

# Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy

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## Abstract

**Importance** In December 2019, a novel coronavirus (severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) emerged in China and has spread globally, creating a pandemic. Information about the clinical characteristics of infected patients who require intensive care is limited.

**Objective** To characterize patients with coronavirus disease 2019 (COVID-19) requiring treatment in an intensive care unit (ICU) in the Lombardy region of Italy.

**Design, Setting, and Participants** Retrospective case series of 1591 consecutive patients with laboratory-confirmed COVID-19 referred for ICU admission to the coordinator center (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy) of the COVID-19 Lombardy ICU Network and treated at one of the ICUs of the 72 hospitals in this network between February 20 and March 18, 2020. Date of final follow-up was March 25, 2020.

**Exposures** SARS-CoV-2 infection confirmed by real-time reverse transcriptase–polymerase chain reaction (RT-PCR) assay of nasal and pharyngeal swabs.

**Main Outcomes and Measures** Demographic and clinical data were collected, including data on clinical management, respiratory failure, and patient mortality. Data were recorded by the coordinator center on an electronic worksheet during telephone calls by the staff of the COVID-19 Lombardy ICU Network.

**Results** Of the 1591 patients included in the study, the median (IQR) age was 63 (56-70) years and 1304 (82%) were male. Of the 1043 patients with available data, 709 (68%) had at least 1 comorbidity and 509 (49%) had hypertension. Among 1300 patients with available respiratory support data, 1287 (99% [95% CI, 98%-99%]) needed respiratory support, including 1150 (88% [95% CI, 87%-90%]) who received mechanical ventilation and 137 (11% [95% CI, 9%-12%]) who received noninvasive ventilation. The median positive end-expiratory pressure (PEEP) was 14 (IQR, 12-16) cm H<sub>2</sub>O, and FIO<sub>2</sub> was greater than 50% in 89% of patients. The median PaO<sub>2</sub>/FIO<sub>2</sub> was 160 (IQR, 114-220). The median PEEP level was not different between younger patients (n = 503 aged ≤63 years) and older patients (n = 514 aged ≥64 years) (14 [IQR, 12-15] vs 14 [IQR, 12-16] cm H<sub>2</sub>O, respectively; median difference, 0 [95% CI, 0-0]; P = .94). Median FIO<sub>2</sub> was lower in younger patients: 60% (IQR, 50%-80%) vs 70% (IQR, 50%-80%) (median difference, -10% [95% CI, -14% to 6%]; P = .006), and median PaO<sub>2</sub>/FIO<sub>2</sub> was higher in younger patients: 163.5 (IQR, 120-230) vs 156 (IQR, 110-205) (median difference, 7 [95% CI, -8 to 22]; P = .02). Patients with hypertension (n = 509) were older than those without hypertension (n = 526) (median [IQR] age, 66 years [60-72] vs 62 years [54-68]; P < .001) and had lower PaO<sub>2</sub>/FIO<sub>2</sub> (median [IQR], 146 [105-214] vs 173 [120-222]; median difference, -27 [95% CI, -42 to -12]; P = .005). Among the 1581 patients with ICU disposition data available as of March 25, 2020, 920 patients (58% [95% CI, 56%-61%]) were still in the ICU, 256 (16% [95% CI, 14%-18%]) were discharged from the ICU, and 405 (26% [95% CI, 23%-28%]) had died in the ICU. Older patients (n = 786; age ≥64 years) had higher mortality than younger patients (n = 795; age ≤63 years) (36% vs 15%; difference, 21% [95% CI, 17%-26%]; P < .001).

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**Conclusions and Relevance** In this case series of critically ill patients with laboratory-confirmed COVID-19 admitted to ICUs in Lombardy, Italy, the majority were older men, a large proportion required mechanical ventilation and high levels of PEEP, and ICU mortality was 26%.