

HOW DO PEOPLE CATCH CORONAVIRUS? WHAT WE KNOW SO FAR

Relevant for: Developmental Issues | Topic: Health & Sanitation and related issues

The modus operandi is becoming clearer. For the most part, SARS-CoV-2, the coronavirus that causes [Covid-19](#), spreads by close personal contact via tiny particles emitted when an infected person coughs, sneezes, speaks, sings -- or even just breathes normally. These can infect another person by falling into an eye, nose or mouth, by being inhaled or getting stuck on a hand and transferred to one of these entry sites. Here's an explanation of the established route of contagion and other pathways under investigation.

Respiratory Droplets

These spatters of virus-laden liquid of varying sizes, expelled from an infected person in a turbulent gas cloud, are thought to be the main route.

The warm, moist atmosphere within the gas cloud delays evaporation, while airflow helps propel the payload of pathogen-bearing droplets further than if they were outside a cloud. A cough can disperse virus particles 4-to-5 meters (13-16 feet) and a sneeze can project them as far as 8 meters away, depending on humidity and temperature. Infection could occur if the droplets drift into the nose, mouth or eye of someone nearby.

Droplets can contaminate surfaces when they settle, creating what's called a "fomite." Although less likely, transmission could occur when a hand touches a fomite, such as a doorknob or utensil, and then comes in contact with the mouth, nose or eyes.

Patients may harbor potentially infectious [SARS-CoV-2 virus](#) in their saliva, stool, and urine as long as 15 days after falling ill, researchers in South Korea showed in a study of five patients in July. Spending at least 15 minutes in close contact (being within 1.8 meters) with an infected person, and spending even briefer periods with someone who is coughing or sneezing, are associated with higher risk for transmission.

The virus can be highly stable in favorable environments, lingering for weeks in near-freezing temperatures. At room temperature, it can survive as long as 24 hours on cardboard, 48 hours on stainless steel, and 72 hours on plastic, one study found. Standard disinfection kills it though.

Public health authorities recommend people wash their hands frequently, avoid close contact for prolonged periods with those outside their household, and forgo shaking hands, hugging and kissing for now. For households with a suspected or confirmed case of infection, doctors suggest keeping that person separated from others as much as possible and cleaning and disinfecting "high-touch surfaces" in common areas -- such as switches, tables and remotes -- daily. Where members of the public are crowded together, such as on buses and subways, numerous health authorities across the world are telling people to cover their faces. If medical masks are in short supply, many suggest using home-made versions.

Tiny Aerosolized Particles

The tiniest particles emitted from an infected person may be carried aloft in gas clouds tens of meters from where they started. Indoor and closed environments without adequate ventilation and air-filtration enable these microdroplets to float longer, while their small size increases their

odds of being inhaled, causing a potentially more severe infection. Evidence for airborne transmission is still emerging, however, and incomplete.

Researchers who aerosolized SARS-CoV-2 intentionally found active virus can float in the air for as long as 3 hours. The World Health Organization said the experiment didn't reflect normal coughing or clinical settings, but later acknowledged the possibility of airborne transmission can't be ruled out.

Meat processing plants have been the site of outbreaks around the world. Researchers in Germany showed in July that cold and stale air conditions enabled virus particles from an infected worker to travel more than 8 meters, spreading to several others.

Intensive care units are especially hazardous because of procedures known to generate aerosols. These include tracheotomies, inserting and removing airway tubes used for mechanical ventilation, and blowing air into patients' noses using a nasal cannula. The risk of infection is reduced when patients are treated in a negative pressure room in which the air is changed at least 12 times an hour.

Others studies found particles of the virus in the air and on surfaces of rooms where patients were receiving care and in adjacent hallways. In some cases, such particles weren't capable of causing an infection. In one study, researchers who examined air samples in two hospitals in China raised the theoretical concern that aerosols could arise from surfaces contaminated by droplets, for instance when hospital workers shed their masks and gowns, or when floors were cleaned. These risks are one reason medical workers who deal with suspected or confirmed Covid-19 patients are directed to wear face masks, specifically the more protective type known as N95 respirators, and dispose of them carefully.

Food or Water

The WHO has said it's "highly unlikely" that people could contract Covid-19 through food or food packaging; authorities in the U.S. have concurred. Still, the WHO recommends people who handle food practice good hygiene, including frequently cleaning and disinfecting work surfaces, to minimize the risk of contamination. In epidemic areas, Chinese health officials recommended drinking boiled water, avoiding eating raw food, washing hands frequently and preventing water and food from being contaminated by patients. According to U.S. officials, the coronavirus has not been detected in municipal drinking water supplies. Conventional treatment methods that use filtration and disinfection should remove or inactivate the virus.

Animals

SARS-CoV-2 is thought to have originated in bats and spread to humans via a yet-to-be identified intermediate mammalian host. Almost two dozen animal species are known to be susceptible to infection, and there have been numerous reports of infected people transmitting the virus to their pet cats and dogs, to farm animals and even to lions and tigers at the Bronx Zoo. Instances of people catching SARS-CoV-2 from animals, however, are extremely rare. At least two people probably caught it from minks -- semi-aquatic, carnivorous mammals raised for their soft pelts -- in the Netherlands, where outbreaks occurred on about a dozen farms. Still, health authorities say there's no evidence that animals play a significant role in spreading the virus, and consider the risk of them doing so to be low.

Fecal-to-Oral

Another possible route of transmission arises when infected people improperly wash their hands

after using the toilet, and then touch surfaces that others come in contact with. Some patients have been found to have viable virus particles in their stool. The WHO has said that the fecal-to-oral route does not appear to be a significant pathway for the novel coronavirus. To the extent it is a means of transmission, sanitizing bathrooms, food-preparation and serving areas could help slow the virus, in addition to regular hand-washing.

Mother-to-Child

After the infection appeared in babies born to mothers with the disease in China, the possibility was raised that the virus could be passed in utero. Subsequent studies reached different conclusions. One looked at nine infected women who gave birth to uninfected babies. No virus was detected in amniotic fluid, cord blood, the babies' throats or in breast milk, suggesting that transmission from mother to child occurs through respiratory droplets. However, doctors in China reported on the case of a mother with Covid-19 whose baby had elevated antibody levels two hours after birth. That suggests the baby was infected in utero, since the antibodies aren't transferred to the fetus via the placenta and usually don't appear until three to seven days after infection.

This story has been published from a wire agency feed without modifications to the text. Only the headline has been changed.

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