Coronavirus disease 2019 (COVID-19) is an [infectious disease](https://en.wikipedia.org/wiki/Infectious_disease) caused by [severe acute respiratory syndrome coronavirus 2](https://en.wikipedia.org/wiki/Severe_acute_respiratory_syndrome_coronavirus_2) (SARS-CoV-2). The disease was first identified in December 2019 in [Wuhan](https://en.wikipedia.org/wiki/Wuhan), the capital of China's [Hubei](https://en.wikipedia.org/wiki/Hubei) province, and has since spread globally, resulting in the ongoing [2019–20 coronavirus pandemic](https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic) (Hui *et al.,*2020) Common [symptoms](https://en.wikipedia.org/wiki/Symptom) include [fever](https://en.wikipedia.org/wiki/Fever), [cough](https://en.wikipedia.org/wiki/Cough) and [shortness of breath](https://en.wikipedia.org/wiki/Shortness_of_breath). Other symptoms may include fatigue, [muscle pain](https://en.wikipedia.org/wiki/Myalgia), [diarrhea](https://en.wikipedia.org/wiki/Diarrhea), [sore throat](https://en.wikipedia.org/wiki/Sore_throat), [loss of smell](https://en.wikipedia.org/wiki/Loss_of_smell) and abdominal pain (Hopkins, 2020) The [time from exposure to onset of symptoms](https://en.wikipedia.org/wiki/Incubation_period) is typically around five days, but may range from two to 14 days (Velavan et al.,2020) While the majority of cases result in mild symptoms, some progress to viral [pneumonia](https://en.wikipedia.org/wiki/Pneumonia) and [multi-organ failure](https://en.wikipedia.org/wiki/Multi-organ_failure). As of 9 April 2020, more than 1.5 million[cases](https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic_cases/WHO_situation_reports) have been reported in more than 200 countries and territories, resulting in more than 90,000 [deaths](https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic_deaths/WHO_situation_reports). More than 340,000 people have recovered.

The virus is mainly [spread](https://en.wikipedia.org/wiki/Transmission_(medicine)) between people during close contact, often via [small droplets](https://en.wikipedia.org/wiki/Respiratory_droplet) produced during cough, sneeze, or talk. While these droplets are produced when breathing out, they usually fall to the ground or surfaces rather than [being infectious in the air over large distances](https://en.wikipedia.org/wiki/Airborne_disease). People may also become infected by touching a contaminated surface and then their face. The virus can survive on surfaces for up to 72 hours. Coronavirus is most contagious during the first three days after onset of symptoms, although spread may be possible before symptoms appear and in later stages of the disease.

The standard method of [diagnosis](https://en.wikipedia.org/wiki/Diagnosis) is by [real-time reverse transcription polymerase chain reaction](https://en.wikipedia.org/wiki/Real-time_reverse_transcription_polymerase_chain_reaction) (rRT-PCR) from a [nasopharyngeal swab](https://en.wikipedia.org/wiki/Nasopharyngeal_swab). The infection can also be diagnosed from a combination of symptoms, [risk factors](https://en.wikipedia.org/wiki/Risk_factor) and a chest [CT scan](https://en.wikipedia.org/wiki/CT_scan) showing features of pneumonia ( Jin *et al*.,2020)

VIROLOGY

The [World Health Organization](https://en.wikipedia.org/wiki/World_Health_Organization) (WHO) declared the 2019–20 coronavirus [outbreak](https://en.wikipedia.org/wiki/Outbreak) a [Public Health Emergency of International Concern](https://en.wikipedia.org/wiki/Public_Health_Emergency_of_International_Concern) (PHEIC) on 30 January 2020 and a [pandemic](https://en.wikipedia.org/wiki/Pandemic) on 11 March 2020. [Local transmission](https://en.wikipedia.org/wiki/Local_transmission) of the disease has been recorded in many countries across all six [WHO regions](https://en.wikipedia.org/wiki/WHO_regions). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a [novel](https://en.wikipedia.org/wiki/Novel_virus) severe acute respiratory syndrome coronavirus, first isolated from three people with pneumonia connected to the [cluster](https://en.wikipedia.org/wiki/Disease_cluster) of acute respiratory illness cases in Wuhan (Salehi et al., 2020) All features of the novel SARS-CoV-2 virus occur in related coronaviruses in nature. Outside the human body, the virus is killed by household [soap](https://en.wikipedia.org/wiki/Soap), which bursts its protective bubble (Zhu et al., 2020)

SARS-CoV-2 is closely related to the original SARS-CoV. It is thought to have a [zoonotic](https://en.wikipedia.org/wiki/Zoonosis) origin. Genetic analysis has revealed that the coronavirus genetically clusters with the genus [*Betacoronavirus*](https://en.wikipedia.org/wiki/Betacoronavirus), in subgenus [*Sarbecovirus*](https://en.wikipedia.org/wiki/Severe_acute_respiratory_syndrome-related_coronavirus) (lineage B) together with two bat-derived strains. It is 96% identical at the whole [genome](https://en.wikipedia.org/wiki/Genome) level to other bat coronavirus samples (BatCov RaTG13). In February 2020, Chinese researchers found that there is only one [amino acid](https://en.wikipedia.org/wiki/Amino_acid) difference in certain parts of the genome sequences between the viruses from [pangolins](https://en.wikipedia.org/wiki/Pangolins) and those from humans, however, whole-genome comparison to date found at most 92% of genetic material shared between pangolin coronavirus and SARS-CoV-2, which is insufficient to prove pangolins to be the [intermediate host](https://en.wikipedia.org/wiki/Intermediate_host).

EPIDEMIOLOGY

Several measures are commonly used to quantify mortality. These numbers vary by region and over time and are influenced by the volume of testing, healthcare system quality, treatment options, time since initial outbreak and population characteristics such as age, sex and overall health. In late 2019, WHO assigned the emergency [ICD-10](https://en.wikipedia.org/wiki/ICD-10) disease codes [U07.1](https://en.wikipedia.org/wiki/ICD-10_Chapter_XXII:_Codes_for_special_purposes) for deaths from lab-confirmed SARS-CoV-2 infection and U07.2 for deaths from clinically or epidemiologically diagnosed COVID-19 without lab-confirmed SARS-CoV-2 infection.

The death-to-case ratio reflects the number of deaths divided by the number of diagnosed cases within a given time interval. Based on Johns Hopkins University statistics, the global death-to-case ratio is 6.0% (90,057/1,506,936) as of 9 April 2020. The number varies by region.

Other measures include the [case fatality rate](https://en.wikipedia.org/wiki/Case_fatality_rate) (CFR), which reflects the percent of diagnosed individuals who die from a disease, and the infection fatality rate (IFR), which reflects the percent of infected individuals (diagnosed and undiagnosed) who die from a disease. These statistics are not time bound and follow a specific population from infection through case resolution. A number of academics have attempted to calculate these numbers for specific populations. In the epicentre of the outbreak in Italy, Castiglione d'Adda, a small village of 4500, 80 (1.8%) are already dead. Most people in the village appear to have developed [antibodies](https://en.wikipedia.org/wiki/Antibodies) and plausible immunity, most did so without being diagnosed, and many did not have symptoms. An investigation is underway to test the entire population to learn more about the disease.

CONTROL

Recommended measures to prevent infection include frequent [hand washing](https://en.wikipedia.org/wiki/Hand_washing), [social distancing](https://en.wikipedia.org/wiki/Social_distancing) (maintaining physical distance from others, especially from those with symptoms), covering coughs and sneezes with a tissue or inner elbow and keeping unwashed hands away from the face. The use of [masks](https://en.wikipedia.org/wiki/Surgical_mask) is recommended for those who suspect they have the virus and their caregivers. Recommendations for mask use by the general public vary, with some authorities recommending against their use, some recommending their use and others requiring their use. Currently, there is no [vaccine](https://en.wikipedia.org/wiki/Vaccine) or specific [antiviral treatment](https://en.wikipedia.org/wiki/Antiviral_treatment) for COVID-19. Management involves [treatment of symptoms](https://en.wikipedia.org/wiki/Palliative_care), [supportive care](https://en.wikipedia.org/wiki/Supportive_care), [isolation](https://en.wikipedia.org/wiki/Isolation_(health_care)) and [experimental measures](https://en.wikipedia.org/wiki/Medical_research).

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