HEALTH BASICS

Types coronavirus

Coronavirus types are groups of related viruses that can infect people or animals.

WHAT IT IS
Groups of related viruses within the coronavirus family

WHERE IT COMES UP
Respiratory test results, outbreak reports, and COVID-19 discussions

WHY IT MATTERS
Different coronaviruses are linked to different illnesses

WHAT IT IS NOT
Not a disease or a list of COVID-19 variants

WHO TO ASK
Primary care clinician or public health service

HOW IT IS CHECKED
Molecular or antigen tests designed for specific viruses

Overview

"Coronavirus" is the name of a large family of related viruses. It is not the name of one disease. Some coronaviruses infect people, while others mainly infect animals.

Seven coronaviruses are known to infect people. Four commonly circulate around the world and usually cause mild respiratory illnesses, such as a common cold:

Three other human coronaviruses have caused outbreaks of more serious illness:

A virus and the illness it causes do not always have the same name. For example, SARS-CoV-2 is the virus, while COVID-19 is the disease.

The word "type" is useful in everyday conversation, but it is not always a precise scientific category. Researchers classify coronaviruses by their genetic features and evolutionary relationships. They may refer to families, genera, species, viruses, lineages, or variants.

- Human coronavirus 229E
- Human coronavirus NL63
- Human coronavirus OC43
- Human coronavirus HKU1

- SARS-CoV, which causes severe acute respiratory syndrome, or SARS
- MERS-CoV, which causes Middle East respiratory syndrome, or MERS
- SARS-CoV-2, which causes COVID-19

How it works

Coronaviruses contain genetic material called RNA. A layer of protein and fat surrounds this RNA. Spike proteins project from the surface and help the virus attach to cells. Under an electron microscope, these spikes can look like a crown, or corona .

Scientists divide the coronavirus family into four main groups called genera: alpha, beta, gamma, and delta coronaviruses. A genus is a broad category of closely related organisms or viruses.

The known human coronaviruses belong to two of these groups:

Being in the same group does not make two viruses identical. SARS-CoV and SARS-CoV-2 are distinct viruses, even though formal taxonomy places them within the same coronavirus species. They differ in their genetic sequences, patterns of spread, and the diseases they cause.

A variant is also different from a coronavirus type. Variants develop when a virus changes as it copies its RNA. COVID-19 variants, such as named lineages of SARS-CoV-2, remain versions of SARS-CoV-2. They do not become one of the four common-cold coronaviruses.

Tests only detect the viruses they were designed to find. A SARS-CoV-2 antigen test looks for proteins from that virus. A molecular test, such as a PCR test, looks for selected parts of its genetic material.

Some laboratory respiratory panels test for several viruses at once. They may report individual common human coronaviruses or group them under a result such as "seasonal coronavirus." SARS-CoV-2 is usually listed separately. The test instructions or laboratory report should state what was included.

Genomic sequencing reads much more of a virus's genetic material. Public health laboratories use sequencing to identify and monitor variants. It is not needed for most routine diagnoses.

- 229E and NL63 are alphacoronaviruses
- OC43, HKU1, SARS-CoV, MERS-CoV, and SARS-CoV-2 are betacoronaviruses

Why it matters for your health

Knowing which coronavirus is involved can affect the meaning of a test result and the advice you receive.

The four commonly circulating human coronaviruses usually cause upper respiratory infections. These affect areas such as the nose and throat. They can sometimes contribute to lower respiratory illness, including bronchitis or pneumonia, especially in babies, older adults, or people with weakened immune systems.

SARS-CoV-2 is handled separately because it causes COVID-19. Testing, treatment options, vaccination, and public health advice for COVID-19 are specific to SARS-CoV-2. A positive result for a seasonal coronavirus is not the same as a positive COVID-19 result.

SARS and MERS are also separate diseases. SARS-CoV is not known to be circulating routinely in people. MERS-CoV infections continue to occur mainly in or around the Arabian Peninsula, with some travel-related cases elsewhere.

The exact virus often does not need to be identified when a person has a mild, uncomplicated cold. Testing becomes more useful when the result could affect treatment, infection-control steps, travel or workplace requirements, or care for someone at higher risk of serious illness.

Vaccines and treatments are also virus-specific. A COVID-19 vaccine targets SARS-CoV-2; it is not a vaccine against every member of the coronavirus family.

What can go wrong

The coronavirus family is linked to several different health conditions. These include common colds, COVID-19, SARS, MERS, bronchitis, and viral pneumonia. The coronavirus "type" is not itself a condition.

Confusing the virus with the disease can lead to misunderstandings. "Coronavirus positive" may refer to SARS-CoV-2 on one test and a seasonal human coronavirus on another. The name of the test and the exact wording of the result matter.

A negative test may also be misunderstood. It means the test did not detect its target in that sample. It does not rule out every respiratory infection, and a test taken very early may not detect an infection yet.

Coinfections can occur. This means more than one virus or other germ is present at the same time. Finding one coronavirus does not always prove that it explains every health problem, particularly when symptoms are severe or unusual.

Most respiratory infections can be discussed through routine care. Contact a clinician promptly

if breathing is becoming more difficult, symptoms are worsening, you cannot keep down enough fluids, or you are at higher risk of serious illness and have a positive SARS-CoV-2 test. Some COVID-19 treatments must be started early, so timing may matter.

Call emergency services for severe trouble breathing, persistent chest pain or pressure, new confusion, inability to wake or stay awake, or pale, grey, or blue lips, skin, or nail beds. Skin colour changes may look different across skin tones.

What you can do

If a test report says "coronavirus," check which virus the test covered. Useful questions include:

Keep the test name, result, sample date, and testing location. A screenshot may leave out important details, so keep the full report when possible.

There is usually nothing you need to do to determine the formal genus or species yourself. That level of classification rarely changes personal medical care.

You also do not normally need genomic sequencing to learn which SARS-CoV-2 variant you had. Routine tests generally cannot name the variant, and sequencing results are mainly used for public health monitoring.

If you are reading an animal's veterinary test result, do not assume it refers to a human coronavirus. Ask the veterinary service what the named virus means for that animal and whether any advice for people is needed.

- Did the result identify SARS-CoV-2 or a seasonal human coronavirus?
- Was this an antigen test, PCR test, or multi-virus respiratory panel?
- Does the result change treatment or follow-up?
- Is repeat or confirmatory testing needed because of timing or symptoms?

Common questions

Is coronavirus the same as COVID-19?

No. Coronavirus is a family of viruses. COVID-19 is the disease caused by one member of that family, SARS-CoV-2.

Are all coronaviruses dangerous?

No. The viruses differ greatly. Four human coronaviruses commonly cause mild respiratory

illness, although more serious illness can occur in some people. SARS-CoV, MERS-CoV, and SARS-CoV-2 have caused outbreaks of more severe disease.

Are COVID-19 variants new coronavirus types?

Not in the usual sense. They are genetically changed lineages of SARS-CoV-2. They remain part of the same virus.

Can one coronavirus turn into another?

A virus can develop mutations and new variants, but SARS-CoV-2 does not turn into 229E, NL63, OC43, or HKU1. These are distinct viruses with separate evolutionary histories.

Can a home test identify every coronavirus?

No. Most home coronavirus tests are designed to detect SARS-CoV-2 only. Check the package label and instructions to see the exact target.

Does a seasonal coronavirus result mean I have COVID-19?

No. A result for 229E, NL63, OC43, or HKU1 is not a SARS-CoV-2 result. It is possible to have more than one infection, so use the complete laboratory report and clinical advice rather than the word "coronavirus" alone.

Do animal coronaviruses infect people?

Most animal coronaviruses do not routinely infect people. On uncommon occasions, an animal coronavirus can cross into humans, a process called spillover. SARS-CoV, MERS-CoV, and SARS-CoV-2 have animal evolutionary origins, although their exact histories differ.

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