With all the focus on coronavirus, let's not forget the other respiratory viruses

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With coronaviruses taking over our news feeds—and lives—you may be fooled into thinking it's the only virus affecting humans at the moment. But it's important to remember that there are many viruses, especially

respiratory viruses, that regularly infect us. These viruses range from the mildly annoying, such as those that cause the common cold, to the potentially deadly, such as influenza.

Despite the challenges posed by the pandemic, scientists around the world are still working hard on these viruses, to find treatments and vaccines to improve our quality of life.

1. Rhinoviruses

Rhinoviruses (from the Greek "rhinos" for "of the nose") are usually associated with the common cold. They cause a nasal infection, resulting in congestion and a runny nose. But rhinoviruses have a more malevolent side. They have been linked to exacerbating lower respiratory tract diseases, such as asthma and COPD (an obstructive lung disease that causes long-term breathing problems and poor airflow).

Rhinoviruses can spread all year round, and there is no vaccine against them as they are an incredibly diverse group of viruses. There is also no licensed antiviral medication against rhinoviruses, although scientists are working on this to help manage conditions such as asthma and COPD.

Interestingly, rhinoviruses have only been found in humans and are closely related to viruses that infect our guts.

2. Adenoviruses

Adenoviruses were first isolated from the adenoids—an area of the throat near the tonsils—hence the name. There are over 50 human adenoviruses, most of which cause respiratory disease. But some cause infections of the gastrointestinal tract, the eye (conjunctivitis), and the urinary tract (cystitis). In most healthy people these viruses only cause mild, short-lived disease, but they tend to spread quickly in densely

populated areas.

There are no antiviral treatments for adenoviruses, although some are in clinical trials). But there are vaccines for two of the respiratory adenoviruses that cause regular outbreaks in crowded populations. These vaccines are regularly used by armed forces.

An exciting area of research is using adenoviruses as anti-cancer therapies, as some strains can selectively infect and destroy cancer cells while leaving healthy cells untouched.

3. Pneumoviruses

Humans are infected with two kinds of pneumoviruses: respiratory syncytial virus (RSV) and metapneumovirus (MPV). All members of the pneumoviruses ("pneumo" being Greek for lung) are respiratory viruses, but they have a range of hosts they can infect. As well as humans, certain pneumoviruses can infect cows (bovine respiratory syncytial virus), mice (murine pneumonia virus) and birds (avian metaphneumovirus).

Most people will have had many human respiratory syncytial virus (HRSV) infections in their lifetime, with over 80% of the population infected by the age of two years. For most healthy people, HRSV causes a nasty cold, but this will resolve itself without the need for any treatment. In those with respiratory conditions such as asthma, however, the consequences can be severe. In 2015 alone, it is estimated that RSV caused 3.2 million hospitalisations and over 59,000 deaths in the under-fives.

HRSV has been linked with the development of asthma, though this is a contentious area of science that is still much debated and researched.

4. Parainfluenza viruses

The parainfluenza viruses (PIVs) are a sub-group of viruses known as paramyxoviruses and are closely related to other pathogens such as mumps and measles. They also infect our respiratory tract and are major causes of a lower respiratory tract disease called croup. People with croup often have a barking cough, like a seal.

There are two distinct paramyxovirus groups of parainfluenza viruses, one called the respiroviruses (PIV1 and 3) and the other the rubulaviruses (PIV2 and 4). PIV1 and 3 have counterparts in other animal species, such as mice and cows, while PIV2 and 4 are relatively closely related to the mumps virus.

PIVs tend to spread in autumn and spring. There is no licensed vaccine or antivirals against PIVs, although researchers have made significant progress on this.

5. Influenza viruses

Influenza viruses are perhaps the most worrying of respiratory viruses, given their capacity for causing pandemics, such as the 1918 flu pandemic. They are highly diverse viruses with four major types (A, B, C and D). All but influenza D virus infect humans, and A and B can cause significant lower respiratory tract disease and even death. Influenza B and C remain associated with humans while influenza A virus is really a virus of aquatic birds, although influenza A viruses circulate in humans, pigs and even bats.

Occasionally, avian flu A viruses jump species into humans and may even spread well and can cause pandemics.

Influenza viruses continuously circulate in humans because they are able to mutate and evade our immune responses. We have vaccines against influenza viruses, but they have to be updated each year to keep up with

the mutations.

Antivirals, such as Tamiflu, when used early enough, can be effective at reducing how long you are sick for. Researchers are continuing to develop broader, long-lasting flu vaccines and more potent antivirals.

All the above respiratory viruses routinely infect humans. Most lack a vaccine and effective treatments—and many disproportionately affect the most vulnerable in society. Now that there is a raised scientific and public awareness on respiratory infections, we must take this opportunity now to make major advances against respiratory infections through research and increased preventative measures such as hand hygiene and social distancing.

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