NHS Grampian
Summary of the National Healthcare Associated Infection (HAI) Report
October 2021

The following is a summary of the ARHAI (Antimicrobial Resistance and Healthcare Associated Infection) Scotland Quarterly Epidemiological Data Report for Quarter 2 (April to June 2021) published on 5th October 2021.

Executive Summary

April – June 2021

Clostridioides difficile Infection (CDI)

- **Total** number of cases of CDIs in NHS Grampian: **14**
  - A **decrease** of 9 from the previous quarter (23)
  - 5.1% of the total across Scotland (277)

Escherichia coli bacteraemia (ECB)

- **Total** number of cases of ECBs in NHS Grampian: **103**
  - An **increase** of 11 from the previous quarter (92)
  - 9.3% of the total across Scotland (1103)

Staphylococcus aureus bacteraemia (SAB)

- **Total** cases of SABs in NHS Grampian: **41**
  - An **increase** of 1 from the previous quarter (40)
  - 10.0% of the total across Scotland (408)

Surgical Site Infection (SSI)

- Surgical Site Infection (SSI) data is not included in this report due to the pausing of surveillance to support the COVID-19 response.

Targets from the Scottish Government *	
Healthcare Associated CDIs:	Reduction of 10% in the national rate from 2019 to 2022, with 2018 / 19 used as the baseline for reduction.
Healthcare Associated ECBs:	An initial reduction of 25% by 2021 / 22, with 2018 / 19 used as the baseline for reduction. Reduction of 50% by 2023 / 24.
Healthcare Associated SABs:	Reduction of 10% in the national rate from 2019 to 2022, with 2018 / 19 used as the baseline for reduction.

* *Please note that percentage reductions in SABs, CDIs and ECBs will be **measured against individual NHS Scotland Boards' current levels**, rather than taking a "best in class" approach as previously*

Clostridioides difficile Infection (CDI)

- Number of **healthcare associated cases** of CDIs in NHS Grampian: **11**
  - A **decrease** of 6 from the previous quarter (17)
  - An incident rate of 9.6 per 100,000 total occupied bed days
  - **Below** the national incident rate (14.6 per 100,000 total occupied bed days)

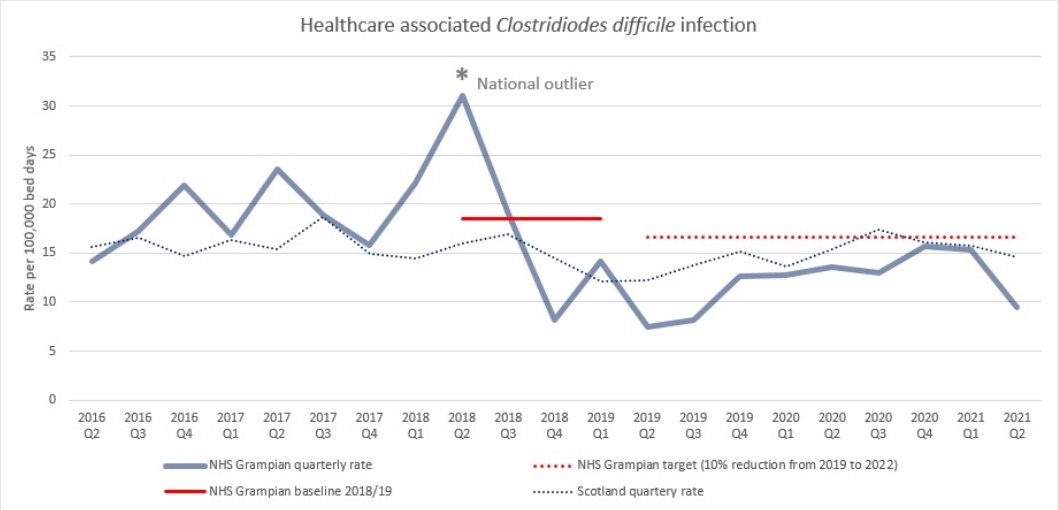


Figure (1a) shows trends in healthcare associated *C. difficile* infection in NHS Grampian (thick blue line) and Scotland (dotted blue line) over the past 5 years. In the latest quarterly data (2021 Q2) **NHS Grampian rates of healthcare associated *C. difficile* infection are stable** i.e. average / below average (within the statistical limits of variation) compared to the rest of Scotland.
The COVID-19 pandemic has impacted other areas of healthcare and caution is advised interpreting data from 2020 Q2 onwards.
Locally, NHS Grampian is forecast to meet the Scottish Government target for reducing *C. difficile* infection.

- Number of **community associated cases** of CDIs in NHS Grampian: **3**
  - A **decrease** of 3 from the previous quarter (6)
  - An incident rate of 2.1 per 100,000 population
  - **Below** the national incident rate (5.4 per 100,000 population)

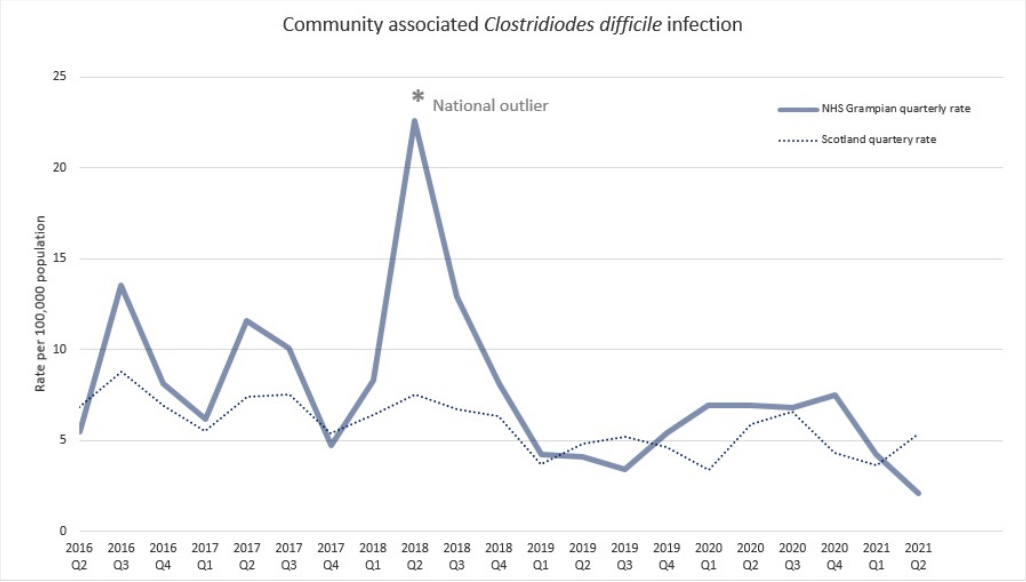


Figure (1b) shows trends in community associated *C. difficile* infection in NHS Grampian (thick blue line) and Scotland (dotted blue line) over the past 5 years. In the latest quarterly data (2021 Q2) **NHS Grampian rates of community associated *C. difficile* infection are stable** i.e. average / below average (within the statistical limits of variation) compared to the rest of Scotland.
The COVID-19 pandemic has impacted other areas of healthcare and caution is advised interpreting data from 2020 Q2 onwards.

Escherichia coli bacteraemia (ECB)

- Number of **healthcare associated cases** of ECBs in NHS Grampian: **42**
  - A **decrease** of 3 from the previous quarter (45)
  - An incident rate of 36.8 per 100,000 total occupied bed days
  - **Below** the national incident rate (38.2 per 100,000 total occupied bed days)

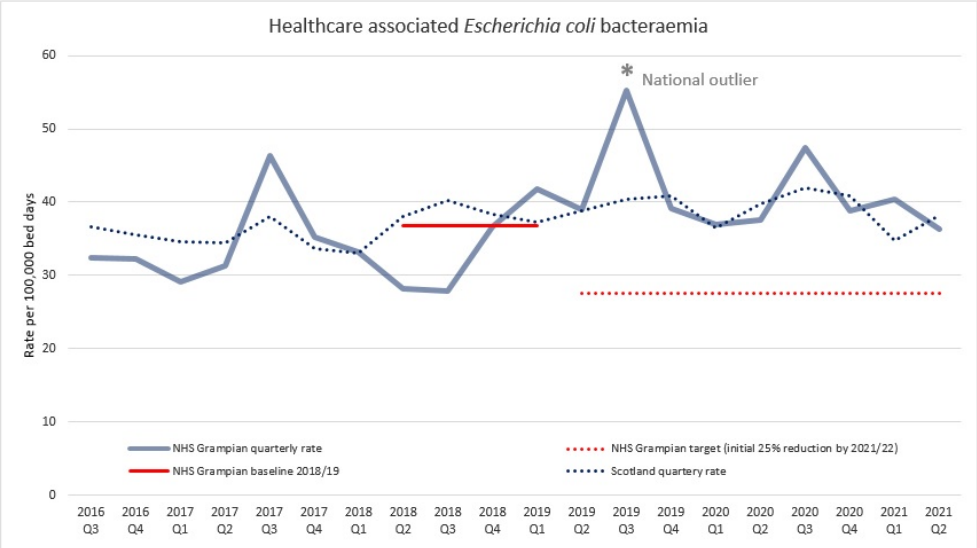


Figure (2a) shows trends in healthcare associated *E. coli* bacteraemia in NHS Grampian (thick blue line) and Scotland (dotted blue line) from 2016 to date. In the latest quarterly data (2021 Q2) **NHS Grampian rates of healthcare associated *E. coli* bacteraemia are stable** i.e. average / below average (within the statistical limits of variation) compared to the rest of Scotland.
The COVID-19 pandemic has impacted other areas of healthcare and caution is advised interpreting data from 2020 Q2 onwards.
Locally, NHS Grampian like other Health Boards, is not on track to meet the Scottish Government target for reducing *E. coli* bacteraemia. Clarity is sought regarding whether these targets will be deferred / modified.

- Number of **community associated cases** of ECBs in NHS Grampian: **61**
  - An **increase** of 14 from the previous quarter (47)
  - An incident rate of 41.8 per 100,000 population
  - **Below** the national incident rate (41.9 per 100,000 population)

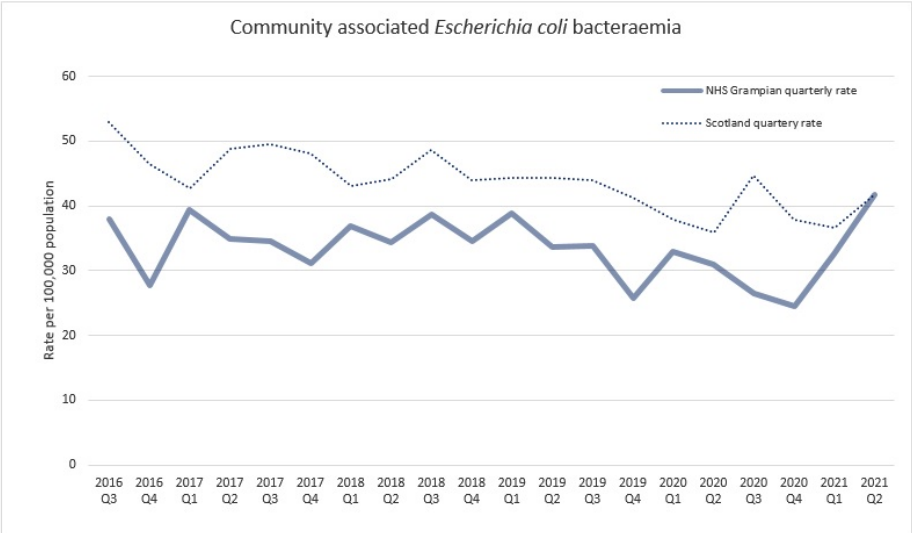


Figure (2b) shows trends in community associated *E. coli* bacteraemia in NHS Grampian (thick blue line) and Scotland (dotted blue line) from 2016 to date. In the latest quarterly data (2021 Q1) **NHS Grampian rates of community associated *E. coli* bacteraemia are stable** i.e. average / below average (within the statistical limits of variation) compared to the rest of Scotland.
The COVID-19 pandemic has impacted other areas of healthcare and caution is advised interpreting data from 2020 Q2 onwards.
Note, this data is retrospective and the local upward trend has reversed (see January 2022 HAIRT).

Staphylococcus aureus bacteraemia (SAB)

- Number of **healthcare associated cases** of SABs in NHS Grampian: **22**
  - An **increase** of 4 from the previous quarter (26)
  - An incident rate of 19.3 per 100,000 total occupied bed days
  - **Above** the national incident rate (18.7 per 100,000 total occupied bed days)

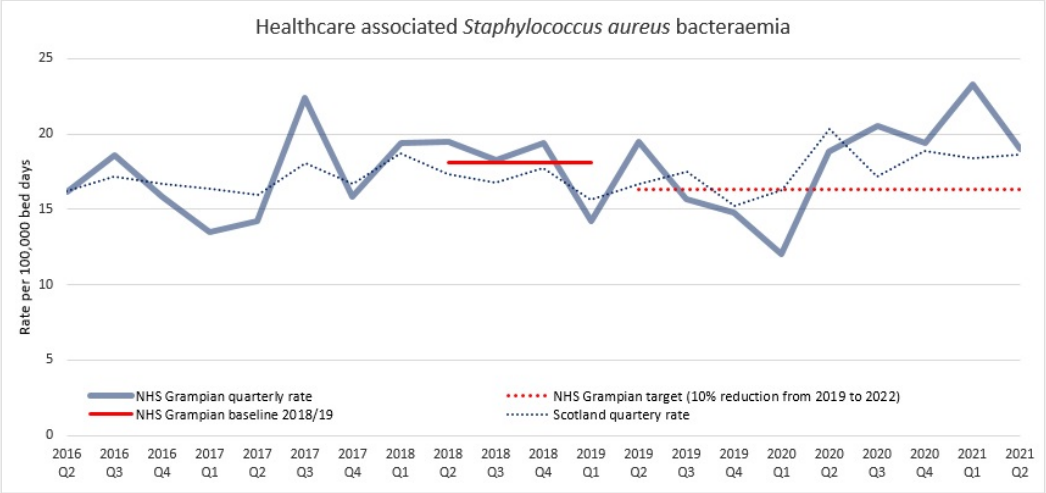


Figure (3a) shows trends in healthcare associated *S. aureus* bacteraemia in NHS Grampian (thick blue line) and Scotland (dotted blue line) over the past 5 years. In the latest quarterly data (2021 Q2) **NHS Grampian rates of healthcare associated *S. aureus* bacteraemia are stable** i.e. average / below average (within the statistical limits of variation) compared to the rest of Scotland.
The COVID-19 pandemic has impacted other areas of healthcare and caution is advised interpreting data from 2020 Q2 onwards.
Locally, NHS Grampian is not on track to meet the Scottish Government target for reducing *S. aureus* bacteraemia. Clarity is sought regarding whether these targets will be deferred / modified.

- Number of **community associated cases** of SABs in NHS Grampian: **19**
  - An **increase** of 5 from the previous quarter (14)
  - An incident rate of 13.0 per 100,000 population
  - **Above** the national incident rate (10.9 per 100,000 population)

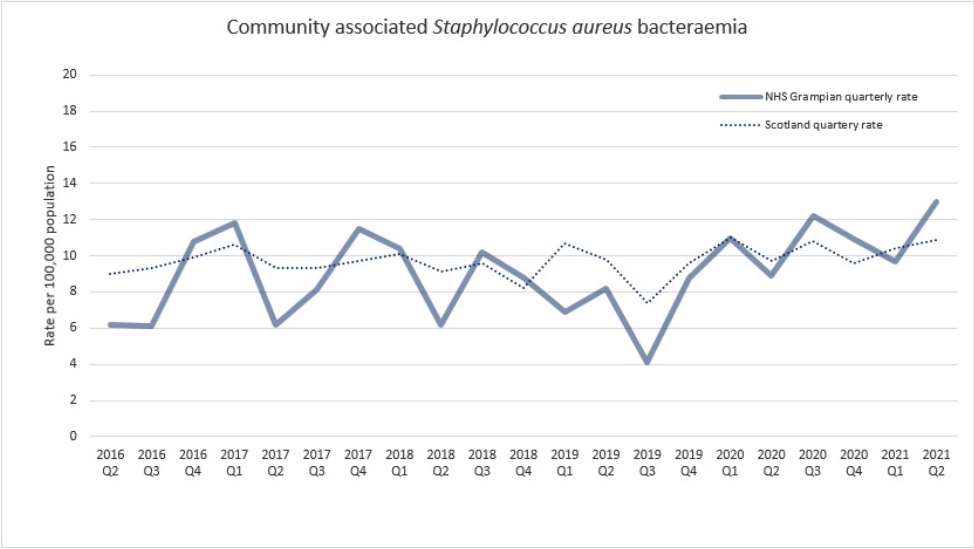


Figure (3b) shows trends in community associated *S. aureus* bacteraemia in NHS Grampian (thick blue line) and Scotland (dotted blue line) over the past 5 years. In the latest quarterly data (2021 Q1) **NHS Grampian rates of community associated *S. aureus* bacteraemia are stable** i.e. average / below average (within the statistical limits of variation) compared to the rest of Scotland.
The COVID-19 pandemic has impacted other areas of healthcare and caution is advised interpreting data from 2020 Q2 onwards.

ARHAI Scotland

Antimicrobial Resistance and Healthcare Associated Infection

NHS National Services Scotland

Quarterly epidemiological data on Clostridioides difficile infection, Escherichia coli bacteraemia, Staphylococcus aureus bacteraemia and Surgical Site Infection in Scotland

April to June 2021

5 October 2021

This is an Official Statistics Publication

The Official Statistics (Scotland) Order 2008 authorises NHS National Services Scotland (the legal name being the Common Services Agency for the Scottish Health Service) to produce official statistics.

All official statistics should comply with the UK Statistics Authority's Code of Practice which promotes the production and dissemination of official statistics that inform decision making. They can be formally assessed by the UK Statistics Authority's regulatory arm for National Statistics status.

Find out more about the Code of Practice at:
https://code.statisticsauthority.gov.uk/

Find out more about official statistics at:
https://uksa.statisticsauthority.gov.uk/about-the-authority/uk-statistical-system/producers-of-official-statistics/

Contents

Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland provides a commentary on quarterly epidemiological data in Scotland for April to June (Q2) 2021 on the following:

- *Clostridioides difficile* infection
- *Escherichia coli* bacteraemia
- *Staphylococcus aureus* bacteraemia
- Surgical Site Infection

Data are provided for the 14 NHS boards and one NHS Special Health Board.

Main Points

Clostridioides difficile infection (CDI) during April to June 2021

- The total number of CDI cases in patients reported to ARHAI was 277.
- 203 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 14.6 cases per 100,000 total occupied bed days (TOBDs).
- 74 CDI cases were reported as community associated. This corresponds to an incidence rate of 5.4 cases per 100,000 population.
- No NHS boards were above the 95% confidence interval upper limit for healthcare associated CDI in the funnel plot analysis.
- NHS Dumfries & Galloway was above the 95% confidence interval upper limit for community associated CDI in the funnel plot analysis and was also above normal variation for community associated CDI when analysing trends over the past three years.

Escherichia coli bacteraemia (ECB) during April to June 2021

- The total number of ECB cases in patients reported to ARHAI was 1,103.
- 532 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 38.2 cases per 100,000 TOBDs.
- 571 ECB cases were reported as community associated. This corresponds to an incidence rate of 41.9 cases per 100,000 population.
- No NHS boards were above the 95% confidence interval upper limit for healthcare or community associated ECB in the funnel plot analysis.
- No NHS boards were above normal variation for healthcare or community associated ECB when analysing trends over the past three years.

Staphylococcus aureus bacteraemia (SAB) during April to June 2021

- The total number of SAB cases in patients reported to ARHAI was 408.
- 260 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 18.7 cases per 100,000 TOBDs.
- 148 SAB cases were reported as community associated. This corresponds to an incidence rate of 10.9 cases per 100,000 population.
- No NHS boards were above the 95% confidence interval upper limit for healthcare associated SAB in the funnel plot analysis.
- NHS Dumfries & Galloway was above the 95% confidence interval upper limit for community associated SAB in the funnel plot analysis.
- NHS Dumfries & Galloway was above normal variation for community associated SAB when analysing trends over the past three years.

Surgical Site Infection (SSI) April to June 2021

Epidemiological data for SSI are not included for this quarter due to the pausing of surveillance to support the COVID-19 response.

Results and Commentary

Clostridioides difficile Infection (CDI)

Total Cases for Quarter

- During Q2 2021, 277 *Clostridioides difficile* infection (CDI) cases in patients were reported to ARHAI. In the previous quarter there were 262 cases.
- In the clinical surveillance typing scheme (covering severe cases and/or outbreaks) ribotype 015 and 078 (both 18.5%) were the most common ribotypes isolated, followed by 023 (9.3%), 005 (7.4%), 002, 056 (both 5.6%), and 013, 020, 050, 106 (all 3.7%) out of a total of 54 isolates. The remaining ribotypes comprise a mixture each with a prevalence of less than 3%. All clinical surveillance isolates tested were susceptible to metronidazole and vancomycin.
- In the snapshot surveillance (which reflects the general distribution of ribotypes among all CDI cases), ribotype 005 was the most common (13.3%) followed by 014 and 015 (both 12.0%), 078 (10.8%), 023 (9.6%), 002 (7.2%), 026, 106 (both 4.8%), and 012, 013, 020 (all 3.6%) out of a total of 83 isolates. The remaining ribotypes comprise a mixture each with a prevalence of less than 3%. All snapshot surveillance isolates tested were susceptible to both metronidazole and vancomycin.

Healthcare associated infection cases by health board of laboratory

- During Q2 2021, 203 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 14.6 cases per 100,000 total occupied bed days (TOBDs) (Table 1).
- Yearly trends (comparing year-ending June 2020 with year-ending June 2021) show that there was an increase in NHS Ayrshire & Arran and Scotland overall (Table 2).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 1).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Community associated infection cases by health board of residence

- During Q2 2021, 74 CDI cases were reported as community associated. This corresponds to an incidence rate of 5.4 cases per 100,000 population (Table 3) and is an increase compared to the Q1 2021 incidence rate of 3.6 cases per 100,000 population.
- Yearly trends (comparing year-ending June 2020 with year-ending June 2021) show that there was no increase or decrease in NHS boards or Scotland overall. (Table 4).
- NHS Dumfries & Galloway were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 2) and were also above normal variation when analysing trends over the past three years (see supplementary data).

Table 1: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).[1,2]

NHS Board	Q1 Cases	Q1 Bed Days	Q1 Rate	Q2 Cases	Q2 Bed Days	Q2 Rate
AA	25	99,393	25.2	21	102,178	20.6
BR	0	28,168	0.0	2	29,586	6.8
DG	8	37,147	21.5	6	40,199	14.9
FF	11	78,623	14.0	8	79,787	10.0
FV	7	68,486	10.2	7	68,278	10.3
GJ	1	12,150	8.2	0	12,350	0.0
GR	17	108,735	15.6	11	114,082	9.6
GGC	60	384,314	15.6	66	396,839	16.6
HG	14	65,903	21.2	16	65,070	24.6
LN	30	126,794	23.7	24	135,443	17.7
LO	31	226,087	13.7	30	232,475	12.9
OR	0	3,174	0.0	0	2,939	0.0
SH	1	2,106	47.5	2	2,025	98.8
TY	6	103,158	5.8	10	105,386	9.5
WI	2	5,794	34.5	0	6,022	0.0
Scotland	**213**	**1,350,032**	**15.8**	**203**	**1,392,659**	**14.6**

1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
2. Figures include any updates received following the last publication (see Appendix 2).

Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).[1,2,3]

NHS Board	YE Q2 20 Cases	YE Q2 20 Bed Days	YE Q2 20 Rate	YE Q2 21 Cases	YE Q2 21 Bed Days	YE Q2 21 Rate
AA	72	411,485	17.5	96	402,050	23.9 ↑
BR	14	107,868	13.0	7	110,210	6.4
DG	28	163,954	17.1	32	151,606	21.1
FF	32	333,174	9.6	32	311,277	10.3
FV	43	279,424	15.4	35	273,379	12.8
GJ	4	42,793	9.3	5	45,771	10.9
GR	58	491,319	11.8	59	436,852	13.5
GGC	246	1,565,029	15.7	267	1,548,472	17.2
HG	52	271,271	19.2	54	254,300	21.2
LN	90	534,712	16.8	106	512,184	20.7
LO	122	917,213	13.3	128	903,010	14.2
OR	1	11,184	8.9	0	11,868	0.0
SH	4	9,472	42.2	5	8,340	60.0
TY	33	427,037	7.7	36	412,554	8.7
WI	6	23,143	25.9	3	21,119	14.2
Scotland	**805**	**5,589,078**	**14.4**	**865**	**5,402,992**	**16.0 ↑**

1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
3. Figures include any updates received following the last publication (see Appendix 2).

Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).[1,2,3,4]

NHS Board	Q1 Cases	Q1 Population	Q1 Rate	Q2 Cases	Q2 Population	Q2 Rate
AA	6	367,990	6.6	7	367,990	7.6
BR	0	115,240	0.0	1	115,240	3.5
DG	0	148,290	0.0	9	148,290	24.3
FF	5	374,130	5.4	4	374,130	4.3
FV	0	305,930	0.0	2	305,930	2.6
GR	6	585,550	4.2	3	585,550	2.1
GGC	8	1,185,240	2.7	17	1,185,240	5.8
HG	3	320,860	3.8	6	320,860	7.5
LN	10	661,960	6.1	7	661,960	4.2
LO	8	912,490	3.6	13	912,490	5.7
OR	0	22,400	0.0	1	22,400	17.9
SH	0	22,870	0.0	0	22,870	0.0
TY	2	416,550	1.9	4	416,550	3.9
WI	1	26,500	15.3	0	26,500	0.0
Scotland	**49**	**5,466,000**	**3.6**	**74**	**5,466,000**	**5.4 ↑**

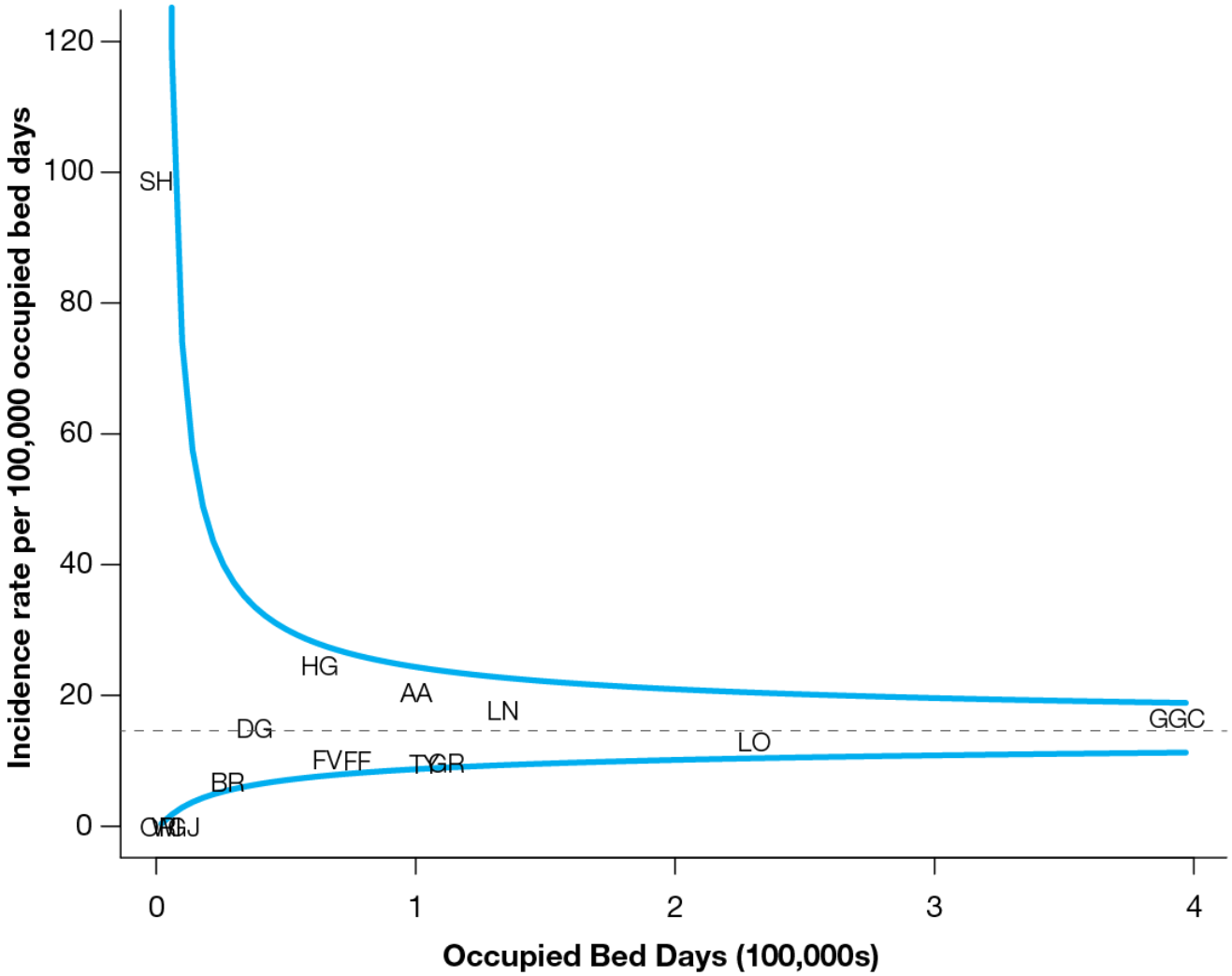
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last publication (see Appendix 2).

Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).[1,2,3]

NHS Board	YE Q2 20 Cases	YE Q2 20 Population	YE Q2 20 Rate	YE Q2 21 Cases	YE Q2 21 Population	YE Q2 21 Rate
AA	30	367,990	8.2	28	367,990	7.6
BR	5	115,240	4.3	5	115,240	4.3
DG	11	148,290	7.4	18	148,290	12.1
FF	9	374,130	2.4	17	374,130	4.5
FV	5	305,930	1.6	4	305,930	1.3
GR	33	585,550	5.6	30	585,550	5.1
GGC	45	1,185,240	3.8	44	1,185,240	3.7
HG	20	320,860	6.2	20	320,860	6.2
LN	36	661,960	5.4	29	661,960	4.4
LO	54	912,490	5.9	50	912,490	5.5
OR	0	22,400	0.0	4	22,400	17.9
SH	0	22,870	0.0	2	22,870	8.7
TY	10	416,550	2.4	17	416,550	4.1
WI	3	26,500	11.3	1	26,500	3.8
Scotland	**261**	**5,466,000**	**4.8**	**269**	**5,466,000**	**4.9**

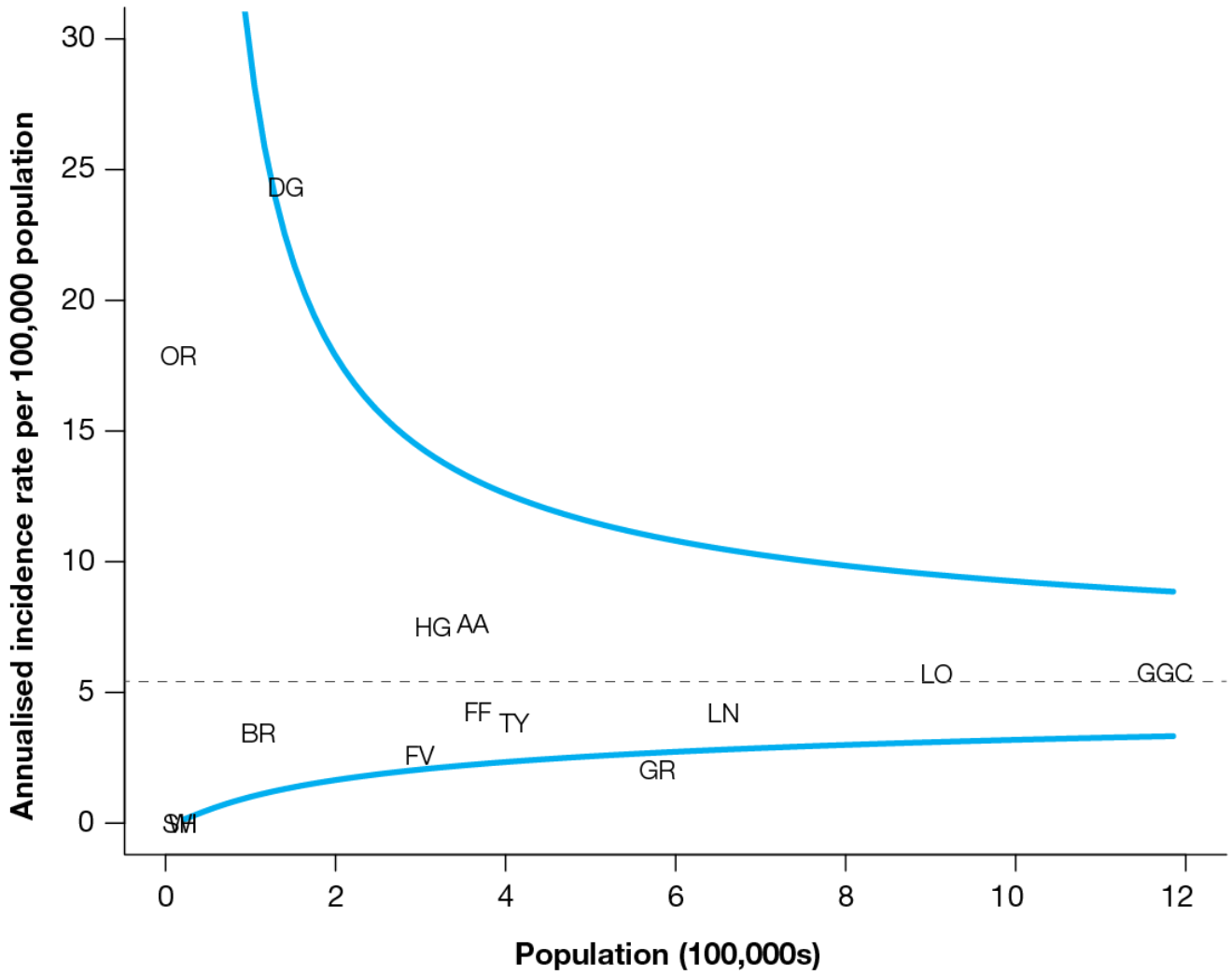
1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
2. Figures include any updates received following the last publication (see Appendix 2).
3. An arrow denotes statistically significant change.

Figure 1: Funnel plot of CDI incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q2 2021.[1,2]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
2. NHS Golden Jubilee, NHS Orkney and NHS Western Isles overlap as do NHS Grampian and NHS Tayside.

Figure 2: Funnel plot of CDI incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q2 2021.[1,2]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
2. NHS Shetland and NHS Western Isles overlap.

Escherichia coli bacteraemia (ECB)

Total Cases for Quarter

- During Q2 2021, 1,103 *Escherichia coli* bacteraemia (ECB) cases in patients were reported to ARHAI. In the previous quarter there were 961 cases.

Healthcare associated infection cases by health board of laboratory

- During Q2 2021, 532 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 38.2 cases per 100,000 TOBDs (Table 5).
- Yearly trends (comparing year-ending June 2020 with year-ending June 2021) show that there was no increase or decrease in NHS boards or Scotland overall (Table 6).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 3).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Community associated infection cases by health board of residence

- During Q2 2021, 571 ECB cases were reported as community associated. This corresponds to an incidence rate of 41.9 cases per 100,000 population and is an increase compared to the Q1 2021 incidence rate of 36.6 per 100,000 population (Table 7).
- Yearly trends (comparing year-ending June 2020 with year-ending June 2021) show that there was a decrease in NHS Borders and NHS Greater Glasgow & Clyde, and an increase in NHS Lothian. (Table 8).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 4).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).[1,2,3]

NHS Board	Q1 Cases	Q1 Bed Days	Q1 Rate	Q2 Cases	Q2 Bed Days	Q2 Rate
AA	41	99,393	41.3	50	102,178	48.9
BR	9	28,168	32.0	19	29,586	64.2
DG	10	37,147	26.9	15	40,199	37.3
FF	17	78,623	21.6	30	79,787	37.6
FV	28	68,486	40.9	32	68,278	46.9
GJ	0	12,150	0.0	1	12,350	8.1
GR	45	108,735	41.4	42	114,082	36.8
GGC	122	384,314	31.7	150	396,839	37.8
HG	18	65,903	27.3	20	65,070	30.7
LN	50	126,794	39.4	45	135,443	33.2
LO	75	226,087	33.2	80	232,475	34.4
OR	3	3,174	94.5	2	2,939	68.1
SH	2	2,106	95.0	2	2,025	98.8
TY	44	103,158	42.7	43	105,386	40.8
WI	4	5,794	69.0	1	6,022	16.6
Scotland	**468**	**1,350,032**	**34.7**	**532**	**1,392,659**	**38.2**

1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
3. Figures include any updates received following the last publication (see Appendix 2).

Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).[1,2,3]

NHS Board	YE Q2 20 Cases	YE Q2 20 Bed days	YE Q2 20 Rate	YE Q2 21 Cases	YE Q2 21 Bed days	YE Q2 21 Rate
AA	182	411,485	44.2	207	402,050	51.5
BR	46	107,868	42.6	53	110,210	48.1
DG	55	163,954	33.5	51	151,606	33.6
FF	148	333,174	44.4	120	311,277	38.6
FV	146	279,424	52.3	142	273,379	51.9
GJ	5	42,793	11.7	3	45,771	6.6
GR	212	491,319	43.1	180	436,852	41.2
GGC	571	1,565,029	36.5	573	1,548,472	37.0
HG	64	271,271	23.6	76	254,300	29.9
LN	257	534,712	48.1	210	512,184	41.0
LO	321	917,213	35.0	290	903,010	32.1
OR	6	11,184	53.6	6	11,868	50.6
SH	6	9,472	63.3	9	8,340	107.9
TY	173	427,037	40.5	173	412,554	41.9
WI	9	23,143	38.9	9	21,119	42.6
Scotland	**2,201**	**5,589,078**	**39.4**	**2,102**	**5,402,992**	**38.9**

1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
3. Figures include any updates received following the last publication (see Appendix 2).

Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).[1,2,3,4]

NHS Board	Q1 Cases	Q1 Population	Q1 Rate	Q2 Cases	Q2 Population	Q2 Rate
AA	47	367,990	51.8	51	367,990	55.6
BR	10	115,240	35.2	10	115,240	34.8
DG	21	148,290	57.4	25	148,290	67.6
FF	32	374,130	34.7	30	374,130	32.2
FV	38	305,930	50.4	24	305,930	31.5
GR	47	585,550	32.6	61	585,550	41.8
GGC	91	1,185,240	31.1	125	1,185,240	42.3
HG	30	320,860	37.9	32	320,860	40.0
LN	58	661,960	35.5	77	661,960	46.7
LO	79	912,490	35.1	76	912,490	33.4
OR	3	22,400	54.3	4	22,400	71.6
SH	0	22,870	0.0	3	22,870	52.6
TY	37	416,550	36.0	45	416,550	43.3
WI	0	26,500	0.0	8	26,500	121.1
Scotland	**493**	**5,466,000**	**36.6**	**571**	**5,466,000**	**41.9 ↑**

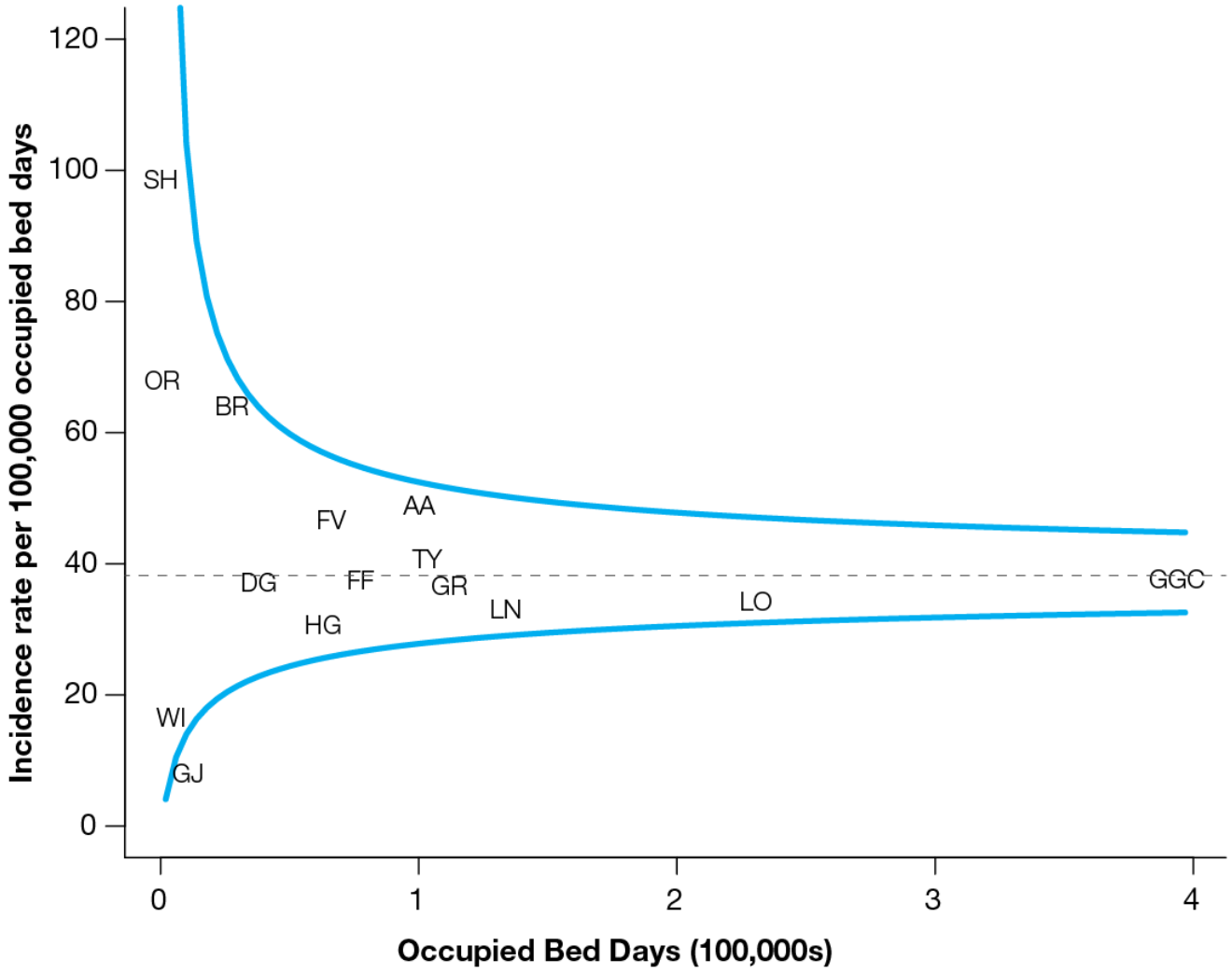
1. Quarterly population rates are based on an annualised population.
2. An arrow denotes statistically significant change.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last publication (see Appendix 2).

Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).[1,2,3]

NHS Board	YE Q2 20 Cases	YE Q2 20 Population	YE Q2 20 Rate	YE Q2 21 Cases	YE Q2 21 Population	YE Q2 21 Rate
AA	193	367,990	52.4	213	367,990	57.9
BR	56	115,240	48.6	36	115,240	31.2 ↓
DG	92	148,290	62.0	92	148,290	62.0
FF	141	374,130	37.7	132	374,130	35.3
FV	161	305,930	52.6	164	305,930	53.6
GR	181	585,550	30.9	183	585,550	31.3
GGC	463	1,185,240	39.1	405	1,185,240	34.2 ↓
HG	115	320,860	35.8	115	320,860	35.8
LN	307	661,960	46.4	328	661,960	49.5
LO	243	912,490	26.6	328	912,490	35.9 ↑
OR	8	22,400	35.7	10	22,400	44.6
SH	9	22,870	39.4	6	22,870	26.2
TY	187	416,550	44.9	168	416,550	40.3
WI	20	26,500	75.5	19	26,500	71.7
Scotland	**2,176**	**5,466,000**	**39.8**	**2,199**	**5,466,000**	**40.2**

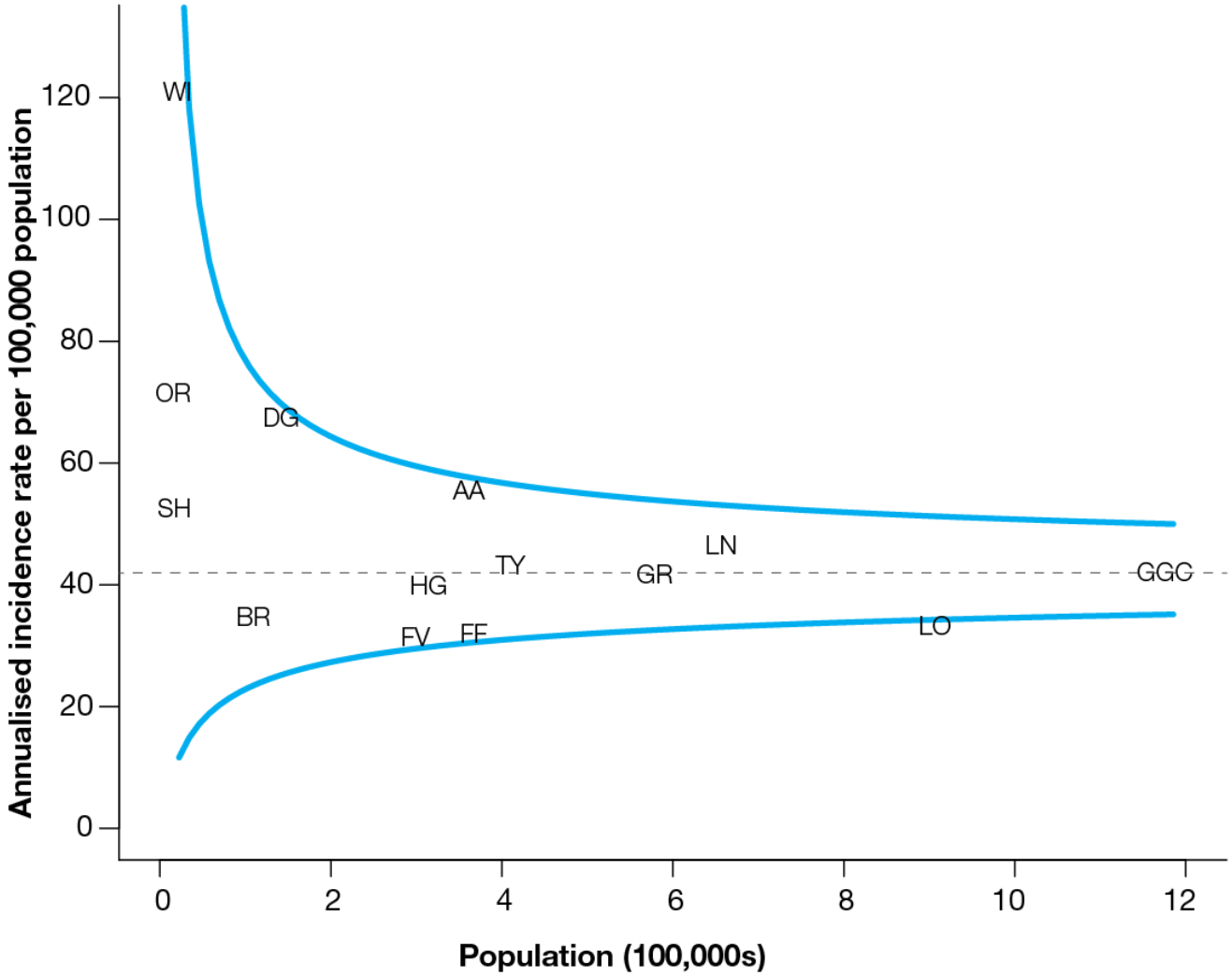
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 3: Funnel plot of ECB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q2 2021.[1]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.

Figure 4: Funnel plot of ECB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q2 2021.[1,2]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.

Staphylococcus aureus bacteraemia (SAB)

Total cases for quarter

- During Q2 2021, 408 *Staphylococcus aureus* bacteraemia (SAB) cases were reported to ARHAI. In the previous quarter there were 388 SAB cases.

Healthcare associated infection cases by health board of laboratory

- During Q2 2021, 260 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 18.7 cases per 100,000 TOBDs (Table 9).
- Yearly trends (comparing year-ending June 2020 with year-ending June 2021) show that there was an increase in NHS Grampian (Table 10).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 5).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Community associated infection cases by health board of residence

- During Q2 2021, 148 SAB cases were reported as community associated. This corresponds to an incidence rate of 10.9 cases per 100,000 population (Table 11).
- Yearly trends (comparing year-ending June 2020 with year-ending June 2021) show that there was no increase or decrease in NHS boards or Scotland overall (Table 12).
- NHS Dumfries & Galloway was above the 95% confidence interval upper limit in the funnel plot analysis (Figure 6).
- NHS Dumfries & Galloway was above normal variation when analysing trends over the past three years (see supplementary data).

Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).[1,2,3]

NHS Board	Q1 Cases	Q1 Bed Days	Q1 Rate	Q2 Cases	Q2 Bed Days	Q2 Rate
AA	12	99,393	12.1	18	102,178	17.6
BR	7	28,168	24.9	6	29,586	20.3
DG	4	37,147	10.8	10	40,199	24.9
FF	14	78,623	17.8	5	79,787	6.3
FV	10	68,486	14.6	11	68,278	16.1
GJ	4	12,150	32.9	5	12,350	40.5
GR	26	108,735	23.9	22	114,082	19.3
GGC	59	384,314	15.4	86	396,839	21.7
HG	15	65,903	22.8	10	65,070	15.4
LN	34	126,794	26.8	26	135,443	19.2
LO	37	226,087	16.4	36	232,475	15.5
OR	0	3,174	0.0	0	2,939	0.0
SH	0	2,106	0.0	0	2,025	0.0
TY	24	103,158	23.3	24	105,386	22.8
WI	2	5,794	34.5	1	6,022	16.6
Scotland	**248**	**1,350,032**	**18.4**	**260**	**1,392,659**	**18.7**

1. An arrow denotes statistically significant change.
2. Note: Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
3. Figures include any updates received following the last publication (see Appendix 2).

Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).[1,2,3]

NHS Board	YE Q2 20 Cases	YE Q2 20 Bed days	YE Q2 20 Rate	YE Q2 21 Cases	YE Q2 21 Bed days	YE Q2 21 Rate
AA	80	411,485	19.4	71	402,050	17.7
BR	10	107,868	9.3	20	110,210	18.1
DG	18	163,954	11.0	25	151,606	16.5
FF	39	333,174	11.7	49	311,277	15.7
FV	47	279,424	16.8	52	273,379	19.0
GJ	6	42,793	14.0	12	45,771	26.2
GR	75	491,319	15.3	91	436,852	20.8 ↑
GGC	306	1,565,029	19.6	294	1,548,472	19.0
HG	29	271,271	10.7	40	254,300	15.7
LN	106	534,712	19.8	108	512,184	21.1
LO	130	917,213	14.2	125	903,010	13.8
OR	4	11,184	35.8	1	11,868	8.4
SH	3	9,472	31.7	2	8,340	24.0
TY	95	427,037	22.2	92	412,554	22.3
WI	9	23,143	38.9	6	21,119	28.4
Scotland	**957**	**5,589,078**	**17.1**	**988**	**5,402,992**	**18.3**

1. An arrow denotes statistically significant change.
2. Note: Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
3. Figures include any updates received following the last publication (see Appendix 2).

Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).[1,2,3,4]

NHS Board	Q1 Cases	Q1 Population	Q1 Rate	Q2 Cases	Q2 Population	Q2 Rate
AA	9	367,990	9.9	8	367,990	8.7
BR	4	115,240	14.1	3	115,240	10.4
DG	3	148,290	8.2	11	148,290	29.8
FF	13	374,130	14.1	8	374,130	8.6
FV	8	305,930	10.6	5	305,930	6.6
GR	14	585,550	9.7	19	585,550	13.0
GGC	23	1,185,240	7.9	20	1,185,240	6.8
HG	6	320,860	7.6	9	320,860	11.3
LN	25	661,960	15.3	20	661,960	12.1
LO	21	912,490	9.3	27	912,490	11.9
OR	0	22,400	0.0	0	22,400	0.0
SH	0	22,870	0.0	1	22,870	17.5
TY	13	416,550	12.7	17	416,550	16.4
WI	1	26,500	15.3	0	26,500	0.0
Scotland	**140**	**5,466,000**	**10.4**	**148**	**5,466,000**	**10.9**

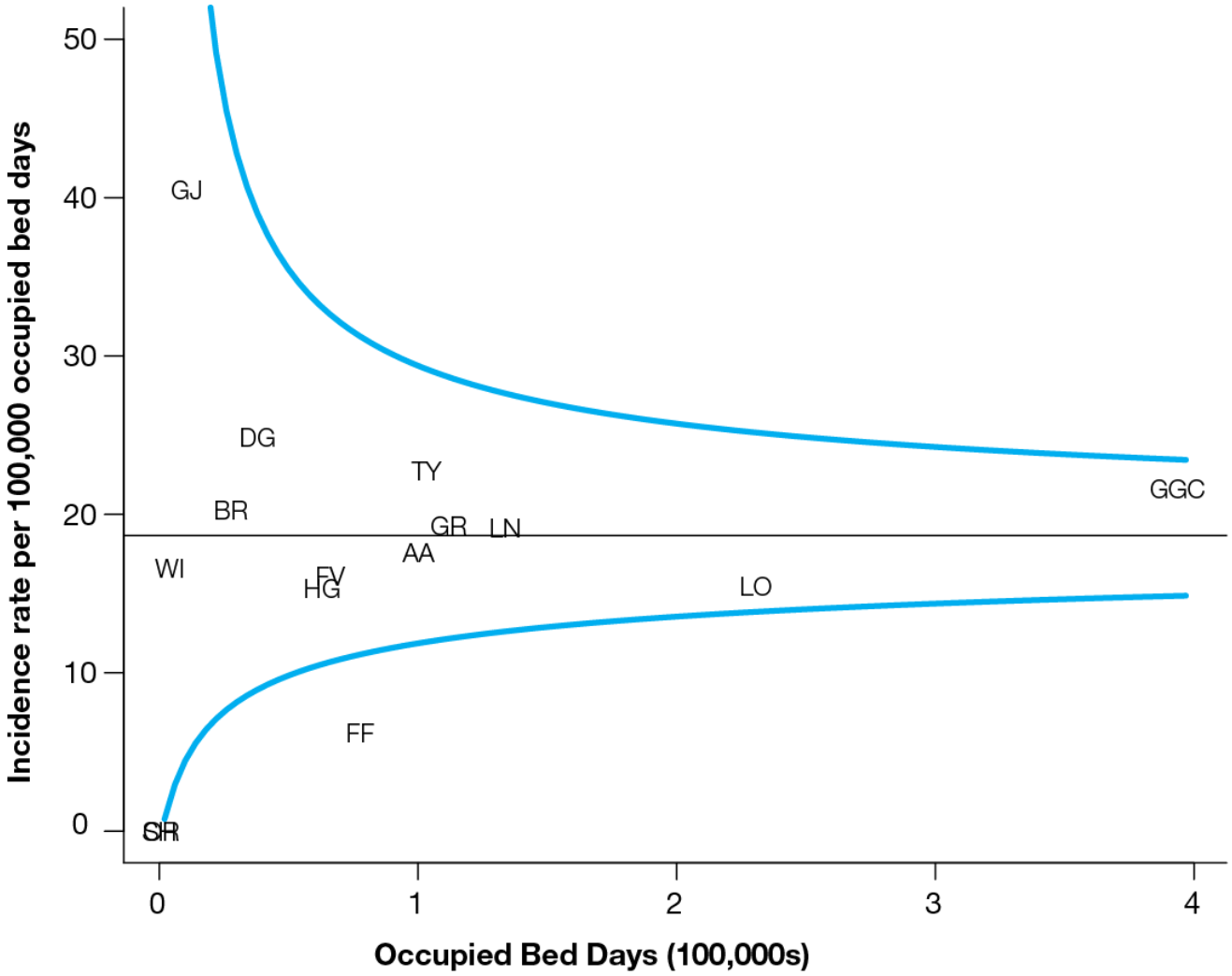
1. Quarterly population rates are based on an annualised population.
2. An arrow denotes statistically significant change.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last publication (see Appendix 2).

Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).[1,2,3]

NHS Board	YE Q2 20 Cases	YE Q2 20 Population	YE Q2 20 Rate	YE Q2 21 Cases	YE Q2 21 Population	YE Q2 21 Rate
AA	45	367,990	12.2	44	367,990	12.0
BR	12	115,240	10.4	12	115,240	10.4
DG	17	148,290	11.5	18	148,290	12.1
FF	38	374,130	10.2	39	374,130	10.4
FV	41	305,930	13.4	34	305,930	11.1
GR	48	585,550	8.2	67	585,550	11.4
GGC	76	1,185,240	6.4	85	1,185,240	7.2
HG	37	320,860	11.5	35	320,860	10.9
LN	63	661,960	9.5	76	661,960	11.5
LO	83	912,490	9.1	101	912,490	11.1
OR	3	22,400	13.4	2	22,400	8.9
SH	3	22,870	13.1	1	22,870	4.4
TY	46	416,550	11.0	52	416,550	12.5
WI	3	26,500	11.3	2	26,500	7.5
Scotland	**515**	**5,466,000**	**9.4**	**568**	**5,466,000**	**10.4**

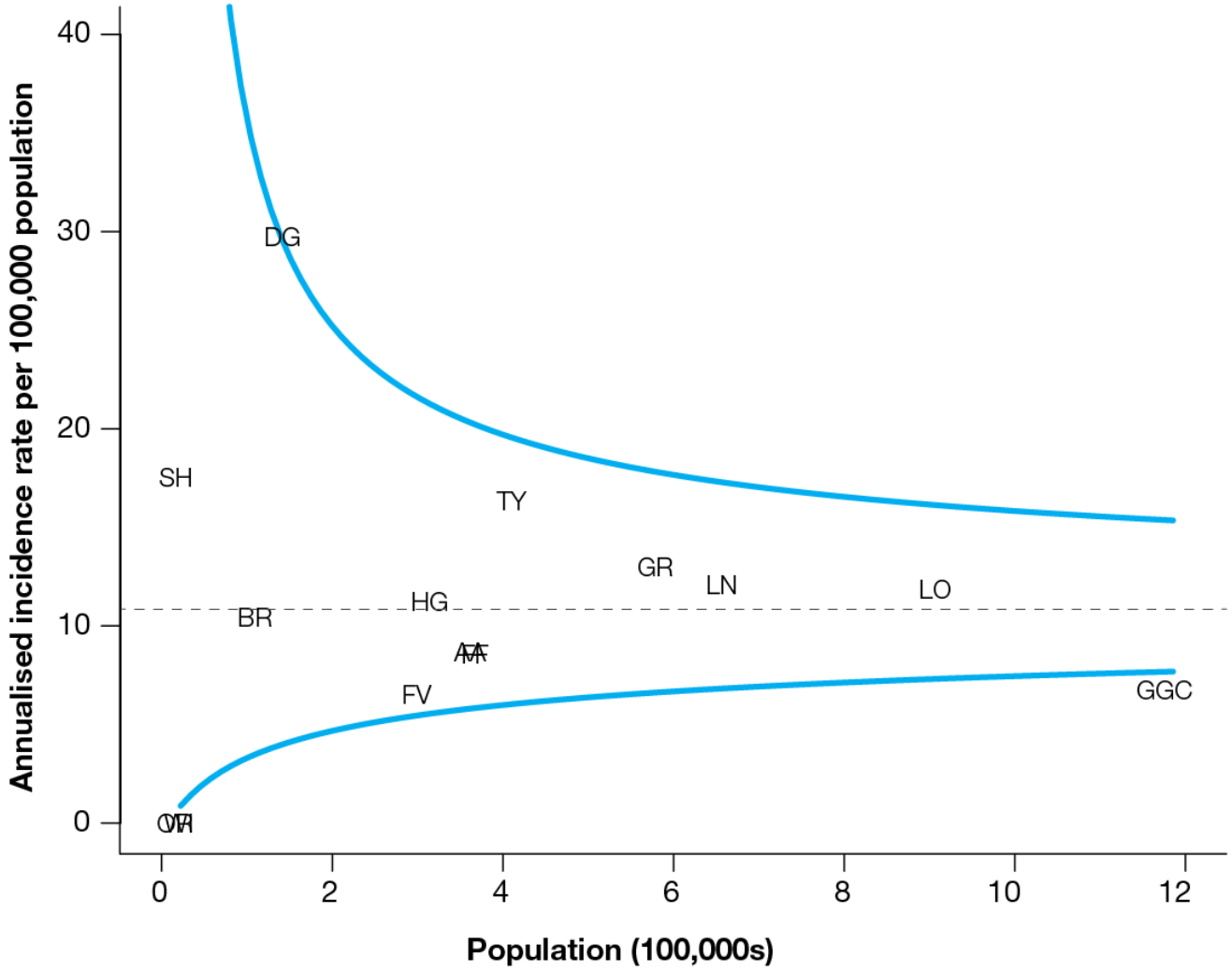
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 5: Funnel plot of SAB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q2 2021.[1,2]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
2. NHS Highland and NHS Forth Valley overlap as do NHS Shetland and NHS Orkney.

Figure 6: Funnel plot of SAB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q2 2021.[1,2]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
2. NHS Orkney and NHS Western Isles overlap as do NHS Ayrshire and Arran and NHS Fife.

Surgical Site Infection (SSI)

Epidemiological data for SSI are not included for this quarter due to the pausing of surveillance to support the COVID-19 response.

List of Tables

File name	File and size
Table 1: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).	supplementary data (452 Kb)
Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).	supplementary data (452 Kb)
Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).	supplementary data (452 Kb)
Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).	supplementary data (452 Kb)
Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).	supplementary data (452 Kb)
Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).	supplementary data (452 Kb)
Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).	supplementary data (452 Kb)
Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).	supplementary data (452 Kb)
Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).	supplementary data (452 Kb)
Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).	supplementary data (452 Kb)
Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q1 2021 (January to March 2021) compared to Q2 2021 (April to June 2021).	supplementary data (452 Kb)
Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending June 2020 (YE Q2 20) compared to year-ending June 2021 (YE Q2 21).	supplementary data (452 Kb)

Contact

Laura Imrie, Clinical Lead ARHAI
Phone: 0141 300 1922
Email: NSS.HPSHAIIC@nhs.scot

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 CDI, ECB, SAB and SSI pages.

The next release of this publication will be January 2022.

Rate this publication

Please provide feedback on this publication to help us improve our services.

Appendices

Appendix 1 – Background information

Revisions to the surveillance

Description of Revision	First report revision applied	Report section(s) revision applies to	Rational for revision
Name change for *Clostridium difficile* to *Clostridioides difficile*.	October 2018	CDI	A novel genus *Clostridioides* has been proposed for *Clostridium difficile* which will now be known as *Clostridioides difficile*. There are no implications with regards to the natural history of infection, infection prevention and control, or clinical treatment. https://www.sciencedirect.com/science/article/pii/S1075996416300762?via%3Dihub
Addition of healthcare/ community case assignment	October 2017	CDI/SAB	An increasing awareness of those infections occurring in community settings has warranted measurement of incidence rates by healthcare setting (healthcare settings vs. community settings) to enable interventions to be targeted to the relevant settings.
Use of standardised denominator data for CDI/ECB/SAB	October 2017	CDI/SAB	The 'total occupied bed days' data will be extracted from the ISD(S)1 data collection which contains aggregated information on acute and non-acute bed days including geriatric medicine and long-term stays in real-time. The standardisation of denominator data across the three surveillance programmes could result in slightly less accurate denominators due to inclusion of persons in the denominator who are at slightly lower risk of infection. However, in surveillance programmes developed for the purpose of preventing infection and driving quality

			improvement in care, consistency of the denominators over time tend to be more important than getting a very precise estimate of the population at risk, as the primary aim is to reduce infection to a lower incidence relative to what it was at the initial time of benchmarking.
Reporting of CDI cases aged 15 years and above only	October 2017	CDI	Current Scottish Government Local Delivery Plan Standards are based on the incidence rate in cases aged 15 years and above, therefore the report has been aligned to reflect this. ARHAI will continue to monitor CDI incidence rates in the separate age groups (15-64 years and 65 years and above) internally.
Reporting of total SAB cases only (i.e. Removal of MRSA sub-analysis)	October 2017	SAB	MRSA numbers are becoming too small to carry out statistical analysis. ARHAI will continue to monitor internally.
Addition of year end trends to ECB	October 2018	ECB	This analysis (already included for other reported organisms) is now possible for ECB due the amount of data that has now been collected.
Change in production of Quarterly SPC Charts	April 2020	All sections	Updated method used for calculating exceptions within the SPC charts. The mean, Trigger/warning lines (+2 standard deviations) and upper control limits (+3 standard deviations) presented, are now calculated using the 12 quarters prior to the most recent quarter, as to compare the new rate against an existing baseline.
Changes to data collection in response to COVID-19	July 2020	All sections	A CNO letter sent 25th March 2020 asked NHS Boards to continue to report case numbers and origin of infection data but they would not be required to report risk factor data as would normally be expected under enhanced/extended surveillance for

			Staphylococcus aureus bacteraemia (SAB), *Escherichia coli* bacteraemia (ECB) and *Clostridioides difficile* infection (CDI). All mandatory and voluntary Surgical Site Infection (SSI) surveillance was paused until further notice.
Change from Health Protection Scotland to ARHAI Scotland	October 2020	All sections	In April 2020, as part of launch of Public Health Scotland, the ARHAI Group within Health Protection Scotland (HPS) became ARHAI Scotland. ARHAI Scotland will continue to support NHS boards in the prevention and control of healthcare associated infections. The report was updated to reflect this branding change.
Change from National Waiting Times Centre (NWTC) to NHS Golden Jubilee (GJ)	January 2021	All sections	Labelling updated.

Report methods and caveats

Full details of the report methods and caveats can be found here – https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/

UK comparisons

Improved collaboration with the other UK nations has made comparisons and standardisation across the UK a high priority for all four nations' governments/health departments. The changes introduced in the Scottish HAI surveillance, described here facilitate benchmarking of the Scottish data against those of the rest of the UK.

Appendix 2 – Publication Metadata

Metadata Indicator	Description
Publication title	Quarterly epidemiological data on *Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland
Description	This release provides information on *Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland for the period April to June 2021.
Theme	Infections in Scotland
Topic	*Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection
Format	Excel workbooks
Data source(s)	***Clostridioides difficile* infection:** **Case data source:** Electronic Communication of Surveillance in Scotland (ECOSS) **Data linkage source**: General / Acute Inpatient and Day Case Scottish Morbidity Records (SMR01) **Healthcare associated denominator:** Total occupied bed days: Information Services Division ISD(S)1 **Community associated denominator:** National Records of Scotland (NRS) mid-year population estimates ***Escherichia coli* bacteraemia:** **Case data source:** Electronic Communication of Surveillance in Scotland (ECOSS) Enhanced Surveillance Web Tool **Healthcare associated denominator:** Total occupied bed days: Information Services Division ISD(S)1 **Community associated denominator:** NRS mid-year population estimates ***Staphylococcus aureus* bacteraemia:** **Case data source:** Electronic Communication of Surveillance in Scotland (ECOSS) Enhanced Surveillance Web Tool **Healthcare associated denominator:** Total occupied bed days: Information Services Division ISD(S)1 **Community associated denominator:** NRS mid-year population estimates

<table>
<tr><th>Metadata Indicator</th><th>Description</th></tr>
<tr><td></td><td>Surgical Site Infection:

Case data source: Surgical Site Infection Reporting System (SSIRS)

Number of procedures denominator: SSIRS</td></tr>
<tr><td>Date that data are acquired</td><td>The date the data were extracted for analysis.

Clostridioides difficile: 22/07/2021
Escherichia coli Bacteraemia: 23/08/2021
Staphylococcus aureus Bacteraemia: 23/08/2021
Surgical Site Infection: Epidemiological data for SSI are not included for this quarter due to the pausing of surveillance to support the COVID-19 response.</td></tr>
<tr><td>Release date</td><td>5 October 2021</td></tr>
<tr><td>Frequency</td><td>Quarterly</td></tr>
<tr><td>Timeframe of data and timeliness</td><td>The latest iteration of data is 30 June 2021, therefore the data are three months in arrears.</td></tr>
<tr><td>Continuity of data</td><td>Quarterly as at March, June, September, December</td></tr>
<tr><td>Revisions statement</td><td>These data are not subject to planned major revisions. However, ARHAI aims to continually improve the interpretation of the data and therefore analysis methods are regularly reviewed and may be updated in the future.</td></tr>
<tr><td>Revisions relevant to this publication</td><td>Updates to previously published figures

Total Occupied Bed Days (TOBDs)
Amendments to total occupied bed days dataset provided by Information Services Division (ISD) have been included in historic dataset for analysis and reporting. Updated figures are available to view in the most recent supplementary data.

<table>
<tr><th>Quarter</th><th>NHS Board</th><th>Previous TOBDs</th><th>Updated TOBDs</th></tr>
<tr><td>2020 Q2</td><td>FF</td><td>63,241</td><td>63,495</td></tr>
<tr><td>2020 Q2</td><td>GGC</td><td>304,822</td><td>305,581</td></tr>
<tr><td>2020 Q2</td><td>TY</td><td>81,377</td><td>81,757</td></tr>
<tr><td>2020 Q3</td><td>FF</td><td>75,003</td><td>75,272</td></tr>
<tr><td>2020 Q3</td><td>TY</td><td>99,019</td><td>99,451</td></tr>
<tr><td>2021 Q1</td><td>FF</td><td>78,707</td><td>78,623</td></tr>
</table>

NRS mid-year population estimates

Updated to mid-2020 population estimates for 2020 (Q1 - Q4) and 2021 (Q1)
Clostridioides difficile Infection (CDI)</td></tr>
</table>

<table>
<tr><th>Metadata Indicator</th><th>Description</th></tr>
<tr><td></td><td>Data linkage between CDI surveillance data and the Scottish Morbidity Records (SMR01) is used to identify community and healthcare associated CDI cases. Delays in SMR01 data availability at the time of report production means that some cases may be reassigned as either healthcare associated or community associated CDI at a later date (see Methods and Caveats).
<table>
<tr><th>NHS Board</th><th>Quarter</th><th>Previous Healthcare associated CDI cases</th><th>Updated Healthcare associated CDI cases</th><th>Previous Community associated CDI cases</th><th>Updated Community associated CDI cases</th><th>Reason</th></tr>
<tr><td>GGC</td><td>Q1 2021</td><td>58</td><td>60</td><td>10</td><td>8</td><td>Retrospective data amendment</td></tr>
</table>
Surgical Site Infection (SSI)
Epidemiological data for SSI are not included for this quarter due to the pausing of surveillance to support the COVID-19 response.</td></tr>
<tr><td>Concepts and definitions</td><td>Clostridioides difficile Infection (CDI)

Clostridioides difficile infection (CDI) is the most common cause of intestinal infections (and diarrhoea) associated with antimicrobial therapy. Clinical disease comprises a range of toxin mediated symptoms from mild diarrhoea, which can resolve without treatment, to severe cases such as pseudomembranous colitis (PMC), toxic megacolon and peritonitis that can lead to death.

For mild disease, diarrhoea is usually the only symptom. Other clinical features consistent with more severe forms of CDI include fever, leukocytosis, pseudomembranous colitis and ileus.

Symptoms of CDI, and associated immune reactions in children differ from those in adults, but the pathology is not well described. Routine testing in children aged less than 3 years old is not recommended.

Approximately 3% of healthy adults and 20% of hospital patients carry C. difficile in their gut. The elderly living in care homes or staying in long-term care facilities are more likely to carry C. difficile than other adults. In studies from the US, 20% of care home residents and 50% of patients in long-term care facilities, respectively, were colonised with C. difficile.

The Scottish CDI guidance ‘Guidance on Prevention and Control of CDI in Healthcare Settings in Scotland’ and C. difficile testing protocol ‘protocol for diagnosis of CDI’ are key documents for the control and reduction of CDI in Scotland.

There remains scope for a reduction of incidence rates through continued local monitoring, appropriate prescribing, and compliance with infection prevention and control measures.

Escherichia coli Bacteraemia (ECB)

Escherichia coli (E. coli) is a bacterium commonly found in the gut of animals and people where it forms part of the normal gut flora that helps human digestion. Although most types of E. coli live harmlessly in your gut, some types can make you unwell. Some types E. coli can cause urinary tract infections (UTI) and illnesses such as pneumonia.</td></tr>
</table>

Metadata Indicator	Description
	E. coli continues to be the most frequent cause of Gram-negative bacteraemia in Scotland and is a frequent cause of infection worldwide. The number of patients with *E. coli* bacteraemia (ECB) reported to ARHAI has increased continuously since 2009. New cases of ECB are identified by laboratory testing (via positive blood cultures) and submitted to the national system ECOSS. Only cases of ECB that have been reviewed and confirmed by the NHS boards in the enhanced surveillance system are included in the quarterly commentaries. ***Staphylococcus aureus* Bacteraemia (SAB)** *Staphylococcus aureus* (*S. aureus*) is a Gram positive bacterium which colonises the nasal cavity of about a quarter of the healthy population. This colonisation is usually harmless. However, infection can occur if *S. aureus* breaches the body's defence systems and can cause a range of illnesses from minor skin infections to serious systemic infections such as bacteraemia. Some strains of *S. aureus* produce toxins or show resistance to first line treatments therefore can be more complicated to treat. Scotland has had a mandatory meticillin resistant *S. aureus* (MRSA) bacteraemia surveillance programme since 2001. The programme was extended to include meticillin sensitive *S. aureus* (MSSA) bacteraemias in 2006 and in 2014 to include enhanced *S. aureus* bacteraemia (SAB) surveillance. Full details of the surveillance methods may be found in the protocol. **Surgical Site Infection (SSI)** A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where the surgery took place. SSI may be superficial infections involving the skin only, while other SSI is more serious and can involve tissues under the skin, organs, or implanted material. SSI is one of the most common types of healthcare associated infection in Scotland, estimated to account for 16.5% of inpatient healthcare associated infection within NHSScotland, according to Scottish Point Prevalence Survey 2016. Surgical Site Infection Surveillance (SSIS) is mandatory across NHSScotland and all NHS boards participate in SSI surveillance for all inpatient and post discharge surveillance (PDS) for 10 post-operative days for caesarean section procedures and prospective readmission surveillance for hip arthroplasty for 30 post-operative days. Additional new mandatory large bowel and vascular procedures commenced since April 2017. Reporting these procedures will not take place until it is assessed that robust data have been provided by boards. Further information on the methods and caveats for can be found here: https://www.hps.scot.nhs.uk/web-resources-container/quarterly-epidemiological-commentary-for-the-surveillance-of-healthcare-associated-infections-in-scotland-methods-caveats/ When a board is highlighted as an exception this will be looked at further as per the exception reporting process.

Metadata Indicator	Description
	Further information on the production of quarterly exception reports (SOP) can be found here: https://www.hps.scot.nhs.uk/web-resources-container/quarterly-epidemiological-commentary-for-the-surveillance-of-healthcare-associated-infections-in-scotland-production-of-quarterly-exception-reports-sop/
Relevance and key uses of the statistics	***Clostridioides difficile* Infection (CDI)** Surveillance data is essential for monitoring trends and assisting in outbreak investigations. Certain strains of *C. difficile* have been associated with more severe disease (e.g. PCR types 027 and 078) and antibiotic resistance has been suggested to be a factor in the emergence and spread of *C. difficile* epidemic types. In addition, the identification of ribotypes can assist in the investigation of outbreaks. The surveillance data should inform and support NHS boards in implementing antimicrobial prescribing policies, infection control and prevention interventions. ***Escherichia coli* Bacteraemia (ECB)** The outputs of the surveillance programme are intended to support the NHS boards in controlling and reducing the burden of ECB. Benchmarking against other NHS boards (and other countries) is an important function of the surveillance. In conjunction with other sources of intelligence (including enhanced surveillance data) the outputs of the quarterly surveillance can also help the NHS boards with planning and targeting activities to reduce risk to patient of becoming infected and improve the care of patients (i.e. strategic planning, targeted intervention, care quality improvement). As urinary tract infections are commonly associated with *E. coli* bacteraemia cases, we are collaborating with the Scottish Urinary Tract Infection Network (SUTIN). This will promote collaborative working with our partners within Health and Social Care around change ideas which may reduce the risk of *E. coli* bacteraemia. Work is also being done on improving antimicrobial treatment of people with infections – co-ordinated by the Scottish Antimicrobial Prescribing Group (SAPG) through a network of antimicrobial management teams. ***Staphylococcus aureus* Bacteraemia (SAB)** ARHAI continues to offer support to NHS boards across Scotland to aid their local SAB reduction strategies. A programme of enhanced SAB surveillance commenced in all NHS boards in Scotland on 1 October 2014. This is providing further intelligence to focus future reduction interventions. **Surgical Site Infection (SSI)** SSIs are estimated to double the length of post-operative stay in hospital and significantly increase the cost of care. The national SSIS programme is intended to enhance the quality of patient care with use of data obtained from surveillance to compare incidence of SSI over time and against a benchmark rate and to use this information locally to review and guide clinical practice. **Key to NHS boards**

Metadata Indicator	Description
	AA = NHS Ayrshire & Arran BR = NHS Borders DG = NHS Dumfries & Galloway FV = NHS Forth Valley FF = NHS Fife GJ = NHS Golden Jubilee GR = NHS Grampian GGC = NHS Greater Glasgow & Clyde HG = NHS Highland LN = NHS Lanarkshire LO = NHS Lothian OR = NHS Orkney SH = NHS Shetland TY = NHS Tayside WI = NHS Western Isles
Accuracy	CDI, ECB and SAB data are the product of the Electronic Communication of Surveillance in Scotland (ECOSS). Participating laboratories routinely report all identifications of organisms, infection or microbiological intoxication, unless they are known to be of no clinical or public health importance. The collected data is used for: the identification of single cases of severe disease, outbreaks, and longer term trends in the incidence of laboratory reported infections, enhanced surveillance, health protection, analytical and statistical use. Delays in SMR01 data availability at the time of report production means that some CDI cases may be reassigned at a later date. Therefore, healthcare-associated and community-associated CDI cases in this report are provisional and may change. The enhanced ECB and SAB ECOSS web tool has built-in validation rules that have to be met before the data is submitted. Further checks of the data are made by ARHAI before the data are analysed. CDI validation of collected data entails sending a list of CDI cases extracted from ECOSS and asking for confirmation that the cases represent true CDI cases, i.e., meet the case definition which is defined in the surveillance protocol sent to all the NHS boards and available on the HPS website. The final list of CDI cases is then agreed before publishing. SSI data comes from the Surgical Site Infection Reporting System (SSIRS). Complying with a national minimum dataset and definitions for Surgical Site Infections, enables the data submitted to Health Protection Scotland to be mapped into the national dataset following a rigorous quality assurance process. SSIRS has built-in validation rules and data cannot be submitted until rules are met. SSIRS primary validation checks for incomplete or ambiguous core data fields, for example, if presentation to the surgery is 'emergency' the OPCS code should correspond. Secondary validation includes data checks that can be accepted without completion and/or values that are outside the stated requirements.
Completeness	**ECB/SAB:** Surveillance data are collected using an ECOSS Surveillance Web Tool that allows data collectors in NHS boards to validate ECOSS records as well as additional cases that may not

Metadata Indicator	Description
	be included in the ECOSS system. This therefore means that completeness is near to 100%. Only cases reviewed in the enhanced surveillance are included in the 'analysis' in the commentary publication. **CDI:** Diagnosis of CDI is confirmed in a patient who is both symptomatic with diarrhoea and whose stool has tested positive using a two-step diagnostic algorithm. Laboratory reports of positive samples are then sent to ECOSS for data extraction. In the community, patients with CDI may have a mild illness that does not require a GP visit, or the symptoms may not be recognised by a GP for a *C. difficile* test request. In hospitals, the chance of a diarrhoea sample not being tested for *C. difficile* is much lower, and patients who have ileus (i.e., CDI but with no diarrhoea) might be missed; however, as a result of ARHAI published guidance on managing CDI patients, this is not likely. ARHAI carries out validation with the NHS boards to check that no CDI cases have been missed from ECOSS each quarter. As with most surveillance programmes, completeness will not be 100% but mandatory surveillance, supported by ARHAI through issued guidance on diagnosis of CDI and validation of cases, ensures this is as near to 100% as practically possible. When categorising by healthcare or community, not all cases may be successfully data linked in any one quarter. Therefore, the sum total of the healthcare and community CDI cases may not equal the total number of CDI cases reported to ARHAI. **SSI:** Surveillance coordinators are responsible for completeness and accuracy of data. At hospital level, processes are in placed to ensure all patients included in the standard surveillance have had forms completed (e.g. cross checking with admission or theatre list). ARHAI also compare SSIRS data with data from ISD to a make sure all procedures under surveillance have been included; however, this comparison is only done annually.
Comparability	**CDI / ECB / SAB:** Public Health England report rates per quarter for CDI, ECB and SAB (methods and definitions may differ) – https://www.gov.uk/government/statistics/mrsa-mssa-and-e-coli-bacteraemia-and-c-difficile-infection-quarterly-epidemiological-commentary **SSI:** SSI rates by health board are not published by the rest of UK. Annual numbers are reported by Public Health England - https://www.gov.uk/government/publications/surgical-site-infections-ssi-surveillance-nhs-hospitals-in-england
Accessibility	It is the policy of ARHAI 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/data/healthcare-associated-infection-quarterly-epidemiological-commentary/
Value type and unit of measurement	Healthcare associated cases and incidence rates (per 100,000 Total occupied bed days (TOBDs)) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia & *Staphylococcus aureus* bacteraemia. Community associated cases and incidence rates (per 100,000 population) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia & *Staphylococcus aureus* bacteraemia.

Metadata Indicator	Description
	Number of procedures and Surgical Site Infections and incidence per categories (per 100 procedures) for inpatients and post discharge surveillance.
Disclosure	The HPS protocol on Statistical Disclosure Protocol is followed https://publichealthscotland.scot/publications/statistical-disclosure-protocol/
Official Statistics designation	Official Statistics
UK Statistics Authority Assessment	Not Assessed
Last published	6 July 2021
Next published	January 2022
Date of first publication	7 April 2015 Prior to this *Clostridioides difficile* infection (first publication - 2 Apr 2008) and *Staphylococcus aureus* bacteraemia (first publication - 3 Apr 2002) were separate reports.
Help email	NSS.HPSHAIIC@nhs.scot
Date form completed	5 October 2021

Appendix 3 – Early access details

Pre-Release Access

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

Appendix 4 – ARHAI Scotland and Official Statistics

About ARHAI Scotland

ARHAI Scotland works at the very heart of the health service across Scotland, delivering services critical to frontline patient care and supporting the efficient and effective operation of NHS Scotland.

Official Statistics

Our statistics comply with the **Code of Practice for Statistics** in terms of trustworthiness, high quality and public value. This also means that we keep data secure at all stages, through collection, processing, analysis and output production, and adhere to the '**five safes**'.