



# Comparison of High-Flow Nasal Canula and Non-Invasive Mechanical Ventilation in Treating COVID-19 Patients

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## Introduction

The World Health Organization has declared COVID-19 a global pandemic in March 2020. Multiple COVID-19 waves are putting tremendous stress on healthcare systems. Evidence showed that high-flow nasal canula (HFNC) reduced the need for mechanical ventilation and shortened the time to clinical recovery among patients with severe COVID-19.

## Objectives

This study aims to assess the effect of using HFNC compared to non-invasive mechanical ventilation (NIV), on adult patients with COVID-19.

## Methods

This retrospective study included patients hospitalized due to COVID-19 between October 2020 to December 2021 with appropriate ICD-10 diagnosis recorded in a commercially available, all-payer administrative database across 300+ hospitals. The identified patients were divided in two cohorts, one being the patients treated with HFNC as the first line respiratory support and another with NIV. Outcomes included all-cause mortality rate and length of stay. Multivariable analyses were performed to adjust for baseline characteristics.

## Results

Out of 16,534 eligible patients, 4,334 patients received HFNC as the first line respiratory support, whereas 12,200 received NIV (Table 1). The all-cause mortality rate was 20.24% and 37.14% in the HFNC and NIV group, respectively (Table 2). After adjusting for baseline characteristics, the all-cause mortality rate in the HFNC group was lower compared to NIV (odds ratio [OR], 0.51; 95% confidence interval [CI], 0.47-0.55; p<0.001). The total length of stay was around 15 days for all patients. No difference was observed between groups (mean difference 0.3 days; 95% CI, -0.27 – 0.92 days; p>0.05). Overall, ICU admission rate was slightly higher in the NIV group compared to HFNC, 28.54% vs. 25.17% (Table 3).

## Conclusion

Patients treated with HFNC showed lower mortality rates compared to NIV for hospitalized COVID-19 patients. However, further studies are still needed to better elucidate the clinical and economic benefit of HFNC in COVID-19 patients.

Table 1. Quarterly COVID hospitalization cases HFNC vs. NIV as 1st line therapy, 2020 Q4 to 2021 Q4

	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Total
COVID Hospitalization, N	83,838	99,328	29,701	28,970	51,350	293,187
HFNC as 1st Line of Therapy, %	1.97%	5.16%	11.46%	18.87%	19.84%	9.66%
NIV as 1st Line of Therapy, %	30.99%	25.19%	32.37%	29.02%	22.88%	27.18%

Table 2. Quarterly all-cause mortality HFNC vs. NIV as 1st line therapy, 2020 Q4 to 2021 Q4, unadjusted

	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Total
HFNC as 1st Line of Therapy, N	209	796	498	932	1899	4334
All-cause mortality, %	22.01%	19.85%	16.27%	18.56%	22.06%	20.24%
NIV as 1st Line of Therapy, N	3285	3886	1406	1433	2190	12200
All-cause mortality, %	38.90%	34.79%	30.01%	39.50%	41.69%	37.14%

Table 3. Quarterly ICU admission HFNC vs. NIV as 1st line therapy, 2020 Q4 to 2021 Q4

	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Total
HFNC as 1st Line of Therapy, N	209	796	498	932	1899	4334
ICU admission, %	25.84%	36.06%	21.29%	27.36%	36.44%	25.17%
NIV as 1st Line of Therapy, N	3285	3886	1406	1433	2190	12200
ICU admission, %	29.41%	33.87%	28.73%	14.52%	32.24%	28.54%