

Implications of the omicron variant on COVID-19 pregnancy related outcomes: a retrospective cohort analysis

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Introduction

- Pregnant women who are not fully vaccinated have an increased risk of severe disease with COVID-19; it is estimated that **98%** of pregnant COVID-19 admissions to critical care units in the UK were **unvaccinated**¹.
- COVID-19 is unlikely to adversely affect foetal development, however, pregnant women with severe disease are 2-3x more likely to have preterm births².
- There has been a respective increase in the proportion of pregnant women with severe disease corresponding to the changes in variant dominant periods (**Wildtype**, **Alpha**, **Delta**)³, however, there are few publications exploring the severity of disease as it correlates to the now dominant **Omicron** variant.

Aims

- To identify the characteristics associated with severe COVID-19 disease in pregnant women.
- To assess the maternal and foetal outcomes associated with severe COVID-19 disease in pregnant women.
- To identify any **shifts in trend** corresponding with the dominance of the **Omicron** variant.

COVID-19 Severity and Variants

COVID-19 Severity	Criteria
Asymptomatic	No symptoms of COVID-19
Mild	Symptomatic without pneumonia on imaging and no respiratory support requirement
Moderate	Symptomatic with pneumonia on imaging or requiring non-invasive respiratory support
Severe	Requiring level 3 care, high flow oxygen, CPAP, or ECMO

Table 1. COVID-19 severity based on the WHO classification of severity⁴ – CPAP; continuous positive airway pressure, ECMO; extracorporeal membrane oxygenation

Dominant Variant	Time Period
Wildtype	March 1 – November 30, 2020
Alpha	December 1, 2020 – May 15, 2021
Delta	May 16 – December 17, 2021
Omicron	December 18, 2021 - Present

Table 2. Variant dominant periods

Methods

- The characteristics, maternal outcomes, and foetal outcomes of 59 pregnant patients admitted to Whiston Hospital with PCR confirmed COVID-19 from January 2021 to March 2022 were retrospectively analysed.
- Odds ratios were formulated using MedCalc comparing patients with severe vs. mild/moderate disease.
- Plots were created using Rstudio.

Results

- Of the 31 symptomatic patients, women with severe disease were more likely to be overweight or obese (odds ratio [OR] 1.71 95% CI 1.06-2.77, and OR 1.38 95% CI 1.04-1.85, respectively).
- Non-vaccinated patients were 1.33 times as likely to develop symptoms than vaccinated patients (95% CI 1.01-1.76).
- The Delta variant appears to be 3.87 times as likely to require admission (95% CI; 1.26-11.85) than the Omicron variant. Moderate and severe disease was not observed during the Omicron dominant period.
- Foetal and maternal complications were rare.

AGE	Under 20	2
	20-29	30
	30-39	39
	40-49	2
BMI	Under 20	2
	20-29.9	36
	30-39.9	26
	40-49.9	6
	50+	3
SMOKING	Non-smoker	44
	Current smoker	15
	Quit prior to pregnancy	11
	Quit during pregnancy	3

Figure 1. Patient characteristics

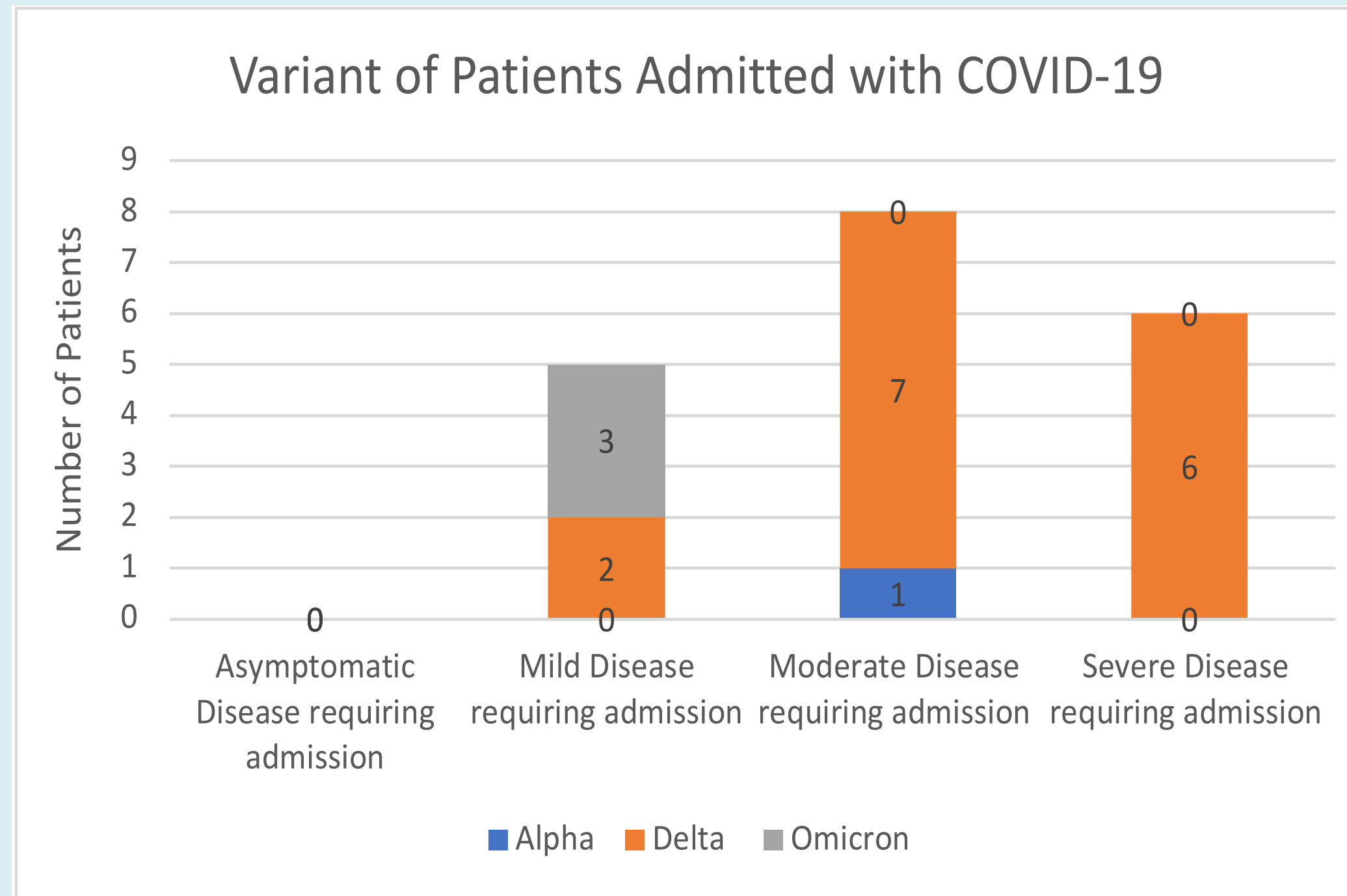


Figure 2. Patient variants and admission

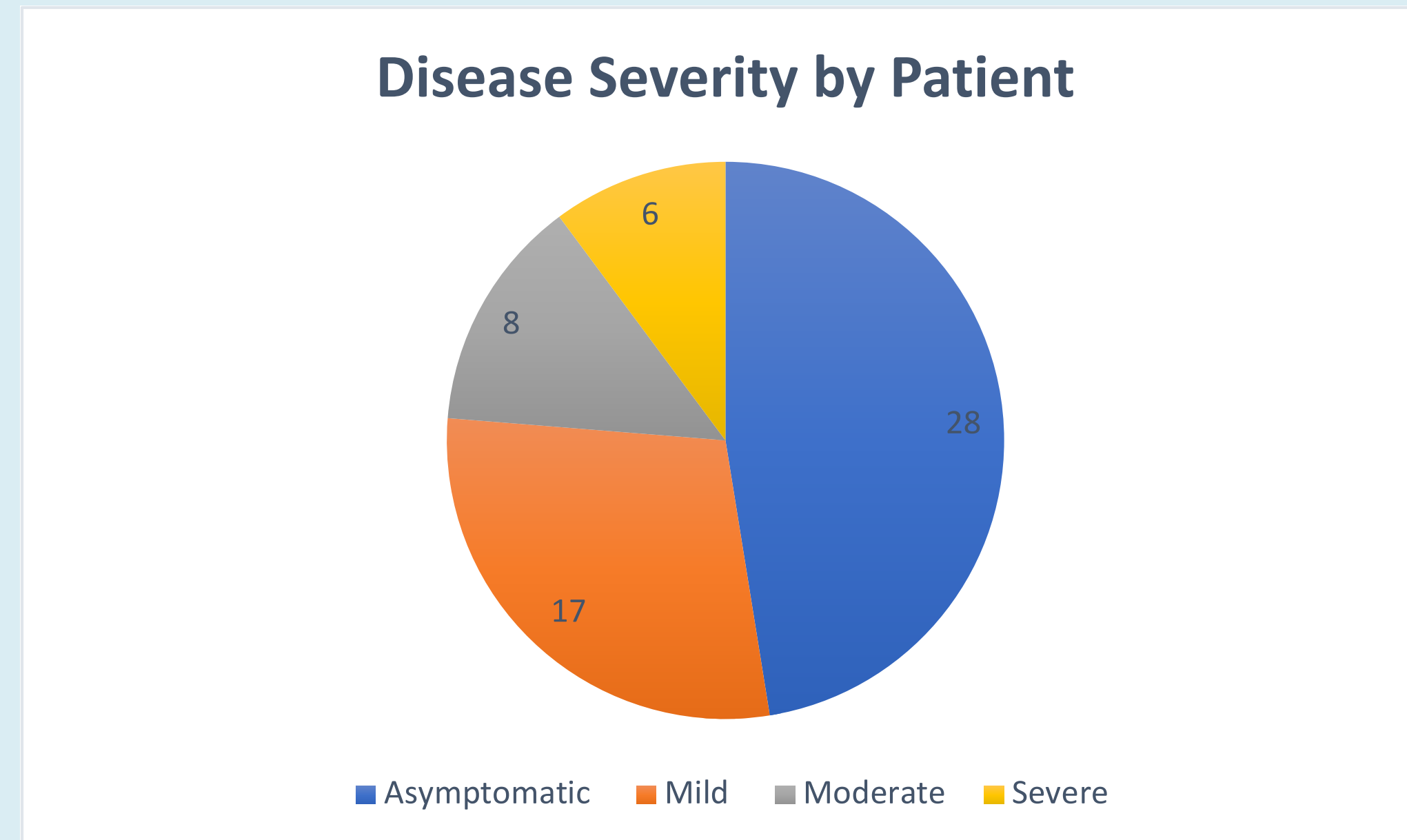


Figure 3. Patient disease severity

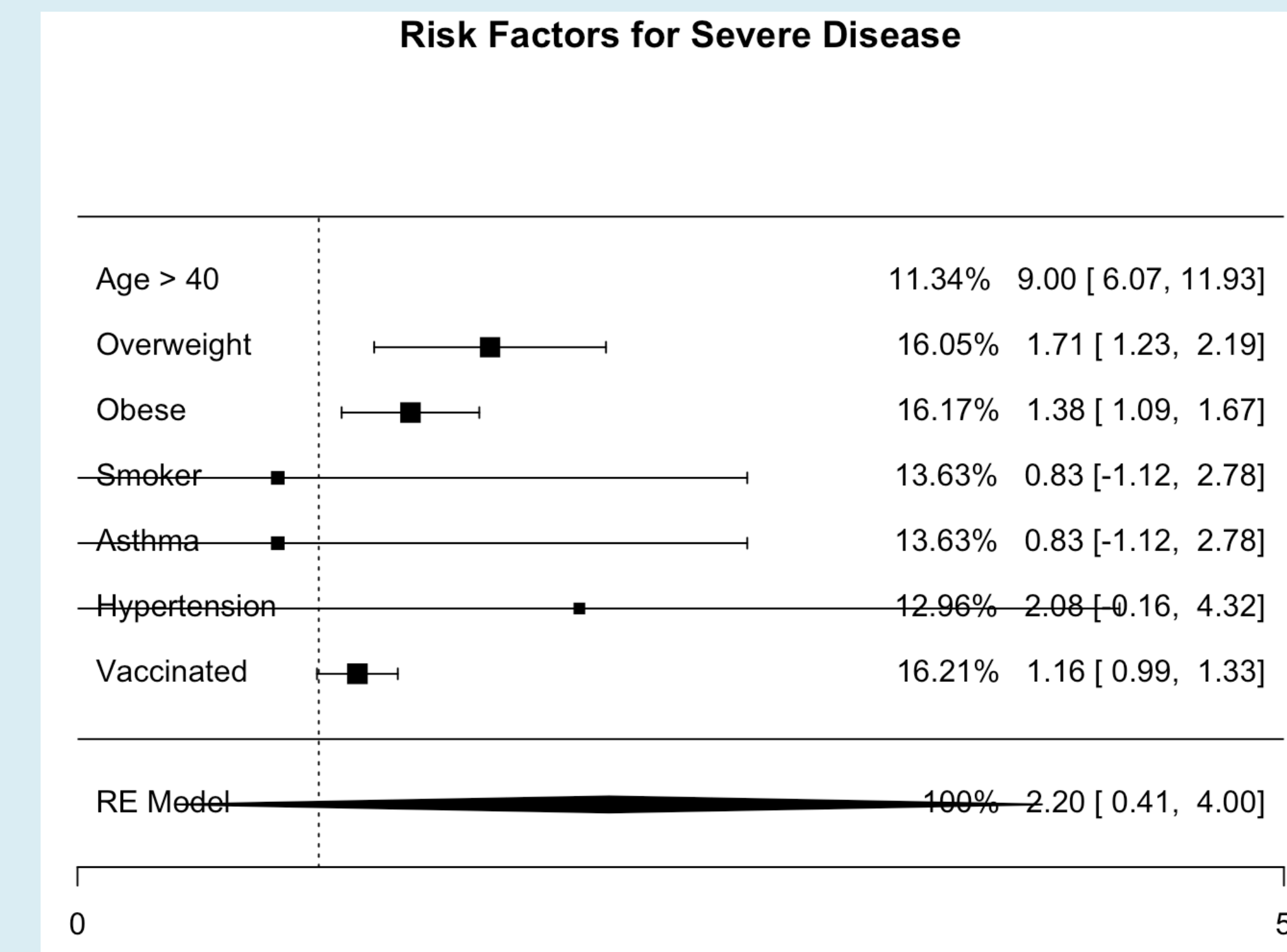


Figure 4. Odds ratios for predictor variables of severe disease

Conclusions

- While significant maternal and foetal complications from COVID-19 infection in pregnancy remain rare, prevention of the disease remains as important as it was prior to the development of vaccines.
- Vaccination has proved to be the most important therapy in combatting symptomatic COVID-19 infection.
- The Omicron variant has resulted in a decrease in the amount of moderate/severe COVID-19 infection seen.

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References

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