

Public Health Scotland COVID-19 Statistical Report

As at 27 June 2022

A Management Information release for Scotland

Publication date: 29 June 2022

Revised: 30 June 2022





Translations



Easy read



BSL



Audio




Large print



Braille

Translations and other formats are available on request at:

 p hs.otherformats@p hs.scot

 **0131 314 5300**

Public Health Scotland is Scotland's national agency for improving and protecting the health and wellbeing of Scotland's people.

© Public Health Scotland 2022

OGL

This publication is licensed for re-use under the [Open Government Licence v3.0](#).

For more information, visit www.publichealthscotland.scot/ogl

www.publichealthscotland.scot

Contents

This is a Management Information publication	4
Introduction	5
Main Points	6
Incidence of Variants of Concern and Variants Under Investigation	7
Reported COVID-19 Cases and Estimated Infection Levels	8
Severity of Illness ^R	15
COVID-19 Vaccine	24
Vaccine Effectiveness	25
Wider Impact of COVID-19	30
Contact	32
Further Information	32
Next Release	32
Open Data	32
Rate this publication	33
Appendices	34
Appendix 1: Background information	34
Appendix 2: Testing policy in 2022	34
Appendix 3: Wastewater analysis notes	35
Appendix 4: Notes	36
Appendix 5: Hospital admissions 'because of' COVID-19	37
Appendix 6: Early access details	38

This is a Management Information publication

Published management information are non-official statistics which may be in the process of being transitioned into official statistics. They may not comply with the UK Statistics Authority's Code of Practice with regard to high data quality or high public value but there is a public interest or a specific interest by a specialist user group in accessing these statistics as there are no associated official statistics available.

Users should therefore be aware of the aspects of data quality and caveats surrounding these data, all of which are listed in this document. Therefore, the data presented are subject to change.

Find out more about Management Information on the [**UK Statistics Authority website**](#).

Introduction

The **Scottish Government Test and Protect Transition Plan** sets out changes to testing, contact tracing and isolation that came into effect on 01 May 2022. Many COVID-19 testing centres have now closed from this date, with testing only remaining in place for certain groups to protect high risk settings and support clinical care.

This planned change to testing policy will lead to a reduction in the quantity and quality of the available daily data. Therefore, caution should be used when making comparisons between metrics and comparing trends over time. This report summarises the current COVID-19 data in Scotland presenting statistics on reported COVID-19 cases, estimated infection levels, COVID-19 hospital and ICU admissions and COVID-19 vaccine effectiveness.

Additional information and supporting data can be found in the following places:

- COVID-19 **Statistical Report interactive dashboard**
- **Public Health Scotland COVID-19 Dashboard** updated weekly (Wednesday)
- **Deaths involving coronavirus in Scotland – National Records of Scotland**
- **Coronavirus (COVID-19): Modelling the Epidemic – Scottish Government**
- **Enhanced Surveillance of COVID-19 in Scotland**
- **Hospital Onset COVID-19 Cases in Scotland**
- **Coronavirus (COVID-19) Infection Survey – Office for National Statistics**

REVISION: 30 June 2022 – the “Severity of Illness” section was revised. The March 2022 data point was missing from Figure 8 and has now been added. The correct data was in Table 3 and is unaffected.

Main Points

- In the week ending 26 June 2022 there were 14,500 reported COVID-19 cases
- In the week ending 26 June 2022, 2,575 (17.8%) of all cases reported that week were determined to be reinfections when applying the 90-day threshold
- In the latest week ending 26 June 2022, the number of new COVID-19 admissions to hospital increased from 815 to 848 (3.9%) from the week ending 19 June 2022. The highest number of admissions are now in those aged 80+ (24.4%)
- In the week ending 26 June 2022 there were 12 new admissions to Intensive Care Units (ICUs) with a laboratory confirmed test of COVID-19
- In the week ending 26 June 2022, there were on average 1,148 patients in hospital with COVID-19, a 32% increase from the previous week ending 19 June 2022 (870)

Incidence of Variants of Concern and Variants Under Investigation

The UK Health Security Agency (UKHSA) has elevated the classification of the COVID-19 variants Omicron BA.4 and Omicron BA.5 to variants of concern (VOCs) on the basis of observed growth.

Public Health Scotland (PHS) continues to monitor COVID-19 variants of concern, in collaboration with other Public Health Agencies in the UK.

The latest **information on the number of such variants detected by genomic analyses across the UK** is published by UK Health Security Agency (UKHSA).

Reported COVID-19 Cases and Estimated Infection Levels

Reported COVID-19 cases

The purpose of COVID-19 testing has now shifted from population-wide testing to reduce transmission, to targeted testing and surveillance. Reported cases will no longer be representative of all COVID-19 cases in Scotland, and caution is advised when comparing trends in cases over time. Data are continuously updated, therefore, figures for previous week may differ from published data in previous week's report.

The **Scottish Government Test and Protect transition plan** sets out changes to testing, contact tracing and isolation that came into effect on 01 May 2022. Many COVID-19 testing centres have now closed and testing remains in place only for certain groups in order to protect high risk settings and support clinical care.

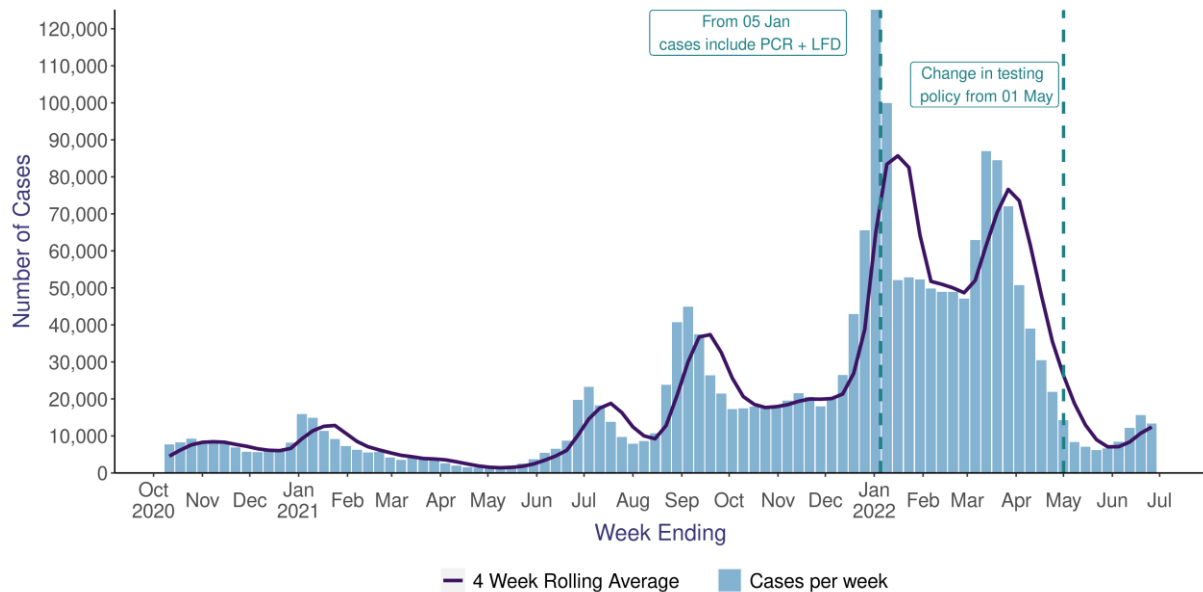
Lateral Flow Device (LFD) Universal Offer ended on 01 May 2022 but remains in place for specific groups: those visiting a hospital or care home; unpaid carers; those eligible for COVID treatments; and those applying for the self-isolation support grant. Trend data are now only being reported on the COVID-19 Statistical Report [interactive dashboard](#).

Please note, we are aware that this week's figures are likely to be an under report and cover less than a 7-day period. This is due to a data processing issue since 9am on 25 June 2022.

In the week ending 26 June 2022, there were 14,500 reported positive cases which is a decrease of 6.6% in the number of reported cases from the previous week ending 19 June 2022 (15,517)¹. Due to changes in testing policy caution is advised when comparing week on week percentage increases.

In the week ending 26 June 2022, there were 2,575 COVID-19 reinfections (two or more episodes). This represents 17.8% of all cases reported in that week.

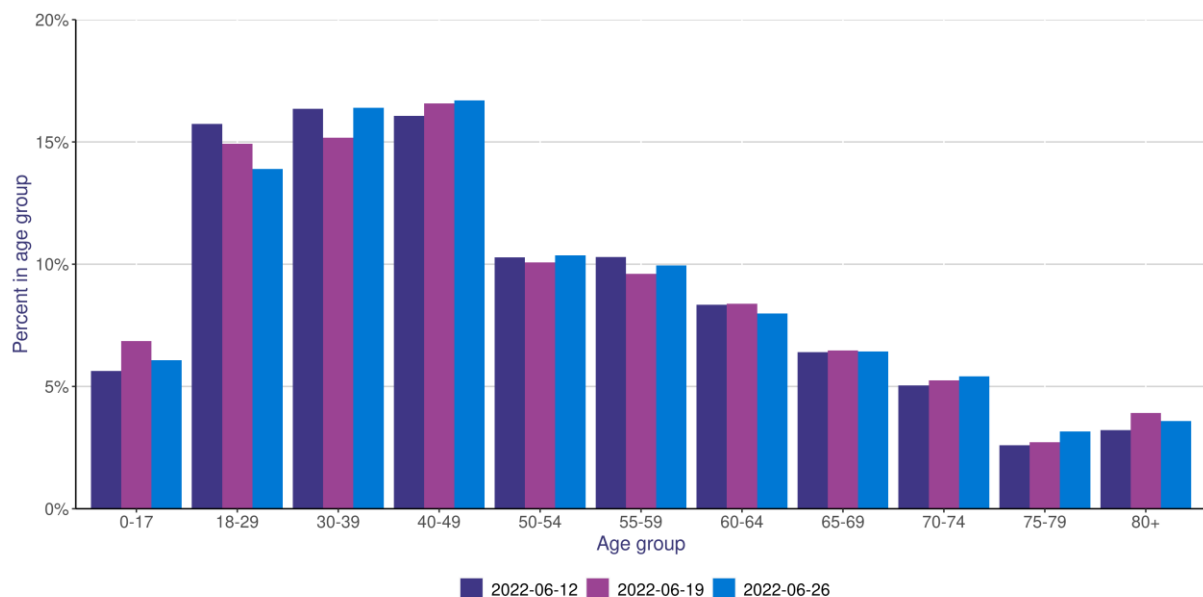
Figure 1: Number of positive cases per week with 4-week average, by specimen date



1 Correct as at 27 June, may differ from more recently published data in the previous week's report and on the [COVID-19 Daily Dashboard](#).

Figure 2 below shows the proportion of COVID-19 cases by age group for the most recent three weeks. In the week ending 26 June 2022, the 40-49 age group had the highest proportion of reported cases.

Figure 2: Proportion of COVID-19 cases by age group, weeks ending 12 June 2022 to 26 June 2022, by specimen date



Trend data since the start of the outbreak can be found on the Public Health Scotland [COVID-19 Dashboard](#).

Of the 14,500 positive cases, 11,847 (81.7%) were reported using a LFD test and 2,653 (18.3%) were reported using a PCR (polymerase chain reaction) test. Figure 3 below illustrates the trend of test type used and shows an increase in the number of positive LFD tests recorded in the past 3 weeks. Furthermore, 75.1% (10,896) of reported positive cases were taken at home.

Figure 3: Number of cases by test type, week ending 03 April 2022 to 26 June 2022

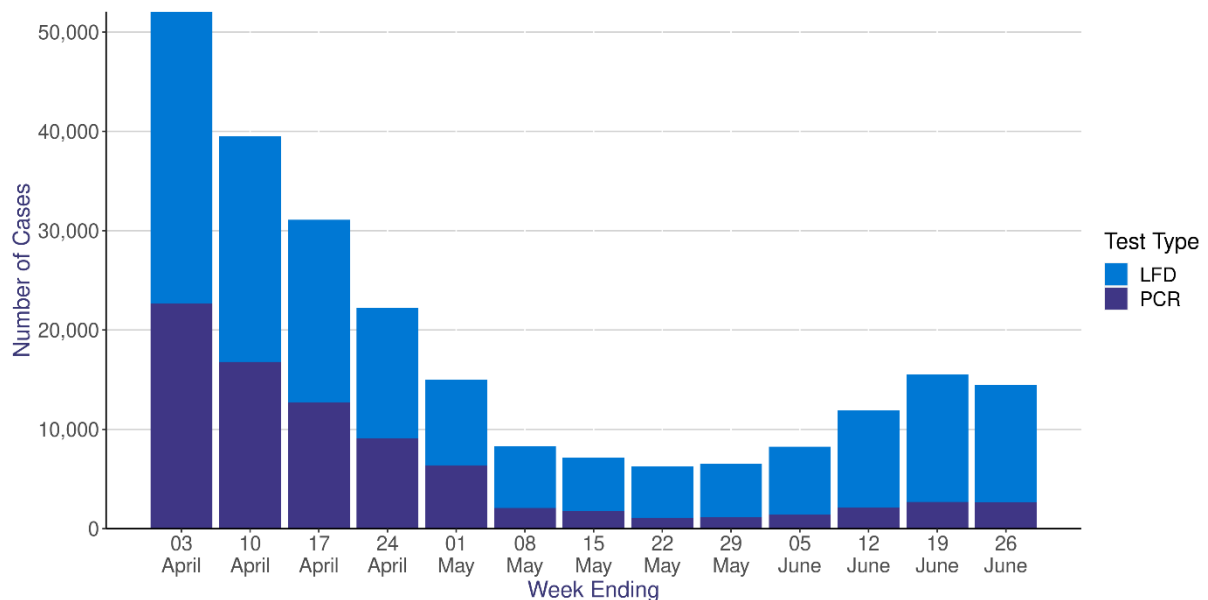


Table 1 below gives an insight into the reasons for testing, with just over half (55.3%) of positive cases reported assigned to the LFD Universal Offer testing reason. Please note the quality of this data relies on individuals accurately recording their testing reason via the [gov.uk website](#).

Table 1: Number of cases by test reason and type, week ending 26 June 2022

Test reason	Number of positive tests reported	% of positive tests reported
<i>LFD tests</i>		
Universal offer	8,012	55.3
Workplace	1,377	9.5
COVID-19 treatments	458	3.2
Eligible carer	320	2.2
Care Home visit	266	1.8
Other	44	0.3
Unknown	1,370	9.4
<i>PCR tests</i>		
Health care setting	1,095	7.6
Home test	547	3.8
Care Home	582	4.0
ONS survey	113	0.8
Other	216	1.5
Unknown	100	0.7
Total (PCR and LFD)	14,500	100.0

Infection survey

The Office for National Statistics (ONS) publish results from the COVID-19 Infection Survey which aims to estimate how many people test positive for COVID-19 infection at a given point.

The Infection Survey invites private residential households to test whether they have the infection, regardless of whether they have symptoms, using a PCR test. Data are based on confirmed positive COVID-19 test results of those living in private households, excluding those living in care homes or other communal establishments. All data are provisional and subject to revision.

Figure 4 below shows the trend in official weekly reported estimates of the percentage of people living in private residential households in Scotland testing positive for COVID-19.

The estimated percentage of people testing positive for COVID-19 peaked in mid-March 2022 (9.00%). In the most recent week (11 June 2022 to 17 June 2022), the estimated percentage of the population living in private residential households that had COVID-19 was 4.76% (95% credible interval: 4.16% to 5.40%)². The estimated percentage of people testing positive increased in the most recent week.

There is a degree of uncertainty in these estimates as indicated by the credible intervals; results should be interpreted with caution.

In the same week, the ONS estimate that 250,700 people (95% credible interval: 218,900 to 284,400)² living in private residential households in Scotland at any given time had COVID-19. This represents around 1 in 20 people (95% credible interval: 1 in 25 to 1 in 19 people)².

For more details and further breakdowns on the Infection Survey please refer to [Coronavirus \(COVID-19\) Infection Survey, UK - Office for National Statistics](#).

Figure 4: Trend of official weekly reported estimates of the percentage of people living in private residential households in Scotland testing positive for COVID-19



Source: [Coronavirus \(COVID-19\) Infection Survey, UK - Office for National Statistics](#).

2 - A *credible interval* gives an indication of the uncertainty of an estimate from data analysis based on a sample population. 95% credible intervals are calculated so that there is a 95% probability of the true value lying in the interval.

Reproduction (R) number

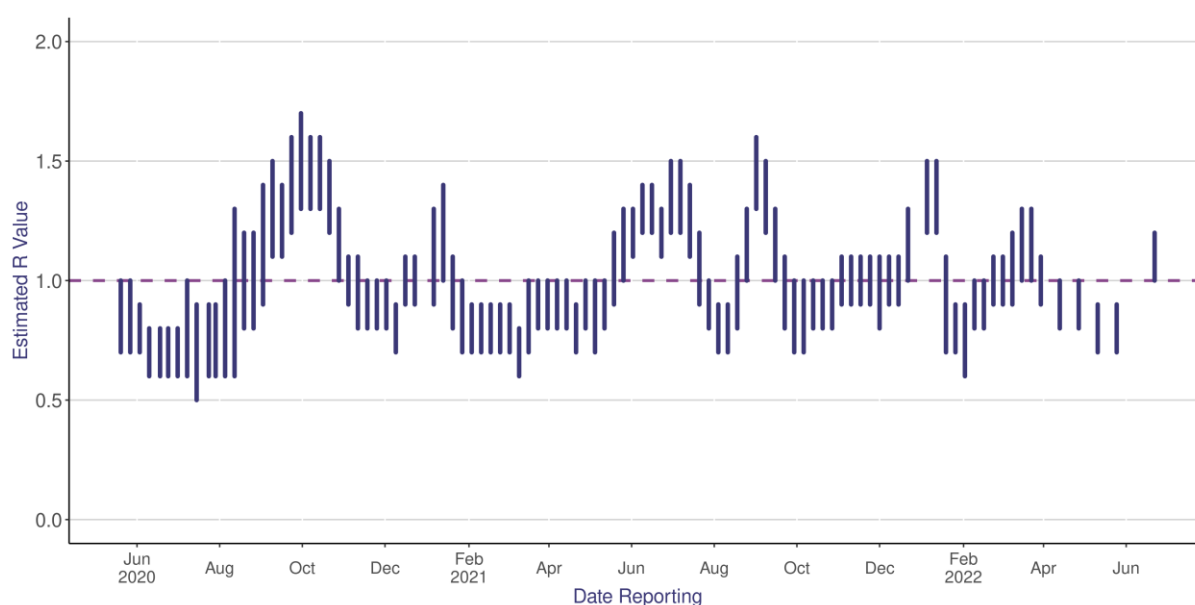
The reproduction (R) number is the average number of secondary infections produced by a single infected person. The R number is a useful measure in assessing if the epidemic is growing or shrinking. If R is greater than one the epidemic is growing, if R is less than one the epidemic is shrinking. The higher the R is above one, the more people an infectious person is likely to further infect.

Please note that R lags by two or three weeks.

Figure 5 below shows the trend of The UK Health Security Agency's (UKHSA) consensus estimate for R in Scotland. As at 07 June 2022 (reported 22 June 2022) the UKHSA's consensus estimate is between 1.0 and 1.2. Both the lower and upper limits of the R value have increased since the last publication.

For more information, please visit the [UK Government website](#).

Figure 5: R estimate in Scotland over time by reporting date



Source: [COVID-19 Modelling the Epidemic](#)

Wastewater analysis

COVID-19 outbreaks and general trends can be monitored by measuring concentrations of the virus in wastewater. Sewage samples are taken from sample sites across Scotland and used to calculate the number of COVID-19 markers, reported as million gene copies per litre (Mgc/p/d). Samples are representative of wastewater from between 70-80% of the Scottish population. Data are adjusted for population and environmental factors such as flow through the sewage works, which is affected by rainfall. See [Appendix 3: Wastewater analysis notes](#) for more information.

Figure 6 shows the national running average trends in wastewater COVID-19 from the beginning of 2022. In Scotland, during the period 03 June 2022 to 17 June 2022, COVID-19 RNA levels have remained between 60 and 140 million gene copies per person, per day (Mgc/p/d). During the first week in particular, there was considerable variability in the data. The data suggests that wastewater COVID-19 levels are currently increasing.

Figure 6: Average trends in wastewater COVID-19 from 03 January 2022 to 17 June 2022



Source: [COVID-19 Modelling the Epidemic](#)

Severity of Illness ^R

REVISION 30 June 2022: The March 2022 data point was missing from Figure 8 and has now been added. The correct data was in Table 3 and is unaffected.

Hospital admissions 'with' COVID-19

Since the start of the pandemic Public Health Scotland have been reporting on the number of people in acute hospitals with recently confirmed COVID-19. These admissions are identified from Rapid and Preliminary Inpatient Data (RAPID) and a definition of an admission can be found in [Appendix 4: Notes](#).

From 27 June 2022, Health Boards moved from daily to weekly submissions of RAPID data. This publication now reports more up to date data on hospital admissions, showing data up to week ending Sunday, which aligns with other COVID-19 measures in this report (cases, hospital occupancy and ICU admissions). Hospital admissions for the most recent week may be incomplete for some Boards and should be treated as provisional and interpreted with caution. These provisional data will be refreshed next week. More information can be found in [Appendix 4: Notes](#).

From 01 May, most people in Scotland no longer need to take a COVID-19 test. These planned changes to testing policy will lead to a reduction in the quantity and quality of available data, which will in turn limit the utility of reporting. Therefore, COVID-19 hospital admissions data should be interpreted with caution.

It is important to note, that the figures presented below may include patients being admitted and treated in hospital for reasons other than COVID-19. Additionally, these figures are correct as at 28 June 2022 and may differ from data published in previous weeks' reports.

Figure 7 below shows the weekly trend of hospital admissions with COVID-19 from week ending 03 January 2021 to 26 June 2022.

Figure 7: Trend of hospital admissions ‘with’ COVID-19 in Scotland

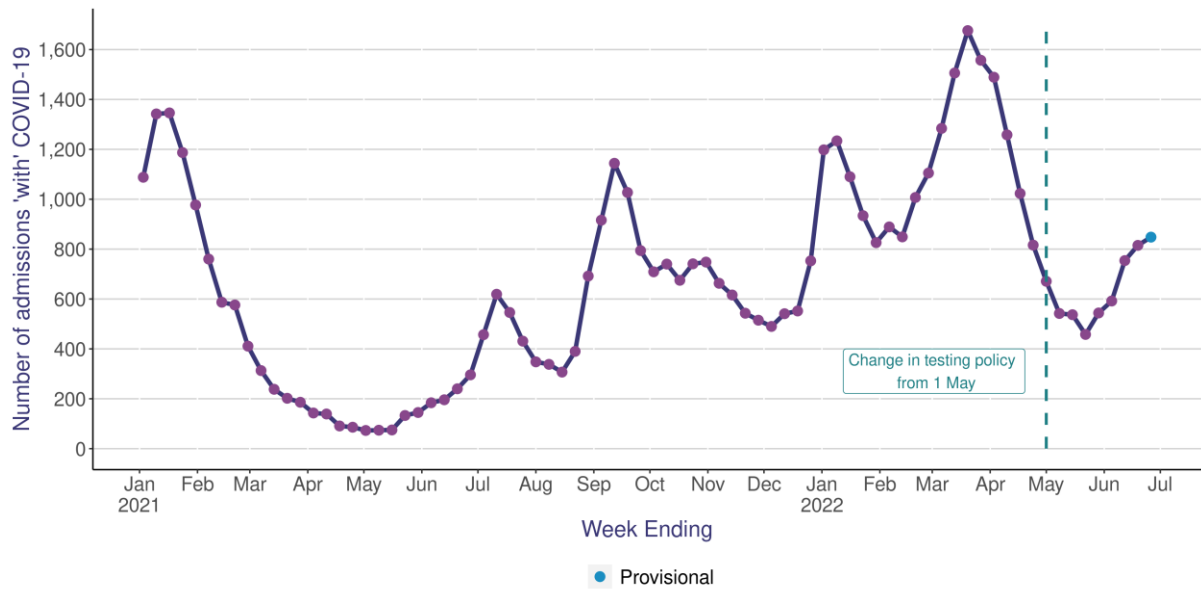


Table 2 below shows a breakdown of people admitted to hospital across all ages and by age group for the most recent five weeks. Data from March 2021 is available on the [COVID-19 Statistical Report website](#).

Table 2: COVID-19 hospital admissions³ by age, weeks ending 29 May 2022 to 26 June 2022

Age Band	23 May - 29 May	30 May - 05 June	06 June - 12 June	13 June - 19 June	20 June - 26 June
Under 18	34	45	56	73	80
18-29	18	18	32	32	39
30-39	35	35	41	49	47
40-49	21	32	46	55	60
50-54	31	30	26	40	38
55-59	32	37	46	44	55
60-64	38	47	62	58	57
65-69	54	55	56	65	71
70-74	50	80	116	96	103
75-79	71	66	66	75	91
80+	160	147	207	228	207
Total	544	592	754	815	848

Source: RAPID (Rapid and Preliminary Inpatient Data)

p - Please note that for the most recent week ending (date), these data are provisional.

3 Please refer to [Appendix 4](#) for explanatory notes regarding RAPID Hospital Admissions.

In the latest week ending 26 June 2022, the number of new COVID-19 admissions to hospital increased from 815 to 848 (3.9%) from the week ending 19 June 2022. The highest number of admissions are now in those aged 80+ (24.4%).

Hospital Admissions 'because-of' COVID-19

As previously reported, not all people hospitalised with a recent COVID-19 diagnosis will be in the hospital setting because of this infection. It is important, though, to be able to differentiate between patients in hospital who are admitted to hospital 'because of' their COVID-19 as opposed to patients who are admitted to hospital coincidentally 'with' their COVID-19 diagnosis. Knowing this can help us to predict whether we are likely to see future pressures on hospital systems based on recent patterns of infections in the surrounding community.

SMR01 (acute inpatient and day case activity) analysis

In September 2021 Public Health Scotland developed and reported analysis from SMR01 to calculate the proportion of people in hospital 'because of' COVID-19. A limitation of this approach is that there is typically a two-to-three-month lag in receiving SMR01 discharge summaries from NHS boards.

To estimate the proportion of patients in hospital 'because of' COVID-19, analysis was carried out using the national SMR01 dataset using the clinical diagnosis information recorded from the patient discharge summary. A hospital admission 'because of' COVID-19 is defined as an admission where acute COVID-19 illness is recorded as the main reason that the patient required treatment (including reinfections).

There was a rapid increase in COVID-19 case numbers in Scotland observed at the end of 2021, during this period Omicron rapidly became the dominant variant. At the end of January 2022, Public Health Scotland published a final report of clinical audit data on people with a recent, community-acquired COVID-19 diagnosis admitted to hospital in selected NHS Boards.

Updated SMR01 analysis

The analysis on hospital admissions (Table 1) 'because of' COVID-19 is based on data from six NHS Boards, with good quality and complete data. The aggregated data for these six NHS Boards is used as a proxy to represent the Scotland position. These six NHS Boards are listed in **Appendix 4: Hospital admissions 'because of' COVID-19**.

Table 3 shows the trend in hospital admissions where COVID-19 is recorded as the main diagnosis.

Between October and December 2021, the percentage of hospital admissions 'because of' COVID-19 has ranged between 60-72%, however between January and March 2022, it has ranged between 37%-41%.

The average length of time a patient is spending in hospital ‘because of’ COVID-19 has decreased from 9.5 days in October 2021 to 6.0 days in March 2022. More detailed information by age group is shown below in Figure 8.

Table 3: SMR01 COVID-19 Hospital Admissions with a primary diagnosis of COVID-19

	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
Percentage of hospital admissions 'because of' COVID-19	72%	70%	60%	41%	37%	37%
Average length of stay 'with' COVID-19 (days)	10.3	10.0	8.7	7.7	8.6	6.5
Average length of stay 'because of' COVID-19 (days)	9.5	9.4	7.6	7.5	7.2	6.0

Source: SMR01 (Scottish Morbidity Records -Acute Inpatient & Day Case) & ECOSS. Notes and definitions can be found in Appendix 5: Hospital admissions ‘because of’ COVID-19

Figure 8: Percentage of COVID-19 hospital admissions with a primary diagnosis of COVID-19, and average length of stay ^R

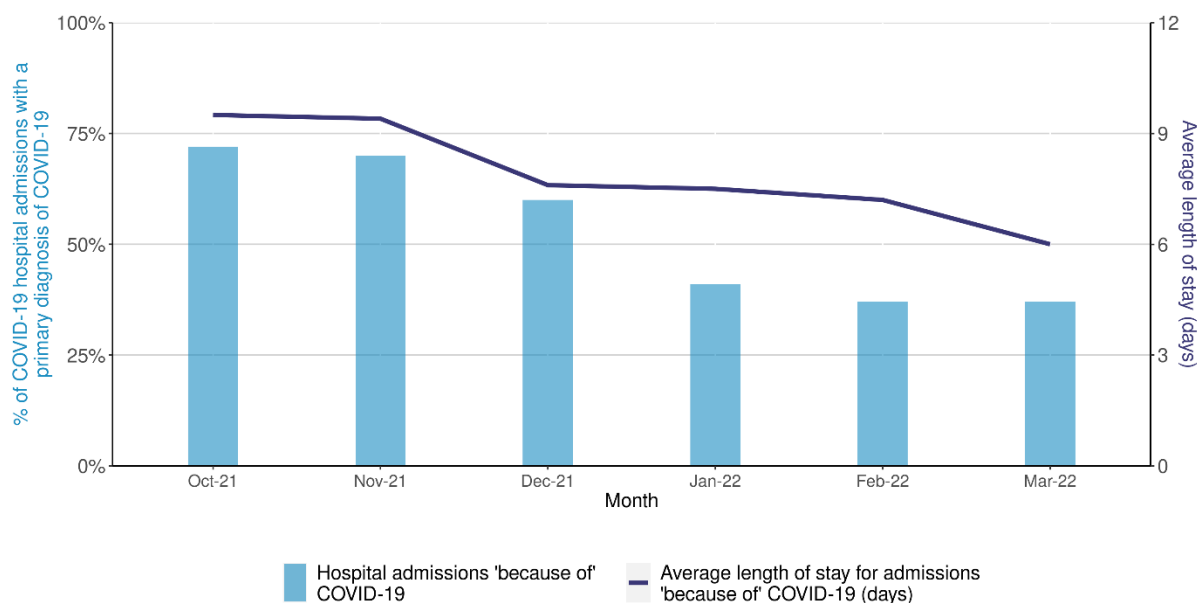
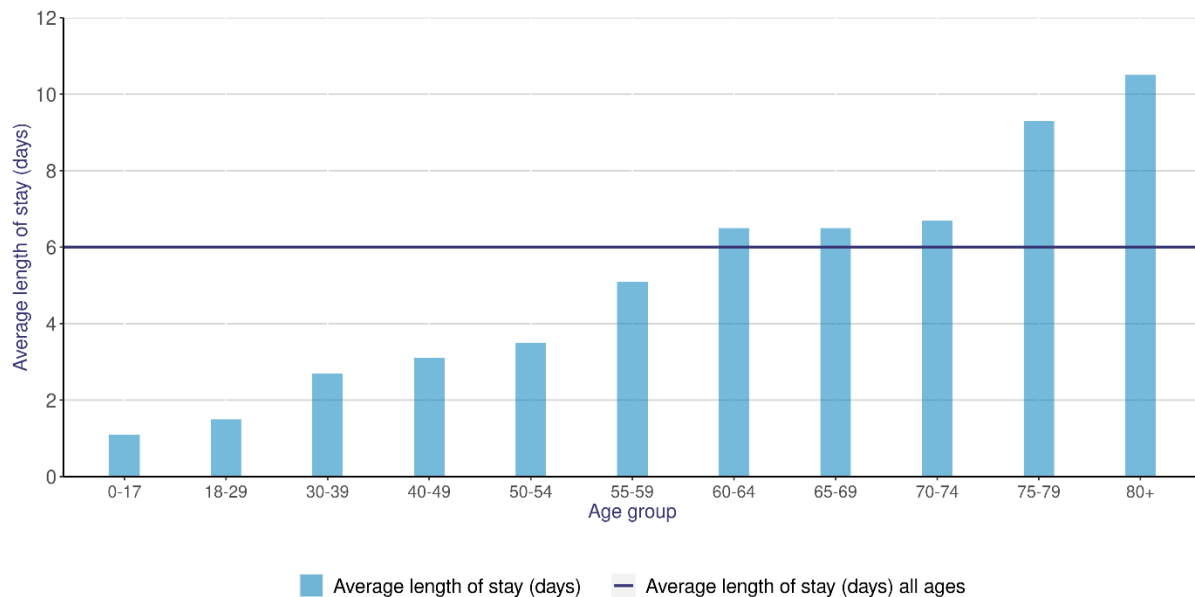


Figure 9 below shows a breakdown of the average length of stay in days for March 2022 for COVID-19 hospital admissions with a primary diagnosis of COVID-19.

Figure 9: Average length of stay of SMR01 COVID-19 hospital admissions with a primary diagnosis of COVID-19 by age band; March 2022



Hospital occupancy (COVID-19 patients in hospital)

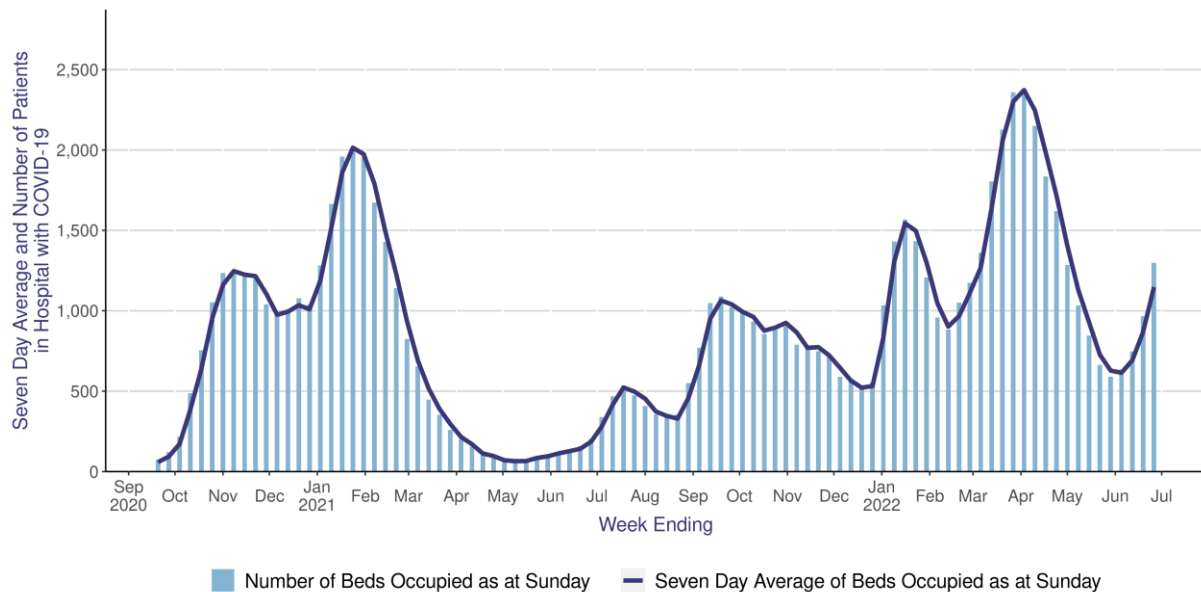
The number of COVID-19 patients in hospital is an indicative measure of the pressure on hospitals, as these patients still require isolation from other patients for infection control purposes.

Information is collected from NHS Boards on the number of COVID-19 patients in beds at 8am the day prior to reporting.

Figure 10 shows a snapshot of the number of patients in hospital with COVID-19 along with the seven-day average each Sunday. Following a peak in early April 2022, the average number of patients in hospital with COVID-19 was decreasing until early June 2022, but has been rising again in recent weeks. In the most recent week ending 26 June 2022, on average there were 1,148 patients in hospital with COVID-19 which is a 32% increase from the previous week ending 19 June 2022, when on average there were 870 patients.

Alternative daily breakdowns of this data are available on the [COVID-19 dashboard](#).

Figure 10: Number of beds occupied with COVID-19 in hospital each Sunday in Scotland from 17 September 2020 to 26 June 2022



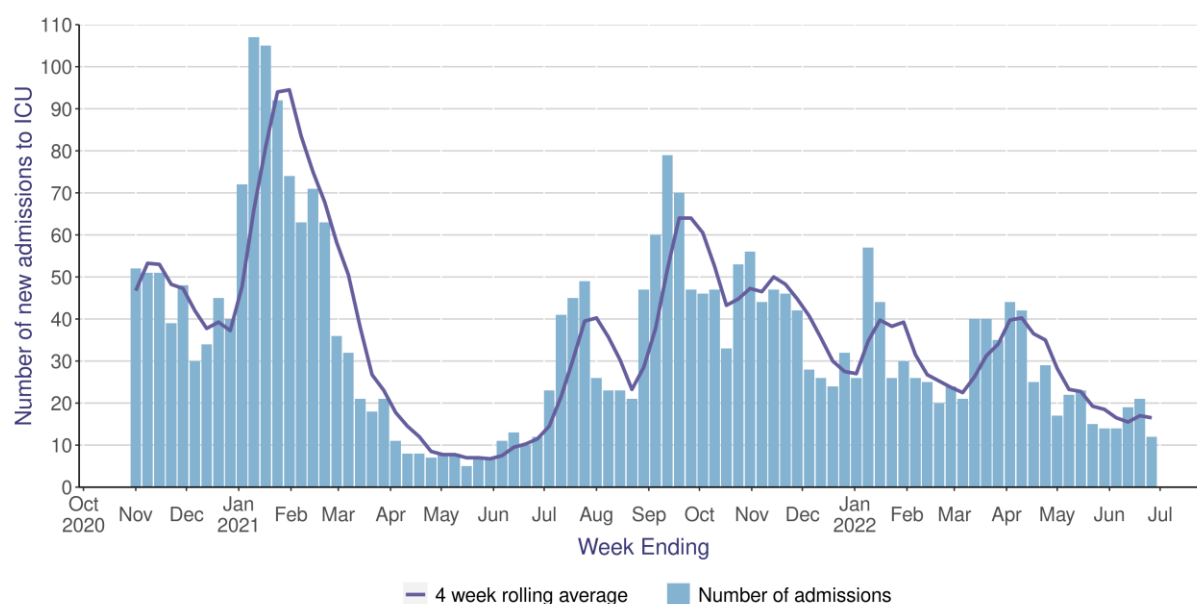
Intensive Care Unit (ICU) admissions

The severity of COVID-19 varies from very mild symptoms through to those who require intensive care treatment and supported ventilation. Monitoring the admission frequency to critical care units in Scotland (ICU) is therefore an important measure of the severity of COVID-19.

Figure 11 below shows the weekly trend of admissions to ICU. The number of admissions has generally been decreasing since the beginning of April. In the week ending 26 Jun 2022 there were 12 admissions to ICU, a decrease of 9 from the previous week (week ending 19 Jun 2022) when there were 21 admissions.

Please note, we are aware that this week’s figures are likely to be an under report and cover less than a 7-day period. This is due to a data processing issue since 9am on 25 June 2022.

Figure 11: Weekly trend of COVID-19 ICU admissions in Scotland



Deaths involving COVID-19

National Records of Scotland publish weekly information on deaths involving COVID-19. These are deaths where COVID-19 has been identified as being involved in the death by a doctor, either as the underlying cause of death or as a contributory cause of death.

In the week ending 19 June 2022, there were 41 deaths where COVID-19 was mentioned on the death certificate (with or without laboratory diagnosis). Of these deaths, there were 22 (53.7%) deaths where COVID-19 was the underlying cause of death.

The number of deaths where COVID-19 was mentioned on the death certificate has been falling since March 2022. There were 2 more deaths in the week ending 19 June 2022 compared to the week prior (39 deaths in the week ending 12 June 2022).

In addition to reporting on the number of deaths involving COVID-19, National Records of Scotland publish excess mortality statistics. This is another important measure as it presents seasonal variation in deaths and describes the difference between the number of deaths in the current year and the 'expected number of deaths'.

Further breakdowns of deaths involving COVID-19 and excess mortality can be found on [NRS website](#).

COVID-19 Vaccine

On 08 December 2020, a COVID-19 vaccine developed by Pfizer BioNTech was first used in the UK as part of national immunisation programmes. The AstraZeneca (Vaxzevria) vaccine was also **approved for use** in the national programme, and rollout of this vaccine began on 04 January 2021. Moderna (Spikevax) vaccine was approved for use on 08 January 2021 and rollout of this vaccine began on 07 April 2021. These vaccines have met strict standards of safety, quality and effectiveness set out by the independent Medicines and Healthcare Products Regulatory Agency (MHRA).

For the latest information on COVID-19 vaccines, including information on eligibility, please see our **[COVID-19 vaccine information and resources pages](#)**.

Information on uptake across the vaccine programme is available on a weekly basis via the **[PHS COVID-19 Dashboard](#)**, every Wednesday at 12pm. This provides a cumulative picture of the position nationally and locally.

The dashboard provides total uptake nationally with breakdowns by **[Joint Committee on Vaccination and Immunisation \(JCVI\)](#)** age based cohorts and non-age based cohorts for priority groups 1-9.

The vaccination content of this weekly publication is kept under continual review and specific editions have contained more in-depth analyses of uptake by particular groups or characteristics, including uptake by ethnicity and deprivation category, for teachers, for prisoners and for pregnant women.

Vaccine Effectiveness

Public Health Scotland has a **COVID-19 vaccine surveillance strategy** to monitor the effectiveness, safety and impact of all approved COVID-19 vaccines in Scotland. The key measure of the success of the vaccination programme in protecting against severe disease, hospitalisations and deaths is vaccine effectiveness.

Vaccine effectiveness is a scientific method used to measure how well a vaccine protects people against outcomes such as infection, symptoms, hospitalisation, and death in the 'real-world'. Vaccine effectiveness analysis accounts for potential biases in the data and risk factors such as age, sex, prior infection, co-morbidities, socio-economic status, and time since vaccination. This method is the most robust way to measure if a vaccine is working.

Vaccinated individuals can still be infected with COVID-19

The **current evidence** suggests that you may test positive for COVID-19, or be reinfected even if you are vaccinated, especially since the emergence of the Omicron variant in the UK. The major benefit of vaccination against the Omicron variant is to protect from severe disease, see below. For the latest COVID-19 guidance, please visit the **NHS Inform website**.

COVID-19 vaccines protect most people against severe outcomes, but some people will still get sick because no vaccine is 100% effective

Evidence suggests the COVID-19 vaccines are very effective at preventing a severe outcome of COVID-19. COVID-19 **hospitalisations** and **deaths** are strongly driven by older age, with most deaths occurring in those over 70 years old and those with multiple other illnesses. But overall, you are less likely **to be hospitalised if you are vaccinated with a booster**.

Vaccine effectiveness against symptomatic disease

Analyses from Scotland show that the booster and third dose of the COVID-19 vaccines are associated with 57% reduced risk of symptomatic infection with the Omicron variant compared to those who are more than 25 weeks post-second dose

of COVID-19 vaccine. Vaccine effectiveness against symptomatic infection for the Omicron variant is thought to wane (reduce) over time.

Studies looking at the Omicron variant sub-lineage known as **BA.2 (VUI-22JAN-01)** show no apparent reduction in vaccine effectiveness against symptomatic disease when compared to the first Omicron variant (BA.1) (**1, 2, 3, 4**). To note, the studies described above do not account for severity of symptoms. For example, one person may only have mild symptoms such as a runny nose for one day and another person severe symptoms such as long-term fatigue and breathing issues. These people would have different outcomes of infection, but they would both be recorded as having symptoms. This could result in an under or overestimate of vaccine effectiveness.

Vaccine effectiveness against hospitalisation

A number of studies have estimated COVID-19 vaccine effectiveness against hospitalisation and have found high levels of protection against hospitalisation with all COVID-19 vaccines against the Alpha and Delta variants (**1, 2, 3, 4**).

Vaccine effectiveness against hospitalisation with the **Omicron variant** is slightly lower than the Delta variant, but the booster or third dose of COVID-19 vaccine still provides excellent protection against COVID-19 related hospitalisation (**1**).

Everyone who is admitted to hospital for any reason in the UK are tested for COVID-19. A large proportion of people who have a positive COVID-19 test on admission are likely to have COVID-19 as an incidental finding rather than COVID-19 be the primary reason for admission. This causes a problem when trying to calculate vaccine effectiveness estimates against COVID-19 hospitalisation as inclusion of incidental cases may result lower estimates of effectiveness against hospitalisation than reality. To try and account for this issue, the **UK Health Security Agency (UKHSA)** have conducted studies using stricter definitions of COVID-19 hospitalisation to identify patients hospitalised with severe respiratory disease and found that vaccine effectiveness estimates against COVID-19 hospitalisation are high with less evidence of vaccine waning over time since vaccination.

In Finland, they are able to exclude incidental COVID-19 hospital admissions from their analysis, and a **study** (preprint) of elderly populations over 70 years old found a COVID-19 vaccine effectiveness of approximately 90% against COVID-19 hospitalisation in the first few months following vaccination during the emergence of Omicron.

Vaccine effectiveness against death

Evidence has shown that vaccination is highly effective in protecting against death from COVID-19. **A study** in Israel found that adults who had received their Pfizer (Comirnaty) booster dose five months after their second dose had a 90% lower risk of mortality due to COVID-19 than adults who hadn't received their booster dose five months after their second dose. Data from **UKHSA** also shows a vaccine effectiveness of approximately 85-98% against mortality two or more weeks after a COVID-19 booster. A small number of COVID-19 deaths are still expected in vaccinated people, especially in vulnerable individuals where the vaccine or the immune response may not have been effective.

Vaccine effectiveness in at-risk groups

A study from England (VIVALDI) found the COVID-19 vaccines were 85% effective against COVID-19 hospitalisations and 94% against COVID-19 death among care home residents between two and 12 weeks after the second dose. This declined to 54% against hospitalisations and 63% against death from 12 weeks after the second dose. However, a booster vaccination restored protection with vaccine effectiveness estimated to be 90% against hospitalisations and 98% against death among care home residents.

Evidence (**1, 2, 3, 4, 5**) from studies in Israel in over 60s who have had a fourth dose show greater protection than those who have only had three doses, with reduction in severe infection, hospitalisation, and death due to COVID-19.

Other vaccine studies

A review by UKHSA shows that people who have had one or more doses of a COVID-19 vaccine are less likely to develop long COVID-19 than those who remain unvaccinated.

A UK study has investigated how vaccination affects symptoms of long-covid. After an initial dose of vaccine there was a 12.8% decrease in long-covid, with further reductions after a second dose.

Studies from the USA (**1, 2**) show protection against the Omicron variant in children and adolescents (12-18 years old) following two doses of vaccine. Hospitalisation risk associated with Omicron infection in this group was also reduced following a second dose.

Vaccine effectiveness summary

UKHSA publish a summary of current vaccine effectiveness in their weekly COVID-19 vaccine surveillance report. **The latest evidence** can be found below, which suggests the COVID-19 booster/third dose vaccine lowers your risk of a severe outcome compared to the second dose.

The Office for National Statistics (ONS) has also published research into the **risk of testing positive** for COVID-19 by vaccination status and **deaths involving COVID-19 by vaccination status**.

Figure 12: UKHSA consensus estimates of vaccine effectiveness against the Omicron variant

Vaccine product for primary course	Outcome	Second dose: 0 to 3 months	Second dose: 4 to 6 months	Second dose: 6+ months	Booster dose: All Periods	Booster dose: 0 to 3 months	Booster dose: 4 to 6 months	Booster dose: 6+ months
AstraZeneca	All Infection	30% (20 to 40%)	0 to 30% (range only)	0% (0 to 10%)	See Individual Periods	45% (35 to 55%)	15% (0 to 30%)	0% (0 to 10%)
	Symptomatic	40% (30 to 50%)	20% (5 to 30%)	5% (0 to 5%)	See Individual Periods	60% (50 to 70%)	40% (30 to 50%)	10% (0 to 20%)
	Hospitalisation	85% (60 to 90%)	70% (50 to 75%)	65% (45 to 85%)	See Individual Periods	90% (85 to 95%)	85% (85 to 95%)	70% (50 to 85%)
	Mortality	Insufficient Data	Insufficient Data	Insufficient Data	See Individual Periods	90% (85 to 98%)	Insufficient Data	Insufficient Data
	Transmission	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Moderna	All Infection	30% (20 to 40%)	0 to 30% (range only)	30% (10 to 50%)	See Individual Periods	45% (35 to 55%)	15% (0 to 30%)	0% (0 to 10%)
	Symptomatic	55% (35 to 75%)	30% (15 to 35%)	15% (10 to 20%)	See Individual Periods	65% (55 to 75%)	40% (30 to 50%)	10% (0 to 20%)
	Hospitalisation	85 to 95% (range only)	75 to 85% (range only)	55 to 90% (range only)	See Individual Periods	85 to 95% (range only)	Insufficient Data	Insufficient Data
	Mortality	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
	Transmission	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Pfizer	All Infection	30% (20 to 40%)	0 to 30% (range only)	20% (10 to 30%)	See Individual Periods	45% (35 to 55%)	15% (0 to 30%)	0% (0 to 10%)
	Symptomatic	50% (30 to 65%)	20% (15 to 30%)	15% (10 to 15%)	See Individual Periods	65% (55 to 75%)	45% (35 to 55%)	10% (0 to 20%)
	Hospitalisation	90% (85 to 95%)	80% (75 to 85%)	70% (55 to 90%)	See Individual Periods	90% (85 to 95%)	85% (85 to 95%)	70% (50 to 85%)
	Mortality	Insufficient Data	Insufficient Data	Insufficient Data	See Individual Periods	90% (85 to 98%)	Insufficient Data	Insufficient Data
	Transmission	Insufficient Data	Insufficient Data	Insufficient Data	0 to 25% (range only)	Insufficient Data	Insufficient Data	Insufficient Data

High Confidence	Evidence from multiple studies which is consistent and comprehensive
Medium Confidence	Evidence is emerging from a limited number of studies or with a moderately level of uncertainty
Low Confidence	Little evidence is available at present and results are inconclusive

Wider Impact of COVID-19

The COVID-19 pandemic has direct impacts on health as a result of illness, hospitalisations, and deaths due to COVID-19. However, the pandemic also has wider impacts on health, healthcare, and health inequalities. Reasons for this may include:

- Individuals being reluctant to use health services because they do not want to burden the NHS or are anxious about the risk of infection.
- The health service delaying preventative and non-urgent care such as some screening services and planned surgery.
- Other indirect effects of interventions to control COVID-19, such as changes to employment and income, changes in access to education, social isolation, family violence and abuse, changes in the accessibility and use of food, alcohol, drugs and gambling, or changes in physical activity and transport patterns.

More detailed background information on these potential impacts is provided by the Scottish Public Health Observatory in a section on [Covid-19 wider impacts](#).

The surveillance work stream of the Public Health Scotland social and systems recovery cell aims to provide information and intelligence on the wider impacts of COVID-19 on health, healthcare, and health inequalities that are not directly due to COVID-19. The [wider impact dashboard](#) can be viewed online and includes the following topics:

- Hospital and unscheduled care
- Accident and Emergency attendances
- NHS 24 completed contacts
- Out of hours cases

- Scottish Ambulance Service
- Excess deaths
- Outpatient appointments
- Healthcare for cardiovascular disease
- Healthcare for mental health
- Women booking antenatal care
- Healthcare for birth and babies
- Termination of pregnancy
- Child health
- Cancer
- Substance use
- Injuries

These analyses are based on a selected range of data sources that are available to describe changes in health service use in Scotland during the COVID-19 pandemic. More detailed information is available at NHS Board and Health and Social Care Partnership (HSCP) level.

Contact

Public Health Scotland

phs.covid19data&analytics@phs.scot

Further Information

COVID surveillance in Scotland

Scottish Government

Daily Dashboard by Public Health Scotland National Records of Scotland

UK and international COVID reports

Public Health England

European Centre for Disease Prevention and Control

WHO

Weekly National Seasonal Respiratory Report:

Weekly national seasonal respiratory report - Week 24 2022 - Weekly national seasonal respiratory report - Publications - Public Health Scotland

Next Release

The next release of this publication will be 06 July 2022.

Open Data

Data from this publication is available to download from the **Scottish Health and Social Care Open Data Portal**.

Rate this publication

Let us know what you think about this publication via the link at the bottom of this [publication page](#) on the PHS website.

Appendices

Appendix 1: Background information

In late December 2019, the People's Republic of China reported an outbreak of pneumonia due to unknown cause in Wuhan City, Hubei Province.

In early January 2020, the cause of the outbreak was identified as a new coronavirus. While early cases were likely infected by an animal source in a 'wet market' in Wuhan, ongoing human-to-human transmission is now occurring.

There are a number of coronaviruses that are transmitted from human-to-human which are not of public health concern. However, COVID-19 can cause respiratory illness of varying severity.

On the 30 January 2020, the World Health Organization **declared that the outbreak constitutes a Public Health Emergency of International Concern.**

Extensive measures have been implemented across many countries to slow the spread of COVID-19.

Further information for the public on COVID-19 can be found on **NHS Inform**.

Appendix 2: Testing policy in 2022

Please note the following changes to testing policy in 2022:

- Prior to 05 January 2022, reported cases consisted only of positive Polymerase Chain Reaction (PCR) tests
- From 05 January 2022, reported cases included both PCR and Lateral Flow Device (LFD) positive tests. See [here](#) for more information
- From 01 March 2022, reported cases included episodes of reinfection at least 90 days after initial infection. Prior to this date, COVID-19 cases were based

on an individual's first positive test only. More information is available on the PHS website [here](#)

- From mid-April 2022, as part of the Scottish Government's **Test and Protect transition plan**, asymptomatic testing was no longer recommended
- Symptomatic PCR testing was still available, and LFD testing was still encouraged for hospital and care home visitors, those who had been in close contact with a case and to allow cases to finish their isolation after 7 days
- 01 May 2022 marks the beginning of updated testing policy. The purpose of COVID-19 testing has now shifted from population-wide testing to reduce transmission, to targeted testing. Therefore, reported cases will primarily include clinical care settings, health and social care workforce, surveillance, and outbreak response

Appendix 3: Wastewater analysis notes

In May 2020, the Scottish Environment Protection Agency (SEPA) began exploratory work to pinpoint fragments of coronavirus' ribonucleic acid (RNA) in local wastewater samples. In contrast to COVID-19 case records, virus shedding into wastewater is a biological process, meaning wastewater data is unaffected by factors that impact whether testing is done. Sewage samples are taken by Scottish Water from 141 sample sites across Scotland from the sewage network (wastewater treatment works). Composite samples are built up over a period of time. The amount of unique fragments of viral DNA within known volumes of the sample is calculated, outputting a number which can be used to calculate the number of COVID markers in each sample which is reported as million gene copies per litre (Mgc/p/d). Site level wastewater level can show substantial degree of variability, especially when prevalence of COVID-19 is high. An average and standard deviation is taken for three samples. Household drainage water is mixed with water from other urban sources, meaning composite samples will contain rainwater which dilutes the sample. Therefore, this variability is accounted for by controlling for rainfall.

Appendix 4: Notes

Case Definition

From 01 March 2022, PHS now include episodes of reinfection within COVID-19 reporting. Prior to this date COVID-19 cases were based on an individual's first positive test result only. The new daily calculation includes both new infections and possible reinfections. Possible reinfections are defined as individuals who tests positive, by PCR (polymerase chain reaction) or LFD (lateral flow device), 90 days or more after their last positive test. This update to reporting will ensure that PHS's surveillance data reflects underlying transmission rates. More information is available on the PHS website [here](#).

RAPID (Rapid and Preliminary Inpatient Data)

Hospital admissions 'with' COVID-19 are defined as: A patient's first positive PCR or LFD test of the episode of infection (including reinfections at 90 days or more after their last positive test) for COVID-19 up to 14 days prior to admission to hospital, on the day of their admission or during their stay in hospital.

The number reported does not take into account the reason for hospitalisation. Therefore, people that were admitted for a non-COVID-19 related reason (and tested positive upon admission) may be included.

RAPID is a weekly submission of people who have been admitted and discharged to hospital. From 27 June 2022, RAPID submissions are now made on a weekly basis. This change has been made as the pandemic has moved away from the emergency response to effective management of the virus, so Health Boards have returned to pre-pandemic submission schedules.

Hospital admissions for the most recent week may be incomplete for some Boards and should be treated as provisional and interpreted with caution. These provisional data will be refreshed next week.

Further, figures are subject to change as hospital records are updated. It can take on average 6-8 weeks before a record is finalised, particularly discharge details.

These data include admissions to acute hospitals only and do not include psychiatric or maternity/obstetrics specialties. In the data presented here, an admission is defined as a period of stay in a single hospital. There may be multiple admissions for a single patient if they have moved between locations during a continuous inpatient stay (CIS), or if they have been admitted to hospital on separate occasions.

Hospital Inpatients (Scottish Government Data)

Number of patients in hospital with recently confirmed COVID-19, identified by their first positive LFD test (from 5 January 2022) or PCR test. This measure (available from 11 September 2020 and first published 15 September 2020) includes patients who first tested positive in hospital or in the 14 days before admission. Patients stop being included after 28 days in hospital (or 28 days after first testing positive if this is after admission). Further background on this new approach is provided in [this Scottish Government blog](#).

This is based on the number of patients in beds at 8am the day prior to reporting, with the data extract taken at 8am on the day of reporting to allow 24 hours for test results to become available. Where a patient has not yet received a positive test result, they will not be included in this figure. Patients who have been in hospital for more than 28 days and still being treated for COVID-19 will stop being included in this figure after 28 days.

All patients in hospital, including in intensive care, and community, mental health and long stay hospitals are included in this figure.

Appendix 5: Hospital admissions ‘because of’ COVID-19

The SMR01 dataset comprises episode-based patient records relating to all inpatients and day cases discharged from non-obstetric, non-psychiatric specialties and excluding geriatric long stay records. Data are updated on a monthly basis and include clinical and non-clinical data.

Analyses are based on month of admission.

Average length of stay is the mean length of stay (in days) of a patient's entire continuous inpatient stay (CIS). A CIS is an unbroken period of time that a patient spends as an inpatient. However, a patient may change consultant, significant facility, specialty, and/or hospital during a continuous inpatient stay. A COVID-19 hospital admission 'with' COVID-19 is defined as: A patient's first positive PCR test for COVID up to 14 days prior to admission to hospital, on the day of their admission or during their stay in hospital.

A hospital admission 'because of' COVID-19 is defined as an admission with a diagnosis of laboratory confirmed (U07.1) or clinically diagnosed COVID-19 illness (U07.2) in the primary diagnostic position of the SMR01 record, within the first episode of the Continuous Inpatient Stay. As SMR coding is done on discharge, 'main condition' reflects that which is considered retrospectively to be primarily responsible for the patient's need for treatment, rather than necessarily the condition with which they presented. Data using this definition prior to 1st June 2021 will include a greater proportion of COVID-19 admissions, as prior to this date COVID-19 was more likely to be assigned to the 'main condition' position due to the coding guidance at that time.

ICD-10 COVID-19 diagnostic codes used: U07.1 and U07.2.

The six NHS Boards included in the analysis are: NHS Ayrshire & Arran, NHS Dumfries & Galloway, NHS Grampian, NHS Greater Glasgow & Clyde, NHS Lothian, and NHS Tayside.

Appendix 6: Early access details

Pre-Release Access: Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", PHS is obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:

Scottish Government Health Department

NHS Board Chief Executives

NHS Board Communication leads