# Human Metapneumovirus Infections: What you need to know

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The Chinese Centre for Disease Control and Prevention has reported a sharp increase in respiratory viral infections, including human metapneumovirus (hMPV) infections, in northern China since December 2024. Consequently, this article was planned in conjunction with the news about the recent surge of this virus.

hMPV was discovered in 2001, though data suggest that it has been responsible for respiratory tract infections for at least 60 years, with a widespread global distribution. The delay in identifying hMPV can be attributed to two main factors: its clinical manifestations are not unique, and the virus replicates slowly and inefficiently in culture. Originally classified under the Paramyxoviridae family, hMPV was reclassified in 2016 into the Pneumoviridae family. It shares genetic similarities with avian metapneumovirus (APV) but does not infect birds. hMPV is divided into two subgroups, A and B. These subtypes co-circulate annually, although a predominant subtype emerges each year. Despite genetic variations, research has shown that hMPV strains do not exhibit significant differences in virulence.

hMPV is mostly transmitted through direct or close contact with contaminated secretions, including large particle aerosols, droplets, or fomites. Small particle aerosols are not thought to be a primary mode of transmission. **The virus spreads efficiently in close-contact environments such as households, daycare centers, schools, and healthcare facilities.**

Asymptomatic carriers may also contribute to viral transmission, making containment efforts more challenging. The incubation period for hMPV is typically between 5 to 9 days.

Globally, hMPV is associated with upper and lower respiratory infections, particularly in young children and older adults. In 2018, an estimated 14.2 million cases of hMPV-related acute lower respiratory infections occurred in children under the age of five. The virus exhibits seasonal variation, with outbreaks occurring in late winter and early spring in many countries. Most children are infected by age five, and hMPV has been detected in 5-15% of children with respiratory illnesses, particularly in infants under one year. Younger children, especially those under six months or from larger households, are at higher risk for hospitalization. Severe disease is more common in females, preterm infants, and those infected with genotype B. In adults, while hMPV is less commonly associated with lower respiratory infections, frail older adults are more likely to require medical care. **Asymptomatic individuals can also harbor the virus and contribute to its spread.**

hMPV typically causes mild, self-limited respiratory infections in both children and adults. After inoculation, there is often an asymptomatic period of several days, followed by upper respiratory symptoms that last for about a week. The peak of virus shedding is likely to occur about one week after inoculation, with peak symptoms following within a day or two. In severe cases, the infection may progress to the lower respiratory tract, causing wheezing, bronchiolitis, pneumonia, or even acute respiratory distress syndrome (ARDS), particularly in hospitalized patients. In children, common symptoms include cough (68–90%), rhinitis (44–77%), fever (52–86%), and wheezing (51–56%). Diagnoses often include bronchiolitis (59%), croup (18%), asthma exacerbation (14%), and pneumonia (8%).



Coinfection with RSV may worsen the disease, and in rare cases, encephalitis has been reported.

**In adults, the symptoms are similar to those in children, with cough (100%), nasal congestion (85%), rhinorrhea (75%), dyspnea (69%), and wheezing (62%).** Older adults tend to experience more dyspnea and wheezing, while younger adults commonly present with hoarseness. hMPV may also contribute to asthma and possibly exacerbate chronic obstructive pulmonary disease (COPD). Reinfection with hMPV is common in adults, typically resulting in mild symptoms. However, immunocompromised patients may experience prolonged and more severe illnesses due to impaired viral clearance.

Given the overlap of symptoms with other respiratory viruses, laboratory confirmation is essential for diagnosing hMPV. **Reverse-transcriptase PCR (RT-PCR) is the most sensitive diagnostic method, detecting viral RNA in respiratory secretions.** The BioFire FilmArray Respiratory Panel is a multiplex PCR test that can identify hMPV along with other respiratory pathogens. Direct fluorescent antibody (DFA) testing can detect viral antigens in nasopharyngeal samples within hours but requires expertise and is mainly used in reference laboratories. Although viral culture is employed in research settings, its yield is low. Serologic testing is not commonly used in clinical practice but is valuable for epidemiologic studies and vaccine research. Seropositivity for hMPV is nearly universal by age five, and a definitive serologic diagnosis requires seroconversion or a fourfold increase in titer from serial samples. Chest X-rays may show nonspecific findings such as perihilar opacities, hyperinflation, atelectasis, or consolidation. Blood tests are typically non-specific, with the early infection sometimes presenting with a reduced lymphocyte count and an elevated monocyte ratio.

**Treatment for hMPV is supportive and depends on the clinical manifestations.** Although ribavirin has shown antiviral activity against hMPV in vitro, there are no clinical data to support its use or that of other antivirals for hMPV infections. Therefore, antiviral therapy is not recommended for hMPV patients. The rate of secondary bacterial infections, such as bacterial pneumonia or bacteremia, in patients with hMPV is not well-defined but is considered to be low. Consequently, antibiotics are not usually indicated for infants hospitalized with hMPV bronchiolitis or pneumonia.


In terms of prevention, maintaining a physical distance of at least 6 feet is recommended. Infection control measures similar to those for respiratory syncytial virus (RSV) are recommended, including frequent handwashing and contact precautions, especially in hospital settings. Patients with hMPV infection should be placed in single rooms or grouped with other infected patients to prevent nosocomial spread. Children with hMPV can shed the virus for several days or even weeks. After recovery, they may return to daycare or school, but immunocompromised individuals should avoid contact with them during acute infection or early convalescence. Vaccines for hMPV are still in the early stages of development and are not yet available for clinical use.

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