

What We Currently Know

- COVID-19 is caused by the SARS-CoV-2 virus, which shares similarities with the SARS coronavirus and MERS coronavirus. Much of the guidance as it relates to COVID-19 is based on what we know about the former SARS and MERS coronaviruses, as well as some epidemiologic data that has come in from China.
- COVID-19 is not fake news. It also does not carry the same mortality rate as SARS or MERS but is likely 10x more lethal than influenza.
- Best estimates right now are ~ 80% will have a mild to moderate illness course and recover uneventfully without need for significant medical treatment or intervention.
- On March 11, 2020 the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic. This has significant implications for our current and future efforts to respond to this outbreak, as this indicates that – on a global scale – we are beyond the stage of trying to contain the outbreak and have moved into the stage of “mitigate” (Stage 2) and “respond” (Stage 3), with the goal of preventing the outbreak from reaching its full potential.
- As of March 23rd, there were currently over 372,000 confirmed cases worldwide, with 42,433 cases in the United States.
 - a. For reference on how quickly the outbreak is spreading, on March 11th, the day the pandemic was declared, there were only 126,000 worldwide cases and 1,000 confirmed cases in the US.
 - b. Like Italy, which has been on a country-wide lockdown for a few weeks, several States in the United States have issued shelter-in-place orders to try and slow the spread within communities.
- As of March 23rd, there were 16,381 deaths attributed to COVID-19, for a global mortality rate of 4.4%. In the past 2 weeks, the number of deaths globally has increased 4-fold.
 - a. This mortality rate changes substantially depending on which country you are looking at data from. For instance, the mortality rate in South Korea is 1.2%, whereas in Italy it is closer to 9.5%.
 - b. The mortality rate in the United States is currently around 1.4%, but this varies by State.
 - c. It is currently thought that the mortality rate being reported is slightly higher than the true rate, due to the inability to test persons with mild diseases who do not contact the healthcare system for testing (i.e. people who need testing are more likely to die than those who do not need testing).
- COVID-19 seems to be of particular consequence for persons who are elderly (age > 60 years) and those with chronic medical conditions (cancer, hypertension, diabetes mellitus, cardiovascular disease, and chronic lung disease).
 - a. The mortality rate for otherwise younger persons without comorbid medical conditions is felt to be < 1%.
 - b. It is currently reported to be between:
 - i. 3-4% for those > 60 years
 - ii. ~ 8% for those > 70 years
 - iii. > 14% for those > 80 years.
 - iv. There was recently 1 reported death from COVID-19 in China (a 10-month old) but deaths in children under 10 years is extremely rare.
 - v. Only 2% of the cases from China were in persons who were < 20 years of age.
- Most of the cases in the United States are currently in New York (almost 50% of the total in the United States), New Jersey, Washington State, California, and Michigan ([JHU real-time tracker](#)) – yet all States and the District of Columbia have reported positive cases.

Disease Characteristics

- SARS-CoV-2 is thought to be spread primarily via respiratory droplets that are generated by coughing or sneezing. Aerosol-generating procedures (e.g. suctioning, nebulizer treatments, intubations, sputum induction, high-flow nasal cannula oxygen, and positive pressure ventilation) also can create these droplets.
- At this point in time, 1 person infects, on average, 2.2 additional people (once this number drops below 1, it will become possible to contain further spread of the virus).
- The original concept that a patient needed to have a fever + lower respiratory symptoms (cough or shortness of breath) to be considered a potential case is evolving. Most patients will indeed present with a fever (up to 90%), however, some may develop a fever later in their illness.
 - a. For instance, one study in China reported only 50% of patients had a fever at the time of admission to a hospital, with several more developing a fever after being hospitalized.
- Cough is seen in the majority of patients, but not all, and body aches, fatigue, and shortness of breath also occur, but in decreasing frequency. It has recently been noted that some patients will present with upper respiratory symptoms and others will present with GI symptoms such as nausea and vomiting (for more details, follow this link under [Clinical Presentation](#)).
 - a. Recent reports from China regarding COVID-19 in children showed fever was present in only 41.5% of cases. 48.% had a cough and 46.2% had redness in the throat. Up to 16% did not have any symptoms or radiographic evidence of infection.
- The clinical course shows that there is a delay from the onset of symptoms until clinical deterioration. Dyspnea will develop somewhere in the range of 5-13 days after the onset of symptoms in a majority of patients (median 8 days) and the average time from symptom onset until hospitalization is around 9 days.

Case Definitions

- The CDC case definition for a Person Under Investigation (PUI) for COVID-19 remains a person who is symptomatic (fevers + cough or dyspnea + exposure – either travel within 14 days of symptom onset to 1 of 5 international locations or known contact with a person with a confirmed SARS-CoV-2 infection). We anticipate this criteria to change as we transition to mitigation efforts (i.e. the risk of coming into contact with a person with contagion who has NOT traveled out of the country is higher than contacting a person with a significant travel history)

Treatment

- As of this time, there is no specific treatment or vaccine for SARS-CoV-2. Some treatments are currently under clinical investigation and several vaccines are in development. Until those become available, treatment is largely supportive, based on the patient's symptoms and disease severity.

Slowing the Spread

- Part of the mitigate and respond efforts are to try and slow the spread of disease (i.e. “flatten the curve”) so that the US Healthcare system does not become overwhelmed. Should this occur, as it did in Italy, there will likely be several deaths that occur that could have been prevented had proper equipment and supplies been available.
- Given that many cases are spread by persons with mild symptoms, it is imperative that we follow all guidance on social distancing, hand hygiene, and travel restrictions faithfully
- All EMS clinicians should have a heightened index of suspicion for COVID-19 cases in the community. Cardiac arrest cases may be due to patient succumbing from a COVID-19 infection. Please exercise caution and your best judgment to maintain the safety of yourself and your family.

Monitoring

We recommend that you monitor the situation in the United States closely. Due to the fact that community transmission is widely occurring in most States, our criteria for suspecting illness is going to change and our approach to clinical care of patients with upper or lower respiratory symptoms will become more challenging. Please continue to monitor reputable websites ([CDC](#), [WHO](#)) for additional updates. It is critical that all EMS clinicians, Captains, District Chiefs, and Fire Chiefs remain intimately familiar with:

- the epidemiology of coronavirus transmission within their communities
- the local resources and hospitals available to care for patients with coronavirus (e.g. who can perform testing, are alternative care sites established, is home testing via public health authorities an option, etc)
- local and State reporting requirements, as well as military chain-of-command reporting requirements