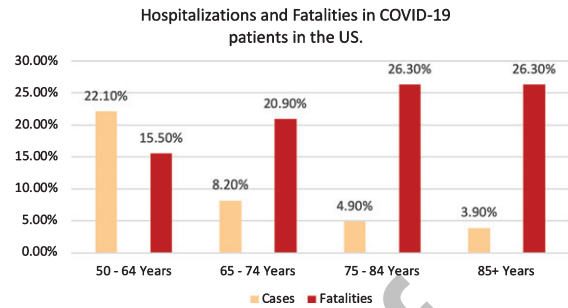


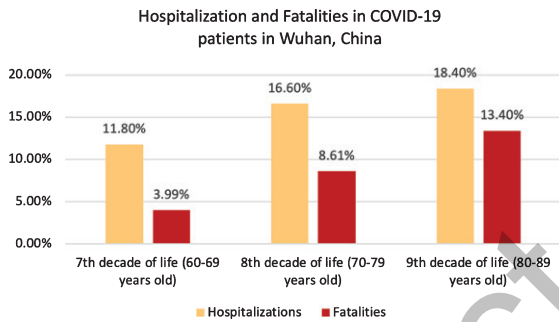
(shown in Graph 1). According to the CDC, as of July 2020, there have been 3,186,778 positive cases in the US. The largest age group presenting COVID-19 cases is the 50–64 years old group (22.10%), followed by the 65–74 years old (8.20%), 75–84 years old (4.9%), and 85+ years old (3.9%). Fatalities, however, show a different trend as illustrated in Graph 2.

Clinical manifestations

The clinical manifestations of COVID-19 range from asymptomatic or mild disease, to respiratory failure requiring mechanical ventilation and intensive care unit support, to widespread multi-organ-systemic disease [48]. Acute respiratory distress



Graph 2. Hospitalizations and Fatalities in COVID-19 patients in the US [3].



Graph 1. Hospitalizations and Fatalities in COVID-19 patients in Wuhan, China [43].

syndrome (ARDS) trend prevalence is higher in the older age group, while a more significant percentile of heart, liver, and kidney function injuries were seen in the younger group [49]. Clinical presentation of patients with COVID-19 includes severe dyspnea and hypoxemia, renal impairment with decreased urine output, tachycardia, altered mental status, and multiple organ dysfunction. This clinical presentation is accompanied by altered laboratory values such as hyperbilirubinemia, acidosis, high lactate, coagulopathy, and thrombocytopenia [50].

The Chinese Center for Disease Control report has classified the disease by severity (see Table 1).

The Chinese guidelines for diagnosis and treatment of SARS-CoV-2 infection classify pneumonia caused by the novel coronavirus 2019 in four types. See Table 2 [48, 50].

Table 1
Adapted from [48] Classification of COVID-19 Pneumonia like symptoms

Mild	Non-pneumonia and mild-pneumonia in approx. 81% of cases [48].
Severe	Dyspnea, Respiratory Rate ≥ 30 rpm, blood oxygen saturation (SpO ₂) $\leq 93\%$, PaO ₂ /FiO ₂ ratio or P/F < 300 , and/or lung infiltrates $> 50\%$ within 24 to 48 hours. 14% of cases [48].
Critical	Respiratory failure, septic shock, and/or multiple organ dysfunction (MOD) or failure (MOF), which occurred in 5% of cases [48].

Table 2
Adapted from [48, 50] Classification of severity of COVID-19

Mild	Usually presenting symptoms of an upper respiratory infection: mild fever, dry cough, sore throat, nasal congestion, malaise, and headache, but no imaging signs of pneumonia [48, 50].
Moderate	Presenting respiratory symptoms, such as cough and dyspnea (tachypnea in children), and imaging signs of pneumonia [48, 50].
Severe	Presents with any of the following: <ul style="list-style-type: none"> – Fever – Severe dyspnea, respiratory distress, and tachypnea with RR > 30 rpm – Hypoxia $< 90\%$, or PaO₂/FiO₂ < 300 mmHg. – Cyanosis could be present in children [48, 50]
Critically Severe	– Respiratory failure needing mechanical ventilation [48, 50]