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Winter Modelling 2024/25

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Providing evidence and advice for Health and Social Services
Group on behalf of the Chief Scientific Advisor for Health

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Headline Results

Winter 2024/25 modelling scenarios for respiratory illnesses in Wales:

- **Influenza ('flu') and pneumonia** modelling scenarios have peak daily hospital admissions ranging from 63 to 132 for winter 2024/25. Admissions scenarios 1-3 suggest a peak in the first week of January (03/01/2025). Scenario 4 (the most likely scenario) suggests a smaller peak of 63 in the third week of January (26/01/2025). The peak in the occupancy scenarios for patients admitted due to influenza ranges from 441 to 1,058 and is estimated to occur in the second week of January 2025.
- **Respiratory syncytial virus (RSV)** modelling scenarios for winter 2024/25 have peak daily hospital admissions for 0–4-year-olds ranging from 36 to 63. Scenario 1 suggests a peak during the first week of December (07/12/2024) and scenarios 2 and 3 suggest a peak a few days prior to this (02/12/2024). Scenario 4 suggests an early peak in the first week of November (06/11/2024). The daily peak in the number of beds occupied by RSV patients aged 0-4 ranges from around 40 to 70 estimated to occur between early November and the first week of December 2024.
- **COVID-19** admissions scenarios 2 and 3 indicate there could be three COVID-19 peaks throughout the winter however, scenario 4 suggests two peaks and scenario 1 indicates a stable series with no peaks. Across the scenarios with peaks these range from 24 to 116 daily admissions. ICU scenarios predict peaks between 1 to 7 daily admissions
- **COVID-19** occupancy scenarios estimate a varying number of peaks, with the maximum of these peaks between 391 and 1,549 daily beds. Scenario 4, the repeat of last year's data suggests a peak of 520 beds in second week of October after which occupancy decreases throughout winter.
- **Combined scenarios** assess the collective impact of the flu, RSV and COVID-19. In the most likely combined scenario, flu admissions contribute more than 50% of total admissions after January 2025. The daily admissions most likely scenario is expected to peak at 126 admissions in the first week of January 2025 (3rd January 2025). The most likely occupancy is likely to peak at 896 beds on 13th October 2024. The combined worst-case scenario estimates daily admissions of 262 to peak on 11th December 2024 and daily occupancy of 2,485 to peak on 21st December 2024.
- **Care home residents** are more likely to be admitted due to winter viruses and COVID-19 than those who do not reside in a care home. In 2023/24, 5.83% of care home residents and 1.2% of non-care home residents were admitted due to flu.
- By examining the **international** picture as a means to estimate what we may see in Wales, the flu season is likely to be similar to recent years but with the potential to see increased cases compared to 2023/24.

Additional winter 2024/25 modelling scenarios (for respiratory illnesses and all causes) in Wales:

- The modelling scenarios suggest there will be a peak of 261 to 511 **emergency department (ED) attendances due to respiratory problems** per day in Wales over the 2024/25 winter period. Scenarios 1-3 suggest daily peaks in ED attendances in the last week of December (30/12/2024) and Scenario 4 suggests peak daily attendances in the first week of January (01/01/2025).
- The percentage of ED attendances (from all causes) that met the 4-hour target decreased from 92% in October 2019 to 70% in April 2024.
- Modelled scenarios suggest **monthly ambulance calls due to all causes** coded as red calls are estimated to peak at 5,923, and amber calls are estimated to peak at 25,979, with both peaks occurring in December 2024.
- Scenarios 1-3 suggest that the **daily ambulance calls due to respiratory illness** are likely to peak in the first week of January 2025 with peak values of 216, 270 and 324 daily ambulance calls. Scenario 4, which is the repeat of last year's data, suggests a slightly smaller peak of 190 daily ambulance calls in the same week.
- **Red ambulance calls due to respiratory illness** are estimated to peak during third week of December (17/12/2024) with a peak value of 70 calls (upper limit=79, lower limit=60) while amber calls are expected to peak last week of December (29/12/2024) with a peak value of 100 calls (upper limit=124 and lower limit=76).
- Modelled scenarios suggest there will be a peak of 30 to 138 **GP consultations for influenza-like illness (ILI)** per day in Wales over the 2024/25 winter period (0.95 to 4.34 per 100,000 people). The smallest peak in the scenarios (30 daily consultations or 0.95 per 100,000) is a repeat of the 2023/24 data. The three scenarios with the highest peak suggest the peak will be during the first week of January 2025. The scenario with the lowest peak estimates the peak will arrive in the last week of January 2025.
- All modelling scenarios suggest that the **paediatric bed occupancy** is likely to peak in November 2024 with peak values of between 271 and 419 occupied beds per day.

Additional context of NHS demand throughout winter 2024/25:

- **Referrals for any cause from a GP or other medical practitioner to hospital** for treatment in the NHS in Wales with a wait time of above 36 weeks was the highest during August 2022 when it reached a maximum of 271,165 in the data included in this analysis between September 2011 and March 2024. However, the number of monthly referrals has been increasing since September 2023 and reached 271,872 in June 2024.

- During a 72-hour period of **industrial action** by junior doctors in January 2024, 41% (22,258) of outpatient appointments and 62% (1,467) of surgical cases were cancelled or postponed.
- **COVID-19 Vaccine uptake** of the population of Wales aged 65 and above who have taken a COVID-19 vaccination (at least 1 dose in 2020/21 and a booster in subsequent years) has decreased from 97% in 2020/21 to 75% in 2023/24.
- **Flu vaccine uptake rates** among those aged 65 and over in Wales have been above 70% in recent years although uptake among those at risk aged below 65 is substantially lower. For both groups, uptake increased during the pandemic compared with winter 2019/20, but decreased again during winter 2023/24. In the winter of 2023/24, the flu vaccine uptake was 72% among adults aged 65 and above, and 39% among 6 month-64-year-olds at risk respectively.
- A survey question regarding whether people would accept an RSV vaccine offer showed, 44% would accept the offer, 14% would not, and 40% would need more information in order to make their decision.
- **Absences of health care workers due to flu** as a percentage of absences due to all sickness between 2013/14 and 2022/23 seasons was 5.25%, 5.64%, and 6.78% of occurrences of sickness absence among nurses, medical staff, and allied health professions respectively. This increased to around 10% each winter during the peak of flu season.
- **Cost of living** is likely to contribute to issues relating to hunger, poor-quality diets and cold homes, which may lead to increased winter mortality and hospital admissions for respiratory conditions. The reallocation of resources to emergency care during winter may exacerbate existing healthcare delays, potentially influencing levels of workforce participation. The challenges in accessing GP services could also intensify winter health problems if individuals postpone seeking medical attention or resort to A&E. Patients and service users may need financial support and advice along with their medical care.

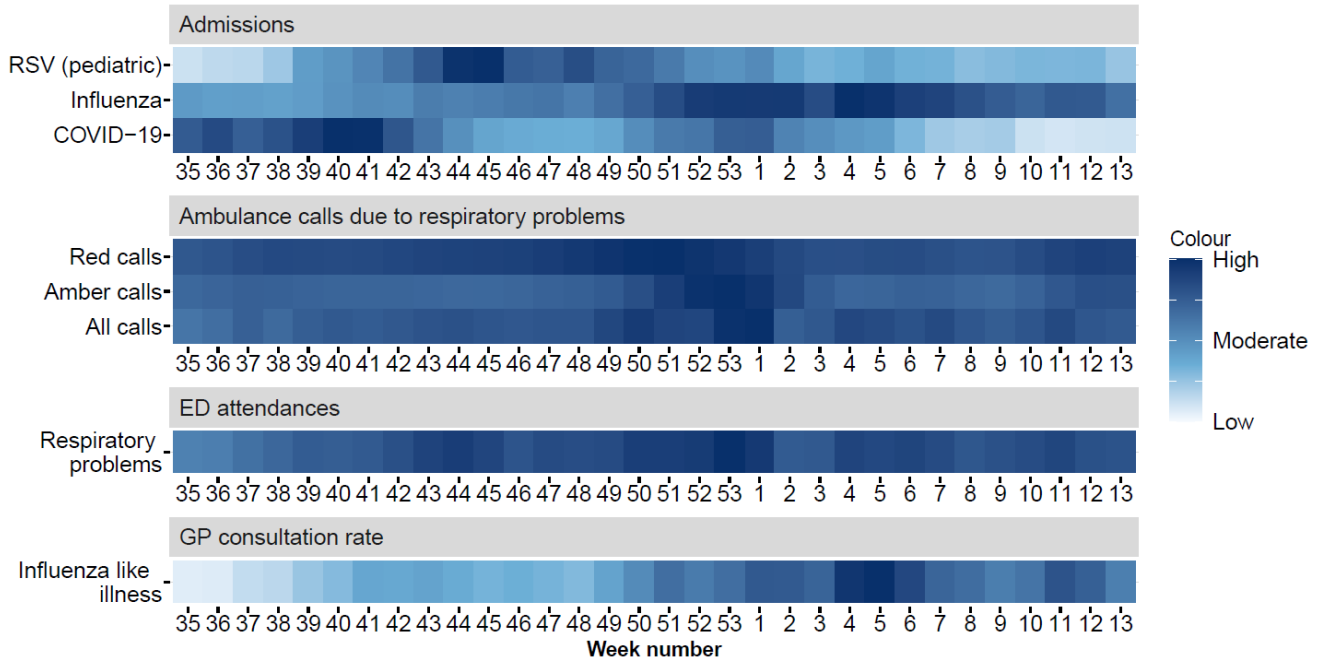
Definitions

- Note that we refer to the most likely scenario (MLS) throughout this report. This is the scenario, out of the provided modelling scenarios, that we consider most likely to occur during the 2024/25 winter in Wales.
- Unless stated otherwise, averages are referring to the mean.
- Admissions and occupancy refer to new admissions to hospital and hospital bed occupancy respectively. For admissions, this is where the relevant diagnosis code is the primary diagnosis for the first episode of the spell only (ie. The admitting episode). For more information, see [NHS Wales data dictionary](#).
- Most analysis in this report focusses on the winter period (between 1st September and 31st March inclusive). Unless stated otherwise, analysis carried out is usually only over the winter period. However, there are parts of the report where the whole year is considered, such as the vaccine rollout as it is important to deduce vaccine uptake throughout the year.

2024/25 Winter Peaks

To convey winter pressures for different elements of the health care system (admissions, ambulance calls, ED attendances and GP consultations), we have created the following visual:

Figure 1: Most likely modelled scenario pressures due to admissions, ambulance calls, ED attendances and GP consultations between week 35 and 13 of Winter 2024/25 [Note 1]



Sources: Digital Health and Care Wales (DHCW), Welsh Ambulance Services University NHS Trust (WAST), and Public Health Wales

[Note 1]: The average value for each week was calculated from daily data. 'High', where the darkest blue is observed, refers to the estimated 2024/25 winter peak. All other colours are relative to the estimated peak.

The most likely modelled scenarios from our analysis estimates that: For admissions, peaks are likely to occur in week 45 2024, week 4 2025, and week 40 2024 for RSV, influenza and COVID-19 respectively. For ambulances calls coded red, amber and green, the peaks occur in weeks 51 2024, week 53 2024 and week 1 2025 respectively. ED attendances due to respiratory problems peaks in week 53 2024. GP consultation rates for influenza like illness peaks in week 5 2024.

For tables of the number of peak admissions, ambulance calls, ED attendances and GP consultation rates, see the [Appendix](#).

Summary

Winter respiratory viruses cause increased demand on the NHS in Wales each year. However, there is always uncertainty about how these viruses will impact the healthcare services. The demand can vary depending on a variety of factors, for example if several viruses peak at the same time or how well a vaccination matches the virus in circulation.

The modelled scenarios in this paper include analysis of historical data used to project forward to estimate what we may see in winter 2024/25, contributing to winter planning for NHS Wales. We aim to estimate the pressures that could be seen by an increase in respiratory viruses and other factors which are typically more prevalent in the winter months than other times of the year. In this paper, there is a focus on influenza (flu) and pneumonia, Respiratory Syncytial Virus (RSV) and COVID-19. Although COVID-19 has not shown signs that it is solely a 'winter virus', the virus can cause compounding pressures if the peaks are combined with those of flu and RSV.

The paper also explores other areas of the care system that can be impacted by winter pressures beyond hospital admissions and occupancy. This includes Emergency Department attendances and ambulance calls, with modelled scenarios focusing on respiratory health. Outside of emergency and secondary care, we also explore historical data for GP consultations for influenza-like illnesses and acute respiratory infections, emphasising how winter pressures are over-arching across the whole NHS Wales system. This paper also provides estimates of vaccine uptake rates for flu and COVID-19 across different groups and considers the potential effect of the RSV vaccine due to be rolled out September 2024 to older adults and pregnant women.¹

As with all modelling, the scenarios in this paper are not a prediction of what will happen but estimates of what could happen. We could also see similar peaks occurring at a different time in the season. The modelling uses past data to estimate future projections. Any changes to the NHS system, particularly in the past 12 months, may not have been taken into account in the modelling.

Looking at wider determinants of health, the paper explores socio-economic factors that can influence the pressures of winter not only on the healthcare system but population health too. This includes risks with regard to cold homes and inadequate nutrition due to financial difficulties experienced by many people.

This paper estimates the impact of known viruses and other determinants of health likely to increase the demand for healthcare in Wales across the 2024/25 winter period. It should be used as an indication of what we expect to see based on historical data, rather than what will happen. A similar modelling approach has been taken for the past 2 years ([2022/23](#) and [2023/24](#)) Please see the appendix to see how last year's 2023/24 winter modelling compared to the actual number of hospital admissions etc which occurred.

¹ [National RSV vaccination programme announced - GOV.UK \(www.gov.uk\)](#)

Winter Modelling 2024/25: Acute Respiratory Infections

Top Line Summary – Acute Respiratory Infections

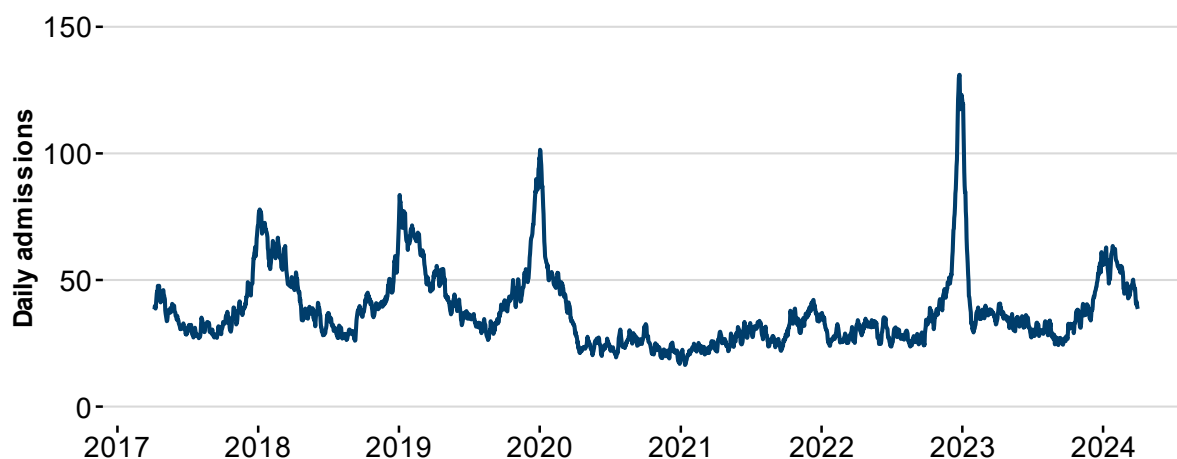
- Flu and pneumonia modelling scenarios have peak admissions ranging from 63 to 132 daily admissions for winter 2024/25. The peak in the occupancy scenarios for patients admitted due to influenza ranges from 441 to 1,058.
- Flu and pneumonia admissions during the non-pandemic years peaked between 24th December and 26th January.
- Respiratory syncytial virus (RSV) scenarios from winter 2024/25 have peak paediatric admissions ranging from 36 to 63 daily admissions. The daily peak in the number of beds occupied by RSV patients ranges from around 40 to 70.
- RSV paediatric admissions during the non-pandemic years peaked between 6th November and 2nd December.
- In 2023/24, admissions among children aged 0-4 accounted for 57% of the total RSV admissions while admissions among adults aged 65 and above amounted to 21% of the total RSV admissions.
- COVID-19 admissions scenarios 2 and 3 indicate there could be three COVID-19 peaks throughout the winter however, scenario 4 suggests two peaks and scenario 1 indicates a stable series with no peaks. Across the scenarios with peaks these range from 24 to 116 daily admissions. ICU scenarios predict peaks between 1 to 7 daily admissions.
- COVID-19 occupancy scenarios estimate a varying number of peaks, with the maximum of these peaks between 391 and 1,549 daily beds. Scenario 4, the repeat of last year's data suggests a peak of 520 beds in second week of October after which occupancy decreases throughout winter.
- Combined scenarios assess the collective impact of flu and pneumonia, RSV and COVID-19. In the most likely combined scenario, flu admissions contribute more than 50% of total admissions after January 2025. The daily admissions most likely scenario is expected to peak at 126 admissions in the first week of January 2025 (3rd January 2025). The most likely hospital occupancy scenario peaks at 896 beds occupied on 13th October 2024.
- The combined worst-case scenario estimates a peak of 262 daily admissions on 11th December 2024 and peak daily bed occupancy of 2,485 on 21st December 2024.
- There were 36 admissions due to whooping cough in Wales Between April 2023 and March 2024, although numbers remain low. This is more than double the number seen in the six previous years (2017/18 to 2022/23 range from below 5 to 17 admissions).

Influenza (flu) and Pneumonia

Seasonal flu viruses can cause severe acute respiratory illness, leading to hospitalisations, especially among older adults and individuals with underlying risk factors. These infections result from established, circulating influenza viruses.² These viruses mutate rapidly over time, making them prone to immune escape allowing for the reinfection of previously infected or vaccinated individuals.³

To assess the impact of influenza (flu) on secondary care in Wales, daily hospital admissions related to flu and pneumonia were deduced using International Classification of Diseases, Version 10 ([ICD-10](#)) codes: J09-J18.⁴ Subsequently, admissions data was smoothed by calculating the 7-day rolling averages. Following this, peaks and trends during each season were identified.

Figure 2: 7-day rolling average of daily influenza and pneumonia admissions, between April 2017 and March 2024 [Note 1]



Source: Digital Health and Care Wales (DHCW)

[Note 1]: Data includes diagnosis codes J09 to J18 (flu and pneumonia) from [ICD-10](#)

Within the financial year of 2023/24⁵, a total of 14,110 flu admissions were recorded, with only 3% of those admissions being to the Intensive Care Unit (ICU). Of all flu admissions, 64% were among patients aged 65 years and older, 26% among 20–64-year-olds, 4% among 5–19-year-olds and 6% among 0–4-year-olds. The daily admissions showed a smaller peak of 63 in 2023/24, around half the size of 2022/23 winter peak. The 2023/24 peak in admissions occurred during the last week of January 2024, which was 3-4 weeks later than in previous years.

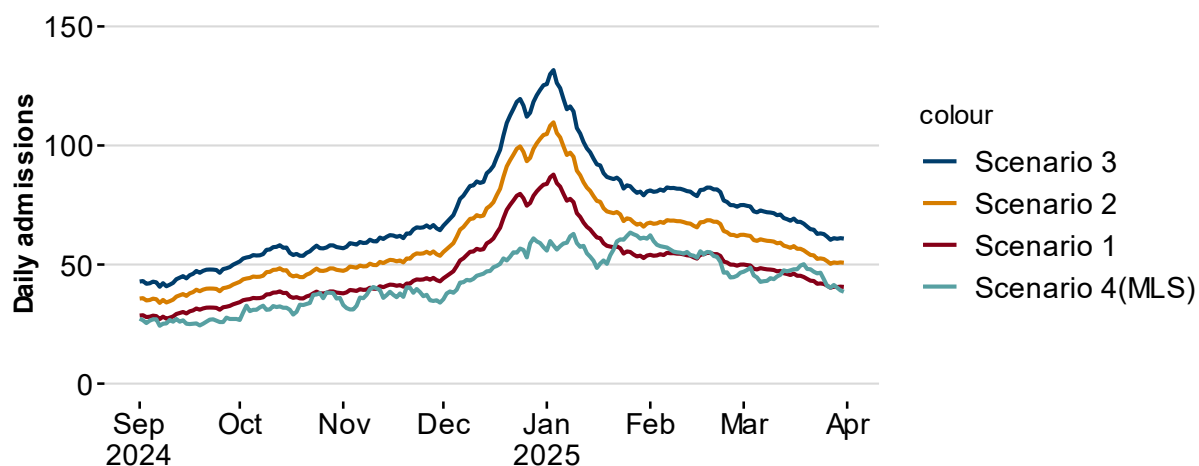
³ [The evolution of seasonal influenza viruses | Nature Reviews Microbiology](#)

⁴ This includes syndromic evaluation of the patient and does not necessarily always include testing for flu virus.

⁵ which we took to be 1 April 2023 to 31 March 2024.

Based on the previous seven years of historical data,⁶ the following scenarios were created for flu admissions and occupancy: Scenario 1 represents the average of non-pandemic years (2017/18, 2018/19, 2019/20, 2022/23 and 2023/24). Scenarios 2 and 3 are obtained by multiplying Scenario 1 by scalars 1.25 and 1.5. Finally, scenario 4, which repeats last year's admissions, is considered the most likely scenario (MLS).

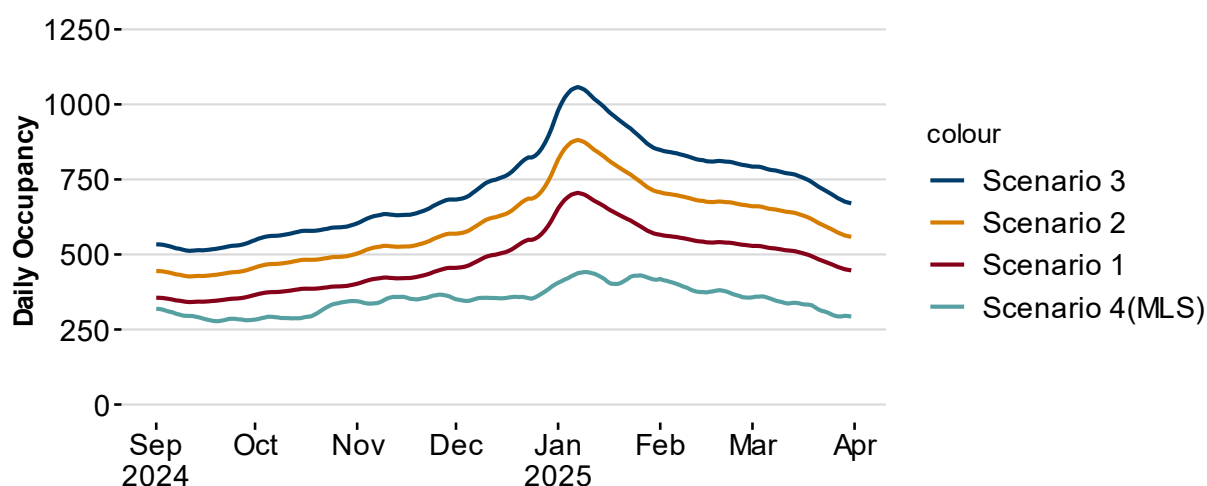
Figure 3: Daily flu and pneumonia admissions scenarios– Winter 2024/25



Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Admissions scenarios 1 to 3 suggest a peak of 88, 110 and 132 admissions in the first week of January (03/01/2025). Scenario 4 suggests a small peak of 63 in the third week of January (26/01/2025). This is in line with the peaks in historical admissions during the non-pandemic years which peaked between 24th December 2024 and 26th January 2025.

Figure 4: Daily flu and pneumonia occupancy scenarios– Winter 2024/25



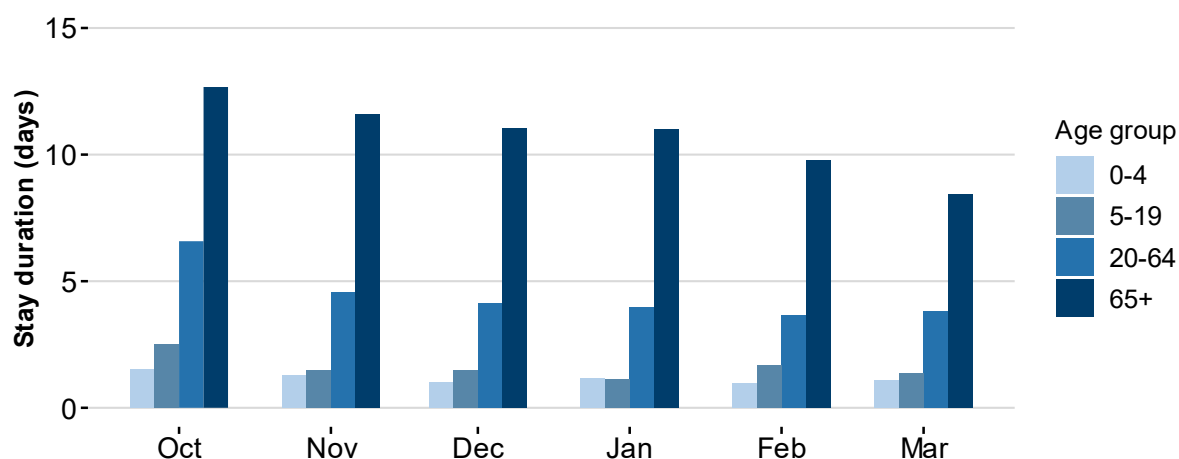
⁶ Admissions during the pandemic years were not included in the scenarios due to very low numbers.

Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Occupancy scenarios 1-3 suggest peaks of 705, 882 and 1,058 patients occupying hospital beds due to flu, which is estimated to occur a few days behind the flu admissions peak (07/01/2025). The Scenario 4 peak suggests a maximum occupancy of 441 on 09/01/2025.

The average length of stay was calculated for patients admitted due to flu in the winter of 2023/24. However, due to incomplete clinical coding during that season, there's a possibility that we are underestimating the actual length of stay.⁷ With these caveats in mind, the average length of stay for all age groups in October 2023 was 10.4 days but this decreased to 7.3 days in January 2024 and 5.9 days in March 2024.

Figure 5: Average length of stay in hospital due to flu and pneumonia during the winter of 2023/24, by month and age group



Source: DHCW and SEA calculations

Compared to other age groups, adults aged 65 and above had longer hospital stays due to flu with an average stay length ranging from 8.4 to 12.7 days across the months. Meanwhile, the 0-4 year old age group had an average stay length of 1.0 to 1.5 days, and the 20-64 year old age group had an average stay length between 3.6 and 6.6 days.

⁷ For more details, please refer to the [Appendix](#)

Respiratory syncytial virus (RSV)

RSV Paediatric admissions

RSV is a common respiratory virus that usually causes mild, cold-like symptoms.⁸ While most RSV infections usually cause mild illness, infants aged less than 6 months may develop conditions such as bronchiolitis and pneumonia, resulting in hospital admissions.⁹ Over 90% of children have been infected by 2 years of age. Therefore, admissions for the 0–4-year-old age group were analysed between April 2017 and March 2024.

Figure 6: 7 day rolling average of daily RSV paediatric admissions (ages 0-4 years), April 2017 to March 2024 [Note 1]



Source: Digital Health and Care Wales (DHCW)

[Note 1] : Data includes diagnosis codes J21 to J22 from the [ICD-10](#)

RSV admissions among 0-4 year olds followed a consistent seasonal pattern before the pandemic, with peak rolling admissions exceeding slightly above 60 during the last week of November. Although admissions declined in the winter of 2020/21, they rebounded in the subsequent winters. However, both the peak and total number of admissions remained significantly smaller compared to pre-pandemic years.

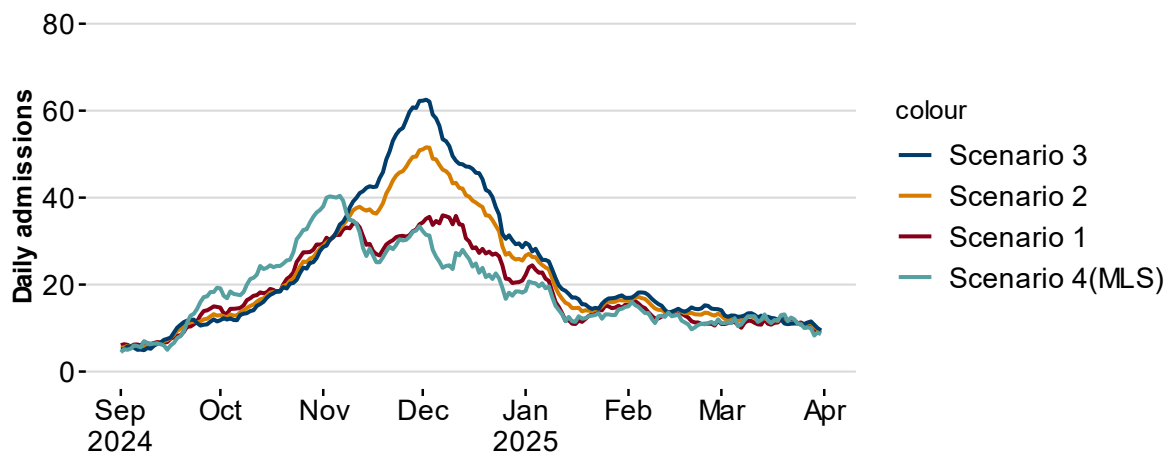
During the 2023/24 financial year, there were a total of 5,168 RSV paediatric (aged 0-4 years) admissions, with only 0.23% of those resulting in ICU admission. The 7-day rolling average peaked at 40 daily admissions on 6th November 2023, which was a month earlier than observed in the 2022/23 season. The peak height in 2023/24 was around two thirds the height of the pre-pandemic average. Based on the previous historical data, the following scenarios were created for RSV admissions and occupancy:

⁸ [Respiratory syncytial virus \(RSV\) immunisation programme for infants and older adults: JCVI full statement, 11 September 2023 - GOV.UK \(www.gov.uk\)](#)

⁹ [Respiratory syncytial virus \(RSV\): symptoms, transmission, prevention, treatment - GOV.UK \(www.gov.uk\)](#)

Scenario 1 reflects trends in the last two years. Scenario 3 assumes pre-pandemic patterns (from 2017/18, 2018/19 and 2019/20). Scenario 2 combines elements from both Scenario 1 and 3 (2017/18, 2018/19, 2019/20, 2022/23 and 2023/24). Scenario 4 is the repeat of the last year's data and the most likely scenario. The scenarios for RSV differ to the scenarios for other conditions due to the varying historical trends before, during and after the COVID-19 pandemic. These scenarios do not consider the impact of the new [RSV vaccination programme](#), which will provide vaccines to older adults (aged 75 years and above) and pregnant women starting in September 2024.

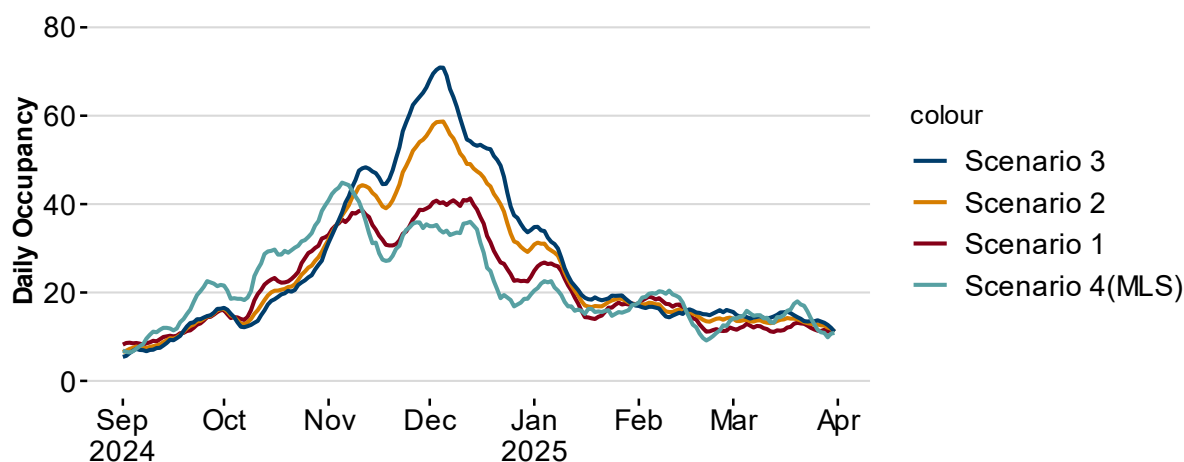
Figure 7: RSV Winter 2024/25 modelling scenarios for daily paediatric hospital admissions (0-4 years)



Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Scenario 1 suggests a peak of 36 daily admissions during the first week of December (07/12/2024). Scenarios 2 and 3 suggest a peak of 52 and 63 admissions few days before Scenario 1 (02/12/2024). Scenario 4 suggests an early peak of 40 admissions in the first week of November (06/11/2024). Historically, the peak of RSV admissions occurred between 6th November and 2nd December.

Figure 8: RSV Winter 2024-25 modelling scenarios for daily paediatric hospital occupancy.



Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Occupancy scenarios 2 and 3 suggest a peak of around 60-70 daily beds occupied by RSV patients in the first week of December while scenarios 1 and 4 suggest a maximum of around 40-45 beds occupied by RSV patients in hospitals per day.

RSV admissions across age groups

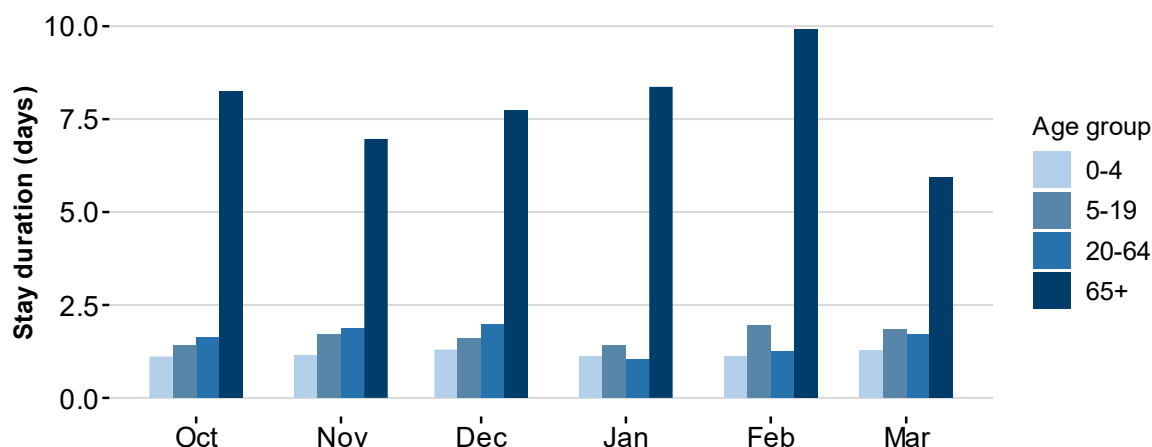
Table 1: Total number of RSV admissions and percentage, by age, in financial years between 2017/18 and 2023/24

financial year	0-4	5-19	20-64	65+	0-4 (%)	5-19 (%)	20-64 (%)	65+ (%)
2017/18	5,590	650	1,564	3,694	49%	6%	14%	32%
2018/19	6,342	621	1,554	3,249	54%	5%	13%	28%
2019/20	6,179	724	1,616	3,066	53%	6%	14%	26%
2020/21	661	159	516	1,109	27%	7%	21%	45%
2021/22	5,270	385	768	1,287	68%	5%	10%	17%
2022/23	5,636	442	1,085	1,652	64%	5%	12%	19%
2023/24	5,168	728	1,245	1,954	57%	8%	14%	21%

Source: Digital Health and Care Wales

Children aged 0-4 and adults aged 65 and above account for most of the RSV admissions each year. In 2023/24, admissions among children aged 0-4 accounted for 57% of the total RSV admissions while adults aged 65 and above accounted for 21% of the admissions. The number of admissions among adults aged 65 and above decreased from 3,694 in 2017/18 to 1,954 in 2023/24.

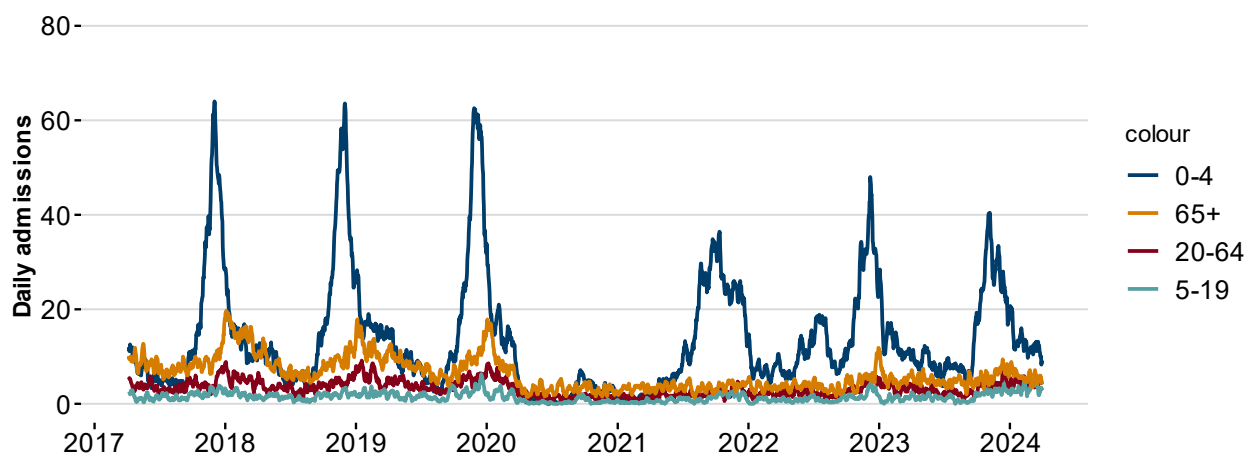
Figure 9: Average length of stay due to RSV, by age group, winter of 2023/24



Source: Digital Health and Care Wales

The duration of hospital stays resulting from RSV admissions varied across different age groups. Specifically, for children aged 0-4 years, the length of stay due to RSV ranged from 1.1 to 1.3 days between October 2023 and March 2024. Adults aged 65 and above experienced longer stays, lasting approximately between 5.9-9.9 days due to RSV.

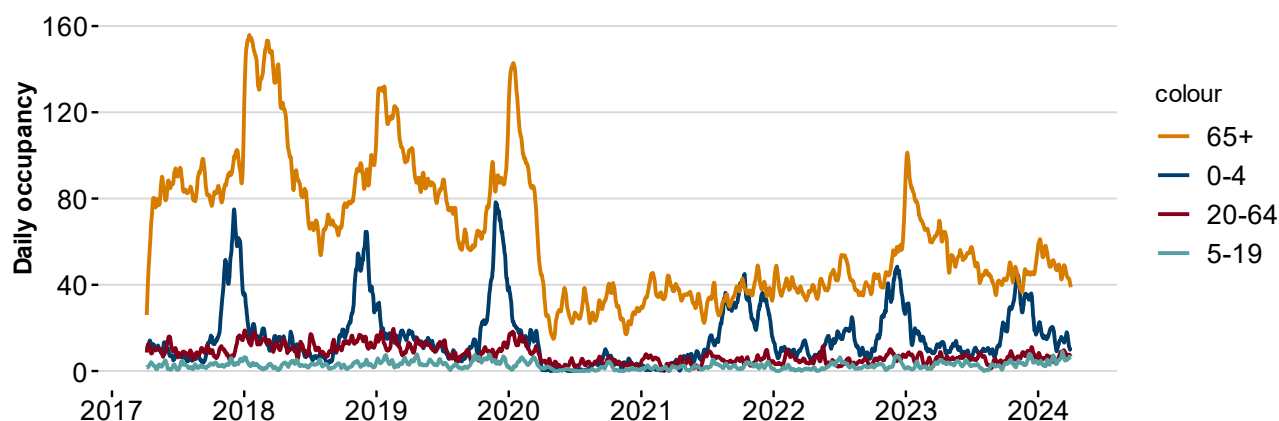
Figure 10: 7 day rolling average of RSV admissions, by age group, April 2017 to March 2024.



Source: Digital Health and Care Wales

Among adults aged 65 and above, there was a peak of under 20 RSV admissions in the first week of January in each of the three years before the pandemic (2017/18, 2018/19, and 2019/20). These annual peaks occurred roughly a month after the RSV admissions peaks observed in children aged 0-4. The peaks in RSV admissions in adults aged 65 and above decreased by half after the pandemic, reaching 12 and 9 admissions in winter of 2022/23 and 2023/24 respectively.

Figure 11: 7 day rolling average of RSV occupancy, by age group, April 2017 to March 2024



Source: Digital Health and Care Wales

As reflected in the stay length, admissions among 65 years and above resulted in a higher daily occupancy than admissions among 0-4-year-olds. The occupancy peaks were around 130-150 beds per day before the pandemic. After the pandemic, the peak daily beds occupied decreased to around 100 beds and 60 beds in the winters of 2022/23 and 2023/24 respectively. Hospital bed occupancy due to RSV in age groups 20-64 and 5-19 were under 20 beds per day.

Effects of RSV vaccination on hospital admissions

A number of vaccines have been developed to protect against RSV disease including: a bivalent RSV prefusion F vaccine (Abrysvo, Pfizer) and a long-acting monoclonal antibody (Ia-mAB, Nirsevimab, Sanofi).^{10 11} The vaccine Abrysvo given to adults aged 60 and older and pregnant women (24–36 weeks gestational age) has an efficacy against medically attended lower respiratory tract infections (LRTI) of 57.1% (99.5% CI, 14.7% to 79.8%) and 51.3% (99.5% CI, 29.4% to 66.8%) within 90 and 180 days after birth.¹² The Ia-mAB vaccine (Nirsevimab) has an efficacy against medically attended RSV-associated LRTI of 76.4% (95% CI, 62.3% to 85.2%). The new NHS Wales [vaccination programmes](#) against Respiratory Syncytial Virus will provide the RSV vaccine Abrysvo to pregnant mothers at gestational age 28 weeks and adults aged 75 and above from September 2024.

The introduction of a maternal vaccine for RSV coincides with winter 2024/25. This will result in a small reduction in RSV admissions amongst those aged 0 to 4. At the end of the winter period (the end of March 2025), all babies under the age of 6 months will have been born to mothers eligible for a maternal vaccine for RSV, at that time making

¹⁰ [Bivalent Prefusion F Vaccine in Pregnancy to Prevent RSV Illness in Infants | New England Journal of Medicine \(nejm.org\)](#)

¹¹ [Nirsevimab for Prevention of RSV in Healthy Late-Preterm and Term Infants | New England Journal of Medicine \(nejm.org\)](#)

¹² [Respiratory syncytial virus \(RSV\) immunisation programme for infants and older adults: JCVI full statement, 11 September 2023 - GOV.UK \(www.gov.uk\)](#)

up around 10% of all those aged 0 to 4¹³. If 60% of eligible mothers take up the RSV vaccine offer, the babies of those mothers are estimated to receive around 50% protection from hospitalisation. At the very end of winter 2024-25, this would result in roughly 3% of RSV hospitalisations amongst those aged 0 to 4 being prevented at the end of winter, and even fewer before then. ¹⁴ Over the next few winters, the number of 0–4 year-olds whose mothers would have received the maternal vaccine will increase and the effect of the RSV vaccine will also increase. Therefore, each subsequent winter period will see others amongst those aged 0 to 4 with at least residual vaccine-caused immunity and so a cumulatively greater effect.

The effect of RSV vaccines on young children would be clearer to see if data allowed us to look at a smaller age bands for younger children (eg. 0-9 months) rather than assuming hospital admissions are equally distributed in 0-4 year olds. Since most hospitalisations of 0–4-year-olds occur in those under 1 year of age, there may be a large impact on preventing hospitalisations in this younger group following the RSV maternal vaccine rollout.

For older adults, assuming a vaccine uptake of 60 to 80% among adults aged 75 and above based on historical flu uptake data, and vaccine efficacy of 57% from the clinical trials, we would expect a reduction of hospitalisations of those aged 75 and above of 34% to 46% once vaccine uptake exceeds 60%.

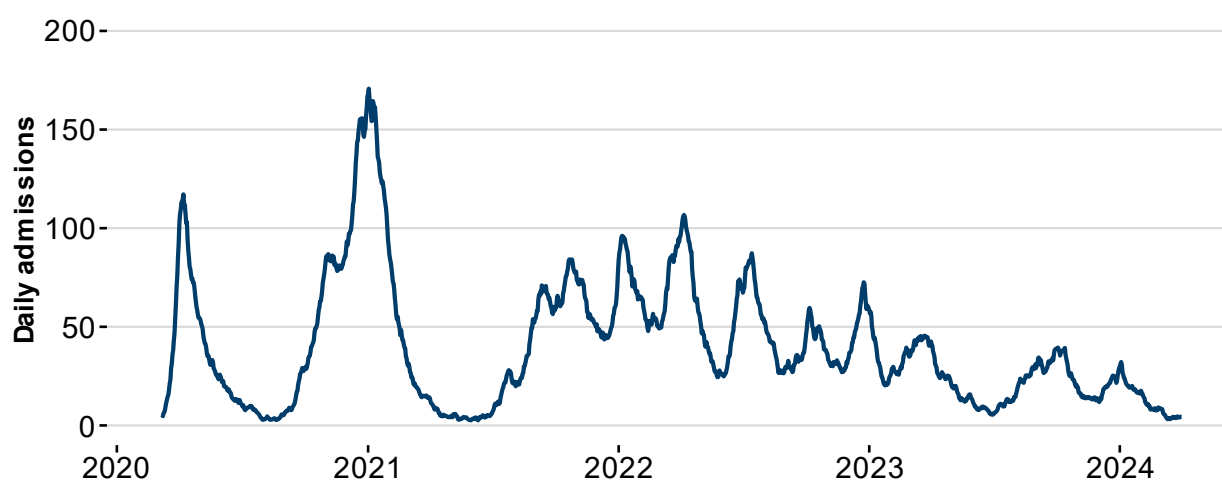
¹³ Assuming the number of babies and children aged 0-4 years are uniformly distributed.

¹⁴ The product of 10% of babies, 60% uptake rate, and 50% vaccine efficacy).

COVID-19

In May 2023, the World Health Organization (WHO) announced that COVID-19 is no longer classified as a global health emergency. However, the WHO also emphasised that the risk of virus evolution remains, with new variants emerging. Despite an overall downward trend, we should still anticipate the virus's impact on the population for some time to come.

Figure 12: 7 day rolling average of admissions due to COVID-19 (any mention), between March 2020 to March 2024 [Note 1]



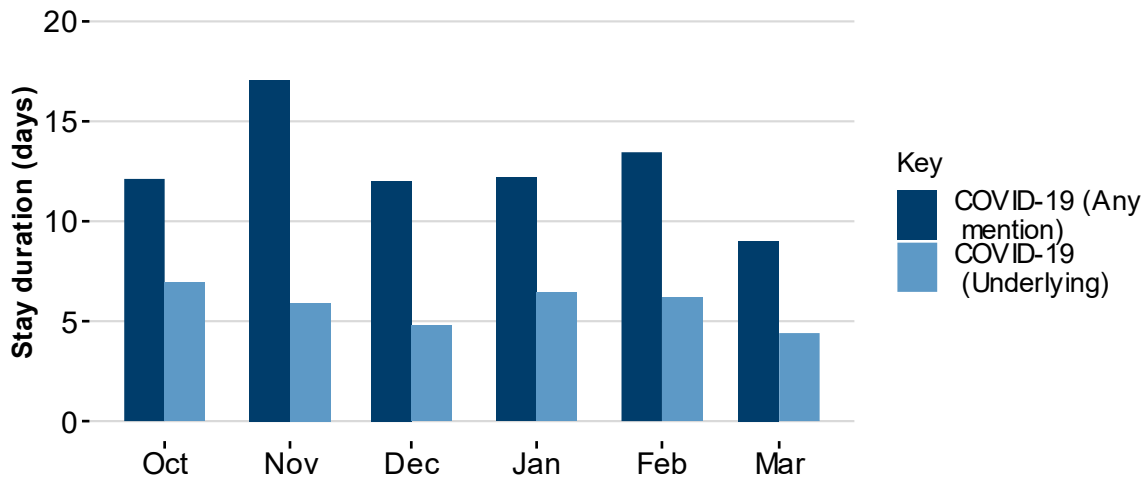
Source: Digital Health and Care Wales

[Note 1]: Includes ICD-10 codes U071, U072, U099, U109.

In Wales, admissions with any mention of COVID-19 showed a similar decreasing trend totalling 6,574 admissions in 2023/24, compared to 19,196 in 2020/21. Additionally, the daily admission peaks were significantly smaller, below 40 admissions per day. Only 3% of these admissions required intensive care unit (ICU) treatment compared to 7% in 2020/21. Adults aged 65 and above accounted for 61% of the total admissions, while 11% of the admissions were among children aged 0-4 years in 2023/24. By contrast, only 1% of the total admissions were among children aged 0-4 in 2020/21.

The average length of stay with admissions due to COVID-19 as an underlying condition ranged between 4.4 and 6.9 days across the months in the winter of 2023/24. Admissions with any mention of COVID-19 had a longer mean stay duration between 9.0 and 17.1 days possibly due to other co-morbidities or co-infections.

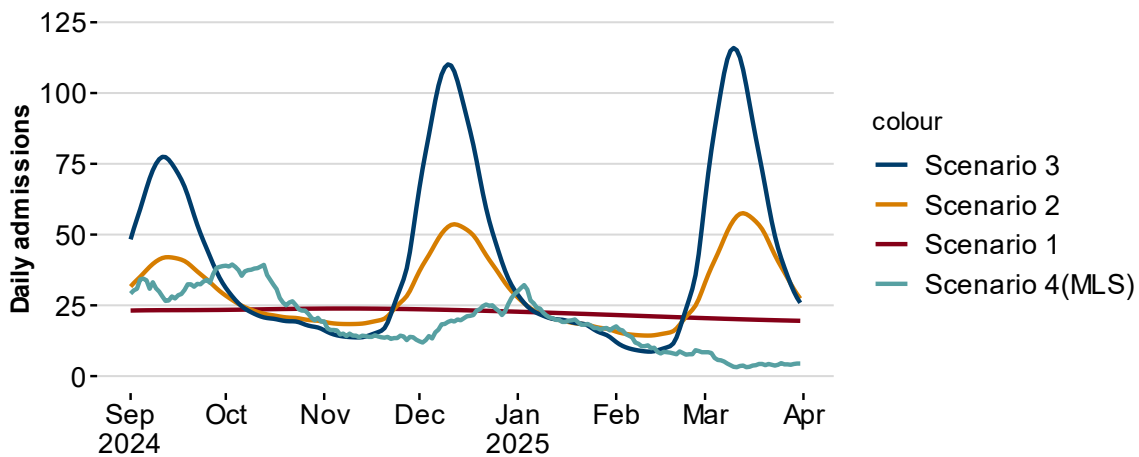
Figure 13: Average length of stay in hospital due to COVID-19 (any mention or underlying condition) in the winter of 2023/24



Source: Digital Health and Care Wales

COVID-19 admissions and occupancy scenarios were created by Swansea University where a new variant emerges gradually every 3 months. The degrees of immune evasion from the variant is given by the scalar value 1, 1.2 and 1.5 and represented as scenarios 1-3. Scenario 4 is the repeat of last year’s data from Digital Health and Care Wales.

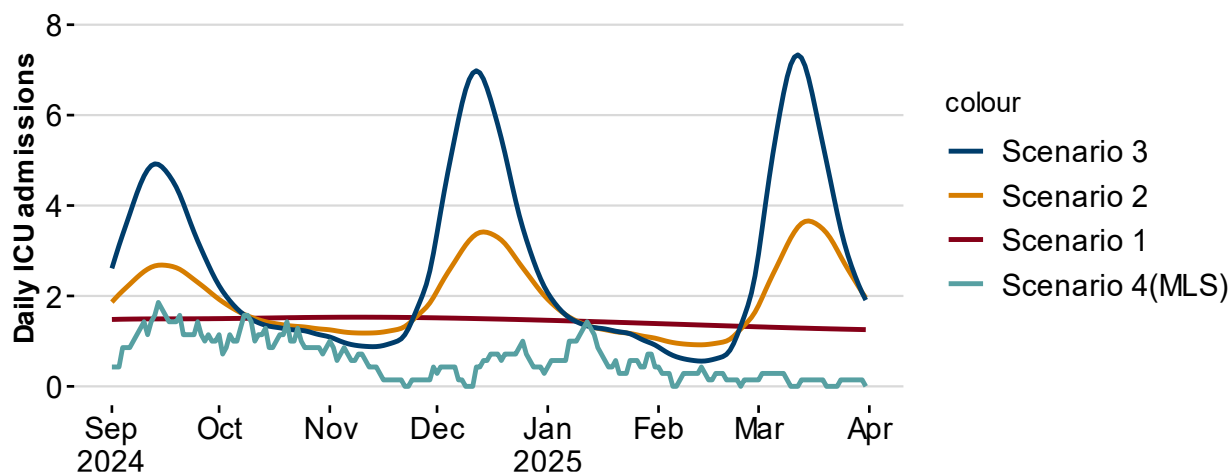
Figure 14: COVID-19 Winter 2024-25 modelling scenarios for all hospital admissions including ICU admissions



Source: Swansea University modelling (Scenarios 1, 2 3), actuals underlying the MLS to 31 March 2024 provided by DHCW, projected MLS scenarios from 1 September 2024 to 31 March 2025 from SEA

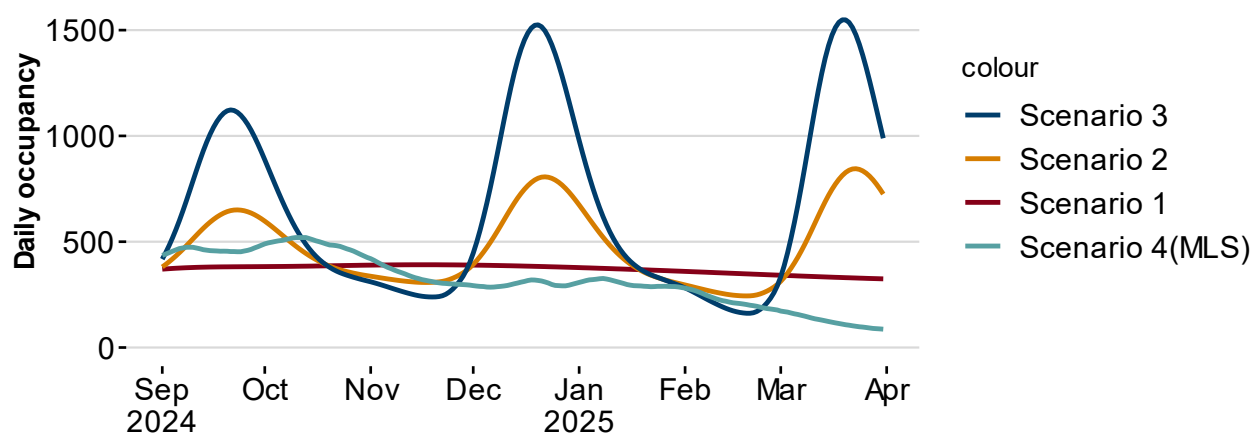
Scenario 1 indicates a flat time series with a maximum of 24 daily admissions. Scenarios 2 and 3 both suggest three peaks, occurring in the second weeks of September, December, and March. Scenario 2 projects smaller peaks of 42, 54, and 58 daily admissions respectively, while scenario 3 projects larger peaks of 77, 110, and 116 daily admissions respectively. Scenario 4, the repeat of last years’ data suggests two peaks: 39 admissions in the first week of October and 32 admissions in the first week of January. ICU scenarios predict peaks between 1-7 daily admissions.

Figure 15: COVID-19 Winter 2024-25 modelling scenarios for ICU hospital admissions



Source: Swansea University modelling (Scenarios 1, 2 3), actuals underlying the MLS to 31 March 2024 provided by DHCW, projected MLS scenarios from 1 September 2024 to 31 March 2025 from SEA

Figure 16: COVID-19 Winter 2024-25 modelling scenarios for hospital occupancy



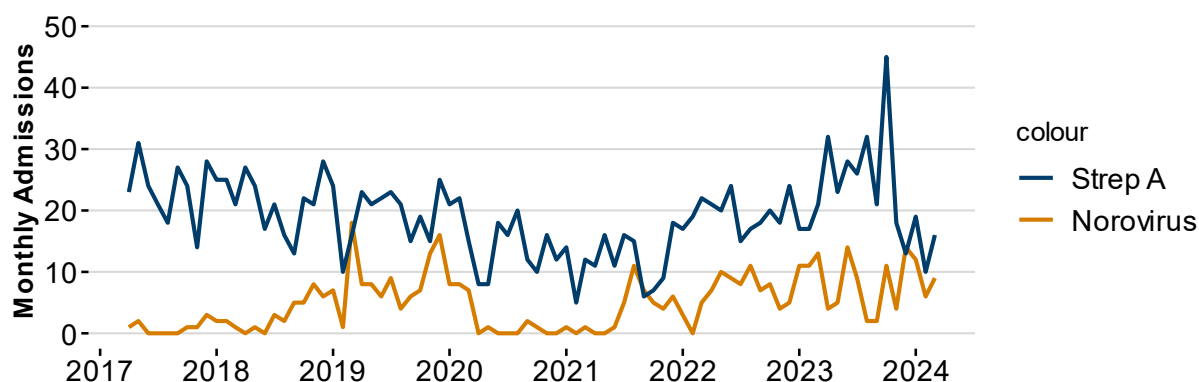
Source: Swansea University modelling (Scenarios 1, 2 3), actuals underlying the MLS to 31 March 2024 provided by DHCW, projected MLS scenarios from 1 September 2024 to 31 March 2025 from SEA

Occupancy scenario 1 suggests occupancy to lie between 325-391 daily beds. Scenarios 2 and 3 both suggest three peaks, occurring in the third weeks of September, December, and March, approximately a week after the admissions peaks. Scenario 2 projects smaller peaks of 650, 807, and 845 daily beds occupied respectively, while scenario 3 projects larger peaks of 1123, 1525, and 1549 daily beds being occupied. Scenario 4, the repeat of last year’s data suggests a peak of 520 beds in second week of October after which occupancy decreases throughout winter.

Other Admissions

Admissions due to infectious diseases notifiable to local authority proper officers under the Health Protection (Notification) Regulations 2010 were analysed monthly.¹⁵

Figure 17: Monthly admissions due to Strep A and Norovirus, April 2017 to March 2024



Source: Digital Health and Care Wales

Table 2: Total admissions due to Norovirus, Whooping cough, Mycoplasma and Strep A in Wales by financial years between 2017/18 and 2023/24 [Note 1]

Financial year	Norovirus	Whooping Cough	Mycoplasma	Strep A
2017/18	13	14	Below 5	281
2018/19	56	13	8	239
2019/20	100	17	6	242
2020/21	6	Below 5	Below 5	151
2021/22	47	Below 5	Below 5	167
2022/23	104	12	Below 5	232
2023/24	92	36	25	283

Source: Digital Health and Care Wales

[Note 1]: ICD-10 codes used: Norovirus (A081), Whooping Cough (A37), Mycoplasma (A493, B960) and Strep A (A389, A40, B95)

Admissions due to Streptococcus A (Strep A) increased from 232 in the financial year of 2022/23 to 283 in 2023/24. These include admissions due to Scarlet fever and IGAS (invasive Group A Streptococcal disease).¹⁶ However, there were higher notifications due to Scarlet fever in 2022/23 winter than the 2023/24 winter.¹⁷

Therefore, it is possible that while there are fewer Strep A admissions in 2022/23, the infected individuals might have accessed other avenues in the healthcare system (i.e GPs). There were 92 admissions due to Norovirus in 2023/24 and 36 admissions due to whooping cough.

¹⁵ [Notifiable diseases and causative organisms: how to report - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/notifiable-diseases-and-causative-organisms-how-to-report) Whooping cough and Mycoplasma have been suppressed due to low numbers

¹⁶ [Streptococcus A \(strep A\), Scarlet Fever and iGAS - Public Health Wales \(nhs.wales\)](https://public.tableau.com/app/profile/public.health.wales.health.protection/viz/NotificationsofSCARLETFEVERinWales/Dashboard2)

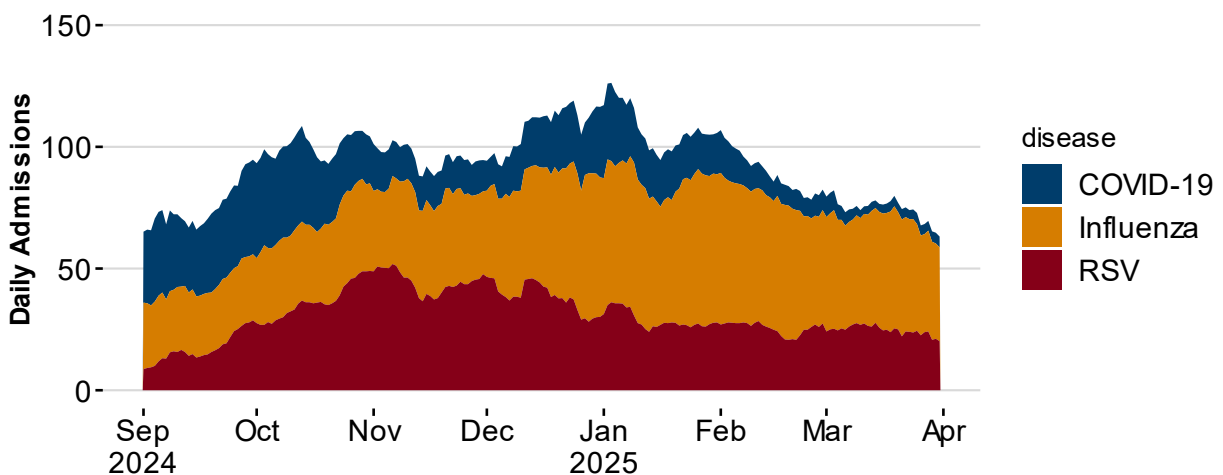
¹⁷ <https://public.tableau.com/app/profile/public.health.wales.health.protection/viz/NotificationsofSCARLETFEVERinWales/Dashboard2>

Combined scenarios

In order to assess the collective impact of the three winter viruses (flu, RSV and COVID-19), a most likely scenario and a reasonable worst-case scenario was selected for each, and then combined. The most likely scenario combines the following three scenarios from above:

- COVID-19 - “Scenario 4”, which is a repeat of last year’s actual data (2023/24)
- Influenza & pneumonia – “Scenario 4”, which is a repeat of last year’s actual data (2023/24)
- RSV – a repeat of last year’s actual data for all age groups (2023/24)

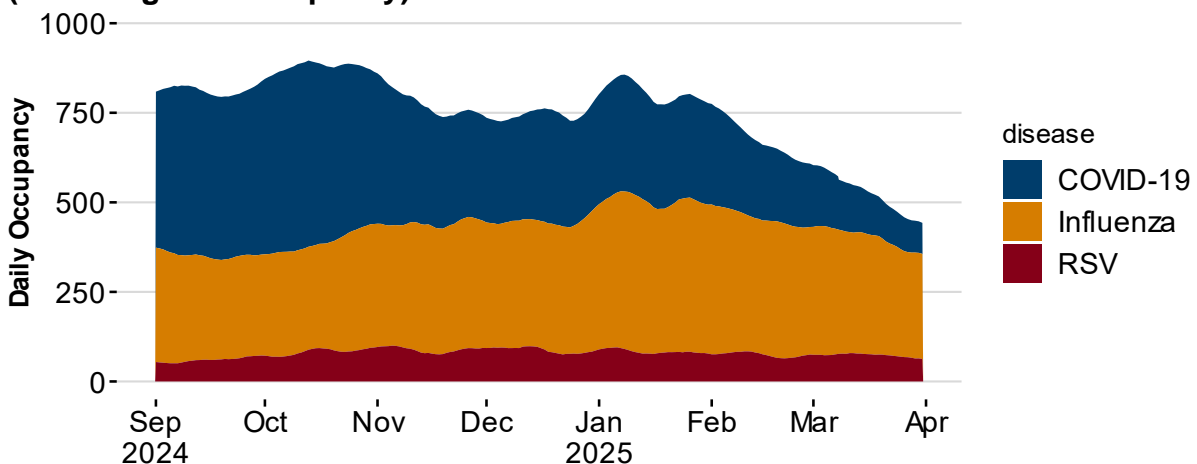
Figure 18: Combined most likely scenario – daily hospital admissions (including ICU admissions) for winter 2024/25



Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Flu admissions contribute mainly towards admissions compound pressure accounting for more than 50% of total admissions after January 2025. The daily admissions most likely scenario is expected to peak at 126 admissions in the first week of January 2025 (03/01/2025). The most likely occupancy is likely to peak at 896 beds on 13/10/2025.

Figure 19: Combined most likely scenario – daily hospital occupancy (including ICU occupancy) for winter 2024/25

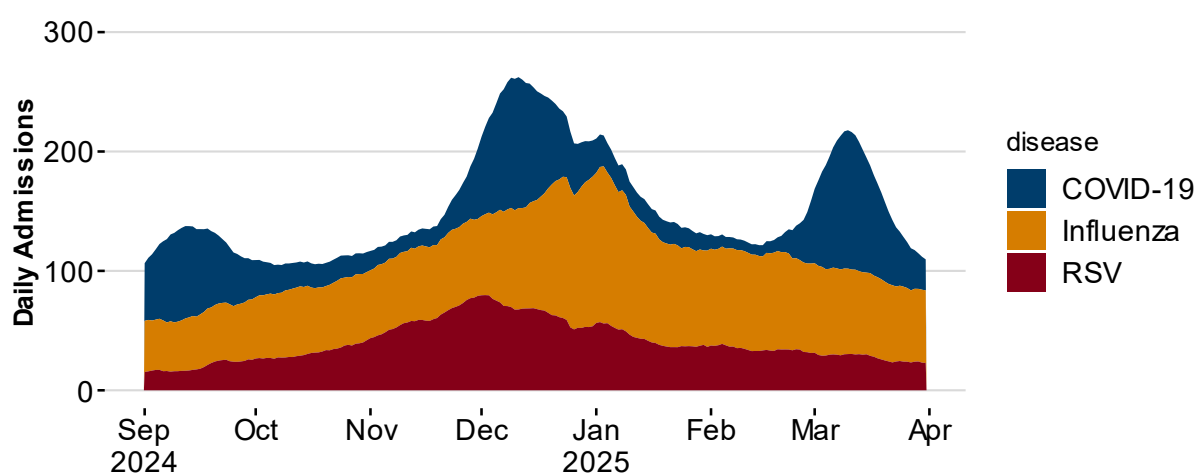


Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

The worst case combines the following three scenarios:

- COVID-19 - “Scenario 3”, which is the introduction of a new COVID-19 variant that becomes dominant every 3 months (cos wave) with a scalar of 1.5
- Influenza & pneumonia – “Scenario 3”, which is the average of the non-pandemic years (2017/18, 2018/19, 2019/20, 2022/23 and 2023/24) multiplied by 1.5
- RSV – “Scenario 3” which is the average of pre-pandemic years (2017/18, 2018/19 and 2019/20)

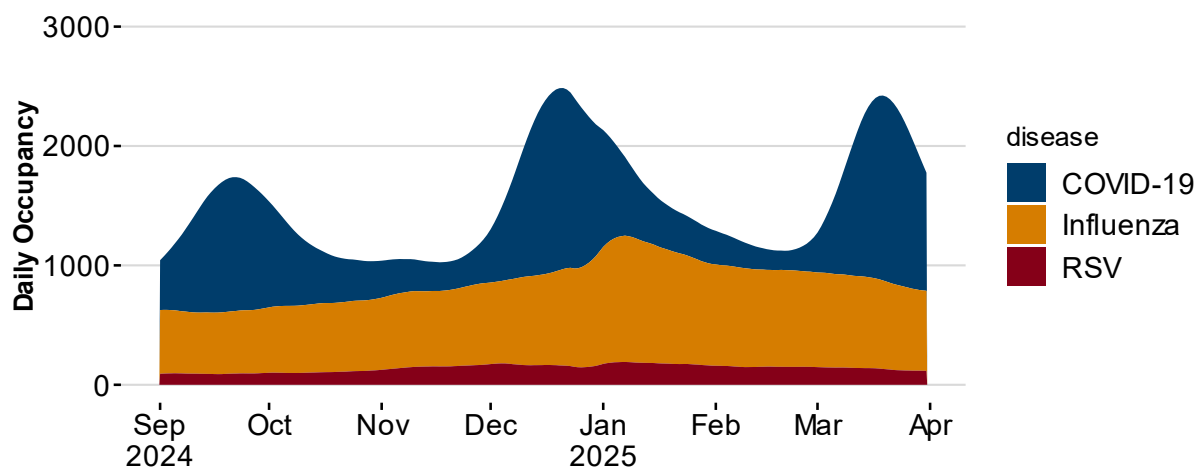
Figure 20: Combined worst case scenario – daily hospital admissions (including ICU admissions) for winter 2024/25



Source: Swansea University COVID-19 modelling, Influenza and RSV actuals to 31 March 2024 provided by DHCW, projected scenarios (for Influenza and RSV) from 1 September 2024 to 31 March 2025 from SEA

The worst-case scenario estimates daily admissions of 262 to peak on 11/12/2024 and daily occupancy of 2485 to peak on 21/12/2024 (more than 2 times the peak admissions height and around 3 times the peak occupancy height predicted by the most likely scenarios).

Figure 21: Combined worst case scenario – daily hospital occupancy (including ICU occupancy) for Winter 2024/25



Source: Swansea University COVID-19 modelling, Influenza and RSV actuals to 31 March 2024 provided by DHCW, projected scenarios (for Influenza and RSV) from 1 September 2024 to 31 March 2025 from SEA

International Winter Season

We looked to the southern hemisphere for an indication of how next winter may play out in Wales due to the different timing of the seasons between the northern and southern Hemispheres.

In Australia monitoring up to week 28 (week ending 14 July 2024) shows the percentage of FluTracking participants reporting new fever and cough symptoms are above the percentages seen in 2023 and tracking closely to the five-year mean (2017-2019 and 2022-2023).¹⁸ It is too early in the winter season to say if the peak has passed. However, of the samples referred to the World Health Organization Collaborating Centre, most have been antigenically similar to the corresponding vaccine components, suggesting a good vaccine match to the circulating virus.

There is a similar story across other countries including Hong Kong where the ILI consultation rate in 2024 is similar to 2023.¹⁹ In Singapore the polyclinic attendances for acute respiratory infection are similar to the attendances seen in 2023.²⁰

Using the international picture to estimate what we may see in Wales, the flu season is likely to be similar to recent years but with the potential to see increases on figures seen in 2023/24.

¹⁸ [Australian Respiratory Surveillance Reports – 2024 | Australian Government Department of Health and Aged Care](#)

¹⁹ [Centre for Health Protection - Sentinel Surveillance of Infectious Diseases among Chinese Medicine Practitioners \(CMPs\) \(chp.gov.hk\)](#)

²⁰ [MOH | Weekly Infectious Diseases Bulletin](#)

Admissions from care home residents

All care home residents

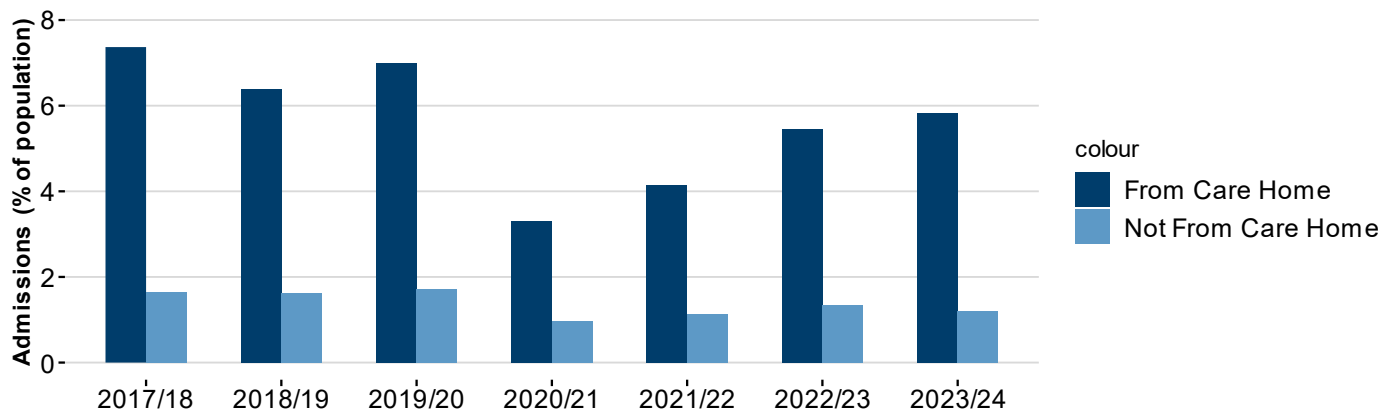
In 2023/24, there were 1,036 influenza and pneumonia admissions, 263 RSV admissions and 225 COVID-19 admissions were from people residing in care homes.

Care home residents aged 65 and over

To assess the impact of winter viruses and COVID-19 on care home residents, we analysed admission rates as a proportion of the population. We focused on adults aged 65 and above, who constituted 81% of the total care home population in Wales based on 2021 census data.²¹ For non-census years, we extrapolated the resident population using the population of adults aged 65 and above in Wales.

Our analysis suggests that care home residents were more likely to be admitted due to winter viruses and COVID-19. Before the pandemic, an average of 6.9% of care home residents aged 65 and above were admitted annually due to flu. In contrast, only 1.67% of those who did not reside in a care home experienced flu admissions. Although these numbers declined during the pandemic (3.32% for care home residents and 0.96% for non-care home residents), they have been rising since. In 2023/24, 5.83% of care home residents and 1.2% of non-care home residents were admitted due to flu.

Figure 22: Admissions (% of population) due to flu and pneumonia, in adults aged 65 and above in Wales by financial years between 2017/18 and 2023/24.



Source: Digital Health and Care Wales

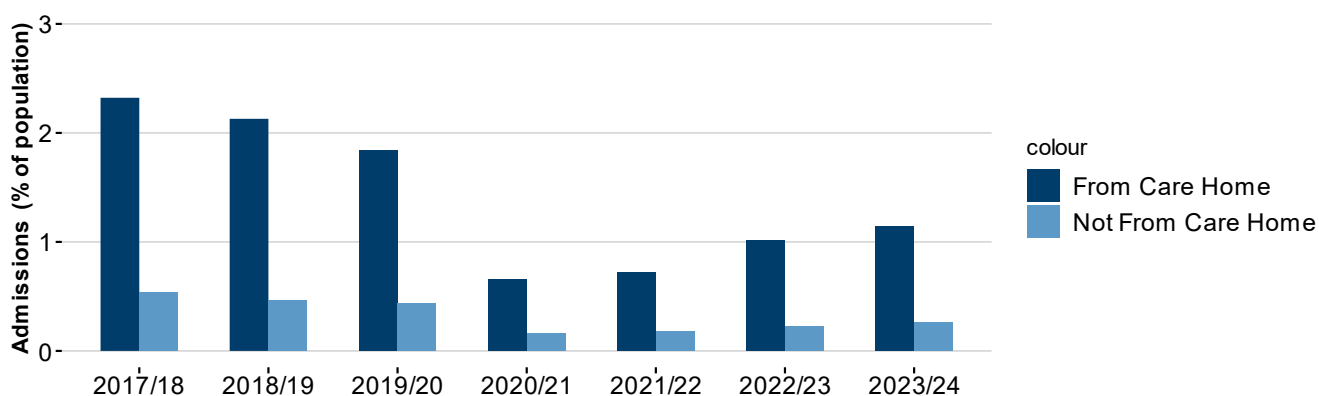
²¹ [Care home resident population, England and Wales: Census 2021 - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk)

Table 3: Admissions (% of population) due to flu and pneumonia, in adults aged 65 and above, by care home status, by financial years, 2017/18 to 2023/24.

Financial year	From Care Home	Not From Care Home
2017/18	7.37%	1.66%
2018/19	6.38%	1.62%
2019/20	7.01%	1.72%
2020/21	3.32%	0.96%
2021/22	4.15%	1.13%
2022/23	5.46%	1.33%
2023/24	5.83%	1.20%

A similar trend is seen in RSV admissions where a greater percentage of RSV admissions occurred among care home residents compared to non-care home residents. In 2023/24, 1.15% of care home residents were admitted due to RSV while only 0.27% of non-care home residents were admitted due to RSV. Compared to flu admissions, a lower percentage of the care home population were admitted due to RSV.

Figure 23: Admissions (% of population) due to RSV, in adults aged 65 and above in Wales by financial years between 2017/18 and 2023/24.



Source: Digital Health and Care Wales

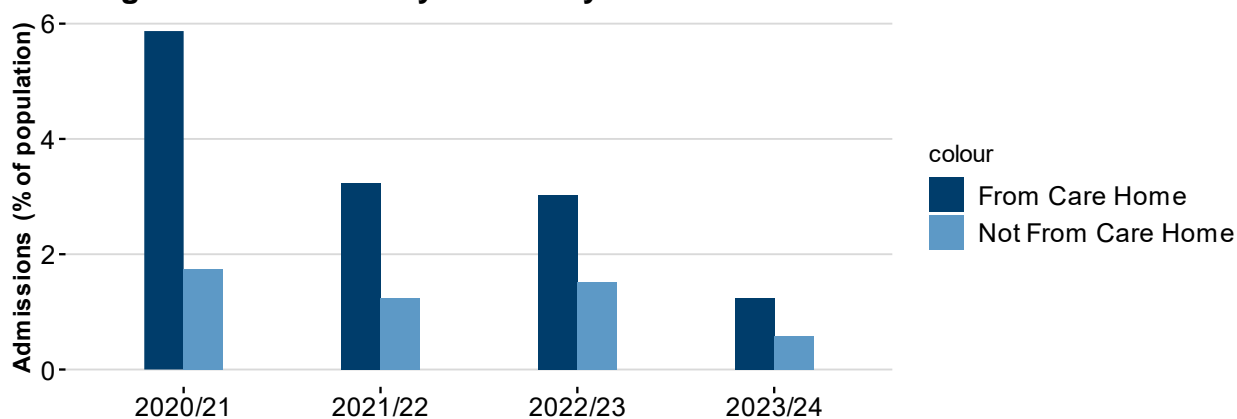
Table 4: Admissions (% of population) due to RSV, in adults aged 65 and above, by care home status, in Wales by financial years between 2017/18 and 2023/24.

Financial year	From Care Home	Not From Care Home
2017/18	2.32%	0.54%
2018/19	2.13%	0.47%
2019/20	1.84%	0.44%
2020/21	0.66%	0.16%
2021/22	0.72%	0.18%
2022/23	1.01%	0.23%
2023/24	1.15%	0.27%

Source: Digital Health and Care Wales

Percentage of care home residents being admitted due to any mention of COVID-19 decreased from 5.87% in 2020/21 to 1.23% in 2023/24 while percentage of non-care home residents admitted decreased from 1.75% to 0.58%.

Figure 24: Admissions (% of population) due to COVID-19 (any mention), in adults aged 65 and above by financial years between 2020/21 and 2023/24.



Source: Digital Health and Care Wales

Table 5: Admissions (% of population) due to COVID-19 (any mention), in adults aged 65 and above in Wales by financial years between 2020/21 and 2023/24.

Financial year	From Care Home	Not From Care Home
2020/21	5.87%	1.75%
2021/22	3.23%	1.24%
2022/23	3.02%	1.52%
2023/24	1.23%	0.58%

Source: Digital Health and Care Wales

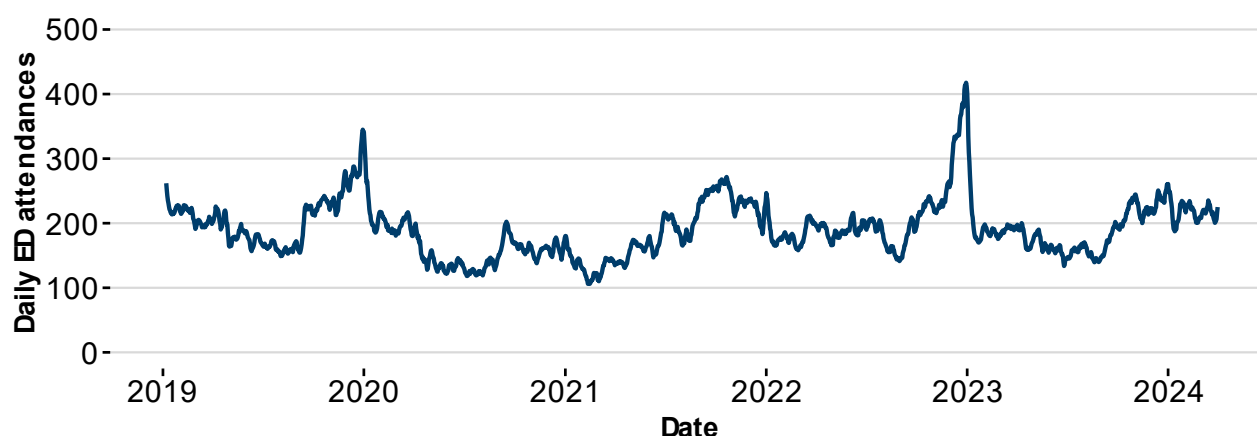
Emergency Department (ED) attendances

Top Line Summary

- The scenarios suggest a peak of 261 to 511 ED attendances per day in Wales over the 2024/25 winter period.
- If the trend observed between October 2019 to April 2024 continues, the percentage of ED attendances estimated to meet the 4-hour target would decrease to from 70% in April 2024 to 67% in April 2025.

ED attendances due to respiratory problems

Figure 25: 7 day rolling average of daily ED attendances due to respiratory problems between January 2019 and March 2024

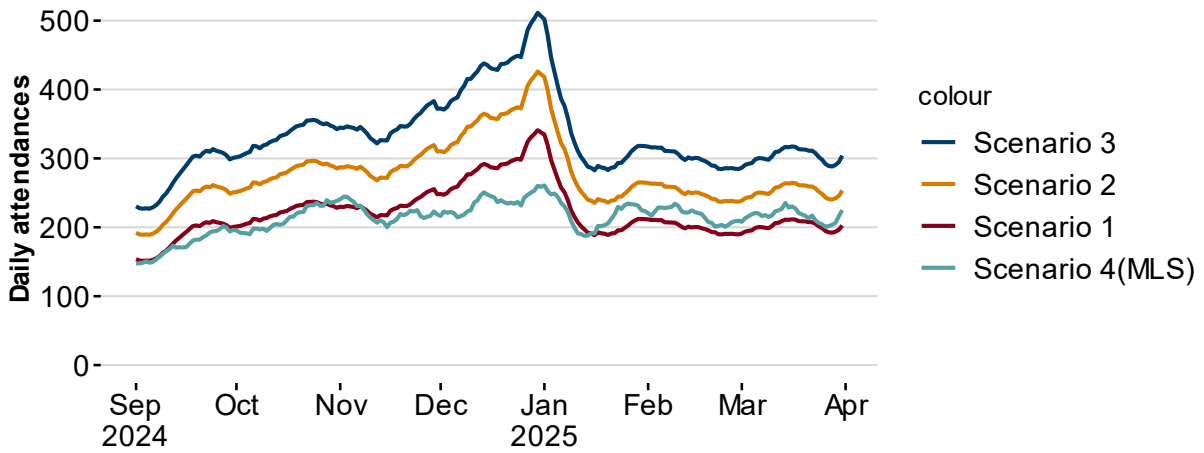


Source: Digital Health and Care Wales

ED attendances due to respiratory problems were analysed between January 2019 and March 2024. On average, there were 191 ED attendances per day due to respiratory issues. Additionally, small upticks were observed during the winters of 2019/20 and 2022/23 giving rise to daily peaks of 345 and 418 ED attendances. In line with these peaks, the following ED scenarios were created for the winter of 2024/25. Scenario 1 is the average of the non-pandemic years (2019/20, 2022/23 and 2023/24). Scenarios 2 and 3 are obtained by multiplying Scenario 1 by scalars 1.25 and 1.5. Scenario 4, which repeats last year's ED attendances, is considered the most likely scenario.

Scenarios 1-3 suggest daily peaks of 341, 426 and 511 ED attendances in the last week of December (30/12/2024). Scenario 4 suggests a smaller peak of 261 ED attendances per day on 01/01/2025 (first week of January).

Figure 26: ED attendances due to respiratory problems scenarios for winter 2024/25

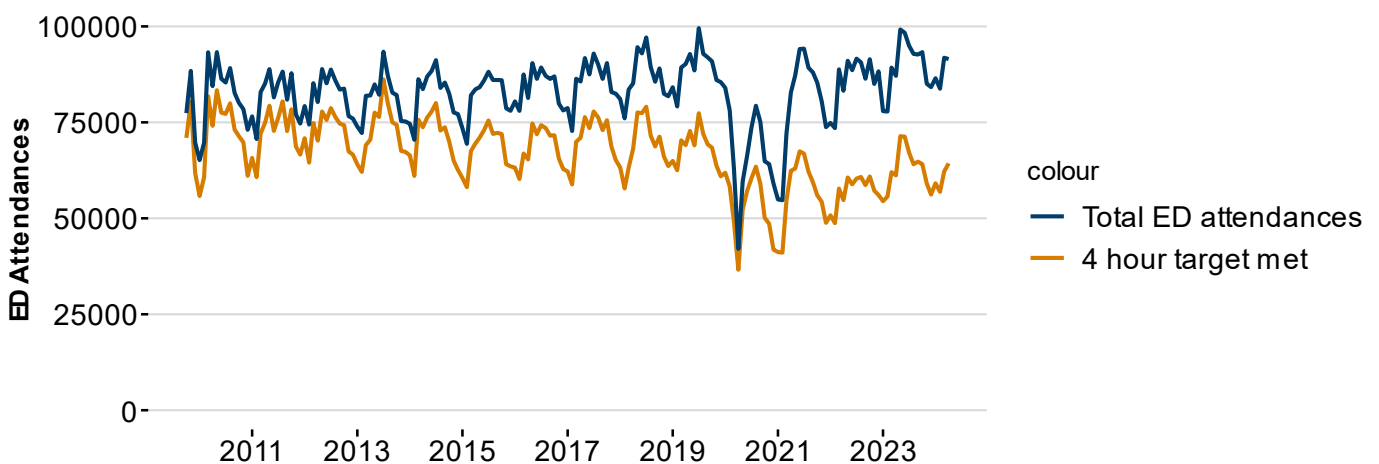


Source: Actuals to 31 March 2024 provided by DHCW, projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Total ED attendances

There is a seasonal pattern to the ED attendances due to all causes, with maxima typically occurring in spring/early summer (May to July), and minima typically occurring in February. In 2023/24, Emergency Department (ED) attendances reached their highest in May with 99,193 attendances, and their lowest in February with 83,761 attendances

Figure 27: Monthly total ED attendances and performance against 4 hour waiting times target between October 2009 and April 2024



Source: [Performance against 4 hour waiting times target, all emergency care facilities by local health board \(gov.wales\)](https://www.gov.wales/performance-against-4-hour-waiting-times-target-all-emergency-care-facilities)

Ambulance calls

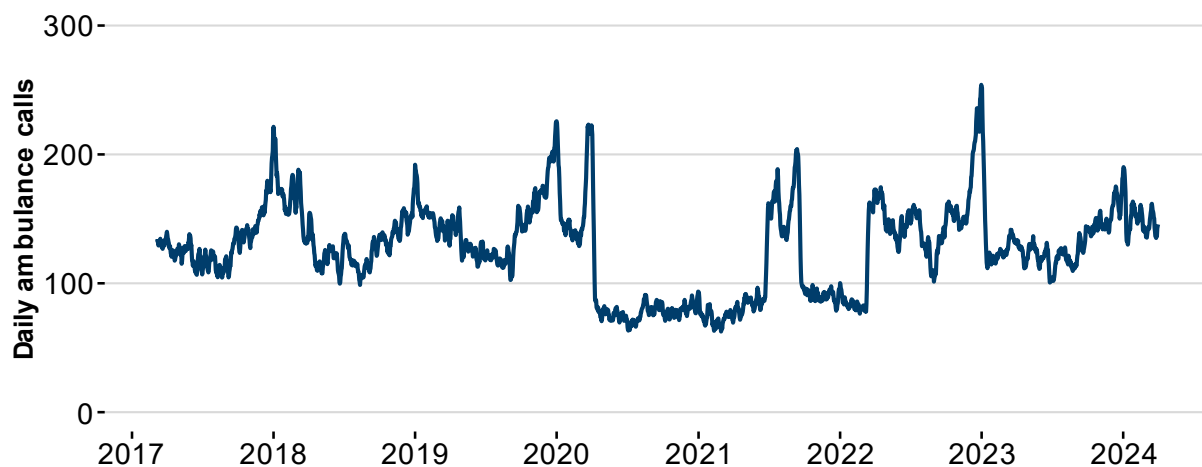
Top Line Summary

- Scenarios estimating the number of ambulance calls for respiratory problems (code 6) suggest a peak between 190 and 324 daily calls for the 2024/25 winter season.
- Modelled projections suggest red calls due to respiratory problems are likely to peak during third week of December with an estimated peak value of 70 daily calls while amber calls are expected to peak last week of December with an estimated peak value of daily 100 calls.

Ambulance calls due to respiratory problems

Emergency ambulance calls due to respiratory problems (code 6) were analysed between March 2017-2024. Calls due to pandemic flu (code 36) were excluded from the analysis due to low numbers after 2021. Total number of ambulance calls exhibited a seasonal pattern over the years, typically peaking during the first week of January (excluding pandemic years).

Figure 28: 7-day rolling average of daily ambulance calls due to respiratory problems between March 2017 and March 2024



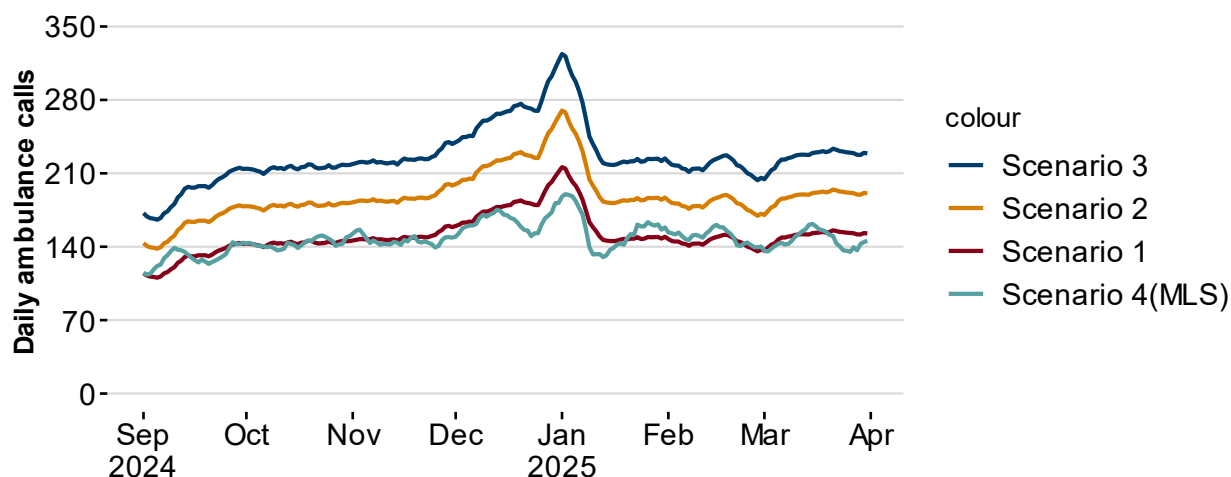
Source: Welsh Ambulance Services University NHS Trust (WAST)

During the winter of 2023/24, there was a smaller peak than the year prior of 190 daily emergency calls on 2nd January 2024, 75% times of the peak height during the winter of 2022/23 of 254 daily emergency calls on 31st December 2022. A similar trend was observed in the total number of ambulance calls, with the financial year 2023/24 experiencing fewer ambulance calls compared to 2022/23 (49,910 compared to 53,726 respectively).

As the total number of ambulance calls showed a seasonal trend, the following scenarios were created for the winter of 2024/25. Scenario 1 was the average of the non-pandemic years (2017/18, 2018/19, 2019/20, 2022/23 and 2023/24). Scenarios 2

and 3 are obtained by multiplying Scenario 1 by scalars 1.25 and 1.5. Scenario 4, which repeats last year's ambulance calls data, is considered the most likely scenario.

Figure 29: Ambulance calls due to respiratory problems scenarios for 2024/25 winter

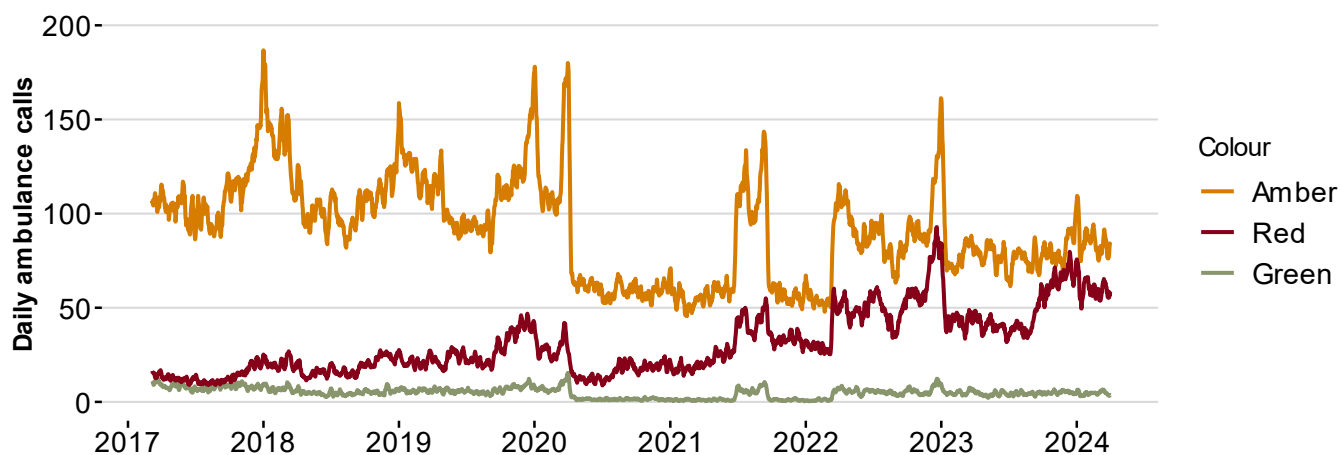


Source: Actuals to 31 March 2024 provided by Welsh Ambulance Services University NHS Trust (WAST), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Scenarios 1-3 suggest that the daily ambulance calls are likely to peak in the first week of January 2025 with peak values of 216, 270 and 324 daily ambulance calls. Scenario 4, which is the repeat of last year's data, suggests a slightly smaller peak of 190 daily ambulance calls in the same week.

Ambulance calls are colour coded- red calls (immediately life-threatening situation), amber calls (life-threatening or serious) and green calls (not serious or life-threatening).²²

Figure 30: 7-day rolling average of daily ambulance calls in Wales due to respiratory problems (code 6), by colour, March 2017 to March 2024.



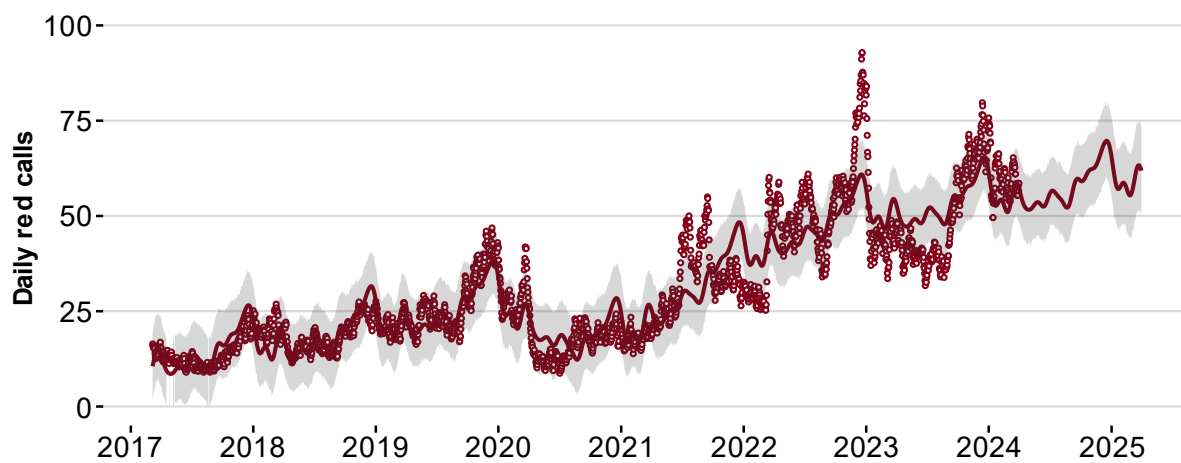
Source: Welsh Ambulance Services University NHS Trust (WAST)

²² [NHS 111 Wales](#)

The total number of red calls due to respiratory problems (code 6) increased from 5,516 in 2017/18 to 19,015 in 2023/24. By contrast, the number of code 6 amber calls decreased from 42,599 in 2017/18 to 29,235 in 2023/24.

Given the increasing trend in red calls and the decreasing trend in amber calls over the years included in this analysis, along with a monthly seasonal pattern, the Prophet model was used to generate scenarios that combine both annual and seasonal trends. Prophet is a procedure implemented by Meta for forecasting time series data based on an additive model where non-linear trends are fit.²³ Scenarios were not created for green calls as the numbers were too low.

Figure 31: Ambulance red calls due to respiratory problems scenarios for 2024/25 winter [Note 1]

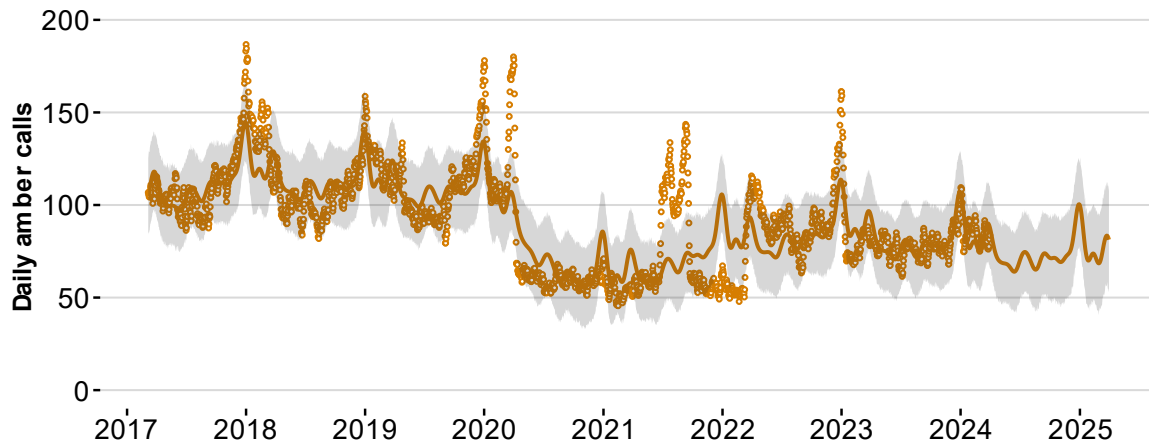


Source: Actuals to 31 March 2024 provided by Welsh Ambulance Services University NHS Trust (WAST), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

[Note 1]: The red dots represent the historical data points, the red line depicts the model fit, and the grey ribbons indicate the confidence intervals.

²³ [Prophet | Forecasting at scale. \(facebook.github.io\)](https://facebook.github.io/prophet/)

Figure 32: Ambulance amber calls due to respiratory problems scenarios for 2024/25 winter [Note 1]



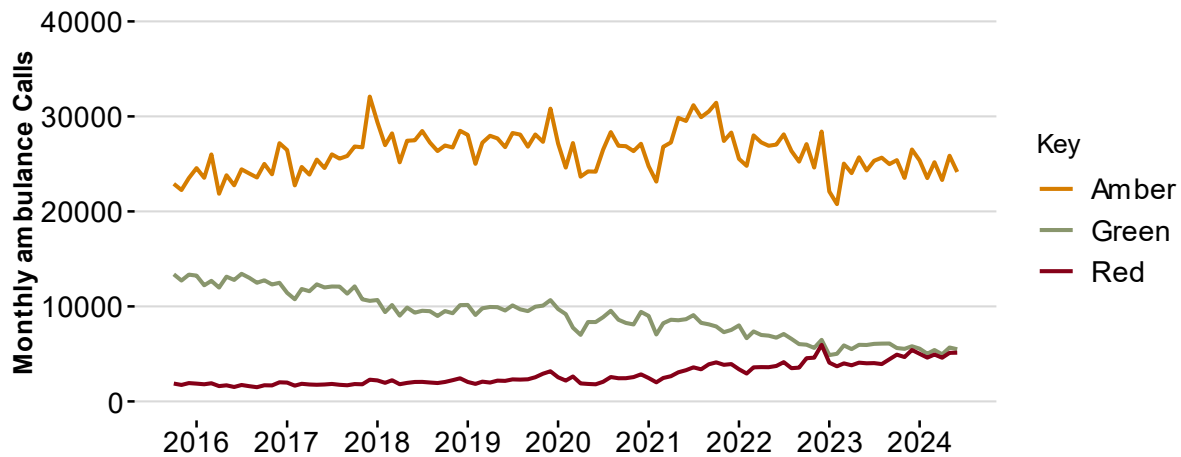
Source: Actuals to 31 March 2024 provided by Welsh Ambulance Services University NHS Trust (WAST), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

[Note 1]: The amber dots represent the historical data points, the amber line depicts the model fit, and the grey ribbons indicate the confidence intervals.

Red calls are estimated to peak during third week of December (17/12/2024) with a peak value of 70 calls (lower limit=60, upper limit=79) while amber calls are expected to peak last week of December (29/12/2024) with a peak value of 100 calls (lower limit=76, upper limit=124).

Ambulance calls due to all causes by month

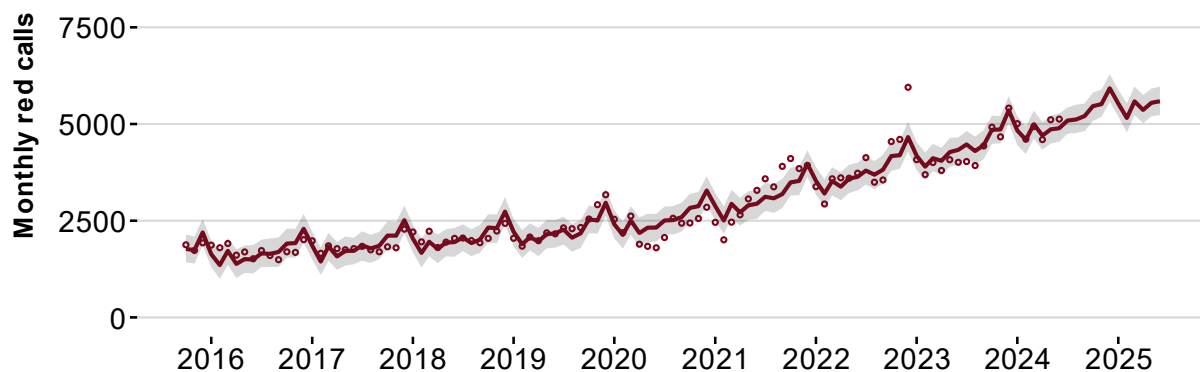
Figure 33: Monthly emergency ambulance calls due to all causes from October 2015 to June 2024



Source: [Emergency ambulance calls and responses to red calls, by LHB and month \(gov.wales\) and SEA calculations](#)

Monthly ambulance calls due to all causes were obtained from Stats Wales. Red calls showed an increasing trend, rising from 1,877 in October 2015 to 5,127 in June 2024. Green calls decreased from 13,337 in October 2015 to 5,487 in June 2024. Amber calls increased between 2015 and 2018, after which it plateaued. Red and amber calls typically peaked in December each winter, except during the pandemic years. Scenarios were created using Prophet, as mentioned previously.

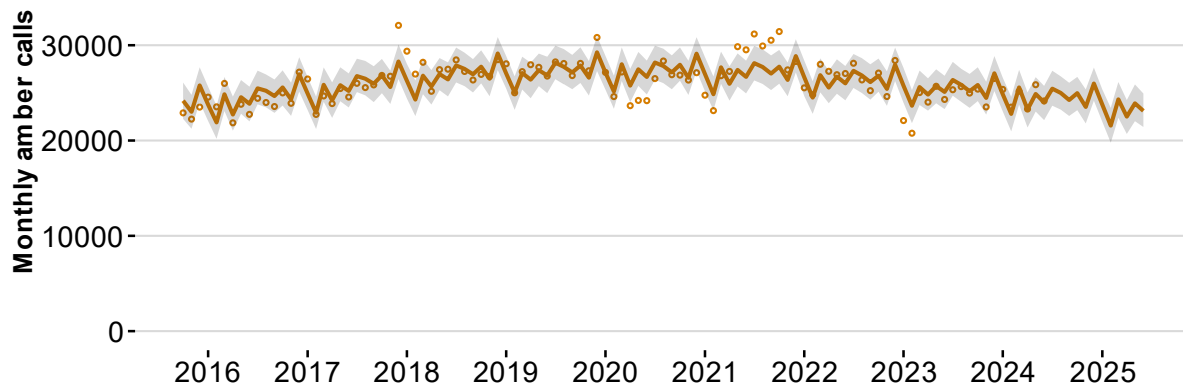
Figure 34: Monthly ambulance red calls due to all causes, scenarios for 2024/25 winter.



Source: [Emergency ambulance calls and responses to red calls](#), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

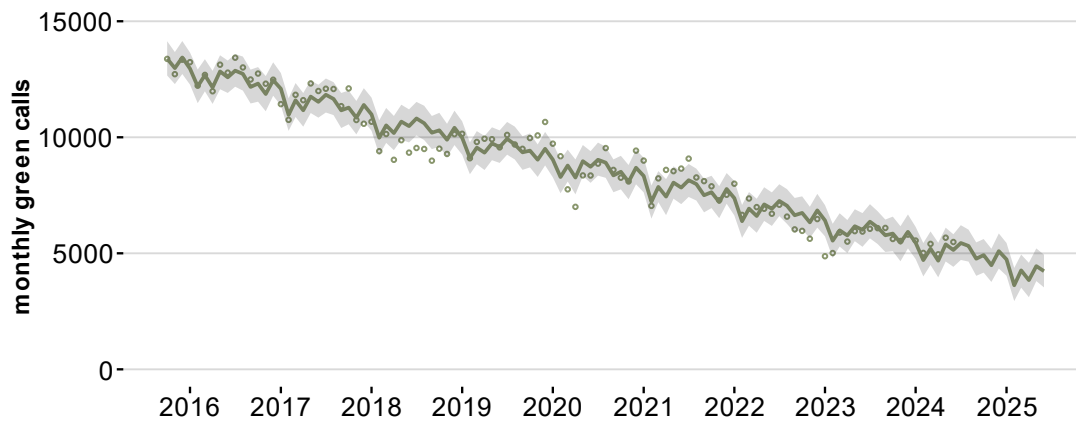
Red calls are estimated to peak at 5,923 and amber calls are estimated to peak at 25,979 with both peaks occurring in December 2024.

Figure 35: Monthly ambulance amber calls due to all causes, scenarios for 2024/25 winter.



Source: [Emergency ambulance calls and responses to amber calls](#), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Figure 36: Monthly ambulance green calls due to all causes, scenarios for 2024/25 winter.



Source: [Emergency ambulance calls and responses to green calls](#), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Primary Care

Top Line Summary

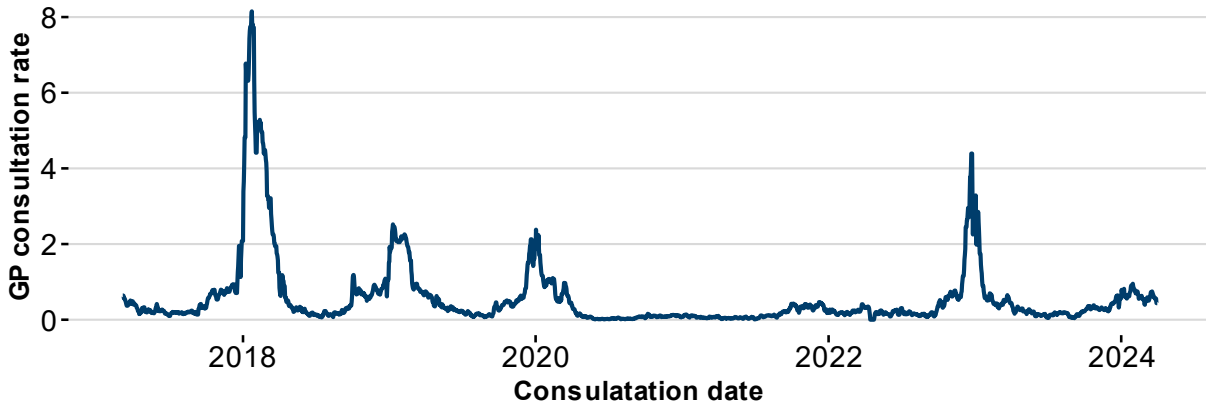
- The scenarios suggest there will be a peak of 30 to 138 GP consultations for influenza-like illness (ILI) per day in Wales over the 2024/25 winter period. The smallest peak in the scenarios (30 daily consultations) is a repeat of the 2023/24 data.
- The total acute respiratory infections (ARI) GP consultation rate dropped in 2023/24 with only 6,331.5 consultations per 100,000, compared to 8,706.1 in 2022/23.

GP consultations data related to infectious diseases (such as influenza and COVID-19) are derived from the GP Sentinel Surveillance of Infections Scheme in Wales. This program monitors a subset of GP practices within Wales. The diagnosis relies on syndromic evaluation of patients, without conducting specific pathological tests for confirmation. Therefore, it is likely that GP consultations might over/underestimate the incidence of infectious diseases. To standardise the data, consultation rates are normalised by the practice population, resulting in consultations per 100,000 population.

Influenza-like illness (ILI)

Daily sentinel GP consultation rate for influenza-like illness (ILI) was analysed between March 2017 and March 2024. Before the pandemic, an average of 333.2 consultations per 100,000 population was observed in Wales annually. The ILI consultation rates dipped during the COVID-19 pandemic years in line with the influenza and pneumonia admissions. ILI rates returned to nearly pre-pandemic levels (220.3 consultations per 100,000 population) in 2022/23 but decreased almost by 46% to 119.7 consultations per 100,000 population in 2023/24. Similarly, 2023/24 winter showed a significantly smaller daily peak ILI rate when compared to 2022/23 (1.0 vs 4.4 consultations per 100,000 population).

Figure 37: 7-day rolling average of daily Influenza like illness (ILI) GP consultation rate, March 2017 to March 2024

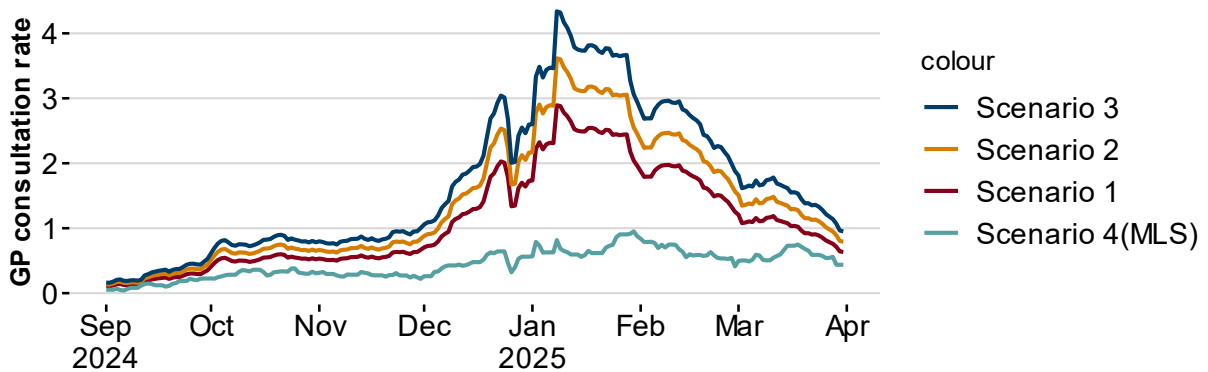


Source: Public Health Wales

Using the historical data, the following scenarios for ILI consultation rates were created. Scenario 1 was the average of the non-pandemic years (2017/18, 2018/19, 2019/20, 2022/23 and 2023/24). Scenarios 2 and 3 are obtained by multiplying Scenario 1 by scalars 1.25 and 1.5. Scenario 4, which repeats last year’s ILI rate, is considered the most likely scenario.

Scenarios 1-3 suggest that the daily ILI consultations are likely to peak in the first week of January 2025 with peak values of daily GP consultation rate 2.89, 3.62 and 4.34 per 100,000 population (or 92,115 and 138 consultations) respectively. Scenario 4, which is the repeat of last year’s data, suggests a significantly smaller peak of 0.95 per 100,000 population daily GP consultation rate in the last week of January (40 consultations).

Figure 38: Daily Influenza like illness (ILI) GP consultation rate scenarios for 2024/25 winter.

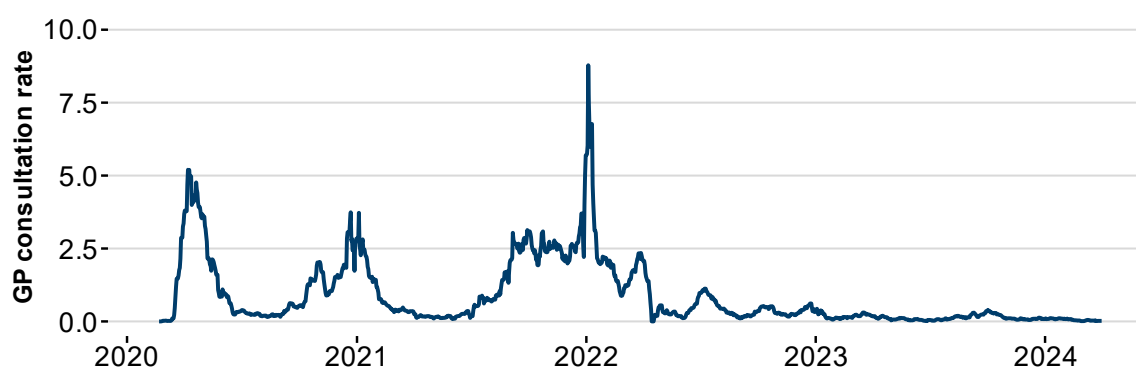


Source: Actuals to 31 March 2024 provided by Public Health Wales (PHW), projected scenarios from 1 September 2024 to 31 March 2025 from SEA

Suspected COVID-19

GP consultation rates due to suspected COVID-19 were high in 2020/21 and 2021/22 reaching 446.8 and 611.5 consultations per 100,000 population annually. This number dropped to around 38 consultations per 100,000 population in 2023/24 suggesting the impact of COVID-19 pandemic on the primary care system has reduced considerably.

Figure 39: 7-day rolling average of daily suspected COVID-19 GP consultation rate, March 2020 to March 2024



Source: Public Health Wales

Acute Respiratory Infections

UKHSA defines acute respiratory infections (ARI) as the acute onset of one or more of the respiratory symptoms listed at [People with symptoms of a respiratory infection including COVID-19](#) and a clinician's judgement that the illness is due to a viral acute respiratory infection (for example COVID-19, flu, respiratory syncytial virus (RSV)).²⁴ During the winter of 2022/23, there was a peak of 78.8 acute respiratory infection (ARI) consultations per 100,000 population. In contrast, the winter of 2023/24 saw a smaller peak, with 29.6 consultations per 100,000. Total ARI GP rate dropped in 2023/24 with only 6,331.5 consultations per 100,000, compared to 8,706.1 per 100,000 population in 2022/23.

Figure 40: 7-day rolling average of daily Acute respiratory infections (ARI) GP consultation rate, March 2020 to March 2024



Source: Public Health Wales

²⁴ [Infection prevention and control \(IPC\) in adult social care: acute respiratory infection \(ARI\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/infection-prevention-and-control-ipc-in-adult-social-care:acute-respiratory-infection-ari)

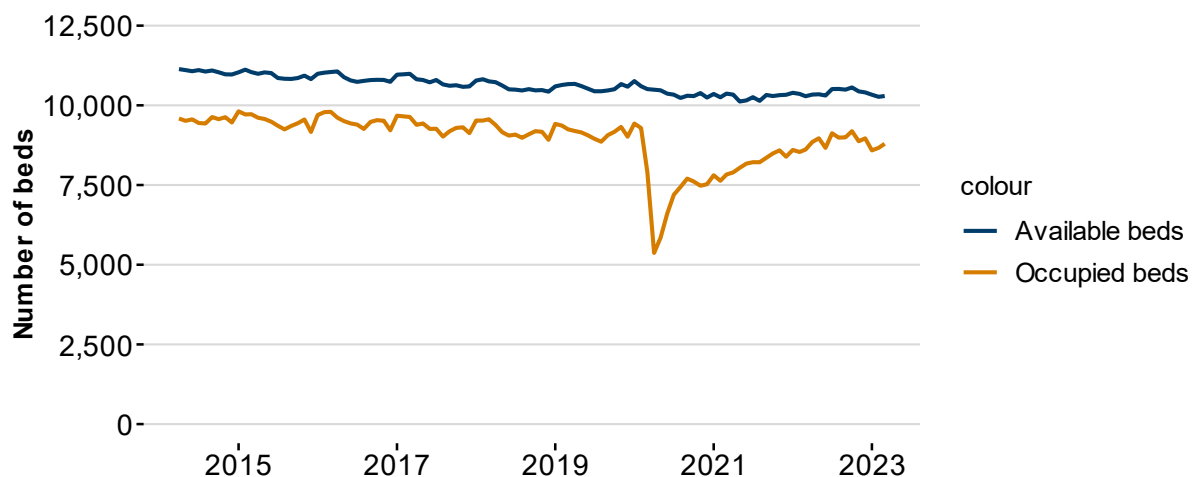
Capacity and Resilience

Top Line Summary

- All scenarios suggest that the paediatric bed occupancy is likely to peak in November 2024 with peak values between of 271 and 419 occupied beds per day.
- Overall, patients waiting to start treatment increased to 768,899 in March 2024, the maximum recorded figure since September 2011.
- Referrals with a wait time of above 36 weeks was the highest during August 2022 when it reached a maximum of 271,165. In 2023/24, this decreased to 251,287 in March 2024.

NHS Hospital Beds

Figure 41: Number of beds available and occupied, April 2014 to March 2023.



Source: [Monthly NHS beds data by measure, site and specialty, March 2014 onwards \(gov.wales\)](https://gov.wales)

Between April 2014 and March 2023, the number of beds occupied by patients in hospitals in Wales never exceeded the number of beds available. This is contrary to the pressures in demand observed in hospitals which is often publicised whereby patients are unable to obtain hospital beds. The difference between the number of hospital beds available and those occupied could be attributed to several factors such as:

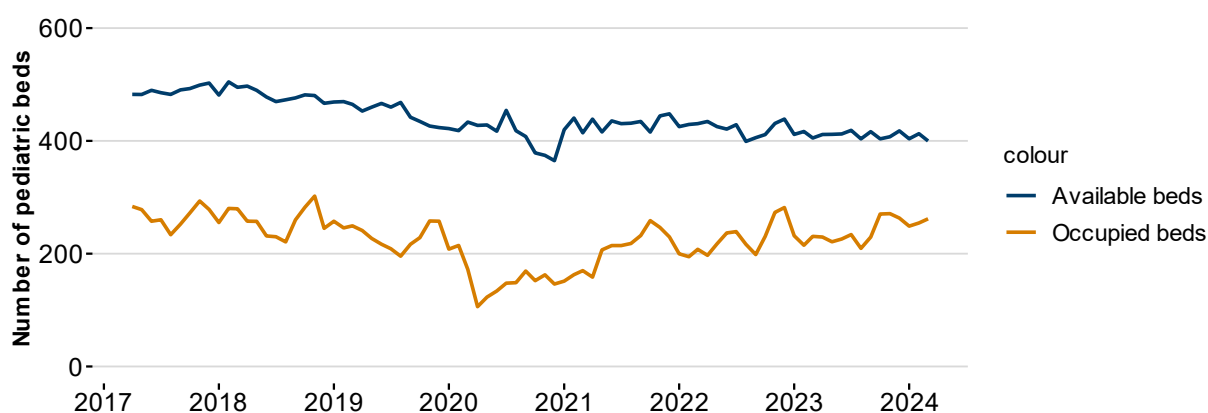
- Staffing issues where a shortage of health care staff may limit the hospital's ability to utilise their beds effectively,
- Specialised care requirements where some patients require care that is only available in certain types of beds (eg. ICU, cardiac care or paediatric beds)

- Emergency admissions where hospitals may face sudden surges leading to a temporary mismatch between bed availability and demand. During these peaks, patients may be placed in corridors until beds become available
- Hospital policies and procedures where some hospitals may mandate keeping a percentage of hospital beds free for emergency situations
- Logistical and administrative delays where cleaning and preparing beds could lead to delays in a bed becoming available again after a patient is discharged from it

NHS Paediatric Hospital Beds

Paediatric beds are defined here as beds designated for paediatric care, typically to those aged 0 to 18 years. The annual peak for the number of paediatric beds occupied in Wales was between 258 and 302 beds per day from 2017/18 to 2023/24, with the exception of 2020/21 when the peak was 170 beds occupied per day. The peak in 2023/24 equated to 67% of the available beds being occupied. This is the highest peak in percentage occupied across the timeseries analysed. Figure 42 shows that the number of beds occupied in Wales has remained below the beds available across the whole timeseries.

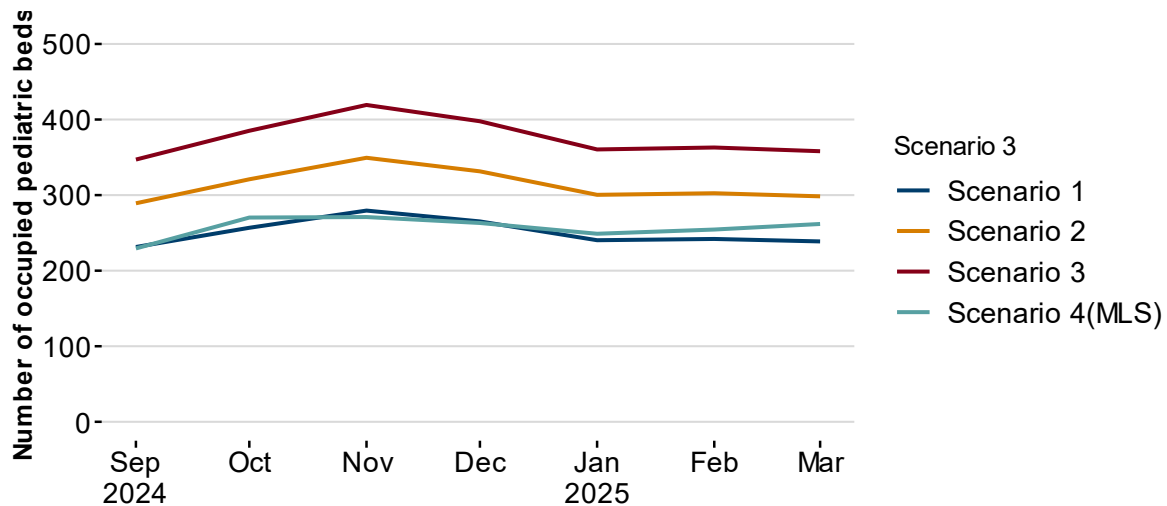
Figure 42: Number of paediatric beds available and occupied, April 2017 to March 2024



Source: Digital Health and Care Wales

Using the historical data, the following scenarios for number of paediatric beds occupied were created. Scenario 1 was the average of the non-pandemic years (2017/18, 2018/19, 2019/20, 2022/23 and 2023/24). Scenarios 2 and 3 are obtained by multiplying Scenario 1 by scalars 1.25 and 1.5. Scenario 4, which repeats last year's paediatric beds data, is considered the most likely scenario.

Figure 43: Number of paediatric beds occupied scenarios for 2024/25 winter.

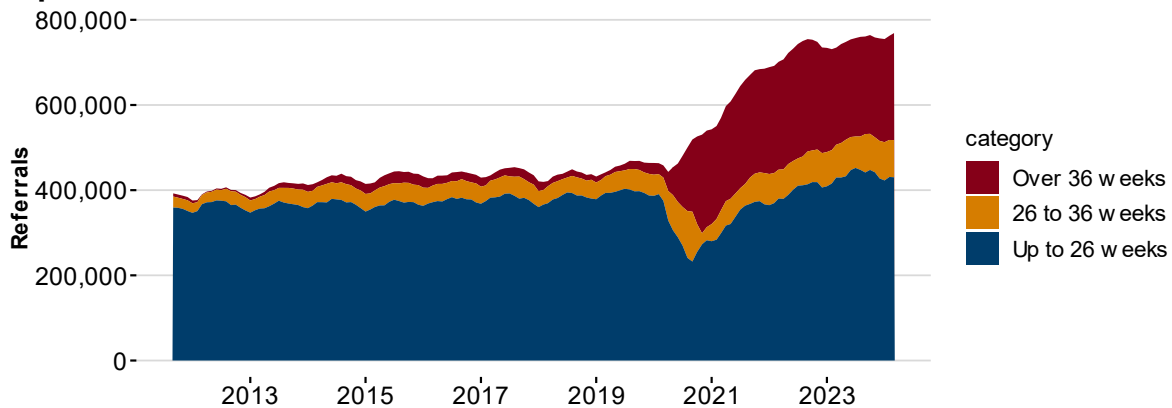


Source: Actuals to 31 March 2024 provided by DHCW projected scenarios from 1 September 2024 to 31 March 2025 from SEA

All scenarios suggest that the paediatric bed occupancy is likely to peak in November 2024 with peak values of 280, 349, 419 and 271 occupied beds per day (scenario 1-4 respectively).

Referrals

Figure 44: Referral to treatment patient waiting times to start treatment, September 2011 to March 2024



Source: [Patient pathways waiting to start treatment](#) (StatsWales)

The patients receiving referrals from a GP or other medical practitioner to hospital for treatment in the NHS in Wales were categorised by the wait times: up to 26 weeks, 26-36 weeks and above 36 years.²⁵ Overall, patients waiting to start treatment increased in the month of April 2023 from 743,060 to 768,899 in March 2024. This increase is the maximum recorded figure since September 2011. Referrals with a wait time of above 36 weeks was the highest during August 2022 reaching a maximum of 271,165 during the period covered by the chart (September 2011 to March 2024).

²⁵ [Referral to treatment \(gov.wales\)](#)

However, the number of monthly referrals has been increasing since September 2023 and reached 271,872 in June 2024.

Industrial Action

Between 7am on Monday 15 January to 7am on Thursday 18 January 2024, industrial action by junior doctors took place. During this 72-hour period, data from self-assessments provided by Local Health Boards in Wales showed that 41% (22,258) of outpatient appointments and 62% (1,467) of surgical cases were cancelled or postponed. Knowing this should allow for more accurate modelling prior to future strikes. There are however other varying factors to consider for any potential future industrial action, including the increased amount of annual leave booked during a holiday (eg. Easter) by staff who could potentially cover the staff shortages.

In June 2024, the British Medical Association's (BMA's) consultants, junior doctors and SAS (specialist, associate specialist, and specialty doctors) committees in Wales have all accepted the Welsh Government's pay offers after members voted in favour of the deals, putting an end to the three separate pay disputes for doctors working in secondary care. The acceptance of the pay offers following the referendum officially puts an end to the current pay disputes.²⁶ A GP strike has been announced in England on 2 August 2024. It is unclear whether similar action will take place in Wales, but early planning may help mitigate any impacts of any future industrial action by health care workers.

²⁶ [Doctors in Wales vote to accept pay offers - BMA media centre - BMA](#)

Vaccine uptake

Top Line Summary

- Vaccine uptake for flu has remained fairly stable between 2020/21 and 2023/24. Vaccine uptake for COVID-19 (at least 1 dose in 2020/21 and a booster in subsequent years) has decreased from 97% in 2020/21 to 75% in 2023/24, meaning uptake rates are now similar to those for flu.
- Recent studies assessing vaccine uptake interventions report varying results. There is evidence to support the effectiveness of providing information on the benefits and risks of a vaccine from a trusted source, as well as for behaviourally informed reminders such as letters, phone calls and texts.
- 40% of respondents to a Public Health Wales survey said they would need more information before deciding whether or not to accept the new Respiratory Syncytial Virus (RSV) vaccine this winter, in addition to the 14% who said they would not accept it.

Evidence on vaccine uptake and interventions

Each winter, vaccinations are offered to certain groups within the Welsh population, including health and social care workers, children, and those with clinical vulnerabilities. High uptake for flu and COVID-19 vaccinations, as well as a new vaccine for RSV to be introduced in 2024, is critical for minimising pressures on the health service over winter by reducing incidence and severity of illness.

There is some concern that vaccine hesitancy is increasing globally following the COVID-19 pandemic, especially with social media as a tool for sharing anti-vaccine content to a wider audience^{27,28}. Flu vaccine uptake rates among those aged 65 and over in Wales have been above 70% in recent years²⁹ although uptake among those at risk aged below 65 is substantially lower. For both groups, uptake increased during the pandemic compared with winter 2019/20, but decreased again during winter 2023/24. Uptake of COVID-19 vaccines has decreased over time but is now at similar levels to the flu vaccine. It is unclear whether there is a significant problem with vaccine hesitancy for winter vaccines in Wales.

Healthcare workers

Achieving high uptake of winter vaccines among healthcare workers is crucial as they may have higher levels of exposure to viruses and more opportunities to pass on viruses to vulnerable patients/service users if infected. In addition, high levels of sickness absence among healthcare workers over winter puts additional strain on a

²⁷ [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(23\)00136-8/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(23)00136-8/fulltext)

²⁸ <https://www.bmj.com/content/384/bmj-2023-076542>

²⁹ The WHO target for those aged 65 and over is 75% uptake; this was exceeded in Wales for three consecutive winters between 2020/21 and 2022/23.

system which already experiences substantial pressure during this period. It has been previously shown that improving NHS flu vaccination rates can reduce staff sickness absence levels³⁰.

Public Health Wales “Time to talk” surveys

Public Health Wales have asked questions relating to vaccines in several iterations of their Time to Talk panel survey.³¹ In December 2023, 80% of respondents who were offered a COVID-19 booster vaccine for winter 2023/24 said they had already had it or were planning to have it. For the flu vaccine, the equivalent figure was 81%.

In May 2024, survey respondents were asked questions about the vaccine for RSV, which will be offered for the first time in winter 2024/25. When asked if they would accept an RSV vaccine offer, 44% said that they would, 14% said they would not, and 40% said they would need more information in order to make their decision. 80% of the participants reported that they did not have difficulties getting an appointment for a vaccine. There was a spread of responses to the acceptable travelling distance for a vaccine appointment from up to 1 mile (10%), up to 3 miles (26%), Up to 5 miles (33%), up to 10 miles (21%) and over 10 miles (7%), reflecting a broad range of circumstances and or attitudes to travel. The most preferred appointment slots were in the morning on a Monday, Tuesday, Wednesday and Saturday, whilst evenings were least preferred across all the days amongst the respondents.

Vaccine uptake in Wales

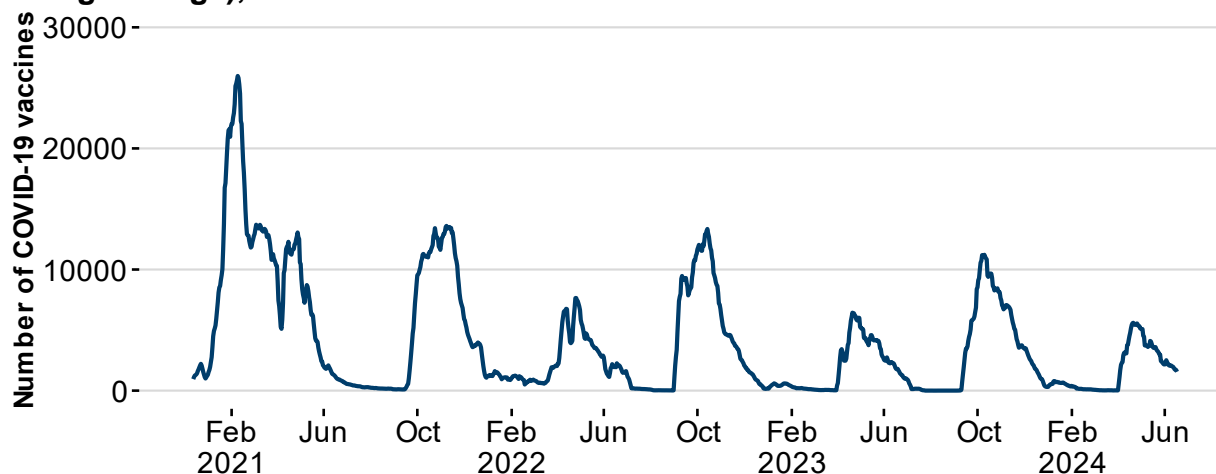
COVID-19 Vaccinations

Since vaccination programmes (for COVID-19 and flu) are often rolled out in Autumn (and again the following spring for COVID-19), we have taken the vaccination years in our analysis to run from 1 September to 31 August. We have used the ONS population mid-year estimates to estimate the size of the population aged 65 and above in Wales. For example, the 2020/21 vaccine year would include vaccines administered in Wales between 1 September 2020 and 31 August 2021 and would use the mid-2021 population size to estimate the vaccine uptake levels. Note that, in the absence of population estimates beyond mid-2022, we have also used the mid-2022 population estimate for the 2022/23 and 2023/24 vaccine years.

³⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6297706/>

³¹ <https://phw.nhs.wales/topics/time-to-talk-public-health-panel/time-to-talk-public-health-panel-publications/publications/time-to-talk-public-health-december-2023-panel-survey-findings/>

Figure 45: Number of COVID-19 vaccines administered to health care workers per day, adults aged 65 and above and immunocompromised individuals (7 day rolling average), December 2020 to June 2024

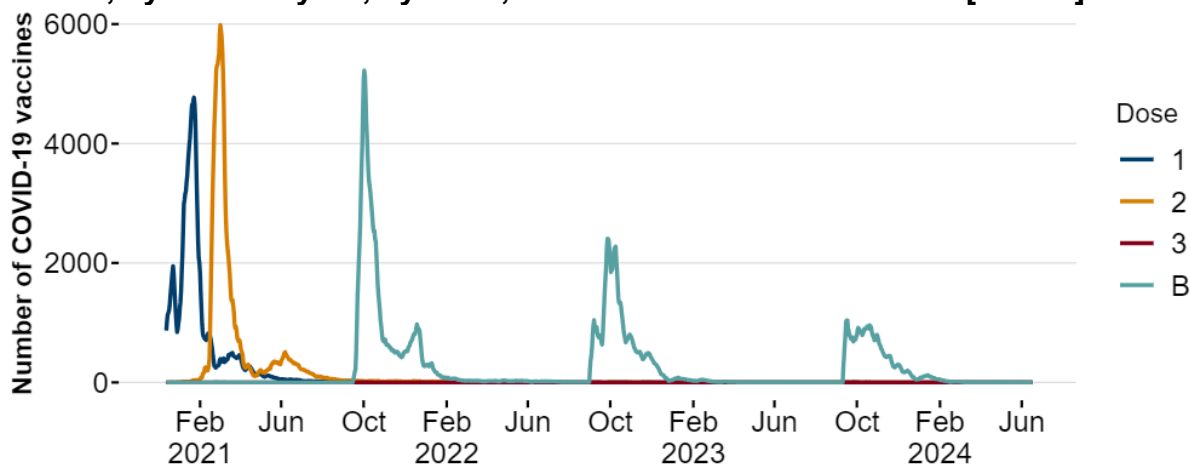


Source: Public Health Wales

The large peak of over 25,000 daily COVID-19 vaccines in early 2021 was due to the initial rollout of the COVID-19 vaccine to a large proportion of the population of Wales. Since then, booster COVID-19 vaccines have been offered to certain individuals (eg. health and social care workers, those aged over 65 and those immunocompromised). Booster programmes have been run twice a year, with an offer to certain individuals in Autumn and then another roll out to fewer individuals in spring for the past 3 years. This explains why the daily vaccines administered peaked at higher levels in Autumn (around 11,000 to 13,500) compared with spring (around 5,000 to 8,000).

Different populations meet different eligibility criteria for COVID-19 vaccine programmes so it may be more useful to look at the populations of those aged 65 and above in Wales, health and social care workers, and those who are immunocompromised separately.

Figure 46: COVID-19 vaccines administered daily to health and social care workers, by vaccine year, by dose, December 2020 to June 2024 [Note 1]

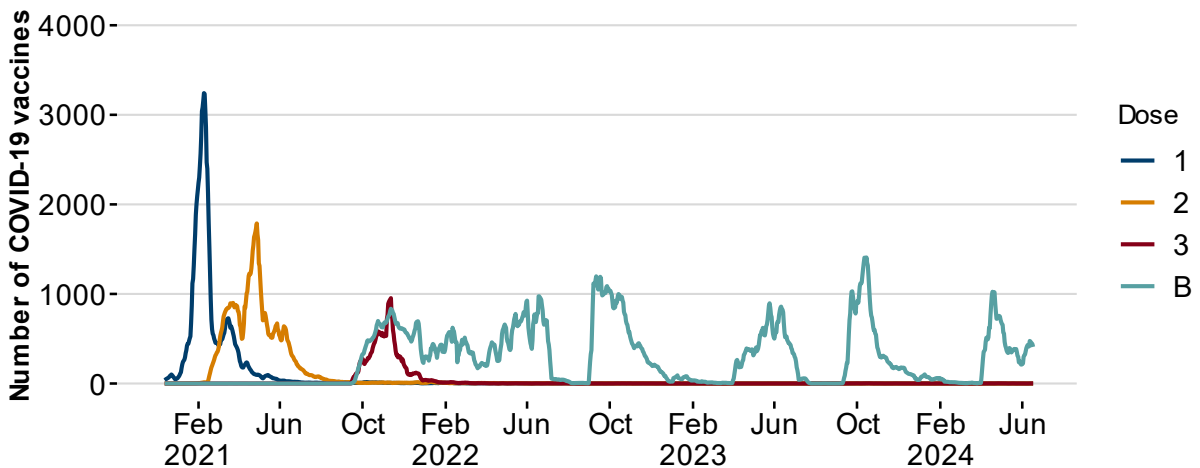


Source: Public Health Wales

[Note 1]: Dose B stands for the booster COVID-19 vaccination.

Though health and social care workers have been eligible for one COVID-19 booster vaccine each year for the past 3 years (2021/22, 2022/23 and 2023/24), the number of COVID-19 total vaccines being administered has decreased each year. Since 2020/21 where 172,000 first doses and 169,000 second doses were administered, the vaccines taken by health and social care workers has decreased from 156,000 vaccines in 2021/22 to 63,000 in 2023/24. Note that, the 2023/24 vaccine year is not complete yet but vaccine uptake tailed off after February 2024 so is unlikely to rise much above this figure.

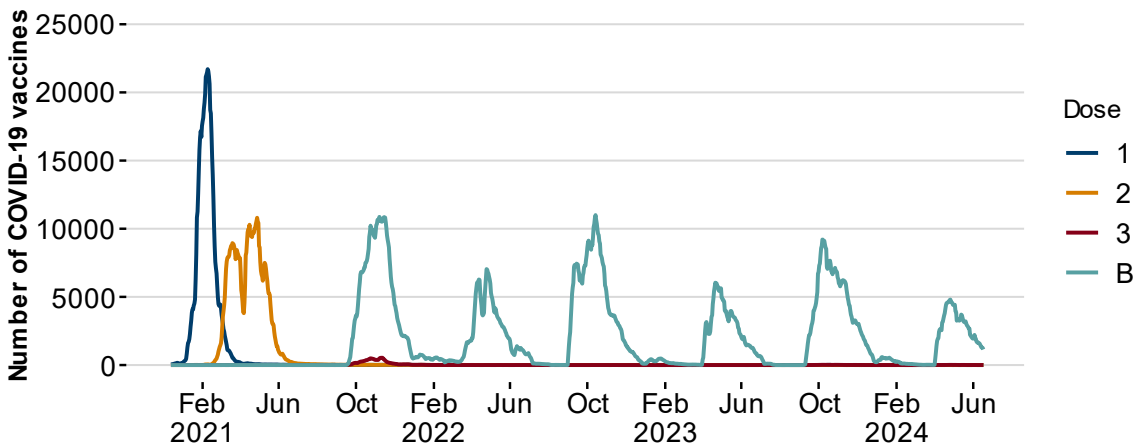
Figure 47: Number of COVID-19 vaccines administered per day (7 day rolling average) to immunocompromised individuals, December 2020 to June 2024



Source: Public Health Wales

The vaccines rolled out to immunocompromised individuals follow a slightly different pattern to other groups eligible for the COVID-19 vaccine. There were 2 clear spikes each year from 2021/22 indicating a separate autumn and spring vaccination programme for health and social care workers and adults aged 65+. This wasn't the case for immunocompromised individuals where numbers of vaccines administered per day did not fall to near zero between September 2020 and June 2021.

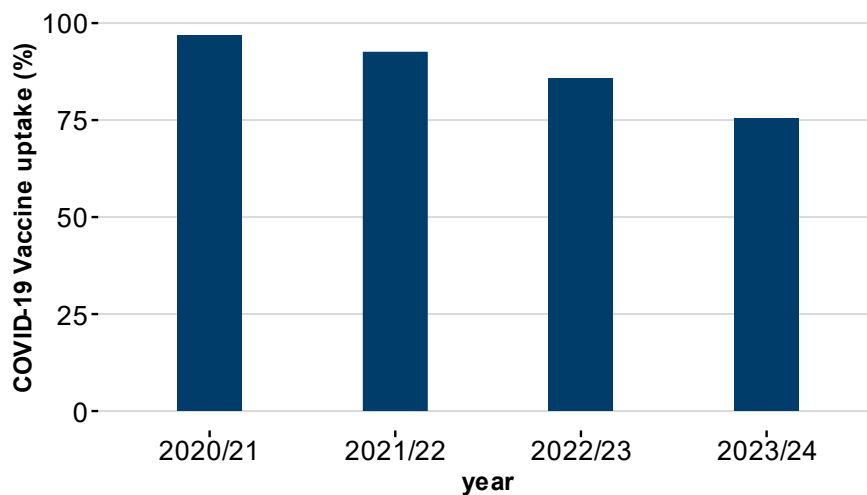
Figure 48: Number of COVID-19 vaccines administered per day (7 day rolling average) to adults aged 65 years and over, December 2020 to June 2024



Source: Public Health Wales

The first course of COVID-19 vaccines included 2 doses. Dose 1 was mainly rolled out between December 2020 and March 2021 and dose 2 between February 2021 and June 2021. A small proportion of the population had a third dose. Since then, boosters have been administered each year, usually with an Autumn vaccination programme followed by a spring vaccination programme. The 2 programme rollouts can be observed in Figure 35 (above), as there are 2 peaks throughout each vaccine year from 2021/22 onwards. Not all those that had the Autumn booster were eligible for the spring booster.³² The second wave in each vaccination year from the spring vaccination programmes are smaller than the autumn vaccination programme waves, at around half the size (50% for 2021/22, 47% for 2022/23, 45% for 2023/24). These figures were used to determine the vaccine uptake of people aged 65 and over in Wales having at least one booster within the year. Note that, some of those who had the spring booster may not have had the previous Autumn booster which may affect the estimation, but these numbers should be small.

Figure 49: Estimated percentage of adults aged 65 and above vaccinated with a COVID-19 vaccine (with dose 1 in 2020/21, and booster in subsequent years), December 2020 to June 2024



Source: Public Health Wales, ONS mid year population estimates

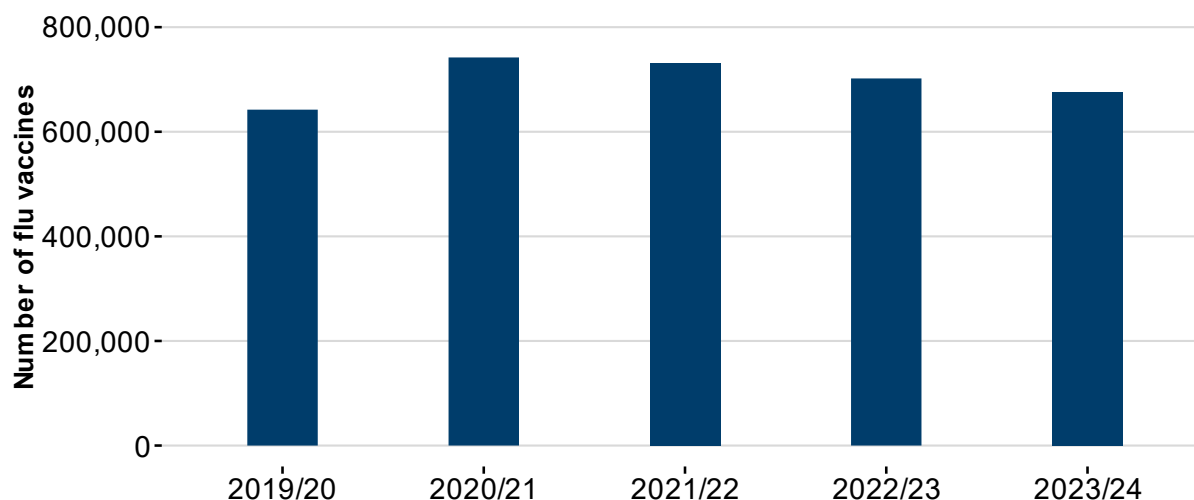
The vaccine uptake of the population of Wales aged 65 and above who have taken a COVID-19 vaccination (at least 1 dose in 2020/21 and a booster in subsequent years) has decreased from 97% in 2020/21 to 75% in 2023/24.

Influenza vaccinations

The vaccine programme offers one flu vaccine per vaccine year to eligible individuals. Therefore, the number of vaccines offered per year are like the same/similar to the number of people vaccinated for flu (which was not the case with COVID-19 where multiple vaccines could be administered within each vaccine year).

³² [COVID-19 vaccination programme | GOV.WALES](#)

Figure 50: Total number of flu vaccines administered to adults aged 65 and above and individuals at risk (aged 6 months - 64 years) October 2019 to March 2024



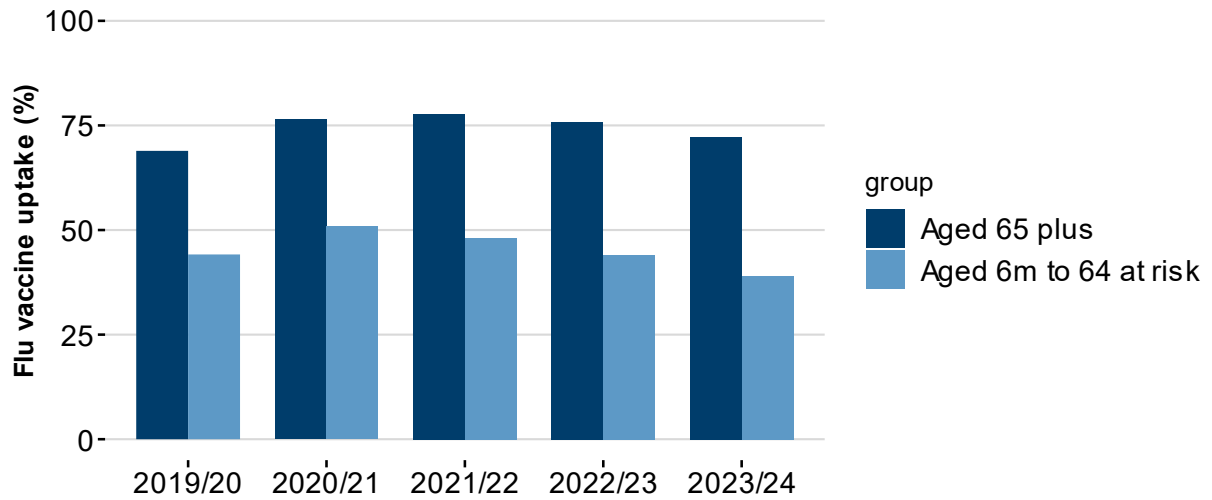
Source: Public Health Wales

Excluding the 2019/20 vaccine year where the flu vaccines administered were lower³³, the number of flu vaccines taken have decreased each year since 2020/21, closer to pre-pandemic levels. The total number of flu vaccines administered per year have decreased from 742,000 in 2020/21 to 676,000 in 2023/24. However, because the population eligible for the flu vaccine (provided by PHW) has also decreased, the vaccine uptake has remained fairly stable (between 67% and 70%).

However, it is useful to look at the different age groups (above 65 years and 6 months -64 year olds at risk). The target flu vaccine uptake for both age groups is 75%. Adults aged 65 and above had higher vaccine uptake than at-risk individuals aged 6 months - 64-years-old, meeting the threshold in the years 2020/21 – 2022/23. However, the at-risk individuals aged 6 months - 64 fell short of the 75% target, with vaccine uptake consistently around 50% or lower in previous years (2020/21 – 2022/23). In the winter of 2023/24, the vaccine uptake was 72% and 39% among adults aged 65 and above and at-risk individuals aged 6 months – 64 years respectively.

³³ [Table \(nhs.wales\)](#)

Figure 51: Estimated percentage of people vaccinated with the flu vaccine, October 2019 to March 2024

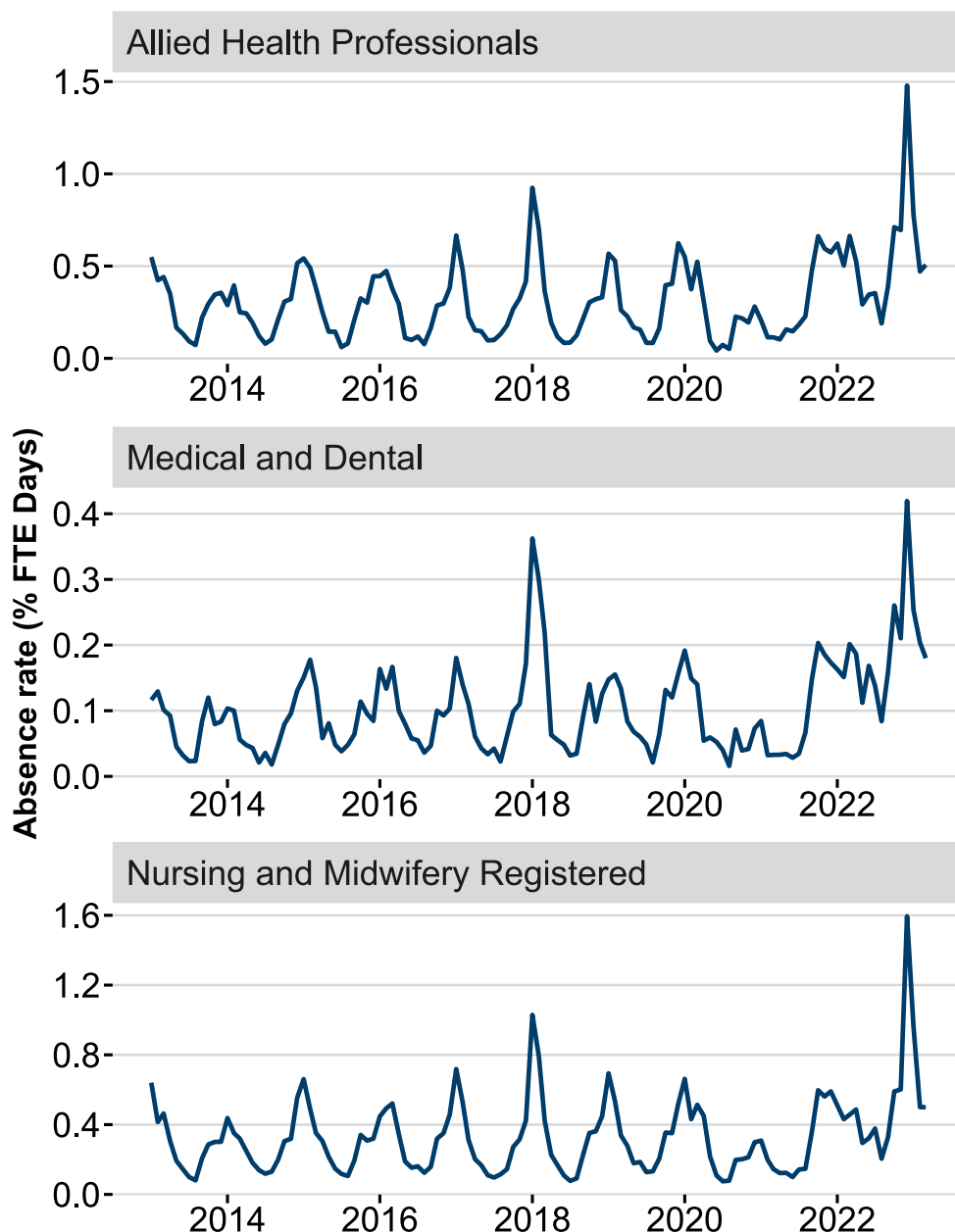


Source: Public Health Wales, ONS mid year population estimates

Absence rates of health care workers and the effect of flu vaccine uptake

Since health care workers are eligible for certain vaccines (flu, COVID-19 etc), we analysed whether there was a relationship between vaccine uptake and absence rates for each health care worker group (Allied health professionals, medical and dental, nursing and midwifery).

Figure 52: Monthly absence rate (% FTE days available) due to cold, cough or flu among different staff groups from 2013-2023.



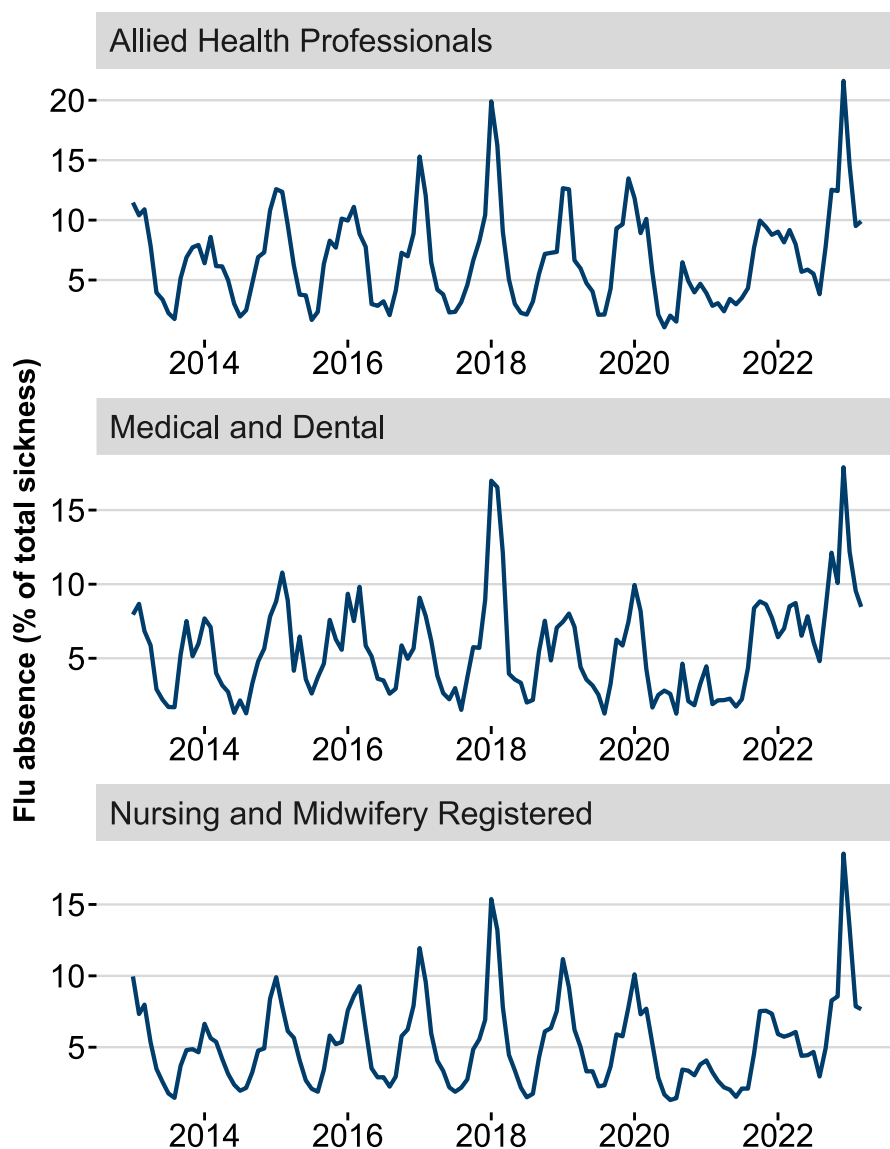
Source: Health Education and Improvement Wales (HEIW)

Between January 2013 and March 2023, the absence rate due to cold, cough or flu was lowest among medical and dental staff averaging to 0.10% within the given time frame. The average absence rate of nurses and allied health professionals was 0.33% and 0.31% respectively, around three times that of medical and dental staff resulting in 0.73 and 0.69 days per person lost due to flu each year.

Absence rate due to flu, cold and cough cycled periodically among health care workers (HCWs) in Wales, peaking each winter. Absence rates due to flu decreased in 2020-21 and 2021-22 flu seasons when compared to previous seasons before the COVID-19 pandemic. However, the 2022-2023 season saw a rise in absence rates in

comparison. Peak absence rates due to cough, cold and flu were 1.59% for nurses, 0.42% for medical staff, and 1.48% for Allied Health Professionals occurring in the month of December 2022.

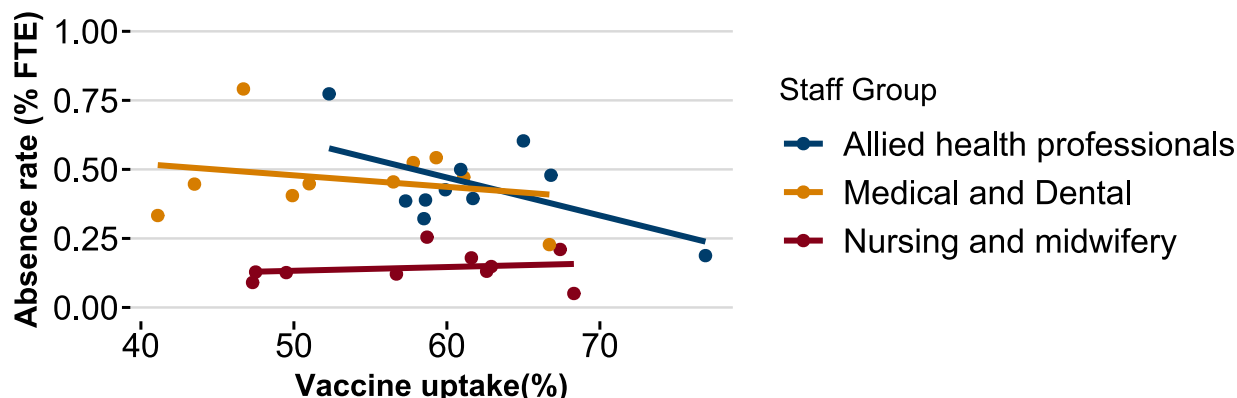
Figure 53: Monthly absences due to cold, cough or flu (% of total sickness) among different staff groups from 2013-2023.



Source: Health Education and Improvement Wales (HEIW)

Absences due to flu as a percentage of absences due to all sickness was plotted between 2013/14 and 2022/23 seasons. Flu on average accounted for 5.25%, 5.64%, and 6.78% of occurrences of sickness absence among nurses, medical staff, and allied health professions respectively. This increased to around 10% each winter during the peak of flu season. The 2022/23 season saw a high occurrence of absences due to flu reaching a maximum of 18.56% ,17.89%, and 21.61% among nurses, medical staff, and allied health professions respectively.

Figure 54: Linear regression using vaccine uptake and staff group type as predictor variables and average absence rate (% full time equivalent) due to flu each season as the response variable.



Source: Public Health Wales and Health Education and Improvement Wales

To better understand if the vaccine uptake reduced absence rate, a fixed effects linear model was employed with vaccine uptake and staff group type as predictor variables. The model explains around 60% of the variation in absence rates (Adjusted $R^2 = 0.5981$). The model predicts a weak negative relationship between vaccine uptake and absence rate in allied health professionals ($\beta = -0.014$, $p < 0.018$). In other words, 10 percentage points increase in vaccine uptake is significantly associated with a reduction of 0.14 percentage points sickness absence rate in allied health professionals. However, there was no significant relationship found between vaccine uptake and absence rate in medical and dental staff and nurses ($\beta = -0.004$ and 0.001 , $p > 0.05$).

RSV vaccinations

In September 2024, the UK will become the first country in the world to offer a national vaccination programme that uses the same vaccine to protect both infants and older adults from RSV. ³⁴ The new routine RSV vaccination programme will be offered year-round to older adults, as they turn 75 years old and pregnant women, who will be offered vaccination at 28 weeks gestation, with a catch-up programme for those already past 28 weeks gestation, but that have not yet given birth. ³⁵

Both the maternal and older adults programmes will commence on 1st September 2024. As explored more fully in the RSV section, it is likely that the reduction on the number of people contracting the virus will be more evident in older people than infants. For the older group vaccine uptake suffers from a lag but can be completed within this winter season. For infants the lag between the vaccination and birth date for the maternal vaccinations and the part of the 0 to 4 population affected this year leads to a smaller initial effect. We will continue to monitor both vaccine uptake and the RSV hospitalisations over the winter months compared to historical data.

³⁴ [National RSV vaccination programme announced - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/national-rsv-vaccination-programme-announced)

³⁵ [Introduction of RSV vaccination programme 2024 \(WHC/2024/032\) \[HTML\] | GOV.WALES](https://www.gov.wales/government/news/introduction-of-rsv-vaccination-programme-2024)

Socio-Economic Factors

Top Line Summary

- Impacts of the cost-of-living crisis are still being felt by households despite inflation returning to target levels.
- High food and energy prices relative to wages and benefits mean ongoing risks relating to hunger, poor-quality diets and cold homes. Fuel poverty is associated with winter mortality and hospital admissions for respiratory conditions. Malnutrition and obesity can increase risk of infections such as COVID-19 and flu, result in a slower recovery, and increase likelihood of hospital admission.
- Socio-economic deprivation is associated with higher hospital admissions in winter for both flu and COVID-19.
- The number of people out of work due to long-term sickness is at an historic high. Diversion of resources away from planned care over winter to cope with emergency pressures may exacerbate current backlogs and levels of economic inactivity.
- Some people in Wales struggle to get an appointment with their GP, which may add to winter pressures in emergency care if patients subsequently present at A&E, particularly if they have become more unwell in the meantime.
- Regardless of entry point to the healthcare system, patients and service users experiencing hardship due to the cost of living may benefit from signposting to appropriate financial support and advice in addition to their medical care and treatment.

Macroeconomic overview

Continued pressures on household costs are demonstrated in responses to the Opinions and Lifestyle Survey (OPN) during the combined survey period 10 May to 30 June 2024³⁶. The cost of living was cited as one of the most important issues facing the UK by 87% of respondents.

Essential expenditure

Increased costs will disproportionately impact lower-income households, who typically spend a higher proportion of their income on essential expenditure. With energy costs remaining high, risks associated with living in a cold home are likely to be a persistent contributor to public ill-health over the winter period. The most common ailments seen as a result of poorly heated homes are circulatory diseases, respiratory problems, and mental ill-health. Other conditions which are influenced or exacerbated by cold

³⁶<https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/bulletins/publicopinionsandsocialtrendsgreatbritain/latest>

housing include the common flu and cold, as well as arthritis and rheumatism. Analysis of official data by End Fuel Poverty Coalition estimates that cold housing contributes to a substantial number of excess deaths over winter³⁷. A Public Health Wales report on winter health and well-being³⁸ states that fuel poverty³⁹ in particular has been linked to hospital admissions for respiratory conditions, and that fuel-poor households have a “significant risk” of winter morbidity. This has cost implications for the NHS and care services, with increased demand for GP appointments, A&E visits, hospital stays, and social care and support.

Given the cost of food remains high in relative terms, it is unlikely that food insecurity levels will lessen substantially over the coming winter period. Malnutrition can increase the risk of being infected with COVID-19 and result in a slower recovery from it⁴⁰. Hunger can have immediate health risks such as decreased immunity, poorer mental and physical health, and can cause malnutrition, heart disease and fatigue⁴¹. The long-term impacts may also be seen in children’s educational attainment, particularly during school holidays when free school meal provision is varied⁴². In times where budgets are stretched, it is also imperative to safeguard good quality healthy food in schools, since this also has an impact on educational attainment as well as authorised absences, which are usually linked to illness and health⁴³.

Over the long-term, poor diet and nutrition can cause high body mass index (BMI), high blood pressure, cardiac disease, diabetes, and malnutrition⁴⁴. Obesity and living with excess weight, which can result from a poor-quality diet, also increases the risk of requiring hospitalisation for COVID-19⁴⁵. In general, poor nutrition has been shown to increase the risk of bacterial, viral, and other infections.⁴⁶

Socio-economic deprivation

Socio-economic deprivation is associated with higher likelihood of hospital admission due to flu and COVID-19. NHS England found that flu admission rates for people living in the most deprived areas were, on average, 2.6 times higher than the least deprived areas during the 2022/23 winter period and corresponding COVID-19 admission rates were 2.1 times higher.⁴⁷

³⁷ [4,950 excess winter deaths caused by cold homes last winter \(endfuelpoverty.org.uk\)](https://endfuelpoverty.org.uk)

³⁸ <https://phw.nhs.wales/news/winter-health-how-we-can-all-make-a-difference/report/>

³⁹ Fuel poverty is defined in Wales as a household needing to spend more than 10% of net income on fuel to heat their home to an adequate standard of warmth.

⁴⁰ <https://www.guysandstthomas.nhs.uk/health-information/coronavirus-covid-19-and-malnutrition#:~:text=Malnutrition%20can%20increase%20your%20risk,need%20to%20make%20some%20change>

⁴¹ [Why preventing food insecurity will support the NHS and save lives | NHS Confederation](https://www.nhs.uk/health-information/coronavirus-covid-19-and-malnutrition#:~:text=Malnutrition%20can%20increase%20your%20risk,need%20to%20make%20some%20change)

⁴² [On the interplay between educational attainment and nutrition: a spatially-aware perspective | EPJ Data Science](https://www.nhs.uk/health-information/coronavirus-covid-19-and-malnutrition#:~:text=Malnutrition%20can%20increase%20your%20risk,need%20to%20make%20some%20change)

⁴³ [Healthy school meals and educational outcomes - ScienceDirect](https://www.nhs.uk/health-information/coronavirus-covid-19-and-malnutrition#:~:text=Malnutrition%20can%20increase%20your%20risk,need%20to%20make%20some%20change)

⁴⁴ [NHS England » Food and nutrition](https://www.nhs.uk/health-information/coronavirus-covid-19-and-malnutrition#:~:text=Malnutrition%20can%20increase%20your%20risk,need%20to%20make%20some%20change)

⁴⁵ <https://nutrition.bmj.com/content/early/2022/01/18/bmjnp-2021-000375>

⁴⁶ <https://nutritionsource.hsph.harvard.edu/2020/04/01/ask-the-expert-the-role-of-diet-and-nutritional-supplements-during-covid-19/>

⁴⁷ <https://www.gov.uk/government/publications/covid-19-and-flu-inequalities-in-emergency-hospital-admission-rates/inequalities-in-emergency-hospital-admission-rates-for-influenza-and-covid-19-england-september-2022-to-february-2023#:~:text=influenza%20admission%20rates%20for%20people,than%20the%20least%20deprived%20areas>

Economic Activity

The percentage of the population off work due to temporary sickness saw a peak during the COVID-19 pandemic and has since stabilised to pre-pandemic levels. However, the percentage of the population classed as “economically inactive” due to long-term sickness has been rising since mid-2021, accounting for 30.0% of economically inactive people in the three months to April 2024, compared with 24.9% in the same period in 2021. The number of people out of work due to ill-health is now at a historic high, following a long-term trend of decline despite population increases. Analysis by the ONS shows that for in the three months to March 2023 (the most recently available data), the most common cause of long-term sickness was “depression, bad nerves or anxiety”, with 53% reporting this as their main or secondary health condition.⁴⁸.

The rise in economic inactivity due to long-term sickness may be caused by a number of factors, some of which are related to the COVID-19 pandemic. In addition to the health impacts of long-covid for some individuals, the pandemic response saw a reduction and subsequent backlog in elective care, diagnostic services and therapies in the NHS, and hospital waiting lists are now at extremely high levels⁴⁹. Some individuals may be unable to work until they have undergone their procedure or treatment, notably those awaiting orthopaedic surgeries such as hip and knee replacements.⁵⁰

It can be challenging for the NHS to maintain planned care over the winter period, as an increase in emergency care demand (such as in the event of high levels of respiratory illness) may necessitate a diversion of resources. If this occurs, it could exacerbate the problem of economic inactivity while waiting for planned care by keeping people out of work for longer, or adding to the number of people leaving the workforce as they wait for care.

Access to GPs

The National Survey for Wales (NSW) asked a series of questions about access to hospital and GP services for the period from April 2021 to March 2022⁵¹. Evidence from the Welsh Index of Multiple Deprivation shows that, in theory, those living in rural areas suffer higher levels of deprivation with regard to GP access as they typically have further to travel to their nearest surgery, particularly if they are reliant on public transport⁵². However, the NSW data demonstrates that it is those in urban areas who report greater difficulty in getting a convenient GP appointment in practice. Almost a quarter (24%) of respondents in the Cardiff & Vale University Health Board area said it was “very difficult” to get a convenient appointment compared with just 10% in Powys

⁴⁸ [Rising ill-health and economic inactivity because of long-term sickness, UK - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk)

⁴⁹ <https://www.gov.wales/nhs-activity-and-performance-summary-may-and-june-2024.html>

⁵⁰ <https://www.health.org.uk/publications/long-reads/what-we-know-about-the-uk-s-working-age-health-challenge>

⁵¹ [Hospital and GP services \(National Survey for Wales\): April 2021 to March 2022 | GOV.WALES](#) and [National Survey for Wales: results viewer | GOV.WALES](#)

⁵² [Indicator data by Rural/Urban Settlement Classification - All Domains \(gov.wales\)](#)

Teaching Health Board area. Geographic differences in GP access are likely to cause disparities by ethnicity, since those belonging to ethnic minority groups are concentrated in urban areas of Wales.

Those responding to the Commissioner's survey, who had been unable to get a suitable appointment with their GP in a timely manner, provided a variety of responses as to what course of action they took as a result. Many chose to keep trying or to accept an appointment at a later date, but some turned to pharmacies, A&E or the NHS 111 service. Others gave up entirely and opted to suffer or self-medicate. Those who find themselves unable to see a GP when they need to, or who have not experienced the care they expected, may subsequently seek help in other parts of the health service. This has the potential to add to pressures in emergency care if patients, who could have been treated by a GP, subsequently present at A&E or out-of-hours services, particularly if they have become more unwell as a result of delays to getting treatment.

In addition, GPs are accustomed to signposting patients to appropriate advice and support beyond their immediate medical care, such as debt support. They can also act as "social prescribing practitioners", recognising that addressing non-medical needs can improve health and wellbeing. Given the winter health risks associated with cold homes, poor diet/hunger and socio-economic deprivation, difficulty accessing support that helps people alleviate these issues could have knock-on effects for the health service.

Discussion

The upcoming 2024/25 winter season will likely see a rise in respiratory viruses as we see each year. The scenarios in this paper give an insight into how these viruses may impact the demand for healthcare in Wales across primary and secondary care.

Vaccination programs remain a first line of defence against an unprecedented rise in cases for the most vulnerable people in the population. With the rollout of the RSV vaccine which will be offered to older adults and pregnant women from 1 September 2024, there may be a reduction on hospital admissions, particularly in babies. The impact (eg. Potential reduction in hospital admissions due to RSV) may increase over the years as more children and older adults become protected by the RSV vaccine.

This paper outlines that it is not only the rise in winter viruses that could increase demand but social-economic factors too. With long-term sickness and unemployment at high levels, coupled with high energy and food prices, we could see a rise in cases from people struggling financially to protect themselves against winter illnesses.

There is also the potential for a rise in cases in a condition that is not expected, like the case of Strep A in winter 2022-23. Cases of Monkeypox (Mpox) have been spreading in parts of Africa and 2 cases of a new clade (Clade 1b) have been identified in Sweden and Thailand.^{53 54} Therefore, there is potential for Mpox to spread to the UK so this may need to be taken into account when planning for winter. Similarly, earlier in the year, avian flu spread in cattle across the USA.⁵⁵ The risk assessment for avian flu remains the same, but the response is being managed more pragmatically.

Over the winter months, there will be continued surveillance of acute respiratory viruses which will allow us to provide insight into what could happen on a shorter-term basis. This includes continuous production of modelled scenarios throughout the winter period to provide the health and care sector with scenarios to inform decision making.

⁵³ [Mpox is spreading rapidly. Here are the questions researchers are racing to answer \(nature.com\)](#)

⁵⁴ [Thailand Confirms First Case of New, Deadlier Mpox Strain, Clade 1b - The New York Times \(nytimes.com\)](#)

⁵⁵ [CDC A\(H5N1\) Bird Flu Response Update August 16, 2024 | Bird Flu | CDC](#)

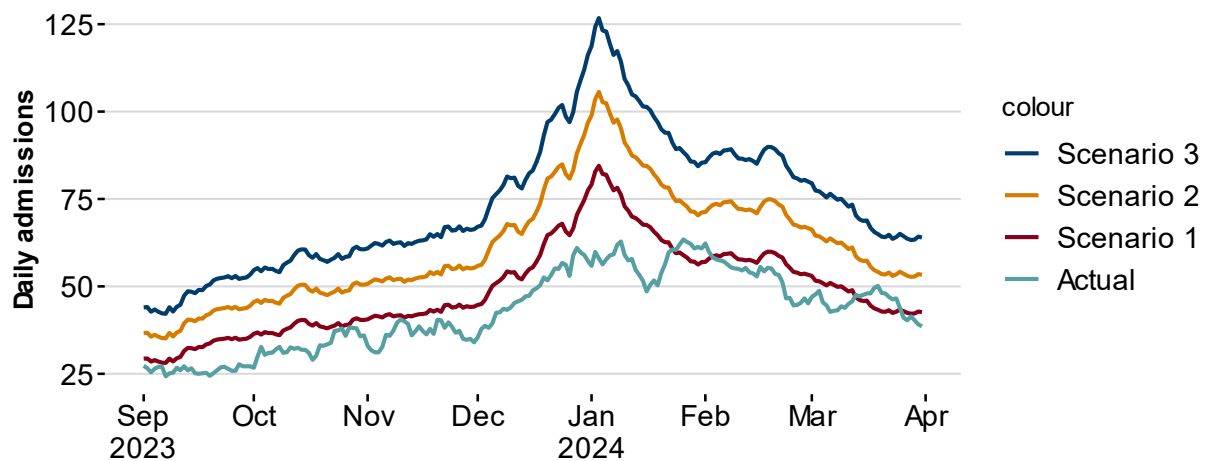
Appendix

Retrospective analysis of 2023/24 winter modelling

Top Line Summary

- Actual flu and pneumonia admissions data closely followed scenario 1 but did not exhibit the sharp peak estimated by scenario 1. Actual daily admissions showed a flatter peak and remained above 50 from the 3rd week of December to the 3rd week of February.
- Between September 2023 and March 2024 daily admissions for RSV peaked on November 6th, 25 days earlier than predicted by scenarios 1 and 2. The peak height reached 40 admissions, falling between the projections of scenario 1 and 2.
- The actual COVID-19 admissions tracked below the most-likely scenario throughout the 2023/24 winter. Actual admissions data revealed several peaks during the winter season, with 40 admissions recorded on 28th September 2023, and 35 admissions on 2nd January 2024.

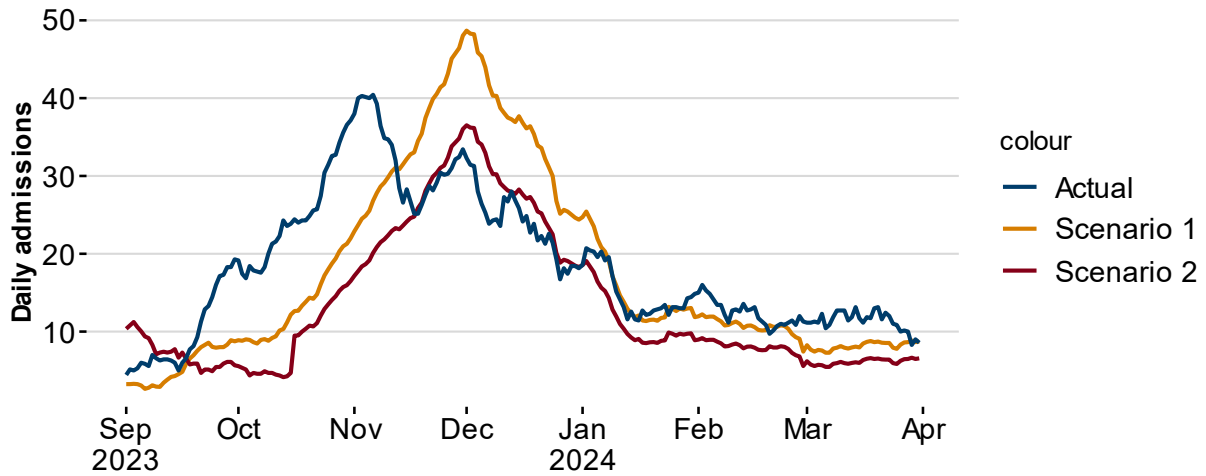
Figure A1: Comparison of flu and pneumonia daily admissions scenarios vs actuals in Wales between September 2023 and March 2024



Source: Digital Health and Care Wales and SEA calculations

Last year's scenarios for flu and pneumonia predicted daily admissions peaking between 85 (scenario 1) and 127 (scenario 3) during the first week of January. While the actual admissions data closely followed scenario 1, it did not exhibit the sharp peak estimated by scenario 1. Actual daily admissions showed a flatter peak remained above 50 from the 3rd week of December to the 3rd week of February.

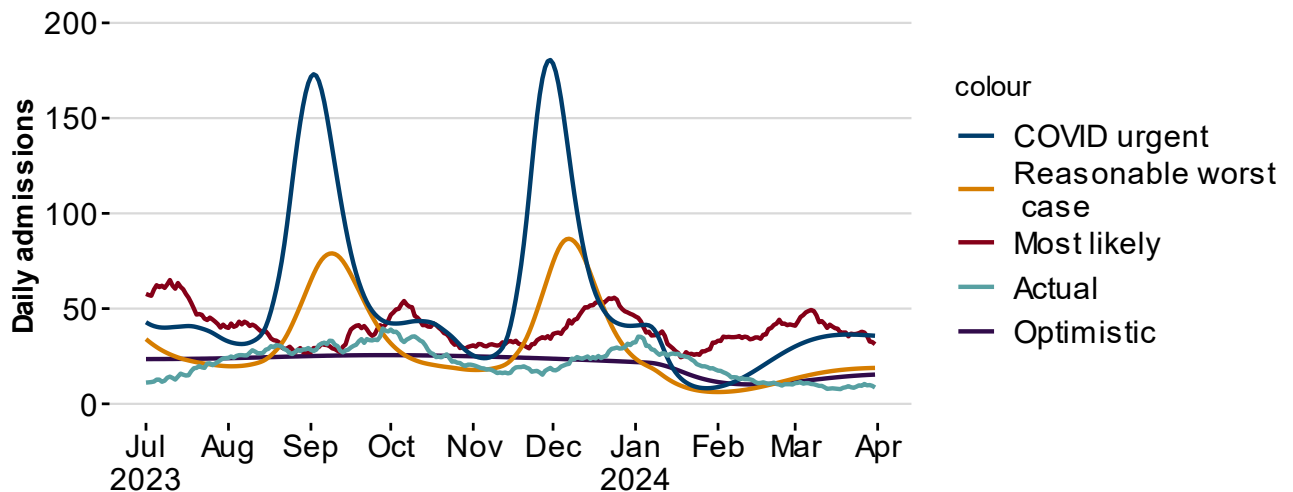
Figure A2: Comparison of RSV paediatric (ages 0-4) daily admissions scenarios vs actuals between September 2023 and March 2024



Source: Digital Health and Care Wales and SEA calculations

Scenarios 1 and 2 estimated daily RSV paediatric admissions to peak at 49 and 37 admissions in the first week of December. However, the actual daily admissions peaked on November 6th, 25 days earlier than estimated by scenarios 1 and 2. The peak height reached around 40 admissions, falling between the projections of scenario 1 and 2.

Figure A3: Comparison of COVID-19 daily admissions scenarios vs actuals between July 2023 and March 2024



Source: Public Health Wales and Swansea University modelling.

For the winter of 2023/24, COVID-19 daily admissions scenarios were created where a new variant that dominates every three months (cos wave) was introduced. The scenarios explored a range of natural immunity lengths, spanning from 100 to 300 days. Within these scenarios, cos waves were multiplied by

1, 1.2, and 1.5 to create optimistic, reasonable worst-case, and COVID-19-urgent scenarios, respectively. The most likely scenario was the repeat of 2022/23 winter. The analysis shows that the actual COVID-19 admissions tracked below the most-likely scenario throughout the 2023/24 winter. Actual admissions data revealed several peaks during the winter season, with 40 admissions recorded on 28th September 2023, and 35 admissions on 2nd January 2024. In summary, the actual admissions data for the 2023/24 winter were lower than the most likely scenarios estimated. These scenarios tended to overestimate admissions, which facilitated planning for extreme situations.

Peaks analysis for the 2024/25 winter

Table A1: Peaks in 7-day rolling averages of flu and pneumonia admissions between the financial years of 2017/2018 and 2023/24.

Financial year	Date	Peak admissions
2017/18	5 January 2018	78
2018/19	3 January 2019	84
2019/20	2 January 2020	101
2020/21	2 October 2020	33
2021/22	11 December 2021	42
2022/23	24 December and 25 December 2022	131
2023/24	26 January 2024	63

Source: Digital Health and Care Wales

Table A2: Peaks in 7-day rolling averages of RSV paediatric admissions between the financial years of 2017/2018 and 2023/24.

Financial year	Date	Peak admissions
2017/18	2 December 2017	64
2018/19	1 December 2018	64
2019/20	27 November 2019	63
2020/21	19 September 2020	7
2021/22	12 October 2021	36
2022/23	7 December 2022	48
2023/24	6 November 2023	40

Source: Digital Health and Care Wales

Table A3: Peaks in 7-day rolling averages of ED attendances due to respiratory problems between the financial years of 2019/2020 and 2023/24.

Financial year	Date	Peak admissions
2019/20	30 December 2019	345
2020/21	16 September 2020	202
2021/22	21 October 2021	272
2022/23	30 December 2022	418
2023/24	01 January 2024	261

Source: Digital Health and Care Wales

Table A4: Peaks in 7-day rolling averages of all ambulance calls between the financial years of 2017/2018 and 2023/24, code 6 calls only

Financial year	Date	Peak number of calls
2017/18	01 January 2017	221
2018/19	01 January 2018	192
2019/20	01 January 2020	226
2020/21	31 December 2020	94
2021/22	12 September 2021	204
2022/23	31 December 2022	254
2023/24	2 January 2024	190

Source: Welsh Ambulance Services University NHS Trust

Table A5: Peaks in 7-day rolling averages of red ambulance calls between the financial years of 2017/2018 and 2023/24, code 6 calls only

Financial year	Date	Peak number of calls
2017/18	10 March 2018	27
2018/19	1 January 2019	28
2019/20	13 December 2019	47
2020/21	17 December 2020	24
2021/22	18 March 2022	60
2022/23	20 December 2022	93
2023/24	13 December 2023	80

Source: Welsh Ambulance Services University NHS Trust

Table A6: Peaks in 7-day rolling averages of amber ambulance calls between the financial years of 2017/2018 and 2023/24, code 6 calls only

Financial year	Date	Peak number of calls
2017/18	1 January 2018	187
2018/19	1 January 2019	159
2019/20	31 March 2020	180
2020/21	2 January 2021	71
2021/22	10 September 2021	144
2022/23	31 December 2022	161
2023/24	2 January 2024	109

Source: Welsh Ambulance Services University NHS Trust

Table A7: Maximum of the average number of monthly paediatric beds occupied, between September and March (inclusive), 2017/18 to 2023/24

Financial year	Maximum number beds occupied	Maximum percentage of beds occupied
2017/18	293	59%
2018/19	302	63%
2019/20	258	61%
2020/21	170	43%
2021/22	259	62%
2022/23	282	64%
2023/24	271	67%

Source: Digital Health and Care Wales

Table A8: Peaks in 7-day rolling averages of ILI consultation rates between the financial years of 2017/2018 and 2023/24

Financial year	Date	Peak rate of consultations
2017/18	23 January 2018	8.2
2018/19	10 January 2019	2.5
2019/20	02 January 2020	2.4
2020/21	07 October 2020	0.2
2021/22	09 December 2021	0.5
2022/23	23, 24, 25 December 2022	4.4
2023/24	30 January 2024	1.0

Source: Public Health Wales

Table A9: Annual acute respiratory infections (ARI) consultation rate, in Wales, between the financial years of 2020/2021 and 2023/24.

Financial year	Number of annual ARI consultations per 100,000 population
2020/21	1,989.9
2021/22	5,675.5
2022/23	8,706.1
2023/24	6,331.5

Source: Public Health Wales

Totals analysis for the 2024/25 winter

Table A10: Total flu and pneumonia admissions, 2017/18 to 2023/24

Financial year	Influenza and pneumonia admissions
2017/18	15,593
2018/19	16,098
2019/20	16,690
2020/21	8,585
2021/22	10,803
2022/23	14,665
2023/24	14,110

Source: Digital Health and Care Wales

Table A11: Total number of RSV admissions in children aged 0-4, by financial years between 2017/18 and 2023/24.

Financial year	RSV admissions
2017/18	5,590
2018/19	6,342
2019/20	6,179
2020/21	661
2021/22	5,270
2022/23	5,636
2023/24	5,168

Source: Digital Health and Care Wales

Table A12: Total number of admissions due to COVID-19 (any mention), in Wales, in financial years between 2020/21 and 2023/24

Year	Admissions
2020/21	19,196
2021/22	16,221
2022/23	16,471
2023/24	6574

Source: Digital Health and Care Wales

Table A13: Total ED attendances due to respiratory problems, by financial years between 2019/20 and 2023/24.

Financial year	ED attendances
2019/20	74,897
2020/21	52,834
2021/22	72,368
2022/23	76,244
2023/24	70,516

Source: Digital Health and Care Wales

Table A14: Total number of ambulance calls due to respiratory problems (code 6), in Wales, between the financial years 2017/2018 and 2023/24.

financial year	Ambulance calls
2017/18	50,931
2018/19	48,696
2019/20	53,866
2020/21	28,196
2021/22	39,993
2022/23	53,726
2023/24	49,910

Source: Welsh Ambulance Services University NHS Trust (WAST)

Table A15: Total number of ambulance calls due to respiratory problems by call code colour, between the financial years 2017/2018 and 2023/24

Financial year	Amber	Green	Red
2017/18	42,599	2,816	5,516
2018/19	39,849	1,896	6,951
2019/20	41,137	2,490	10,239
2020/21	21,590	505	6,101
2021/22	26,649	964	12,380
2022/23	32,662	2,030	19,034
2023/24	29,235	1,660	19,015

Source: Welsh Ambulance Services University NHS Trust (WAST)

Table A16: Annual Influenza like illness (ILI) GP consultation rate, between the financial years of 2017/2018 and 2023/24.

Financial year	Total ILI consultation rate (consultations per 100,000 population)
2017/18	527.4
2018/19	261.0
2019/20	211.4
2020/21	26.2
2021/22	67.8
2022/23	220.3
2023/24	119.7

Source: Public Health Wales

Coding Completion

The ICD-10 coding is used to systematically record and analyse mortality and morbidity data in hospitals in the UK.⁵⁶ However, the completion of coding is often time-consuming and experiences delays of several months. For instance, the coding completion of hospital admissions decreases from 81.3% in October 2023 to 65.7% in April 2024 when the data was received from DHCW. Therefore, it is possible that the admissions calculated for the financial year 2023/2024 in this paper are likely an underestimate.

⁵⁶ [NCCSICD2024\[10.0\]FINAL \(classbrowser.nhs.uk\)](#)

Table A17: Coding completion of hospital admissions, by month, within Wales between January 2020 and April 2020

Month	Coding completion
Jan-20	92.4%
Feb-20	90.3%
Mar-20	86.3%
Apr-20	90.7%
May-20	92.1%
Jun-20	92.8%
Jul-20	92.0%
Aug-20	92.2%
Sep-20	91.7%
Oct-20	91.6%
Nov-20	93.9%
Dec-20	91.8%
Jan-21	92.2%
Feb-21	91.4%
Mar-21	88.6%
Apr-21	87.5%
May-21	88.7%
Jun-21	90.3%
Jul-21	92.6%
Aug-21	92.5%
Sep-21	92.3%
Oct-21	93.7%
Nov-21	91.6%
Dec-21	91.8%
Jan-22	91.6%
Feb-22	90.2%
Mar-22	87.9%
Apr-22	86.9%
May-22	87.9%
Jun-22	89.1%
Jul-22	87.9%
Aug-22	88.1%
Sep-22	88.2%
Oct-22	88.6%
Nov-22	85.0%
Dec-22	86.9%
Jan-23	83.3%

Feb-23	80.3%
Mar-23	77.3%
Apr-23	83.7%
May-23	82.4%
Jun-23	83.4%
Jul-23	83.2%
Aug-23	81.2%
Sep-23	82.5%
Oct-23	81.3%
Nov-23	74.8%
Dec-23	76.0%
Jan-24	74.0%
Feb-24	70.7%
Mar-24	69.4%
Apr-24	65.7%

Source: Digital Health and Care Wales