bengaluru.

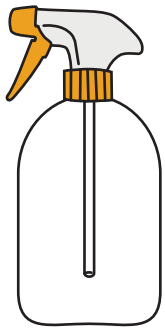
Ask A Question

ACTIVITY SHEET II : COLDS & UNCOVERED SNEEZES

Aim:

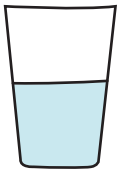
How do uncovered sneezes spread cold viruses?

You will need:



Spray bottle

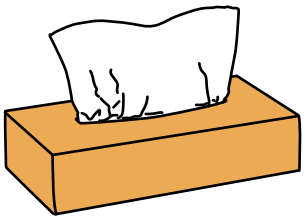
Red, green, or
blue food colouring



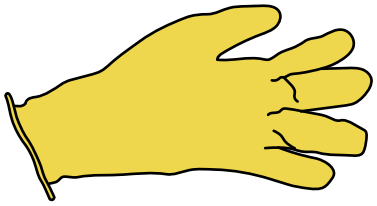
Water

A piece of cardboard

A scale or measuring tape



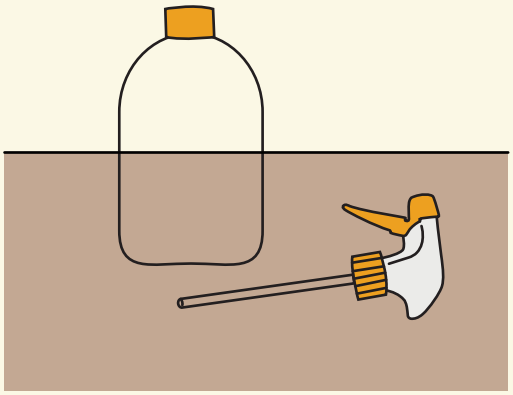
A handkerchief or tissue



A glove

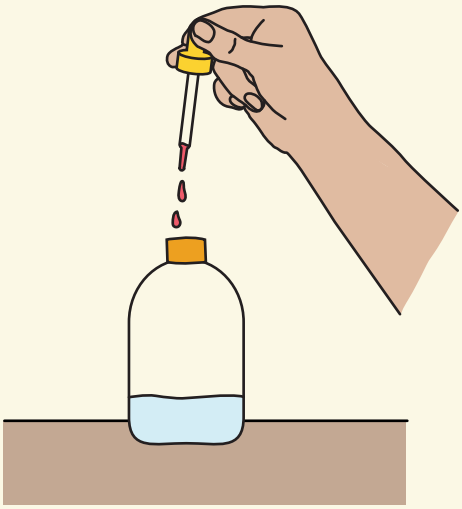
What to do:

1. Fill some water into a spray bottle. Add a few drops of food colouring to it.
2. Use a piece of chalk to mark a circle at one end of a table. Place the bottle within this circle.
3. Ask a friend to pump the spray bottle once. Take care that the bottle remains in the circle.



Open the spray bottle

Pour some water into the bottle



Add a few drops of food colouring to the water in the bottle

Pump the spray bottle

4. Use the tape or scale to measure the length and width of the spray.
5. Repeat steps 3 and 4. But this time, use a piece of tissue to catch as much of the spray as possible. Start with keeping your hand at 5 cm from the spray bottle.
6. Repeat step 5 but try catching the spray with a piece of cardboard instead of a piece of tissue.
7. Repeat step 5 but try catching the spray with a gloved hand.
8. Exchange places with your friend—you get to pump the spray bottle and your friend gets to catch the spray. Repeat Steps 3-7.

Record:

Check the table and your surroundings for any droplets of the coloured spray. Look for the droplets that have traveled farthest from the circle with the spray bottle. Use the scale or tape to measure the distance of these droplets from the spray bottle.

Spray type	Length of spray	Width of spray
Free		
With tissue		
With gloved hand		
With a piece of cardboard		

Observe and explore:

Tip: Read the questions listed below one-by-one. Take a few minutes to guess what you think you will see if you tried this out. Then try the experiment out.

1. What is the farthest the spray can go?
2. How wide can the spray travel?
3. Which of these did you find most efficient—a tissue, a gloved hand, or a piece of cardboard—in catching most of the spray? Which of these did your friend find most effective?

4. What if you changed the size of the spray bottle, the kind or amount of food colouring, or the size of the cardboard piece? Which method of catching the spray would be most effective then? How would you test this?
5. What if you covered the mouth of the spray bottle with a mask? How far and wide would the spray travel?

Think about and discuss:

The pumping of the spray bottle mimics a sneeze. Imagine that the spray contains cold viruses.

- How far would your sneeze travel? Can you guess how many of your classmates would be at risk of being infected by the viruses in each sneeze? Remember: your classmates can get infected when the spray falls on them or when they touch an object (like the tissue, glove, or cardboard piece) that the spray falls on.
- Imagine that you caught a cold and were sneezing. Can you think of some ways to avoid spreading the infection to others through your sneezes? For example, would you use your hand or a tissue paper to catch your sneeze? Would you cover your nose with a mask? Would you go into crowds or avoid them?

Contributed by:
Chitra Ravi, who works at Azim Premji University, Bengaluru.

Ask A Question

ACTIVITY SHEET III : OBSERVING YOUR COLDS

Aim:

How often do you catch colds in a year and what symptoms do you suffer from?

You will need:

A notebook

A pen

What to do:

Imagine you are a scientist studying colds. The subject of your study is yourself. Observe yourself very carefully every time you catch a cold this year.

- Record the duration of your colds in Table 1.
- Record the symptoms of your colds in Table 2.

Sometimes we may imagine that we suffer from symptoms that we read about. Do ask your family members for help in checking which symptoms you actually experience.

Record:

If you have more than four colds this year, try redrawing the two tables in your notebook and adding more columns to them.

Duration of your colds:

	Cold 1	Cold 2	Cold 3	Cold 4
When did you start showing the first symptoms of the cold? Record the date.				
What do you think was the very first symptom of your cold?				
When did you stop showing symptoms of the cold? Record the date.				
What do you think was the very last symptom of your cold?				
How many days did your cold last?				
Did any of the symptoms of your cold persist after 10 days? Which ones?				

Symptoms of your colds:

Possible symptoms	Seen in Cold 1 (which days)?	Seen in Cold 2 (which days)?	Seen in Cold 3 (which days)?	Seen in Cold 4 (which days)?
Watery eyes				
Sore throat				
Hoarseness				
Coughing				
Stuffy/runny nose				
Sneezing				
Change in mucus colour and thickness				
Feeling chilled				
Headache				
Ear ache				
Mild body ache				
Sluggishness				
Low-grade fever				
Other symptoms				

- Did you face any challenges in observing and documenting your colds? How did you work with them? Share in a few words.

Compare and contrast:

Your observations with those of your classmates.

- How many colds did you catch this year? How many colds on average did your class catch this year?
- What was the average duration of your colds this year? How different is this from the average duration of colds that your class as a whole caught this year?
- Which symptoms were common across all your colds this year? Which symptoms were common across the colds caught by your class?
- Which of these symptoms persisted beyond 10 days for you? Which symptoms persisted beyond 10 days for your class as a whole?

Think about and discuss:

- Do you notice any patterns in the duration and symptoms of colds that your class suffered from in this year-long study?
- Let us imagine that you are invited to predict the duration of a cold in someone of your age and from your neighbourhood but from a different school.

- Would you use your own data or your class average to make this prediction and why?
- How sure would you be of your prediction? Can you think of some factors that could make your prediction false?
- In this study, you have observations that you and your classmates made. What if 50 or 100 other students of your age had documented their colds in the same year and you could see all the data they had recorded? Would you feel surer about your predictions?

- If you could change one thing about your study, what would it be and why?

Contributed by:
Chitra Ravi, who works at Azim Premji University, Bengaluru.