Coronavirus (COVID-19): Analysis

State of the Epidemic in Scotland – 3 December 2021

Background

This report summarises the current situation on the Covid-19 epidemic in Scotland. It brings together the different sources of evidence and data about the epidemic in Scotland at this point in time, why we are at that place, and what is likely to happen next. This summarises the data up to and including 2 December 2021 on Covid-19 in Scotland. This updates the previous publication published on 25 November[1]. The information in this document helps the Scottish Government, the health service and the wider public sector respond to the epidemic and put in place what is needed to keep us safe and treat people who have the virus.

This edition of the State of the Epidemic summarises current data on Covid-19 at a national and local level, and how Scotland currently compares to the rest of the UK. It looks at the vaccination program in Scotland and its impact. Information is provided about variants of concern and what impact these may have. Bringing this information together in one place gives the opportunity to better understand the current state of the epidemic in Scotland.

Key Points

- The latest R value for Scotland, as of 16 November (using data to 29 November), was between 0.8 and 1.1, with a growth rate of between -3% and 1%. In both, R value and growth rate, the lower limits have decreased since last week, but the upper limits remain the same.
- Latest modelled estimates suggest that, as at 16 November, based on data to 29 November, the incidence of new daily infections in Scotland was between 79 and 121 new infections per 100,000.

[1] Scottish Government: Coronavirus (COVID-19): state of the epidemic - gov.scot (www.gov.scot)

- An average of 2,566 cases were reported per day in the 7 days to 2 December. This is an 8% decrease from the daily average of 2,792 recorded on 25 November.
- In the last week, 7 day case rates have decreased in Scotland, with some variation across the local authorities. However, we are seeing an increasing trend in wastewater and the ONS Covid Infection Survey that is not reflected in the case data for the same period.
- There were 330 weekly cases per 100,000 population in the week to 29 November (by specimen date). This is a 9% decrease from 364 weekly cases per 100,000 on 22 November. This is lower than the most recent peak (825 weekly cases per 100,000 on 6 September) and lower than the peak in July (425 weekly cases per 100,000 recorded on 3 July).
- As of 29 November, the highest case rates (by specimen date) were observed amongst those aged under 20, followed by 40-59, 20-39, 60-79 and 80+. In the week to 29 November, case rates have decreased in all age groups aged under 80, but have plateaued among those aged over 80.
- In the week to 2 December Covid-19 hospital occupancy and Covid-19 ICU occupancy (short and long stay) fluctuated but decreased by 6% and 14% overall from this time last week.
- Average hospital admissions (3-week rolling average) related to Covid-19 in children and young adults have remained similar to the week leading up to 24 November 2021 compared to the previous three-week period. Average hospital admission increased for those aged 0-1 in this same time period.
- There were 97 deaths registered in Scotland where Covid-19 was mentioned on the death certificate in the week ending 28 November. This is a 1% increase from 96 deaths registered in the week to 21 November.
- Nationwide, Covid-19 wastewater levels have continued to increase, with the week ending on 25 November seeing levels of around 80 million gene copies per person per day (Mgc/p/d), up from around 70 Mgc/p/d in the previous week.
- Over 4.3 million people in Scotland have been given a first vaccine against Covid-19, almost 4 million have received a second dose, and over 1.7 million people have received a booster or dose 3 by 2 December.
- Falkirk currently has the highest weekly case rate in Scotland reporting 599 weekly cases per 100,000 in the week to 29 November, followed by East Ayrshire with 468 weekly cases per 100,000 and East Renfrewshire with 429 weekly cases per 100,000. Orkney

Islands has the lowest case rate in Scotland, reporting 112 weekly cases per 100,000 population.

- As determined through the latest weekly ONS survey, the trend in the percentage of people testing positive for Covid-19 in the private residential population has continued to increase in the most recent week in Scotland (21 November to 27 November 2021).
- Delta variant remains the dominant strain in Scotland. Prevalence rates of AY.4.2 (Delta +) have increased in recent weeks in both Scotland and England. Clinical implications of Delta+ are still to be determined.
- As at 5PM on 1 December, there have been a total of 13 genomically sequenced cases of Omicron variant (B.1.1.529), including 3 in the latest 24 hours.
- There continues to be uncertainty over infections, hospital occupancy and intensive care in the next few weeks. However, depending on the current number of Omicron cases and its characteristics, the number of infections, hospital and ICU occupancy over the next few weeks could be higher than projected.

Method

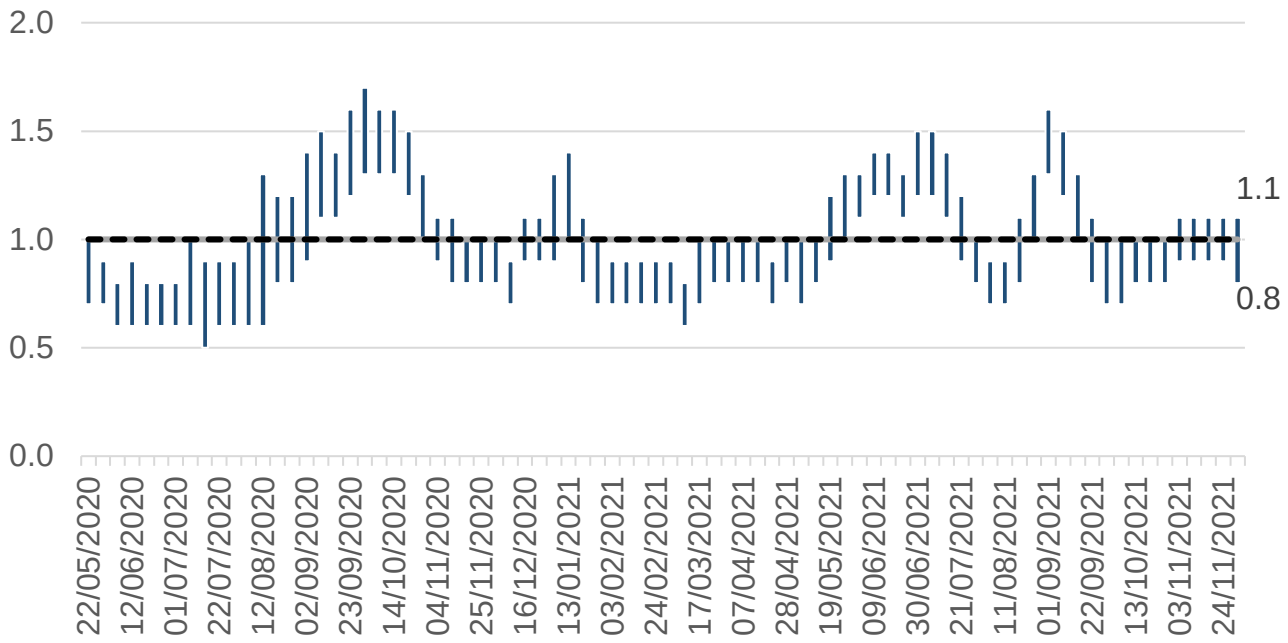
This report brings together a wide range of publically available figures from a range of data sources. These include publications by Scottish Government, Public Heath Scotland, National Records of Scotland and Office for National Statistics along with scientific publications and SAGE and UKHSA summaries where appropriate to summarise the state of the epidemic in Scotland in a given week. We also provide information on public attitudes to the virus from weekly YouGov polling surveys.

The National Picture

Estimated Infection Levels

The latest R value for Scotland, as of 16 November (using data to 29 November)[2], was between 0.8 and 1.1 (Figure 1), with a growth rate of between -3% and 1%. In both, R value and growth rate, the lower limits have decreased since last week, but the upper limits remain the same.

Figure 1: R in Scotland over time



Not everyone who has the virus will be tested, as many people do not realise they have Covid-19, or they have mild symptoms and do not come forward. Latest modelled estimates suggest that, as at 16 November, based on data to 29 November, the incidence of new daily infections in Scotland was between 79 and 121 new infections per 100,000[3]. This equates to between 4,300 and 6,600 people becoming infected each day in Scotland.

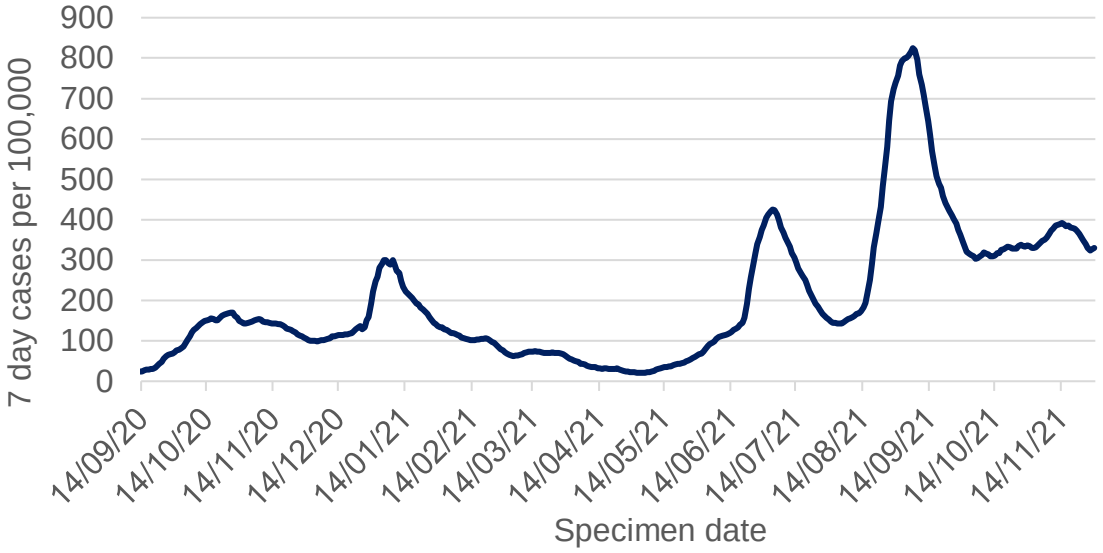
[2] Scottish Government: Coronavirus (COVID-19): modelling the epidemic - gov.scot (www.gov.scot)
[3] Scottish Government: Coronavirus (COVID-19): modelling the epidemic - gov.scot (www.gov.scot)

Covid-19 Cases in Scotland

An average of 2,566 cases were reported per day in the 7 days to 2 December. This is an 8% decrease from the daily average of 2,792 recorded on 25 November[4]. This includes 13 cases of **Omicron variant** (B.1.1.529) which had been identified by 5PM on 1 December. In the week 20 November to 26 November 2021, there were 411 cases (PCR testing only) per 100,000 among unvaccinated individuals, compared to 253 cases per 100,000 for those that had been vaccinated with two or more doses[5].

In the last week, 7 day case rates have decreased in Scotland. There were 330 weekly cases per 100,000 population in the week to 29 November (by specimen date), which is a 9% decrease from 364 weekly cases per 100,000 on 22 November[6]. This is lower than the most recent peak of 825 weekly cases per 100,000 on 6 September and lower than the previous peak of 425 weekly cases recorded on 3 July (Figure 2).

Figure 2: Seven day case rate for Scotland by specimen date. Refers to PCR testing only.

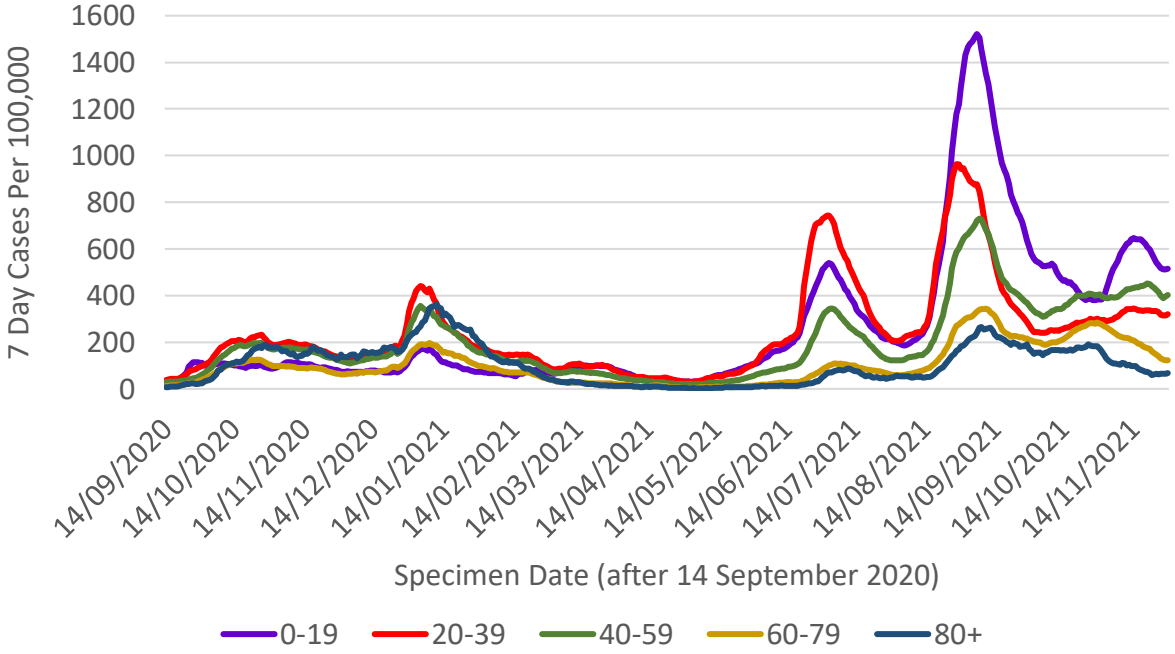


As of 29 November, the highest case rates (by specimen date) were observed amongst those aged under 20, followed by 40-59, 20-39, 60-79 and 80+ (Figure 3). In the week to 29 November, case rates have

[4] Scottish Government: https://www.gov.scot/publications/coronavirus-covid-19-daily-data-for-scotland/ (week on week comparison may be affected by data flow issue.)
[5] Public Health Scotland COVID-19 statistical report
[6] Public Health Scotland Covid-19 dashboard: https://public.tableau.com/profile/phs.covid.19#!/vizhome/COVID-19DailyDashboard_15960160643010/Overview

decreased in all age groups under 80, but have plateaued in the over 80s (Figure 3). Those aged 0-19 saw largest decrease in case rates.

Figure 3: Seven day case rate in Scotland by age group by specimen date[7]. Refers to PCR testing only



The following section provides further breakdown of case rates for younger age groups. It is important to note that schools resumed in Scotland by the week ending 20 August 2021 and universities resumed by end of September 2021. Throughout October schools were on half-term holidays, and testing rates in children were lower during this period. The majority of children and young people have returned to full time education.

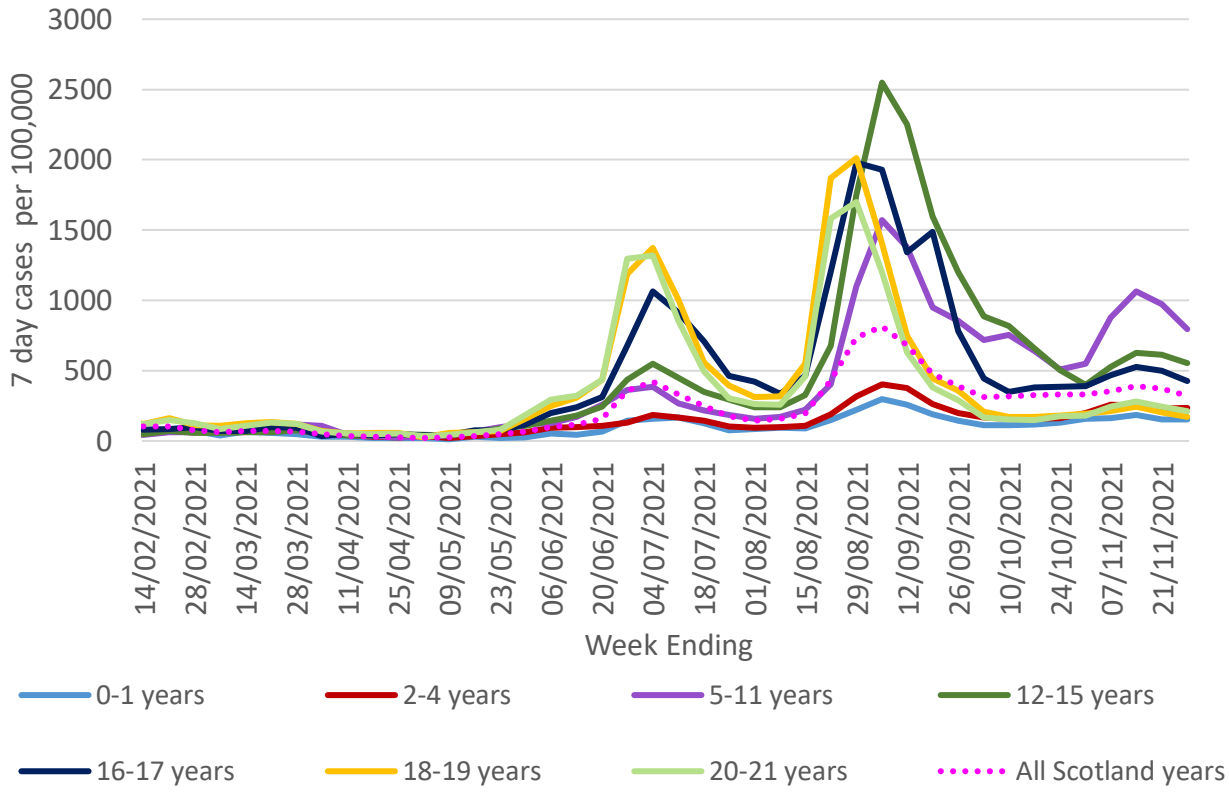
The total number of Covid-19 cases in young people aged under 22 has decreased by 15% over the last week (7,153 cases recorded in the week to 21 November compared to 6,103 cases in the week ending 29 November). The number of cases has decreased or plateaued in all age groups under 22. The percentage of cases made up of children under 12 was 63.4% (3,868 cases) in the week to 28 November, a slight decrease from the previous week (64.5%)[8].

7 day case rates per 100,000 have also decreased or plateaued in all age groups under 22 in the week ending 28 November (Figure 4). The largest decrease in case rates occurred among children aged 5-11. This

[7] Source: Public Health Scotland
[8] Public Health Scotland: PHS COVID-19 Education report (shinyapps.io)

age group has had the highest case rate among young children since 24 October 2021. Those aged 5-11, 12-15 and 16-17 had a higher 7 day case rate than the Scotland average in the week ending 28 November.

Figure 4: Seven day case rate in Scotland by age group by specimen date for children and young people (week ending 28 November). Refers to PCR testing only.



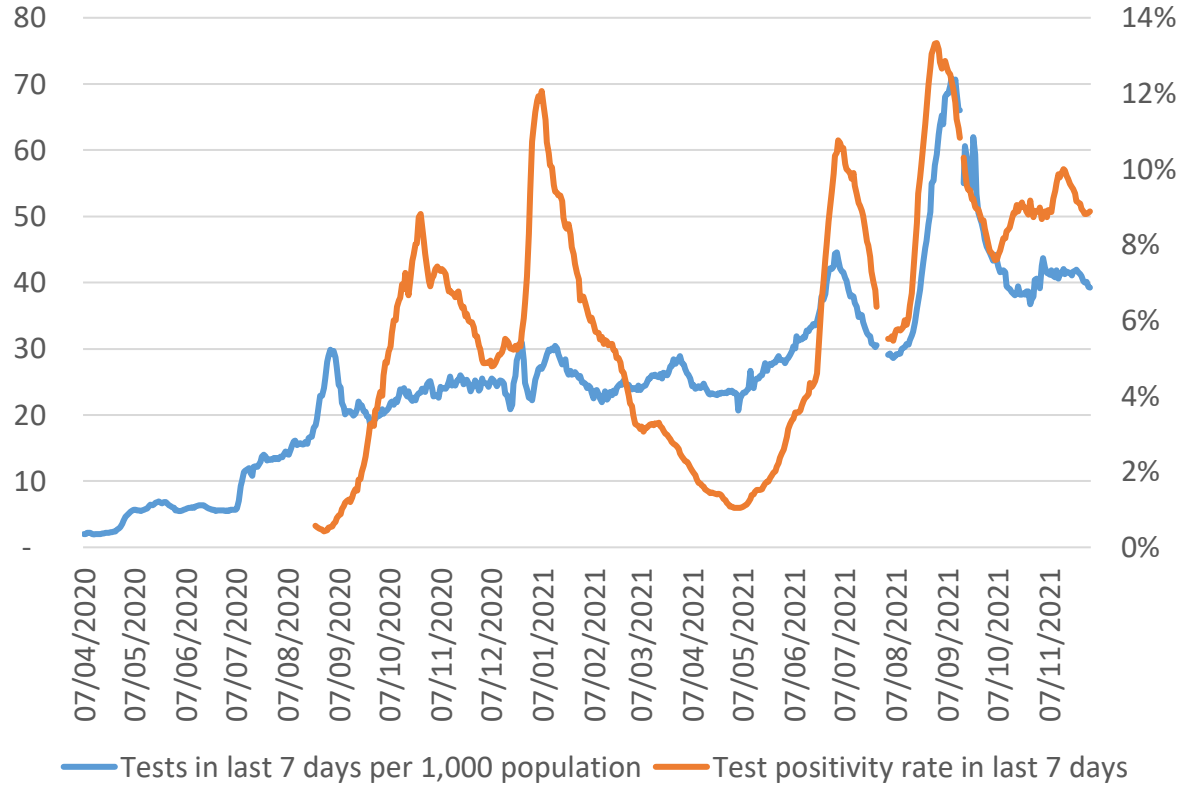
Testing Rates and Positivity

Tests per 1,000 population in the last seven days remained relatively stable throughout November but have been decreasing slightly in the week to 2 December. Test positivity rate in the last seven days (proportion of positive tests) has been decreasing since mid-November (Figure 5)[9].

The rate of testing decreased amongst all younger age groups (under 22 year olds) in the week ending 28 November. Test positivity rates increased in age group 2-4, however decreased or levelled off in other age groups in the same period.

[9] https://www.gov.scot/publications/coronavirus-covid-19-daily-data-for-scotland/

Figure 5: Seven day case rate per 1,000 population and seven day test positivity rate in Scotland (week ending 2 December). Refers to PCR Testing only.



Wastewater Estimates

Measuring Covid-19 levels in wastewater is another way in which current infection levels can be estimated. In contrast to Covid-19 case records, virus shedding into wastewater is a biological process. This means that wastewater data is unaffected by factors that impact whether testing is done. Levels of SARS-CoV-2 in wastewater is monitored at 116 sites around Scotland. Nationwide, Covid-19 wastewater levels have continued to increase, with the week ending on 25 November seeing levels of around 80 million gene copies per person per day (Mgc/p/d), up from around 70 Mgc/p/d in the previous week[10].

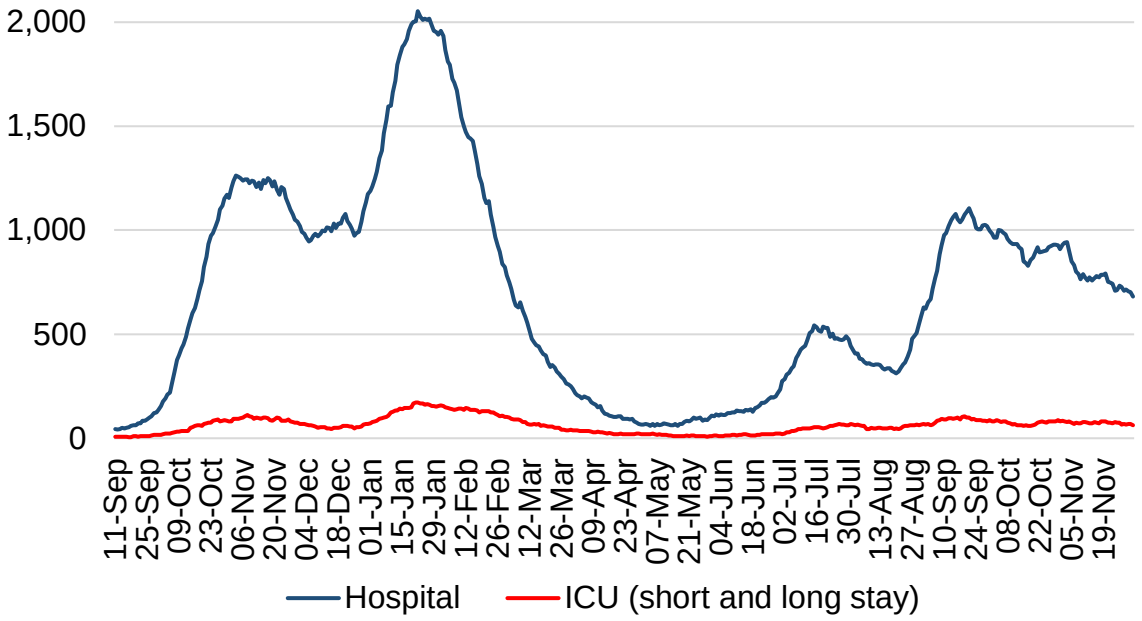
Hospital and ICU Occupancy and Admissions

In the week to 2 December the number of people in hospital with confirmed Covid-19 has fluctuated but has decreased by 6% overall since 25 November. The number of people in hospital with confirmed Covid-19 for less than 28 days peaked at 2,053 on 22 January,

[10] Note: Due to periods of public holiday the last samples obtained for the wastewater analysis have been from 25 November, and thus the data are slightly outdated this week.

decreased to a low of 58 on 6 May, and then increased to 1,107 on 21 September[11]. This has since decreased and as of 2 December there were 680 patients in hospital with Covid-19 and 63 in ICU (short and long stay) (Figure 6)[12]. The number of COVID-19 patients in ICU (short and long stay) has fluctuated but has decreased by 14% overall since 25 November.

Figure 6: Patients in hospital (including those in ICU) (short and long stay) and ICU[13] with recently confirmed Covid-19



The latest data from PHS shows 427 admissions to hospital for people with confirmed Covid-19 in the week to 28 November compared to 476 in the week to 21 November[14]. Average hospital admissions (3-week rolling average) related to Covid-19 in children and young adults have remained similar overall in the week leading up to 24 November 2021 compared to the previous three-week period. However, average hospital admissions slightly increased for those aged 0-1 in this time period.

In the 4 weeks to 26 November 27.9% of acute Covid-19 hospital admissions were in unvaccinated individuals[15]. For context, as of 2 December, 90.8% of those aged 12+ have had at least one dose of the

[11] Scottish Government: https://www.gov.scot/publications/coronavirus-covid-19-daily-data-for-scotland/
[12] ibid
[13] ICU or combined ICU/HDU (with length of stay 28 days or less and with length of stay more than 28 days). Please note that only patients with length of stay 28 days or less in ICU were recorded until 20 January 2021. From 20 January 2021 ICU short and long stay includes both ICU or combined ICU/HDU with length of stay 28 days or less and with length of stay more than 28 days.
[14] Public Health Scotland dashboard: COVID-19 Daily Dashboard - PHS COVID-19 | Tableau Public.
[15] Public Health Scotland COVID-19 statistical report

vaccine. Overall, individuals in the oldest age groups were most likely to be hospitalised. The age-standardised rate of hospital admissions per 100,000 were higher in unvaccinated individuals compared to vaccinated individuals in the four weeks to 26 November. Unvaccinated individuals were 4.1 times more likely to be in hospital with Covid-19 compared to individuals that had received two doses of vaccine in the period 20 November to 26 November[16].

As the population is increasingly vaccinated, more of the patients in hospital will be fully or partially vaccinated. Therefore, it is important that we can differentiate between patients in hospital because of Covid-19 rather than with Covid-19. Public Health Scotland estimates that as at August 2021, 68% of Covid-19 related acute hospital admissions had a primary diagnosis of Covid-19. In March 2021 this figure stood at 75%, and then decreased to a low of 66% in April 2021. This increased to 75% in July, but saw a decrease in August[17].

Deaths

There were 97 deaths registered where Covid-19 was mentioned on the death certificate in the week to 28 November 2021. This is an increase of 1 (+1%) in the number of deaths from the previous week, and 85% lower than the peak in April 2020 (663 deaths). The proportion of deaths in care homes decreased from 60% in April 2020 to 6% in the week to 28 November 2021, with 6 deaths occurring in care homes in this week[18].

In the same week, deaths involving coronavirus decreased in all age groups compared to the week ending 7 November. Deaths decreased from 23 to 16 deaths in age group 45-64, from 43 to 34 in age group 65-74, from 37 to 25 in age group 75-84 and from 35 to 20 deaths among those aged over 85. Death numbers remained at 0 in those aged under 15 in the same period (Figure 7)[19]. From 29 December 2020 to 19 November 2021, 66.3% of Covid-19 deaths were in unvaccinated individuals[20]. Amongst those individuals who have been vaccinated with two doses of Covid-19 vaccine, 78.3% of the confirmed Covid-19 deaths occurred in the 70+ age group[21].

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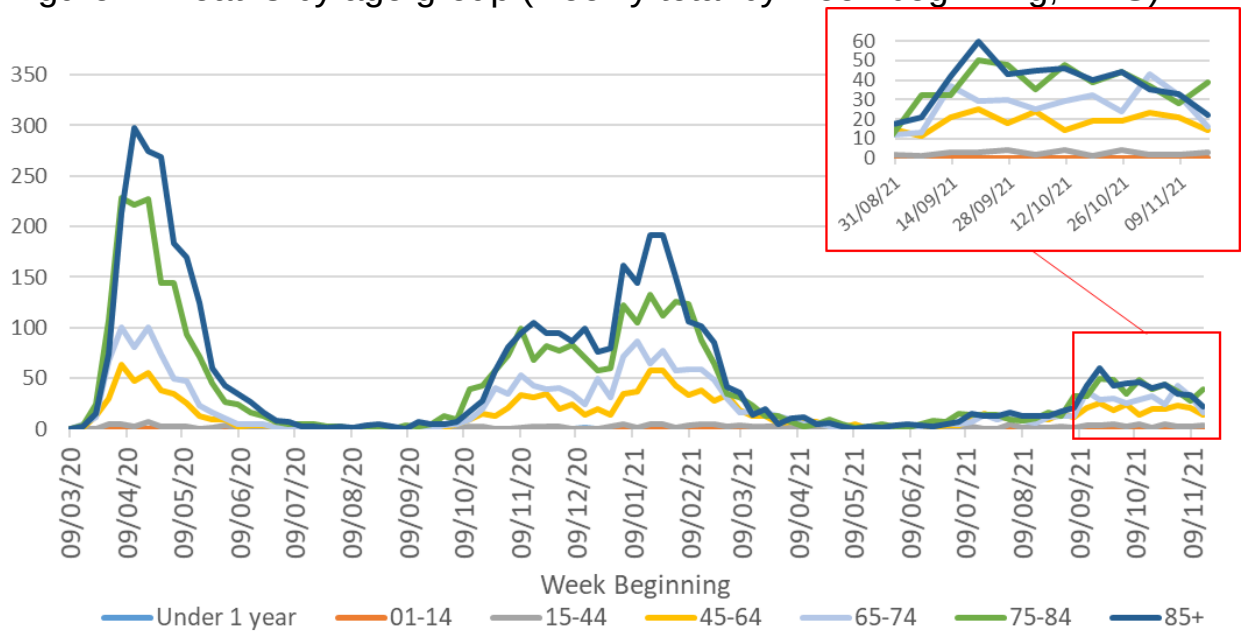
[16] Public Health Scotland COVID-19 Statistical Report
[17] ibid
[18] NRS Scotland: https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/weekly-and-monthly-data-on-births-and-deaths/deaths-involving-coronavirus-covid-19-in-scotland
[19] ibid
[20] Public Health Scotland COVID19 statistical report
[21] ibid

Figure 7: Deaths by age group (weekly total by week beginning, NRS)



Vaccinations

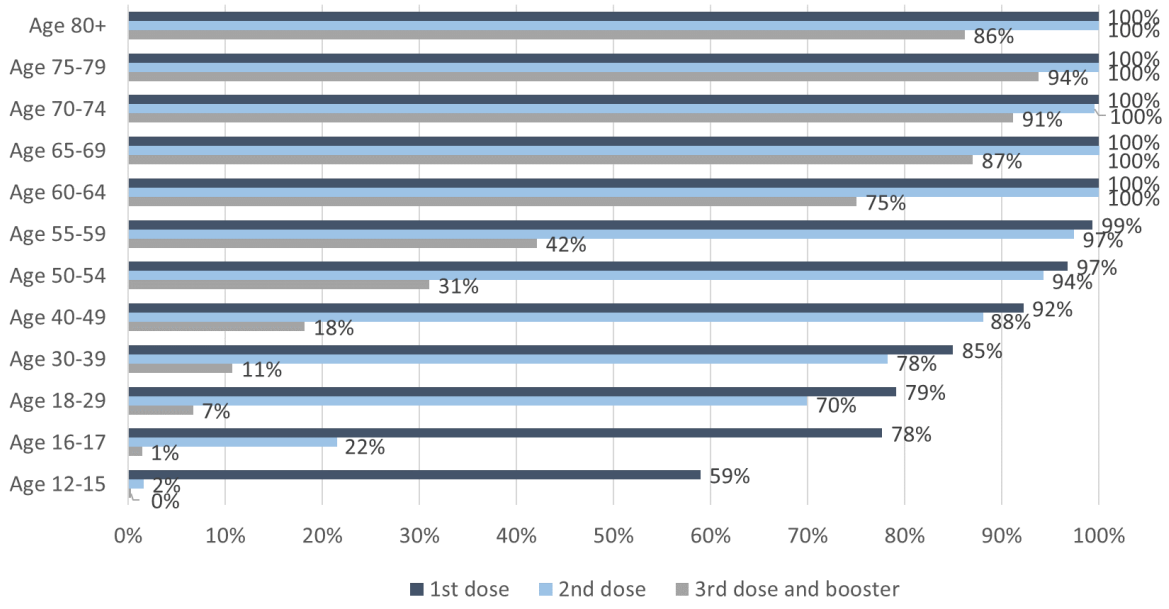
The first vaccines were administered on Tuesday 8 December 2020 and over 4.3 million people had received their first dose by 2 December 2021[22]. This represents just under 91% of the Scottish population over age 12[23]. Almost 4 million people (almost 83% of those aged 12 and over) had received their second dose and over 1.7 million people (just under 37% of those over 12 years of age) have received their dose 3 or booster vaccine by 2 December[24]. There remains a low level of deaths amongst vaccinated individuals (Figure 8).

By age group, almost 100% of those aged over 60 have received both the first and second dose of the vaccine as of 2 December 2021. Vaccination uptake for both the first and the second dose is higher in the older age groups. For younger age groups, 79% of those aged 18-29 have had the first dose, with 70% having received the second dose. 78% of those aged 16-17 have had the first dose, and 22% the second dose. For those aged 12-15, 59% have had the first dose, and 2% have had the second dose.

[22] ibid
[23] Public Health Scotland Covid-19 dashboard: https://public.tableau.com/profile/phs.covid.19#!/vizhome/COVID-19DailyDashboard_15960160643010/Overview
[24] Public Health Scotland Covid-19 dashboard: https://public.tableau.com/profile/phs.covid.19#!/vizhome/COVID-19DailyDashboard_15960160643010/Overview

A booster dose or a third dose of the vaccine is now available in Scotland, in line with JCVI advice including all adults aged over 40 for whom it has been at least 12 weeks since their second dose. Booster vaccine uptake is at least 86% for those aged 65 or over. 75% of those aged 60-64 and 42% of those aged 55-59 have received a booster or third dose, with age groups under 55 have an estimated coverage of less than 31%.

Figure 8: Estimated percentage of adults vaccinated by 2 December 2021



Vaccine uptake in 17-21 year olds as at 29 November was 81.0% for the first dose and 64.3% for the second dose[25]. Please note that under half of Scottish students are in this age category and only Scottish students (i.e. registered with a GP in Scotland) are included in the figures. Covid-19 infection survey estimated that up to the week beginning 1 November 2021, the percentage of 16-24 year olds in the community population in Scotland testing positive for antibodies increased to 95.8%[26].

The proportion of people surveyed who said they have been vaccinated for Covid-19 is high. 92% of all respondents have already received at least their first vaccine dose. Of those not vaccinated (and small base must be noted), 13% report they are likely to be vaccinated when a vaccine becomes available to them[27].

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[25] Public Health Scotland

[26] Office for National Statistics: Coronavirus (COVID-19) Infection Survey, antibody and vaccination data, UK - Office for National Statistics

[27] Source: YouGov online survey. Total sample size on 30 November – 1 December was 1001 adults. Sample size for those who have not yet received their first vaccine was 48 adults. *'Likely' to be vaccinated refers to*

Situation by local authority within Scotland

The trend in case rates varied across the country, but most local authorities saw a slight decrease in case rates over the past week. Case rates increased in East Ayrshire, Na h-Eileanan Siar, Falkirk, East Renfrewshire, West Lothian, East Dunbartonshire, City of Edinburgh and North Ayrshire in the week leading up to November 29, and decreased in all other local authorities. Falkirk currently has the highest weekly case rate in Scotland reporting 599 weekly cases per 100,000 in the week to 29 November, followed by East Ayrshire with 468 weekly cases per 100,000, East Renfrewshire with 429 weekly cases per 100,000, East Dunbartonshire with 421 weekly cases per 100,000, Angus with 401 weekly cases per 100,000, and East Lothian with 399 weekly cases per 100,000 population. Orkney Islands has the lowest case rate in Scotland, reporting 112 weekly cases per 100,000 population in the week to 29 November[28]. Case rates remain high across Scotland with all local authorities, except for Orkney Islands and Shetland Islands, reporting over 200 weekly cases per 100,000 population in that week (Table 1 and Figure 9).

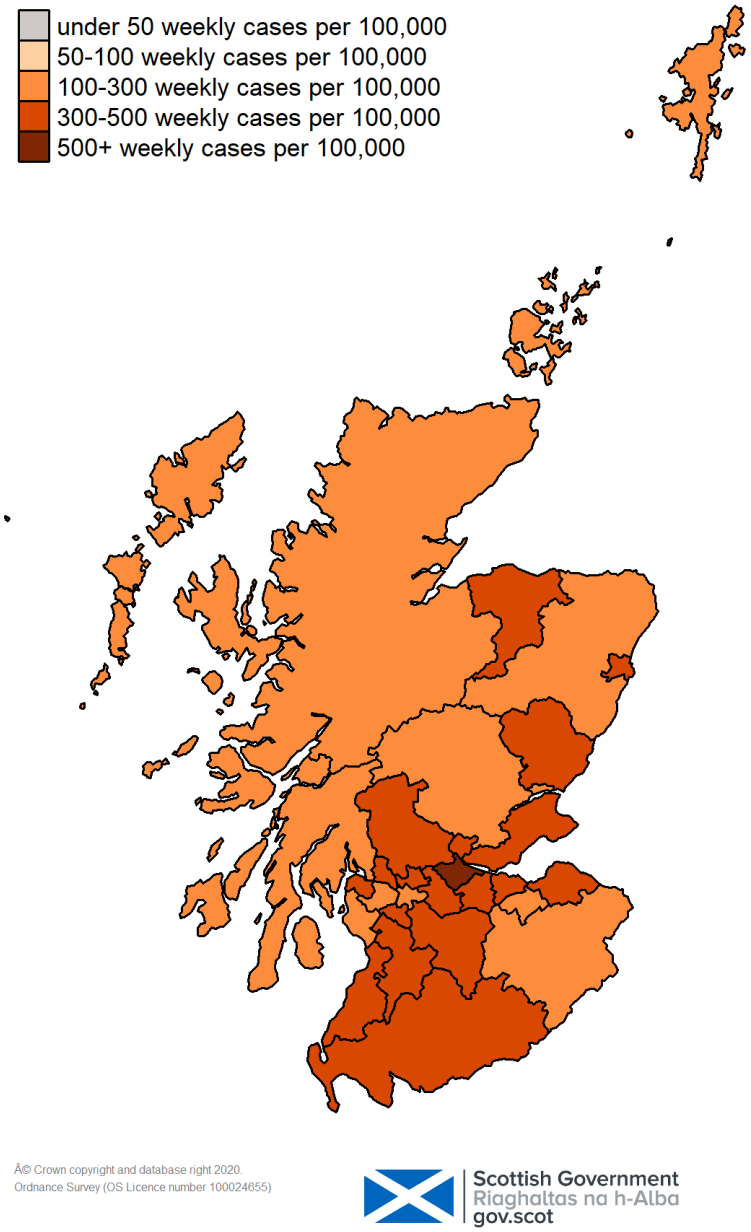
respondents who rated themselves 8 to 10 on a scale of 0-10 for the question: How likely or unlikely are you to be vaccinated for COVID-19 when a vaccine becomes available to you? (Please select a number between 0 and 10, where 0 means 'extremely unlikely' and 10 means 'extremely likely')

[28] Public Health Scotland Covid dashboard: https://public.tableau.com/profile/phs.covid.19#!/vizhome/COVID-19DailyDashboard_15960160643010/Overview

Table 1: Total new weekly cases (by specimen date) per 100,000 population to 29 November 2021, in order of prevalence

Local authority	**Total new cases in the week, per 100,000 population**	**Change since previous week**
Falkirk	599	+36
East Ayrshire	468	+114
East Renfrewshire	429	+31
East Dunbartonshire	421	+16
Angus	401	-86
East Lothian	399	-51
Fife	394	-26
West Lothian	384	+30
Clackmannanshire	367	-45
Dumfries and Galloway	364	-127
Inverclyde	356	-16
Aberdeen City	355	-89
North Lanarkshire	354	-18
Moray	348	-174
West Dunbartonshire	337	-46
Stirling	330	-151
City of Edinburgh	321	+13
South Lanarkshire	316	-17
South Ayrshire	309	-19
Aberdeenshire	291	-60
North Ayrshire	284	+6
Renfrewshire	283	-25
Midlothian	281	-16
Scottish Borders	278	-41
Perth and Kinross	268	-77
Glasgow City	257	-5
Argyll and Bute	246	-111
Dundee City	236	-82
Na h-Eileanan Siar	234	+98
Highland	231	-127
Shetland Islands	166	-284
Orkney Islands	112	-71
Scotland	330	-34

Figure 9: Map of weekly new positive cases per 100,000 people in Scotland



There is uncertainty when modelling predicted case rates in regions with smaller populations, and hence lower test counts. This concerns local authorities such as Na h-Eileanan Siar, Orkney Islands and Shetland Islands.

The most recent modelling predicts, based on data up to 29 November, that for the week commencing 12 December 2021, 29 out of the 32 local authorities are expected to exceed 50 cases per 100,000 population with at least 75% probability. These 29 local authorities are also expected to exceed 100 cases per 100,000 with this probability. There are no local

authorities expected to exceed 300 cases per 100,000 population with at least 75% probability[29]. These models are based on the Delta variant only.

How Scotland compares with the rest of the UK

Average daily cases in Scotland (469 per 1 million) in the week to 2 December were below Northern Ireland (920 per 1 million), Wales (707 per 1 million), and England (672 per 1 million)[30]. Average daily deaths in Scotland (2 per 1 million population) in the week to 2 December were similar to England, Wales and Northern Ireland (2 per 1 million each)[31].

There were 7,644 confirmed Covid-19 patients in hospital in the UK on 30 November 2021, with 6,123 of them reported in England, 706 in Scotland, 473 in Wales and 342 in Northern Ireland[32]. This translates to 11 patients per 100,000 population for England, 13 patients per 100,000 in Scotland, 15 per 100,000 for Wales and 18 per 100,000 for Northern Ireland (based on 7 day averages for all 4 nations). Please note that data about Covid-19 patients in hospitals are collected differently by each nation and therefore might not be directly comparable.

The ONS Covid-19 Infection Survey estimates that in the week 21 to 27 November 2021, the estimated percentage of the population living in private residential households testing positive for Covid-19 in Scotland was 1.58% (95% credible interval: 1.31 % to 1.89%). The percentage of people testing positive for Covid-19 in the private residential population has continued to increase in the most recent week. In the week 21 to 27 November 2021 (18 to 24 November for Northern Ireland), estimates for the other nations of the UK are as follows: 1.65% (95% credible interval: 1.55% to 1.75%) for England, 2.11% (95% credible interval: 1.72% to 2.55%) for Wales and 2.24% (95% credible interval: 1.75% to 2.77%) for Northern Ireland. This equates to around 1 in 65 people in Scotland, 1 in 60 in England, 1 in 45 in Wales and 1 in 45 in Northern Ireland[33].

The ONS Covid-19 Infection Survey estimated that in the week beginning 1 November 2021, 92.5% (95% CI: 91.1% to 93.7%) of the adult population living in private residential households in Scotland

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[29] Scottish Government: Coronavirus (COVID-19): modelling the epidemic - gov.scot (www.gov.scot)
[30] ibid
[31] UK Government: https://coronavirus.data.gov.uk/
[32] UK Government: https://coronavirus.data.gov.uk/details/healthcare
[33] Office for National Statistics: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/coronaviruscovid19infectionsurveypilot/previousReleases

would have tested positive for antibodies against SARS-CoV-2, as a result of having the infection in the past or being vaccinated. This compares to 92.8% in England (95% CI: 91.6% to 93.9%), 91.4% in Wales (95% CI: 89.7% to 92.9%) and 93.3% in Northern Ireland (95% CI: 90.2% to 94.9%)[34].

An estimated 1.9% of the population living in private residential households in the UK were experiencing self-reported long Covid symptoms (symptoms persisting for more than four weeks after the first suspected coronavirus (Covid-19) infection that were not explained by something else) in the 4 weeks ending 31 October 2021. In Scotland, 99,000 people (1.87% of the respective population) living in private households self-reported long Covid symptoms for this period. This compares to 1.88% in England, 1.80% in Wales and 1.52% in Northern Ireland[35].

How the virus is changing

Omicron variant

On 23 November 2021, a small number of cases of a new variant were reported by South Africa to the international genomic database, GISAID. This variant was designated B.1.1.529 on 24 November 2021 and has over 30 mutations within the Spike gene. On 26 November, WHO designated B.1.1.529 as a SARS-CoV-2 Variant of Concern known as Omicron. As at 5PM on 1 December, there have been a total of 13 cases of Omicron variant detected in Scotland, as determined through whole genome sequencing including 3 in the latest 24 hours.[36]

Preliminary evidence suggests that due to the number of mutations in the Spike gene, Omicron could increase the risk of reinfection and possibly cause other unfavourable changes in the epidemiology of Covid-19.[37]

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[34] Office for National Statistics: Coronavirus (COVID-19) Infection Survey, antibody and vaccination data, UK - Office for National Statistics
[35] Office for National Statistics: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/2december2021
[36] https://www.gov.scot/publications/coronavirus-covid-19-additional-data-and-information/
[37] Ibid.

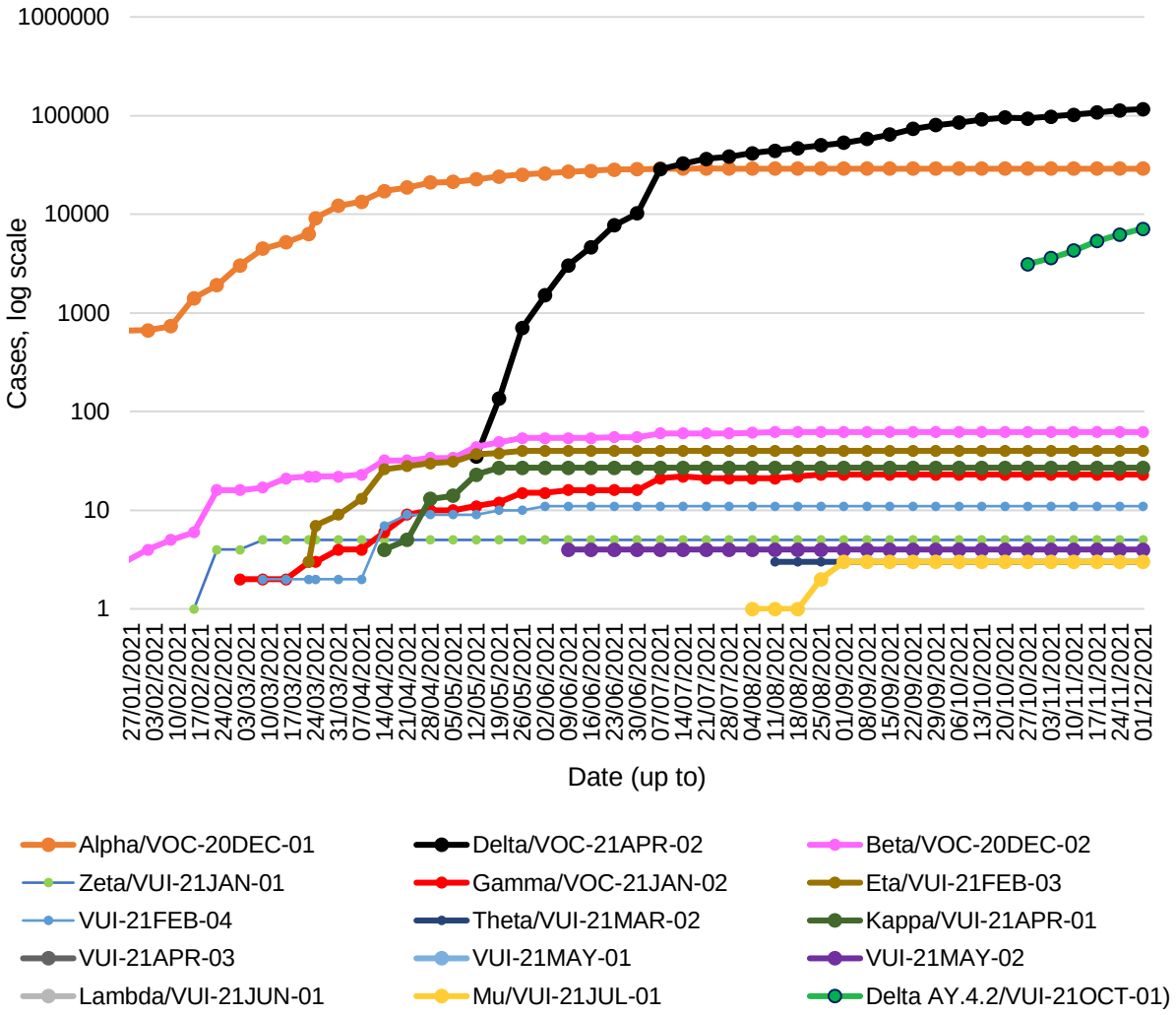
Delta and Other Variants of Concern

The Delta variant (VOC-21APR-02) remains the dominant strain in Scotland. The variant of concern Delta, also referred to as VOC-21APR-02 (first identified in India) is more transmissible than Alpha variant [38] [39] [40]. It quickly replaced Alpha (VOC-20DEC-01), first identified in the UK, as the dominant strain in Scotland, and 116,215 cases have now been identified as Delta to 1 December 2021. A sublineage of Delta, AY.4.2, has been classified as VUI-21OCT-01, and 7,135 cases have now been identified in Scotland.

To date there are four additional 'variants of concern' (VOCs) and eleven 'variants under investigation' (VUIs)[41]. There remains a concern that some of these new variants may partially escape immunity, from both natural infection and from vaccines currently being deployed and we are monitoring the evidence on this[42] [43] [44]. Up to 1 December there have been 62 genomically confirmed cases of the variant Beta/VOC-20DEC-02 (first detected in South Africa), and 23 cases of Gamma in Scotland. Genomically confirmed cases of other VOCs and VUIs remain low, there have been no new cases of other VOCs or VUIs in the last week (Figure 10). There remains uncertainty regarding the impact of the Delta variant on severity of illness, treatment or reinfections. As more data is analysed we shall become more certain of the impact of Delta on infections, hospitalisations and disease severity and long term vaccine protection effects.

[38] S1236_Eighty-nineth_SAGE.pdf (publishing.service.gov.uk)
[39] Risk assessment for SARS-CoV-2 variant: VOC-21APR-02 (B.1.617.2) (publishing.service.gov.uk)
[40] S1284_SAGE_92_minutes.pdf (publishing.service.gov.uk)
[41] Variants: distribution of cases data - GOV.UK (www.gov.uk)
[42] Brief note on SARS-CoV-2 variants (publishing.service.gov.uk)
[43] Brief note on SARS-CoV-2 B.1.351 - 27 January 2021 (publishing.service.gov.uk)
[44] Brief note on SARS-CoV-2 variant of concern P.1 (publishing.service.gov.uk)

Figure 10: Variants detected in Scotland by sequencing (data up to 1 December and reported weekly)[45]



The effectiveness of vaccines

On 29 October 2021, the vaccine effectiveness expert panel (VEEP) published their updated consensus view on the effectiveness of different vaccines on infections, symptomatic disease, and severe disease as well as some initial evidence on vaccine waning effects[46]. The consensus view of vaccine effectiveness against symptomatic disease in fully vaccinated people is between 45-95%, depending on the vaccine and when it was administered. Data from the Office of National Statistics generated during the Delta period reports that two vaccine doses (14 days or more previously) reduced the risk of testing positive by 67% (95% confidence interval: 64% to 70%) compared to a reference group

[45] Variants: distribution of cases data - GOV.UK (www.gov.uk)
[46] Research and analysis overview: VEEP: Vaccine effectiveness table, 24 September 2021 - GOV.UK (www.gov.uk)

which included those not yet vaccinated, those 21 days or more before the first vaccination and those without evidence of prior infection[47].

Public Health England analysis shows that vaccines are highly effective against hospitalisation and death from Delta variant with vaccine effectiveness of over 90% after two doses of vaccine[48]. A recent report from EAVEII finds that from 1 April to 27 September 2021, there were 201 Covid-19 deaths in the group studied. In the 16-39 age bracket, 17 unvaccinated people died and no fully vaccinated people died. The Pfizer-BioNTech vaccine was 95% effective in 40-59 year olds and 87% effective in people 60 and over. The Oxford-AstraZeneca vaccine was 88% effective in 40-59 year olds and 90% effective in people aged 60 or older. In people of all ages who had been double-vaccinated at least two weeks before a positive PCR test, the vaccines offer around 90% effectiveness against Covid-19 deaths caused by the Delta variant[49]. Vaccine effectiveness against symptomatic disease, hospitalisation and death wanes over time[50]. The Joint Committee on Vaccination and Immunisation (JCVI) gave advice on a booster programme to re-vaccinate adults against Covid-19 in the UK[51]. The booster program has been recently expanded in response to emergence of the Omicron variant[52]. Preliminary data shows an increase in vaccine effectiveness after the booster dose[53], however, the impact of the Omicron variant on vaccine and booster effectiveness is still unknown[54] .

PHS estimated in an analysis published on 25 November that 27,656 deaths in people 60 years and older have been directly averted as a result of Scotland's Covid-19 vaccination programme. This equates to an estimated 86% of deaths averted by vaccination in this age group.[55]

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[47] Coronavirus (COVID-19) Infection Survey Technical Article: Impact of vaccination on testing positive in the UK - Office for National Statistics
[48] COVID-19 vaccine surveillance report - week 44 (publishing.service.gov.uk)
[49] BNT162b2 and ChAdOx1 nCoV-19 Vaccine Effectiveness against Death from the Delta Variant | NEJM
[50] COVID-19 vaccine surveillance report - week 46 (publishing.service.gov.uk)
[51] JCVI statement, September 2021: COVID-19 booster vaccine programme for winter 2021 to 2022 - GOV.UK (www.gov.uk)
[52] JCVI advice on the UK vaccine response to the Omicron variant - GOV.UK (www.gov.uk)
[53] COVID-19 vaccine surveillance report - week 46 (publishing.service.gov.uk)
[54] Update on Omicron (who.int)
[55] https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2021.26.47.2101021

Looking ahead

Scottish Contact Survey

Changes in patterns of mixing and adherence to restrictions will impact on future case numbers. The Scottish Contact Survey measures times and settings that people mix where they could potentially spread Covid-19. Average contacts from the most recent Panel B cohort of the Scottish Contact Survey (week ending 24 November) indicate an average of 5.2 contacts.

Mean contacts within the other setting (contacts outside home, school and work) have decreased by 11% in the last two weeks. Contacts within the home and work setting remained at a similar level over the same period. Differences across age groups are largely driven by changes in contacts within the workplace. Those aged between 18-49 have all reported an increase in contacts within the last two weeks, rising by at least 12%. Individuals aged between 50-69 decreased their overall contacts by at least 14%. Those aged between 30-39 have reported the biggest increase in interactions with those aged under 18 in the last two weeks.

Self-reported compliance with the current regulations and guidance has decreased since January but remains at a high level. On 30 November – 1 December, 70% of people reported ‘complete’ or ‘almost complete’ compliance[56].

Modelling the Epidemic

Depending on the current number of Omicron cases and its characteristics, the actual number of hospital occupancy over the next few weeks could be higher than projected here. There continues to be uncertainty over hospital occupancy and intensive care in the next few weeks (Figure 11)[57].

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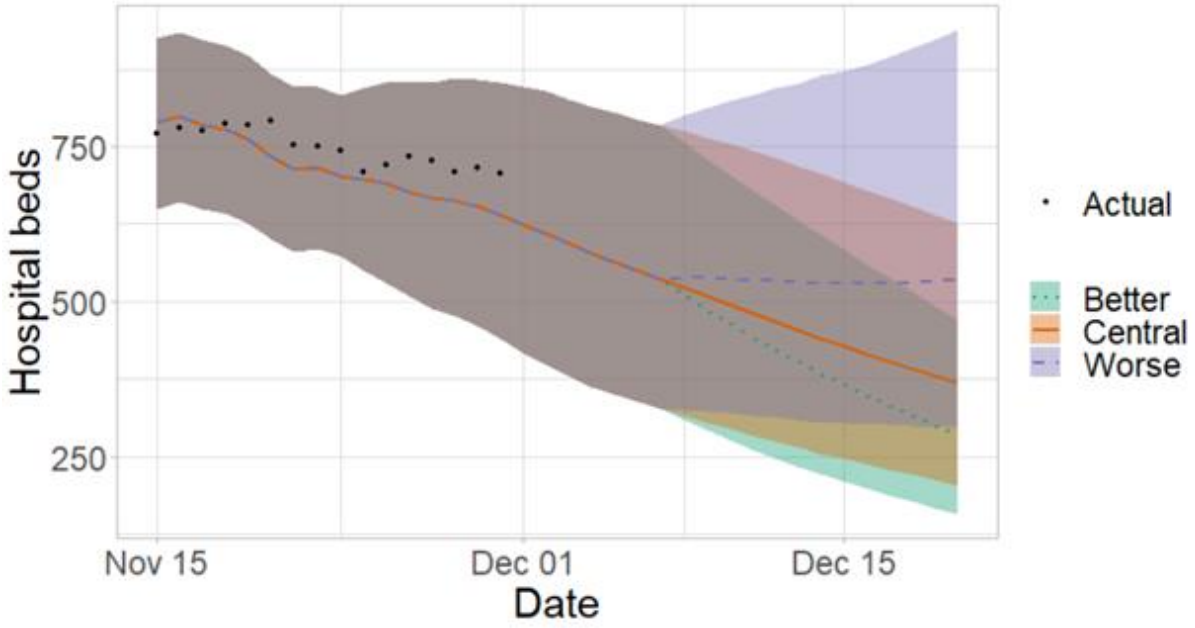
[56] Results are taken from questions run on behalf of Scottish Government on the YouGov online omnibus survey. The sample is demographically and geographically representative of adults 18+ across Scotland, with c. 1000 responses each week. Fieldwork took place on 30 November – 1 December with a total sample size of 1001 adults. ‘Complete’ or ‘almost complete’ compliance refers to respondents who rated themselves 6 or 7 on a scale of 1-7 for the question: *Thinking about ALL of the guidance on what to do and what not to do during the Coronavirus pandemic (including distancing, protection measures and all restrictions).On a scale of 1-7, where 1 is 'Not at all' and 7 is 'Completely', to what extent do you feel you are following the regulations and guidance?*

[57] Scottish Government: Coronavirus (COVID-19): modelling the epidemic - gov.scot (www.gov.scot)

Figure 11: Medium term projections of modelled hospital bed demand, from Scottish Government modelling[58]



Next steps

The Scottish Government continues to work closely with Public Health Scotland and modelling groups to monitor what is happening across Scotland.

Each week this report will provide an overview of the current Covid-19 situation in Scotland. This will include real time data on case rates, hospitalisations and deaths and how Scotland's figures compare to those from the rest of the UK.

Modelling can tell us where the epidemic is likely to be heading. Local data and data by age group can highlight where problems arise, which can help in addressing some of these issues. In the coming weeks the roll out of the vaccine will continue to be monitored along with the impact of this on case rates and deaths among different age cohorts. Investigations are ongoing by NERVTAG, SPI-M, SAGE, UKHSA, Public Health England and Public Health Scotland regarding the impact of new variants and of vaccination; this will be reflected here as work is undertaken.

[58] The difference between the scenarios: 'Central' assumes that infections will plateau at the current level or fall slightly. 'Worse' assumes a rise in transmission from the current level. 'Better' assumes a drop in transmission All scenarios are based on current vaccine roll-out plans and efficacy assumptions.

This publication will be available in accessible HTML on the gov.scot website

The views expressed in this report are those of the researcher and do not necessarily represent those of the Scottish Government or Scottish Ministers.

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