

Public Health Scotland COVID-19 & Winter Statistical Report

As at 05 January 2022

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Introduction

Since the start of the Coronavirus-19 (COVID-19) outbreak Public Health Scotland (PHS) has been working closely with Scottish Government and health and care colleagues in supporting the surveillance and monitoring of COVID-19 amongst the population. As part of our continuous review of reporting, as of 08 December 2021 Public Health Scotland has implemented changes to the COVID-19 Weekly Report to support the reader in drawing insights from a wider range of existing metrics around COVID-19 and winter pressures.

Caution should be used when making comparisons between metrics; each metric is calculated independently and may cover different time periods or cohorts of the population. The consolidated report will include the following content weekly:

COVID-19

- Summary of tests and cases
- Contact Tracing
- Hospital and ICU admissions
- Testing in care homes
- COVID-19 vaccination status cases, hospitalisations and deaths
- Covid-19 vaccination uptake summary
- Adhoc reporting on topics such as: Covid-19 and Vaccination in pregnancy, Equality reporting etc.

Hospital/ Wider System Pressures

- Unscheduled Care
- Waiting Times
- Delayed Discharges

Additional charts for a number of variables related to COVID-19 service use in the NHS, including some metrics previously presented in the weekly COVID-19 report, are available to view in our [interactive dashboard](#). These include breakdowns by age, sex and deprivation. The variables currently available on the dashboard include:

- Positive cases per day and cumulative total
- COVID-19 hospital admissions
- COVID-19 patients admitted to ICU admissions
- COVID-19 related contacts to NHS24 and the Coronavirus Helpline
- Community Hubs and Assessment Centres
- Scottish Ambulance Service incidents
- Contact tracing
- Health care workers
- Care homes
- Targeted community testing
- Travel outside of Scotland
- Quarantine Statistics
- NHS Protect Scotland App
- Lateral Flow Device (LFD) Testing

The Public Health Scotland [COVID-19 Daily Dashboard](#) publishes daily updates on the number of positive cases of COVID-19 in Scotland, with charts showing the trend since the start of the outbreak. From 26 February 2021 the Daily Dashboard also includes daily updates on vaccinations for COVID-19 in Scotland.

There is a large amount of data being regularly published regarding COVID-19 (for example, [Coronavirus in Scotland – Scottish Government](#) and [Deaths involving coronavirus in Scotland – National Records of Scotland](#)). This report complements the range of existing data currently available.

Main Points

- As at 02 January 2022, there have been 966,001 confirmed COVID-19 cases; 91,544 of these were recorded in the most recent week, an increase of 51.5% from the previous week.
- The proportion of cases with S gene target failure, a proxy for the Omicron variant, has exponentially increased since 23 November, and as at 05 January 2022, S gene target failure cases accounted for 91.1% of all cases reported by Pillar 2 Lighthouse Laboratory and therefore has now replaced Delta as the dominant variant of COVID-19 in Scotland.
- Based on clinical audit of hospital admission records in NHS Greater Glasgow and Clyde and NHS Grampian in late December 2021 and early January 2022, 60% of acute hospital admissions were determined to be 'because of' COVID-19 (assuming either a definite or probably attribution).
- There has been a 8.9% decrease in the number of Lateral Flow Device (LFD) asymptomatic tests carried out in the last week. There have been 18,526,264 LFD tests carried out in Scotland since 19 November 2020, of which 159,908 were positive (0.9%).
- In the week ending 26 December 2021, 66,189 individuals were recorded in the contact tracing software, from which 65,476 unique contacts have been traced.
- In the week ending 28 December 2021, there were 653 admissions to hospital with a laboratory confirmed test of COVID-19, an increase of 31% from the previous week. The highest number of new admissions are now in those aged 80+.
- The proportion of all people who were admitted to hospital within 14 days of a laboratory confirmed COVID-19 positive test has declined, from 12% in the week ending 31 January 2021, to 1% in the most recent week ending 19 December 2021.
- In the week ending 26 December 2021 there were 31 new admissions to Intensive Care Units (ICUs) for confirmed COVID-19. This is a increase of 29.1% from the week ending 19 December 2021.

Incidence of Variants of Concern and Variants Under Investigation

Since 31 May 2021, the Delta variant has been the dominant COVID-19 variant in Scotland. Following a rapid increase in the number of cases of the new Omicron variant which was originally detected in South Africa, Omicron now represents the dominant variant in Scotland. Therefore, this will be the last report with a separate Omicron section.

The latest information on the Scotland cases of the new variant of concern is published daily by [Scottish Government](#). Further information can be found below within [The Omicron variant of COVID-19](#) section.

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).

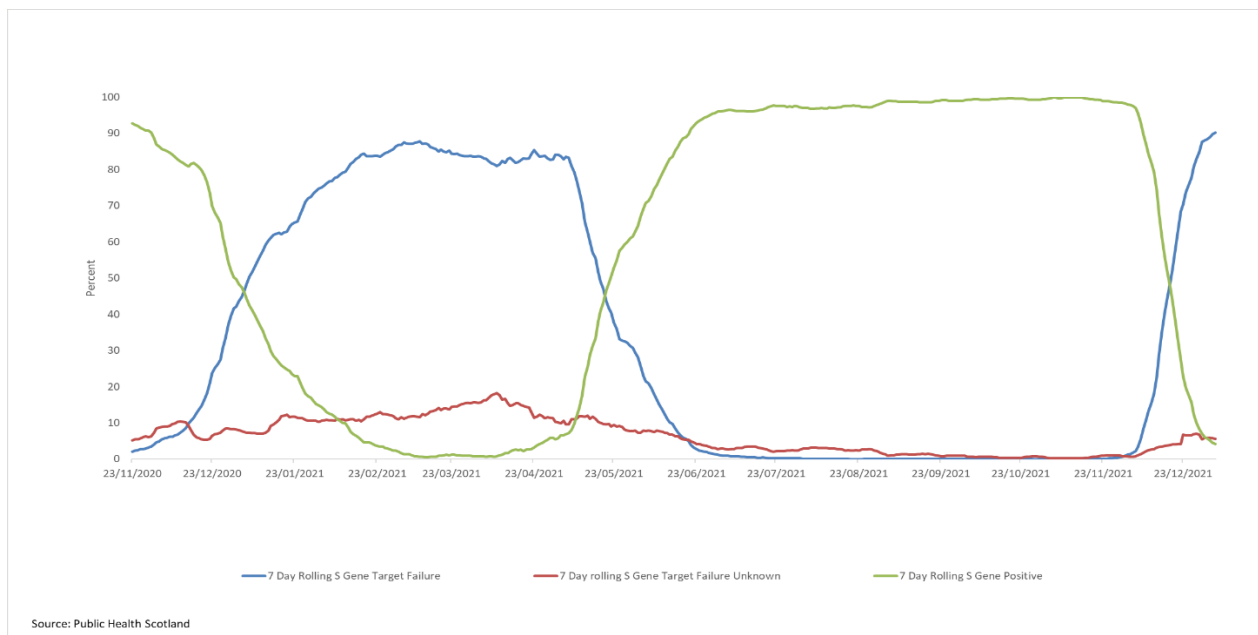
The Omicron Variant of COVID-19

On 23 November 2021, a small number of cases of a new SARS-CoV-2 variant with 32 spike mutations was reported by South Africa to the international genomic database, GISAID. This variant was designated B.1.1.529 on 24 November 2021. On 26 November 2021, the World Health Organisation identified it as a Variant of Concern known as Omicron.

Omicron has rapidly replaced Delta as the dominant variant in Scotland due to either higher transmissibility or immune evasion or both. Early analyses support a reduction in the risk of hospitalisation in those infected with Omicron when compared to Delta but at present, there is insufficient data to determine the severity of illness once in hospital or mortality. The World Health Organisation (WHO) notes that further investigations into the characteristics of the Omicron variant are required.

Like the Alpha variant of COVID-19 that was once dominant in the UK, Omicron has a mutation that leads to S gene target failure (or dropouts) in a widely-used PCR testing platform available at Pillar 2 Lighthouse Laboratories. Lighthouse Labs typically identify approximately 95% of all new cases reported daily in Scotland. Recent analysis by PHS found that since November 1, more than 97% of S gene target failures with confirmed whole genome sequence results were the Omicron variant of SAR-CoV-2. Prior to that, between July and October 2021, S gene target failure background rates in Scotland were stable and low, at less than 1 in 1000 cases (Figure 1). These analyses show that the S gene target failure marker is currently a good proxy for monitoring change in the Omicron variant in Scotland.

Figure 1: Proportion of cases by specimen date tested for the S gene by S gene category, 01 November 2020 – 04 January 2022



* S gene dropout weak positives are S gene dropouts where the cycle threshold of the two other target genes (ORF1AB and N) have CT values greater than 30, or where one of the target genes has dropped out, and the other is greater than 30.

The strategic aims of the PHS response to the Omicron variant of COVID-19 is to 1) understand the epidemiological and clinical characteristics of this variant and the potential

impact it may have on the population and services and 2) delay its spread whilst emerging knowledge informs policy development and the clinical and public health response. Since 02 December 2021, Public Health Scotland has been reporting daily updates of key data on Omicron cases in Scotland via the Scottish Government website.

The following case definitions for Omicron were adopted on 15 December 2021 by all 4 UK nations:

- **Confirmed:** Omicron(B.1.1.529) by sequencing or genotyping i) 417N and 681R failure; ii) 69-70 deletion plus 417N; iii) 69-70 deletion plus 501Y; iv) Q493R, v) other relevant genotyping results;
- **Probable:** COVID-19 PCR positive with specimen dates from 1 December 2021 and i) S Gene Target Failure* or ii) 69-70 deletion.
- **Possible:** COVID-19 PCR positive and S Gene Target Failure from 1 November 2021 up to and including 30th November 2021, excluding those with confirmed non-Omicron variant

Case definitions are subject to revision as understanding of the epidemiology of the Omicron variant evolves and the structure of the virus is more thoroughly characterised. Currently, confirmation of cases by whole genome sequencing occurs following testing by the COVID-19 Genomics UK Consortium. Results of samples sent for whole genome sequencing in Scotland are typically available within eight to twelve days following specimen collection date.

Since the latter part of November, the Omicron variant of SARS-CoV-2 represents a rapidly growing proportion of all daily cases reported to PHS. Between 23 November 2021 (the first date when an Omicron confirmed case was identified in Scotland) and 05 January 2022, prevalence of the S gene target failure as a proportion of all new cases increased from 0.1% to 91.1% (Figure 2).

Figure 2: Proportion of daily new cases reported by Pillar 2 Lighthouse Labs that are S gene target failures by date of report, 23 Nov 2021 – 05 Jan 2022

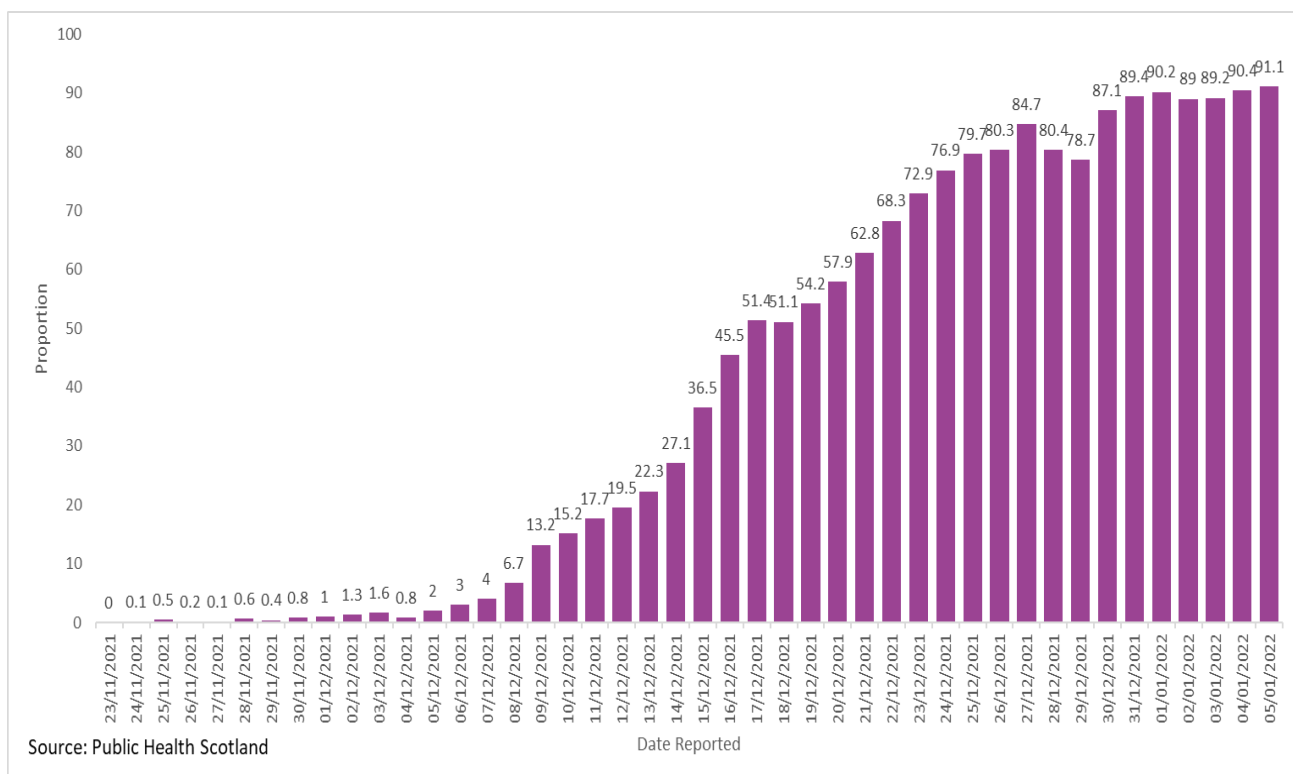
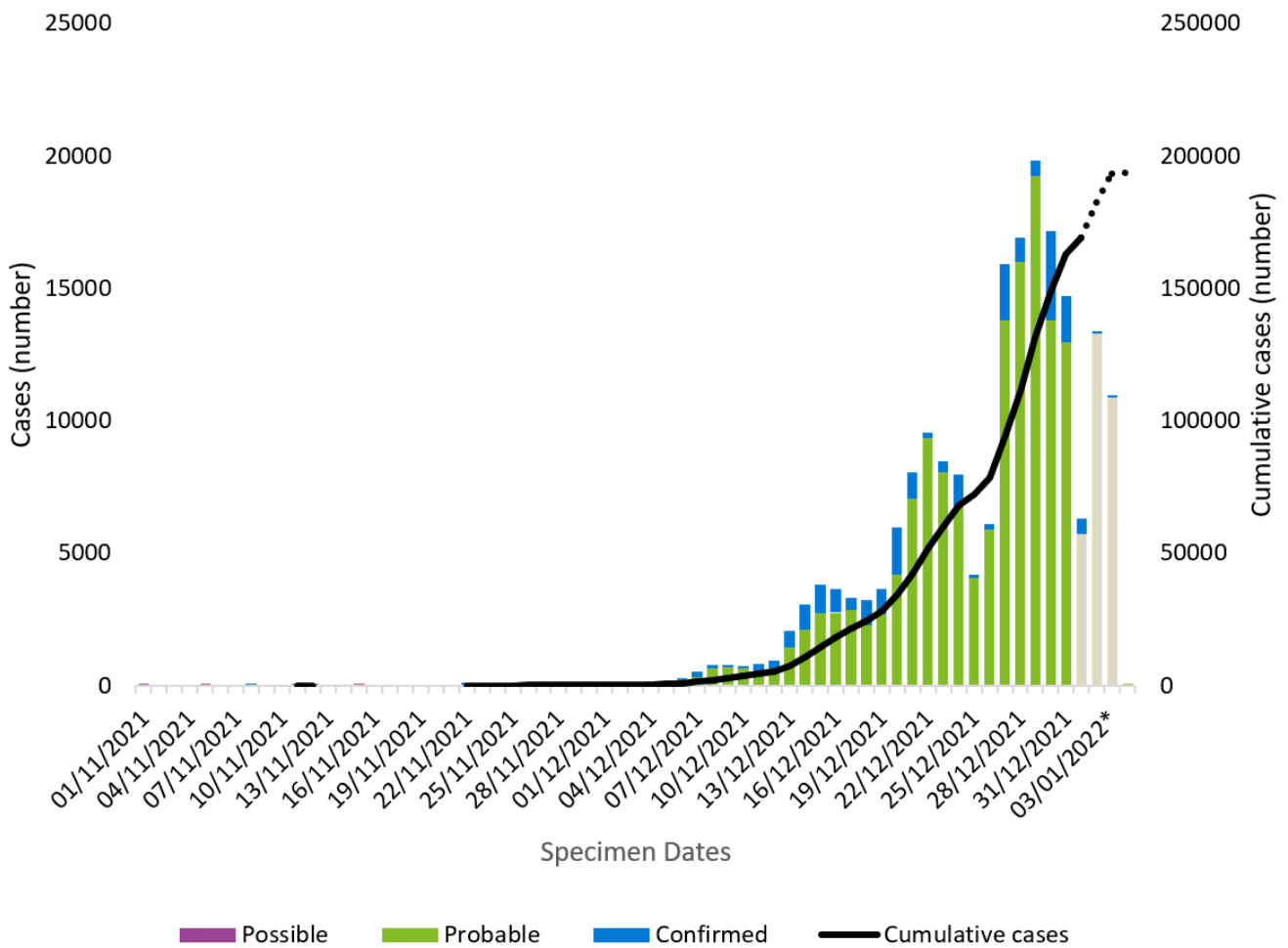


Figure 3 shows the number of confirmed Omicron cases and those probable and possible cases that are under investigation by specimen reporting date. As of 4 January 2022, 193405 cases were reported, of which 21832 (11.3%) were confirmed, 171524 (88.7%) were probable and 49 (0.03%) were possible.

Figure 3: Confirmed Omicron variant of COVID-19 cases or probable or possible cases under investigation by specimen date (n=193,405), as of 04 January 2022 17:00h, Scotland



Source: Public Health Scotland

Note: * Data for these days are lagged due to specimen processing times and data will represent an undercount

* Data for the previous 4 reporting days are subject to revision as censoring times and processing lags result in incomplete reporting for this period.

Table 1 shows the breakdown of cases by case definition and NHS Health Board. NHS Greater Glasgow and Clyde, and NHS Lanarkshire were the first Boards to identify a large number of cases following a private event in Glasgow on 20 November 2021 and a mass public gathering on 22 November 2021. Cases are now present in all NHS Health Boards across Scotland reflecting the sustained community transmission of Omicron.

Table 1: Omicron variant cases (n=193,405) by NHS Health Board as of 04 January 2022 17:00h, Scotland

NHS Health Board of Residence	Confirmed	Probable	Possible	Total cases (confirmed, probable, and possible)
Ayrshire & Arran	1,582	11,870	3	13,455
Borders	364	2,888	0	3,252
Dumfries & Galloway	398	3,278	0	3,676
Fife	1,039	9,253	1	10,293
Forth Valley	1,063	9,558	0	10,621
Greater Glasgow & Clyde	6,027	47,880	16	53,923
Grampian	1,266	11,034	2	12,302
Highland	751	6,768	3	7,522
Lanarkshire	3,736	27,786	17	31,539
Lothian	4,327	30,901	4	35,232
Orkney	20	319	0	339
Shetland	18	36	0	54
Tayside	1,174	9,869	3	11,046
Western Isles	7	82	0	89
Unknown	2	2	0	4
UK	58	0	0	58
Total	21,832	171,524	49	193,405

As of 04 January 2022, PHS identified via routine data linkage 154 people hospitalised in Scotland meeting the confirmed Omicron case definition. These figures include people who have a first positive PCR within 14 days of admission or who were diagnosed with COVID-19 during their stay in hospital. Importantly, the reason for hospitalisation is not reported to PHS. Consequently, these cases may include people admitted for non COVID-19 related reasons.

Table 2 compares the age and sex profile of confirmed, probable and possible case of Omicron variant of COVID-19 to the rest of the cases reported between 01 November 2021 and 04 January 2021; No marked differences are observed in the distribution of incident cases by sex (52% of Omicron confirmed cases were women versus 52% amongst all cases.) Currently 48% (n=92,219) of confirmed, probable or possible Omicron cases are between the ages 20 and 39 years, whereas 37% (n=132,024) of all cases are amongst those ages 20 and 39 years.

Table 2: Confirmed, probable or possible cases of the Omicron variant of COVID-19 cases (n=193,285*) and all cases since 01 November 2021 (n=353,646) by age group and sex, as of 04 January 2022 17:00h, Scotland

Age bands	Omicron confirmed, probable and possible cases				All PCR confirmed covid-19 cases			
	Female	Male	Total	(%)	Female	Male	Total	(%)
<20	16,817	14,370	31,187	16%	43,228	41,715	84,943	24%
20-29	28,894	24,928	53,822	28%	37,130	31,354	68,484	19%
30-39	19,423	18,974	38,397	20%	33,293	30,247	63,540	18%
40-49	14,088	12,805	26,893	14%	28,464	25,794	54,258	15%
50-59	12,832	12,061	24,893	13%	23,809	23,341	47,150	13%
60-69	5,807	6,003	11,810	6%	11,041	11,446	22,487	6%
70-79	2,296	2,547	4,843	3%	4,220	4,550	8,770	2%
80+	758	682	1,440	1%	2,359	1,655	4,014	1%
Total	100,915 (52.2%)	92,370 (47.8%)	193,285	100%	183,544 (51.9%)	170,102 (48.1%)	353,646	100%

* Age and sex specific data unknown for 120 Omicron confirmed, probable or possible cases.

Public Health Scotland continues to monitor cases on a daily basis in coordination with NHS Health Boards. Daily new and cumulative confirmed cases by NHS Health Board are published at: [Coronavirus \(COVID-19\): additional data and information - gov.scot \(www.gov.scot\)](https://www.gov.scot/coronavirus-covid-19-additional-data-and-information).

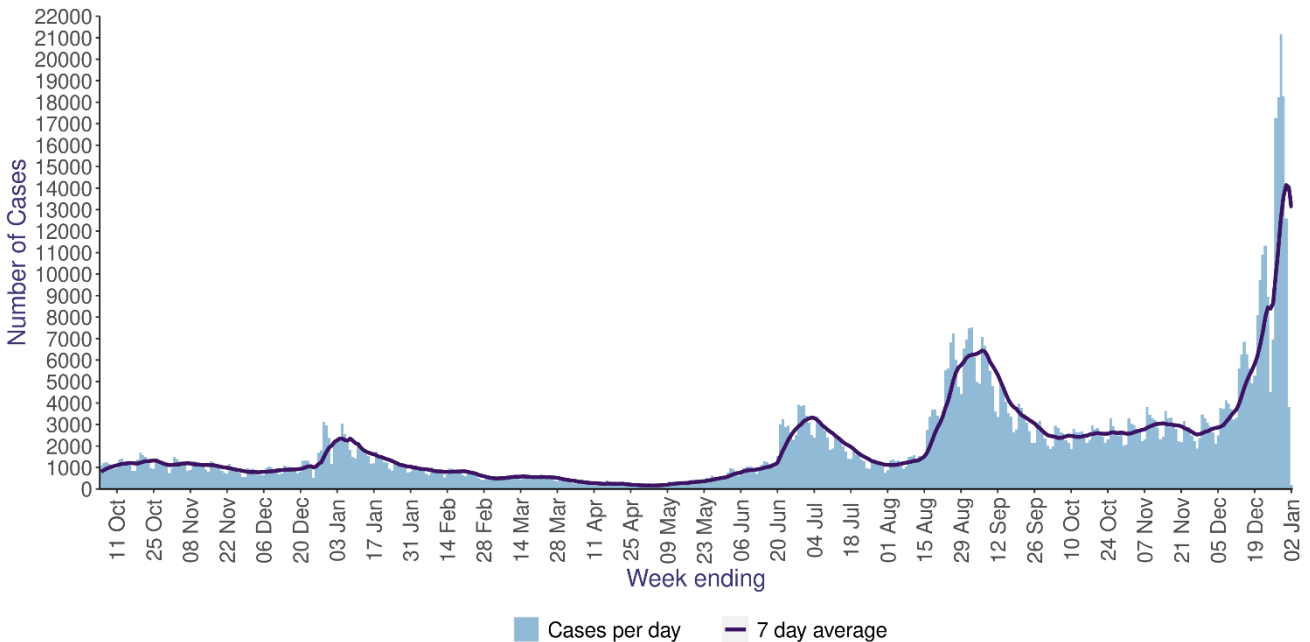
COVID-19 Daily Data

The Public Health Scotland [COVID-19 Daily Dashboard](#) publishes daily updates (5-days per week, Monday to Friday) on the number of positive cases of COVID-19 in Scotland, with charts showing the trend since the start of the outbreak.

The total number of people within Scotland who have, or have had COVID-19, since the coronavirus outbreak began is unknown. The number of confirmed cases is likely to be an underestimate of the total number who have, or have had, COVID-19. A person can have multiple tests but will only ever be counted once. The drop in the number of confirmed cases at weekends likely reflects that laboratories are doing fewer tests at the weekend.

- There have been 966,001 people in Scotland who have tested positive, at any site in Scotland (NHS and UK Government Regional Testing centres), for COVID-19 up to 02 January 2022
- In the week ending 02 January 2022 there were 91,544 confirmed COVID-19 cases.¹

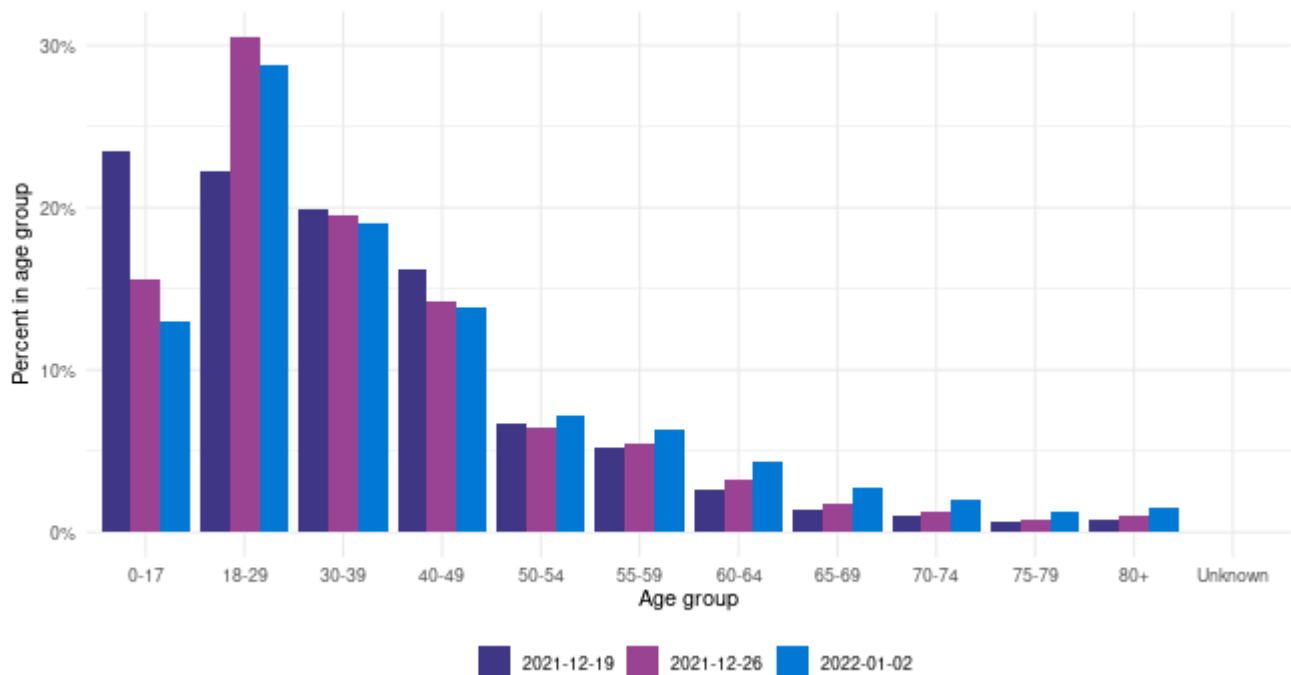
Figure 4: Number of Positive Cases per day with 7 Day Average



1. Correct as at 05 January, may differ from more recently published data in the previous week's report and on the [COVID-19 Daily Dashboard](#).

Figure 5 below shows the proportion of confirmed COVID-19 cases by age group for the most recent three weeks.

Figure 5: Proportion of confirmed COVID-19 cases by age group, weeks ending 19 December 2021 – 02 January 2022

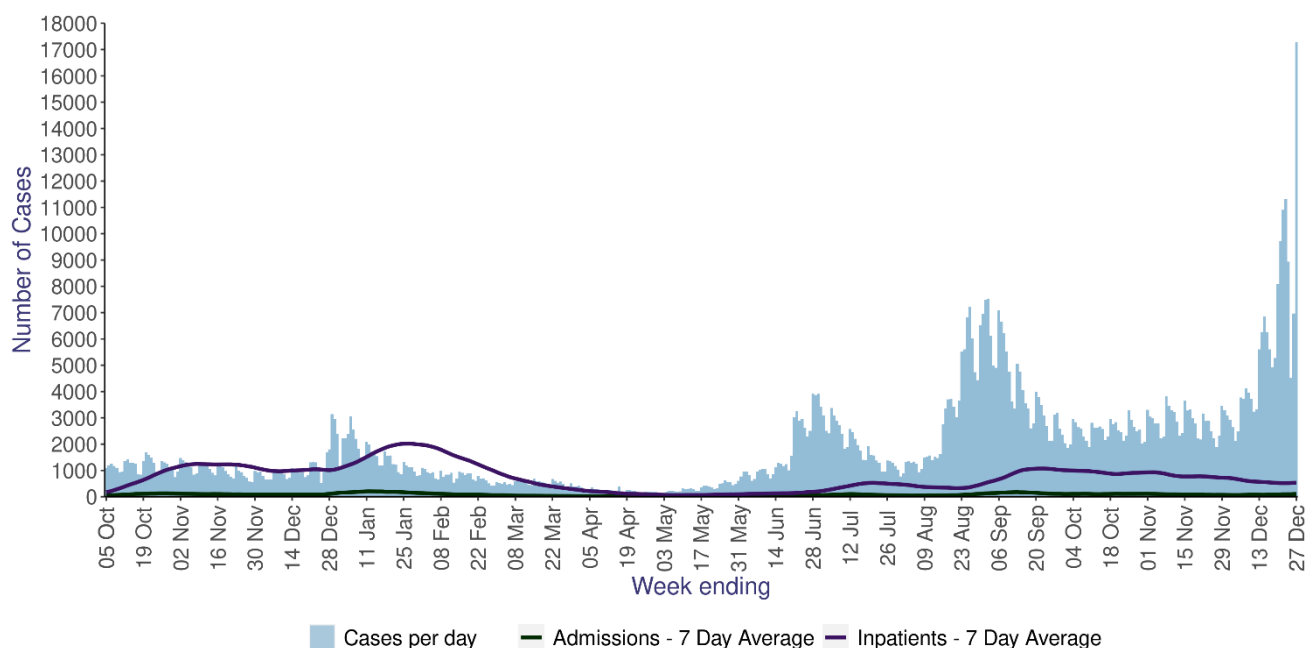


The [daily dashboard](#) also includes data on Hospital Admissions and ICU admissions for patients with COVID-19:

- In the week ending 28 December 2021, there were 653 admissions to hospital with a laboratory confirmed test of COVID-19.
- In the week ending 26 December 2021 there were 31 new admissions to Intensive Care Units (ICUs) for confirmed COVID-19 patients .

The number of confirmed daily COVID-19 cases increased from 9,719 to 17,282 between 21 December 2021 and 26 December 2021. During this same time period, the daily COVID-19 confirmed hospital admissions has increased from 91 to 101 (seven-day rolling average). The seven-day average of inpatients in hospital has increased by 3.0% (from 518 to 532).

Figure 6: Number of Positive Cases, Admissions and Inpatients, as at 26 December 2021²



2. Please refer to [Appendix 3 - Hospital Admissions Notes](#) for definitions of hospital admissions and inpatients.

Additional charts and data are available to view in the [interactive dashboard](#) accompanying this report.

Data is also monitored and published daily on the [Scottish Government Coronavirus website](#).

COVID-19 Hospital Admissions

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 defined as the following: 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. If a patient's first positive PCR test is after their date of discharge from hospital, they are not included in the analysis.

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. Supplementary analysis on COVID-19 related acute hospital admissions by vaccine status is also available within the [COVID-19 cases, acute hospitalisations, and deaths by vaccine status](#) section of this report.

Figure 7 below shows the weekly trend of hospital admissions with COVID-19 from week ending 05 January 2021 to 28 December 2021.

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

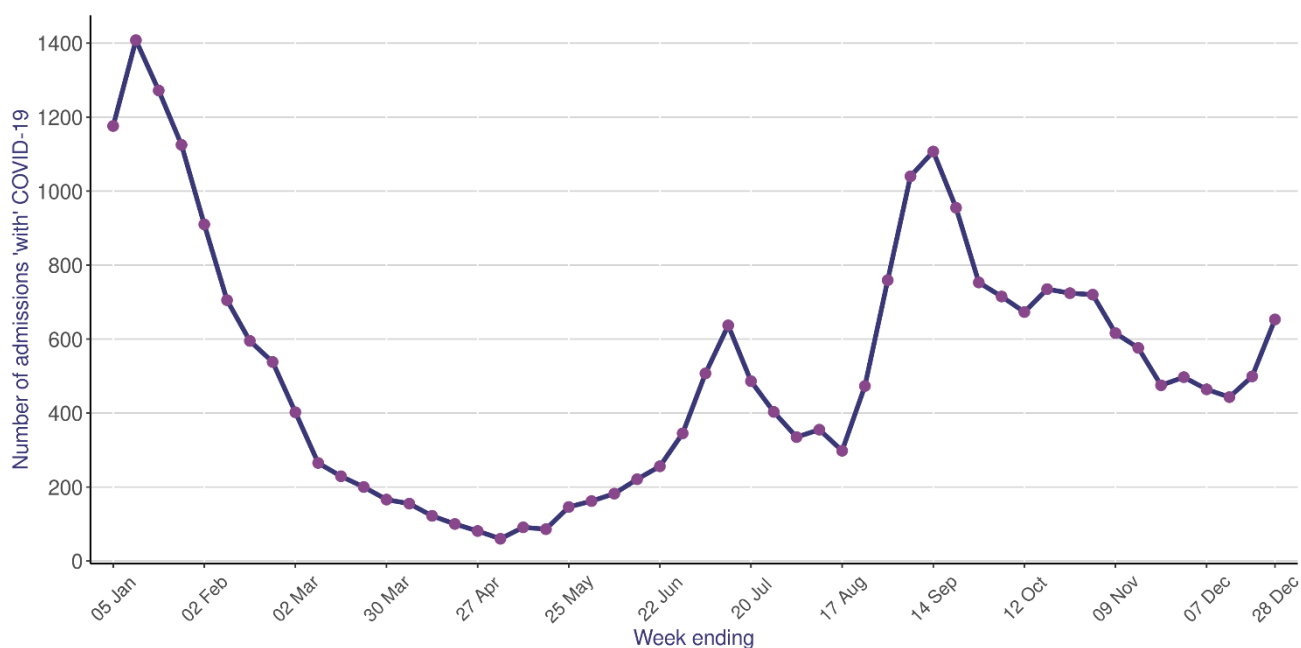


Table 3 below shows a breakdown of people admitted to hospital across all ages and by age group for the most recent four weeks. Data from 03 March 2021 is available on the [Covid Statistical Report website](#).

Table 3: COVID-19 hospital admissions by age as at 28 December 2021³

Age Band	01 December – 07 December	08 December – 14 December	15 December – 21 December	22 December – 28 December
Under 18	41	40	58	76
18-29	21	28	20	62
30-39	48	46	52	66
40-49	46	59	60	66
50-54	31	39	45	48
55-59	39	43	45	48
60-64	33	40	43	28
65-69	45	27	29	38
70-74	29	44	30	49
75-79	39	21	39	36
80+	92	56	78	136
Total	464	443	499	653

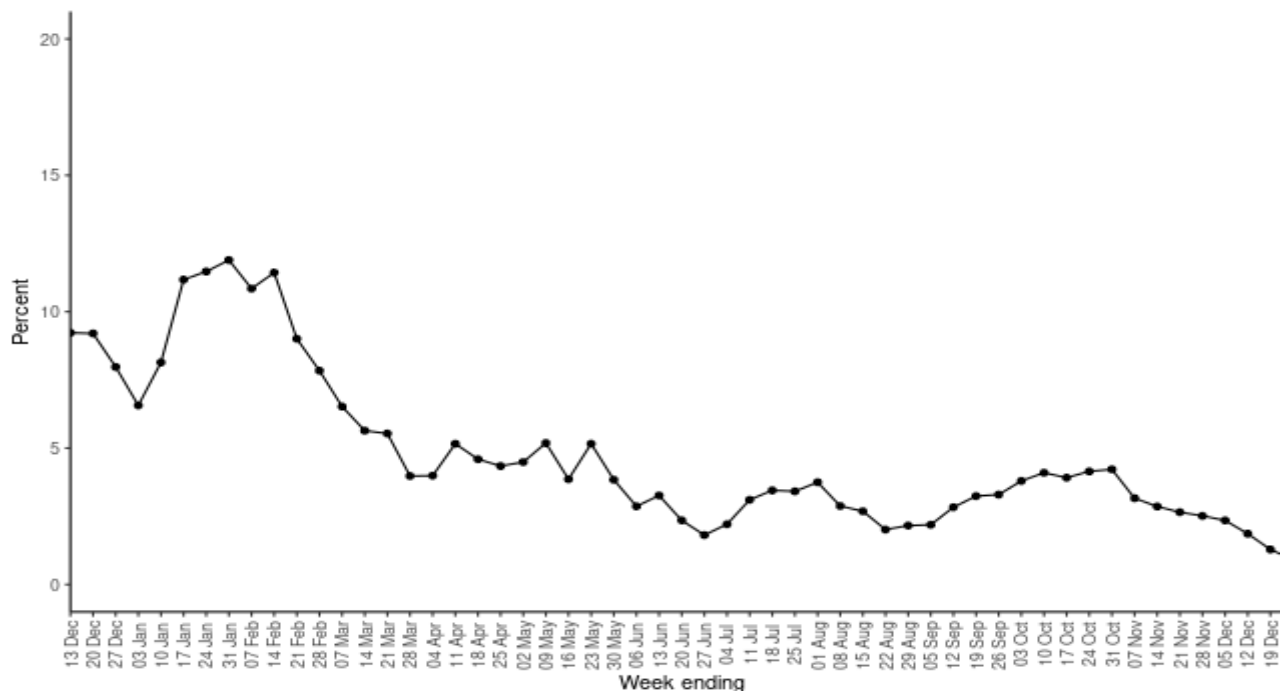
Source: RAPID (Rapid and Preliminary Inpatient Data)

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

In the latest week, there has been a 31% increase in the number of new admissions compared to the previous week, with those aged 80+ years having the highest number of admissions. Also, in the latest week approximately 44% of the hospital admissions related to patients aged 60+.

In recent months, the proportion of all people who were admitted to hospital within 14 days of a laboratory confirmed COVID-19 positive test has also declined, from 12% in the week ending 31 January 2021 to 1% in the most recent week ending 28 December 2021 (Figure 8).

Figure 8: Proportion of weekly cases admitted to hospital within 14 days of a first positive test



Hospital Admissions 'because of' COVID-19

As previously noted, 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 coincident 'with' their COVID-19 diagnosis. Knowing this information can help signal whether population-level changes in public health measures may be warranted, such as a tightening or easing of restrictions. It can also 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. Public Health Scotland last published an analysis of the proportion of people in hospital 'because' of their COVID-19 infection on [01 December 2021](#), covering the period of March-August 2021. To calculate this proportion, patient discharge data from the national Scottish Morbidity Records (SMR01 - acute inpatient and day case activity) dataset for six Boards were analysed to ascertain the primary reason for admission. Findings from the report concluded that, at a time when the Delta variant of COVID-19 was responsible for nearly all circulating infections in Scotland, 68% of patients were in hospital 'because of' their COVID-19 infection.

In light of the recent rapid increase in Covid-19 case numbers in Scotland—of which more than 90% are now estimated to be the new Omicron variant—it is important to update this analysis. However, a limitation of the previously-published approach is that there is typically a two to three month lag in receiving SMR01 discharge summaries from NHS boards. A different approach based on clinical auditing of hospital admission records to monitor this distribution offers an opportunity for more timely results.

Under the umbrella of the Caldicott confidentiality and data sharing agreement, Public Health Scotland and NHS Greater Glasgow and Clyde conducted a clinical audit of case notes of people admitted with a recent COVID-19 diagnosis at acute care hospitals during the first two days of January 2022. NHS Grampian carried out a similar review using daily admission data routinely provide by acute care hospitals in the region. Data from NHS Grampian were obtained over the course of a six-day period, starting 30 December 2021. The primary outcome of interest was whether a person was admitted to hospital 'because of' or coincidental 'with' a COVID-19 diagnosis of a community-acquired infection. People admitted to hospital were included if they had a COVID-19 PCR confirmed diagnosis within 14 days prior to or in the 48 hours following their admission date. Admissions that were either confirmed or probable 'because of' COVID-19 include those who met a clinical definition or who were admitted onto a COVID-19 ward, where available. Hospital-acquired infections, defined as out with the 48 hours following admission, were excluded from the analysis. A more detailed description of methods and definitions are provided in Appendix 7.

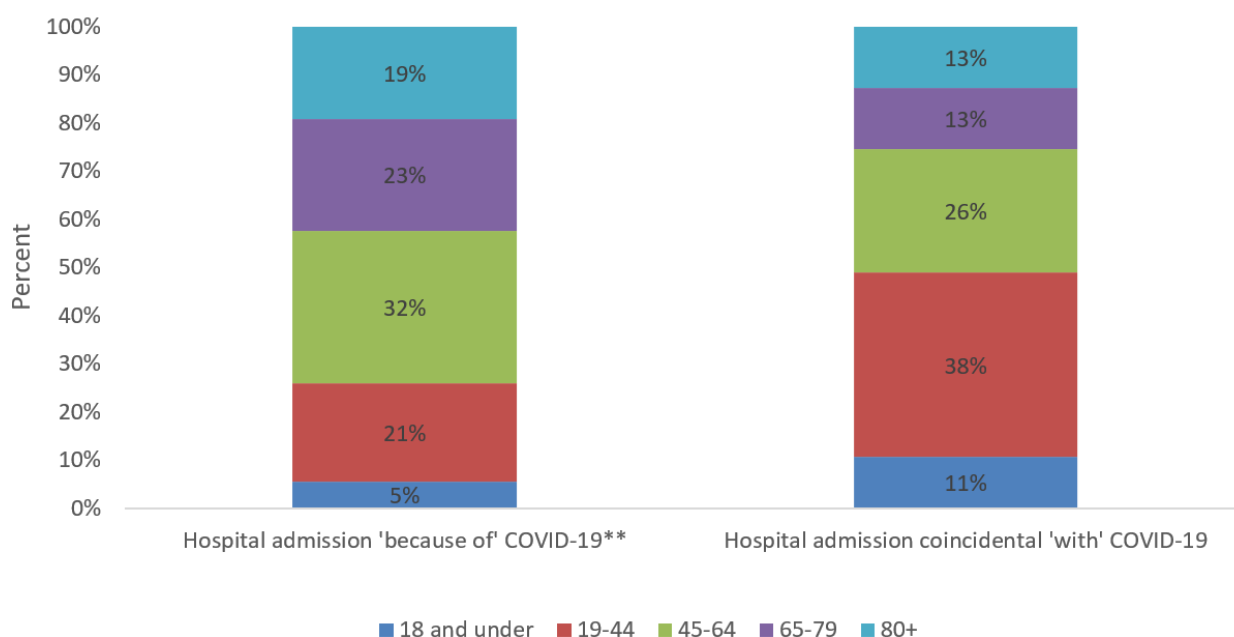
Table 4 shows that as of 02 January 2022 in NHS Greater Glasgow and Clyde and 04 January 2022 in NHS Grampian, 60% of acute hospital admissions were determined to be 'because of' COVID-19 (assuming either a definite or probable attribution) as opposed to coincidental 'with' COVID-19, and reasonably similar between the two Boards. The proportion of 60% in hospital 'because of' COVID-19 is lower than the previously reported value of 68% based on SMR01 discharge summaries from NHS boards from between March and August 2021.

Table 4: Number and proportion of community-acquired hospital admissions within 14 days of a positive COVID-19 test ‘because of’ or ‘with’ COVID-19, NHS Boards’ Greater Glasgow and Clyde between 01 - 02 January 2022 and Grampian between 30 December 2021 - 04 January 2022

	Greater Glasgow and Clyde		Grampian		Total	
	No. of admissions	%	No. of admissions	%	No. of admissions	%
Hospital admission because of COVID-19 (Definite)	37	54%	23	40%	60	48%
Hospital admission because of COVID-19 (Probable)	2	3%	13	23%	15	12%
Hospital admission coincidental with COVID-19	30	43%	21	37%	51	40%
Total	69	100%	57	100%	126	100%

Based on the clinical audit, the age profile of people admitted into hospital in Figure 9 shows a disproportionately greater number of older people in hospital ‘because of’ COVID-19 compared to ‘with’ COVID-19. People aged 65 and older account for 42% of all hospital admissions ‘because of’ COVID-19 but just 26% of all admissions ‘with’ COVID-19.

Figure 9: Proportion of community-acquired hospital admissions within 14 days of a positive COVID-19 test ‘because of’ (n=73) or ‘with’ COVID-19 (n=47) by age group*, NHS Boards’ Greater Glasgow and Clyde between 01-02 January 2022 and Grampian between 30 December 2021-04 January 2022



* Age unknown for 6 people;

** Hospital admissions ‘because of’ COVID-19 include probable and confirmed.

S-gene target failure, a proxy for Omicron, and allele specific PCR results capable of identifying a sample as Omicron or Delta, were missing or not yet available for 68% (86 of 126) of people admitted to hospital (Table 5).

Table 5: Number of community-acquired hospital admissions within 14 days of a positive COVID-19 test ‘because of’ (n=23) or ‘with’ COVID-19 (n=17), by variant type*, in NHS Boards’ Greater Glasgow and Clyde between 01 - 02 January 2022 and Grampian between 30 December 2021 - 04 January 2022

		Hospital admission 'because of' COVID-19**	Hospital admission coincidental 'with' COVID-19	Total
S gene target failure or Allele Specific PCR outcome of Omicron	Greater Glasgow and Clyde	6	2	8
	Grampian	5	1	6
	Total	11	3	14
Positive S gene or allele-specific PCR outcome of Delta	Greater Glasgow and Clyde	1	2	3
	Grampian	11	12	23
	Total	12	14	26
Grand Total		23	17	40

* Variant type was unknown as yet or not possible to ascertain for 86 people;

** Hospital admissions 'because of' COVID-19 include probable and confirmed.

Owing to the still-large proportion of hospital admissions for which the variant is unknown, extreme caution is required to not over-interpret results from these variant. With regard to whether more hospital admissions are likely to be Omicron versus Delta, this distribution did appear to differ significantly by Board, with 73% (8 of 11) of hospital admissions in Greater Glasgow and Clyde likely to be Omicron versus 21% (6 of 23) in NHS Grampian. It is likely that this difference reflects the early patterns of transmission of the Omicron variant in Scotland, which saw the earliest outbreaks in the Greater Glasgow and Clyde area in early December 2021. By 12 December 2021, more than half of all people testing at Pillar 2 UK Gov labs in the Greater Glasgow and Clyde region were likely infected by the Omicron variant, whilst in Grampian, that threshold wasn't reached for another week.

With regard the proportion of hospital admissions that might be ‘because of’ Omicron, the limited data available show that 79% (11 of 14) of people were admitted into hospital because of Omicron whilst 46% (12 of 26) of admissions were ‘because of’ Delta. These numbers are too small to draw any substantial conclusion about whether people are more likely to be in hospital ‘because of’ or ‘with’ the Omicron or Delta variant and any further investigations will have to consider other potential explanatory factors, including prevalence of the variant in the surrounding population and vaccine status.

This most recent analysis by Public Health Scotland was conducted during a period of public holidays during which interruption to the supply of laboratory results on Allele Specific Primer and Whole Genomic Sequencing were observed. Testing was also done primarily in hospitals, which do not have access to testing platforms that allow for a proxy report of the Omicron or Delta variant using S gene status. This explains the high proportion of admissions for which no immediate assignation of variant type could be made, and unfortunately, limits the conclusions that can be drawn on questions related to variant status.

Whilst clinical case audit reviews provide high-quality, near real-time results, there are other limitations that must be considered when interpreting these findings. Because this method takes a cross-sectional approach to determine whether a person is in hospital ‘because of’ COVID-19 or coincidental ‘with’ COVID-19, it may miss people who may have initially been admitted ‘with’ COVID-19 but who later go on to develop more severe COVID-19-related symptoms during their stay. Conversely, it may also disproportionately capture more severe infections since people with severe infections may stay in hospital longer. Other limitations of this approach, including the substantial time and human resources required to review cases and the challenges of generalising these results beyond these two Boards, are described in Appendix 7.

Public Health Scotland will continue to work with NHS Boards to describe the proportion of people in hospital ‘because of’ or ‘with’ COVID-19 using appropriate methods to inform and improve the public health response to the pandemic in Scotland. Improved completeness of data on the variant that people have who are admitted to hospital ‘because of’ COVID-19 will be critical to future investigations.

Test and Protect

Scotland's approach to contact tracing has continued to adapt throughout the pandemic to reflect changing circumstances, variability in cases, and increasing proportion of the population fully vaccinated since the roll out of the vaccination programme. The most recent [Strategic Framework](#) issued by the Scottish Government in November 2021 sets out how Scotland will continue to adapt now that we are in the phase described as "beyond level zero". That will require a constant review of the associated management information compiled in the weekly report. The information we produce will change over time to reflect the most critical information to help understand, plan and deliver contact tracing at any given point in time.

Since initial Omicron cases were found in Scotland, local Health Protection teams, with support from the National Contact Centre, have been delivering contact tracing as a key part of our response to tackle Omicron outbreaks, ensuring that those that need to receive public health advice are able to be notified quickly.

World Health Organisation (WHO) current guidance on "[Contact tracing in the context of COVID-19](#)" focuses on targeted approaches to contact tracing based on transmission patterns, engaging communities, and prioritising follow-up of high risk cases when it is not possible to identify, monitor and quarantine all contacts. For further information please refer to [Appendix 2](#).

Please note, PHS has moved to weekly reporting of this data and cumulative data is available in the [interactive dashboard](#). Data for the most recent week, previously included as provisional, is no longer included as this is variable due to cases which are still open (either because contact tracing is still underway or the NHS Board is still managing the case for a particular reason). Only finalised data will be included within the report going forward.

Further background information and definitions are available in [Appendix 4](#).

Increased case numbers during the holiday period will have had an impact on the number of Index cases and the number of contacts.

Index cases

An **index case** is generated for each positive result with a test date on or after 28 May 2020. This includes tests derived from Scottish laboratories and from UK Government laboratories.

An **individual** is a unique person who has had a positive test. An individual can have multiple positive tests which results in multiple cases within the test and protect system. In these figures, each person is only counted once.

Contact Tracing figures for the week ending 26 December 2021 (based on test date), are detailed in Table 6 below, which provides a recent time trend. A longer time trend is available on the [interactive dashboard](#).

Table 7 provides details of the status of the index cases for each week.

In the week ending 26 December 2021, there were 69,402 Index Cases, of which 43,112 (62.1%) had completed contact tracing by telephone or other digital methods, and a further 87 are in progress (0.1%).

Table 6: Contact Tracing trend information, by week ending

	21 Nov	28 Nov	05 Dec	12 Dec	19 Dec	26 Dec
Total Index Cases ¹	20,948	18,468	20,642	27,054	43,718	69,402
Individuals ²	20,122	17,634	19,730	25,941	41,624	66,189

1. Does not include “Excluded” cases which are those where a decision has been made that the case should not have been created within the contact tracing system.
2. A count of unique individuals with a positive test. An individual can have multiple positive tests which results in multiple cases within the contact tracing system.

Table 7: Contact Tracing trend information by status, by week ending

Status of cases	21 Nov	28 Nov	05 Dec	12 Dec	19 Dec	26 Dec	Cumulative (from May 2020)
New/ Not yet started ¹	1	8	0	0	9	1,365	1,421
% New/ Not yet started	0.0	0.0	0.0	0.0	0.0	2.0	
In progress ²	0	0	0	0	6	87	94
% In progress	0.0	0.0	0.0	0.0	0.0	0.1	
Complete ³	18,534	16,356	18,085	22,727	35,938	43,112	760,101
% Complete	88.5	88.6	87.6	84	82.2	62.1	
Incomplete ⁴	2,413	2,104	2,557	4,327	7,765	24,838	126,061
% Incomplete	11.5	11.4	12.4	16	17.8	35.8	

1. New – New/not yet started cases within the contact tracing system.
2. In progress – The case is still in progress with either the case interview to be completed, or contacts related to the case to be followed up.
3. Complete - The case is complete and all achievable contact tracing has been carried out.
4. Incomplete - Unsuccessful attempts to reach or carry out a case interview via the telephone, or for the index case to provide contacts via digital contact tracing (SMS)

Method of Contacting Index Cases

The data within this section are based on the number of **completed cases** which are recorded in the contact tracing software, these figures are preliminary and may be updated in subsequent publications.

Public Health Scotland works closely with National Services Scotland (NSS) and the Scottish Government to enable local NHS Boards and the National Contact Centre (NCC) to carry out COVID-19 contact tracing effectively. The approach to contact tracing has adapted as restrictions and policy have changed throughout the pandemic in order to best meet the needs of the Scottish population. As numbers of new cases have increased, the method has changed from attempting to phone all new cases and contacts - to prioritising the highest risk situations for telephone calls and sending

public health advice by SMS text to all others, who have tested positive for COVID-19 and their close contacts.

The introduction of SMS messaging was designed to get the best public health advice about isolation to cases and contacts as quickly as possible, this is especially pertinent when daily case numbers are very high. The approach was part of a deliberate decision to manage resources through an agreed framework and is in keeping with the evidence-informed advice of the European Centre for Disease Control.

All index cases will receive an initial SMS containing Public Health information and advice, which will then be followed by contact either by telephone or additional SMS messages containing further Public Health information and advice.

Table 8 below shows a breakdown of the methods used to contact **completed** index cases over time.

Table 8: Contact method used for contact tracing of completed index cases trend information

	21 Nov	28 Nov	05 Dec	12 Dec	19 Dec	26 Dec
Telephone	12,771	11,151	12,356	15,558	16,334	18,004
% Telephone	68.9	68.2	68.3	68.5	45.5	41.8
SMS	5,763	5,205	5,729	7,169	19,604	25,108
% SMS	31.1	31.8	31.7	31.5	54.5	58.2

1. SMS includes those cases deemed low risk and have completed the Co3 online form, every other completed case is categorised as Telephone

In the week ending 26 December 2021, 41.8% of index cases received a telephone call.

Time for a Positive Index Case to be Contact Traced

The data within this section are based on the number of **completed cases** which are recorded in the contact tracing software, these figures are preliminary and may be updated in subsequent publications.

The three measures shown are;

- the time between a sample being taken and the positive individual being contacted (i.e. interviewed by a contact tracer or completing the online tracing form)
- the time between the record appearing in the CMS and the positive individual being contacted (i.e. interviewed by a contact tracer or completing the online tracing form)
- the time between the record appearing in the CMS and contact tracing being closed (i.e. contacts have been interviewed, attempted to be interviewed or contacted digitally).

These figures are now weekly measures, data are available for previous weeks within the [interactive dashboard](#).

Table 9 and Figure 10 below describes the timeliness of contact tracing by calculating the hours between a test sample being taken and the index case being contacted by Test and Protect either by phone or SMS.

Table 9: Time (hours) between date test sample taken (specimen date) and the positive index case being contacted, for cases completed⁵

Hours taken	Week Ending 26 December 2021		
	Number of Complete Index Cases	% of Total Complete Cases	% of Total Complete & Incomplete Cases
0-24	3,859	9.0	5.7
24-48	10,490	24.3	15.4
48-72	9,024	20.9	13.3
Over 72	11,052	25.6	16.3
Not recorded* - SMS	5,222	12.1	7.7
Not recorded* – Phone	3,465	8.0	5.1
Total Complete Cases	43,112	100	
Incomplete Cases	24,838		36.6
Total Complete & Incomplete Cases	67,950		100

5 For further information and additional notes on Contact Tracing, please see [Appendix 4 – Contact Tracing](#)

*Improvements into recording of times and dates are being investigated and technical solutions will be identified to reduce the proportion of ‘Not recorded’ cases. This will be implemented February 2022.

Figure 10: Trend in time (hours) between date test sample taken (specimen date) and the positive individual being called for cases completed; by week

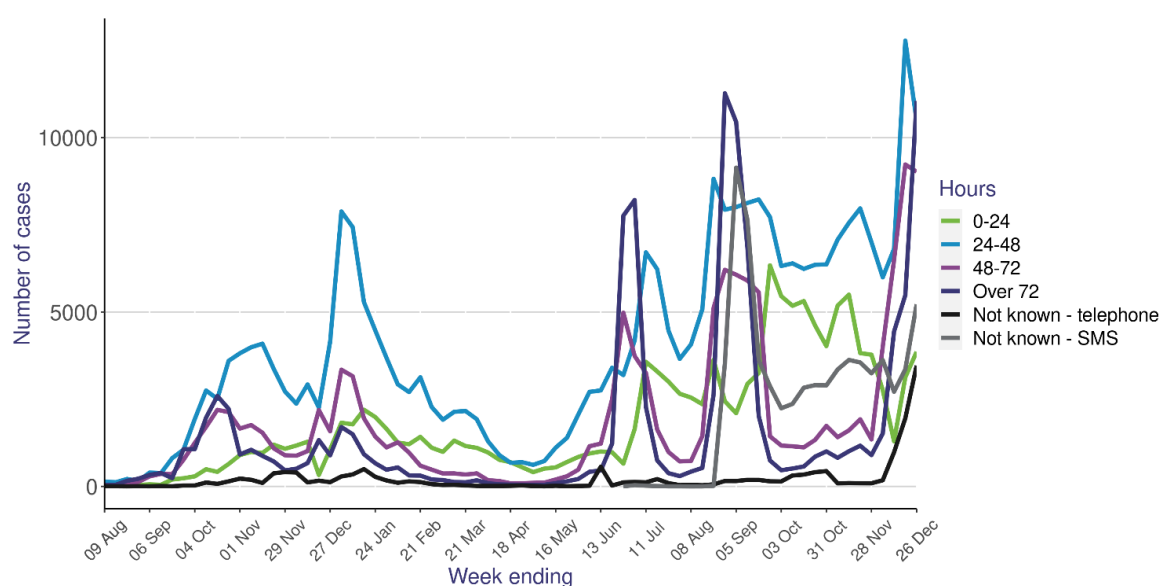


Figure 10 shows that more positive cases were contacted over 72 hours after their test sample was taken in June 2021, August 2021 and December 2021, which corresponds with a rise in cases over the same periods.

On 21 September 2021, there was a technical issue which affected the availability of Test & Protect data. This caused operational delays for the contact tracing service initiating communication with some index cases by up to 24 hours. This issue was rapidly addressed and has subsequently been resolved.

Table 10: Time (hours) between case created in CMS and the positive individual being contacted^{5, 6}

Hours taken	Week Ending 26 December 2021		
	Number of Complete Index Cases	% of Total Complete Cases	% of Total Complete & Incomplete Cases
0-24	21,819	50.6	32.1
24-48	5,080	11.8	7.5
48-72	3,091	7.2	4.5
Over 72	4,435	10.3	6.5
Not recorded* – SMS	5,222	12.1	7.7
Not recorded* - Phone	3,465	8.0	5.1
Total Complete Cases	43,112	100	
Incomplete Cases	24,838		36.6
Total Complete & Incomplete Cases	67,950		100

5 For further information and additional notes on Contact Tracing, please see [Appendix 4 – Contact Tracing](#)

6 Includes being interviewed by a contact tracer or submitting preliminary information via a CO3 form

*Improvements into recording of times and dates are being investigated and technical solutions will be identified to reduce the proportion of 'Not recorded' cases. This will be implemented February 2022.

Table 11: Time (hours) between case created in CMS to its closure^{5, 7}

Hours taken	Week Ending 26 December 2021		
	Number of Complete Index Cases	% of Total Complete Cases	% of Total Complete & Incomplete Cases
0-24	20,837	48.3	30.7
24-48	6,047	14.0	8.9
48-72	5,546	12.9	8.2
Over 72	9,269	21.5	13.6
Not recorded* – SMS	1,204	2.8	1.8
Not recorded* - Phone	209	0.5	0.3
Total Complete Cases	43,112	100	
Incomplete Cases	24,838		36.6
Total Complete & Incomplete Cases	67,950		100

5 For further information and additional notes on Contact Tracing, please see [Appendix 4 – Contact Tracing](#)

7 Measured by the time taken to complete the final contact interview for high risk settings/contacts and those completed via SMS

*Improvements into recording of times and dates are being investigated and technical solutions will be identified to reduce the proportion of 'Not recorded' cases. This will be implemented February 2022.

Incomplete index cases

Table 12 and Figure 11 below show the different reasons why an index case is categorised as incomplete (previously referred to as failed) within the contact tracing system. Incomplete cases are defined as: unsuccessful attempts to carry out a case interview via the telephone, or for the index case to provide contacts via digital contact tracing. This would include scenarios where the mobile/home phone/email address provided by the case was incorrect and no other method of contact could be established; where multiple SMS/telephone call attempts to the case had been made but not been successful in eliciting a response from the index case; where the index case has failed to pass relevant data protection identity checks and where the index case has refused to participate in the contact tracing process.

For operational purposes some index cases are categorised as incomplete because the telephone process has started, but does not complete for the reasons outlined in Table 12 below. Public Health information is typically sent by SMS to 99% of the incomplete index cases.

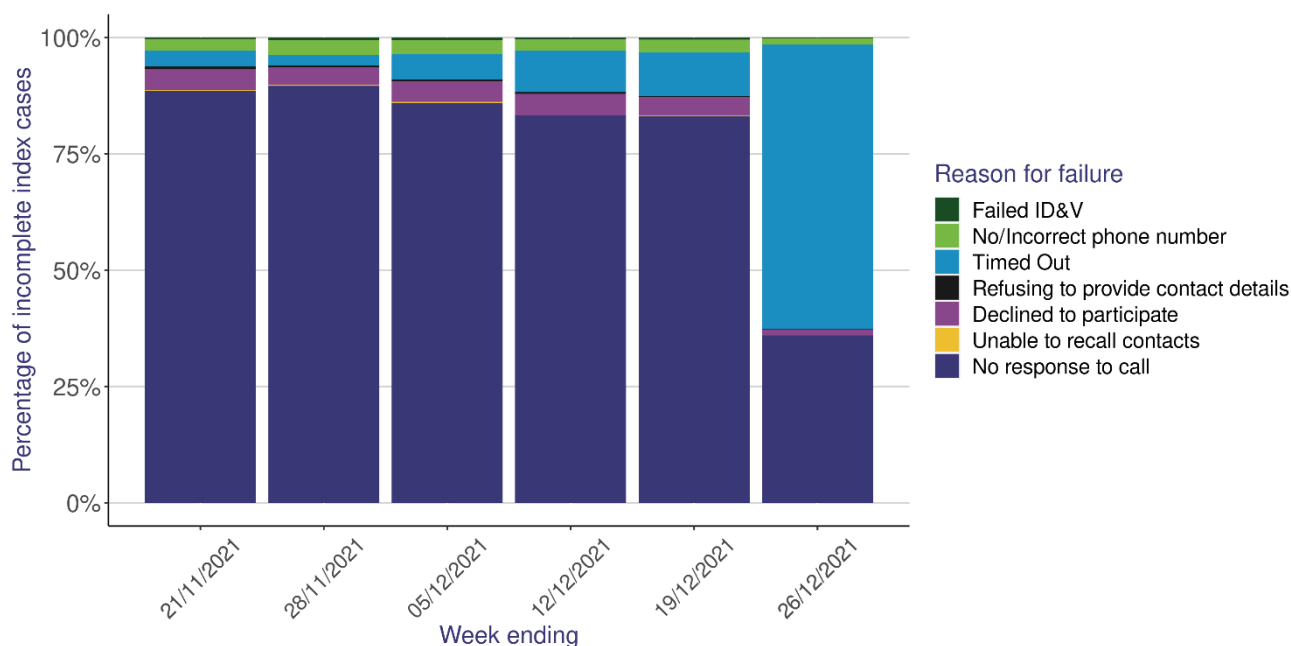
Table 12: Number of incomplete index cases by reason

Reason for Incompletion	Week Ending 26 December 2021	
	Number of Index Cases	% of Incomplete Index Cases
Failed ID & verification	65	0.3
No response to call	8,929	36.0
No/incorrect phone number	302	1.2
Refused to provide contact details	44	0.2
Declined to participate / unable to recall contacts	333	1.3
Timed out ¹	15,165	61.1
Total incomplete cases	24,838	100.0
% incomplete as proportion of all index cases		35.8

1. Timed out includes individuals contacted by SMS and asked to complete an online contact tracing form, but haven't completed the form within 5 days.

In week ending 26 December 2021, 36.0% of incomplete index cases were due to the index case not responding to the multiple calls from Test and Protect.

Figure 11: Proportion of reasons for incomplete index cases



Contacts

The Test and Protect system ensures all positive index cases are asked to identify their close contacts, whether they were contacted by telephone and/or SMS. Table 13 below shows the recent trend information of contacts reported to Test and Protect by the index case.

Table 13: Contact Tracing contacts trend information, by week ending

	21 Nov	28 Nov	05 Dec	12 Dec	19 Dec	26 Dec
Total Primary Contacts ¹	41,492	35,905	42,553	59,628	66,689	75,564
Unique Primary Contacts ²	29,833	25,580	31,197	45,989	56,058	65,476
Average number of primary contacts per case	2.0	1.9	2.1	2.2	1.5	1.1

1. Total number of primary contacts recorded in the contact tracing system.
2. Unique number of primary contacts each week. A contact may have been in close contact with multiple index cases.

The average number of primary contacts per case has remained stable over recent weeks.

Contacts not required to self-isolate

It is worth noting that from 9 August 2021 under 18's do not need to be reported as close contacts. Revised isolation and contact tracing guidance for children and young people under 18 split contacts into 'high' and 'low' risk. High risk contacts are reported through Test and protect with low risk contacts identified by schools and issued with public health guidance locally. Test and Protect does not gather the details of low risk contacts and this is not contained in these figures.

Since the beginning of contact tracing, a small proportion of primary contacts who were successfully contacted were advised they did not need to isolate. Up to 26 December 2021, a total of **3,446** cumulative primary contacts, pertaining to completed index cases, were not advised to self-isolate. This represents **1.1%** of the total **302,937** cumulative primary contacts for which this information is known. Some reasons why contacts do not need to isolate include; children under the age of 16, contact was wearing PPE or did not come into close contact with a positive case.

In the week ending 26 December 2021, of the **65,476** unique contacts recorded, **7,063** (10.8%) went on to test positive within ten days of their contact with an index case.

Lateral Flow Device Testing

Across Scotland, there are numerous testing pathways being rolled out using Lateral Flow Devices (LFD) - a clinically validated swab antigen test taken that does not require a laboratory for processing. This test can produce rapid results within 45 minutes at the location of the test.

Some of the areas using LFD tests are: schools, health and social care workers, care homes and more. Public Health Scotland has collected the information on the number of LFD tests carried out across Scotland and will now publish this information weekly. This section is the totality of LFD across Scotland and across strategies. Sections focussing in on specific topics such as Schools, Higher Education and Community testing can be found later in the report.

LFD testing in Scotland expanded from 26 April 2021, with everyone able to access rapid COVID-19 testing even if they had no symptoms. Any individual who receives a positive test result using a Lateral Flow Device is advised to self-isolate and arrange for a confirmatory PCR test. The PCR result will determine the number of cases of COVID-19 in Scotland. Since 19 November 2020, there have been 18,526,264 LFD tests carried out in Scotland, of which 159,908 were positive (0.9%). Figure 12 below shows the weekly trend of tests carried out from week ending 29 November 2020 to 02 January 2022.

There has been a 8.9% decrease in the number of tests carried out from the week ending 26 December 2021 to the week ending 02 January 2022. Table 14 shows the number of LFD tests carried out in Scotland by testing group.

More detailed information can be found within the LFD section on our [interactive dashboard](#).

For additional details on Lateral Flow Device Tests, please see - [Appendix 5 – Lateral Flow Device Testing](#)

Figure 12: Trend of LFD tests carried out in Scotland from 29 November 2020 to 02 Jan 2022

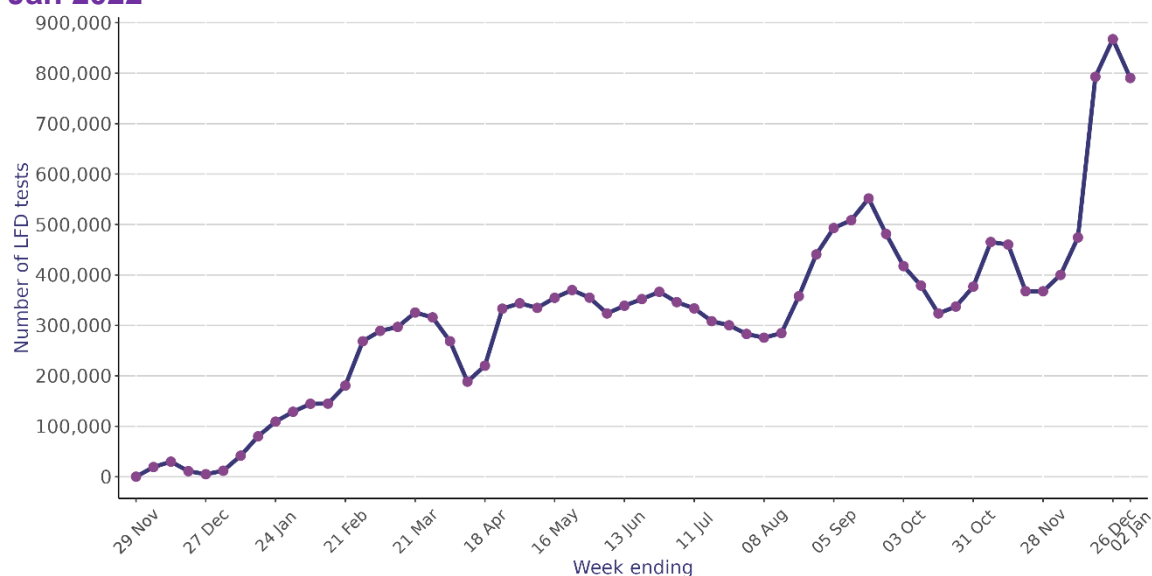


Table 14: Number of LFD¹⁰ tests by Test group 19 November 2020 – 2 January 2022

Test Group	Test Reason	Number of tests	Number of positive tests	% LFT positive
Care Home Testing	Care Home - Visiting Professional	59,879	102	0.2%
	Care Home - Visitor	792,585	750	0.1%
	Care Home Staff	1,813,237	2,156	0.1%
Community Testing	Community Testing	103,452	933	0.9%
Education Testing	Combined School Staff	56,470	172	0.3%
	ELC Staff	324,767	1,535	0.5%
	Primary School Staff	1,543,570	5,317	0.3%
	Secondary School Pupils	942,123	8,973	1.0%
	Secondary School Staff	867,201	2,855	0.3%
	University Staff	12,282	93	0.8%
	University Students	45,748	458	1.0%
Healthcare Testing	University Testing Site	96,958	385	0.4%
	Healthcare Worker	2,975,113	6,756	0.2%
Social Care Testing	Primary Care And Independent Contractors	217,695	454	0.2%
	Children, Young People and Mental Health	1,040	0	0.0%
	NSS Portal Social Care	727,386	1,478	0.2%
	Residential Homes	15,684	39	0.2%
Universal Offer	Support Services	29,572	287	1.0%
	Attend An Event	873,619	3,135	0.4%
	High Cases In Local Area	537,898	11,114	2.1%
	Lives With Someone Who Is Shielding	70,806	1,357	1.9%
	Travel Within UK	225,605	1,329	0.6%
Workplace Testing	Universal Offer	2,978,124	72,901	2.4%
	Private Sector	25,511	94	0.4%
	Public Sector	76,387	299	0.4%
	Quarantine Hotel Staff/Security Personnel	5,011	106	2.1%
	Third Sector	3,558	20	0.6%
Other	UK Gov Other	2,386,488	29,391	1.2%
	Other	718,495	7,419	1.0%
Total	Total	18,526,264	159,908	0.9%

Data extracted: 05 January 2022

Please note some of the data is suppressed due to disclosure methodology being applied to protect staff confidentiality.

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 most people, a 2-dose schedule is advised for the vaccines. For the Pfizer BioNTech (Comirnaty) vaccine, the second vaccine dose can be offered between 3 to 12 weeks after the first dose. For the AstraZeneca (Vaxzevria) and Moderna (Spikevax) vaccine, the second dose can be offered 4 to 12 weeks after the first dose.

Information on uptake across the vaccine programme is available on a daily basis via the PHS [COVID-19 Daily Dashboard](#), 5 days a week at 2pm (Monday to Friday). 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.

COVID-19 Vaccination Uptake

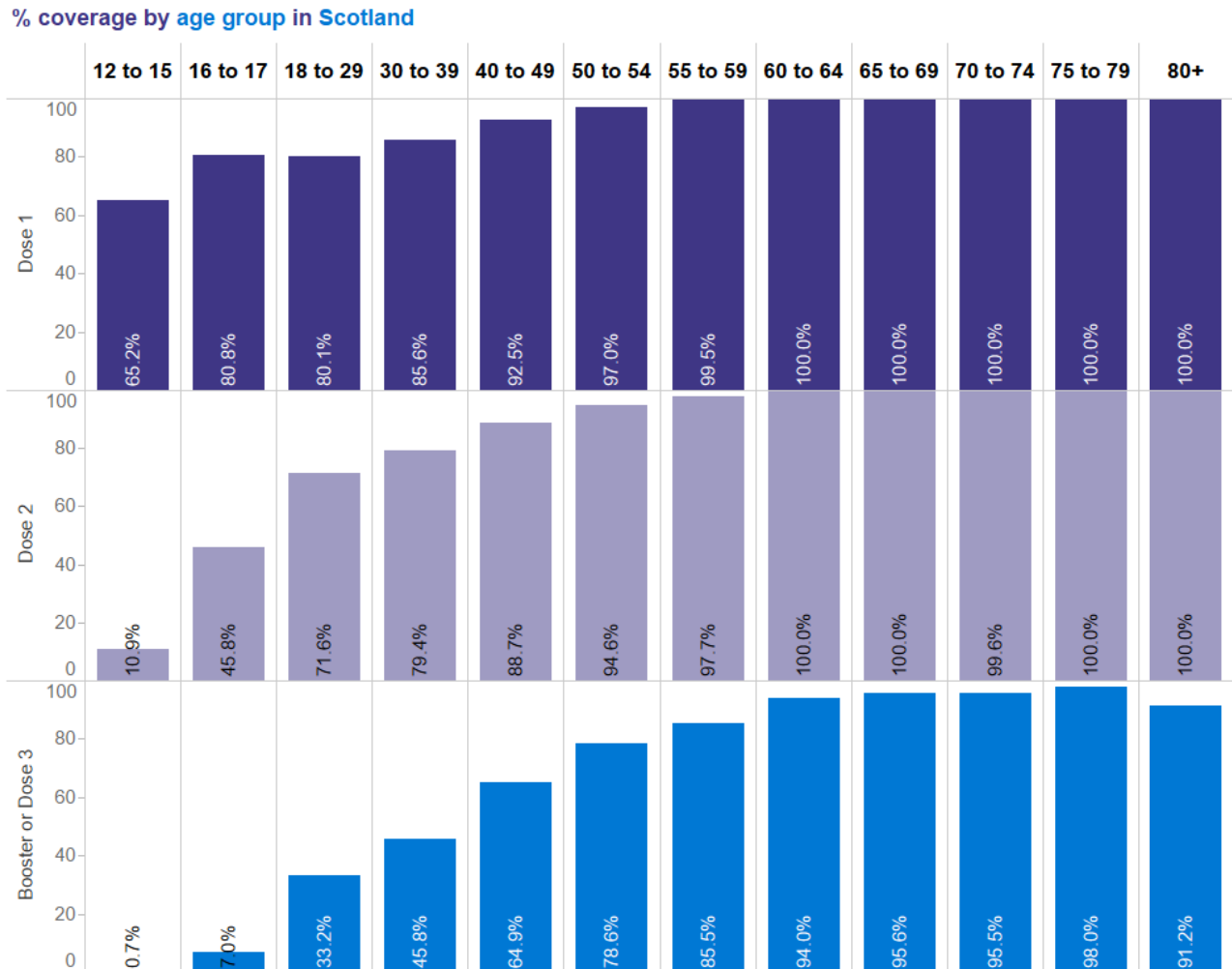
As of 06 January 2022, there has been over 11.4 million Covid-19 vaccine doses administered in Scotland, since the programme began on 08 December 2020.

- 4.39 million people protected through their first dose of the COVID-19 vaccination; 93.2% of those aged 18 and over and 91.5% of those aged 12 and over.
- 4.03 million people provided with further protection by receiving their second dose, of these, 89.1% are aged 18 and over and 84.3% of those aged 12 and over.
- 3.04 million people have received their booster/dose 3, of these, 68.3% are aged over 18 and over and 63.6% of those aged 12 and over.

More detailed age information can be in Figure 13.

Daily Vaccination uptake information is available via the [PHS Covid Daily Dashboard](#).

Figure 13: Covid-19 Vaccine uptake – percentage coverage by age group in Scotland



COVID-19 Vaccine Certification

To show COVID-19 vaccine status, there are a number of options and individuals can choose to use one or more of these:

- Use the NHS Covid Status App
- Request a paper copy of your COVID-19 Status
- Download a PDF copy of your COVID-19 Status

The NHS Covid Status App was launched on 30 September 2021. It is free and offers digital proof of vaccination via a QR code for each vaccination received. You can request a vaccine certificate if you're aged 12 and over and have been vaccinated in Scotland. The record will not show any vaccinations given outside of Scotland.

- As of midnight 1 January 2022 the NHS Covid Status App has been downloaded 2,328,913 times. It is important to note a single user may choose to download the App on multiple devices, so this figure does not represent unique individuals
- Between 03 September 2021 (introduction of QR codes) and midnight 1 January 2022
 - 666,811 paper copies of COVID-19 Status have been requested. This may not represent unique users if an individual requests a second copy (for example if they have lost their paper copy)
 - 1,641,144* PDF versions of COVID-19 Status have been downloaded. This provides a measure of the total number of times a new QR code has been generated via PDF. An individual can generate more than one successful QR code so the figure does not represent unique users

*1st, 2nd, 3rd October data for PDFs is missing due to a technical error, we can reasonably estimate that there were 35,000 – 45,000 PDFs successfully generated PDFs in total for those three days.

COVID-19 Cases, Hospitalisations, and Deaths by Vaccine Status

Vaccine Surveillance

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 preventing infection, hospitalisations and deaths is vaccine effectiveness.

The summary data presented in this chapter record the total number of COVID-19 cases, COVID-19 related acute hospital admissions and confirmed COVID-19 deaths by their vaccination status and does not assess the effectiveness of the vaccine or whether the vaccine has worked in these individuals. The latter requires a careful examination of each case to explore possible reasons, which could be related to the test, virus or the person (e.g. pre-existing conditions).

Summary of key results

- There has been an increase in the COVID-19 case rates in the last four weeks from 20 November 2021. In the last week, 11 December 2021 to 17 December 2021, the case rate in individuals with a booster or 3rd dose of a COVID-19 vaccine was 202 COVID-19 cases per 100,000 individuals compared to a case rate of over 600 per 100,000 in the unvaccinated population and individuals with one or two doses of a COVID-19 vaccine.
- In the last week from 11 December 2021 to 17 December 2021, the seven-day rolling average of COVID-19 related acute hospital admissions decreased from 56.43 to 42.71 admissions per day.
- In the last four weeks from 20 November 2021 to 17 December 2021, the age-standardised acute COVID-19 related hospital admission rates were lower in individuals that had received a booster or 3rd dose compared to unvaccinated individuals.
- Age-standardised mortality rates for COVID-19 deaths are lower for people who have received a booster or 3rd dose of a COVID-19 vaccine compared to individuals that are unvaccinated or have received one or two doses of a COVID-19 vaccine.

Overall results of COVID-19 Cases and Hospitalisations, and Deaths by Vaccination Status

COVID-19 cases by vaccination status

[Recent studies](#) have been released by the UK Health Security Agency, formerly Public Health England (PHE), looking into the effect of vaccination against mild and severe COVID-19 (Alpha and Delta variants). [UKHSA analyses](#) show vaccine effectiveness against symptomatic disease with the Delta variant to be approximately 65 to 70% with AstraZeneca (Vaxzevria) and 80 to 95% with the Pfizer-BioNTech (Comirnaty) and Moderna (Spikevax) vaccines. [Data from the UKHSA](#) shows that vaccine effectiveness after two doses is waning, but remains high, against hospitalisation and death.

The [first real world results](#) of the effectiveness of the booster vaccination against symptomatic disease (Delta variant) shows very high vaccine effectiveness, higher than for the primary course, at 93-94%.

[Initial analysis](#) of vaccine effectiveness against symptomatic disease with the Omicron variant have been shown to be lower than compared to the Delta variant, with estimates of vaccine effectiveness of between 70 to 75% in the early period after a booster dose. Although lower this is still a substantial effectiveness, and much higher than after 1 or 2 doses of the vaccine.

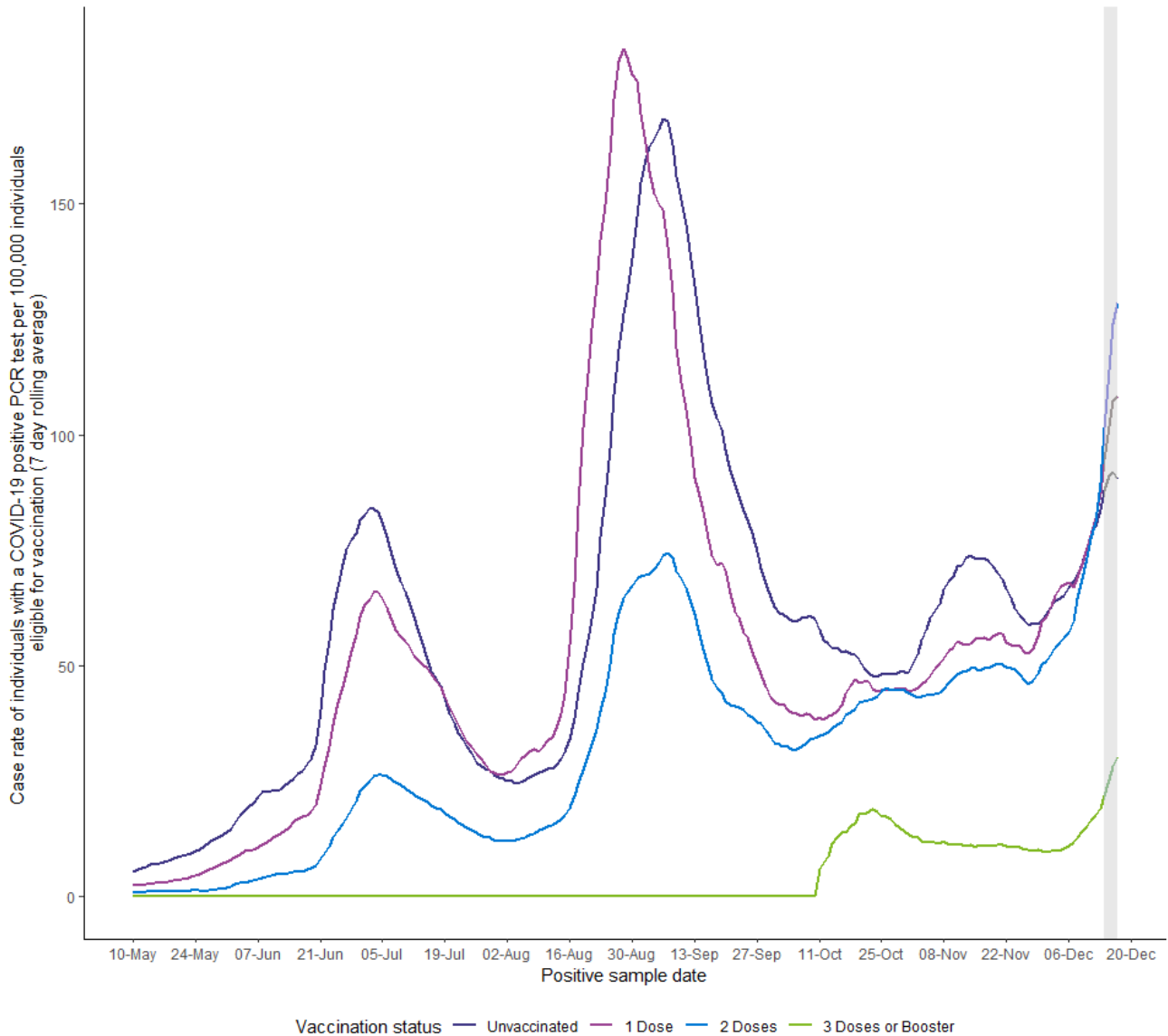
Table 15: Number of COVID-19 positive cases individuals by week and vaccination status, 20 November 2021 to 17 December 2021

Vaccination Status	Unvaccinated			1 Dose		
Week	No. of Cases	Total pop. unvaccinated	% Cases	No. of Cases	Total pop. with 1 dose	% Cases
20 November - 26 November 2021	6,644	1,587,063	0.42%	1,385	372,195	0.37%
27 November - 03 December 2021	7,109	1,580,991	0.45%	1,676	366,637	0.46%
04 December 2021- 10 December 2021	8,285	1,571,497	0.53%	1,944	367,764	0.53%
11 December 2021- 17 December 2021	9,908	1,565,362	0.63%	2,774	363,164	0.76%
Vaccination Status	2 Doses			Booster or 3rd Dose		
Week	No. of Cases	Total pop. with 2 doses	% Cases	No. of Cases	Total pop. with Booster or 3rd Dose	% Cases
20 November - 26 November 2021	9,255	2,743,977	0.34%	759	1,151,407	0.07%
27 November - 03 December 2021	9,906	2,530,731	0.39%	888	1,375,063	0.06%
04 December 2021- 10 December 2021	12,275	2,315,338	0.53%	1,616	1,598,044	0.10%
11 December 2021- 17 December 2021	19,666	2,102,611	0.94%	3,682	1,821,505	0.20%

Vaccination status is determined as at the date of PCR specimen date according to the definitions described in Appendix 6. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated.

There has been an increase in the COVID-19 case rates in the last four weeks from 20 November 2021. In the last week, 11 December 2021 to 17 December 2021, the case rate in individuals with a booster or 3rd dose of a COVID-19 vaccine was 202 COVID-19 cases per 100,000 individuals compared to a case rate of over 600 per 100,000 in the unvaccinated population and individuals with one or two doses of a COVID-19 vaccine.

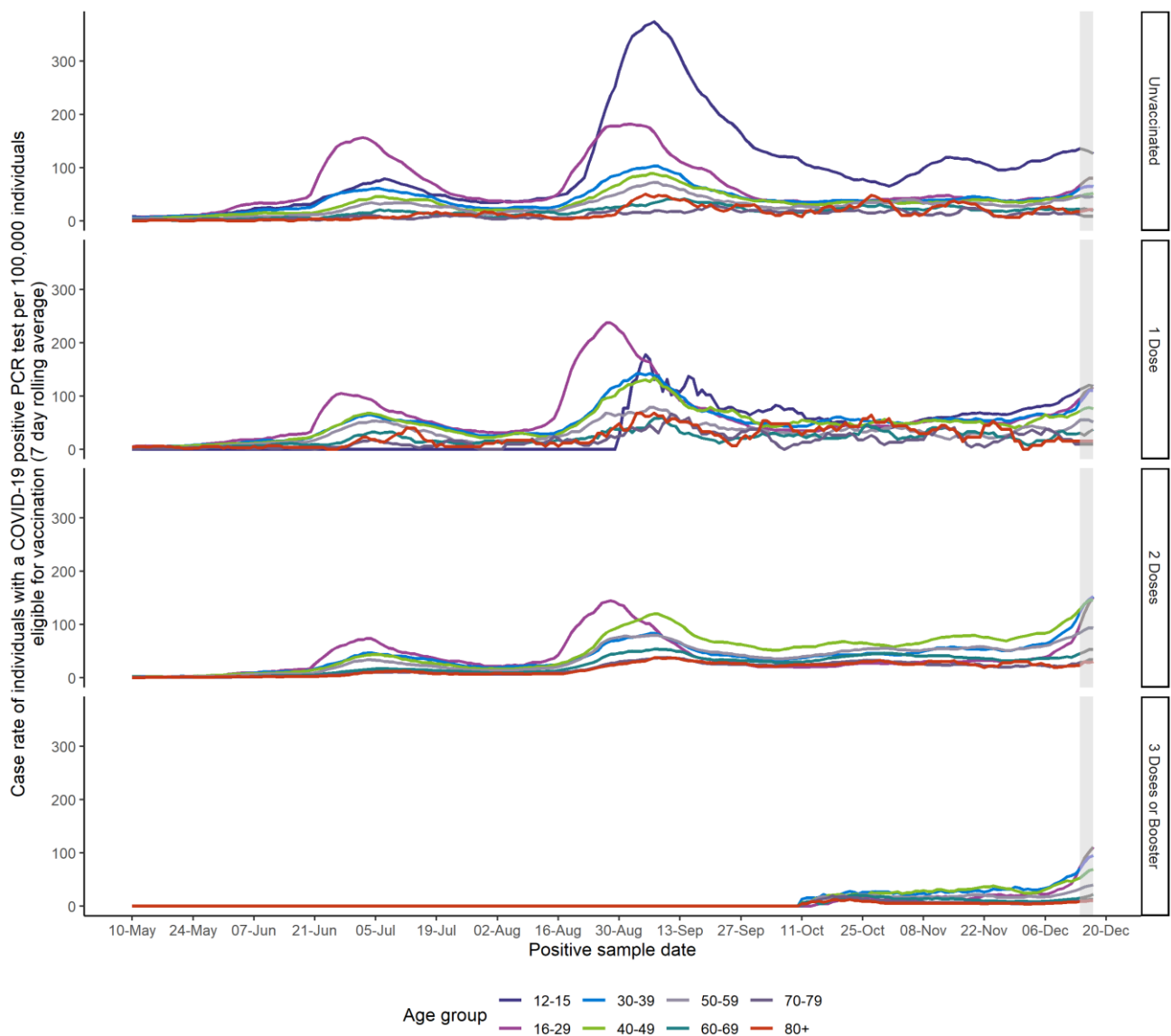
Figure 14: COVID-19 case rate per 100,000 individuals by vaccination status, seven-day rolling average from 10 May 2021 to 17 December 2021



Vaccination status is determined as at the date of PCR specimen date according to the definitions described in Appendix 6. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated.

There are lower rates of cases in individuals with a booster or 3rd dose compared to individuals that are unvaccinated or have one or two doses of a COVID-19 vaccine.

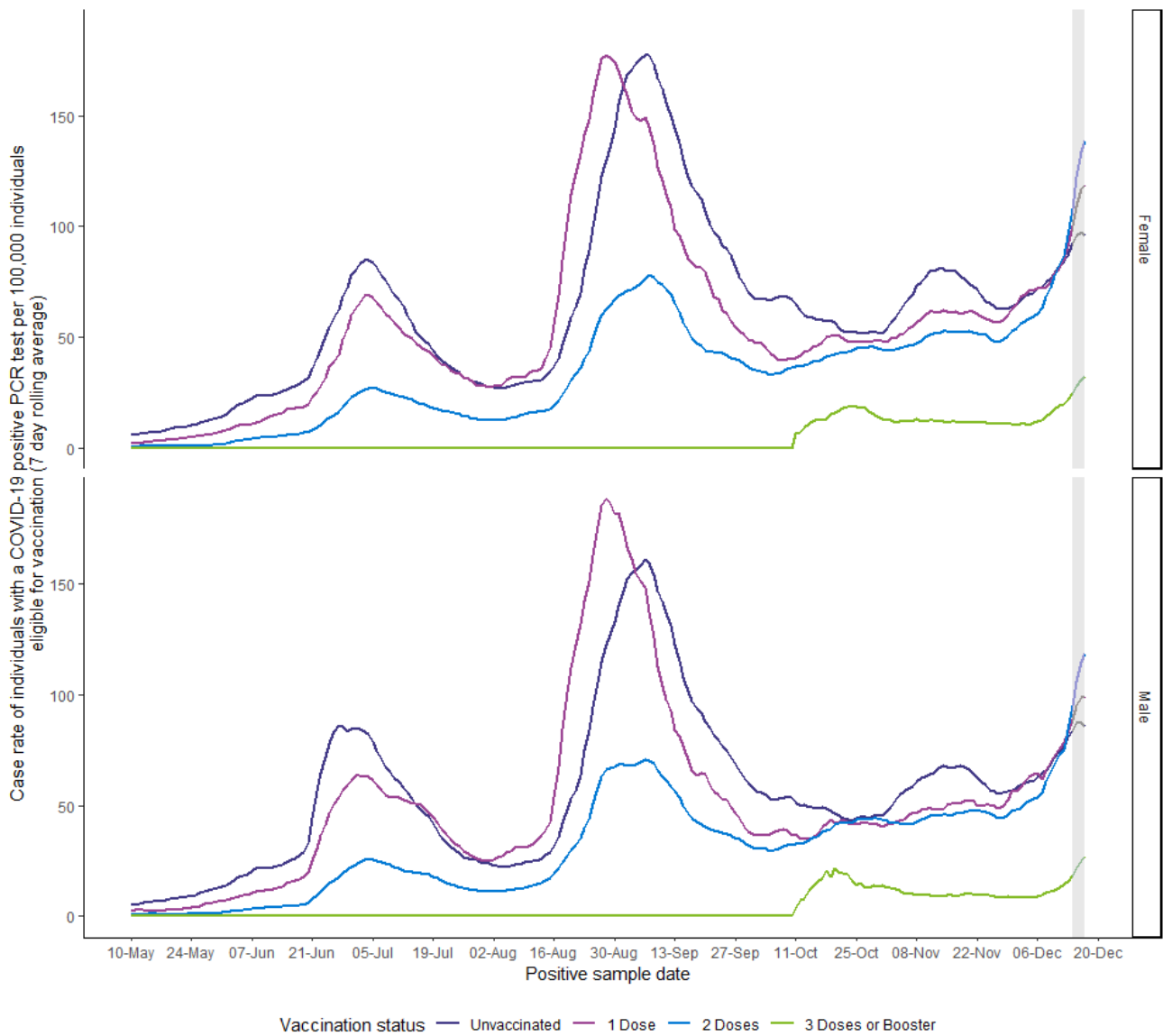
Figure 15: COVID-19 case rate per 100,000 individuals by vaccination status and age group, seven-day rolling average from 10 May 2021 to 17 December 2021



Vaccination status is determined as at the date of PCR specimen date according to the definitions described in Appendix 6. Patient age is determined as their age the date of positive test. Data displayed in this figure only includes ages groups currently eligible for the vaccine e.g. 12 years and over and for 2 doses and booster/3rd dose only 16 years and over. Some clinically vulnerable individuals are eligible in these age groups but they have been excluded due to small numbers and complexity of interpretation. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated.

Since 10 May 2021, a higher proportion of COVID-19 positive PCR cases have been in unvaccinated individuals under the age of 30 years.

Figure 16: COVID-19 case rate per 100,000 individuals by sex and vaccine status, seven-day rolling average from 10 May 2021 to 17 December 2021



Vaccination status is determined as at the date of PCR specimen date according to the definitions described in Appendix 6. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated.

COVID-19 case rates are similar between females and males.

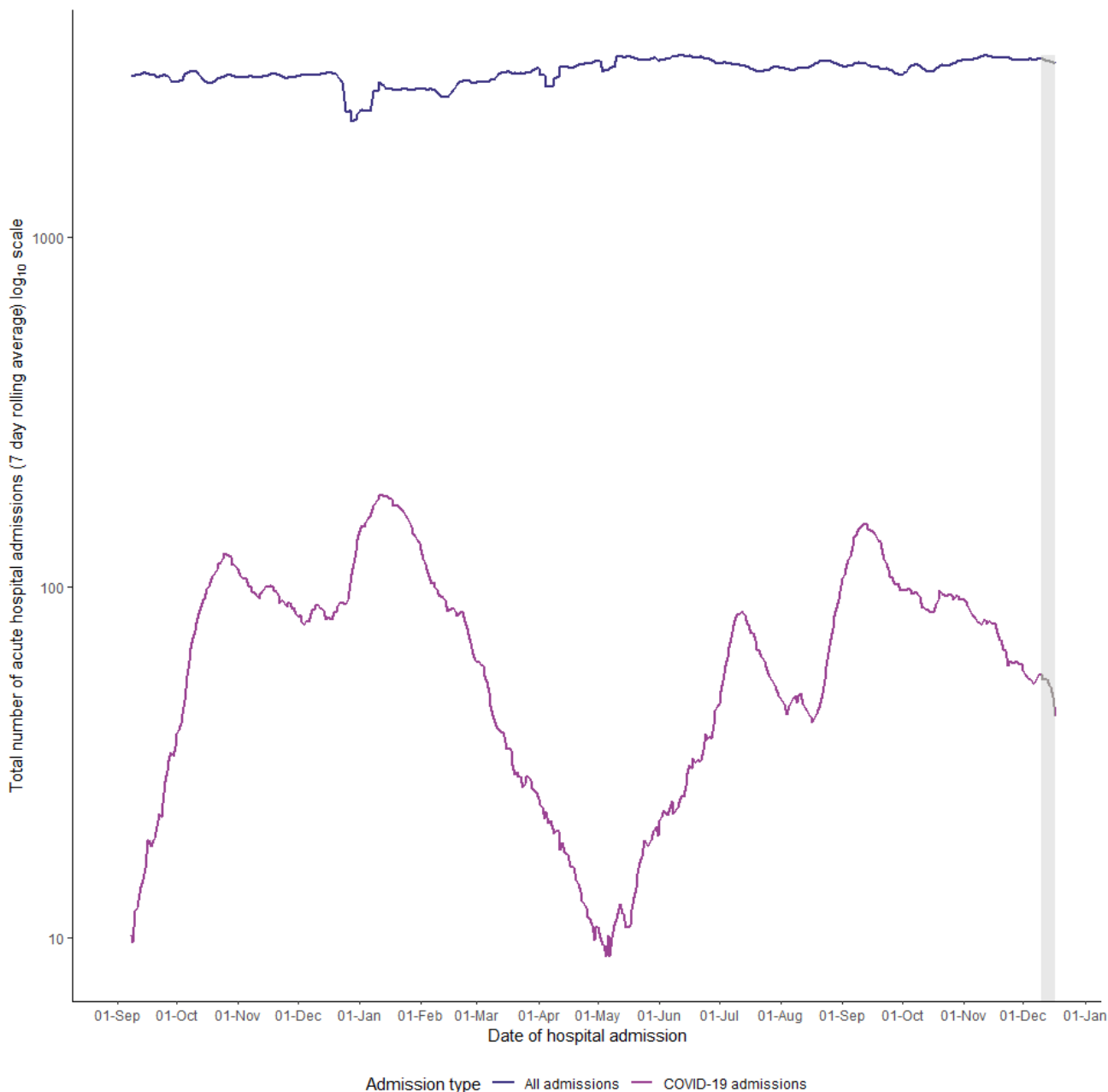
COVID-19 related acute hospital admissions by vaccine status

[A number of studies](#) have estimated vaccine effectiveness against hospitalisation and have found high levels of protection against hospitalisation with all vaccines against the Alpha variant. [A paper](#) observed effectiveness against hospitalisation of over 90% with the Delta variant with all three COVID-19 vaccines including AstraZeneca (Vaxzevria), Pfizer-BioNTech (Comirnaty), and Moderna (Spikevax). In most groups there is relatively limited waning of protection against hospitalisation over a period of at least five months after the second dose.

Please note that COVID-19 related acute hospital admissions data included in this section now only includes individuals 16 years old and over.

From 01 September 2020 to 17 December 2021, there were a total of 1,409,360 acute hospital admissions for any cause, of which 32,233 were associated with a COVID-19 PCR positive test 14 days prior, on admission, the day after admission or during their stay. Using the 90-day exclusion criteria between positive COVID-19 PCR tests associated with an acute hospital admission, 33,416 individuals were admitted to hospital, of which 103 were readmitted more than 90 days after their first admission.

Figure 17: Seven-day rolling average on a \log_{10} scale: acute hospital admissions where the individual had a COVID-19 positive PCR test 14 days prior, on admission or during their stay in hospital, compared to all acute hospital admissions, 01 September 2020 to 17 December 2021



Data displayed are on a \log_{10} scale. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated. Please note that COVID-19 related acute hospital admissions data included in this figure only includes individuals 16 years old and over.

In the last week, 11 December to 17 December 2021, the number of COVID-19 related hospital admissions have decreased. COVID-19 related hospital admissions are small relative to all acute hospitalisations.

Table 16: Age-standardised rate of acute hospital admissions where an individual had a COVID-19 positive PCR test up to 14 days prior, on admission, or during their stay in hospital, by week and vaccination status, 20 November 2021 to 17 December 2021

	Unvaccinated		1 Dose	
Week	No. hospitalised	Age Standardised hospitalisation Rate per 100,000 with 95% confidence intervals	No. hospitalised	Age Standardised hospitalisation Rate per 100,000 with 95% confidence intervals
20 November - 26 November 2021	97	38.55 (20.69 - 56.40)	22	40.46 (10.94 - 69.97)
27 November - 03 December 2021	101	37.52 (20.55 - 54.49)	16	47.02 (-1.69 - 95.73)
04 December 2021- 10 December 2021	107	42.24 (24.95 - 59.53)	16	27.69 (5.93 - 49.33)
11 December 2021- 17 December 2021	76	34.54 (17.38 - 51.69)	16	22.16 (0.88 - 43.43)
	2 Doses		Booster or 3rd Dose	
Week	No. hospitalised	Age Standardised hospitalisation Rate per 100,000 with 95% confidence intervals	No. hospitalised	Age Standardised hospitalisation Rate per 100,000 with 95% confidence intervals
20 November - 26 November 2021	234	31.04 (19.87 - 42.20)	48	5.18 (2.69 - 7.67)
27 November - 03 December 2021	172	37.22 (25.71 - 48.72)	70	6.13 (3.69 - 8.56)
04 December 2021- 10 December 2021	194	37.61 (28.01 - 47.21)	46	3.15 (2.09 - 4.21)
11 December 2021- 17 December 2021	140	29.72 (14.69 - 44.75)	49	2.77 (1.79 - 3.75)

Vaccination status is determined as at the date of positive PCR test according to the definitions described in Appendix 6. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated. Age-standardised hospitalisation rates are per 100,000 people per week, standardised to the 2013 European Standard Population adjusted to only include individuals 16 years old and over. (see Appendix 6).

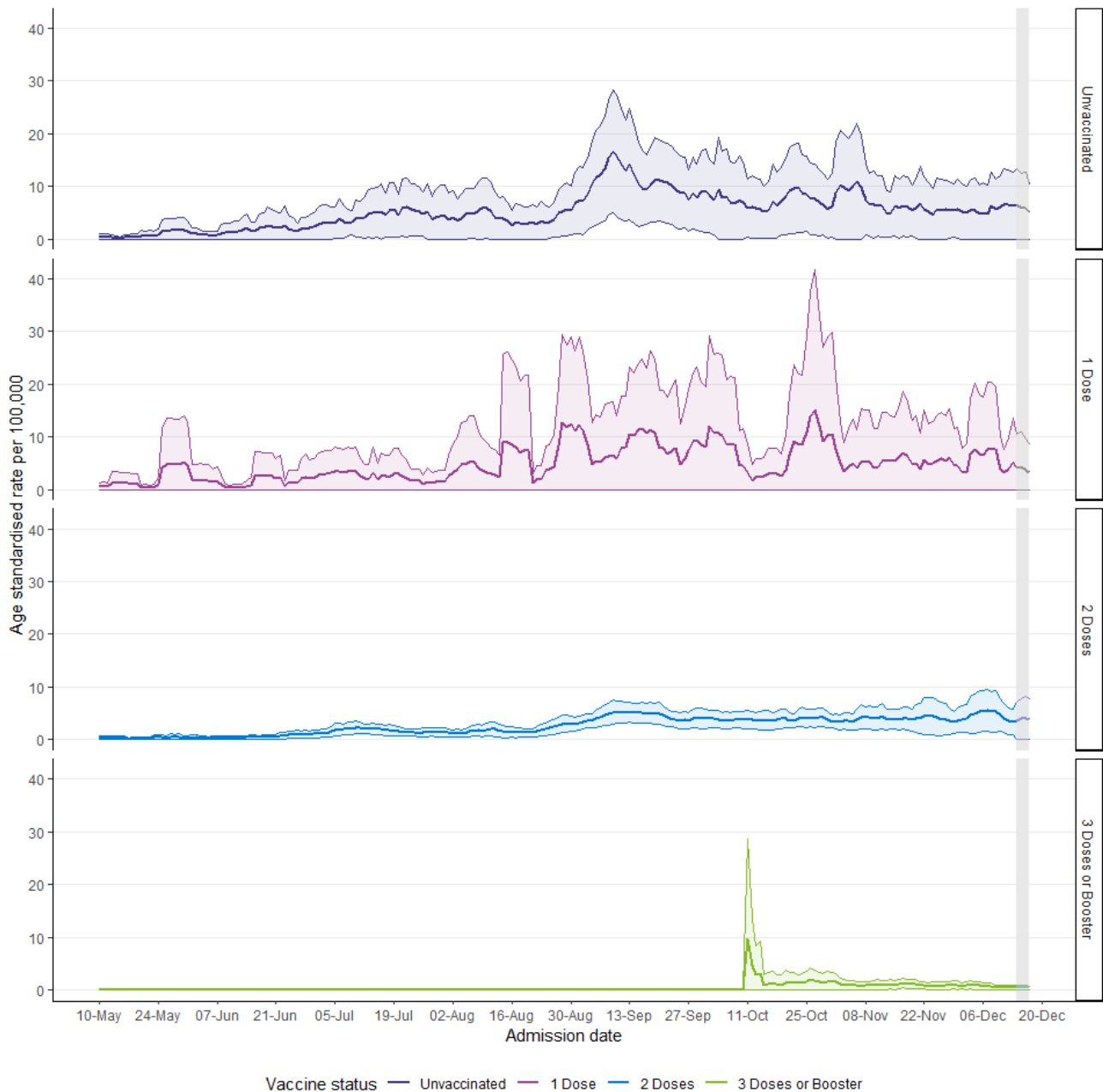
On average, unvaccinated individuals are younger than individuals with a booster or a 3rd dose of a COVID-19 vaccine. Older individuals are more likely to be hospitalised than younger individuals. To account for the different age distribution of individuals in each vaccine status, age-standardised hospitalisation rates are reported in Table 16 and Figure 18.

In the past four weeks, from 20 November 2021 to 17 December 2021, the age-standardised rate of hospital admissions per 100,000 were lower in individuals that had received a booster or 3rd dose compared to unvaccinated individuals. In the last week in an age-standardised population, individuals were 12.5 times more likely to be in hospital with COVID-19 if they were unvaccinated compared to individuals that had received a booster or 3rd dose of a COVID-19 vaccine.

Please note that these statistics do not differentiate between individuals in hospital with COVID-19 illness requiring hospitalisation compared to those in hospital for other reasons (e.g. routine operations) for whom COVID-19 was identified incidentally through testing but they are not requiring hospitalisation because of their COVID-19 symptoms.

The [PHS Weekly Statistical Report](#), published 01 December 2021, provides an updated analysis of hospital admissions 'because of' COVID-19 (where COVID-19 is the primary cause of admission) in comparison to admissions 'with' COVID-19 (where COVID-19 is not the primary reason for admission, but the individual has tested positive by PCR). This was based on aggregated data for six NHS Boards up to August 2021 and does not provide a breakdown by vaccine status. It was estimated that in August 2021, 68% of admissions were 'because of' COVID-19 and the remaining 32% were 'with' COVID-19.

Figure 18: Age-standardised hospitalisation rate of acute hospital admissions where an individual had a COVID-19 positive PCR test up to 14 days prior, on admission, or during their stay in hospital, per 100,000 individuals eligible for COVID-19 vaccination by vaccination status, seven-day rolling average from 10 May 2021 to 17 December 2021



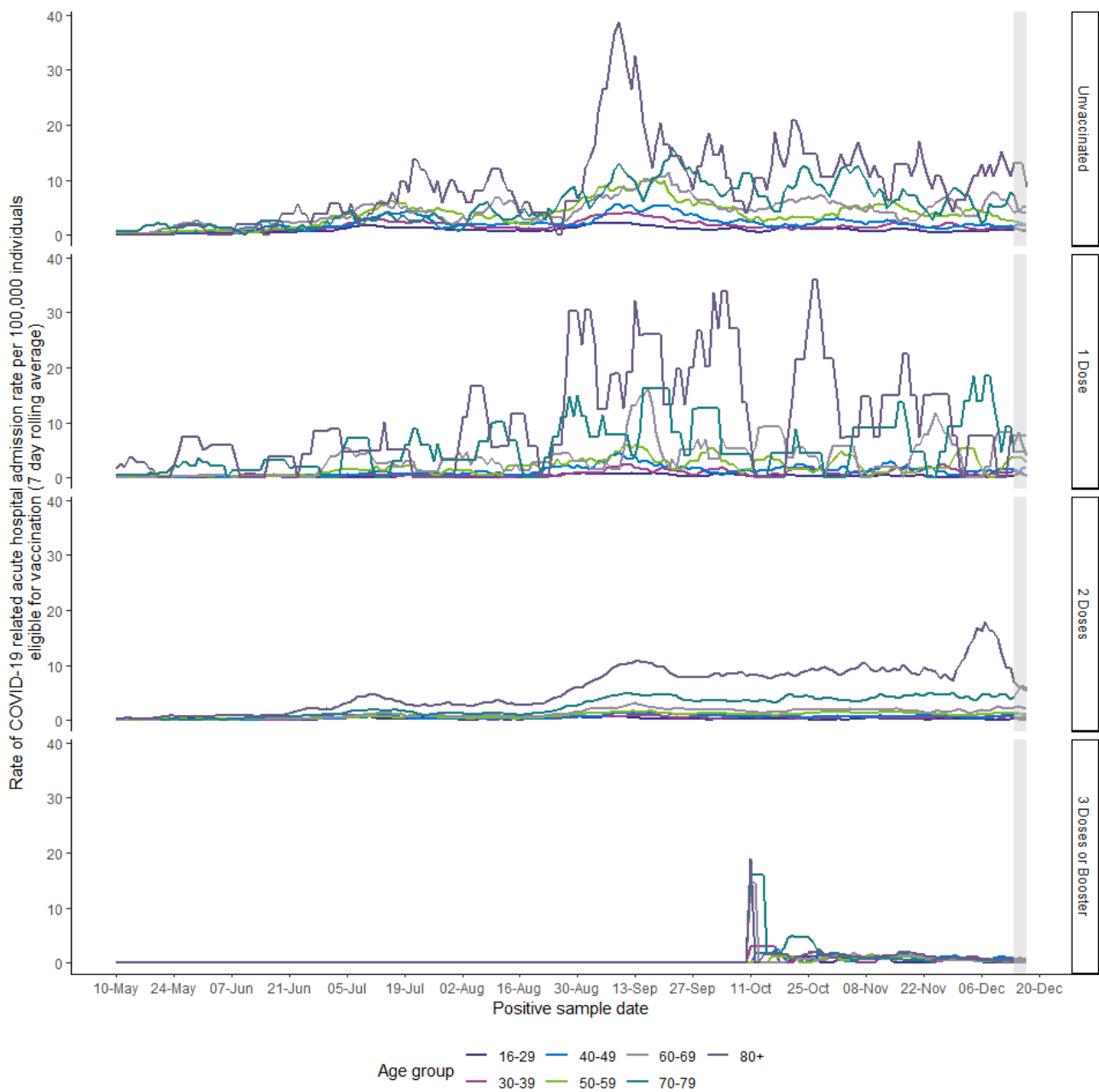
Vaccination status is determined as at the date of positive PCR test according to the definitions described in Appendix 6. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated. 95% confidence intervals are shown as the shaded regions. Age-standardised hospitalisation rates are per 100,000 people per week, standardised to the 2013 European Standard Population adjusted to only include individuals 16 years old and over (see Appendix 6).

Age standardised rates adjusted to only include individuals 16 years old and over, are calculated values by combining rates from different age groups relative to the European standard age distribution population. These calculations have associated 95% confidence intervals shown in the shaded areas of the figure. Smaller populations have wider associated confidence intervals (see 1 dose Age-standardised rate (ASR)) whereas larger populations have narrower associated confidence intervals (see 2 doses ASR).

The age standardised rate of acute hospital admissions for individuals that had received two doses, a booster or a 3rd dose of a COVID-19 vaccine are lower than individuals that have received one dose of a COVID-19 vaccine or are unvaccinated.

Note that the peak in the booster or 3rd dose category around the 11 October 2021 is likely due to a small number of individuals vaccinated at the beginning of the booster programme and the prioritisation of the booster/3rd dose to the clinically extremely vulnerable.

Figure 19: Seven-day rolling average COVID-19 related acute hospital admissions by vaccination status and by age group, 10 May 2021 to 17 December 2021



Vaccination status is determined as at the date of positive PCR test according to the definitions described in Appendix 6. Patient age is determined as their age the date of admission. Please note that COVID-19 related acute hospital admissions data included in this figure only includes individuals 16 years old and over. The data displayed within the greyed-out section are considered preliminary and are subject to change as more data is updated.

Overall, the highest rates of acute hospital admissions were in the oldest age groups. In groups where a very large proportion of individuals have been vaccinated (such as individuals over age 80), any small changes in COVID-19 related acute hospital admissions will result in a larger change shown in the graph, for example in the over 80 partially vaccinated group. These changes tend to be more 'step like' and less smooth.

Note that the peak in the booster or 3rd dose category around the 11 October 2021 is likely due to a small number of individuals vaccinated at the beginning of the booster programme and the prioritisation of the booster/3rd dose to the clinically extremely vulnerable.

Confirmed COVID-19 deaths by vaccination status

COVID-19 vaccines are estimated to significantly reduce the risk of mortality for COVID-19, however 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. Evidence has shown that vaccination is highly effective in protecting against death from coronavirus (COVID-19). [Data published by UKHSA](#) have shown high levels of protection (over 90%) against mortality with all three COVID-19 vaccines including AstraZeneca (Vaxzevria), Pfizer-BioNTech (Comirnaty), and Moderna (Spikevax), and against both the Alpha and Delta variants. [Research from Public Health Scotland, University of Edinburgh and University of Strathclyde](#) have shown two vaccine doses, whether the AstraZeneca (Vaxzevria) or the Pfizer-BioNTech (Comirnaty) vaccine, are over 90 per cent effective at preventing deaths from the Delta variant of COVID-19.

Findings from [a Scottish study](#) show that people who have received two doses of COVID-19 vaccine are far better protected against death from the virus than those who are unvaccinated. However, there are certain characteristics which can make people more vulnerable, including being aged 80 or over, having multiple underlying health conditions, and being male. [Results](#) show that adults aged 18-64 who are double vaccinated have almost four times increased protection against dying from COVID-19 compared to those who are unvaccinated. The figures are even more stark for those who are older, with double vaccinated adults aged 65-79 experiencing 15.5 times greater protection against death than their unvaccinated peers, and for adults over 80, this increased to 30 times higher.

From 29 December 2020 (21 days after the start of the vaccination programme in Scotland to account for protection to develop after the first dose) to 10 December 2021, there have been 5,592 confirmed COVID-19 related deaths with a positive PCR result and where COVID-19 was recorded as an underlying or contributory cause on the death certificate.

Of these, 64.0% (n = 3,579) were in unvaccinated individuals, 6.0% (n = 335) had received one dose of COVID-19 vaccine, 29.2% (n = 1,635) had received two doses of COVID-19 vaccine and 0.8% (n = 43) had received a booster or 3rd dose of a COVID-19 vaccine of COVID-19 vaccine. The risk of death from COVID-19 is strongly linked to age, with the most vulnerable being in the over 70s age group.

In Scotland, over 1.6 million individuals have received a booster or 3rd dose of a COVID-19 vaccine. Of these, 43 individuals (0.003%) tested positive by PCR for SARS-CoV-2 more than fourteen days after receiving their booster or 3rd dose of COVID-19 vaccine and subsequently died with COVID-19 recorded as underlying or contributory cause of death. The mean age was 77.6 years old (IQR 70 to 86.5 years old). Of the confirmed COVID-19 related deaths, 97.7% (n=42) had at least one other contributory cause of death listed alongside COVID-19 on the death certificate.

To account for differences in population size and age of the vaccination status groups over time, age-standardised mortality rates were calculated for deaths where COVID-19 was listed as an underlying or contributory cause of death on the death certificate (Table 17).

Table 17: Number of confirmed COVID-19 related deaths by vaccination status at time of test and age-standardised mortality rate per 100,000, 13 November 2021 to 10 December 2021

	Unvaccinated		1 Dose	
Week	No. of deaths	Age Standardised Mortality Rate per 100,000 with 95% confidence intervals	No. of deaths	Age Standardised Mortality Rate per 100,000 with 95% confidence intervals
13 November - 19 November 2021	13	5.15 (1.48 - 8.83)	2	5.62 (0.00 - 13.47)
20 November - 26 November 2021	20	9.88 (4.53 - 15.22)	1	2.94 (0.00 - 8.71)
27 November - 03 December 2021	15	7.95 (3.19 - 12.71)	4	8.93 (0.00 - 17.98)
04 December 2021- 10 December 2021	15	5.51 (1.94 - 9.09)	6	17.22 (3.36 - 31.09)
	2 Doses		Booster or 3rd Dose	
Week	No. of deaths	Age Standardised Mortality Rate per 100,000 with 95% confidence intervals	No. of deaths	Age Standardised Mortality Rate per 100,000 with 95% confidence intervals
13 November - 19 November 2021	75	5.18 (3.94 - 6.42)	4	0.10 (0.00 - 0.20)
20 November - 26 November 2021	65	5.44 (4.01 - 6.88)	11	0.43 (0.09 - 0.76)
27 November - 03 December 2021	56	6.46 (4.58 - 8.33)	12	0.37 (0.10 - 0.63)
04 December 2021- 10 December 2021	55	9.31 (6.67 - 11.95)	8	0.26 (0.05 - 0.46)

Vaccination status is determined as at the date of positive PCR test according to the definitions described in Appendix 6. A confirmed COVID-19 related death is defined as an individual who has tested positive by PCR for SARS-CoV-2 at any time point and has COVID-19 listed as an underlying or contributory cause of death on the death certificate. Age-standardised mortality rates per 100,000 people per week, standardised to the 2013 European Standard Population (see Appendix 6). This definition is for the purposes of evaluating the impact of the COVID-19 vaccine on confirmed COVID-19 deaths. The numbers reported in this section may differ from other published COVID-19 death data. Data are based on date of registration. In Scotland deaths must be registered within 8 days although in practice, the average time between death and registration is around 3 days. More information on days between occurrence and registration can be found on the NRS website.

Age-standardised mortality rates for COVID-19 deaths shown in Table 3 are significantly lower for people who have received a booster or 3rd dose of a COVID-19 vaccine compared to individuals that are unvaccinated or have received one or two doses of a COVID-19 vaccine.

Hospital/ Wider System Pressures

NHS services across NHS Scotland are subject to increased demand during the winter period. The information presented in this section aims to support the reader in drawing insights from a wider range of existing metrics around COVID-19 and winter pressures.

Unscheduled Care

As individuals in Scotland make contact with Unscheduled Care Services, data about who they are, where they have come from, what is wrong with them and what happens to them are collected, mainly to inform their care. This provides a good picture of the potential unscheduled care journeys that an individual may travel through.

Pressures on unscheduled care services are a familiar sight during the winter. Increased incidence of respiratory infections, alongside an increased acuity of illness and demands on primary care leads to increased demand on unscheduled care.

NHS inform is Scotland's digital health and care resource, providing the up to date standardised information on COVID-19 from a health perspective. Information is provided in a range of languages and alternative formats (www.nhsinform.scot/coronavirus).

Additional information can be found on the [wider impacts dashboard](#) and also in our [interactive dashboard](#).

NHS 24

During COVID-19 there has been a rapid reconfiguration of primary and community care services. As part of this NHS 24's 111 service has been reconfigured as an in-hours (as well as out-of-hours) route for COVID-19 triage for rapid access to care via local COVID-19 assessment hubs. In addition to this, from 1st December 2020, the national Redesign of Urgent Care Programme introduced new pathways from NHS 24 to Flow Navigation Centres, with the aim of reducing the numbers of people attending A&E and diverting to more appropriate care closer to home. This is available as part of a 24/7 service, further increasing NHS 24 in-hours activity (Monday to Friday, 8am to 6pm).

Information on COVID-19 related contacts to NHS24 and the Coronavirus Helpline are presented in our [interactive dashboard](#) which supplements this report.

Primary Care Out of Hours (OOH)

Across Scotland, NHS Boards provide Primary Care Out of Hours (OOH) services for patients' when their registered GP practice is closed. Information is available via the [Wider Impacts](#) dashboard.

Scottish Ambulance Service (SAS)

Key statistics on unscheduled care operational measures across Scotland, including trends in the number of unscheduled care incidents, responses, conveyances to hospital, response times and hospital turnaround times is available from the [Scottish Ambulance Service \(SAS\)](#) weekly unscheduled care operational statistics release.

Accident & Emergency (A&E) Activity

Additional information on Accident and Emergency (A&E) performance is available via the weekly [A&E activity and Waiting Times](#) publication, which provides an update of key statistics on attendances at Accident and Emergency (A&E) services across Scotland. Accident and Emergency waiting times and activity reporting on performance against the 4 hour waiting time standard, and the target to reduce attendances at Emergency Departments.

Large decreases in attendances at A&E services in NHS Scotland were observed in spring 2020 winter 2020/21 due to the measures put in place to respond to COVID-19. Since spring 2021 attendances at A&E have been rising and are getting closer to the pre-COVID levels. However, from the summer of 2021 performance against the four hour standard has dropped below 80% and has remained at this rate for a prolonged period of time.

Emergency Admissions

The information presented in this section aims to provide a better understanding of the underlying trends in emergency admissions during this period.

Figure 16 below shows the overall weekly trend of emergency acute hospital admissions (including COVID-19) from week ending 05 January 2021 to 28 December 2021. The number of emergency admissions have generally been decreasing since week ending 09 November 2021.

Figure 16: Trend of all Emergency Acute Hospital Admissions in Scotland

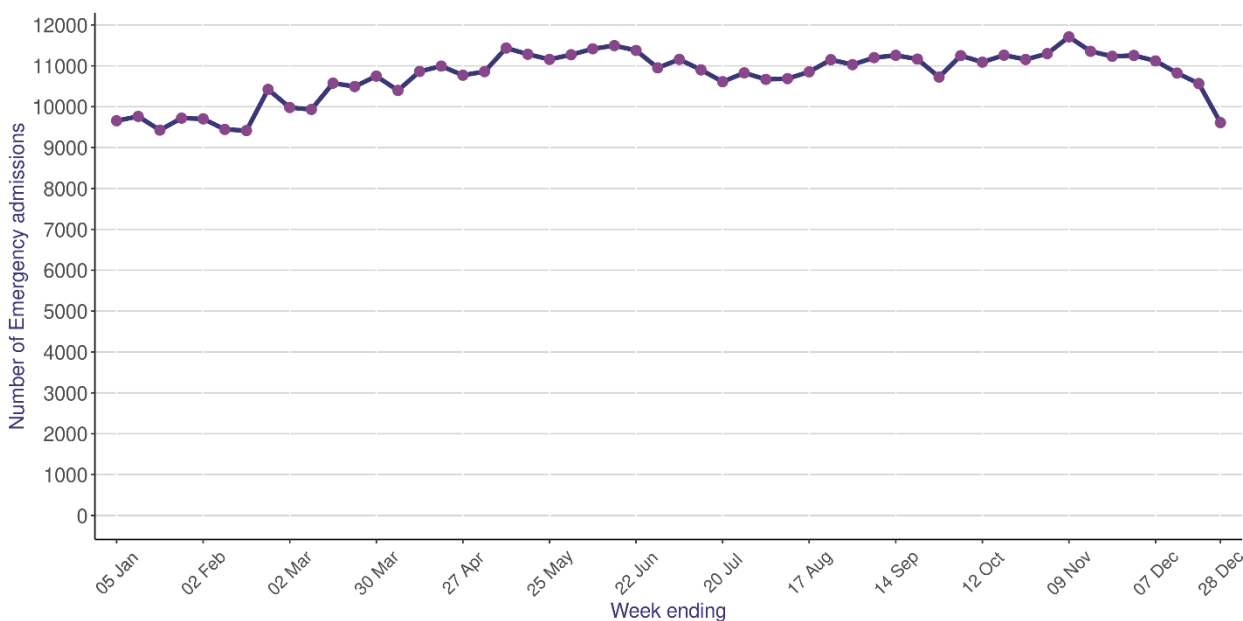


Table 18 below shows a breakdown of Emergency Admissions to acute hospital across all ages and by age group for the period 01 December 2021 to 28 December 2021.

Table 18: Emergency Hospital Admissions by age as at 28 December 2021³

Age Band	01 December – 07 December	08 December – 14 December	15 December – 21 December	22 December – 28 December
Under 18	1,478	1,424	1,335	1,040
18-29	744	706	687	594
30-39	791	815	786	638
40-49	851	840	862	755
50-54	582	587	592	509
55-59	698	696	692	649
60-64	842	745	750	692
65-69	786	800	763	732
70-74	1,033	979	997	919
75-79	1,042	941	939	939
80+	2,273	2,289	2,163	2,143
Total	11,120	10,822	10,566	9,610

Source: RAPID (Rapid and Preliminary Inpatient Data)

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

In the latest week there has been a 10.0% decrease in the number of emergency admissions, with those aged 80+ years having the highest number of admissions. Also, in the latest week 56.5% of the hospital admissions related to patients aged 60+.

Waiting Times

Waiting times are important to patients and are a measure of how the NHS is responding to demands for services. Measuring and regular reporting of waiting times highlights where there are delays in the system and enables monitoring of the effectiveness of NHS performance throughout the country.

Public Health Scotland routinely publish a range of statistics on [Waiting Times](#), including: waiting times for diagnostic tests, new outpatient appointments, inpatient and day case treatments.

These statistics continue to be affected by the COVID-19 (Coronavirus) pandemic. At the start of the outbreak, many services were paused or reduced and there were fewer referrals. Boards started to resume relevant services, from June 2020. However, as a second wave of COVID-19 cases emerged through the Autumn and winter months, many Boards had to temporarily pause non-urgent diagnostic tests during the months of January and February 2021. Access to services has generally increased since then but some Boards may have been temporarily impacted by a return to high infection rates in recent months as lockdown restrictions eased.

Delayed Discharges

Timely discharge from hospital is an important indicator of quality. It is a marker for person-centred, effective, integrated and harm free care.

For most patients, following completion of health and social care assessments, the necessary care, support and accommodation arrangements are put in place in the community without any delay and the patient is appropriately discharged from hospital.

A delayed discharge occurs when a patient aged 18 years and over, clinically ready for discharge, cannot leave hospital because the other necessary care, support or accommodation for them is not readily accessible and/or funding is not available, for example to purchase a care home place.

Public Health Scotland publish monthly statistics on [Delayed Discharges](#) in Scotland. These figures provide the number of hospital bed days associated with delayed discharges and the number of discharges from hospital following a period of delay. Information is also provided on the number of people experiencing a delay in discharge from hospital at the monthly census point.

Delayed Discharge figures in NHS Scotland have been affected by measures put in place to respond to COVID-19. The marked fall in delayed discharges during 2020 is likely due to patients being moved out of hospital to increase capacity.

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

p hs.covid19data&analytics@p hs.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 49 2021 - Weekly national seasonal respiratory report - Publications - Public Health Scotland](#)

The next release of this publication will be 12 January 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.

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). 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

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: World Health Organisation (WHO): Contact tracing in the context of COVID-19

The WHO initially produced guidance on “*enhanced criteria to adjust public health and social measures in the context of Covid-19*” in May 2020. The relevant extract from the criteria about the effectiveness of contact tracing within the context of public health surveillance at that time was:

At least 80% of new cases have their close contacts traced and in quarantine within 72 hours of case confirmation	These indicate that the capacity to conduct contact tracing is sufficient for the number of cases and contacts
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Source: <https://apps.who.int/iris/rest/bitstreams/1277773/retrieve>

In response to questions about whether the Scottish Government had been incorrectly comparing Scottish performance with the WHO “standard” (on the basis that counting in Scotland might start at the wrong point in the process), an assessment was undertaken at the start of 2020, and is available within Appendix 2 of the [Weekly Covid-19 Statistical report \(publication date 27 January 2021\)](#).

Please note this “standard” has subsequently been replaced with further [WHO guidance](#) issued in February 2021, reflecting the evolution of the state of the pandemic. This revised guidance now focuses on targeted approaches to contact tracing based on transmission patterns, engaging communities, and prioritising follow-up of high risk cases when it is not possible to identify, monitor and quarantine all contacts.

Appendix 3: Hospital Admissions Notes

Hospital Admissions

RAPID (Rapid and Preliminary Inpatient Data)

COVID-19 related admissions have been identified as the following: 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. If a patient's first positive PCR test is after their date of discharge from hospital, they are not included in the analysis.

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 daily submission of people who have been admitted and discharged to hospital. These data include admissions to acute hospitals only and do not include psychiatric or maternity/obstetrics specialties. Figures are subject to change as hospital records are updated. It can take 6-8 weeks or longer before a record is finalised, particularly discharge details.

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

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 4: Contact Tracing

Definitions

An **index case** is generated for each positive result with a test date on or after 28 May 2020. This includes tests derived from Scottish laboratories and from UK Government laboratories.

An **individual** is a unique person who has had a positive test. An individual can have multiple positive tests which results in multiple cases within the test and protect system. In these figures, each person is only counted once.

A **contact** may be contacted more than once if multiple positive cases list them as a contact.

Completed cases are cases which are marked as completed in the case management system, which means that all contacts have been followed up and completed. It excludes cases marked as failed, excluded, in progress or new. In the latest weeks there will be cases which are still open either because contact tracing is still underway (particularly for the latest week) or the NHS Board is still managing the case as part of an open outbreak.

Weekly data presented from Monday to Sunday in order to be consistent. Figures are provisional and may change as the test and protect tool is updated by contact tracers.

Individuals unable to be contacted

This information is only available for index cases that have been recorded on the CMS. The CMS went live on 22 June 2020 with NHS Boards migrating on a phased approach with all Boards using CMS from 21 July 2020. Prior to a Board migrating to CMS, data was recorded in a Simple Tracing Tool which did not give the level of granularity required to report on these measures. These data are developmental and an extensive data quality assurance exercise is underway and data may be revised in subsequent publications. Please note the methodology has changed as of 1 November 2020, a refined method has now been applied to identify unique indexes.

Contact tracers will contact index cases by telephone, and by default all close contacts will receive an automated SMS. This approach ensures high quality calls can continue to be prioritised for index cases. Even when SMS is defaulted to, in these scenarios, a number of close contacts are still telephoned, following clinical risk assessment, particularly if they are linked to complex cases. When close contacts of index cases are contacted via SMS text message, the GOV.UK Notify Service is used which means it is known if the SMS has been received by the mobile phone, not just that it has been sent. Where the SMS is not received, a contact tracer will attempt to contact the individual through other means. The case will not be marked as complete unless someone has spoken to the individual.

Appendix 5: Lateral Flow Device Testing

UK Gov other includes any LFD result which has come through the UK Government route (NHS Digital) which has the test site code "Other". Please note the universal offer results up to 28 July 2021 are reported via this method. From 28 July 2021 onwards, universal offer results are reported separately as Universal Offer.

The Attend An Event, High Cases In Local Area, Lives With Someone Who Is Shielding, Travel Within UK and Universal Offer categories only include data from 28 July 2021 onwards. From this date these categories are now options when entering a non-work LFD result via the UK Gov portal. Please note that it is up to the user to select the Attend An Event, High Cases In Local Area, Lives With Someone Who Is Shielding or Travel Within UK category, these are not part of any defined testing programme such as Community Testing or University Testing.

University Testing Site tests are tests which took place at a university testing site, generally in the 2020/21 academic year, though there are still a small number of tests each week in this category. Tests in the university students and university staff categories are tests via the UK Gov portal for someone entering a test to attend their place of work/education, these tests are from 28th July 2021 onwards and will be for the 2021/22 academic year.

For information regarding LFD testing during term time as part of the Schools Asymptomatic Testing Programme, please visit the [COVID-19 Education Surveillance Report](#).

Please note bulk uploading functionality is not yet available so data is likely to be an undercount. Data will be update and revised in future publications.

Other is any result entered via the [gov.uk website](#) where “none of the above” has been selected. Please note anyone requesting a LFD test via the general population offer, will currently report their results via this category.

Appendix 6: Data Sources and Limitations

Due to delays in reporting, figures are subject to change as records are updated. A marker (greyed-out block) has been applied where data is preliminary and caution should be taken in their interpretation.

The definitions described below are being used for the purposes of evaluating the impact of the COVID-19 vaccine on COVID-19 cases, COVID-19 related acute hospital admissions and confirmed COVID-19 deaths. The numbers reported in this section use test data, accounting for potential reinfections, and may differ from other sections and elsewhere which only count the number of new COVID-19 cases.

COVID-19 PCR test results

All positive COVID-19 PCR test results and associated demographics of an individual are extracted from the Test and Protect database (Corporate Data Warehouse) which contains test results from ECOSS. Data included in this analysis is reported up until the Friday of the previous week. Non-Scottish residents are excluded from the dataset.

COVID-19 cases are identified as the following: An individual that has tested positive for COVID-19 by PCR. If an individual tests positive more than once, the repeat positive PCR test is only counted if the positive PCR test is more than 90 days apart. Records with missing CHI numbers are excluded as these data cannot be linked to vaccination status.

Denominators for the 16 and over population are taken from the COVID-19 vaccination database. The denominator for under 16 year olds is from the NRS mid-2020 population estimates. Population data are extracted from Community Health Index (CHI) dataset representing all those currently registered with a GP practice in Scotland. These are different denominators than those in the Public Health Scotland COVID-19 Daily Dashboard and may over-estimate the population size as they will include, for example, some individuals who are no longer residents in Scotland. This is a particular issue for the denominator for the unvaccinated cohort, because for vaccinated individuals we know they were resident in Scotland at the time of their vaccination whereas for the unvaccinated cohort there will be a mixture of people who have chosen not to have the vaccine and those who are no longer resident in Scotland. This means that the rates of COVID infection and harm for the unvaccinated groups will be underestimated, whereas the rates for the vaccinated groups will be more accurate.

Vaccination status for all individuals who test positive for COVID-19 by PCR is extracted from the data used to produce the PHS vaccine uptake/daily dashboard. Vaccine records include the number of doses and date of vaccination. Individuals are listed as unvaccinated if there is no vaccination record linked to their unique CHI identifier at the time of analysis.

Vaccination status is taken at date of specimen for COVID-19 cases, acute hospital admissions, or death and assigned to number of doses according to the case definitions described below.

COVID-19 vaccination status is defined as per the following:

- **Unvaccinated:** An individual that has had no doses of COVID-19 vaccine and has tested positive for COVID-19 by PCR or has had one dose of COVID-19 vaccine and has tested positive less than or equal to 21 days after their 1st dose of COVID-19 vaccine.
- **Dose 1:** An individual that has had one dose of COVID-19 vaccine and has tested positive for COVID-19 by PCR more than 21 days after their 1st dose of COVID-19 vaccine or less than or equal to 14 days after their second dose of COVID-19 vaccine.
- **Dose 2:** An individual that has had two doses of COVID-19 vaccine and has tested positive for COVID-19 by PCR more than 14 days after their 2nd dose of COVID-19 vaccine.
- **Booster or 3rd dose:** An individual that has had a booster or 3rd dose of COVID-19 vaccine and has tested positive for COVID-19 by PCR more than 14 days after their booster or 3rd dose of COVID-19 vaccine.

COVID-19 related acute hospital admissions have been identified as the following: An individual that has tested positive for COVID-19 by PCR:

- Up to 14 days prior to hospital admission
- On the day of, or day following admission (if no discharge date is available)
- In between hospital admission and discharge (if there is a valid discharge date available).

Where an individual has more than one PCR positive test, positive results are only included for the first PCR positive test associated with a hospitalisation, or if the positive PCR test is more than 90 days after the previous PCR positive test that was eligible for inclusion. Using these criterion, all records of hospitalisation occurring within 90 days of a previous positive test are excluded. Therefore, if a positive PCR test result for an individual meets these criteria for multiple hospital stays, for example, an individual is admitted twice within a week, only the earliest hospital admission is included in the analysis.

If a patient tested positive after their date of discharge from hospital, they are not included in the analysis unless they are readmitted to hospital and meet the criteria described above.

The number of reported acute hospitalisations 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 and result in an overestimation of COVID-19 related acute hospitalisations.

Hospital admission data is extracted from the Rapid and Preliminary Inpatient Data (RAPID) dataset on Monday 20 December 2021. RAPID is a daily submission of people who have been admitted and discharged to hospital. Figures are subject to change as hospital records are updated. Data included in this analysis is reported up until the Friday of the previous week.

In the data presented here, an admission is defined as a period of stay in a single hospital. If the patient has been transferred to another hospital during treatment, each transfer will create a new admission record. Therefore, 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.

Confirmed COVID-19 deaths Death data were extracted from the SMRA dataset on Thursday 16 December 2021. Data included in these analysis are reported up until the last date of death registration for the previous week.

A confirmed COVID-19 related death is defined as an individual who has tested positive by PCR for SARS-CoV-2 at any time point and has COVID-19 listed as a underlying or contributory cause of death on the death certificate. Vaccine status is determined at time of most recent specimen date.

Age standardised hospitalisation and mortality rates are used to allow comparisons of hospitalisation and mortality rates between populations that have different age distributions. The 2013 European Standard Population is used to standardise rates. Age-standardised rates for COVID-19 related hospital admissions are standardised to the 2013 European Standard Population and are adjusted to only include individuals 16 years old and over. For more information see [the ONS methods](#). Denominators used to calculate age-standardised mortality rates are the same as the cases and hospitalisations rate figures and tables described above.

Appendix 7: Hospital admissions ‘because of’ COVID-19

For the purposes of this analysis, people admitted to hospital were included if they had a COVID-19 PCR confirmed diagnosis within 14 days prior to or in the 48 hours following their admission date. Primary outcomes of in hospital ‘because of’ versus coincidental ‘with’ COVID-19 were assigned according to the case definitions described in Box 1.

- **Definite because of COVID-19:** Admitted (or transferred in within 48 hours of admission) to a COVID-designated ward or ICU if applicable – OR – determined through case review as having a presenting complaint mentioning COVID-19 as a cause for admission.
- **Probable because of COVID-19:** Admitted (or transferred in within 48 hours of admission) to COVID designated ward or ICU but presenting complaint does not mention COVID-19 – OR – clinical symptomatology, radiological or low oximetry or other investigation consistent with COVID diagnosis – OR – treatment indicative of COVID-19, including requirement for oxygen therapy amongst those admitted with respiratory complaint or dexamethasone, appropriate antivirals, monoclonal antibodies, etc.
- **With Covid** – All admissions to non-COVID-19 wards where the primary presenting complaint is complete but does not mention COVID-19.

Cases that had an unknown admission complaint or that had a confirmatory diagnosis more than 48 hours after admission were excluded, as we sought to assess the contributions of community-acquired COVID-19 infections to hospital admissions rather than infections possibly or definitely acquired in hospital. For Greater Glasgow and Clyde, 33 of 102 cases did not meet the inclusion criteria. In Grampian, this figure was 8.

Community Health Index numbers were used to link to the primary outcome of 'because' or 'with' to other information held by Public Health Scotland, including whether the infection was likely to be Omicron or some other variant and demographic data. Six people had an unknown age.

Caution should be taken when comparing the results of this approach compared to the previous one reported in December by Public Health Scotland. The proportion of people in hospital because of COVID-19 through August 2020 would have included nosocomial transmissions.

Other limitations that are important to consider when putting these findings into context or considering the replicability of this approach going forward is that only two Boards were able to conduct this study owing to the substantial human resources and time required to review case files. In addition, there is a potential for misclassification of the primary outcome, as only a single reviewer was available to review and assign outcomes to cases. For these reasons, the findings are not necessarily generalizable to other NHS Boards or other time periods. Results reported elsewhere using different methods, including the previous Public Health Scotland results based on national Scottish Morbidity Records may also not be directly comparable, as this most recent analysis using a clinical audit approach looks at community-acquired transmission only.