

Outcomes of Critically-Ill Patients with Coronavirus Disease 2019 at Advocate-Aurora Health Christ Medical Center and the VIRUS Registry

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Introduction

Background

Coronavirus disease 2019 (COVID-19) was declared a global pandemic in March 2020. The COVID-19 pandemic has resulted in over 3,000,000 deaths worldwide as of April 19, 2021.

Cook County was an early epicenter of the outbreak.

The most severe forms of COVID-19 often lead to critical illness due to respiratory failure, often requiring invasive mechanical ventilation (IMV) and, potentially, multiorgan system failure.

Objectives

1. To describe the outcomes of critically-ill patients with COVID-19 at Advocate Christ Medical Center.
2. To participate in a multicenter, international coronavirus disease 2019 registry known as the Society of Critical Care Medicine Discovery Viral Infection and Respiratory Illness Universal Study (VIRUS) COVID-19 Registry

Methods

Design

Observation study including COVID-19 patients hospitalized with laboratory-confirmed severe acute respiratory syndrome coronavirus-2 infection.

Dates: February 15, 2020 to May 31, 2020

Setting(s)

1. CMC: an urban, Level 1 trauma and tertiary care center
2. International VIRUS Registry: 168 hospitals in 16 countries within the Society of Critical Care Medicine's Discovery Viral Infection and Respiratory Illness University Study coronavirus disease 2019 registry.

Patients

Adult patients with coronavirus disease 2019 patients admitted from the emergency department to the medical intensive care unit.

Outcomes

The primary outcome was in-hospital mortality. Secondary outcomes were discharge location and length of stay.

Statistics

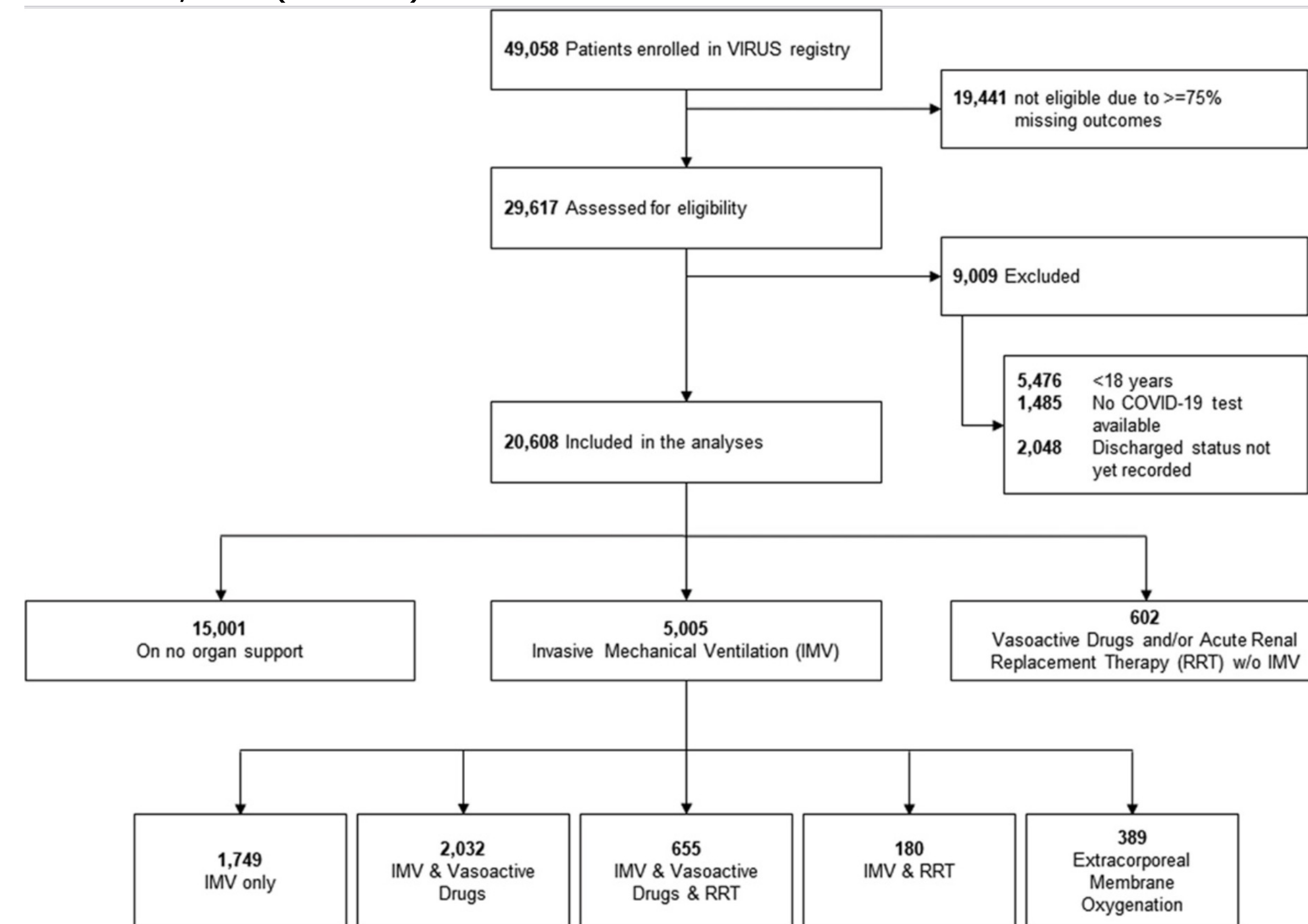
The primary analysis is descriptive in nature. Results are stratified by age and need for organ support (mechanical ventilation, renal replacement therapy, and extra-corporeal membrane oxygenation [ECMO]).

Results: Worldwide VIRUS Registry*

Subject Characteristics

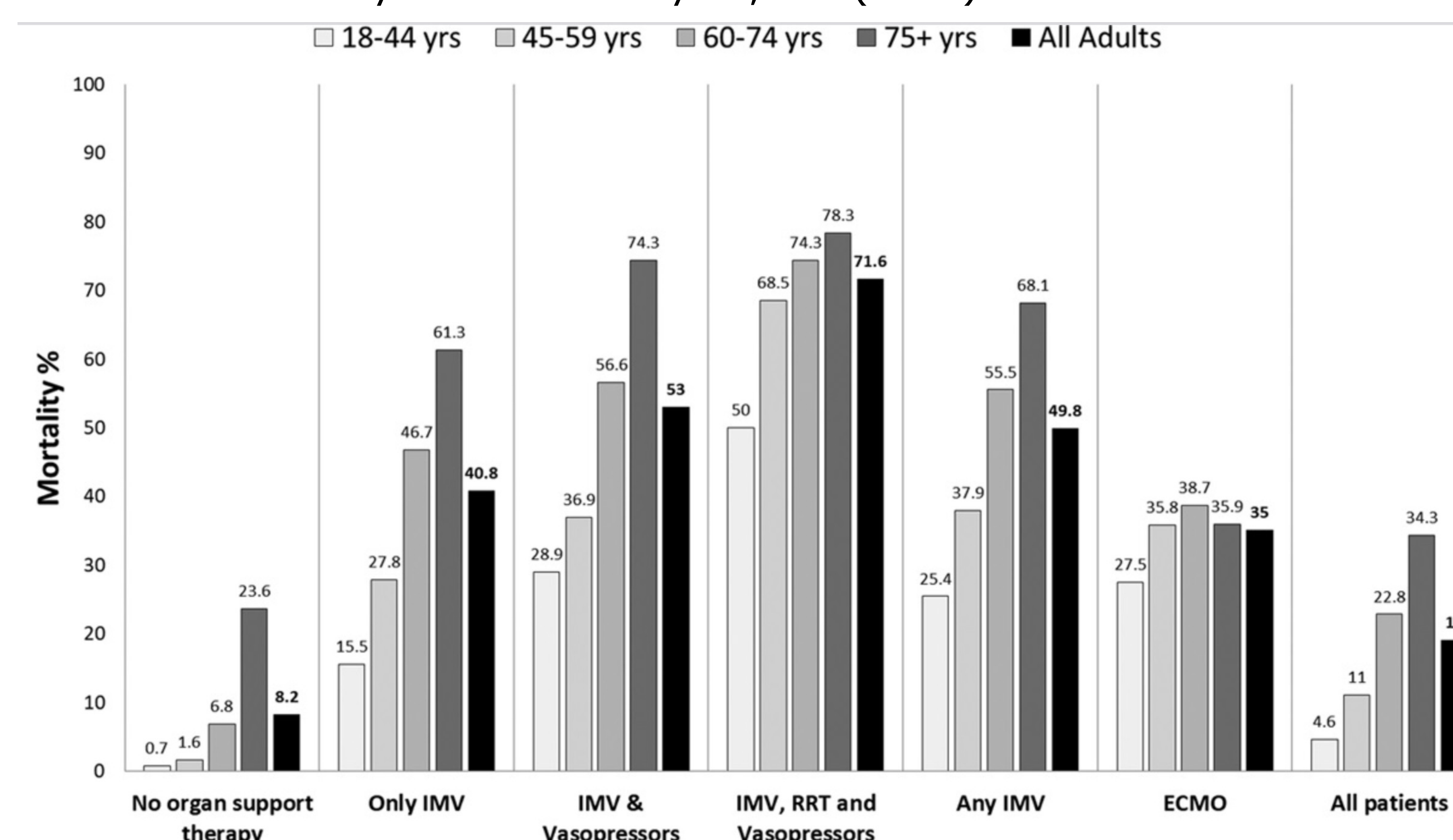
20,608 patients *internationally* with coronavirus disease 2019

- Mean [SD] age 60.5 [17]
- Male 11,1887 (54.3%)
- ICU 8,745 (42.4%)



Outcomes: Mortality

Overall mortality internationally: 3,906 (19%)



* Domecq JP, Lal A, Sheldrick CR, Kumar VK, Boman K, Bolesta S, Bansal V, Harhay MO, Garcia MA, Kaufman M, Danesh VC, Cheruku S, Banner-Goodspeed VM, Anderson HL, Milligan PS, Densen JL, St. Hill CA, Dodd KW, Gajic O, Walkey AJ, Kashyap R, For The Society of Critical Care Medicine Discovery Viral Infection and Respiratory Illness Universal Study (VIRUS): COVID-19 Registry Investigator Group. Outcomes of Patients with COVID-19 receiving Organ Support Therapies: The International VIRUS Registry. Crit Care Med. 2020;49(3):437-48

Preliminary Results: CMC MICU

Subject Characteristics

218 *critically-ill* patients were admitted to the CMC MICU

- Mean [SD] Age 65.2 [13.4]
- Male 129 [59.2%]
- Race/Ethnicity: 91 [42%] white, 82 [38%] black, and 34 [16%] Hispanic)

Incidence of organ support modalities:

- Mechanical ventilation 79 (36%)
- Renal replacement therapy 34 (16%)
- ECMO 6 (3%)

Primary Outcome: Mortality

In-hospital mortality was 29% (n = 80)

For patients requiring organ support, mortality was

- 33/79 (42%) for mechanical ventilation
- 25/34 (75%) for renal replacement therapy
- 2/6 (33%) on ECMO

Primary Outcome: Mortality

Discharge to Home

Rates of discharge home were 63/125 (50%) for patients who did not require organ support therapies, 24/79 (30%) for mechanical ventilation, 3/34 (9%) for renal replacement therapy, and 2/6 (33%) for ECMO.

Length of Stay

For patient requiring mechanical ventilation, the median (IQR) hospital length of stay was 17.3 (11.3-27.5) days.

Elderly Patients

In patients older than 74 years old that required mechanical ventilation:

- In-hospital mortality was 11/16 (69%)
- 0 patients were discharged to home

Conclusions

Need for organ support modalities and increasing age were associated with higher mortality and lower rate of discharge to home during the early experience with COVID-19 at CMC.

This study provides important baseline data for clinical planning and future research.