

# What's driving increasing length of stay in hospitals since 2019?

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## Key points

- Since the COVID-19 pandemic, fewer patients have been admitted for treatment in NHS hospitals. However, those admitted are spending longer in hospital. This has contributed to record waits for elective treatments and emergency care and raised concerns about NHS hospital productivity.
- While there were 521,000 (9%) fewer emergency hospital admissions in 2022 compared with 2019, the average length of stay for these patients increased by 1.1 days (14%). This analysis explores some health-related factors that might underlie this increase.
- There has been an increase in the proportion of both admitted patients aged 65 years and older and patients with more complex care needs. These increases, however, are in line with longer term trends and do not appear to account for all the differences in length of stay between 2019 and 2022.
- Hospital admissions in 2022 not involving COVID-19 were marginally longer than hospital admissions in 2019 (0.1 days, 1.3%), once age and clinical complexity are factored in.
- In 2022, 9% of emergency admissions involved COVID-19. These patients spent on average 8.6 more days – twice as long – in hospital than non-COVID-19 admissions, after controlling for age and clinical complexity. This suggests that the differences in length of stay between 2022 and 2019 may have been driven by admissions involving COVID-19.
- The number of recorded patients in hospital with COVID-19 has fallen dramatically since the start of 2021, with hospitalisation and survival rates improving greatly since the start of the pandemic. However, pressure on the NHS from the disease has not completely gone away. The latest national figures still report that 2,000 people in England are admitted to hospital with COVID-19 each week.
- Our analysis contributes to the debate around NHS productivity and raises questions about the contribution COVID-19 might have made to changes in length of stay in 2022. Further work is needed to better understand the contribution COVID-19 is making, the mechanisms behind this and whether these patterns have persisted into 2023. Efforts to address this, and other challenges, are needed if the NHS is to achieve its ambition to improve productivity levels.

# 1. Introduction

For over two decades before the COVID-19 pandemic, there were sustained reductions in the average length of patient stays in hospital. This allowed the NHS in England to deliver more inpatient care while gradually reducing the number of hospital beds. However, as shown by our [previous analysis](#), 2022 broke this trend. Compared with 2019, the average length of a hospital stay increased by 14% in 2022 (from 7.3 days to 8.3 days). This was mostly driven by emergency admissions, which saw an increase in average length of stay from 7.9 days in 2019 to 9.1 days in 2022.

**Prolonged stays in hospital can be bad for patients.** Individuals who have longer hospital stays are at greater risk of falling and catching infections. Their physical and mental capabilities, including mobility, physical strength and awareness levels, may also be negatively impacted.

Increases in length of stay can also affect patients waiting for elective and emergency care. The NHS has limited ability to increase hospital capacity. Therefore, longer stays mean fewer patients can be admitted. There were 800,000 fewer hospital admissions in 2022 than in 2019. Both elective and emergency care services are under continued pressure. The waiting list for elective treatment in England is currently the highest on record at **7.8 million**, and this is **expected to grow**. In emergency care, around one in 12 people (8.2%), or 44,700 individuals, **waited more than 12 hours** from the decision to admit to hospital admission in October 2023.

Improving emergency and elective performance, including reducing waiting times, is a **major priority** for the NHS and the UK government. One way of achieving this is through increasing bed capacity. Going into the pandemic, England had one of the lowest bed capacities in the OECD, with the system operating **beyond levels considered safe or efficient**. In June 2019, the then Chief Executive of NHS England, Simon Stevens, said the hospital bed stock was **'overly pressurised'** and that bed capacity needed to increase. Yet in Q1 2023/24, the **total number of acute beds in the NHS** (around 104,000) was no greater than at the same time in 2015/16, despite a growing and ageing population and extensive evidence of the problems caused by inadequate bed capacity.

Rising average lengths of stay present a unique challenge for the NHS, for whom productivity is currently a major concern. Despite increased funding and staffing in recent years, **hospital admissions have not increased**. Constrained capacity is likely a contributing factor. Another often-cited factor is that **patients are now sicker on average than previous years**, requiring more resources to treat.

A better understanding of what has driven increased lengths of stays can help inform long-term resource and capacity planning as the NHS seeks to address its productivity challenge. The aim of this analysis is to build this understanding by examining the extent to which changes in clinical needs, including COVID-19, might explain the increase in the length of stays and to explore the possible implications for health services and policymakers.

## Box 1: Data source, approach and limitations

### Data source

We used data from Hospital Episode Statistics, including information on all admissions to NHS hospitals in England. We only included emergency admissions for people aged 18 years and older at the time of their admission who were discharged between 2015 and 2019 or in 2022. The years 2020 and 2021 were excluded from the analysis due to **the significant effect COVID-19 had on hospital admissions**, including reduced admissions for non-urgent conditions.

### Approach

We compared patient characteristics across multiple years, focusing on year-on-year changes in patient age profiles and clinical complexity.

Clinical complexity was measured using the Charlson Comorbidity Index (CI), which categorises the complexity of a patient's health as none, mild, moderate or severe. It is based on diagnosis information from hospital admission records and combines scores based on 19 diagnosed conditions associated with higher mortality risk. A higher Charlson CI score indicates more severe conditions that may require more complex management.

We employed standardisation techniques to control for age-related and clinical complexity-related variations in our analysis. We used the age and clinical complexity distributions from 2015 as a reference point and applied them to the datasets spanning from 2016 to 2019 and 2022. By accounting for the contributions of changes in age and clinical complexity on the length of stays, we were able to quantify changes that were due to other factors over this period.

We included COVID-19-related admissions as a separate characteristic in the 2022 data. To determine if an admission was COVID-19-related, we had to rely on diagnostic rather than testing data. If a hospital stay included a reference to COVID-19 in either the primary or secondary diagnosis, that admission was classified as COVID-19-related.

### Limitations

Due to the reliance on diagnostic data, the statistics for COVID-19-related admissions may not be completely accurate. There could be variation in coding practices, and some patients' COVID-19 diagnoses may not have been confirmed through testing. However, the diagnostic data served as a reasonable proxy for COVID-19 activity in hospital.

In some cases, patients flagged with a COVID-19-related admission may have required treatment for other conditions during their stay. In such scenarios, the entire duration of the hospital stay may not have been solely due to COVID-19. Due to the challenge of distinguishing the length of stay for each condition, if COVID-19 was documented in the hospital record, we considered the entire stay a COVID-19-related admission.

COVID-19 is not captured by the Charlson CI. Whilst we have been able to capture this disease in our analysis, there could feasibly be other conditions contributing to increased clinical needs not captured by Charlson CI. With the inability to control for these other conditions, we may not have fully controlled for clinical complexity.

## 2. Factors affecting length of stay

When comparing 2022 with 2019, factors that may have contributed to the rise in the average length of hospital stay can be broadly thought of in two ways:

**Health-related characteristics.** Patients admitted in 2022 may have had **different characteristics** than those admitted in 2019. Older patients tend to spend longer in hospital, as do individuals with more complex clinical needs. COVID-19, which was not a factor in 2019, might also have impacted length of stay in 2022. The pandemic may have exacerbated individuals' health issues, with restrictions potentially deterring people from seeking prompt medical advice and them now requiring more complicated treatment. These characteristics are driven by both the patients who present at hospital and the application of admission thresholds.

**Wider system factors.** Patients admitted in 2022 may have had the same health needs as those admitted in 2019, but inefficiencies in patient flow – caused by, for example, delays in the assessment, diagnosis, treatment and discharge of patients – may be leading to an increased average length of stay. This is in the **context of** constrained bed capacity, staff shortages due to stress and burnout and underinvestment in the health and care system.

This analysis focuses on whether health-related characteristics contributed to the rise in the average length of stay for emergency admissions in 2022.

### 3. Age, clinical complexity and COVID-19

Compared with 2019, patients admitted to hospital in 2022 were more likely to be older. The proportion of emergency admissions of adults aged 65 years and older resulting in an overnight stay rose from 57.3% to 58.5%. This is in line with longer term trends.

Patients admitted in 2022 were also more likely to have more complex clinical needs than those admitted in 2019. The proportion of emergency hospital admissions whose clinical complexity was classified as severe using the Charlson CI rose from 1.6% to 2.1%, and the proportion classified as moderately complex increased from 12.3% to 13.9%. The total number of admissions for these two groups also increased. As Figure 1 shows, these increases are in line with the **trends seen since 2015**, reflecting the continuation of a longer term increase in clinical complexity rather than any impact from the pandemic.

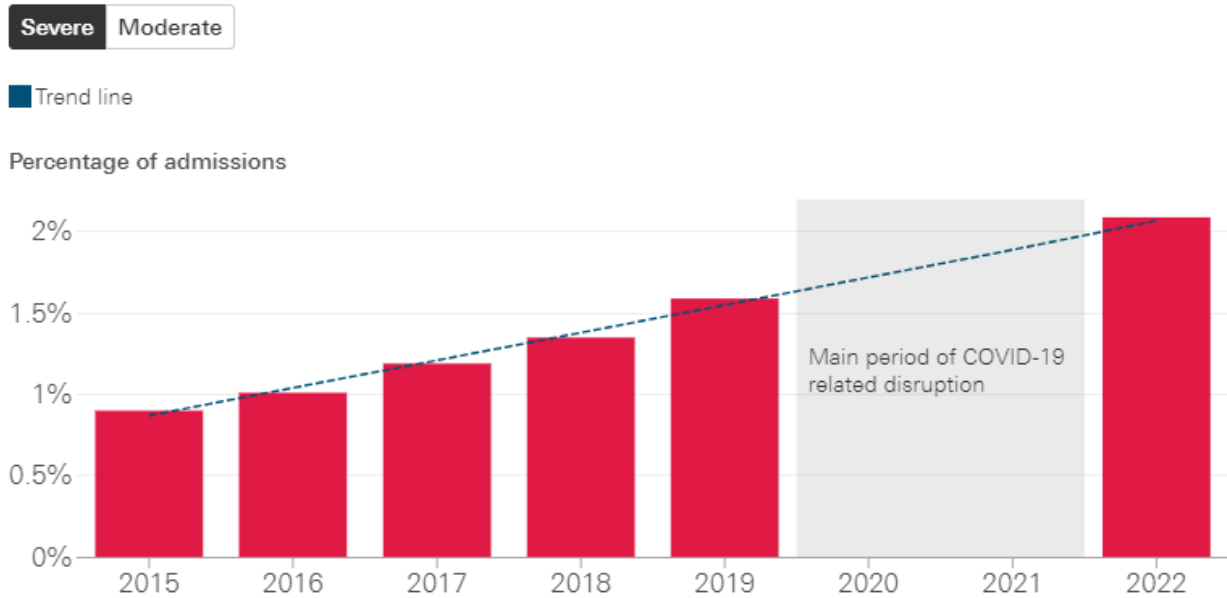
COVID-19-related admissions accounted for 9% of emergency admissions in 2022. These included patients admitted primarily for COVID-19 (referred to as primary COVID-19 admissions), patients admitted with the disease as a comorbidity and patients who acquired the infection during their hospital stay (both regarded as secondary COVID-19 admissions).



Figure 1

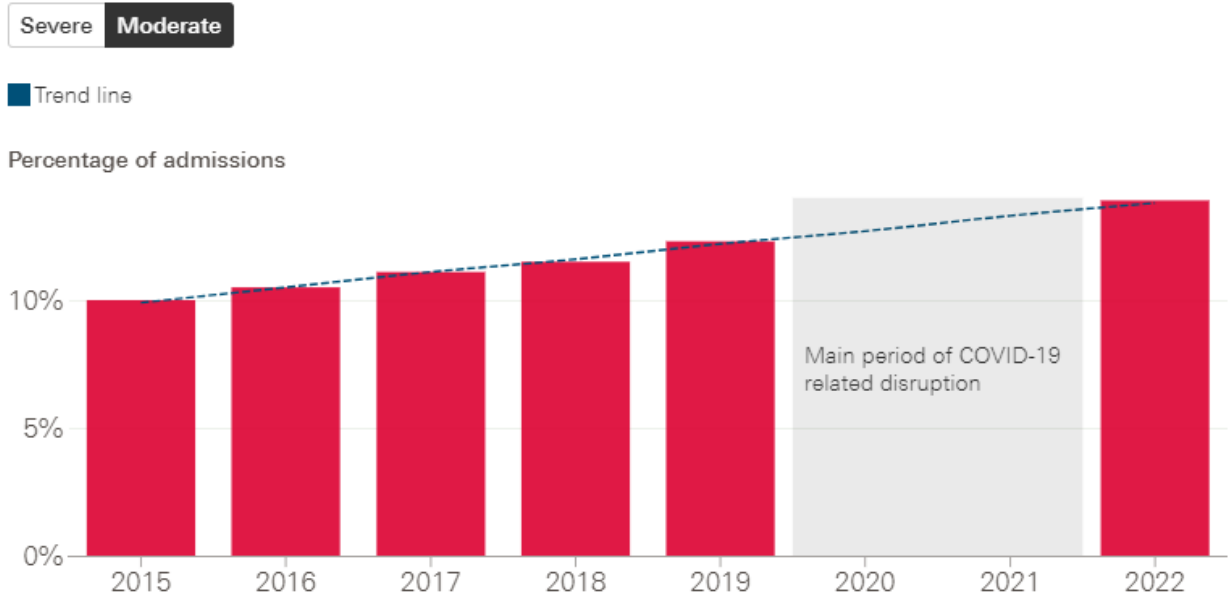
## Increases in emergency admissions of clinically complex patients in 2022 are in line with longer term trends

Proportion of emergency admissions classified as severely and moderately clinically complex



# Increases in emergency admissions of clinically complex patients in 2022 are in line with longer term trends

Proportion of emergency admissions classified as severely and moderately clinically complex



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Source: Hospital Episode Statistics 2015 to 2022

## 4. Average length of stay adjusted for age, clinical complexity and COVID-19

To understand how much the increase in average length of stay can be explained by these factors, we first analysed the change in length of stay for non-COVID admissions. These accounted for 91% of all emergency admissions in 2022. Comparing 2019 and 2022, the average length of stay for non-COVID admissions increased by around 0.2 days (1.9%). This is substantially lower than the 1.1 day (14%) increase seen across all emergency admissions.

Some of this 1.9% increase will be due to the different health-related characteristics of these non-COVID patients in 2022 compared with 2019. After adjusting for age and clinical complexity, the increase in average length of stay was 0.1 days (1.3%) (Figure 2). For all emergency admissions, the increase after adjusting for age and clinical complexity was 0.9 days (11%).

The substantial differences in average length of stay between non-COVID admissions and all emergency admissions suggest that COVID-19 admissions drove most of the increase in average length of stay in 2022.

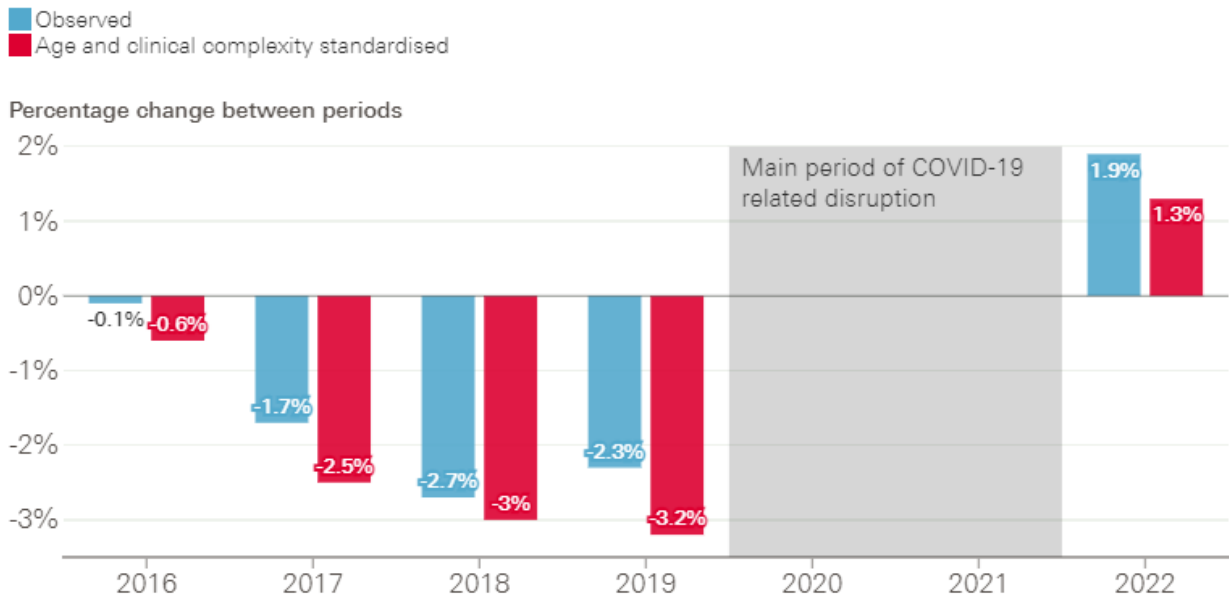
After controlling for age and clinical complexity, 2022 still represents a reversal of pre-pandemic trends in average length of stay. Between 2016 and 2019, average length of stay reduced by around 3% year on year. Assuming the continuation of this trend and allowing for the disruption from COVID-19 in 2020 and 2021, length of stay would have been 3% lower in 2022 than in 2019. Thus, the 1.3% increase in length of stay seen between 2019 and 2022 is 4% higher than we might expect. This suggests that wider system factors, such as barriers to patient flow, have also contributed to the increase in average length of stay.

With only one reference point, it is important not to overinterpret these data as the emergence of a new upward trend in average length of stay. However, available data on hospital activity in 2023 to date suggests average length of stay will have increased again this year.

Figure 2

After accounting for COVID-19, the difference in average length of stay between 2019 and 2022 reduced to 0.1 days (1%)

Change in average length of stay from previous year,\* adjusting for age and clinical complexity



## 5. Understanding COVID-19-related admissions

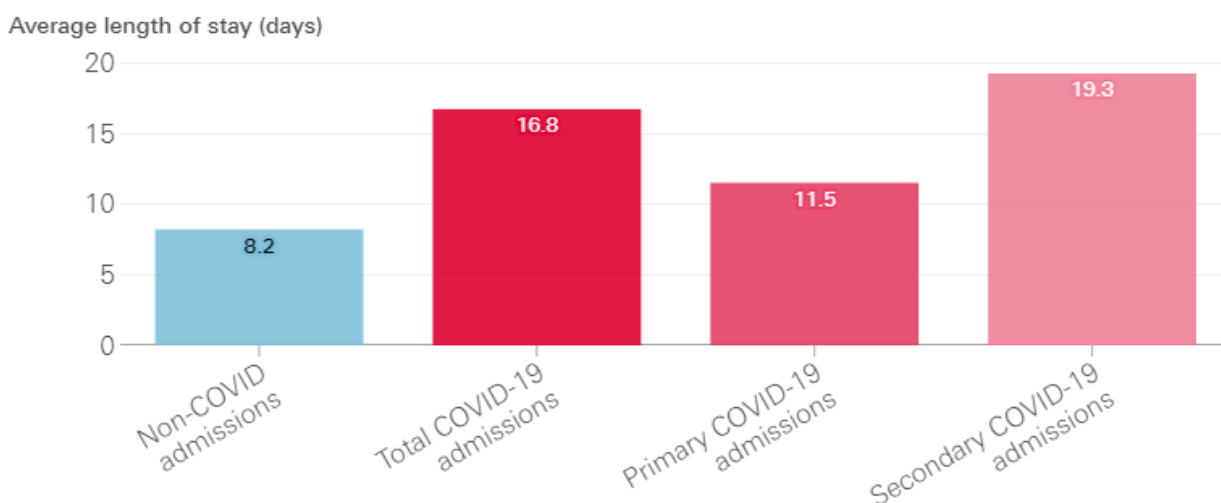
We have shown that a large part of the increase in average length of stay in 2022 compared with 2019 is likely to have been driven by COVID-19. Here, we look more closely at COVID-19 admissions to better understand the role the pandemic might have played.

Despite transmission of COVID-19 reducing in 2022, approximately 6% of hospital beds were still occupied by patients with COVID-19 in December 2022. We found that, on average, COVID-19-related admissions have longer lengths of stay compared with non-COVID admissions. Controlling for age and clinical complexity, COVID-19-related admissions required hospital stays 8.6 days longer on average than non-COVID admissions (Figure 3).

Figure 3

Controlling for age and clinical complexity, patients with COVID-19 related admissions spent 8.6 days longer on average in hospital than non-COVID admissions

Comparing non-COVID emergency admissions with COVID-19 related admissions in 2022, adjusted for age and clinical complexity



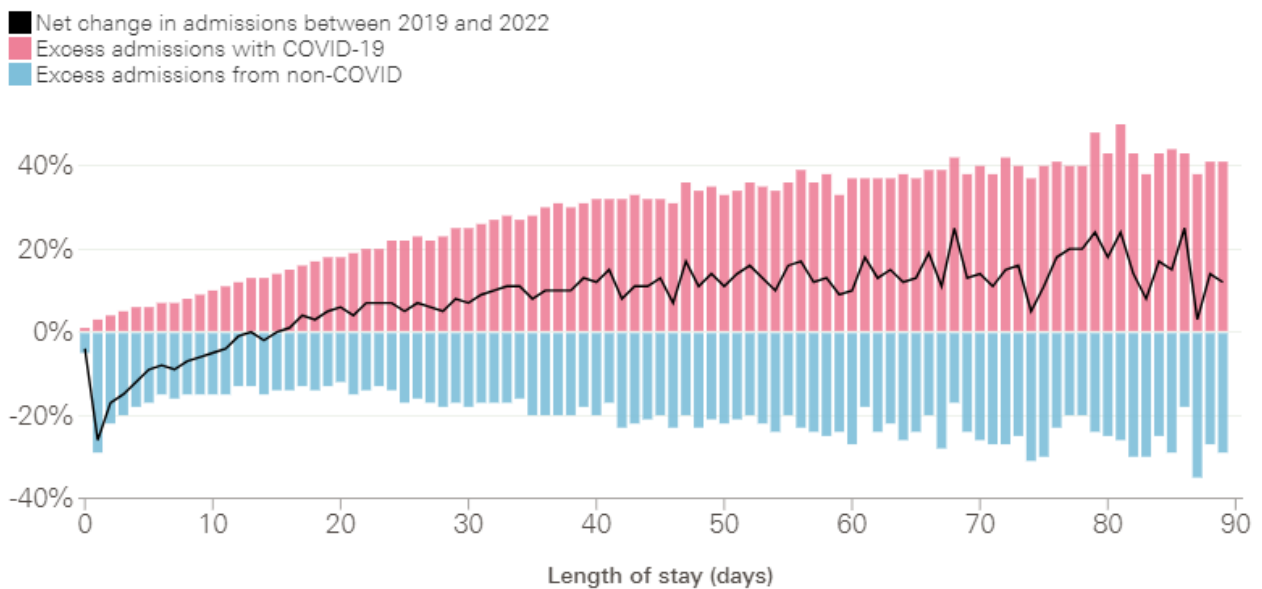
Looking at the distribution of admissions across different lengths of stay in 2022 compared with 2019, we found that there were fewer short-stay admissions (less than 14 days) and more stays of 14 days or longer. Patients requiring longer stays reduce the number of beds available for other admissions, including those with less complex needs.

This difference appears to be largely driven by COVID-19-related admissions. As a proportion of admissions, excess admissions with COVID-19 increased as length of stay increased. To offset the increase in admissions with COVID-19, the number of non-COVID admissions reduced. Proportionally, this reduction in non-COVID admissions was relatively even across all lengths of stay. These trends are illustrated in Figure 4. The black line corresponds to the net change in admissions between 2019 and 2022. The red bars highlight the excess admissions with COVID-19, with the blue bars indicating the excess non-COVID admissions.

**Figure 4**

As a proportion, excess COVID-19 admissions increase at longer lengths of stay. This is offset by reductions in non-COVID admissions in 2022, compared with 2019

Change in admissions by average length of stay for 2022, compared with 2019



## 6. Comparing primary and secondary COVID-19 admissions

Patients with COVID-19-related admissions are recorded as having the disease as either a primary or secondary condition. COVID-19 as a primary condition means patients are admitted principally because of the disease, while a secondary diagnosis may indicate COVID-19 being a comorbidity upon hospital admission or the patient acquiring the infection during their hospital stay. Approximately 33% of COVID-19-related admissions recorded the disease as a primary condition and 67% as a secondary condition.

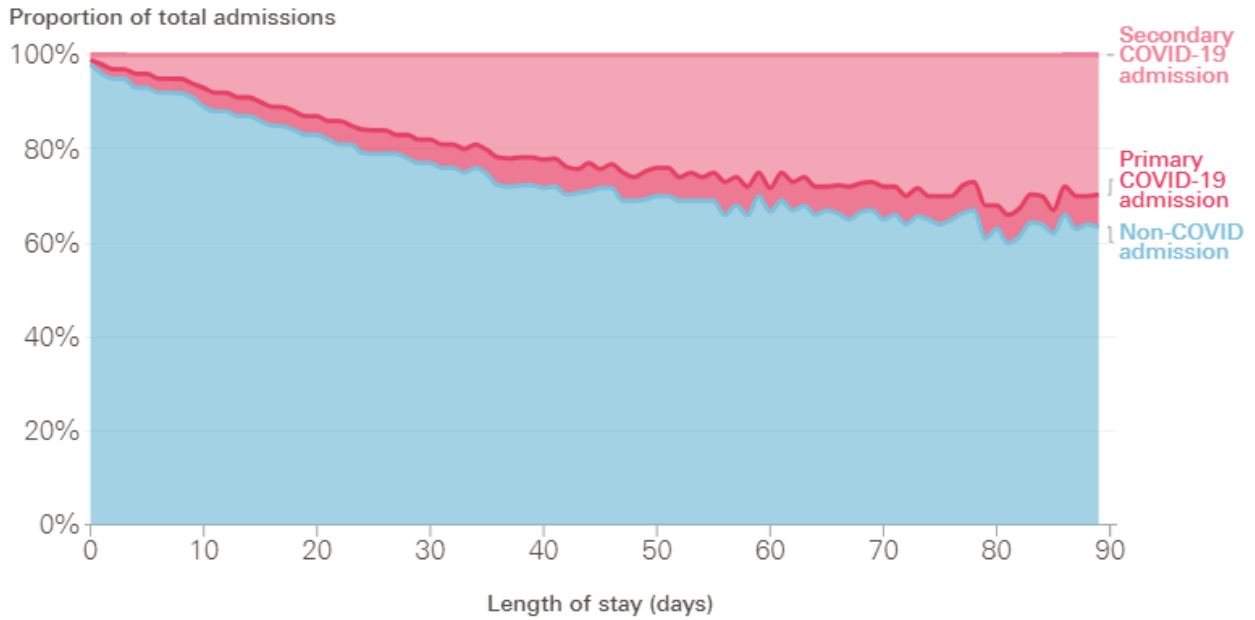
Patients with COVID-19 as a primary condition had an average hospital stay of 11.5 days (after controlling for age and clinical complexity), 3.3 days longer than those admitted for non-COVID-19-related reasons. Those with COVID-19 as a secondary condition spent an average of 19.3 days in the hospital (age and clinical complexity adjusted), 11.1 days longer than non-COVID-19 admissions.

It is difficult to determine how many patients with a secondary diagnosis had the infection at the time of admission and how many contracted it during their stay. Longer hospital stays **increase the risk of hospital-acquired infections**, including COVID-19. This heightens demand for beds that meet infection-control standards. Our analysis suggests the need for appropriate beds to treat patients with COVID-19 remained elevated throughout 2022.

A consequence of increased hospital infections among longer-stay patients is a reduction in the proportion of non-COVID long-stay admissions compared with previous years (Figure 5). This figure indicates that as length of stay increases, patients are more likely to have COVID-19 as a secondary diagnosis.

Figure 5

As length of stay increases, the proportion of non-COVID-19 admissions reduces and secondary COVID-19 admissions increase  
Proportion of emergency hospital admissions across length of stay in 2022





## 7. Discussion and conclusions

Our analysis suggests that, despite accounting for just 9% of hospital admissions, COVID-19 is likely a key driver of the increase in length of stay. This suggests that whilst the impact of COVID-19 on hospital capacity was less severe in 2022 than during the peak of the pandemic throughout 2020 and 2021, it was still significant. As the government and the NHS in England look to recover waiting times, reduce the backlog and improve productivity, it is important to recognise the ongoing challenges posed by the virus. **Recent national statistics** report around 2,000 patients admitted to hospital with COVID-19 each week, though this is down 40% from the same period the year before, which saw 3,400 COVID-19-related admissions.

Many of the measures introduced during the height of the pandemic, such as for infection prevention and control, have since been **stepped down**. One reason given for the relaxation of such measures was to free up capacity and improve productivity. We were unable to assess the magnitude of hospital-acquired COVID-19 and therefore could not determine whether the easing of measures has affected the spread of the virus within hospitals. But if the relaxation of measures has led to an increase in hospital-acquired COVID-19 infections, this may be running counter to the aim of improving productivity.

The future trajectory of the virus will likely have implications for NHS productivity. With all other hospital-related **factors that drive productivity** remaining constant, a continued decrease in COVID-19 admissions could help NHS productivity levels recover. However, any resurgence in COVID-19, especially a more potent strain, may mean a continued struggle to increase productivity and reduce the waiting list for treatment.

Although our findings indicate that COVID-19 was a driver of the increased average length of stay, it did not account for all of the increase. This suggests that wider system factors, including patient flow through the hospital, contributed to the increased average length of stay. Patient flow may be constrained by bed capacity, leaving the system **vulnerable to shocks and struggling to reduce the waiting**.

This analysis highlights the need to ensure the NHS is able to continue dealing with the demands of COVID-19 without reducing admissions as well as the need to better understand the wider factors driving decreases in productivity so that bottlenecks can be identified and appropriate solutions implemented.

## 8. Supporting information

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