

# Mortality of COVID-19 Admitted Patients on Mechanical Ventilators

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Here we examine the mortality of patients who received invasive mechanical ventilation as treatment for acute respiratory failure due to COVID-19.

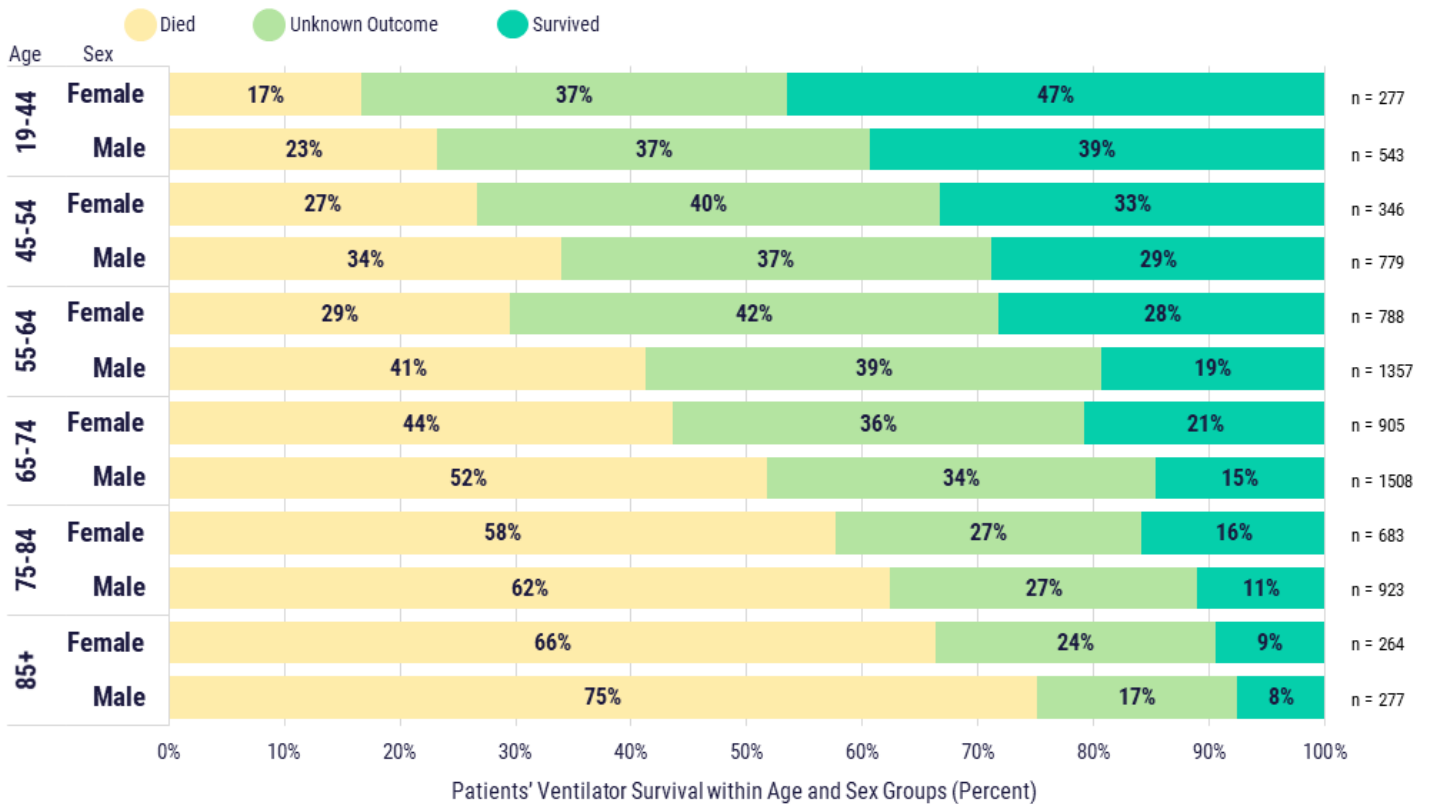
As of April 30, 2020, for COVID-19 positive patients age 19+ requiring invasive mechanical ventilation (n = 8650), 1833 (21%) were discharged from the hospital, 3847 (44%) died, and 2970 (34%) remain in the hospital. Data are pooled from 31 health systems representing 300 hospitals spanning 18 states and covering 136 million patients.

In the best case scenario, all currently admitted ventilator patients will survive and the mortality rate will be equal to the percentage of patients who have already died. In the worst case scenario, all currently admitted ventilator patients will die and the mortality rate will be equal to the sum of the percentage of patients who have already died and the percentage of patients with an unknown outcome. The actual ventilator mortality rate for these patients will be in between these two values. The overall mortality rate in this sample of patients is between 44%-78%. Survival varies with age and sex, with younger and female patients having an increased likelihood of survival.

Understanding ventilator survival rates by age and sex may be helpful for clinicians who are counseling patients and family members on likely outcomes with mechanical ventilation.

## Ventilator Survival

by Age and Sex (n=8,650)



Term	Definition
<b>COVID-19 Patient</b>	Patient with a positive SARS-CoV-2 lab result or a COVID-19 diagnosis. <b>Start Date:</b> The earlier of the earliest positive SARS-CoV-2 lab result collection date or earliest diagnosis noted date
<b>Positive COVID-19 Lab Result</b>	A final result flagged as abnormal for one of the lab components identified by individual health systems for SARS-CoV-2. <b>Positive/Start Date:</b> Date the test was collected/performed
<b>COVID-19 Diagnosis</b>	A patient with one of the following codes for one of the following diagnosis settings. <ul style="list-style-type: none"> <li>• <b>Diagnosis Code:</b> U07.1 (ICD-10), 840539006 (SNOMED)</li> <li>• <b>Diagnosis Setting:</b> Encounter Diagnosis, Billing Diagnosis, Problem List, Hospital Problem, Discharge Diagnosis</li> </ul>
<b>COVID-19 Related Admission</b>	A hospital admission during which the patient has a positive SARS-CoV-2 lab test or COVID-19 diagnosis, OR a hospital admission with any respiratory diagnosis which happens within 14 days of the patient's COVID-19 "start date." <b>Respiratory Diagnosis Codes:</b> J00-J99 (ICD-10)
<b>Ventilator Usage</b>	A patient is considered to be on a ventilator if they have a procedure with one of the following CPT codes during their COVID-19 related admission. Alternatively, a patient is ventilated if on any given calendar day there is documentation other than "Off" in a Vent Mode flowsheet row or an oxygen delivery device of ventilator. For this study, we only consider the worst severity a patient reaches on a given calendar day, so if a patient is placed on a ventilator and dies on the same day they will not be included in ventilator usage counts. <b>CPT Codes:</b> 94002, 94003, 94004, 94005
<b>COVID-related Death</b>	A COVID-19 patient with a death date or discharge date with a discharge disposition of deceased within 6 weeks of their COVID-19 start date.
<b>Patient Sex</b>	Patient's legal sex. Possible values include "Male," "Female," and "Other." Due to low numbers of patients who fell into the "Other" category, it was excluded for clarity.

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Check for [updates](https://ehrn.org/wp-content/uploads/Mortality-COVID-19-Ventilator.pdf) at <https://ehrn.org/wp-content/uploads/Mortality-COVID-19-Ventilator.pdf>