

Hospital onset COVID-19 cases in Scotland

Week ending 01 March 2020
to week ending 11 December 2022

05 January
2023

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Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland, part of National Services Scotland, works closely with Public Health Scotland to deliver the COVID-19 response. This release provides data for probable and definite hospital onset COVID-19 cases (first positive specimen of COVID-19 episode taken on day eight of an inpatient stay or later) in Scotland from week ending 01 March 2020 to week ending 11 December 2022.

A system for monitoring COVID-19 is critical to tracking hospital transmission and has informed development of infection prevention and control (IPC) measures during the pandemic. The published data can be used to improve care of patients. The transmission of COVID-19 is thought to occur mainly through respiratory droplets generated by coughing and through contact with contaminated surfaces. Further information on SARS-CoV-2 and current IPC guidance can be found in the [National Infection Prevention and Control Manual](#).

This report includes all probable and definite hospital onset cases of COVID-19 regardless of episode (i.e. first episode or possible reinfection episode) or variant (e.g. Delta and Omicron). Further information on COVID-19 in Scotland can be found here:

<https://publichealthscotland.scot/publications/covid-19-statistical-report/>.

ARHAI Scotland is working with NHS boards to validate hospital onset COVID-19 cases to ensure the data are robust.

The content of this report has evolved during the pandemic to account for changes in testing for SARS-CoV-2. Due to the cessation of almost all population testing for SARS-CoV-2 at the end of April 2022, the inclusion of community onset cases in this report was discontinued in May 2022. Additionally, following the pausing of almost all routine asymptomatic testing in hospitals at the end of September 2022, the inclusion of non-hospital onset and indeterminate hospital onset cases (cases where first specimen of COVID-19 episode taken on days one to seven of an inpatient stay) has also been discontinued. Please see Appendix 1 for further details on recent revisions to the hospital onset COVID-19 surveillance.

Results and Commentary

Breakdown of probable and definite hospital onset COVID-19 cases by hospital onset status – cumulative data

The total number of probable and definite hospital onset COVID-19 cases reported to ARHAI Scotland, with specimen dates up to 11 December 2022, was 17,824. Of these:

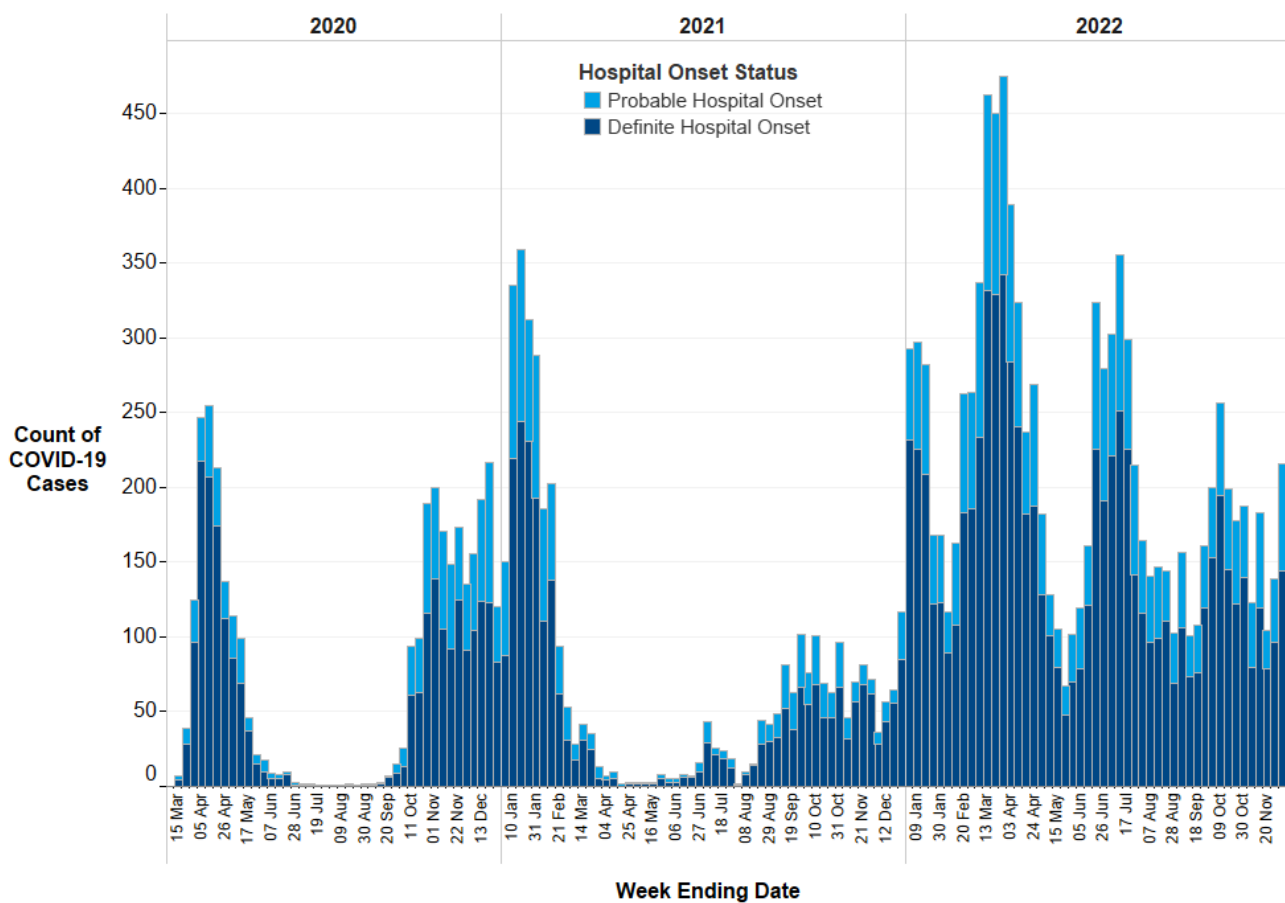
- 5,136 were reported as probable hospital onset (first positive specimen of COVID-19 episode on days 8 to 14 of admission to NHS board).
- 12,688 were reported as definite hospital onset (first positive specimen of COVID-19 episode on day 15 of admission to NHS board or later).

Breakdown of probable and definite hospital onset COVID-19 cases by hospital onset status – weekly data

The total number of probable and definite hospital onset COVID-19 cases reported to ARHAI Scotland this week (week ending 11 December 2022) was 251. Of these:

- 48 were reported as probable hospital onset (first positive specimen of COVID-19 episode on days 8 to 14 of admission to NHS board). In the previous week (week ending 04 December 2022) there were 72.
- 203 were reported as definite hospital onset (first positive specimen of COVID-19 episode on day 15 of admission to NHS board or later). In the previous week (week ending 04 December 2022) there were 144.

Figure 1: Epidemic curve of probable and definite hospital onset COVID-19 cases (first positive specimen of COVID-19 episode taken on day eight of inpatient stay or later), by onset status: week ending 01 March 2020 to week ending 11 December 2022 (n= 17,824). ^{1,2}



1. Source of data are Corporate Data Warehouse (CDW), which includes test results from Electronic Communication of Surveillance in Scotland (ECOSS), and Rapid Admission Preliminary Inpatient Data (RAPID) or local admission data.
2. Data include any reinfection episodes from samples taken on day eight of an inpatient stay or later.

Table 1: Probable and definite hospital onset COVID-19 cases (first positive specimen of COVID-19 episode taken on day eight of inpatient stay or later), by onset status and NHS board: specimen dates up to 11 December 2022.^{1,2,3}

NHS board	Probable hospital onset cases (n)	Definite hospital onset cases (n)	Total probable and definite hospital onset COVID-19 cases (n)
Ayrshire & Arran	580	1,314	1,894
Borders	91	298	389
Dumfries & Galloway	61	171	232
Fife	183	762	945
Forth Valley	236	586	822
Golden Jubilee	11	15	26
Grampian	226	689	915
Greater Glasgow & Clyde	1,508	3,871	5,379
Highland	124	436	560
Lanarkshire	718	1,414	2,132
Lothian	947	2,129	3,076
Orkney	5	21	26
Shetland	3	4	7
Tayside	432	952	1,384
Western Isles	11	26	37
Scotland	5,136	12,688	17,824

1. Source of data are Corporate Data Warehouse (CDW) that contains test results from Electronic Communication of Surveillance in Scotland (ECOSS) and Rapid Admission Preliminary Inpatient Data (RAPID) or local admission data.
2. The data used has not been adjusted for differing patient populations nor size of NHS board.
3. Data include any reinfection episodes from samples taken on day eight of an inpatient stay or later.

Contact

Shona Cairns

Consultant Healthcare Scientist

Antimicrobial Resistance and Healthcare Associated Infections (ARHAI) Scotland
NHS National Services Scotland

Phone: 0141 300 1922

Email: NSS.ARHAIdatateam@nhs.scot

Further information

Further Information can be found on the [PHS website](#).

The next release of this publication will be 11 January 2023.

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Appendices

Appendix 1 – Revisions to the surveillance

Description of Revision	First report revision applied	Rationale for revision
Change from ECOSS to Corporate Data Warehouse (CDW) database	18/08/2021 (2021 Week 29 report)	<p>On the 28th July 2021, the COVID-19 reporting processes were updated by Public Health Scotland, which resulted in some changes to the cumulative positive cases reported. From the 2021 Week 29 report (data to week ending 25/07/2021) data have been generated using this new methodology, resulting in changes to the overall number of cases reported. Non-Scottish residents who first tested positive for COVID-19 within a Scottish hospital were excluded with this new methodology.</p> <p>Please see the Public Health Scotland website for more information.</p>
Re-inclusion of non-Scottish cases defined as a hospital onset case	06/10/2021 (2021 Week 36 report)	<p>After the update in the methodology to report cases by Public Health Scotland, non-Scottish residents were excluded from this report, from the 2021 Week 29 report (data to week ending 25/07/2021) to the 2021 Week 35 report (data to week ending 05/09/2021).</p> <p>As of the 2021 Week 36 report (data to week ending 12/09/2021), any COVID-19 cases from non-Scottish residents defined as a hospital onset case were reinstated, and continue to be reported. These cases are reported under the NHS board where the first COVID-19 sample was taken. ARHAI report these additional cases to accurately reflect the burden of infection and extent of nosocomial transmission of COVID-19 in Scottish hospitals.</p>
Inclusion of private laboratory data in Public Health Scotland COVID-19 dataset	15/12/2021 (2021 Week 46 report)	<p>The case inclusion methodology was updated by Public Health Scotland. New data feeds from private labs are now included in the overall PHS COVID-19 dataset used for COVID-19 hospital onset reporting.</p>

Description of Revision	First report revision applied	Rationale for revision
Change in case definition to include Lateral Flow Device (LFD) positive results	02/02/2022 (2022 Week 1 report)	<p>Public Health Scotland updated the Scottish COVID-19 national case definition to reflect the revised testing strategy from 5th January 2022. The new definition is valid for cases from 5th January 2022 onwards, whereby either a person's first LFD or PCR positive test is accepted. LFD positive cases followed by a negative PCR result within 48 hours are excluded. This change in definitions primarily affects the number of cases reported as community onset, and has a minimal impact on hospital onset COVID-19.</p> <p>Please see the Public Health Scotland website for more information.</p>
Inclusion of reinfections data	04/05/2022 (2022 Week 14 report)	<p>On the 1st of March 2022, Public Health Scotland updated the Scottish COVID-19 national case definition to include reinfections of COVID-19.</p> <p>Previously COVID-19 cases were based on an individual's first positive test result only. The new definition includes both first infections and possible reinfections. Possible reinfections are defined as individuals who test positive, by PCR (polymerase chain reaction) or LFD (lateral flow device), 90 days or more after their last positive test. Note that as per the change in definitions to include LFD tests as above, positive tests after 90 days from an LFD before the 5th January 2022 are not included as a reinfection.</p> <p>All reinfection data from the beginning of the pandemic are now included in the report. From the 2022 Week 7 report (data to week ending 16/03/2022) to the 2022 Week 13 report (data to week ending 03/04/2022) only reinfections from 29th November 2021 were validated by NHS boards and included in the report, with reinfections prior to these classified as community onset. From 2022 Week 14 (data to week ending 10/04/2022) the remaining reinfections from the beginning of the pandemic until 28th November 2021 were validated.</p> <p>Please see the Public Health Scotland website for more information.</p>

Description of Revision	First report revision applied	Rationale for revision
Exclusion of community onset cases	01/06/2022 (2022 Week 18 report)	<p>On the 1st of May 2022, the Scottish Government Test and Protect Transition Plan changed testing strategies, with the cessation of almost all population-based testing for SARS-CoV-2.</p> <p>Following this change, the reporting of community onset cases in this report was discontinued. From the 2022 Week 18 report (data to week ending 08/05/2022) to the 2022 Week 38 report (data to week ending 25/09/2022), the proportion of each hospital onset status was presented as a proportion of all hospital onset cases (non-hospital onset, indeterminate hospital onset, probable hospital onset and definite hospital onset).</p> <p>NHS Golden Jubilee was excluded from all proportion data until the 2022 Week 17 report (data to week ending 01/05/2022), as there were no “community onset” cases assigned to that board. From the 2022 Week 18 report (data to week ending 08/05/2022) to the 2022 Week 38 report (data to week ending 25/09/2022) NHS Golden Jubilee was included in all proportions.</p> <p>For more information on this change in testing, please see the Scottish Government website, https://www.gov.scot/publications/test-protect-transition-plan/</p>
Exclusion of non-hospital onset and indeterminate hospital onset cases	26/10/2022 (2022 Week 39 report)	<p>On the 28th September 2022, the majority of routine asymptomatic testing for COVID-19 in hospitals was paused.</p> <p>This change in testing policy, along with the cessation of almost all community testing in May 2022, means that it is difficult to accurately distinguish between community onset, non-hospital onset and indeterminate hospital onset cases. Therefore, the reporting of non-hospital onset and indeterminate hospital onset cases in this report has been discontinued.</p> <p>The proportion of cases in each hospital onset category is no longer reported, as the changes in testing policy are expected to result in changes to the overall number of hospital onset COVID-19 cases identified. There is no other appropriate and</p>

Description of Revision	First report revision applied	Rationale for revision
		<p>timely denominator to use to calculate proportions or rates of hospital onset COVID-19 cases.</p> <p>The changes in testing policy also mean that not all episodes of infection are identified, and so the number and proportion of cases that are reinfections are no longer separated out within this report, but are still included in the cumulative and weekly totals reported.</p> <p>For more information on this change in testing, please see DL (2022) 32.</p>

Appendix 2 – Publication metadata

Publication title

Hospital onset COVID-19 cases in Scotland

Description

This release provides information on probable and definite hospital onset COVID-19 cases, there is a need for consistent reporting using standardised case definitions.

Theme

Infections in Scotland

Topic

COVID-19

Format

Word document

Data source(s)

COVID-19 Cases:

- Case data source: Corporate Data Warehouse (CDW), inclusive of test results from Electronic Communication of Surveillance in Scotland (ECOSS).
- Admissions Data Source: Rapid Admission Preliminary Inpatient Data (RAPID) or Local Patient Admissions Systems.

Date that data are acquired

20 December 2022

Release date

05 January 2023

Frequency

Weekly

Timeframe of data and timeliness

Timeframe of this publication was decided by first positive sample in Scotland (i.e. March 2020)

The latest iteration of data is 11 December 2022; therefore, the data are 3 or 4 weeks in arrears.

Continuity of data

Weekly updates

Revisions statement

ARHAI Scotland aims to continually improve the interpretation of the data and therefore analysis and reporting methods are regularly reviewed and may be updated in the future.

Revisions relevant to this publication

Data are continually validated by NHS boards, within the ECOSSE laboratory database, and within CDW. The databases are live and data may change due to possible changes in specimen dates, personal demographics or amendments to COVID-19 test results. Any changes to probable and definite hospital onset COVID-19 cases, which are validated by NHS boards, are tracked by ARHAI Scotland.

There were no revisions relevant to this publication for probable and definite hospital onset COVID-19 cases up to 04 December 2022.

Concepts and definitions

A COVID-19 case is defined as an individual who has tested positive for COVID-19 by SARS-CoV-2 RT-PCR (PCR), or, from 5th January 2022 onwards by PCR, Lateral Flow Device (LFD) or other point of care rapid test. LFD positive cases that are followed by a negative PCR result within 48 hours are excluded.

The first positive test and possible reinfections for each individual are counted. Episodes of infection are described as:

- First positive test recorded for an individual since March 2020
- Possible reinfections defined as individuals who test positive 90 days or more after their last positive test.

The transmission of COVID-19 is thought to occur mainly through respiratory droplets generated by coughing and through contact with contaminated surfaces. Further information on SARS-CoV-2 and current IPC guidance can be found in the [National Infection Prevention and Control Manual](#).

The agreed hospital onset case definitions for the UK are based on the number of days from admission to an NHS board to the date of specimen sampling for a positive COVID-19 test. Time since admission to specimen sampling is categorised as:

- non-hospital onset (first positive specimen of episode on day 1 or 2 of admission to NHS board)
- indeterminate (first positive specimen of episode on days 3 to 7 of admission to NHS board)
- probable (first positive specimen of episode on days 8 to 14 of admission to NHS board)
- definite hospital onset (first positive specimen of episode was 15 or more days after admission to NHS board)

Any remaining COVID-19 cases where the first positive specimen of the episode is taken in the community are defined as community onset.

These definitions are necessary due to the maximum incubation period of 14 days. See table below:

Day of sampling post admission	Nosocomial categorisation
Before admission	Community onset COVID-19
Day 1 of admission/on admission to NHS board	Non-hospital onset COVID-19
Day 2 of admission	Non-hospital onset COVID-19
Day 3 of admission	Indeterminate hospital onset COVID-19

Day 4 of admission	Indeterminate hospital onset COVID-19
Day 5 of admission	Indeterminate hospital onset COVID-19
Day 6 of admission	Indeterminate hospital onset COVID-19
Day 7 of admission	Indeterminate hospital onset COVID-19
Day 8 of admission	Probable hospital onset COVID-19
Day 9 of admission	Probable hospital onset COVID-19
Day 10 of admission	Probable hospital onset COVID-19
Day 11 of admission	Probable hospital onset COVID-19
Day 12 of admission	Probable hospital onset COVID-19
Day 13 of admission	Probable hospital onset COVID-19
Day 14 of admission	Probable hospital onset COVID-19
Day 15 of admission and onwards to discharge	Definite hospital onset COVID-19
Post discharge	Community onset COVID-19

This report only includes probable and definite hospital onset COVID-19 cases (first positive specimen of episode on day eight of admission or later). Community onset, non-hospital onset and indeterminate hospital onset cases are not included.

The hospital onset cases in this report represent cases presenting in hospital, and are calculated according to their current inpatient episode. Previous reports of non-hospital onset cases may have included cases presenting with a readmission to hospital, and similarly any cases presenting in the community post-discharge are not considered hospital onset cases.

Admission to health board was agreed as the appropriate point to start counting the duration of hospital stay to first positive specimen date within a first infection or reinfection episode, rather than the date of admission to a single hospital, since patients can be transferred between hospitals which would lead to restarting the clock to 'day 1' each time and therefore underestimating the number of nosocomial infections.

Any discharges and re-admissions within the same health board which occur within the same calendar day will be classed as a continuous stay; the clock will not be restarted in these instances, only when a readmission occurs on the second day or more after any discharge.

For hospital onset COVID-19 cases the NHS board reported is where the first positive sample of the episode was taken, established either using Rapid Admission Preliminary

Inpatient Data (RAPID) data and validated by the NHS boards, or using individual NHS boards' internal admissions systems. Since the definition of hospital-onset COVID-19 was determined using date of admission to NHS board, the board assigned may not represent the board of attribution of hospital-onset COVID-19 infection. These data include non-Scottish residents who have been hospital inpatients at the time of their COVID-19 episode date, assigned to the NHS board of positive test as above.

Relevance and key uses of the statistics

Surveillance data are essential for monitoring trends and assisting in outbreak investigations and to understand the extent of ongoing transmission within the hospital setting. ARHAI Scotland offers support to NHS boards across Scotland to aid their local COVID-19 prevention strategies.

Accuracy

It is acknowledged that patients can be transferred between NHS boards and if transferred into a different NHS board during the same hospital stay, then the clock is restarted to 'day 1' which could lead to an underestimation of cases. However, the decision to restrict start date to admission to a single NHS board was due to the requirement to report data at the NHS board level. Any discharges and re-admissions which occur within the same calendar day and within the same NHS board will be overlooked - the clock will not be restarted in these instances, only when a readmission occurs on the second or more day after any discharge.

COVID-19 cases identified after discharge from hospital but within 14 days may be associated with the hospital. These cases, including those identified on readmission to hospital, are not included as hospital onset. This may result in under-reporting of COVID-19 cases associated with hospital care.

Completeness

Data are sent to NHS boards for validation, allowing any missing cases not captured by CDW and RAPID to be added, and any cases with incorrect details to be corrected. Therefore, completeness for probable and definite hospital onset cases is near to 100%.

Comparability

The agreed hospital onset case definitions for the UK have been adopted to allow comparison across the four nations. However, geographical differences and healthcare delivery, for example NHS board versus NHS Trust must be considered.

COVID-19 testing policy has changed over the course of the pandemic, impacting the number of COVID-19 cases identified and reported in hospitals. Therefore, data may not be comparable over time.

Accessibility

It is the policy of ARHAI Scotland to make its web sites and products accessible according to [published guidelines](#).

Link to this report open data platform can be found here:

<https://www.opendata.nhs.scot/dataset/hospital-onset-covid-19-cases-in-scotland>

Coherence and clarity

Previous published reports can be found at:

<https://www.publichealthscotland.scot/publications/show-all-releases?id=20584>

Value type and unit of measurement

At national level, the number of COVID-19 cases which can be classed as definite hospital onset and probable hospital onset, and broken down by week using the date of the first positive COVID-19 sample of the first infection or reinfection episode.

At NHS board level, the cumulative number of COVID-19 cases which can be classed as definite hospital onset and probable hospital onset.

Disclosure

The PHS protocol on [Statistical Disclosure Control Protocol](#) is followed.

Official Statistics designation

Management Information

UK Statistics Authority Assessment

Not assessed

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Help email

NSS.ARHAIdatateam@nhs.scot

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Appendix 3 – Early access details

Pre-Release Access

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

Standard Pre-Release Access:

- Scottish Government Health Department
- NHS board Chief Executives
- NHS board Communication leads