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

July to September 2023

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Contents

Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland provides a commentary on quarterly epidemiological data in Scotland for July to September (Q3) 2023 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 July to September 2023

- The total number of CDI cases in patients reported to ARHAI was 325.
- 239 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 15.5 cases per 100,000 total occupied bed days (TOBDs).
- 86 CDI cases were reported as community associated. This corresponds to an incidence rate of 6.2 cases per 100,000 population.
- NHS Dumfries & Galloway and NHS Highland were above the 95% confidence interval upper limit for healthcare associated CDI in the funnel plot analysis.
- No NHS boards were above the 95% confidence interval for community associated CDI in the funnel plot analysis.
- No NHS boards were above normal variation for healthcare or community associated CDI when analysing trends over the past three years.

Escherichia coli bacteraemia (ECB) during July to September 2023

- The total number of ECB cases in patients reported to ARHAI was 1,155.
- 581 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 37.8 cases per 100,000 TOBDs.
- 574 ECB cases were reported as community associated. This corresponds to an incidence rate of 41.6 cases per 100,000 population.
- No NHS boards were above the 95% confidence interval upper limit for healthcare associated ECB in the funnel plot analysis.
- NHS Ayrshire and Arran and NHS Highland 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 associated ECB when analysing trends over the past three years.
- NHS Highland was above normal variation for community associated ECB when analysing trends over the past three years.

Staphylococcus aureus bacteraemia (SAB) during July to September 2023

- The total number of SAB cases in patients reported to ARHAI was 418.
- 278 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 18.1 cases per 100,000 TOBDs.
- 140 SAB cases were reported as community associated. This corresponds to an incidence rate of 10.1 cases per 100,000 population.
- NHS Lanarkshire was above the 95% confidence interval upper limit for healthcare associated SAB in the funnel plot analysis.
- No NHS boards were above the 95% confidence interval upper limit for community associated SAB in the funnel plot analysis.
- NHS Lanarkshire was above normal variation for healthcare associated SAB when analysing trends over the past three years.
- No NHS boards were above normal variation for community associated SAB when analysing trends over the past three years.

Surgical Site Infection (SSI) during July to September 2023

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 Q3 2023, 325 *Clostridioides difficile* infection (CDI) cases in patients were reported to ARHAI. In the previous quarter there were 314 cases.
- In the clinical surveillance typing scheme (covering severe cases and/or outbreaks) ribotype 002 (17.1%) was the most common ribotype isolated, followed by 015 (12.2%), 001, 005 and 023 (all 9.8%), 011 (7.3%), and 014, 020 and 054 (all 4.9%) out of a total of 41 isolates. The remaining 19.5% 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), ribotype 015 (19.4%) was the most common ribotype isolated, followed by 005 (16.1%), 002 (14.5%), 023 (8.1%), 014 (6.5%) and 011,078 and 081 (all 3.2%) out of a total of 62 isolates. The remaining 25.8% 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 Q3 2023, 239 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 15.5 cases per 100,000 total occupied bed days (TOBDs) (**Table 1**).
- Yearly trends (comparing year-ending September 2022 with year-ending September 2023) show that there show that there were no increases or decreases in NHS boards or Scotland overall (**Table 2**).
- NHS Dumfries & Galloway and 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 Q3 2023, 86 CDI cases were reported as community associated. This corresponds to an incidence rate of 6.2 cases per 100,000 population. (**Table 3**).
- Yearly trends (comparing year-ending September 2022 with year-ending September 2023) show that there were no increases or decreases in NHS boards or Scotland overall (**Table 4**).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 2**).
- No NHS boards 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: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).[1,2,3]

NHS Board	Q2 Cases	Q2 Bed Days	Q2 Rate	Q3 Cases	Q3 Bed Days	Q3 Rate
AA	17	115,702	14.7	21	115,755	18.1
BR	2	31,141	6.4	4	32,770	12.2
DG	6	45,765	13.1	15	45,757	32.8
FF	16	88,856	18.0	4	86,938	4.6
FV	11	75,633	14.5	10	74,790	13.4
GJ	2	13,181	15.2	1	13,279	7.5
GR	19	133,105	14.3	12	130,580	9.2
GGC	69	445,421	15.5	71	443,511	16.0
HG	14	75,789	18.5	24	76,808	31.2
LN	39	151,775	25.7	27	151,491	17.8
LO	32	240,019	13.3	30	237,856	12.6
OR	0	3,469	0.0	0	3,466	0.0
SH	0	2,046	0.0	2	2,180	91.7
TY	17	116,874	14.5	17	116,759	14.6
WI	0	5,886	0.0	1	5,824	17.2
Scotland	**244**	**1,544,662**	**15.8**	**239**	**1,537,764**	**15.5**

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 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).[1,2,3]

NHS Board	YE Q3 22 Cases	YE Q3 22 Bed Days	YE Q3 22 Rate	YE Q3 23 Cases	YE Q3 23 Bed Days	YE Q3 23 Rate
AA	89	455,119	19.6	73	469,368	15.6
BR	13	125,492	10.4	9	128,822	7.0
DG	24	178,489	13.4	33	184,047	17.9
FF	27	348,330	7.8	39	357,238	10.9
FV	37	302,401	12.2	55	307,994	17.9
GJ	2	49,781	4.0	3	52,747	5.7
GR	51	515,053	9.9	49	530,377	9.2
GGC	219	1,699,174	12.9	255	1,780,051	14.3
HG	54	290,437	18.6	78	304,460	25.6
LN	104	578,742	18.0	120	605,798	19.8
LO	122	973,688	12.5	120	973,716	12.3
OR	3	13,341	22.5	2	13,390	14.9
SH	3	9,820	30.5	3	9,556	31.4
TY	51	472,007	10.8	65	478,994	13.6
WI	4	25,055	16.0	2	23,836	8.4
Scotland	**803**	**6,036,929**	**13.3**	**906**	**6,220,394**	**14.6**

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 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).[1,2,3,4]

NHS Board	Q2 Cases	Q2 Population	Q2 Rate	Q3 Cases	Q3 Population	Q3 Rate
AA	5	368,690	5.4	8	368,690	8.6
BR	2	116,020	6.9	1	116,020	3.4
DG	1	148,790	2.7	5	148,790	13.3
FF	3	374,730	3.2	8	374,730	8.5
FV	0	305,710	0.0	1	305,710	1.3
GR	9	586,530	6.2	9	586,530	6.1
GGC	15	1,185,040	5.1	16	1,185,040	5.4
HG	7	324,280	8.7	3	324,280	3.7
LN	8	664,030	4.8	12	664,030	7.2
LO	15	916,310	6.6	15	916,310	6.5
OR	0	22,540	0.0	0	22,540	0.0
SH	0	22,940	0.0	0	22,940	0.0
TY	4	417,650	3.8	6	417,650	5.7
WI	1	26,640	15.1	2	26,640	29.8
Scotland	**70**	**5,479,900**	**5.1**	**86**	**5,479,900**	**6.2**

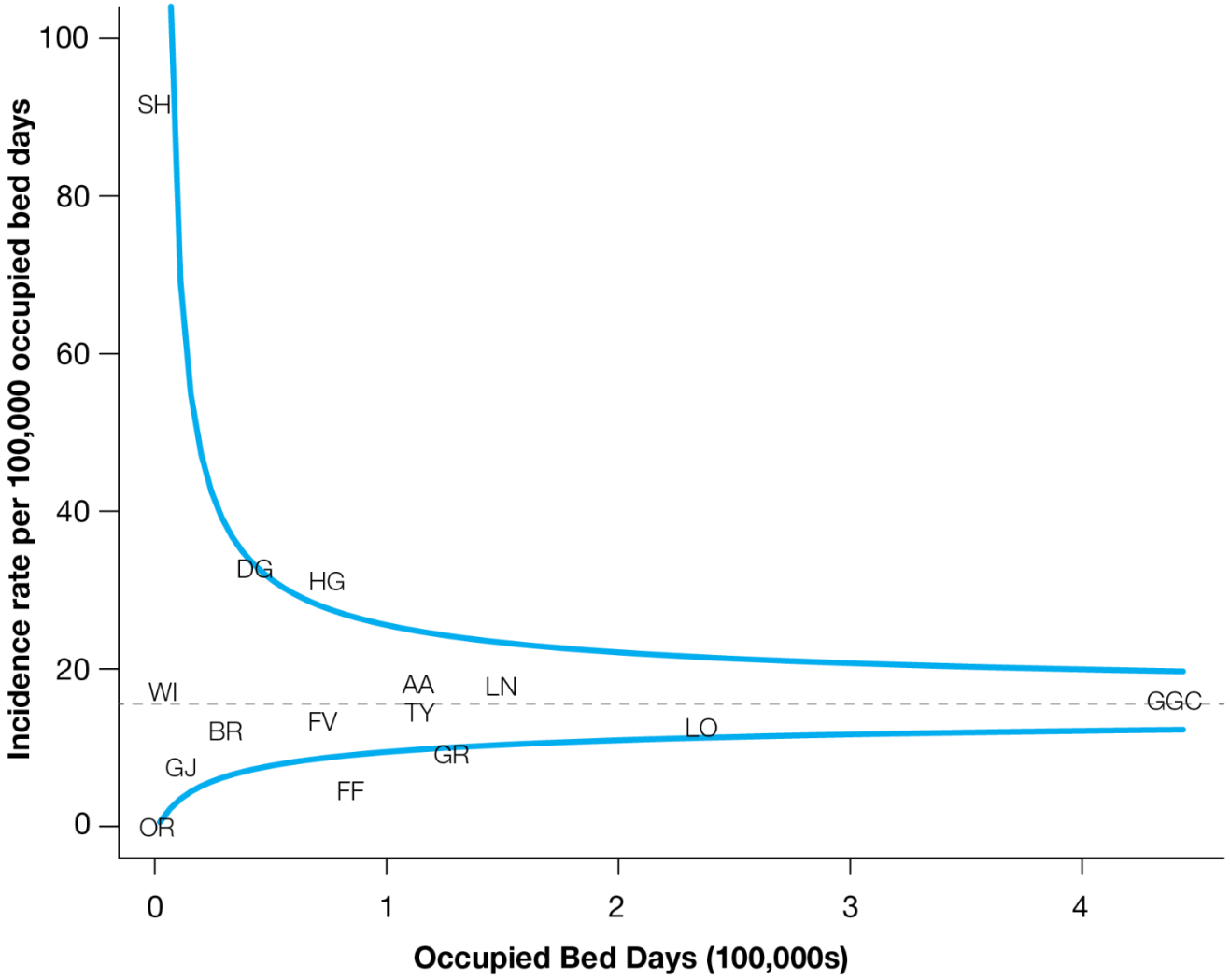
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
4. Figures include any updates 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 September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).[1,2,3]

NHS Board	YE Q3 22 Cases	YE Q3 22 Population	YE Q3 22 Rate	YE Q3 23 Cases	YE Q3 23 Population	YE Q3 23 Rate
AA	24	368,690	6.5	26	368,690	7.1
BR	4	116,020	3.4	5	116,020	4.3
DG	14	148,790	9.4	11	148,790	7.4
FF	9	374,730	2.4	16	374,730	4.3
FV	0	305,710	0.0	3	305,710	1.0
GR	25	586,530	4.3	26	586,530	4.4
GGC	46	1,185,040	3.9	45	1,185,040	3.8
HG	24	324,280	7.4	22	324,280	6.8
LN	30	664,030	4.5	31	664,030	4.7
LO	65	916,310	7.1	48	916,310	5.2
OR	1	22,540	4.4	0	22,540	0.0
SH	0	22,940	0.0	2	22,940	8.7
TY	12	417,650	2.9	19	417,650	4.5
WI	4	26,640	15.0	3	26,640	11.3
Scotland	**258**	**5,479,900**	**4.7**	**257**	**5,479,900**	**4.7**

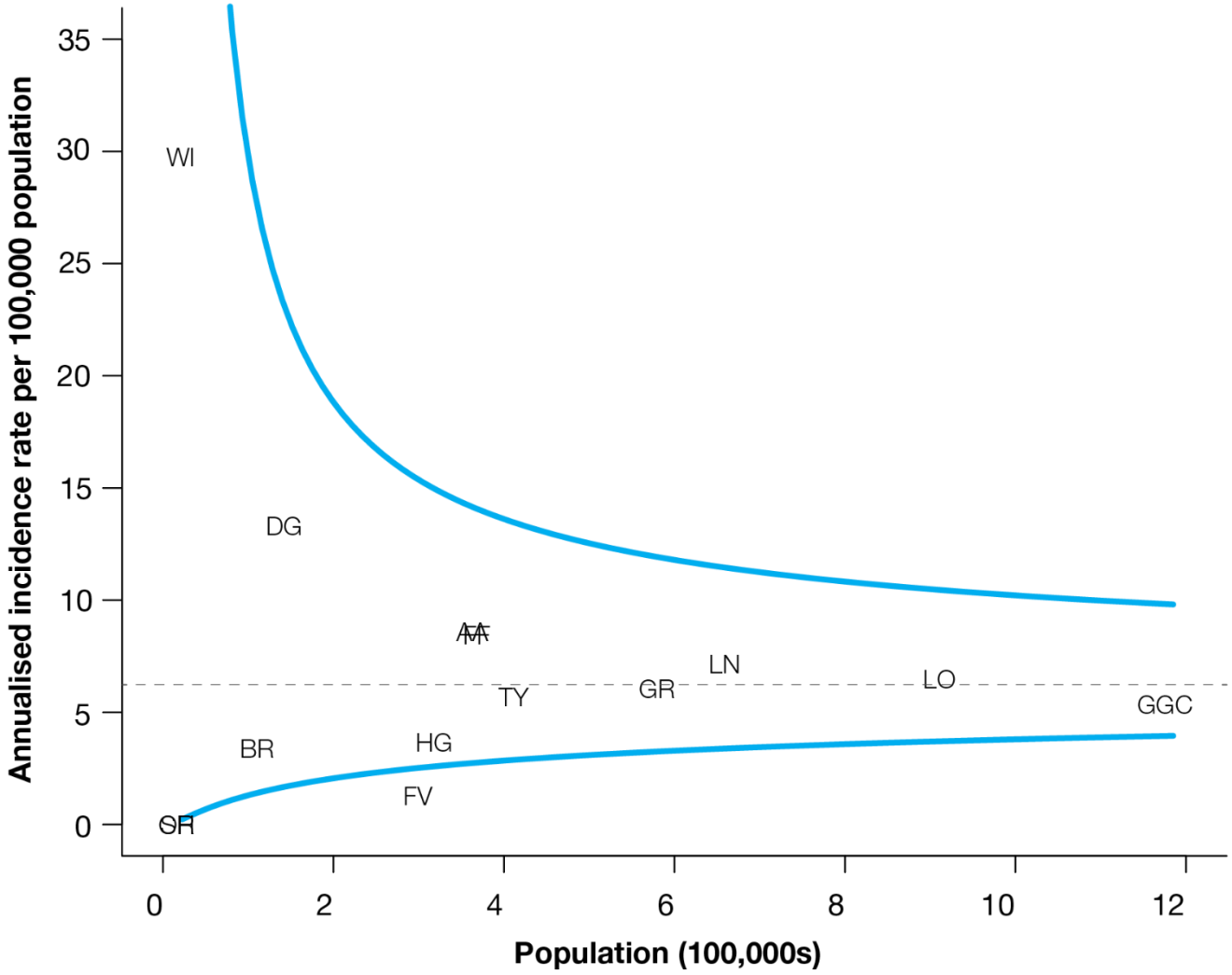
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 1: Funnel plot of CDI incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q3 2023.[1]



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

Figure 2: Funnel plot of CDI incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q3 2023.[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 Orkney and NHS Shetland overlap, as do NHS Ayrshire and Arran and NHS Fife.

Escherichia coli bacteraemia (ECB)

Total Cases for Quarter

- During Q3 2023, 1,155 *Escherichia coli* bacteraemia (ECB) cases in patients were reported to ARHAI. In the previous quarter there were 1,083 cases.

Healthcare associated infection cases by NHS board where specimen taken

- During Q3 2023, 581 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 37.8 cases per 100,000 TOBDs (**Table 5**).
- Yearly trends (comparing year-ending September 2022 with year-ending September 2023) show that there was an increase in NHS Borders, NHS Greater Glasgow & Clyde, NHS Lothian, and NHS Scotland overall (**Table 6**).
- No NHS boards 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 Q3 2023, 574 ECB cases were reported as community associated. This corresponds to an incidence rate of 41.6 cases per 100,000 population and is an increase compared to the Q2 2023 incidence rate of 36.7 cases per 100,000 population (**Table 7**).
- Yearly trends (comparing year-ending September 2022 with year-ending September 2023) show there was a decrease in NHS Fife (**Table 8**).
- NHS Ayrshire & Arran and NHS Highland were above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 4**).
- NHS Highland was 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: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).[1,2,3]

NHS Board	Q2 Cases	Q2 Bed Days	Q2 Rate	Q3 Cases	Q3 Bed Days	Q3 Rate
AA	51	115,702	44.1	48	115,755	41.5
BR	13	31,141	41.7	21	32,770	64.1
DG	25	45,765	54.6	16	45,757	35.0
FF	26	88,856	29.3	28	86,938	32.2
FV	35	75,633	46.3	36	74,790	48.1
GJ	1	13,181	7.6	2	13,279	15.1
GR	41	133,105	30.8	43	130,580	32.9
GGC	156	445,421	35.0	177	443,511	39.9
HG	18	75,789	23.8	24	76,808	31.2
LN	70	151,775	46.1	58	151,491	38.3
LO	79	240,019	32.9	69	237,856	29.0
OR	1	3,469	28.8	1	3,466	28.9
SH	1	2,046	48.9	1	2,180	45.9
TY	64	116,874	54.8	51	116,759	43.7
WI	0	5,886	0.0	6	5,824	103.0
Scotland	**581**	**1,544,662**	**37.6**	**581**	**1,537,764**	**37.8**

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 September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).[1,2,3]

NHS Board	YE Q3 22 Cases	YE Q3 22 Bed days	YE Q3 22 Rate	YE Q3 23 Cases	YE Q3 23 Bed days	YE Q3 23 Rate
AA	190	455,119	41.7	176	469,368	37.5
BR	38	125,492	30.3	60	128,822	↑ 46.6
DG	64	178,489	35.9	73	184,047	39.7
FF	124	348,330	35.6	107	357,238	30.0
FV	163	302,401	53.9	158	307,994	51.3
GJ	4	49,781	8.0	10	52,747	19.0
GR	177	515,053	34.4	196	530,377	37.0
GGC	537	1,699,174	31.6	634	1,780,051	↑ 35.6
HG	65	290,437	22.4	74	304,460	24.3
LN	217	578,742	37.5	247	605,798	40.8
LO	237	973,688	24.3	305	973,716	↑ 31.3
OR	4	13,341	30.0	8	13,390	59.7
SH	12	9,820	122.2	6	9,556	62.8
TY	202	472,007	42.8	232	478,994	48.4
WI	15	25,055	59.9	13	23,836	54.5
Scotland	**2,049**	**6,036,929**	**33.9**	**2,299**	**6,220,394**	**↑ 37.0**

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 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).[1,2,3,4]

NHS Board	Q2 Cases	Q2 Population	Q2 Rate	Q3 Cases	Q3 Population	Q3 Rate
AA	48	368,690	52.2	53	368,690	57.0
BR	14	116,020	48.4	11	116,020	37.6
DG	24	148,790	64.7	15	148,790	40.0
FF	27	374,730	28.9	42	374,730	44.5
FV	17	305,710	22.3	30	305,710	38.9
GR	43	586,530	29.4	47	586,530	31.8
GGC	102	1,185,040	34.5	120	1,185,040	40.2
HG	35	324,280	43.3	48	324,280	58.7
LN	77	664,030	46.5	71	664,030	42.4
LO	74	916,310	32.4	82	916,310	35.5
OR	1	22,540	17.8	4	22,540	70.4
SH	1	22,940	17.5	2	22,940	34.6
TY	36	417,650	34.6	47	417,650	44.6
WI	3	26,640	45.2	2	26,640	29.8
Scotland	**502**	**5,479,900**	**36.7**	**574**	**5,479,900**	**↑ 41.6**

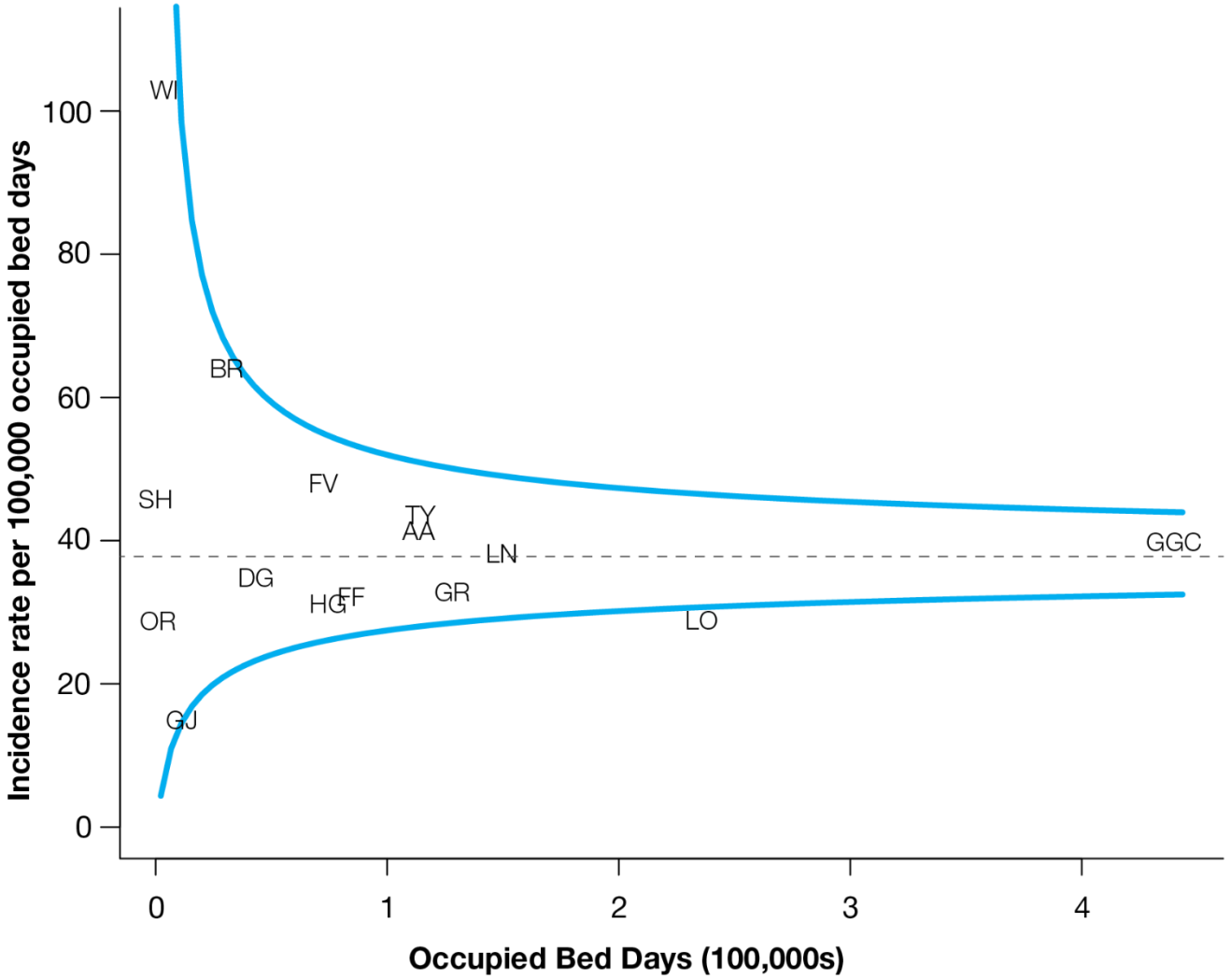
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
4. Figures include any updates 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 September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).[1,2,3]

NHS Board	YE Q3 22 Cases	YE Q3 22 Population	YE Q3 22 Rate	YE Q3 23 Cases	YE Q3 23 Population	YE Q3 23 Rate
AA	205	368,690	55.6	187	368,690	50.7
BR	55	116,020	47.4	50	116,020	43.1
DG	84	148,790	56.5	86	148,790	57.8
FF	177	374,730	47.2	136	374,730	↓ 36.3
FV	108	305,710	35.3	97	305,710	31.7
GR	179	586,530	30.5	171	586,530	29.2
GGC	444	1,185,040	37.5	435	1,185,040	36.7
HG	110	324,280	33.9	140	324,280	43.2
LN	325	664,030	48.9	303	664,030	45.6
LO	318	916,310	34.7	284	916,310	31.0
OR	8	22,540	35.5	14	22,540	62.1
SH	8	22,940	34.9	7	22,940	30.5
TY	154	417,650	36.9	152	417,650	36.4
WI	8	26,640	30.0	6	26,640	22.5
Scotland	**2,183**	**5,479,900**	**39.8**	**2,068**	**5,479,900**	**37.7**

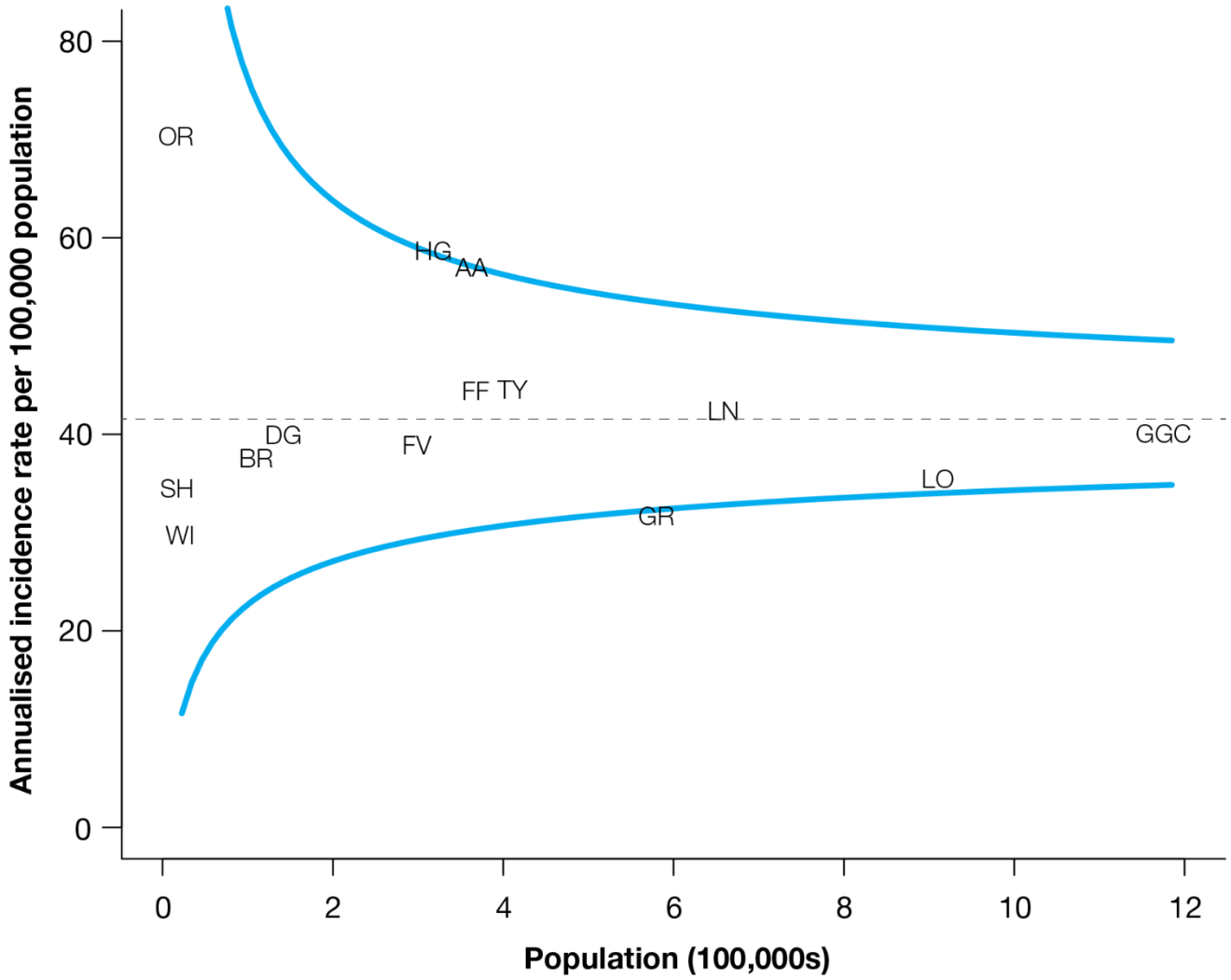
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 3: Funnel plot of ECB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q3 2023.[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 Fife and NHS Highland overlap, as do NHS Ayrshire & Arran and NHS Tayside.

Figure 4: Funnel plot of ECB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q3 2023.[1]



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

Staphylococcus aureus bacteraemia (SAB)

Total cases for quarter

- During Q3 2023, 418 *Staphylococcus aureus* bacteraemia (SAB) cases in patients were reported to ARHAI. In the previous quarter there were 423 SAB cases.

Healthcare associated infection cases by NHS board where specimen taken

- During Q3 2023, 278 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 18.1 cases per 100,000 TOBDs (**Table 9**).
- Yearly trends (comparing year-ending September 2022 with year-ending September 2023) show that there were there was an increase in NHS Ayrshire & Arran, and in Scotland overall (**Table 10**).
- NHS Lanarkshire was above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 5**).
- NHS Lanarkshire was above normal variation when analysing trends over the past three years (see **supplementary data**).

Community associated infection cases by NHS board of residence

- During Q3 2023, 140 SAB cases were reported as community associated. This corresponds to an incidence rate of 10.1 cases per 100,000 population (**Table 11**).
- Yearly trends (comparing year-ending September 2022 with year-ending September 2023) show that there was an increase in NHS Tayside and a decrease in NHS Lothian (**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: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).[1,2,3]

NHS Board	Q2 Cases	Q2 Bed Days	Q2 Rate	Q3 Cases	Q3 Bed Days	Q3 Rate
AA	26	115,702	22.5	23	115,755	19.9
BR	4	31,141	12.8	5	32,770	15.3
DG	5	45,765	10.9	13	45,757	28.4
FF	13	88,856	14.6	8	86,938	9.2
FV	14	75,633	18.5	12	74,790	16.0
GJ	4	13,181	30.3	1	13,279	7.5
GR	19	133,105	14.3	25	130,580	19.1
GGC	91	445,421	20.4	65	443,511	14.7
HG	17	75,789	22.4	13	76,808	16.9
LN	25	151,775	16.5	43	151,491	28.4
LO	31	240,019	12.9	40	237,856	16.8
OR	0	3,469	0.0	0	3,466	0.0
SH	1	2,046	48.9	2	2,180	91.7
TY	29	116,874	24.8	27	116,759	23.1
WI	4	5,886	68.0	1	5,824	17.2
Scotland	**283**	**1,544,662**	**18.3**	**278**	**1,537,764**	**18.1**

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 September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).[1,2,3]

NHS Board	YE Q3 22 Cases	YE Q3 22 Bed days	YE Q3 22 Rate	YE Q3 23 Cases	YE Q3 23 Bed days	YE Q3 23 Rate
AA	69	455,119	15.2	101	469,368	↑ 21.5
BR	18	125,492	14.3	20	128,822	15.5
DG	35	178,489	19.6	32	184,047	17.4
FF	51	348,330	14.6	47	357,238	13.2
FV	48	302,401	15.9	53	307,994	17.2
GJ	12	49,781	24.1	9	52,747	17.1
GR	89	515,053	17.3	103	530,377	19.4
GGC	309	1,699,174	18.2	319	1,780,051	17.9
HG	46	290,437	15.8	56	304,460	18.4
LN	96	578,742	16.6	119	605,798	19.6
LO	131	973,688	13.5	161	973,716	16.5
OR	5	13,341	37.5	0	13,390	0.0
SH	3	9,820	30.5	8	9,556	83.7
TY	104	472,007	22.0	125	478,994	26.1
WI	10	25,055	39.9	10	23,836	42.0
Scotland	**1,026**	**6,036,929**	**17.0**	**1,163**	**6,220,394**	**↑ 18.7**

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: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).[1,2,3,4]

NHS Board	Q2 Cases	Q2 Population	Q2 Rate	Q3 Cases	Q3 Population	Q3 Rate
AA	22	368,690	23.9	11	368,690	11.8
BR	4	116,020	13.8	4	116,020	13.7
DG	4	148,790	10.8	4	148,790	10.7
FF	15	374,730	16.1	9	374,730	9.5
FV	8	305,710	10.5	9	305,710	11.7
GR	12	586,530	8.2	19	586,530	12.9
GGC	20	1,185,040	6.8	21	1,185,040	7.0
HG	3	324,280	3.7	11	324,280	13.5
LN	14	664,030	8.5	18	664,030	10.8
LO	18	916,310	7.9	15	916,310	6.5
OR	1	22,540	17.8	0	22,540	0.0
SH	3	22,940	52.5	4	22,940	69.2
TY	16	417,650	15.4	14	417,650	13.3
WI	0	26,640	0.0	1	26,640	14.9
Scotland	**140**	**5,479,900**	**10.2**	**140**	**5,479,900**	**10.1**

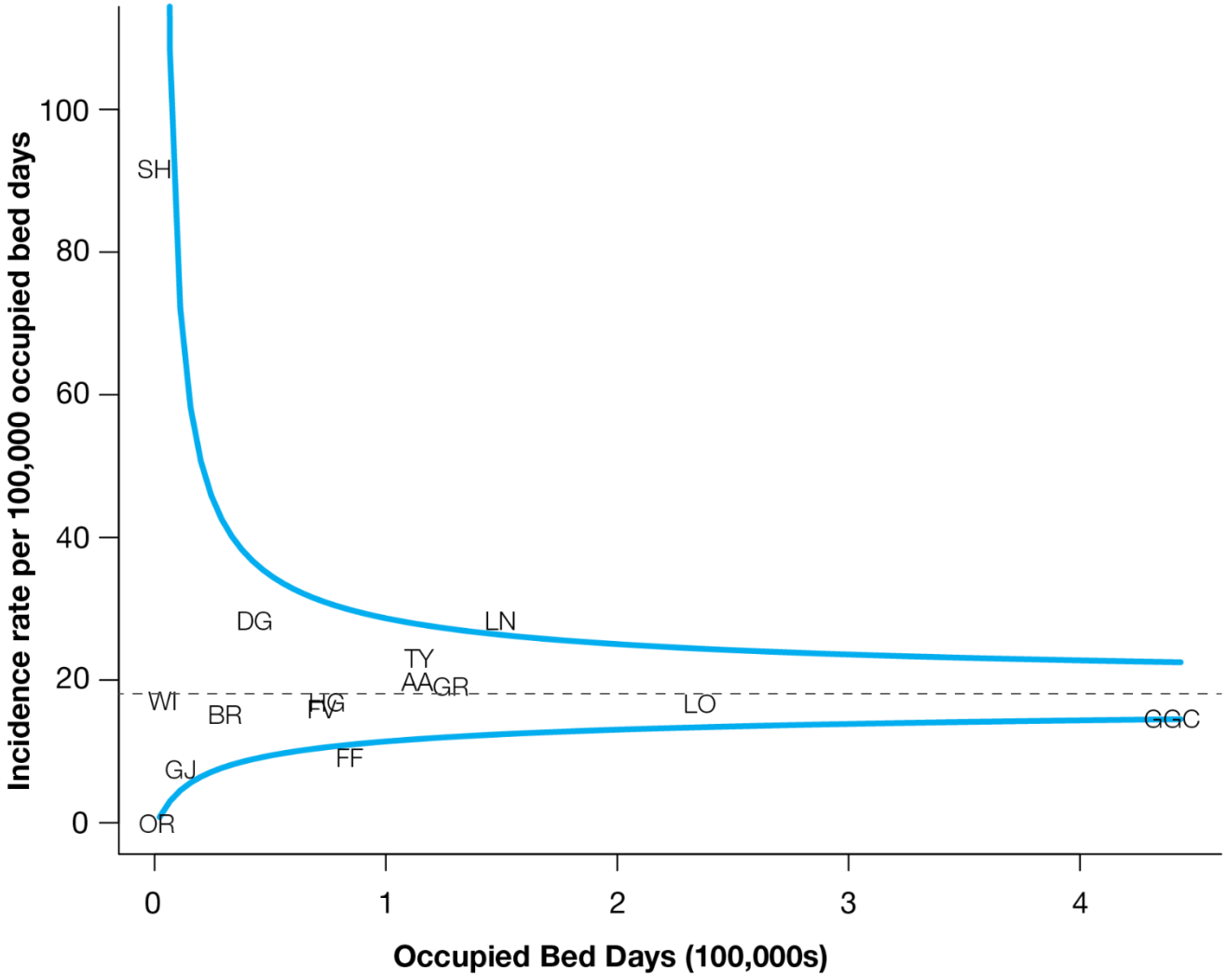
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
4. Figures include any updates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

Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).[1,2,3]

NHS Board	YE Q3 22 Cases	YE Q3 22 Population	YE Q3 22 Rate	YE Q3 23 Cases	YE Q3 23 Population	YE Q3 23 Rate
AA	46	368,690	12.5	59	368,690	16.0
BR	14	116,020	12.1	14	116,020	12.1
DG	29	148,790	19.5	17	148,790	11.4
FF	41	374,730	10.9	49	374,730	13.1
FV	35	305,710	11.4	31	305,710	10.1
GR	67	586,530	11.4	64	586,530	10.9
GGC	73	1,185,040	6.2	81	1,185,040	6.8
HG	31	324,280	9.6	33	324,280	10.2
LN	54	664,030	8.1	60	664,030	9.0
LO	97	916,310	10.6	71	916,310	↓ 7.7
OR	3	22,540	13.3	2	22,540	8.9
SH	3	22,940	13.1	7	22,940	30.5
TY	31	417,650	7.4	55	417,650	↑ 13.2
WI	2	26,640	7.5	1	26,640	3.8
Scotland	**526**	**5,479,900**	**9.6**	**544**	**5,479,900**	**9.9**

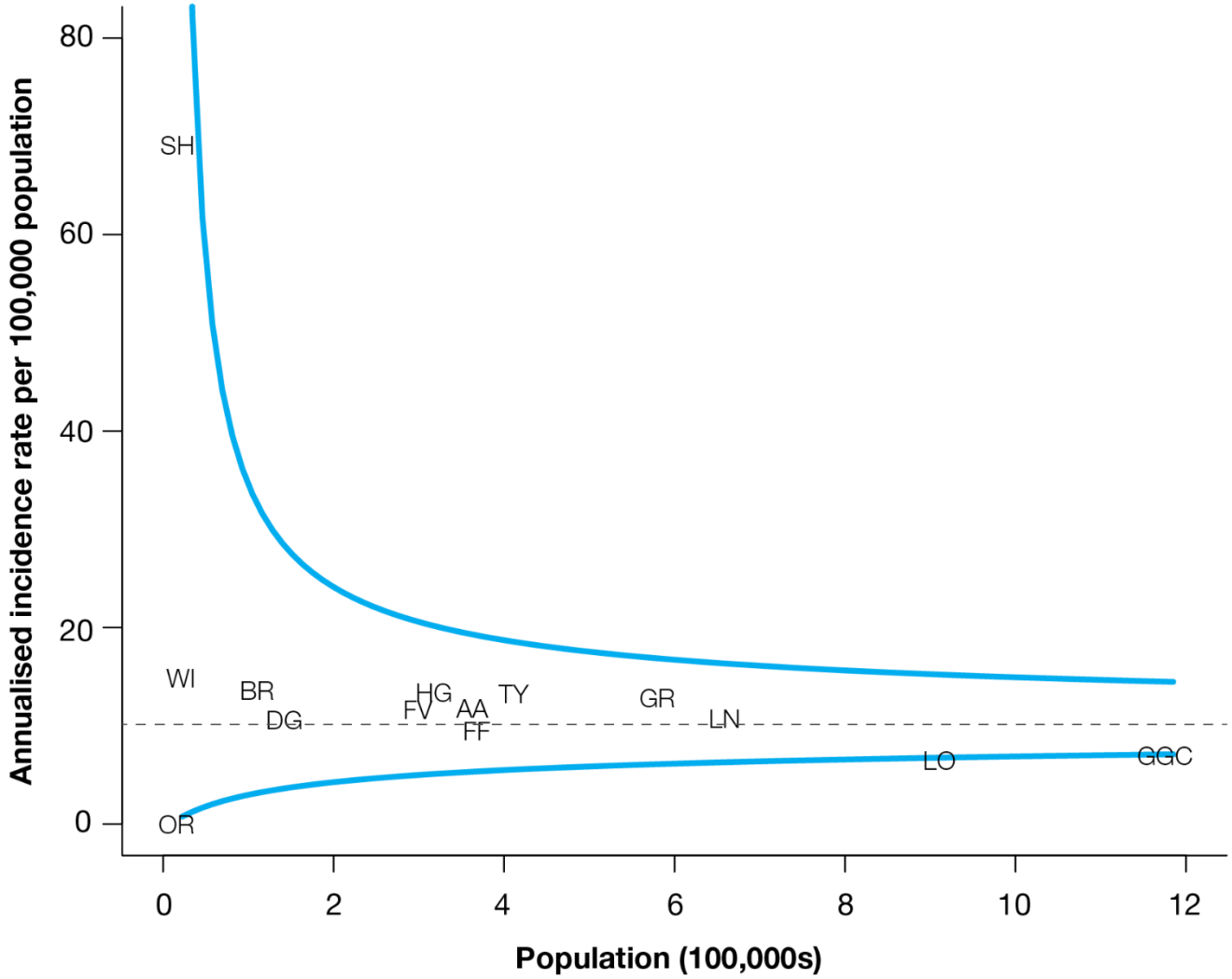
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & National Records of Scotland (NRS) mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 5: Funnel plot of SAB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q3 2023.[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 Forth Valley and NHS Highland overlap.

Figure 6: Funnel plot of SAB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q3 2023.[1]



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

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: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).	supplementary data (490 Kb)
Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).	supplementary data (490 Kb)
Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).	supplementary data (490 Kb)
Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).	supplementary data (490 Kb)
Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).	supplementary data (490 Kb)
Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).	supplementary data (490 Kb)
Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).	supplementary data (490 Kb)
Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).	supplementary data (490 Kb)
Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).	supplementary data (490 Kb)

Name	File and size
Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).	supplementary data (490 Kb)
Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2023 (April to June 2023) compared to Q3 2023 (July to September 2023).	supplementary data (490 Kb)
Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2022 (YE Q3 22) compared to year-ending September 2023 (YE Q3 23).	supplementary data (490 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 April 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 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 July to September 2023.

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: 19/10/2023.

Escherichia coli bacteraemia: 24/11/2023.

Staphylococcus aureus bacteraemia: 24/11/2023.

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

16 January 2024.

Frequency

Quarterly.

Timeframe of data and timeliness

The latest iteration of data is 30 September 2023, therefore the data are three months in arrears.

Continuity of data

Quarterly as at March, June, September, 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.

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

***Clostridioides difficile* infection (CDI)**
Data linkage between CDI surveillance data and the Scottish Morbidity Records (SMR01) is used to assign origin of infection for 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**). In addition during the 2023 Q2 linkage process a small number of CDI cases were miscategorised as Healthcare Associated CDI, as shown in the table below.

Quarter	NHS board	Previous Healthcare associated CDI cases	Updated Healthcare associated CDI cases	Previous Community associated CDI cases	Updated Community associated CDI cases	Reason
2022 Q4	LN	30	29	5	6	Retrospective data amendment
2023 Q1	GGC	53	52	N/A	N/A	Retrospective data amendment
2023 Q1	LN	N/A	N/A	4	5	Retrospective data amendment
2023 Q1	LO	30	29	9	10	Retrospective data amendment
2023 Q2	AA	18	17	4	5	Retrospective data amendment
2023 Q2	FF	N/A	N/A	2	3	Retrospective data amendment
2023 Q2	GGC	71	69	13	15	Retrospective data amendment
2023 Q2	TY	18	17	N/A	N/A	Retrospective data amendment

Escherichia coli bacteraemia (ECB)

There were no retrospective amendments to the data.

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:
SSI rates by health board are not published by the rest of UK. Annual numbers 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-july-to-september-q3-2023/

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.

Disclosure

The PHS 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.

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Next published

April 2024.

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.ARHAIdatateam@nhs.scot

Date form completed

16 January 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'**.