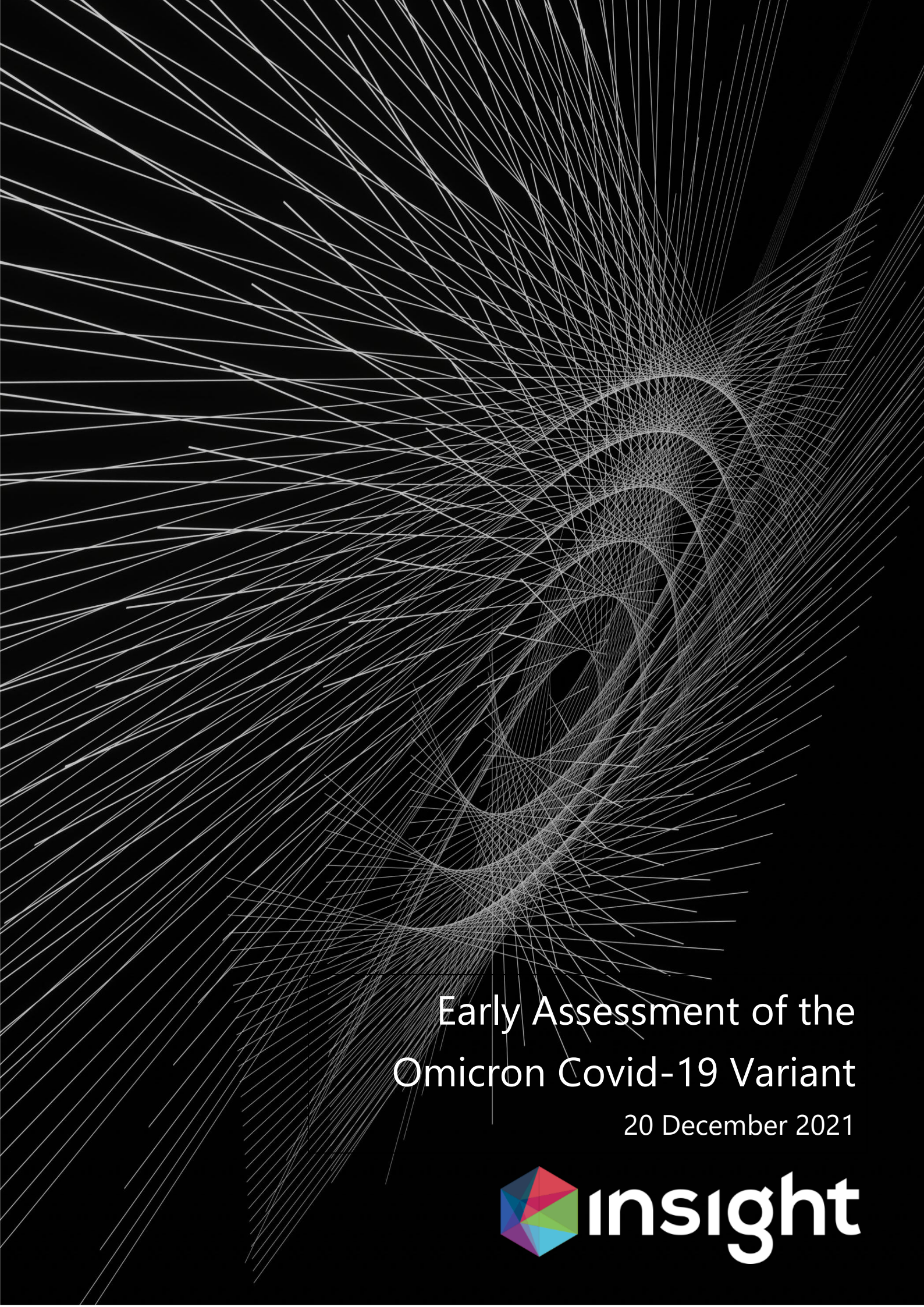


Early Assessment of the Omicron Covid-19 Variant

20 December 2021

insight

1. Overview

- An increasing proportion of young persons (under the age of 30) are being diagnosed with Covid-19 since the emergence of Omicron. The average age of persons testing positive since the emergence of Omicron has been 38.4. For previous variants, the average age ranged between 40.6 and 44.8.

- This suggests that, at least proportionally, younger persons are more susceptible to being diagnosed with Covid-19. This suggests that proportionally younger persons are susceptible to symptomatic infections. Further research is required to determine whether this is attributable to the inherent characteristics of Omicron or extraneous factors as higher vaccination rates amongst the elderly.

- The Omicron case-admission rate is between 39.0% and 47.5% lower than that of preceding variants (after adjusting variations in hospital capacity but not the profile of persons testing positive). This is in part due to the lower age of persons testing positive.

- The Omicron case-admission rate is between 22.8% and 27.5% lower than that of preceding variants (after adjusting for the profile of persons testing positive and variations in hospital capacity). Risk adjusted case-admission rates are a proxy for disease severity. This suggests that Omicron has coincided with less severe disease than previous variants.

- Lower case-admission rates are evident amongst persons over the age of 18. Higher case-admission rates are evident amongst persons under the age of 18. This suggests that Omicron has coincided with less severe disease amongst adults but more severe disease amongst children. Further research, however, is needed to confirm this finding. Further research is also needed to determine whether the reduced severity is attributable to the inherent characteristics of Omicron or extraneous factors such as vaccines.

- Our analysis does not seek to disentangle these effects but would suggest that Omicron is inherently less severe than Delta (amongst fully vaccinated persons). Amongst fully vaccinated persons, Omicron is associated with a risk adjusted case-admission rate which is 18.0% lower than that of Delta. Severity amongst unvaccinated persons is not yet to be considered.

- These findings have significant policy implications. Whilst the need for further research is clear, our early analysis suggest that Omicron could alter the trajectory of the pandemic in that society may now be more easily able to live with Covid-19. This is not to suggest that Omicron should be taken lightly in view of higher transmissibility and immune escape.

- Research into the Omicron fatality rate is needed to further assess the threat posed by Omicron relative to previous variants. It would be premature to measure the Omicron case-fatality rates (given the lag between diagnosis and death). Case-fatality rates will be investigated by Insight in January 2022.

2. Introduction

Insight Actuaries and Consultants (Insight) provides actuarial services to a broad spectrum of medical schemes. Medical scheme members, like the broader South Africa population, have been severely impacted by the Covid-19 pandemic.

Medical schemes collect extensive data on the clinical and demographic characteristics of their members and on the care seeking behaviours of their members. Using this data, powerful insights can be drawn in relation to the Covid-19 pandemic.

The article below provides insights into the recent trajectory of the Covid-19 pandemic since the emergence of Omicron. More specifically, we consider changes in the age profile of persons testing positive for Covid-19 and changes in the Omicron case-infection rate.

The article does not consider the case-fatality rate. The reason being that insufficient time has elapsed to measure the Omicron case-fatality rate. This is because there is often a significant lag between infection and death.

By considering trends in the age of persons testing positive, one can determine whether specific age groups are more heavily impacted by successive variants. By considering trends in the risk adjusted case-admission rate, one can measure the severity of successive variants.

3. Methodology

Based on genomic studies[1], it is estimated that Omicron has been the dominant variant in South Africa since the 15th of November 2021. To assess the impact which Omicron has had, experience prior thereto (when other variants were dominant) is contrasted with experience subsequent thereto.

Prior experience can be further demarcated between variants. Based on genomic studies, the original variant was dominant before the 30th of September 2021 (*original period*). Beta was dominant between the 1st of October 2020 and the 30th of April 2021 (*Beta period).* Delta was dominant between the 1st of May 2021 and the 14th of November 2021 (*Delta period).* These are approximations.

Pathology labs provide medical schemes with Covid-19 test results. This allows for the identification of persons testing positive for Covid-19. Hospitals notify schemes when patients are admitted and detail the reason(s) for the admission. This allows for the identification of Covid-19 admissions.

Case-admission rates are influenced by factors other than disease severity. Case-admission rates are influenced by the mix of persons with Covid-19. A cohort of elderly and sickly persons testing positive will almost invariably have a higher case-admission rate than a cohort of young and healthy persons.

[1] https://www.krisp.org.za/manuscripts/25Nov2021_B.1.1.529_Media.pdf

Variations in the profile of persons testing positive are accounted and adjusted for using actuarial risk adjustment techniques. These techniques account for age, gender and the mix and severity of key chronic conditions. The latter includes asthma, chronic obstructive pulmonary disease, diabetes types one and two, heart failure, HIV, hypertension and rheumatoid arthritis.

Only diagnoses prior to the 30th of November 2021 are considered. Subsequent diagnoses are not considered given the potential lag between diagnosis and admission.

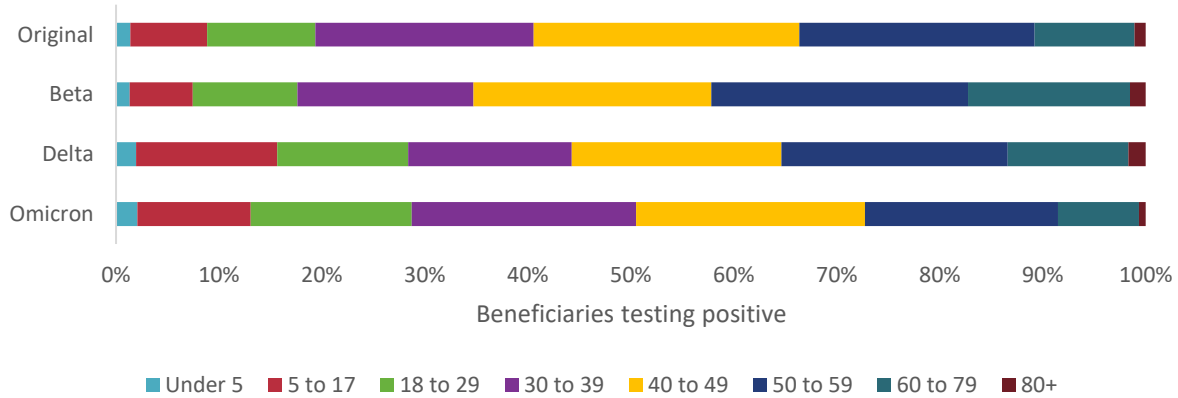
Whilst case-admission rates are a proxy for disease severity, case-admission rates may be influenced by extraneous factors. For example, increased testing capacity may contribute to the diagnosis of more mildly ill persons. This will artificially deflate the case-admission rate. As such, variations in case-admission rates must be carefully interpreted.

4. Diagnosed Infections

Younger persons have become responsible for an increasingly large proportion of positive tests. This is especially true since the emergence of Omicron and to a lesser extent Delta.

- In the original period, 8.9% of infections related to persons under the age of 18. 19.4% of infections related to persons under the age of 30. The average age was 42.1.
- In the Beta period, 8.4% of infections related to persons under the age of 18. 18.6% of infections related to persons under the age of 30. The average age was 44.8.
- In the Delta period, 15.7% of infections related to persons under the age of 18. 28.4% of infections related to persons under the age of 30. The average age was 40.6.
- In the Omicron period, 13.1% of infections related to persons under the age of 18. 28.8% of infections related to persons under the age of 30. The average age was 38.4.

Figure 1: Diagnosed infections by age



The average of age of medical scheme beneficiaries is 32.0.

Proportionally, younger persons are more susceptible to diagnosed Covid-19 infections from Omicron than preceding variants. This could be because of the inherent characteristics of the Omicron variant or because of extraneous factors including but not limited to Covid-19 vaccinations.

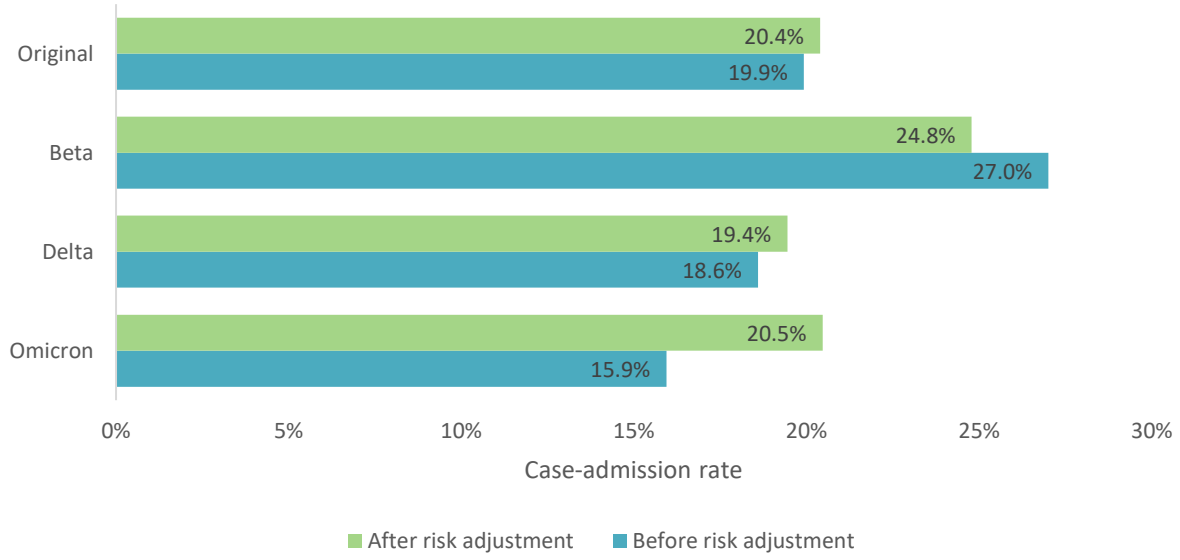
Vaccination rates are higher amongst the elderly than amongst the young[2]. Given that vaccines contribute to fewer diagnosed infections, vaccines may be influencing the age profile of persons testing positive. Further research is required to determine the reasons behind the shift in age profile.

5. Case-Admission Rates

Omicron is associated with a case-admission rate of 15.9%. This is far lower than the case-admission rates associated with preceding variants. The Omicron case-admission rate is 20.0% lower than that of the original variant, 41.0% lower than that of Beta and 14.3% lower than that of Delta.

These results are distorted by the profile of beneficiaries testing positive. On a risk adjusted basis, the Omicron variant is associated with a case-admission rate of 20.5%. This is higher than that of the original and Delta variants but lower than that of the Beta variant.

Figure 2: Case admission rates

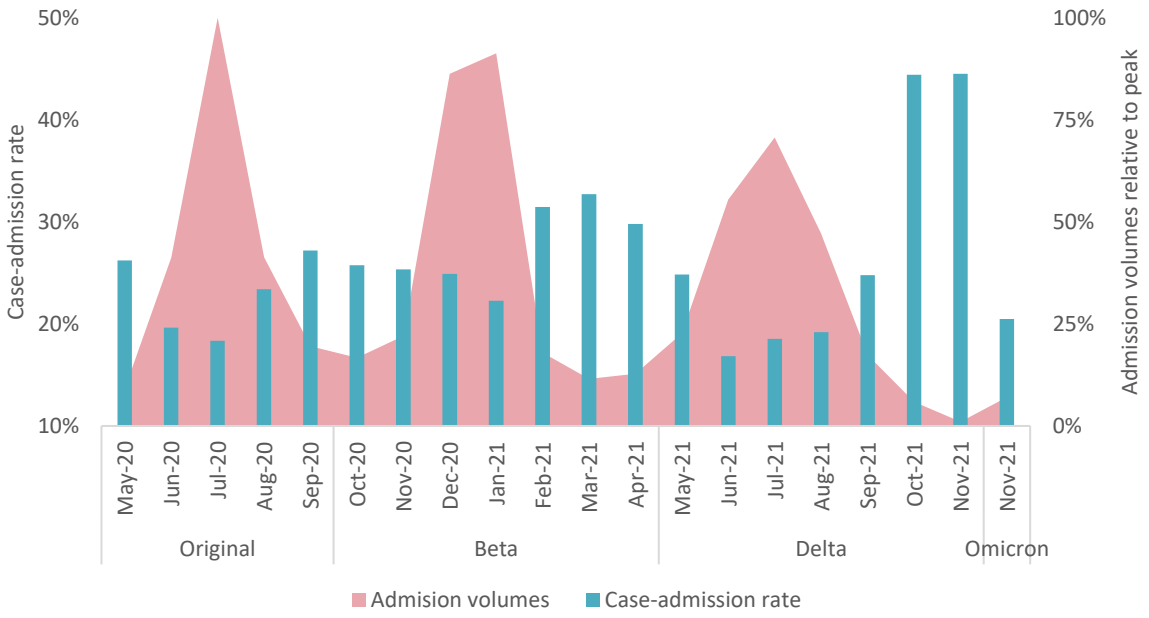


At first glance, this would appear to contradict the anecdotal evidence that Omicron results in less severe disease than preceding variants. This though would be a severely flawed conclusion as hospital capacity distorts case-admission rates. This must be adjusted for.

When there are few Covid-19 admissions, case-admission rates tend to escalate. Hospital beds are plentiful and there is little need to ration care. When there are many Covid-19 admissions, case-admission rates decline. Hospital beds are scarce and there is the need to ration care. The corelation coefficient between Covid-19 admission volumes and the Covid-19 case-admission rate is -59.9%.

[2] https://sacoronavirus.co.za/latest-vaccine-statistics/

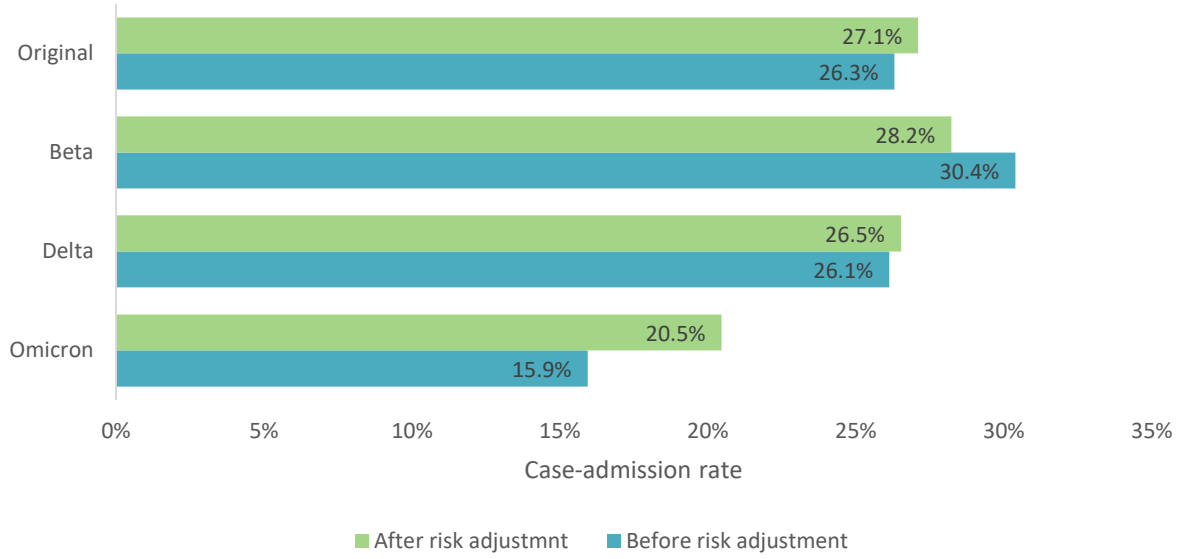
Figure 3: Case admissions rates and hospital capacity



To facilitate more meaningful comparisons to the Omicron period where admission volumes have thus far been comparatively low, results are limited to those months with low admission volumes[3].

After limiting to months with low admission volumes and after risk adjustment, Omicron is associated with a case-admission rates which is far lower than that of preceding variants. The Omicron case-admission rate of 20.5% is 24.5% lower than of the original variant, 27.5% lower than that of Beta and 22.8% lower than that of Delta.

Figure 4: Case-admission rates, unconstrained hospital capacity



[3] Months with low admission volumes are here defined as months with less than 30.0% of the maximum number of admissions in a month.

This suggests that Omicron has coincided with less severe disease then previous variants. As indicated above, whether this is due to the inherent characteristics of the Omicron variant or extraneous factors such as increased vaccination rates remains subject to extensive research.

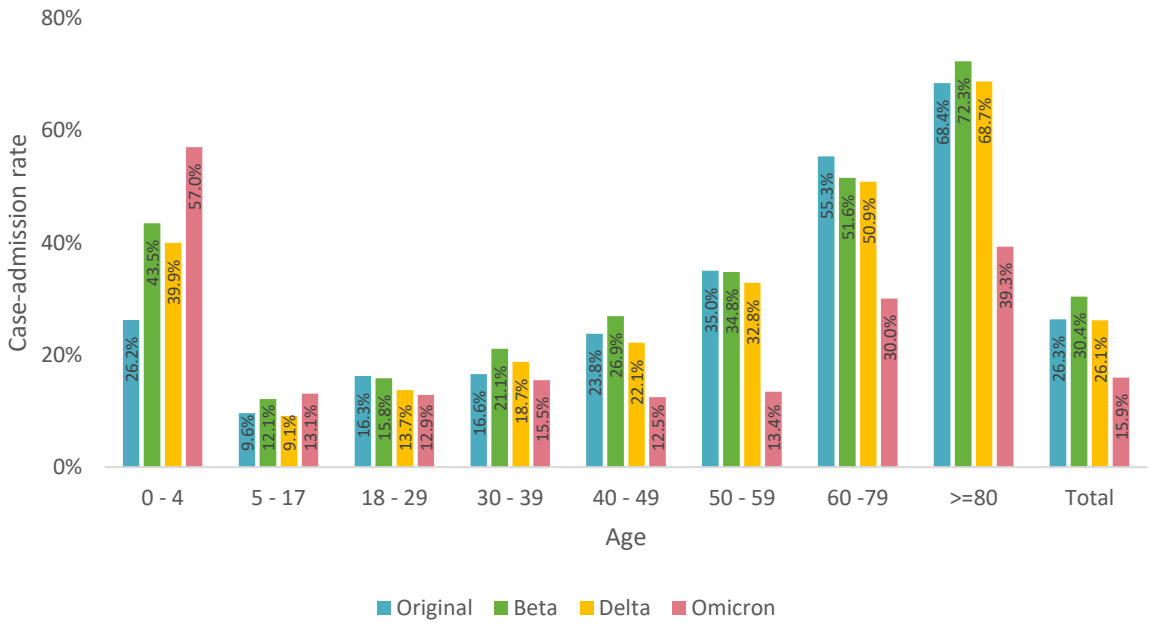
5.1. Case-Admission Rates by Age

Lower risk adjusted case-admission rates are consistently evident amongst persons over the age of 18. This suggests that for adults Omicron has consistently coincided with less severe disease.

Most notably the Omicron case-admission rate for persons between the ages of 50 and 59 is 59.0% lower than that of Delta on a risk adjusted basis. For persons aged 18 to 29, the Omicron case-admission rate is 8.4% lower than that of Delta, 15.6% lower for ages 30 to 39, 41.6% lower for ages 40 to 49, 50.2% lower for ages 60 to 79 and 42.0% lower for ages 80 and above.

Higher risk adjusted case-admission rates are consistently evident amongst persons under the age of 18. This may suggest that Omicron may result is more severe disease amongst children relative to preceding variants. For under-fives, the Omicron case-admission rate is 43.4% higher than Delta. For persons aged between 5 and 17, the Omicron case-admission rate is 44.1% higher than Delta

Figure 5: Case-admission rates by age, unconstrained hospital capacity

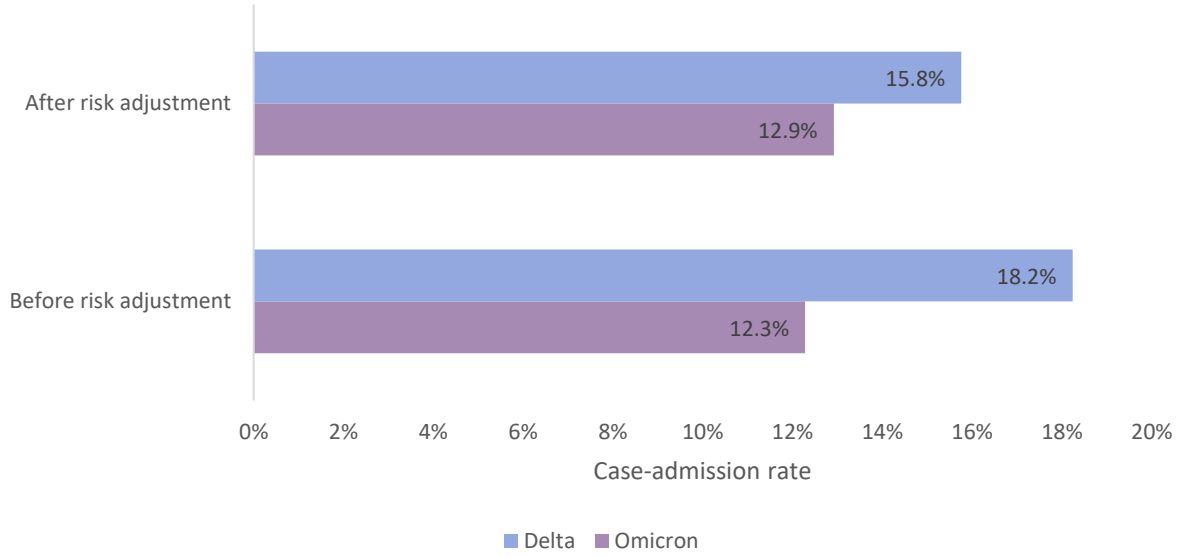


5.2. Fully Vaccinated Lives

Analyses are repeated after limited to fully vaccinated persons (here defined as persons who were fully vaccinated between 28- and 180-days prior[4]). This provides insights into the inherent severity of Omicron amongst the vaccinated relative to that of Delta. Other variants are not considered as they largely preceded the vaccine.

On a risk adjusted basis, Omicron is associated with a 15.8% case-admission rate. This is 18.0% lower than the 12.9% case-admission rate associated with Delta. This suggests that Omicron is inherently less severe than Delta amongst vaccinated persons.

Figure 6: Case-admission rates for vaccinated lives, unconstrained hospital capacity



Unvaccinated persons are not yet considered given data limitations.

[4] Given reduced vaccine efficacy over time

6. Summary and Conclusions

An increasing proportion of young persons (under the age of 30) are being diagnosed with Covid-19 since the emergence of Omicron. The average age of persons testing positive since the emergence of Omicron has been 38.4. For previous variants, the average age ranged between 40.6 and 44.8.

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