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# Assessment of Different Etiologies of Patients Mechanically Ventilated with COVID-19 from 7/1/2022 to 6/31/2023

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## Introduction

- COVID-19 is a respiratory disease that may require the utilization of mechanical ventilation
- Mechanical ventilation is a life support device that is utilized to help the patient breathe and it provides oxygen to them
- The **objective of this data review** was to determine if patients diagnosed with COVID-19 are mechanically ventilated for COVID-19 pneumonia or for some other etiology
- The **vaccination status** and **mortality rate** was also assessed for those patients who were intubated for COVID-19 pneumonia
- The COVID-19 results were stratified by variant type and time frame:

Alpha - 3/1/2020 to 10/31/2020  
Delta - 11/1/2020 to 8/31/2021  
Omicron BA.1 - 9/1/2021 to 1/31/2022  
Omicron BA.2 - 2/1/2022 to 6/30/2022

Omicron BA.2.12.1 – 7/1/2022 to 9/31-2022  
Omicron BQ.1/BQ.1.1 – 10/1/2022 to 1/31/2023  
Omicron XBB.1.5 – 2/1/2023 to 6/31/2023

## Methods

DATA COLLECTION

- Patient data was collected via the five Lehigh Valley Health Network (LVHN) locations for patients that were ventilated with COVID-19 using EPIC data
- The data was stratified into specific categories based on admission/discharge diagnosis  
- Resp\*, Neuro\*, Cardiac, Sepsis, Inc.\*, Misc\*

DATA ANALYSIS

- Those patients admitted for respiratory sequela were further analyzed for specific etiologies during their hospitalization
- COVID-19 variants patient outcomes were analyzed from both previous and current data collection

## Results

Resp. (% <i>,n</i> )	Neuro. (% <i>,n</i> )	Cardiac (% <i>,n</i> )	Sepsis (% <i>,n</i> )	Inc. (% <i>,n</i> )	Misc. (% <i>,n</i> )	Pts. Survival	Pts. Exp.	Pts. Vax.	Pts. Unvax.
<b>39.3 (33)</b>	19.0 (16)	13.1 (11)	9.5 (8)	8.3 (7)	10.7 (9)	51.0 (42)	49.4 (41)	62.7 (52)	37.3 (31)

Table 1. Patients' Principal Diagnosis upon Admission and Clinical Characteristics 7/1/2022 to 6/31/2023

COVID Pneumonia (% <i>,n</i> )	Pneumonia Viral/Bacteria (% <i>,n</i> )	ARDS (% <i>,n</i> )	COPD/Asthma (% <i>,n</i> )	Aspiration (% <i>,n</i> )	Upper Airway Obstruction (% <i>,n</i> )
<b>33.3 (11)</b>	9.1 (3)	3.0 (1)	24.2 (8)	24.2 (8)	6.1 (2)

Table 2. Respiratory Patient Breakdown of Specific Conditions 7/1/2022 to 6/31/2023

COVID-19 Variant	Patients Survived (% <i>,n</i> )	Patients Expired (% <i>,n</i> )	Survived Vaccinated (% <i>,n</i> )	Expired Unvaccinated (% <i>,n</i> )
Alpha	48.7 (94)	51.3 (99)	N/A **	N/A **
Delta	33.1 (136)	<b>66.9 (275)</b>	42.5 (58)	92.8 (255)
Omicron BA.1	23.7 (76)	<b>76.3 (245)</b>	30.4 (23)	83.1 (204)
Omicron BA.2	60.0 (30)	40.0 (20)	32.1 (10)	66.7 (13)

Table 3. COVID-19 Variant Breakdown 3/1/2020 to 6/30/2022 of 975 Patients

COVID-19 Variant	Patients Survived (% <i>,n</i> )	Patients Expired (% <i>,n</i> )	Survived Vaccinated (% <i>,n</i> )	Expired Unvaccinated (% <i>,n</i> )
Omicron BA.2.12.1	N/A	N/A **	N/A **	N/A **
Omicron BQ.1/BQ.1.1	25.0 (2)	75.0 (6)	89.0 (2)	100.0 (6)
Omicron XBB.1.5	33.0 (1)	67.0 (2)	33.0 (1)	50.0 (1)

Table 4. COVID-19 Pneumonia Variant Breakdown from 7/1/2022 to 6/31/2023 of 11 Patients

## Conclusions

- Patients Intubated for Respiratory Disease from 7/1/2022 to 6/31/2023
  - Of the 84 patients with COVID-19, **39.7% (33 patients)** were intubated due to respiratory disease
  - Of the 33 patients with respiratory disease, **33.3% (11 patients)** were intubated due to COVID-19 pneumonia
  - The incidence of mechanical ventilation during the most recent variants is much lower than the historical variants
- Vaccination Status & Mortality Rate
  - Unvaccinated patients mechanically ventilated for COVID-19 pneumonia had a higher degree of mortality compared to patients vaccinated
- COVID-19 Variant Mutation
  - Delta and Omicron BA.1 had the worst mortality rate of all the variants
  - Omicron BQ.1/BQ.1.1 continued to show a high mortality rate due to its low sample size (n=11)

## Future Directions

- Educate the community on the importance of getting vaccinated to reduce the incidence of mortality associated with COVID-19
- Assess patient demographics and clinical characteristics for COVID-19 pneumonia patients for an increased factor of morbidity and mortality
- Compare LVHN statistics to similar medical centers using Vizient

## Clinical Observations

- **Clinical rounds:** NICU/PICU, MICU/SICU, Trauma Neuro ICU, Inpatient Rehabilitation Center. Open Heart Surgery, Emergency Department, PFT Lab, Respiratory Services, MSICU discharge planning meeting

- \* = Respiratory, Neurology, Incidental, and Miscellaneous
- \*\* = Not Applicable (No Data Available)
- ARDS = Acute Respiratory Distress Syndrome
- COPD = Chronic Obstructive Pulmonary Disorder
- Patients Expired, Vaccinated

Scan QR Code to Access "Assessing the Patient Demographics and Clinical Characteristics of Mechanically Ventilated Patients with COVID-19 at Lehigh Valley Health Network (LVHN)" by Danielle Weaver and Kenneth Miller



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