



Novel Coronavirus

2020 Pneumonia outbreak in Wuhan China

Origins

Coronaviruses (CoV) are a broad family of viruses named after the crown-like spikes on their surface. They typically cause mild to moderate upper respiratory tract disease in humans, but can also cause more severe infections such as pneumonia and other lower respiratory tract infections. Mild illness caused by CoV includes the common cold and influenza-like illness. Severe illness caused by CoV includes Severe Acute Respiratory Syndrome (SARS) CoV, Middle East Respiratory Syndrome (MERS)-CoV, and some pneumonias. There are some coronaviruses that can be transmitted from animals to people. Both the SARS-CoV and MERS-CoV are believed to have originated in animals and were transmitted to people, causing infection.

In Jan 2020 a novel CoV was identified in several hundred people in Wuhan China, most of whom had contact with the same seafood market in Wuhan. If the virus is zoonotic, as is believed (meaning animal to human transmission), contact with animals spread the virus to people initially. Person to person transmission is likely with coronaviruses and there is growing evidence of secondary transmission from person to person with this virus as well. The market where the outbreak occurred sells seafood, chickens, bats, cats, marmots, and other wild animals. It is not known which animal(s) are likely the cause of the outbreak.

So far the people infected have had pneumonia, but otherwise mild symptoms with only a lower percentage of deaths than other coronavirus infections, with 10-20% of those infected requiring hospitalization for more severe forms of the disease. For comparison, SARS-CoV had a mortality rate of 9.6% (9.6% of those people infected died from the disease) and MERS-CoV has a mortality rate of 34.5%.

Until the virus causing this illness is formally named, we will refer to it in this document as the Wuhan Coronavirus.

Diagnosis

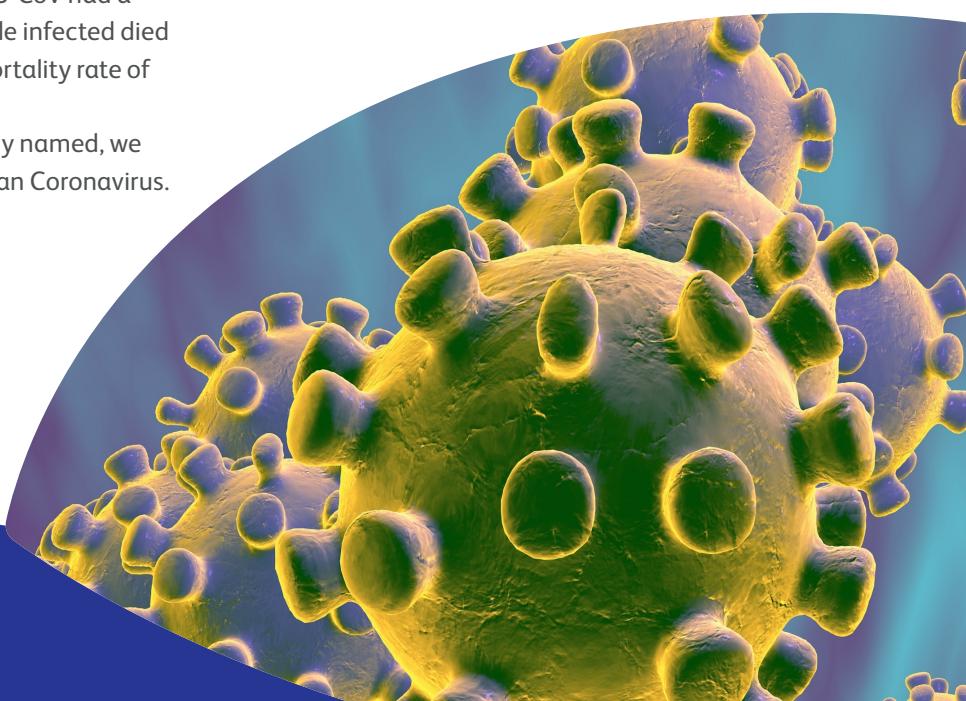
Our understanding of the incubation period (time from exposure to development of symptoms) for the Wuhan Coronavirus and comorbidities that may affect patient risk are in the early stages.

For other CoV, the incubation period is 2-5 days for the development of symptoms, suggesting people exposed to CoV will rapidly present symptoms of infection. If a person does not develop symptoms approximately 7 days after a potential exposure, they are unlikely to have been infected but the range may be as much as 14 days. This knowledge will evolve over time.

The symptoms likely to present early in the illness are often seen in patients with more commonly occurring diseases, such as the common cold, and influenza-like illness, or even other CoV infections. Diagnosis and treatment should only be performed by a trained physician who can rule out other potential diseases.

Symptoms of CoV infection include:

- Sudden onset fever/high fever
- Cough
- Headache
- Stuffy/runny nose
- Sore throat
- Muscle and joint pain, body aches, and fatigue



Method of Transmission/Contagiousness

The Wuhan Coronavirus may be transmitted from animal sources, but the (colonized) animal reservoirs have not been identified to date. In the Wuhan outbreak, if the reservoir is animal(s), the mechanism of transmission to people appears to be inefficient or more people would have been infected in the current outbreak. For all animal carriers of CoV, the animals do not show symptoms of infection and are referred to as asymptotically colonized.

It is also likely CoV can be found in contaminated feed, water, and soil near the colonized animals. CoV can live on environmental surfaces from a few hours to a few days. If the Wuhan Coronavirus contaminated food, trash, or fabrics (such as carpeting), it is likely to survive for longer periods of time and may survive for up to 7-8 weeks, based on studies with SARS-CoV.

The primary site for preventing the spread of the Wuhan Coronavirus is unknown at this point. If the virus has an animal host, which seems most likely, the housing where the animals are kept will be the primary point to control the virus's spread. When person to person transmission occurs, it is most likely where there is close personal contact. Casual contact in the public with an infected person is unlikely to result in transmission. Both SARS-CoV and MERS-CoV are spread by droplet transmission. In droplet transmission, infected droplets of liquid are discharged from the infected person (such as by coughing and sneezing) and only travel up to 1 meter before rapidly settling onto surfaces. The droplets are not carried in air currents over a larger area, minimizing the risk of ongoing transmission.

When the method of transmission for a pathogen is not well understood, the CDC and WHO recommend additional caution for healthcare workers when in close contact or when treating symptomatic patients.

Prevention

Assuming primarily an animal reservoir with some potential for animal to human transmission, the following recommendations apply to a business that handles living or dead animals.

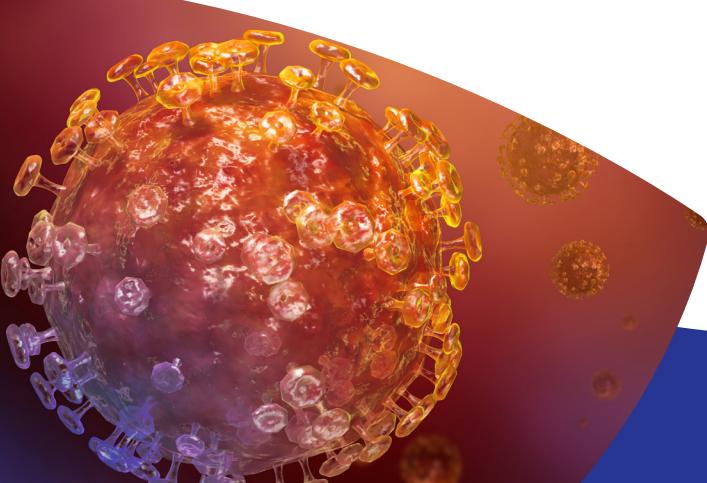
1. Standard Practices: Any business receiving animals (whether the animals are alive or dead) should assess the risk of Wuhan Coronavirus being transmitted and take appropriate precautions in the handling of the animals. Farms and animal sources that observe good Infection Prevention practices are generally better prepared to use practices to minimize the risk of transmission of CoV and other pathogens.

2. Animal Housing and Transfer: Crates, cages, containers, and any other objects/surfaces that come in contact with or in close proximity to potentially colonized or infected animals must be disinfected between uses. Trucks and other transport vehicles used to transport animals (such as from farms to processors or markets) must be disinfected between uses to prevent the potential spread of CoV and other pathogens.

3. Reduce Contact: Minimize direct contact and/or prolonged contact with animals that may be colonized or infected with the Wuhan coronavirus (or other CoV). Avoid or minimize contact with sick people. People who are already sick with cold or influenza-like symptoms should stay home for at least 24 hours after their fever subsides.

4. Protective Equipment: Workers that handle living or dead animals should use protective clothing, gloves, and masks when handling feed, water, feces, or in close contact with the animals. They should wash clothing after contact with animals and change clothing each day.

5. Hand Hygiene: Workers that handle living or dead animals should perform frequent hand hygiene through the day, especially when entering and leaving animal housing areas. Hand hygiene should be performed after sneezing or coughing. Workers should avoid touching their face, mouth, eyes, and nose, especially when around animals.



6. Surface Disinfection: As CoV are easily killed on environmental surfaces with healthcare disinfectants (being enveloped viruses), standard cleaning and disinfection practices are effective and critical in preventing the spread of CoV, including the Wuhan Coronavirus. Environmental hygiene practices should include:

- Spraying disinfectant on a surface should be avoided to minimize the risk of spreading the virus through spraying of surfaces causing splashing during cleaning.
- Use of protective equipment (gloves, face shields, and clothing) for employees during cleaning and during animal handling operations
- Providing opportunities for frequent hand hygiene during cleaning operations
- Surface decontamination – both food and non-food contact surfaces when animals are present. Surfaces need to be cleanable (metal, plastic). Surfaces made from wood or bamboo cannot be disinfected and should not be used for animals.
- Basic steps of cleaning animal handling areas (assuming an animal reservoir) include:
 - Removal of the animals and eggs (if egg laying). Egg shells can become contaminated with feces, which can contaminate chicks with CoV when they hatch.
 - Dry cleaning – scraping/shoveling feces, litter, feathers, and feed should be performed carefully, as dust generated could harbor CoV.
 - Cleaning with a detergent to remove dried on soil
 - Rinsing of surfaces
 - Disinfection with an appropriate disinfectant. Surfaces that cannot be disinfected, such as wood, should be discarded.
 - After the contact time of the disinfectant, rinsing for food contact surfaces. Note in some geographies, these surfaces will additionally be sanitized after rinsing.

- CoV can be cross-contaminated to common environmental surfaces not in contact with animals and can remain viable for several days. Commonly touched surfaces (door handles, light switches, keyboards, counter tops, phones, etc.) should be disinfected regularly or when visible soiled.

Assuming person to person transmission, the following recommendations apply to the general public and healthcare facilities.

Hand Hygiene: Both the general public and healthcare workers should perform frequent hand hygiene through the day, especially when entering and leaving areas with animals or where there are high numbers of people, such as food markets, public transport systems, offices, and retail stores. Hand hygiene should be performed after sneezing or coughing. People should avoid touching their face, mouth, eyes, and nose, especially when around animals.

Surface Disinfection: As CoV are easily killed on environmental surfaces with healthcare disinfectants, standard cleaning and disinfection practices are effective and critical in preventing the spread of CoV including the Wuhan Coronavirus. CoV infections are associated with contaminated droplets of body fluids or secretions, which may contaminate environmental surfaces inside and outside healthcare environments.

Routine, thorough environmental cleaning and disinfection with a cleaner/disinfectant capable of killing CoV on commonly touched environmental surfaces (door handles, toilet flush handles, light switches, elevator buttons, keyboards, phone) or any surfaces that contact bare skin (fitness equipment, exercise mats) is important to reduce the risk posed by environmental surfaces.

Close Contact with Infected People: Avoid close contact with infected people to minimize the risk of person to person transmission. Avoid sharing drinking cups, eating utensils, towels, and clothing with an infected person. Perform hand washing or hand hygiene with an alcohol based hand rub more frequently when around infected people, such as when caring for a sick family member.

Proper Raw Food Handling: Handle and prepare (cook) raw animals correctly to prevent the risk of transmission through food.

Good Health Practices: Practicing good health is also helpful in preventing the development of many illnesses. The strength of a person's immune system is often related to their overall health. Get plenty of sleep, eat healthy, be physically active, manage stress, and drink plenty of fluids to keep your immune system strong.

Healthcare Worker Precautions: The US-CDC recommends that Healthcare workers use contact, droplet, and an N-95 respirator or powered air purifying respirator (PAPR) in addition to standard precautions when treating patients with Wuhan Coronavirus infection. The WHO does not currently have special precautions posted, but recommends droplet and contact precautions in addition to standard precautions for patients with other CoV infections. Additional recommendations for healthcare workers include the following:

1. Personal Protective Equipment (PPE): All healthcare staff who may be required to use PPE must receive training on and demonstrate an understanding of when to use PPE, what PPE is required, how to properly don (put on), use, and doff (take off) PPE, and how to properly dispose of or disinfect and maintain PPE. Reusable PPE must be properly cleaned, decontaminated, and maintained after and between uses.

2. Surface Cleaning and Disinfection: In healthcare facilities, any portable medical equipment being moved between patients (workstations/computers on wheels, ventilators, wheelchairs, blood pressure cuffs, bladder scanners, glucometers, temperature probes, ultrasound machines, crash carts, etc.) should be cleaned and disinfected between patients. Routine, thorough environmental cleaning and disinfection of commonly touched patient care equipment and environmental surfaces (door handles, toilet flush handles, light switches, elevator buttons, keyboards, phone, bedside tables, bedrails, etc.) or any surfaces that contact bare skin

(fitness equipment, exercise mats, therapy equipment, treatment tables, etc.) with a cleaner/disinfectant capable of killing enveloped viruses is important to reduce the risk posed by environmental surfaces or patient care equipment. Cleaning compliance should also be assessed as this affects the effectiveness of environmental hygiene efforts.

3. Hand hygiene as per the World Health Organization's 5 Moments of hand hygiene model.

4. Fabric Handling: Ensure soiled fabric from infected patients is handled in a way to prevent transmission (i.e., by minimizing agitation during collection and handling), and use standard precautions when handling soiled or contaminated fabrics. Healthcare laundering procedures for contaminated fabrics are capable of making the fabric hygienic, but poor handling of contaminated fabrics can contribute to infections.

Vaccination: There are currently no vaccines for the Wuhan Coronavirus or other CoV, and no currently recommended antiviral treatments.

Respiratory Hygiene: When a person or healthcare worker coughs or sneezes, they should cover their mouth with a tissue or use their elbow. They should dispose of used tissues and perform hand hygiene by washing their hands or using alcohol based hand rub after used tissue disposal or after sneezing or coughing.

Protocol for Sick Staff Members: Workers who lose pay for staying home when sick may be tempted to come to work sick, creating risk for other staff and customers. Facility policy should address how to resolve this issue.

References and useful websites

Much of the information used in the development of this brochure was taken from the sites listed below.

<https://emergency.cdc.gov/han/HAN00424.asp>

<https://www.cdc.gov/coronavirus/index.html>



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