Clostridioides difficile infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland

January to March 2024

Publication date: 2 July 2024

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Contents

Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland provides a commentary on quarterly epidemiological data in Scotland for January to March (Q1) 2024 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 January to March 2024

- The total number of CDI cases in patients reported to ARHAI was 295.
- 200 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 12.6 cases per 100,000 total occupied bed days (TOBDs).
- 95 CDI cases were reported as community associated. This corresponds to an incidence rate of 7.0 cases per 100,000 population.
- NHS Highland was above the 95% confidence interval upper limit for healthcare associated CDI in the funnel plot analysis.
- NHS Highland was above the 95% confidence interval upper limit for community associated CDI in the funnel plot analysis.
- No NHS boards were above normal variation for healthcare associated CDI when analysing trends over the past three years.
- NHS Highland and NHSScotland were above normal variation for community associated CDI when analysing trends over the past three years.

Escherichia coli bacteraemia (ECB) during January to March 2024

- The total number of ECB cases in patients reported to ARHAI was 1,069.
- 566 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 35.6 cases per 100,000 TOBDs.
- 503 ECB cases were reported as community associated. This corresponds to an incidence rate of 37.1 cases per 100,000 population.
- NHS Tayside were above the 95% confidence interval upper limit for healthcare associated ECB in the funnel plot analysis.

- NHS Lanarkshire were above the 95% confidence interval upper limit for 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 January to March 2024

- The total number of SAB cases in patients reported to ARHAI was 419.
- 271 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 17.0 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 community or healthcare associated SAB in the funnel plot analysis.
- No NHS boards were above normal variation for healthcare or community associated SAB when analysing trends over the past three years.

Surgical Site Infection (SSI) during January to March 2024

Epidemiological data for SSI are not included for this quarter. National mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

Results and Commentary

Clostridioides difficile infection (CDI)

Total cases for quarter

- During Q1 2024, 295 *Clostridioides difficile* infection (CDI) cases in patients were reported to ARHAI. In the previous quarter there were 302 cases.
- In the clinical surveillance typing scheme (covering severe cases and/or outbreaks), out of a total of 59 isolates, ribotypes 002 and 005 (both 13.6%) were the most common ribotypes identified, followed by ribotypes 023 and 078 (both 8.5%), 014, 015 and 020 (all 6.8%), 011 and 220 (both 5.1%), and 012 and 087 (both 3.4%). The remaining 18.6% of isolates comprise a mixture of ribotypes, each with a prevalence of less than 3%.
- In the snapshot surveillance (which reflects the general distribution of ribotypes among CDI cases across Scotland), out of a total of 71 isolates, ribotype 002 (15.3%) was the most common ribotype identified, followed by 005 (13.9%), 106 (9.7%), 015 and 020 (both 8.3%), 023 and 078 (both 5.6%) and 014 (4.2%). The remaining 27.8% of isolates comprise a mixture of ribotypes, each with a prevalence of less than 3%.
- All isolates tested (clinical and snapshot) were susceptible to metronidazole and vancomycin.

Healthcare associated infection cases by NHS board where specimen taken

- During Q1 2024, 200 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 12.6 cases per 100,000 total occupied bed days (TOBDs) (**Table 1**).
- Yearly trends (comparing year-ending March 2023 with year-ending March 2024) show that there were there were no increases or decreases in NHS boards, or in Scotland overall (**Table 2**).

- NHS Highland 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 NHS board of residence

- During Q1 2024, 95 CDI cases were reported as community associated. This corresponds to an incidence rate of 7.0 cases per 100,000 population. (**Table 3**).
- Yearly trends (comparing year-ending March 2023 with year-ending March 2024) show that there were increases in NHS Greater Glasgow & Clyde and Scotland overall (**Table 4**).
- NHS Highland were above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 2**).
- NHS Highland and NHSScotland were 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: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).[1, 2, 3]

NHS board	Q4 Cases	Q4 Bed Days	Q4 Rate	Q1 Cases	Q1 Bed Days	Q1 Rate
AA	14	115,623	12.1	18	115,754	15.6
BR	4	32,143	12.4	4	32,575	12.3
DG	5	46,695	10.7	8	46,826	17.1
FF	2	90,412	2.2	4	91,031	4.4
FV	9	78,075	11.5	10	80,573	12.4
GJ	0	12,987	0.0	0	13,449	0.0
GR	16	136,406	11.7	14	138,503	10.1
GGC	54	447,695	12.1	56	457,584	12.2
HG	17	77,892	21.8	20	81,678	24.5
LN	30	154,158	19.5	28	155,401	18.0
LO	45	240,891	18.7	29	243,801	11.9
OR	1	3,292	30.4	0	2,994	0.0
SH	3	2,641	113.6	3	2,362	127.0
TY	22	120,534	18.3	6	120,867	5.0
WI	1	6,724	14.9	0	7,187	0.0
Scotland	**223**	**1,566,168**	**14.2**	**200**	**1,590,585**	**12.6**

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 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).[1, 2, 3]

NHS board	YE Q1 23 Cases	YE Q1 23 Bed Days	YE Q1 23 Rate	YE Q1 24 Cases	YE Q1 24 Bed Days	YE Q1 24 Rate
AA	80	468,245	17.1	70	462,834	15.1
BR	13	128,215	10.1	14	128,629	10.9
DG	30	183,748	16.3	34	185,043	18.4
FF	36	357,892	10.1	26	357,237	7.3
FV	55	310,872	17.7	40	309,071	12.9
GJ	2	51,352	3.9	3	52,896	5.7
GR	49	529,681	9.3	61	538,594	11.3
GGC	228	1,760,291	13.0	250	1,794,211	13.9
HG	61	300,704	20.3	75	312,167	24.0
LN	105	592,853	17.7	124	612,825	20.2
LO	116	984,013	11.8	136	962,567	14.1
OR	5	13,085	38.2	1	13,221	7.6
SH	2	10,521	19.0	8	9,229	86.7
TY	58	483,681	12.0	62	475,034	13.1
WI	2	24,883	8.0	2	25,621	7.8
Scotland	**842**	**6,200,036**	**13.6**	**906**	**6,239,179**	**14.5**

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: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024). [1, 2, 3, 4]

NHS board	Q4 Cases	Q4 Population	Q4 Rate	Q1 Cases	Q1 Population	Q1 Rate
AA	6	365,440	6.5	7	365,440	7.7
BR	1	116,820	3.4	0	116,820	0.0
DG	4	145,770	10.9	6	145,770	16.6
FF	0	371,340	0.0	4	371,340	4.3
FV	3	302,730	3.9	0	302,730	0.0
GR	6	582,220	4.1	10	582,220	6.9
GGC	14	1,179,910	4.7	20	1,179,910	6.8
HG	7	323,630	8.6	14	323,630	17.4
LN	12	668,360	7.1	7	668,360	4.2
LO	18	906,190	7.9	23	906,190	10.2
OR	0	22,020	0.0	1	22,020	18.3
SH	0	23,020	0.0	0	23,020	0.0
TY	6	414,130	5.7	3	414,130	2.9
WI	2	26,120	30.4	0	26,120	0.0
Scotland	**79**	**5,447,700**	**5.8**	**95**	**5,447,700**	**7.0**

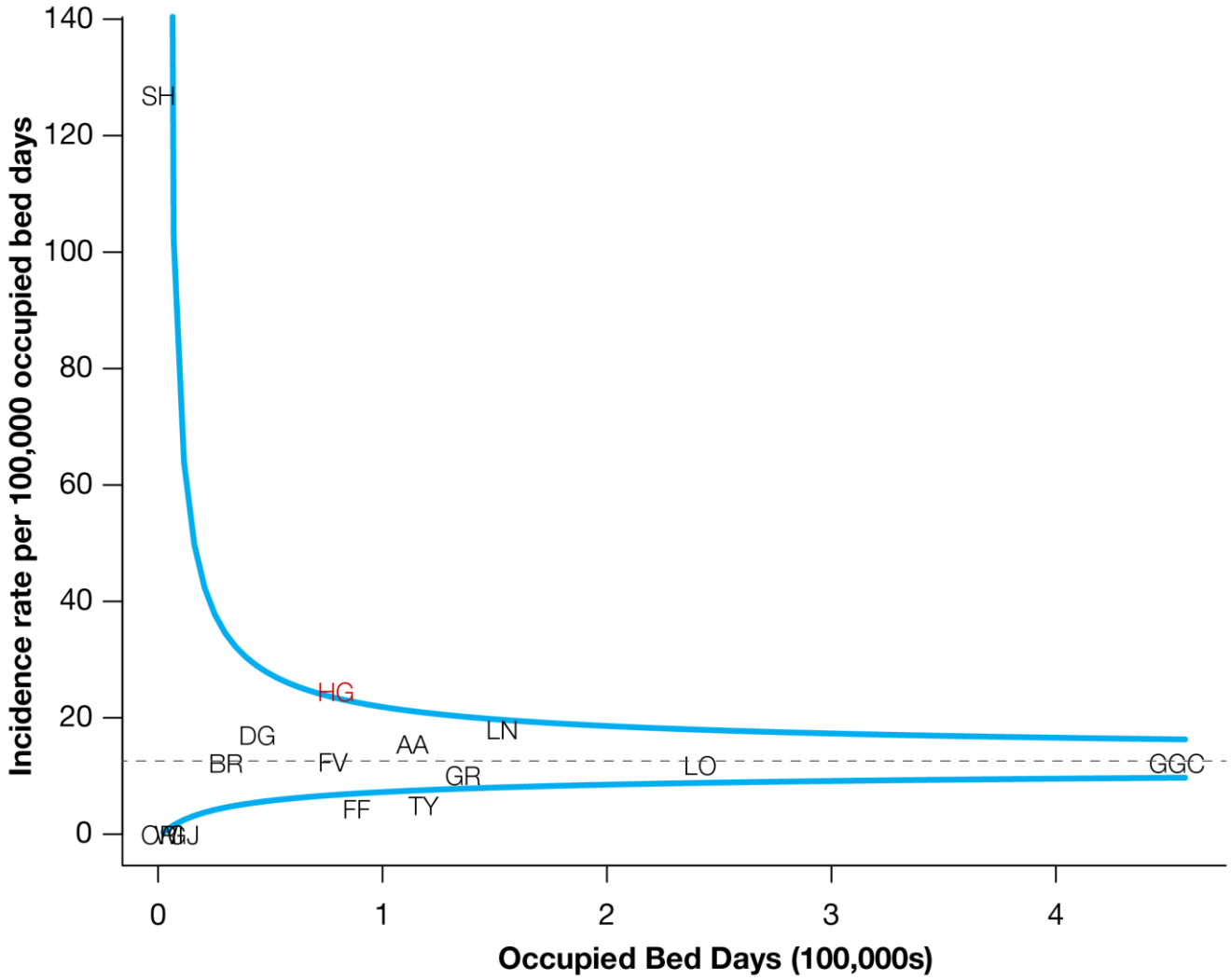
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
4. Figures include any updates 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 March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).[1, 2, 3]

NHS board	YE Q1 23 Cases	YE Q1 23 Population	YE Q1 23 Rate	YE Q1 24 Cases	YE Q1 24 Population	YE Q1 24 Rate
AA	29	365,440	7.9	26	365,440	7.1
BR	5	116,820	4.3	4	116,820	3.4
DG	13	145,770	8.9	16	145,770	11.0
FF	11	371,340	3.0	15	371,340	4.0
FV	2	302,730	0.7	4	302,730	1.3
GR	21	582,220	3.6	34	582,220	5.8
GGC	42	1,179,910	3.6	65	1,179,910	↑ 5.5
HG	28	323,630	8.7	31	323,630	9.6
LN	25	668,360	3.7	39	668,360	5.8
LO	52	906,190	5.7	71	906,190	7.8
OR	0	22,020	0.0	1	22,020	4.5
SH	2	23,020	8.7	0	23,020	0.0
TY	18	414,130	4.3	19	414,130	4.6
WI	1	26,120	3.8	5	26,120	19.1
Scotland	**249**	**5,447,700**	**4.6**	**330**	**5,447,700**	**↑ 6.1**

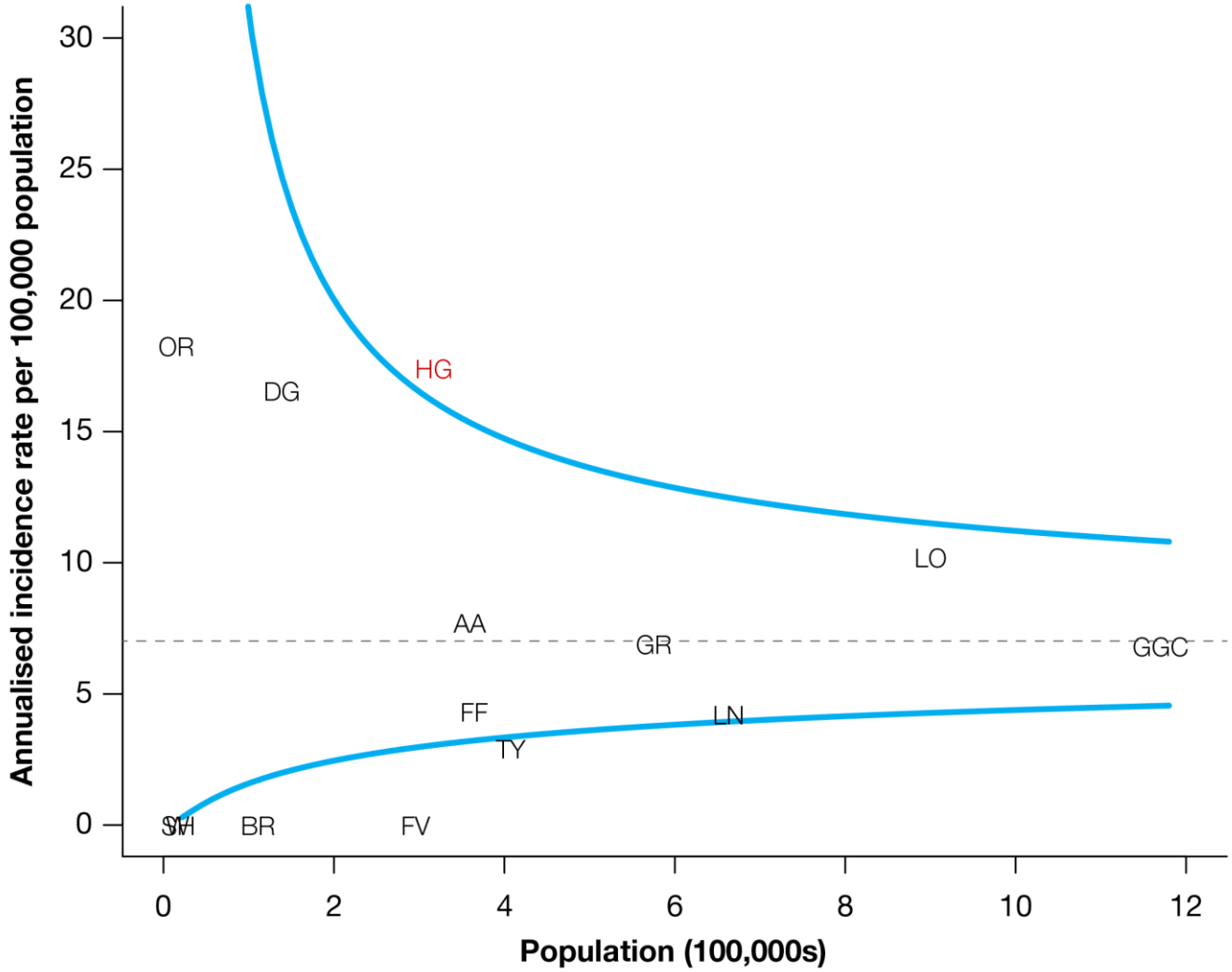
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 1: Funnel plot of CDI incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q1 2024.[1, 2, 3]



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.
3. NHS boards above the 95% confidence interval upper limit are highlighted in red.

Figure 2: Funnel plot of CDI incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q1 2024.[1, 2, 3]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
2. NHS Shetland and NHS Western Isles overlap.
3. NHS boards above the 95% confidence interval upper limit are highlighted in red.

Escherichia coli bacteraemia (ECB)

Total Cases for Quarter

- During Q1 2024, 1,069 *Escherichia coli* bacteraemia (ECB) cases in patients were reported to ARHAI. In the previous quarter there were 986 cases.

Healthcare associated infection cases by NHS board where specimen taken

- During Q1 2024, 566 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 35.6 cases per 100,000 TOBDs (**Table 5**).
- Yearly trends (comparing year-ending March 2023 with year-ending March 2024) show that there was an increase in NHS Ayrshire & Arran (**Table 6**).
- NHS Tayside were above the 95% confidence interval upper limit for ECB 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 NHS board of residence

- During Q1 2024, 503 ECB cases were reported as community associated. This corresponds to an incidence rate of 37.1 cases per 100,000 population and is an increase compared to the Q4 2023 incidence rate of 32.2 cases per 100,000 population (**Table 7**).
- Yearly trends (comparing year-ending March 2023 with year-ending March 2024) show there was an increase in NHS Tayside (**Table 8**).
- NHS Lanarkshire 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: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).[1, 2, 3]

NHS board	Q4 Cases	Q4 Bed Days	Q4 Rate	Q1 Cases	Q1 Bed Days	Q1 Rate
AA	61	115,623	52.8	49	115,754	42.3
BR	11	32,143	34.2	11	32,575	33.8
DG	19	46,695	40.7	13	46,826	27.8
FF	34	90,412	37.6	38	91,031	41.7
FV	30	78,075	38.4	41	80,573	50.9
GJ	1	12,987	7.7	2	13,449	14.9
GR	41	136,406	30.1	45	138,503	32.5
GGC	140	447,695	31.3	144	457,584	31.5
HG	21	77,892	27.0	13	81,678	15.9
LN	43	154,158	27.9	62	155,401	39.9
LO	79	240,891	32.8	79	243,801	32.4
OR	1	3,292	30.4	2	2,994	66.8
SH	1	2,641	37.9	3	2,362	127.0
TY	56	120,534	46.5	59	120,867	48.8
WI	6	6,724	89.2	5	7,187	69.6
Scotland	**544**	**1,566,168**	**34.7**	**566**	**1,590,585**	**35.6**

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 March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).[1, 2, 3]

NHS board	YE Q1 23 Cases	YE Q1 23 Bed days	YE Q1 23 Rate	YE Q1 24 Cases	YE Q1 24 Bed days	YE Q1 24 Rate
AA	164	468,245	35.0	209	462,834	↑ 45.2
BR	46	128,215	35.9	56	128,629	43.5
DG	71	183,748	38.6	73	185,043	39.5
FF	121	357,892	33.8	126	357,237	35.3
FV	175	310,872	56.3	142	309,071	45.9
GJ	11	51,352	21.4	6	52,896	11.3
GR	203	529,681	38.3	170	538,594	31.6
GGC	593	1,760,291	33.7	617	1,794,211	34.4
HG	60	300,704	20.0	75	312,167	24.0
LN	242	592,853	40.8	233	612,825	38.0
LO	275	984,013	27.9	306	962,567	31.8
OR	9	13,085	68.8	5	13,221	37.8
SH	11	10,521	104.6	6	9,229	65.0
TY	225	483,681	46.5	230	475,034	48.4
WI	19	24,883	76.4	17	25,621	66.4
Scotland	**2,225**	**6,200,036**	**35.9**	**2,271**	**6,239,179**	**36.4**

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: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).[1, 2, 3, 4]

NHS board	Q4 Cases	Q4 Population	Q4 Rate	Q1 Cases	Q1 Population	Q1 Rate
AA	42	365,440	45.6	44	365,440	48.4
BR	10	116,820	34.0	12	116,820	41.3
DG	20	145,770	54.4	20	145,770	55.2
FF	35	371,340	37.4	29	371,340	31.4
FV	27	302,730	35.4	25	302,730	33.2
GR	36	582,220	24.5	47	582,220	32.5
GGC	85	1,179,910	28.6	92	1,179,910	31.4
HG	25	323,630	30.6	31	323,630	38.5
LN	51	668,360	30.3	80	668,360	48.1
LO	63	906,190	27.6	72	906,190	32.0
OR	5	22,020	90.1	0	22,020	0.0
SH	0	23,020	0.0	1	23,020	17.5
TY	43	414,130	41.2	48	414,130	46.6
WI	0	26,120	0.0	2	26,120	30.8
Scotland	**442**	**5,447,700**	**32.2**	**503**	**5,447,700**	**↑ 37.1**

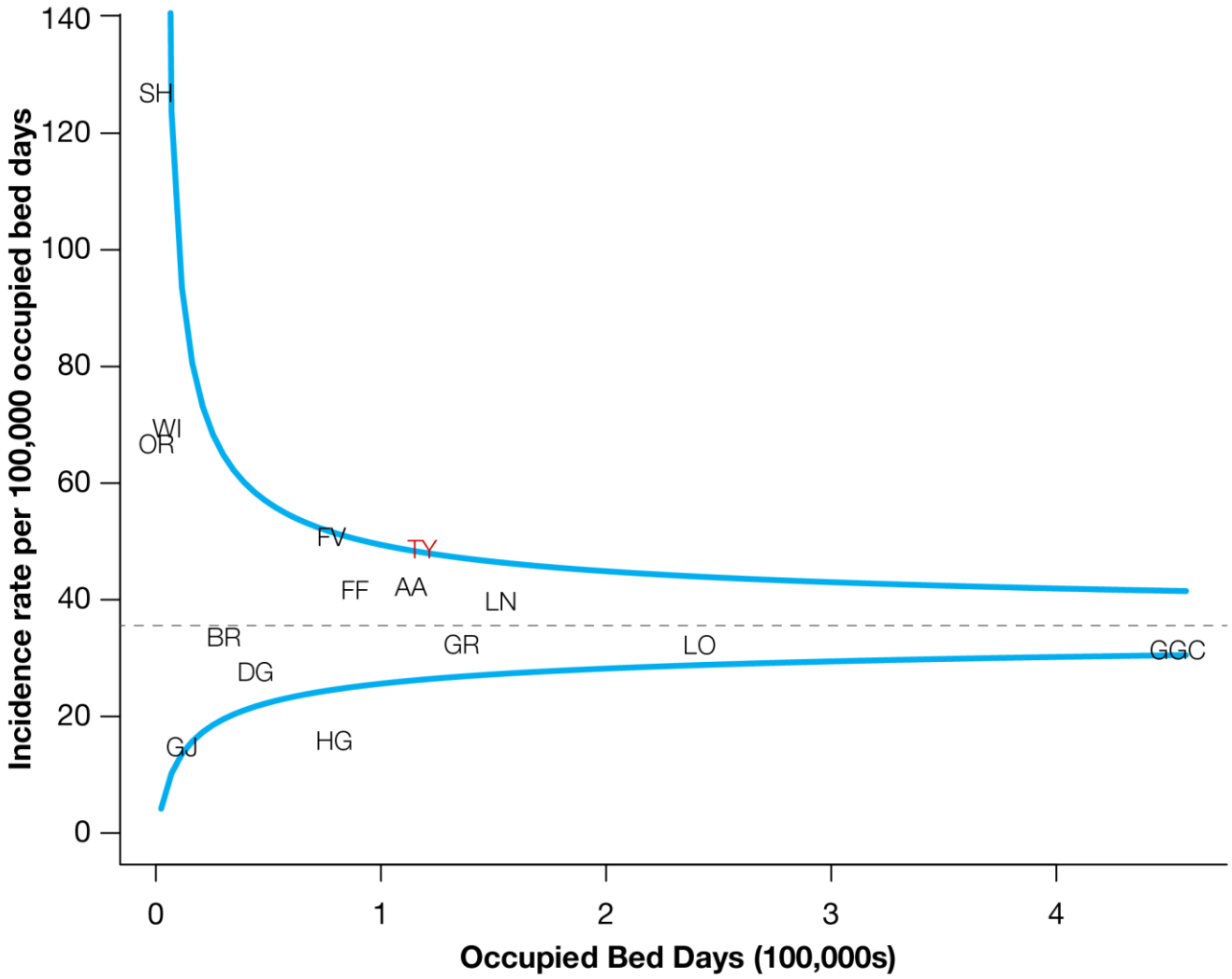
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
4. Figures include any updates 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 March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).[1, 2, 3]

NHS board	YE Q1 23 Cases	YE Q1 23 Population	YE Q1 23 Rate	YE Q1 24 Cases	YE Q1 24 Population	YE Q1 24 Rate
AA	183	365,440	50.1	187	365,440	51.2
BR	53	116,820	45.4	47	116,820	40.2
DG	91	145,770	62.4	79	145,770	54.2
FF	160	371,340	43.1	133	371,340	35.8
FV	110	302,730	36.3	99	302,730	32.7
GR	182	582,220	31.3	173	582,220	29.7
GGC	441	1,179,910	37.4	399	1,179,910	33.8
HG	110	323,630	34.0	140	323,630	43.3
LN	321	668,360	48.0	279	668,360	41.7
LO	284	906,190	31.3	291	906,190	32.1
OR	15	22,020	68.1	10	22,020	45.4
SH	7	23,020	30.4	4	23,020	17.4
TY	138	414,130	33.3	174	414,130	↑ 42.0
WI	3	26,120	11.5	7	26,120	26.8
Scotland	**2,098**	**5,447,700**	**38.5**	**2,022**	**5,447,700**	**37.1**

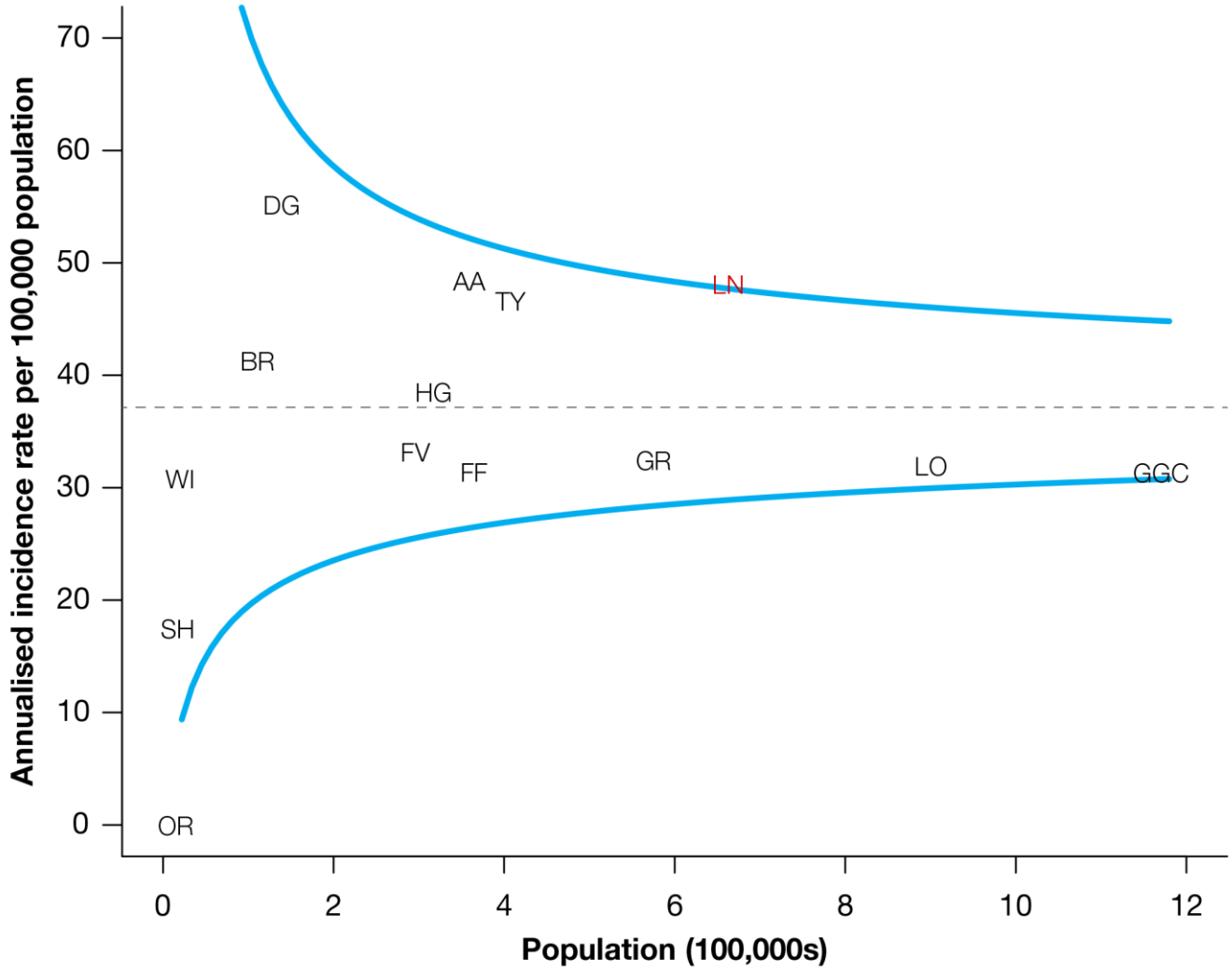
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 3: Funnel plot of ECB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q1 2024.[1, 2, 3]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
2. NHS Orkney and NHS Western Isles overlap.
3. NHS boards above the 95% confidence interval upper limit are highlighted in red.

Figure 4: Funnel plot of ECB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q1 2024.[1, 2]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
2. NHS boards above the 95% confidence interval upper limit are highlighted in red.

Staphylococcus aureus bacteraemia (SAB)

Total cases for quarter

- During Q1 2024, 419 *Staphylococcus aureus* bacteraemia (SAB) cases in patients were reported to ARHAI. In the previous quarter there were 438 SAB cases.

Healthcare associated infection cases by NHS board where specimen taken

- During Q1 2024, 271 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 17.0 cases per 100,000 TOBDs (**Table 9**).
- Yearly trends (comparing year-ending March 2023 with year-ending March 2024) show that there were there were no increases or decreases in NHS boards, or in Scotland overall (**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 NHS board of residence

- During Q1 2024, 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 March 2023 with year-ending March 2024) show there was an increase for NHS Shetland (**Table 12**).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 6**).
- No NHS boards were 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: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).[1, 2, 3]

NHS board	Q4 Cases	Q4 Bed Days	Q4 Rate	Q1 Cases	Q1 Bed Days	Q1 Rate
AA	18	115,623	15.6	20	115,754	17.3
BR	4	32,143	12.4	2	32,575	6.1
DG	9	46,695	19.3	10	46,826	21.4
FF	10	90,412	11.1	12	91,031	13.2
FV	15	78,075	19.2	16	80,573	19.9
GJ	2	12,987	15.4	1	13,449	7.4
GR	26	136,406	19.1	32	138,503	23.1
GGC	91	447,695	20.3	67	457,584	14.6
HG	10	77,892	12.8	13	81,678	15.9
LN	35	154,158	22.7	32	155,401	20.6
LO	48	240,891	19.9	34	243,801	13.9
OR	0	3,292	0.0	0	2,994	0.0
SH	2	2,641	75.7	3	2,362	127.0
TY	30	120,534	24.9	28	120,867	23.2
WI	1	6,724	14.9	1	7,187	13.9
Scotland	**301**	**1,566,168**	**19.2**	**271**	**1,590,585**	**17.0**

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 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).[1, 2, 3]

NHS board	YE Q1 23 Cases	YE Q1 23 Bed days	YE Q1 23 Rate	YE Q1 24 Cases	YE Q1 24 Bed days	YE Q1 24 Rate
AA	87	468,245	18.6	87	462,834	18.8
BR	21	128,215	16.4	15	128,629	11.7
DG	32	183,748	17.4	37	185,043	20.0
FF	53	357,892	14.8	43	357,237	12.0
FV	49	310,872	15.8	57	309,071	18.4
GJ	13	51,352	25.3	8	52,896	15.1
GR	98	529,681	18.5	102	538,594	18.9
GGC	320	1,760,291	18.2	314	1,794,211	17.5
HG	40	300,704	13.3	53	312,167	17.0
LN	102	592,853	17.2	135	612,825	22.0
LO	170	984,013	17.3	153	962,567	15.9
OR	3	13,085	22.9	0	13,221	0.0
SH	6	10,521	57.0	8	9,229	86.7
TY	125	483,681	25.8	114	475,034	24.0
WI	9	24,883	36.2	7	25,621	27.3
Scotland	**1,128**	**6,200,036**	**18.2**	**1,133**	**6,239,179**	**18.2**

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 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).[1, 2, 3, 4]

NHS board	Q4 Cases	Q4 Population	Q4 Rate	Q1 Cases	Q1 Population	Q1 Rate
AA	14	365,440	15.2	15	365,440	16.5
BR	3	116,820	10.2	7	116,820	24.1
DG	5	145,770	13.6	4	145,770	11.0
FF	11	371,340	11.8	13	371,340	14.1
FV	11	302,730	14.4	9	302,730	12.0
GR	18	582,220	12.3	21	582,220	14.5
GGC	18	1,179,910	6.1	24	1,179,910	8.2
HG	5	323,630	6.1	5	323,630	6.2
LN	18	668,360	10.7	15	668,360	9.0
LO	27	906,190	11.8	21	906,190	9.3
OR	0	22,020	0.0	0	22,020	0.0
SH	2	23,020	34.5	2	23,020	34.9
TY	5	414,130	4.8	12	414,130	11.7
WI	0	26,120	0.0	0	26,120	0.0
Scotland	**137**	**5,447,700**	**10.0**	**148**	**5,447,700**	**10.9**

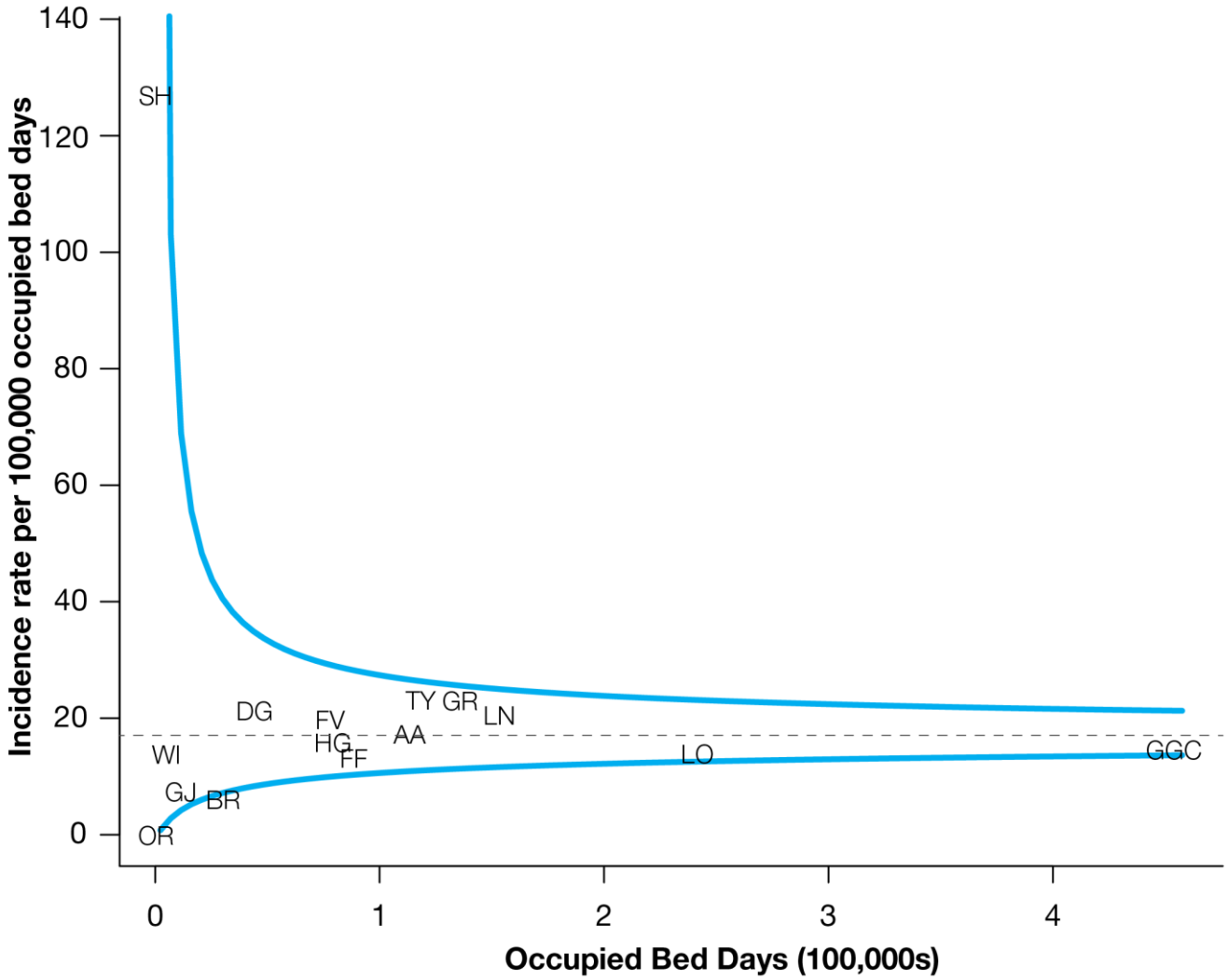
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
4. Figures include any updates 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 March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).[1, 2, 3]

NHS board	YE Q1 23 Cases	YE Q1 23 Population	YE Q1 23 Rate	YE Q1 24 Cases	YE Q1 24 Population	YE Q1 24 Rate
AA	45	365,440	12.3	62	365,440	17.0
BR	12	116,820	10.3	18	116,820	15.4
DG	22	145,770	15.1	17	145,770	11.7
FF	46	371,340	12.4	48	371,340	12.9
FV	31	302,730	10.2	37	302,730	12.2
GR	69	582,220	11.9	70	582,220	12.0
GGC	76	1,179,910	6.4	83	1,179,910	7.0
HG	37	323,630	11.4	24	323,630	7.4
LN	51	668,360	7.6	65	668,360	9.7
LO	95	906,190	10.5	81	906,190	8.9
OR	2	22,020	9.1	1	22,020	4.5
SH	2	23,020	8.7	11	23,020	↑ 47.8
TY	35	414,130	8.5	47	414,130	11.3
WI	1	26,120	3.8	1	26,120	3.8
Scotland	**524**	**5,447,700**	**9.6**	**565**	**5,447,700**	**10.4**

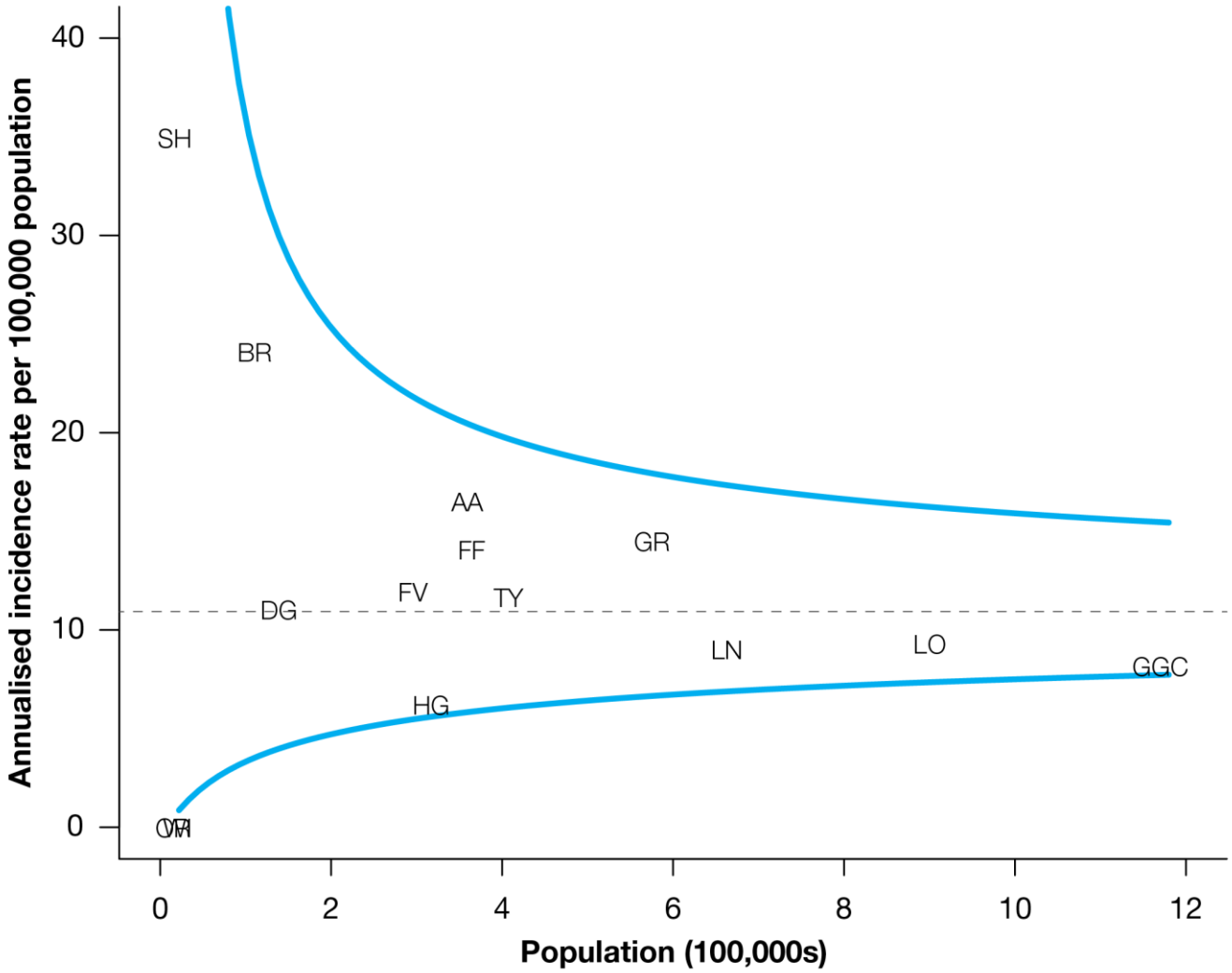
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 5: Funnel plot of SAB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q1 2024.[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 boards above the 95% confidence interval upper limit are highlighted in red.

Figure 6: Funnel plot of SAB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q1 2024.[1, 2, 3]



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
2. NHS Orkney and NHS Western Isles overlap.
3. NHS boards above the 95% confidence interval upper limit are highlighted in red.

Surgical Site Infection (SSI)

Epidemiological data for SSI are not included for this quarter. National mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

List of Tables

Name	File and size
Table 1: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).	supplementary data (517 Kb)
Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).	supplementary data (517 Kb)
Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).	supplementary data (517 Kb)
Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).	supplementary data (517 Kb)
Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).	supplementary data (517 Kb)
Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).	supplementary data (517 Kb)
Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).	supplementary data (517 Kb)
Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).	supplementary data (517 Kb)
Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).	supplementary data (517 Kb)
Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).	supplementary data (517 Kb)

Name	File and size
Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2023 (October to December 2023) compared to Q1 2024 (January to March 2024).	supplementary data (517 Kb)
Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2023 (YE Q1 23) compared to year-ending March 2024 (YE Q1 24).	supplementary data (517 Kb)

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Further Information

Further information can be found on the **ARHAI Scotland website.**

The data from this publication is available to download **from our web page** along with background information and metadata.

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 October 2024.

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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
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 tends 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.

Description of Revision	First report revision applied	Report section(s) revision applies to	Rational for revision
Reporting of CDI cases aged 15 years and above only.	October 2017	CDI	Current Scottish Government Local Delivery Plan (LDP) 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	The count of MRSA bacteraemia cases are now too small to carry out statistical analysis. ARHAI Scotland will continue to monitor internally.
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 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 statistical process control (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	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

Description of Revision	First report revision applied	Report section(s) revision applies to	Rational for revision
response to COVID-19.			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.
Change to reporting of ribotypes.	October 2022	CDI	A description of *C. difficile* PCR ribotypes (RTs) had not been included in the reports published between October 2022 and July 2023, while the CDI typing service provided by the Scottish Microbiology Reference Laboratory (SMiRL) was being reviewed.
Recommencement of mandatory surveillance	April 2023	All sections	As part of a return to pre-pandemic surveillance, for data collected from October 2022 onwards enhanced/extended surveillance

Description of Revision	First report revision applied	Report section(s) revision applies to	Rational for revision
following COVID-19 response.			for *Escherichia coli* bacteraemia (ECB) and *Staphylococcus aureus* bacteraemia (SAB) has been reinstated. Mandatory surveillance of enhanced fields including source of infection/entry point and risk factors as appropriate has resumed in line with the bacteraemia surveillance protocol. Previously, for data collected from 25 March 2020 onwards, only origin of infection was mandatory for ECB and SAB surveillance. Meanwhile all mandatory and voluntary Surgical Site Infection (SSI) surveillance will remain paused until further notice.

Report methods and caveats

Full details of the report methods and caveats can be found **here**.

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.

Key to NHS boards

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

Appendix 2 – Publication Metadata

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 January to March 2024.

Theme

Infections in Scotland.

Topic

Clostridioides difficile infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection.

Format

MS Word reports and MS 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.

Surgical Site Infection:

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

Number of procedures denominator: SSIRS.

Date that data are acquired

The date the data were extracted for analysis.

Clostridioides difficile: 18 April 2024.

Escherichia coli bacteraemia: 23 May 2024.

Staphylococcus aureus bacteraemia: 23 May 2024.

Surgical Site Infection: Epidemiological data for SSI are not included for this quarter. National

Mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

Release date

02 July 2024.

Frequency

Quarterly.

Timeframe of data and timeliness

The latest iteration of data is 31 March 2024, therefore the data are three months in arrears.

Continuity of data

Quarterly as at March, June, September, and December.

Revisions statement

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.

Revisions relevant to this publication

Updates to previously published figures.

National Records for Scotland (NRS) mid-year population estimates
Updated to mid-2022 population estimates for 2022 (Q1 - Q4), 2023 (Q1 – Q4) and 2024 (Q1) as **published** by National Records for Scotland (NRS).

Total Occupied Bed Days (TOBDs)
There were no retrospective amendments to the data.

Clostridioides difficile infection (CDI)

Quarter	NHS board	Previous Healthcare associated CDI cases	Updated Healthcare associated CDI cases	Previous Community associated CDI cases	Updated Community associated CDI cases	Reason
2023 Q4	BR	5	4	2	1	Retrospective data amendment

Escherichia coli bacteraemia (ECB)

Quarter	NHS board	Previous Healthcare associated ECB cases	Updated Healthcare associated ECB cases	Previous Community associated ECB cases	Updated Community associated ECB cases	Reason
2023 Q3	HG	24	23	48	49	Retrospective data amendment

Staphylococcus aureus bacteraemia (SAB)

There were no retrospective amendments to the data.

Surgical Site Infection (SSI)

Epidemiological data for SSI are not included for this quarter. National mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

Concepts and definitions

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 of *E. coli* can cause urinary tract infections (UTI) and illnesses such as pneumonia.

E. coli continues to be the most frequent cause of Gram-negative bacteraemia in Scotland and is a frequent cause of infection worldwide.

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. Full details of the surveillance methods may be found in the **protocol**.

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) bacteraemia 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. Prior to the COVID-19 pandemic, NHS boards participated in SSI surveillance for procedures including caesarean section, hip arthroplasty, large bowel, and vascular procedures. National mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

Further information on the methods and caveats for can be found **here**.

When a board is highlighted as an exception this will be looked at further as per the exception reporting process.

Further information on the production of quarterly exception reports (SOP) can be found **here**.

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 and whole genome sequencing 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, ARHAI Scotland coordinates the sharing of urinary tract infection (UTI) reduction resources. These include the National Hydration Campaign which aims to convey the public health benefits of good hydration in terms of UTI prevention, and the National Catheter Passport which gives information on how to care for urinary catheters at home as well as a clinical section for a nurse, doctor, or carer. 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. National mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

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 the origin of infection for 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 as more data becomes available.

The enhanced ECB and SAB ECOSS web tool has built-in validation rules that must be met before the data are 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 **website**. The final list of CDI cases is then agreed before publishing.

SSI data is reported via the Surgical Site Infection Reporting System (SSIRS). Complying with a national minimum dataset and definitions for Surgical Site Infections, enables the data submitted to ARHAI 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 conflicting information entered in core data fields. 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 be included in the ECOSS system. This therefore means that completeness is near to 100%. Only cases validated in the enhanced surveillance are included in this 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.

CDI Ribotyping: The snapshot programme aims to obtain a representative sample of isolates from CDI cases across all NHS boards in Scotland. However, not all NHS boards have submitted the number of isolates specified by the protocol for the reporting quarter and therefore the data should be interpreted with caution.

The clinical typing scheme aims to provide data from severe CDI cases and/or suspected outbreaks. These data are based on the specimens and information received by the reference laboratory and are not validated by individual NHS boards for completeness; therefore the data should be interpreted with caution.

SSI:
National mandatory SSI surveillance was paused in 2020 to support the COVID-19 response and has not yet resumed.

Comparability

CDI / ECB / SAB:
UK Health Security Agency (UKHSA) report rates per quarter for CDI, ECB and SAB (methods and definitions may differ).

Clostridioides difficile: guidance, data and analysis
Escherichia coli (E. coli): guidance, data and analysis
Staphylococcus aureus: guidance, data and analysis

SSI:
Annual data are reported by UKHSA.

Surgical site infection (SSI): guidance, data and analysis

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 ARHAI Scotland website at:

https://www.nss.nhs.scot/publications/quarterly-epidemiological-data-on-clostridioides-difficile-infection-escherichia-coli-bacteraemia-staphylococcus-aureus-bacteraemia-and-surgical-site-infection-in-scotland-january-to-march-q1-2024/

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. Quarterly rates of community associated infections are calculated pro-rata for the number of days in the quarter, so that quarterly and yearly incidence rates are comparable.

Number of procedures and Surgical Site Infections and incidence per categories (per 100 procedures) for inpatients and post discharge surveillance.

https://www.nss.nhs.scot/publications/quarterly-epidemiological-commentary-for-the-surveillance-of-healthcare-associated-infections-in-scotland-methods-caveats/

Disclosure

The PHS protocol on Statistical Disclosure Protocol is followed:
https://publichealthscotland.scot/publications/statistical-disclosure-protocol/

Official Statistics accreditation

Official Statistics.

UK Statistics Authority Assessment

Not Assessed.

Last published

9 April 2024.

Next published

October 2024.

Date of first publication

07 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.ARHAIdatateam@nhs.scot

Date form completed

02 July 2024.

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'**.