



Hospital onset COVID-19 cases in Scotland

Week ending 1 March
to week ending 14 June 2020



08 July 2020

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Introduction

National Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland, part of National Services Scotland works closely with Public Health Scotland to deliver under the Health Protection Scotland (HPS) COVID-19 response. This release provides data for COVID-19 hospital onset cases in Scotland for week ending 1 March 2020 to week ending 14 June 2020.

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 Health Protection Scotland website.](#)

National 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 National ARHAI Scotland, with specimen dates up to 14 June 2020, was 18,057. Of these:

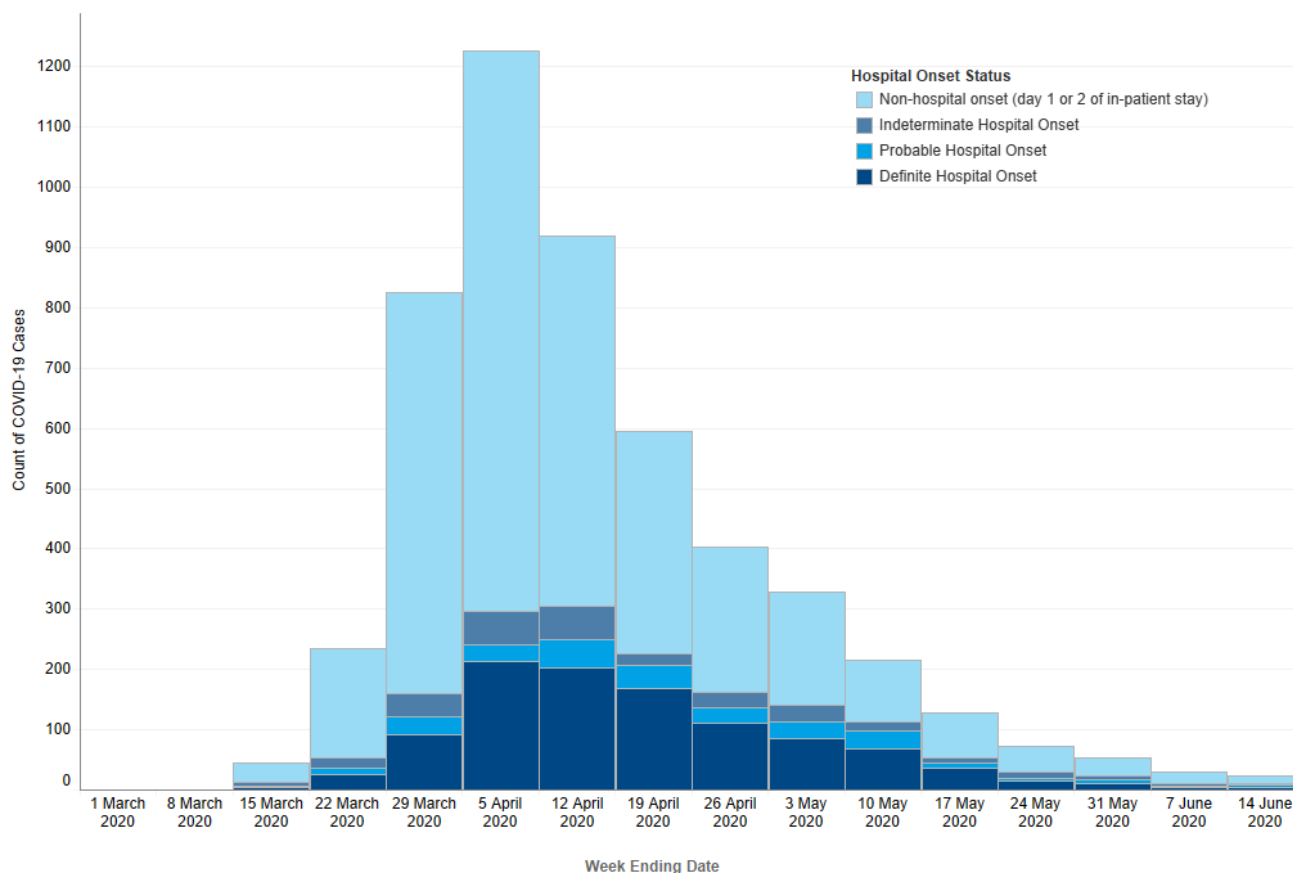
- 12,956 (71.8%) were reported as community onset (first positive specimen taken in the community).
- 3,499 (19.4%) were reported as non-hospital onset (first positive specimen on day 1 or 2 of in-patient admission to NHS board).
- 293 (1.6%) were reported indeterminate hospital onset (first positive specimen on days 3 to 7 of admission to NHS board).
- 268 (1.5%) were reported as probable hospital onset (first positive specimen on days 8 to 14 of admission to NHS board).
- 1,041 (5.8%) 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 National ARHAI Scotland, this week (week ending 14 June 2020) was 162. Of these:

- 139 (85.8%) were reported as community onset (first positive specimen taken in the community) in the previous week (week ending 07 June 2020) there were 186 (86.1%).
- 13 (8.0%) 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 07 June 2020) there were 20 (9.3%).
- 2 (1.2%) were reported indeterminate hospital onset (first positive specimen on days 3 to 7 of admission to NHS board) in the previous week (week ending 07 June 2020) there were 3 (1.4%).
- 3 (1.9%) 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 07 June 2020) there were 3 (1.4%).
- 5 (3.1%) 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 07 June 2020) there were 4 (1.9%).

Figure 1: Epidemic curve of COVID-19 cases with first positive specimen taken during an inpatient stay, by onset status: week-ending 1 March to week-ending 14 June 2020 (n=5,101).^{1,2}



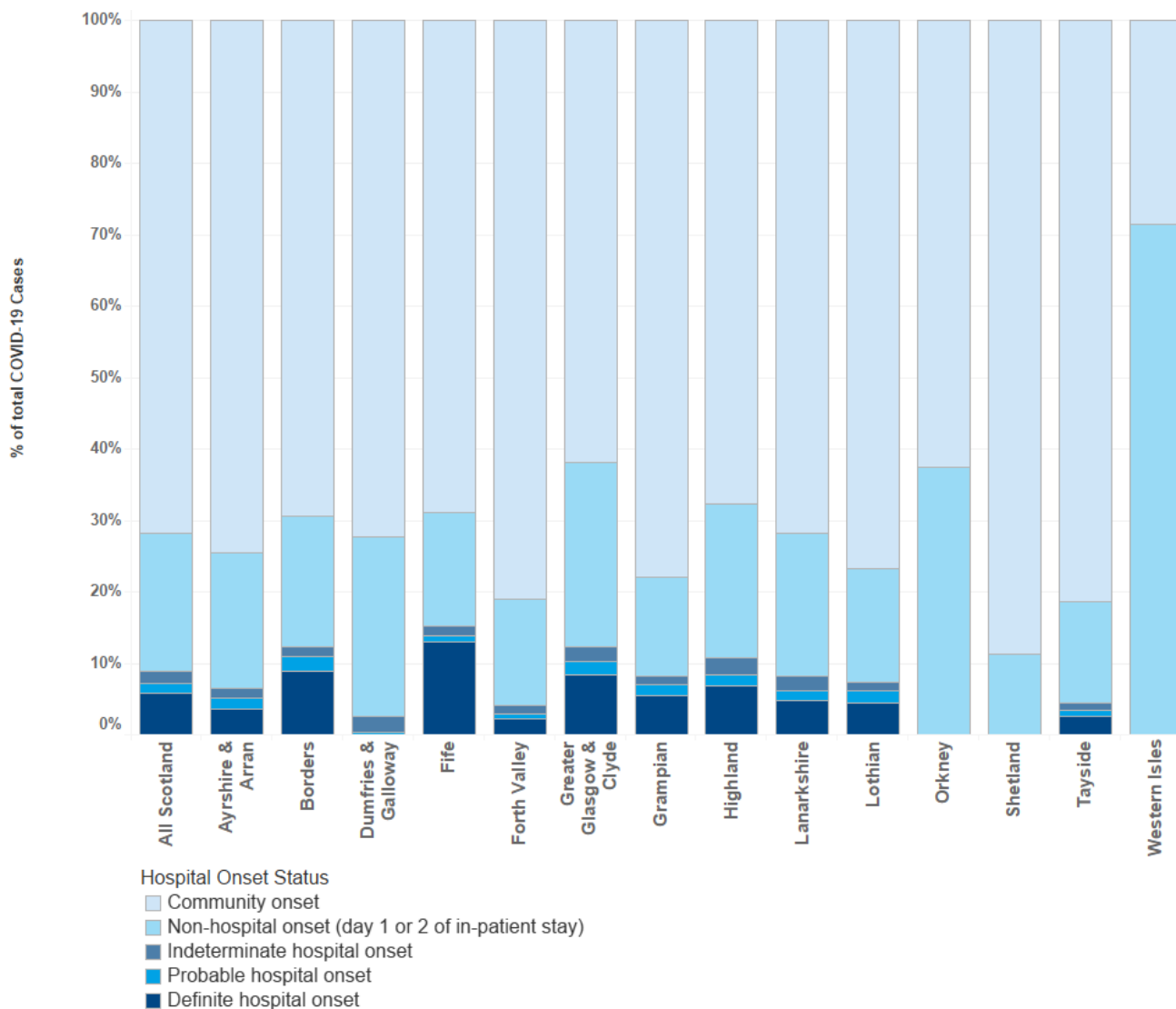
1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) data and Rapid Admission Preliminary Inpatient Data (RAPID) data or local admission data.
2. The community cases are not represented in this chart as first sample was not taken in hospital setting.

Table 1: Number of COVID-19 cases, by onset status and NHS board: specimen dates up to 14 June 2020.^{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	1,231	233	18	19	44	18.9%	1.5%	1.5%	3.6%
Borders	340	62	5	7	30	18.2%	1.5%	2.1%	8.8%
Dumfries & Galloway	281	71	6	1	0	25.3%	2.1%	0.4%	0.0%
Fife	917	146	12	8	119	15.9%	1.3%	0.9%	13.0%
Forth Valley	1,049	156	12	8	23	14.9%	1.1%	0.8%	2.2%
Golden Jubilee	8	3	1	2	2	-	-	-	-
Grampian	1,407	195	18	21	77	13.9%	1.3%	1.5%	5.5%
Greater Glasgow & Clyde	4,975	1,283	104	92	418	25.8%	2.1%	1.8%	8.4%
Highland	335	72	8	5	23	21.5%	2.4%	1.5%	6.9%
Lanarkshire	2,562	515	51	38	121	20.1%	2.0%	1.5%	4.7%
Lothian	3,119	496	41	53	138	15.9%	1.3%	1.7%	4.4%
Orkney	8	3	0	0	0	37.5%	0.0%	0.0%	0.0%
Shetland	53	6	0	0	0	11.3%	0.0%	0.0%	0.0%
Tayside	1,765	253	17	14	46	14.3%	1.0%	0.8%	2.6%
Western Isles	7	5	0	0	0	71.4%	0.0%	0.0%	0.0%
Scotland	18,057	3,499	293	268	1,041	19.4%	1.6%	1.5%	5.8%

1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) data and Rapid Admission Preliminary Inpatient Data (RAPID) data 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 14 June 2020.^{1,2,3}



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Rapid Admission Preliminary Inpatient Data (RAPID) data 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 [HPS website](#).

For more information on types of infections included in this report, please see the [COVID-19](#) pages on the HPS website.

The next release of this publication will be 15 July 2020.

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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: 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	30 June 2020
Release date	08 July 2020
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 14 June 2020, 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, National 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. ECOSS is a live database and 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 National ARHAI Scotland. Changes to retrospective data for the Non-hospital onset, indeterminate hospital onset, probable hospital onset and definite hospital onset groups are outlined in the table below.

Revisions relevant to this publication for COVID-19 cases taken within hospital settings up to 7 June include:

NHS Board	Hospital Onset Category	Change	Reason for Change
Greater Glasgow & Clyde	Non hospital onset	+3	Cases reassigned from LO/HG to GGC due to coding error.
Highland	Non hospital onset	-2	Case reassigned from HG to GGC due to coding error.
Lanarkshire	Community onset	-1	Case no longer valid due to updated laboratory specimen result.
Lothian	Non hospital onset	0 (-1 +1)	Case reassigned from LO community to LO Non hospital due updated admission data submitted. Case reassigned from LO to GGC due to coding error.
Lothian	Community onset	-1	Case reassigned from LO community to LO Non hospital due updated admission data submitted.

These adjustments resulted in the total cases reported up to 7 June being changed from 17,896 to 17,895.

Concepts and definitions

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 Health Protection 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.

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, HPS is working with NHS boards to establish a minimum viable dataset to fulfil this request.

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:

- 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)

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

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 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 in-patient 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

	<p>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).</p> <p>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.</p> <p>Minimum data required to be validated:</p> <ul style="list-style-type: none"> - CHI number - 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
Relevance and key uses of the statistics	<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. HPS offers support to NHS boards across Scotland to aid their local COVID-19 prevention strategies.</p>
Accuracy	<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 would be 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 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>
Completeness	<p>Surveillance data are collected using the ECOSS 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 Electronic Communications of Surveillance in Scotland (ECOSS) system. This therefore means that completeness 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>
Comparability	<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, 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.</p>

	There may be some differences to NHS board level counts within this report and reports from Public Health Scotland, due to the previously described differing methods in classifying the NHS board.
Accessibility	It is the policy of HPS to make its web sites and products accessible according to published guidelines .
Coherence and clarity	Tables and charts are accessible via the HPS website at: https://www.hps.scot.nhs.uk/a-to-z-of-topics/covid-19/hospital-onset-covid-19-cases-in-scotland/
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 HPS 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.HPSHAIC@nhs.net
Date form completed	03 July 2020

Appendix 2 – Early access details

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", National 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