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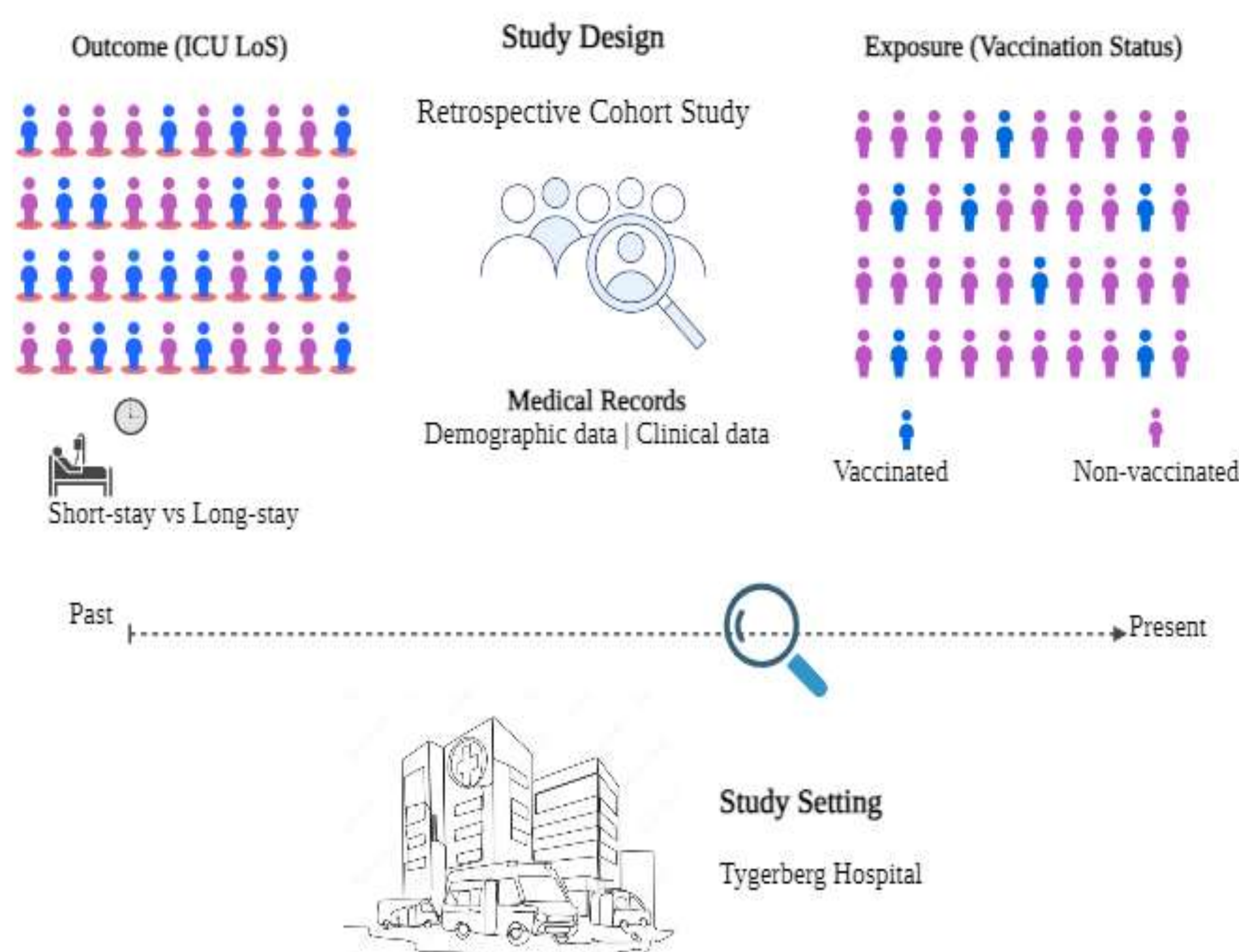
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**COVID-19 vaccination reduced ICU stays by up to 12 days, saving ZAR274,440 (\$15,545.84) per patient day. Key factors for longer ICU stays were obesity, PaCO<sub>2</sub> levels, and the number of days sedated.**

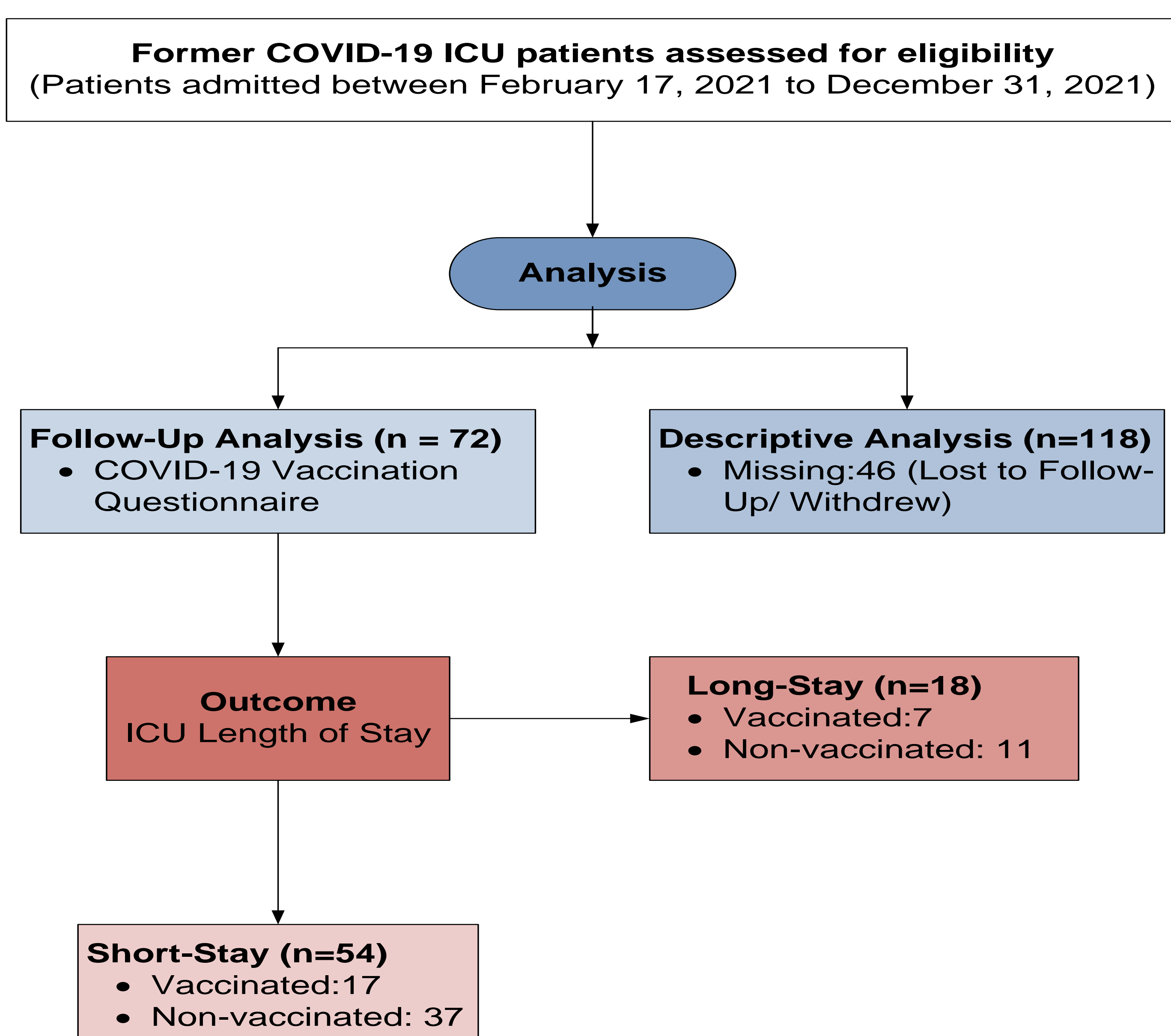
## BACKGROUND

The SARS-CoV-2 pandemic has significantly impacted populations globally. Vaccines reduce the severity of infections, yet breakthrough cases still occur. There is a paucity of data on factors influencing ICU length of stay among vaccinated and unvaccinated COVID-19 patients in South Africa. This study aimed to identify factors associated with prolonged ICU stay in COVID-19 patients during the first year of vaccine rollout, at a tertiary hospital in South Africa.

## METHODS



**Figure 1. Study design, setting, data sources & variables**



**Figure 2. Flow diagram of patient selection & final sample composition**

## RESULTS

The average ICU cost per patient day in South Africa is estimated at **ZAR22,870** (Mahomed & Mahomed, 2018; Cleary et al., 2021). Vaccination reduced ICU stays by **12 days**, resulting in significant cost savings of **ZAR274,440 (\$15,545.84)** per patient, calculated as:  
**Cost savings** = 12 days × ZAR22,870.

**Table 1. Factors Associated with LoS in ICU**

Risk Factor	IRR (95% CI)	p	aIRR (95% CI)	p
Age	0.98 (0.95 - 1.01)	0.176		
Sex	0.64 (0.29 - 1.41)	0.267		
Obesity	2.39 (0.95 - 6.04)	0.066	5.74 (2.24 - 14.68)	<0.001
Dyslipidaemia	1.46 (0.51 - 4.17)	0.478		
Hypertension	2.39 (0.95 - 6.04)	0.066	3.96 (0.99 - 15.90)	0.052
Diabetes mellitus	1.13 (0.46 - 2.74)	0.795		
Heart Disease	1.40 (0.26 - 7.40)	0.695		
HIV/AIDS	1.83 (0.56 - 5.94)	0.315		
No. of days sedated	1.31 (1.12 - 1.54)	0.001	1.3 (1.00 - 1.60)	0.049
Systolic Blood Pressure	1.01 (0.99 - 1.02)	0.477		
Diastolic Blood Pressure	1.02 (1.00 - 1.04)	0.075	1.02 (0.99 - 1.04)	0.223
pH	5.05 (0.00 - 2.19)	0.705		
PaO <sub>2</sub>	0.96 (0.87 - 1.08)	0.519		
PaCO <sub>2</sub>	0.67 (0.47 - 0.94)	0.021	0.3 (0.12 - 0.79)	0.014
HCO <sub>3</sub> <sup>*</sup>	0.94 (0.88 - 1.00)	0.037		
BE	0.95 (0.91 - 0.98)	0.002	1.09 (0.99 - 1.20)	0.068

## CONCLUSIONS

- Obesity, partial pressure of carbon dioxide (PaCO<sub>2</sub>) & the number of days sedated were significantly associated with longer ICU stays.
- Vaccinated patients spent up to 12 fewer days in ICU, resulting in lower healthcare costs and reduced ICU burden.
- Large scale analysis is recommended.

## ADDITIONAL KEY INFORMATION

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