

Hospital onset COVID-19 cases in Scotland

Week ending 1 March 2020
to week ending 26 September 2021

20 October
2021

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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 COVID-19 hospital onset cases in Scotland from week ending 1 March 2020 to week ending 26 September 2021.

A system for monitoring COVID-19 is critical to tracking hospital transmission and will inform infection prevention and control measures. 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. As sustained community transmission has occurred as the pandemic has progressed, it has become more challenging to identify true cases of hospital transmission. [Further information on the epidemiology of COVID-19 in healthcare settings can be found on the Public Health Scotland website.](#)

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

Data are provided for the 14 NHS boards and one NHS special health board.

Results and Commentary

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

The total number of COVID-19 cases reported to ARHAI Scotland, with specimen dates up to 26 September 2021, was 560,247. Of these:

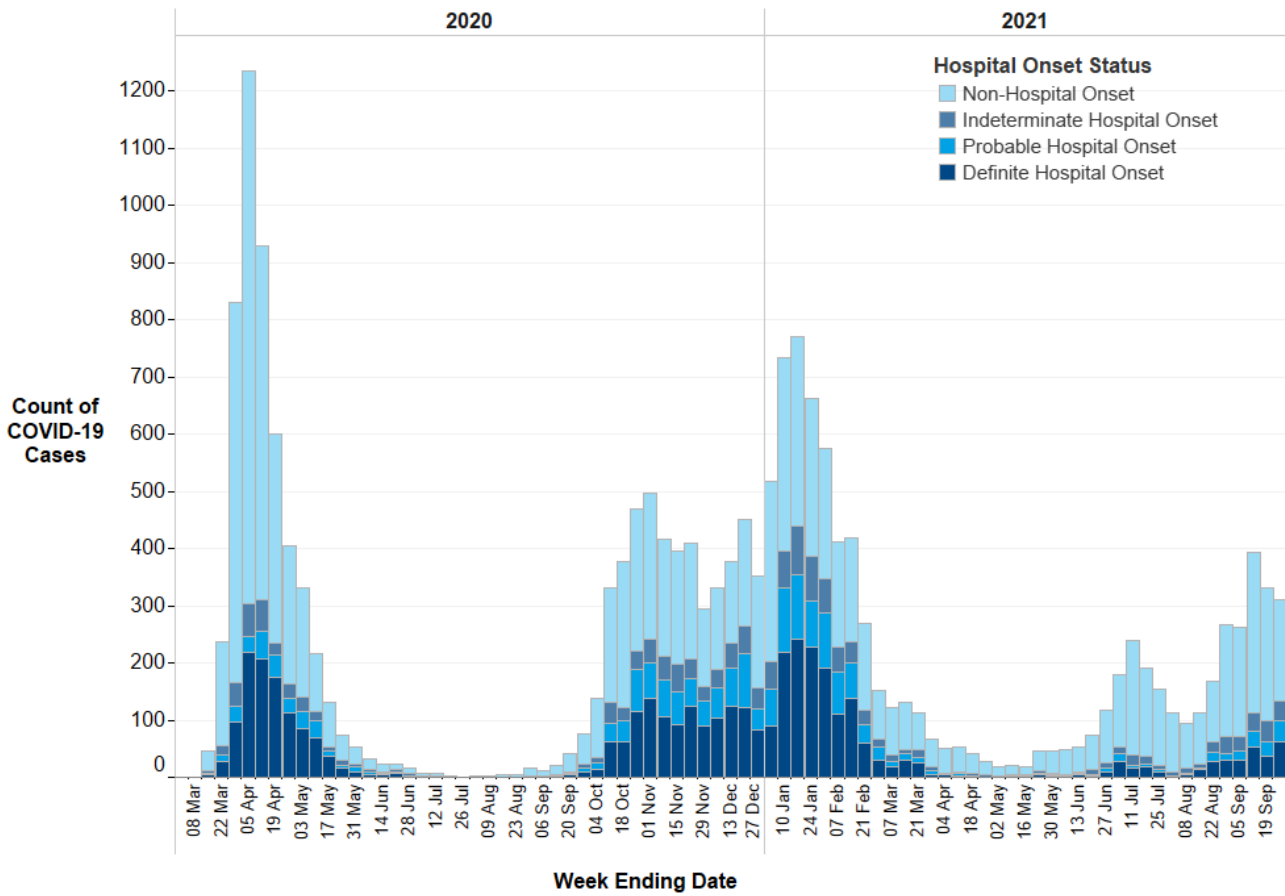
- 541,668 (96.7%) were reported as community onset (first positive specimen taken in the community).
- 11,075 (2.0%) were reported as non-hospital onset (first positive specimen on day 1 or 2 of inpatient admission to NHS board).
- 1,559 (0.3%) were reported as indeterminate hospital onset (first positive specimen on days 3 to 7 of admission to NHS board).
- 1,850 (0.3%) were reported as probable hospital onset (first positive specimen on days 8 to 14 of admission to NHS board).
- 4,095 (0.7%) were reported as definite hospital onset (first positive specimen date was 15 or more days after admission to NHS board).

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

The total number of COVID-19 cases reported to ARHAI Scotland this week (week ending 26 September 2021) was 21,315. Of these:

- 21,004 (98.5%) were reported as community onset (first positive specimen taken in the community). In the previous week (week ending 19 September 2021) there were 25,812 (98.7%).
- 178 (0.8%) were reported as non-hospital onset (first positive specimen on day 1 or 2 of admission to NHS board). In the previous week (week ending 19 September 2021) there were 232 (0.9%).
- 34 (0.2%) were reported as indeterminate hospital onset (first positive specimen on days 3 to 7 of admission to NHS board). In the previous week (week ending 19 September 2021) there were 37 (0.1%).
- 36 (0.2%) were reported as probable hospital onset (first positive specimen on days 8 to 14 of admission to NHS board). In the previous week (week ending 19 September 2021) there were 25 (0.1%).
- 63 (0.3%) were reported as definite hospital onset (first positive specimen date was 15 or more days after admission to NHS board). In the previous week (week ending 19 September 2021) there were 37 (0.1%).

Figure 1: Epidemic curve of COVID-19 cases with first positive specimen taken during an inpatient stay, by onset status: week-ending 1 March 2020 to week-ending 26 September 2021 (n=18,579).^{1,2}



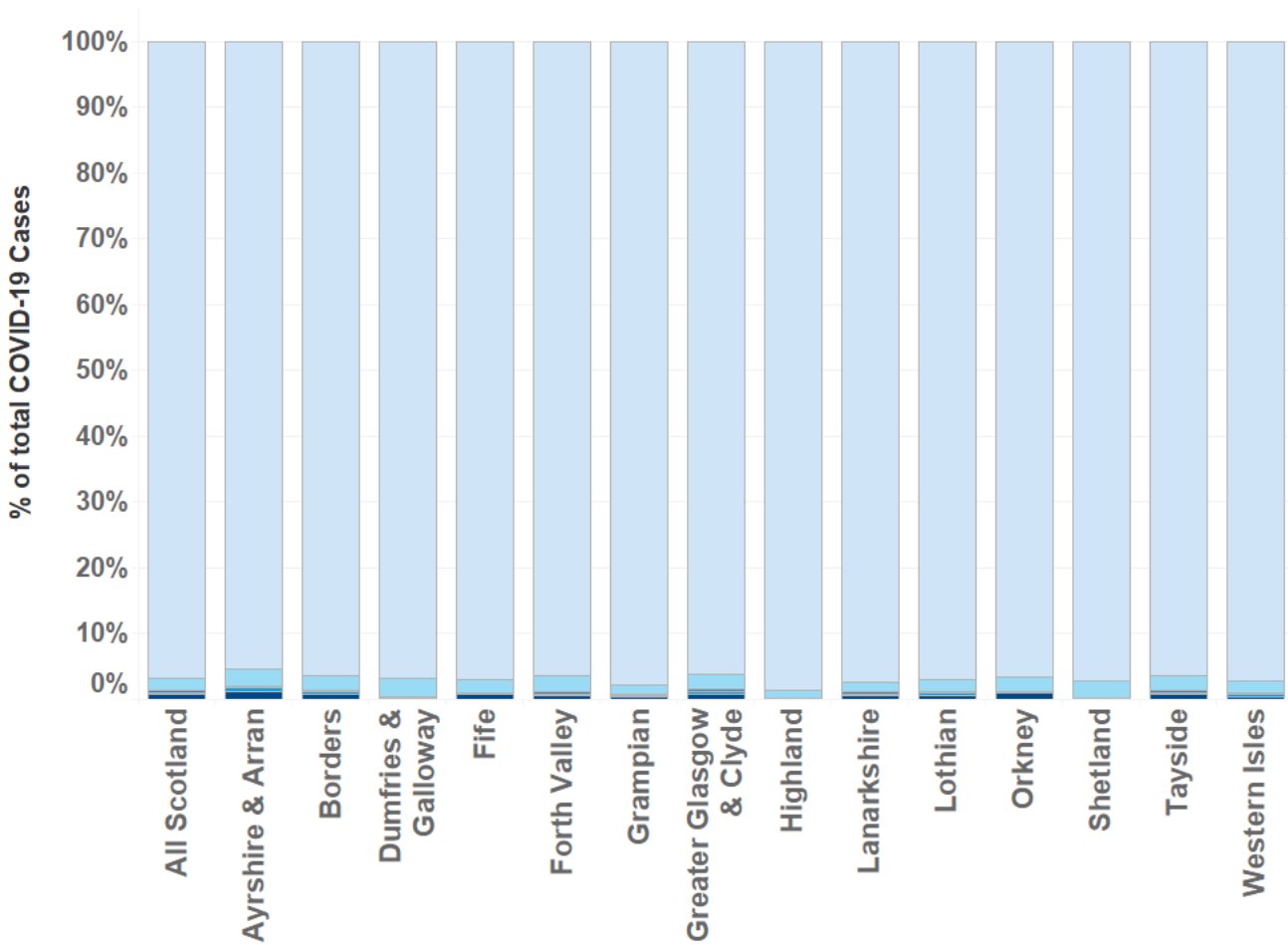
1. Source of data are Corporate Data Warehouse (CDW) that contains test results from Electronic Communication of Surveillance in Scotland (ECOSS) and Rapid Admission Preliminary Inpatient Data (RAPID) or local admission data.
2. The community cases are not represented in this chart as first sample was not taken in hospital setting.

Table 1: Number of COVID-19 cases, by onset status and NHS board: specimen dates up to 26 September 2021.^{1,2,3}

NHS board	Total COVID-19 cases (n)	Non-hospital onset (n)	Indeterminate hospital onset cases (n)	Probable hospital onset cases (n)	Definite hospital onset cases (n)	Non-hospital onset (%)	Indeterminate hospital onset cases (%)	Probable hospital onset cases (%)	Definite hospital onset cases (%)
Ayrshire & Arran	39,354	1,017	143	249	440	2.6%	0.4%	0.6%	1.1%
Borders	7,389	169	21	23	62	2.3%	0.3%	0.3%	0.8%
Dumfries & Galloway	10,740	290	25	9	18	2.7%	0.2%	0.1%	0.2%
Fife	33,620	680	47	42	274	2.0%	0.1%	0.1%	0.8%
Forth Valley	29,758	725	94	81	188	2.4%	0.3%	0.3%	0.6%
Golden Jubilee	31	17	7	3	4	-	-	-	-
Grampian	37,831	528	70	62	196	1.4%	0.2%	0.2%	0.5%
Greater Glasgow & Clyde	160,679	3,548	558	598	1,424	2.2%	0.3%	0.4%	0.9%
Highland	18,489	209	14	8	29	1.1%	0.1%	0.0%	0.2%
Lanarkshire	89,758	1,329	238	289	522	1.5%	0.3%	0.3%	0.6%
Lothian	91,842	1,624	212	336	648	1.8%	0.2%	0.4%	0.7%
Orkney	313	7	0	1	3	2.2%	0.0%	0.3%	1.0%
Shetland	642	17	1	0	0	2.6%	0.2%	0.0%	0.0%
Tayside	39,060	901	128	146	284	2.3%	0.3%	0.4%	0.7%
Western Isles	741	14	1	3	3	1.9%	0.1%	0.4%	0.4%
Scotland	560,247	11,075	1,559	1,850	4,095	2.0%	0.3%	0.3%	0.7%

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. NHS Golden Jubilee has been excluded from the proportions data since data for this board will not be comparable with others due to no “community onset” cases assigned to that board.
3. The data used has not been adjusted for different patient groups and size of NHS board.

Figure 2: Proportion of COVID-19 cases by onset status and NHS board: specimen dates up to 26 September 2021.^{1,2,3}



Hospital Onset Status

- Community Onset
- Non-Hospital Onset
- Indeterminate Hospital Onset
- Probable Hospital Onset
- Definite Hospital Onset

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. NHS Golden Jubilee has been excluded since data for this board will not be comparable with others due to no “community onset” cases assigned to that board.
3. The data used has not been adjusted for different patient groups and size of NHS board.

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Further information

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

The next release of this publication will be 27 October 2021.

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Appendices

Appendix 1 – Publication metadata

Metadata indicator	Description
Publication title	Hospital onset COVID-19 cases in Scotland
Description	This release provides information on 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)	<p>COVID-19 Cases:</p> <p>Case data source: Source of data are Corporate Data Warehouse (CDW) that contains test results from Electronic Communication of Surveillance in Scotland (ECOSS).</p> <p>Admissions Data Source: Rapid Admission Preliminary Inpatient Data (RAPID) or Local Patient Admissions Systems.</p>
Date that data are acquired	5 October 2021
Release date	20 October 2021
Frequency	Weekly
Timeframe of data and timeliness	<p>Timeframe of this publication was decided by first positive sample in Scotland (i.e. March 2020)</p> <p>The latest iteration of data is 26 September 2021, therefore the data are 3 or 4 weeks in arrears.</p>
Continuity of data	Weekly updates
Revisions statement	These data are not subject to planned major revisions. However, ARHAI Scotland aims to continually improve the interpretation of the data and therefore analysis methods are regularly reviewed and may be updated in the future.
Revisions relevant to this publication	Data are continually validated by both NHS boards and within the ECOSS 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, retrospective counts for Community onset cases may vary slightly from week to week. Any changes to cases taken within hospital settings, which are validated by NHS boards, are tracked by ARHAI Scotland. Changes to retrospective data are outlined in the table below if applicable.

Revisions relevant to this publication for COVID-19 cases up to 19 September 2021 include:

NHS Board	Hospital Onset Category	Change	Reason for Change
Scotland	Community onset	+12	Retrospective changes in CDW from week ending 16/02/2020 to 19/09/2021
NHS FF	Non-Hospital onset	+1	Retrospective change in CDW for week ending 29/03/2020
NHS FV	Non-Hospital onset	+1	Retrospective change in CDW for week ending 29/03/2020
NHS BR	Community onset	-4	Retrospective change in CDW for week ending 05/04/2020
	Non-Hospital onset	+4	
NHS BR	Community onset	-1	Retrospective change in CDW for week ending 17/05/2020
	Non-Hospital onset	+1	
NHS LO	Definite Hospital onset	-1	Retrospective correction from NHS board for week ending 14/02/2021
	Community onset	+1	
NHS LO	Probable Hospital onset	-1	Retrospective correction from NHS board for week ending 14/03/2021
	Community onset	+1	
NHS GGC	Definite Hospital onset	-1	Retrospective correction of admission data for week ending 21/03/2021
	Community onset	+1	
NHS GGC	Indeterminate Hospital onset	-1	Retrospective correction of admission data for week ending 28/03/2021
NHS AA	Community onset	+1	
NHS LO	Community onset	-2	Retrospective change in CDW for week ending 18/07/2021
NHS FV	Indeterminate Hospital onset	-1	Retrospective correction of admission data for week ending 22/08/2021
	Community onset	+1	
NHS LO	Definite Hospital onset	-1	Retrospective correction from NHS board for week ending 12/09/2021
	Community onset	+1	
NHS AA	Community onset	-1	Retrospective correction from NHS board for week ending 19/09/2021
	Non-Hospital onset	+1	

On the 28th July 2021, the COVID-19 reporting processes were updated by Public Health Scotland, which has resulted in some changes to the cumulative positive cases reported. Data in this report are generated using this new methodology, resulting in changes to the overall number of cases reported. Please see the Public Health Scotland website for [more information](#).

	<p>With this change in methodology within PHS, it became more challenging for ARHAI to identify non-Scottish residents who first tested positive for COVID-19 within a Scottish hospital. For reports published between 18th August 2021 and 29th September 2021, non-Scottish cases were excluded from this report. As of 6th October 2021, any COVID-19 cases from non-Scottish residents defined as a hospital onset case have been reinstated, and will 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>																		
<p>Concepts and definitions</p>	<p>A COVID-19 case is defined as an individual who has tested positive for COVID-19 by PCR. Only the first positive test for each individual is counted.</p> <p>The transmission of COVID-19 is thought to occur mainly through respiratory droplets and through contact with contaminated surfaces. Further information on the epidemiology of COVID-19 in healthcare settings can be found on the Public Health Scotland website. As sustained community transmission has occurred as the pandemic has progressed, it has become more challenging to identify true cases of hospital transmission.</p> <p>A system for monitoring COVID-19 is critical to tracking nosocomial transmission in healthcare settings to inform infection prevention and control measures. In response to the Scottish Government's request to ascertain and validate the hospital-onset status of all COVID-19 cases in Scotland, ARHAI Scotland are working with NHS boards to establish a minimum viable dataset to fulfil this request.</p> <p>The agreed nosocomial case definition for the UK is based on the number of days since admission to an NHS health board to the date of specimen sampling for a positive SARS-CoV-2 RT-PCR test. Time since admission to specimen sampling is categorised as:</p> <ul style="list-style-type: none"> • community onset (first positive specimen taken in the community) • non-hospital onset (first positive specimen on day 1 or 2 of admission to NHS board) • indeterminate (first positive specimen on days 3 to 7 of admission to NHS board) • probable (first positive specimen on days 8 to 14 of admission to NHS board) • definite hospital onset (first positive specimen date was 15 or more days after admission to NHS board) <p>These definitions are necessary due to the maximum incubation period of 14 days. See table below:</p> <table border="1" data-bbox="341 1585 1410 2060"> <thead> <tr> <th>Day of sampling post admission</th> <th>Nosocomial categorisation</th> </tr> </thead> <tbody> <tr> <td>Before admission</td> <td>Community onset COVID-19</td> </tr> <tr> <td>Day 1 of admission/on admission to NHS board</td> <td>Non-hospital onset COVID-19</td> </tr> <tr> <td>Day 2 of admission</td> <td>Non-hospital onset COVID-19</td> </tr> <tr> <td>Day 3 of admission</td> <td>Indeterminate hospital onset COVID-19</td> </tr> <tr> <td>Day 4 of admission</td> <td>Indeterminate hospital onset COVID-19</td> </tr> <tr> <td>Day 5 of admission</td> <td>Indeterminate hospital onset COVID-19</td> </tr> <tr> <td>Day 6 of admission</td> <td>Indeterminate hospital onset COVID-19</td> </tr> <tr> <td>Day 7 of admission</td> <td>Indeterminate hospital onset COVID-19</td> </tr> </tbody> </table>	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 of sampling post admission	Nosocomial categorisation																		
Before admission	Community onset COVID-19																		
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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

The hospital onset cases in this report represent cases presenting in hospital and do not include COVID-19 associated with hospital care that present on readmission to hospital or post-discharge.

Start point of duration

Admission to health board was agreed as the appropriate point to start counting the duration of hospital stay to first positive specimen date, 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 definite, probable, indeterminate and non-hospital onset (day 1 or 2 of inpatient stay), the NHS board reported is where the first sample was taken, established either using Rapid Admission Preliminary Inpatient Data (RAPID) data and validated by the boards, or using individual NHS board's 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 (Table above).

For community onset (no admission), the NHS board of residence will be used, according to the Electronic Communications of Surveillance in Scotland (ECOSS) lab surveillance database. Non-Scottish residents who tested positive for COVID-19 in the community in Scotland are excluded from reporting.

Minimum data required to be validated:

- CHI number (or for non-Scottish residents patient forename, surname and date of birth)
- Date of positive SARS-CoV-2 RT-PCR test
- Date of admission to health board when patient tested positive for COVID-19
- NHS board where first positive test undertaken

<p>Relevance and key uses of the statistics</p>	<p>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.</p>
<p>Accuracy</p>	<p>It is acknowledged that patients can be transferred between NHS health boards and if transferred into a different health 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 health board represents the requirement to report at the health 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.</p> <p>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.</p>
<p>Completeness</p>	<p>Surveillance data are collected using the ARHAI Scotland system that allows data collectors in NHS boards to validate ECOSS records as well as identifying additional cases that may not be included in the ECOSS or CDW systems. This therefore means that completeness for hospital onset cases under current definitions is near to 100%.</p> <p>NHS Golden Jubilee will be excluded from any views showing the proportion of hospital onset cases due to no non-hospital onset cases being assigned to that board – therefore data for this board will not be comparable with other NHS boards.</p>
<p>Comparability</p>	<p>The agreed nosocomial case definition for the UK has been adopted to allow comparison across the four nations. However, geographical differences for example NHS board versus NHS Trust have to be considered.</p> <p>Prior to 15 June 2020, the total number of cases reported by Public Health Scotland and the Scottish Government did not include those identified in UK Government Laboratories. The number of cases reported in this report includes cases identified in this scheme so will therefore be higher than what was included in the daily reporting prior to 15 June 2020.</p> <p>There may be some differences to NHS board level counts within this report and reports from Public Health Scotland. ARHAI report hospital onset cases against the NHS board where the sample was taken, with community onset reported against NHS board of residence; PHS primarily report all cases by NHS board of residence.</p> <p>On the 28th July 2021 the COVID-19 reporting processes were updated by Public Health Scotland, which has resulted in some changes to the cumulative positive cases reported. Since 18th August 2021, data in this report have been generated using this new methodology, resulting in changes to the overall number of cases reported. Please see the Public Health Scotland website for more information.</p> <p>There may be some differences in the total number of cases within this report and reports from Public Health Scotland as this report includes non-Scottish residents who tested positive for COVID-19 whilst an inpatient in a Scottish hospital, whereas Public Health Scotland reports exclude these individuals.</p>

Accessibility	<p>It is the policy of ARHAI Scotland to make its web sites and products accessible according to published guidelines.</p> <p>Link to this reports open data platform can be found here: https://www.opendata.nhs.scot/dataset/hospital-onset-covid-19-cases-in-scotland</p>
Coherence and clarity	<p>Previous published reports can be found at: https://www.publichealthscotland.scot/publications/show-all-releases?id=20584</p>
Value type and unit of measurement	<p>At National level, the number and proportion of COVID-19 cases which can be classed as definite hospital onset, probable hospital onset, indeterminate hospital onset, non-hospital onset and community onset, and broken down by week using the date of first positive COVID-19 sample.</p> <p>NHS board level, the cumulative number and proportion of COVID-19 cases which can be classed as definite hospital onset, probable hospital onset, indeterminate hospital onset, non-hospital onset and community onset, using the date of first positive COVID-19 sample.</p> <p>Due to rounding the percentages do not always add up to 100%</p>
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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Appendix 2 – 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