

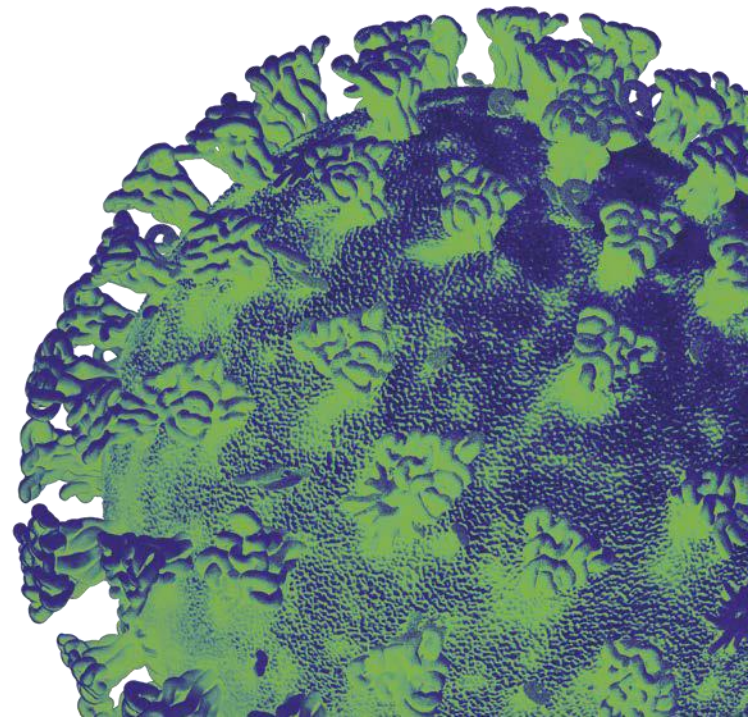
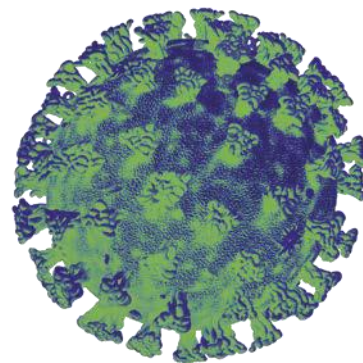
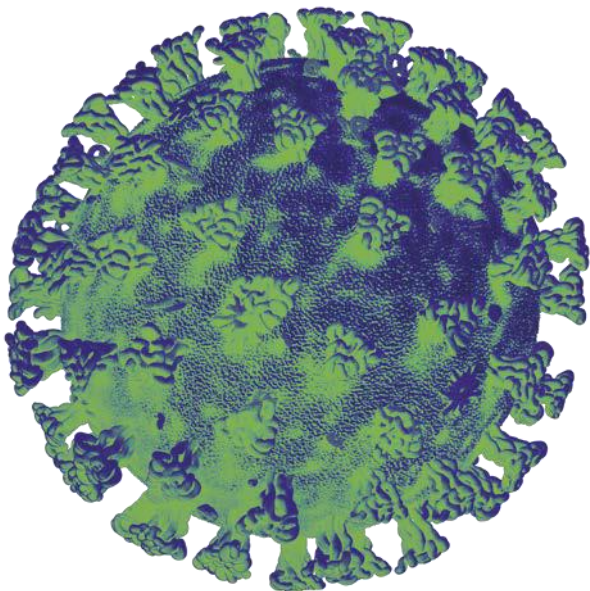


Llywodraeth Cymru
Welsh Government

Technical Advisory Group

Length of stay in hospital for COVID-19 patients in Wales

20 May 2022



COVID-19 Length of Stay (LoS) Analysis (data up to March 2022)

Welsh Government COVID-19 TAG Policy Modelling Subgroup

- This paper analyses the length of stay in hospital of patients who have COVID-19 to better understand the differences in length of stay (LoS) for different groups (hospital acquired infection versus community acquired infection, infection from different variants, and for patients that died or recovered). This is achieved by comparing the median length of stay for each group. This is to inform future modelling of COVID-19 hospital activity.

Summary

- Median length of hospital stay per month for COVID-19 patients has varied (from 5 days to 68 days) throughout the pandemic. The median length of stay per month has not increased above 10 days since the vaccine rollout in December 2020.
- Median length of stay is consistently higher for those who were infected with COVID-19 whilst in hospital when compared with those that were admitted to hospital for COVID-19.
- Median length of stay is consistently longer for those that eventually died in hospital than those who recovered and subsequently left hospital.
- Median length of stay is compared for those patients who were likely to have been infected with the Omicron variant against other non-Omicron variants. The Omicron-infected patients had consistently longer length of stay, but once hospital acquired infections were removed, length of stay decreased significantly.

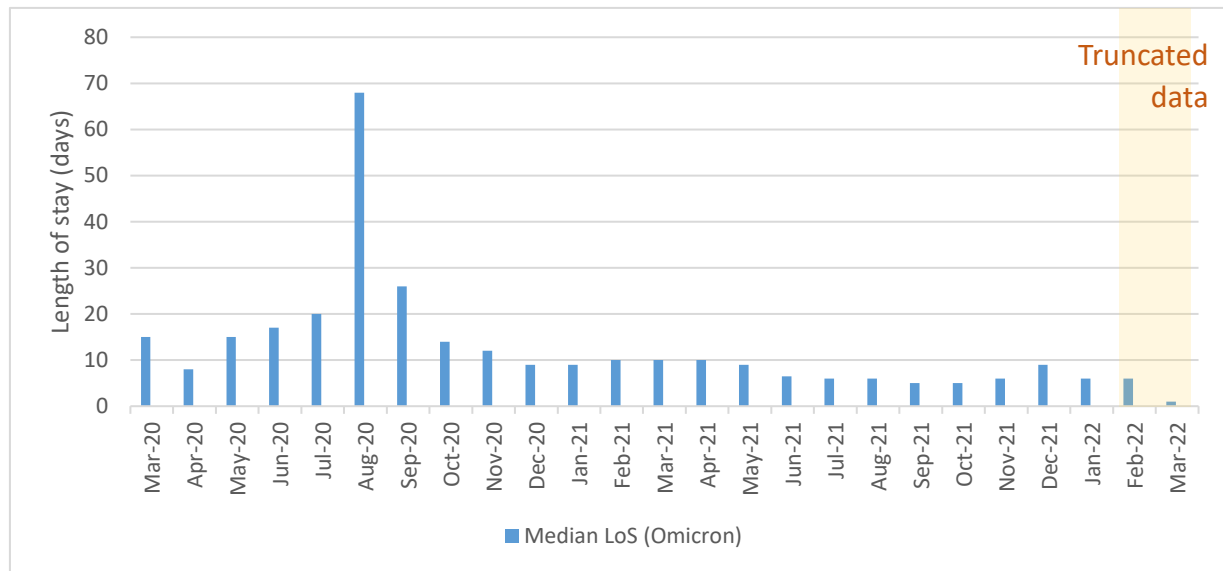
Data Overview

- This study is based on Patient Episode Database for Wales (PEDW) data from the Digital Health and Care Wales (DHCW) based on admission date.
- PEDW data is based on discharges – therefore it is right-censored –for ongoing spells the LoS is truncated at the point the data was extracted, so will increase for some patients.
- So average LoS for recent months (based on admission date) will increase when data is refreshed.

Analysis/Findings

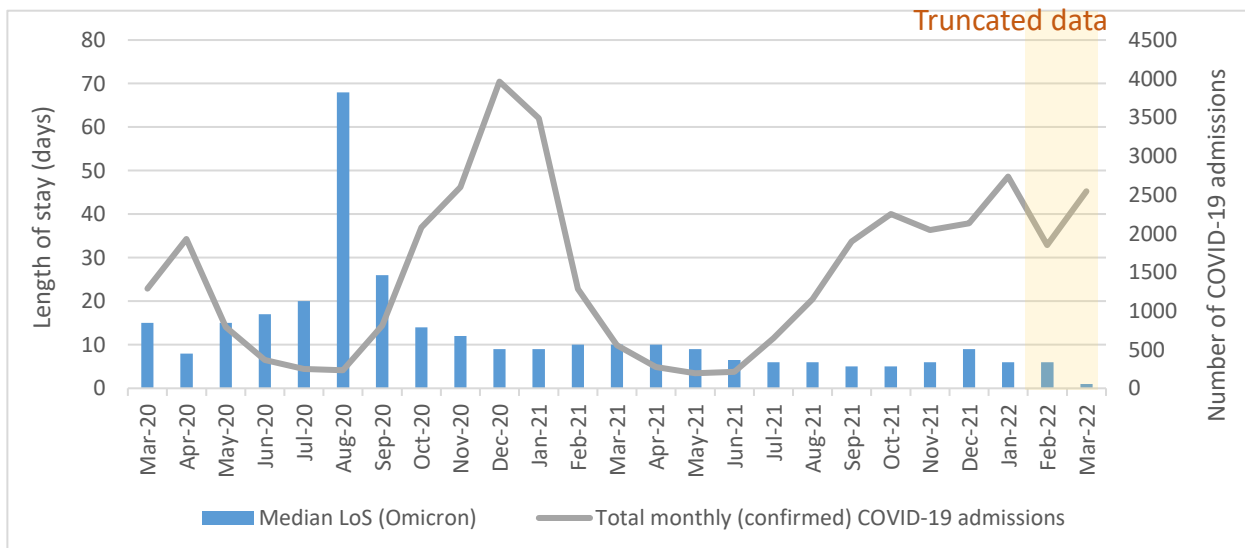
This section shows how length of stay (LoS) in hospital for COVID-19 patients has changed over the course of the pandemic in Wales. Comparisons of LoS are made for various groups of COVID-19 patients in Wales, such as those who acquired COVID-19 in the hospital versus in the community, those who died versus those who recovered, and those infected by Omicron versus another variant.

Figure 1: Median Length of Stay (LoS) for COVID-19 patients, Wales, March 2020 to March 2022



Overall, the LoS varied throughout the COVID-19 pandemic. The median LoS ranged from 5 days (in October 2021) to 68 days (in August 2020). However numbers of admissions were very low in August 2020 so the median was based on a small sample size.

Figure 2: Median length of stay (LoS) of COVID-19 patients and total monthly confirmed COVID-19 admissions, Wales, March 2020 to March 2022



In general, it appears that length of stay decreases as COVID-19 becomes more prevalent, and vice versa. This may be due to patients being discharged more quickly to make way for new admissions when COVID-19 pressures are higher. Since December 2020, when the vaccine rollout began in Wales, the median LoS has remained at or below 10 days. Other factors such as winter pressures, catching up on elective activity, severity of various COVID-19 variants, immunity levels, protections and behaviours may also affect length of stay.

Figure 3: Median Length of Stay (LoS), by hospital acquired infection (HAI) and community-acquired infection (CAI), Wales, March 2020 to March 2022

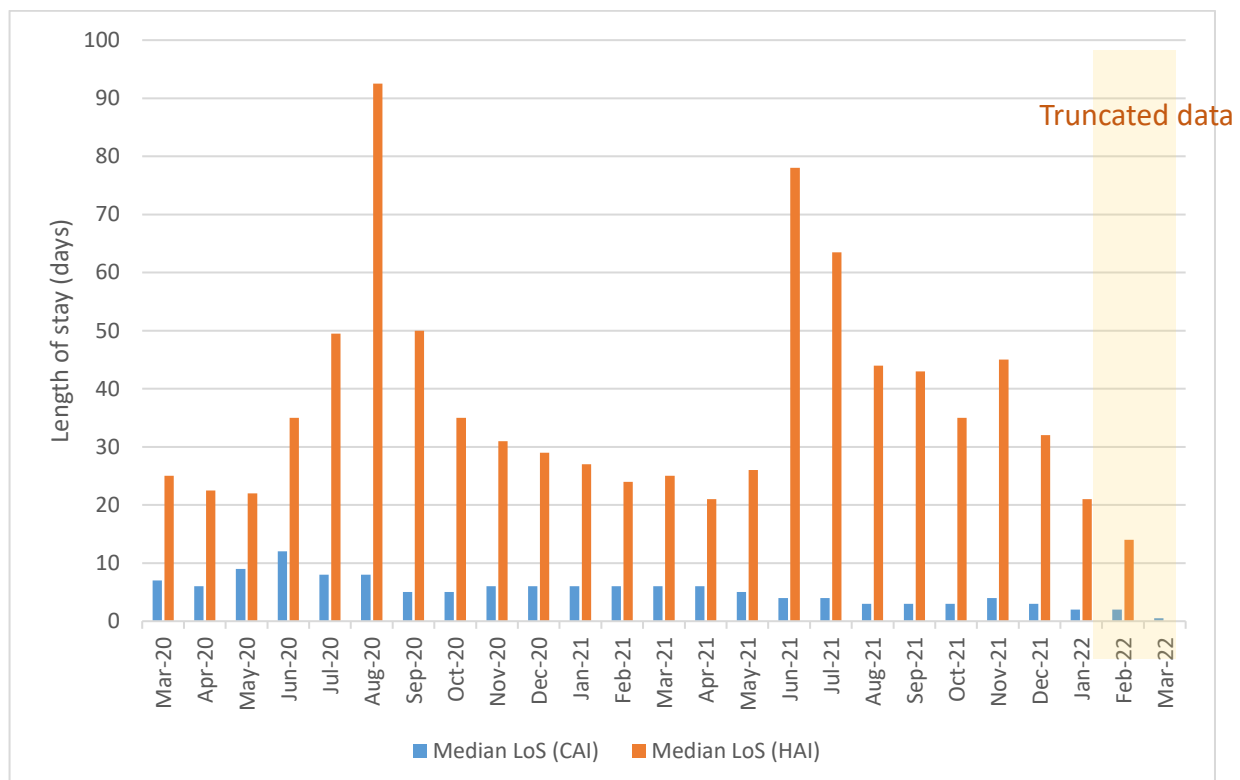


Figure 3 shows the median length of stay by hospital acquired infections (in orange) and community acquired infections (in blue). We can see that the median length of stay is consistently higher among those who were infected with COVID-19 whilst in hospital (HAI) as opposed to those that were admitted to hospital for COVID-19 (CAI). Further analysis that may be useful to carry out would be to consider the length of stay from the date the positive COVID-19 tests rather than the admission date since those patients acquiring COVID-19 within the hospital setting may already have been in hospital a significant amount of time for a different, unrelated condition skewing the results.

Two recently published studies published by Public Health Wales report on nosocomial cases regarding all-cause mortality and lessons learnt from outbreaks. The first, entitled

'All-cause mortality in nosocomial COVID-19 cases in Wales'¹, finds that all-cause mortality is consistent between nosocomial infections and those infected outside of hospital in the community once confounding factors (including age, sex, vaccination status and pandemic wave) were excluded. The second, 'Nosocomial COVID-19 in Wales: Lessons learned from hospital outbreaks, September 2020 – April 2021'², finds that steps taken to limit the spread of COVID-19 in healthcare settings based on lessons learnt from the first outbreak were successful.

Figure 4: Median Length of Stay (LoS), by those who died in hospital and those who recovered, Wales, March 2020 to March 2022

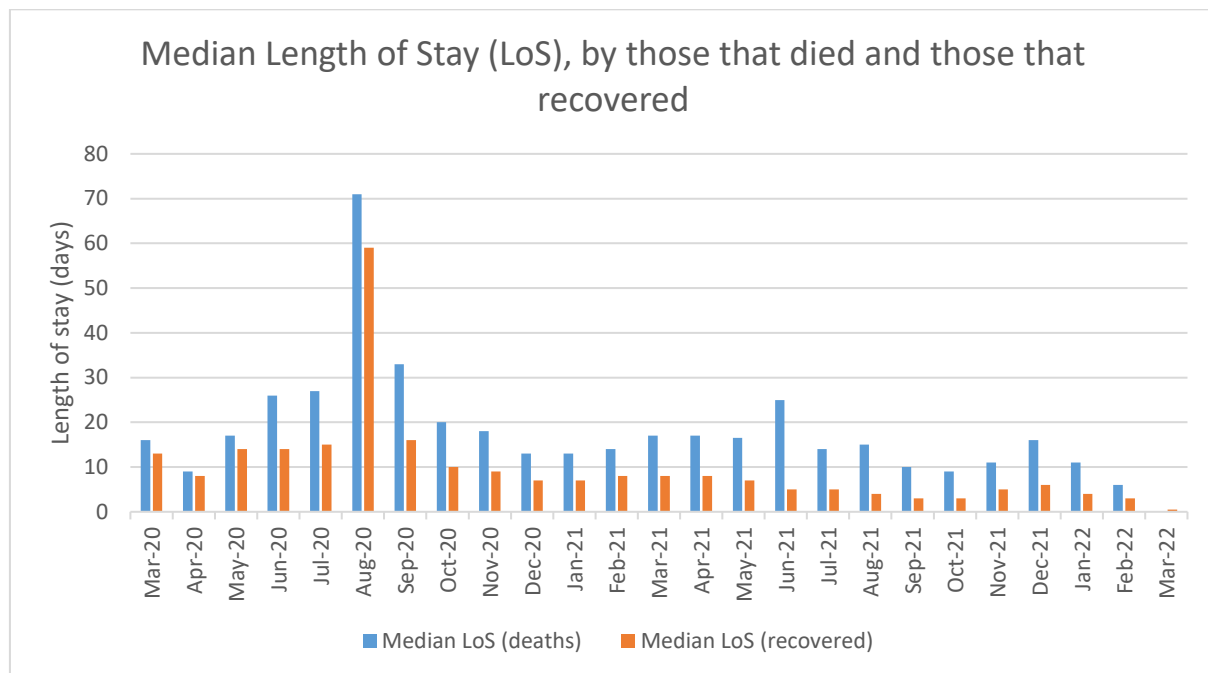


Figure 4 shows the median length of stay for those that died in hospital (in blue) and those that recovered (in orange). The median length of stay is consistently longer among those that eventually died in hospital when compared with those that finally recovered and were discharged from hospital.

¹ <https://publichealthwales.nhs.wales/services-and-teams/harp/nosocomial-covid-briefing-reports/all-cause-mortality-in-nosocomial-covid-19-cases-in-wales-version-12/>

² <https://publichealthwales.nhs.wales/services-and-teams/harp/nosocomial-covid-briefing-reports/nosocomial-covid-19-in-wales-lessons-learned-from-hospital-outbreaks-september-2020-april-2021-version-1/>

Figure 5: Median Length of Stay (LoS), by COVID-19 variant, Wales, March 2020 to March 2022

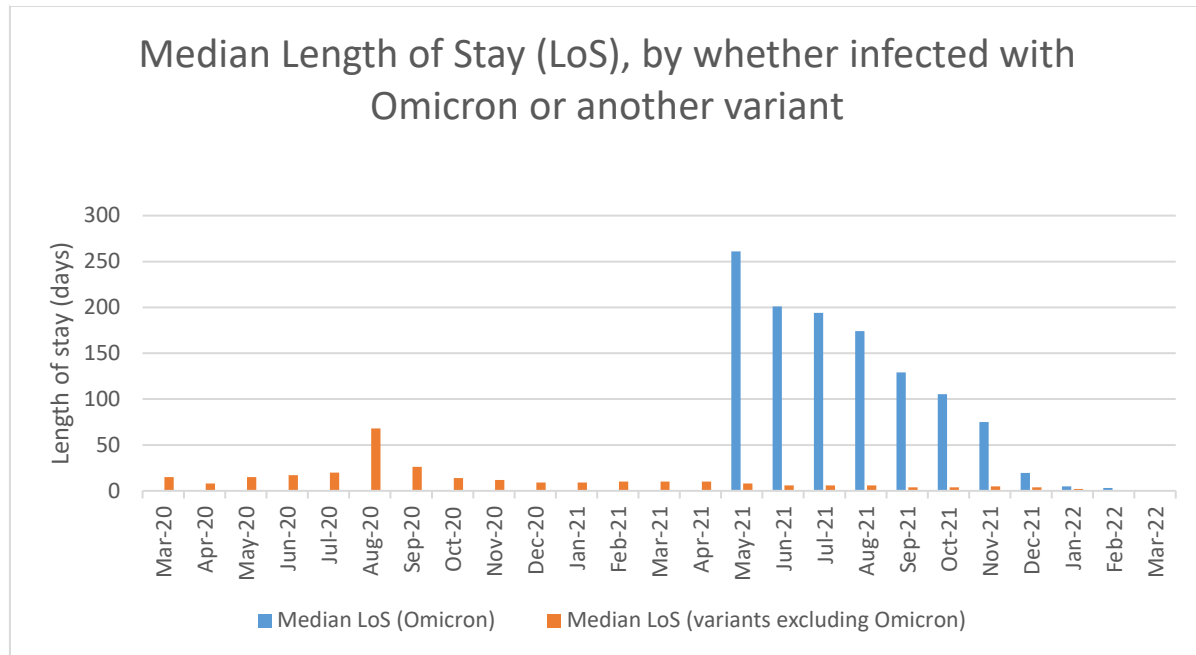
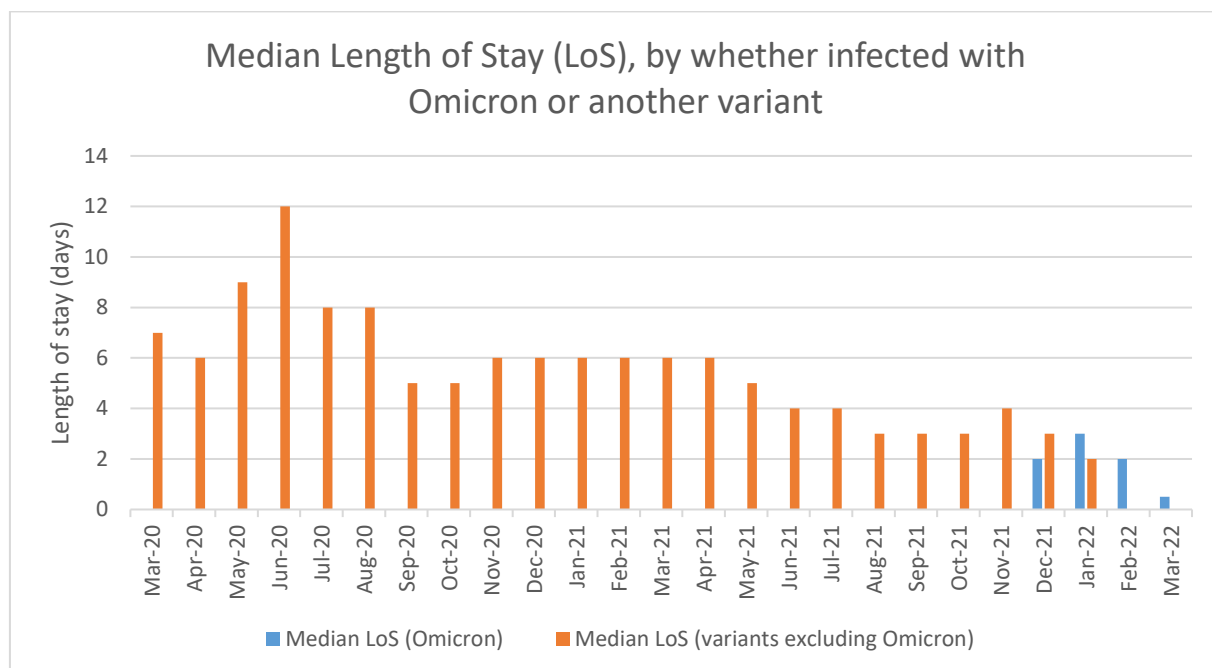


Figure 5 shows the median length of stay, split between whether the infection was due to Omicron or another variant. It was assumed that any cases where the specimen was collected on or after 25 December 2021 would have been due to Omicron as opposed to another variant. The chart appears to show that length of stay due to Omicron tends to be much longer, but this skew is due to hospital acquired infections where patients have been admitted to hospital for a different reason with a long hospital occupancy.

Figure 6: Median Length of Stay (LoS), by COVID-19 variant, excluding patients with hospital acquired infections, Wales, March 2020 to March 2022



Once HAI cases have been excluded, the median length of stay for patients who were infected with Omicron reduces significantly, however there is still significant uncertainty around recent cases, for example where patients have not yet been discharged and the data for length of stay is truncated.

Conclusion/ next steps

This analysis compared the length of stay (LoS) in hospital for different groups of COVID-19 patients (those that acquired the infection in hospital versus community acquired infection, those that died versus those that recovered, and those that were infected by the Omicron variant versus those that were infected with other non-Omicron variants).

There may be other factors to consider which may affect some of the groups included in the comparisons more than others. For example, the healthcare pressures at various points in time may affect decisions on whether to discharge lower risk patients early which would affect their LoS in hospital. Staff shortages may also lead to delayed transfers of care, increasing the length of stay of patients who are waiting for a social care package. Since the rollout of vaccines in December 2020, the median LoS per month has not risen above 10 days. Other factors that may also influence length of stay are the severity of the dominant SARS-CoV2 variants, the current levels of population immunity, and population protections implemented and adherence to them.

The next steps may include carrying out a regression analysis to better understand the contributing factors and patient characteristics that may affect length of stay, for instance pressure on hospital beds, patient age, deprivation and comorbidities, whether it is a first or subsequent covid infection, etc.