

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

**January to March 2022**

Publication date: 5 July 2022

## This is an Official Statistics Publication

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

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

Find out more about the Code of Practice at:

<https://code.statisticsauthority.gov.uk/>

Find out more about official statistics at:

<https://uksa.statisticsauthority.gov.uk/about-the-authority/uk-statistical-system/producers-of-official-statistics/>

## Contents

Introduction	3
Main Points	4
Results and Commentary	6
<i>Clostridioides difficile</i> Infection (CDI)	6
<i>Escherichia coli</i> bacteraemia (ECB)	14
<i>Staphylococcus aureus</i> bacteraemia (SAB)	21
Surgical Site Infection (SSI)	28
List of Tables	29
Contact	31
Further Information	31
Rate this publication	31
Appendices	32
Appendix 1 – Background information	32
Appendix 2 – Publication Metadata	36
Appendix 3 – Early access details	47
Appendix 4 – ARHAI Scotland and Official Statistics	48

### Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland provides a commentary on quarterly epidemiological data in Scotland for January to March (Q1) 2022 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 2022**

- The total number of CDI cases in patients reported to ARHAI was 230.
- 187 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).
- 43 CDI cases were reported as community associated. This corresponds to an incidence rate of 3.2 cases per 100,000 population.
- NHS Highland was 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 upper limit 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 January to March 2022**

- The total number of ECB cases in patients reported to ARHAI was 980.
- 452 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 30.5 cases per 100,000 TOBDs.
- 528 ECB cases were reported as community associated. This corresponds to an incidence rate of 39.2 cases per 100,000 population.
- NHS Forth Valley and NHS Tayside were above the 95% confidence interval upper limit for healthcare associated ECB in the funnel plot analysis.
- NHS Lanarkshire was 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 2022**

- The total number of SAB cases in patients reported to ARHAI was 371.
- 241 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 16.3 cases per 100,000 TOBDs.
- 130 SAB cases were reported as community associated. This corresponds to an incidence rate of 9.6 cases per 100,000 population.
- No NHS boards were above the 95% confidence interval upper limit for healthcare or community associated SAB in the funnel plot analysis.
- No NHS boards were above normal variation for community associated SAB when analysing trends over the past three years.

### **Surgical Site Infection (SSI) January to March 2022**

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

## Results and Commentary

### *Clostridioides difficile* Infection (CDI)

#### Total Cases for Quarter

- During Q1 2022, 230 *Clostridioides difficile* infection (CDI) cases in patients were reported to ARHAI. In the previous quarter there were 264 cases.
- In the clinical surveillance typing scheme (covering severe cases and/or outbreaks) ribotype 078 (16.0%) was the most common ribotype isolated, followed by 005 (12.0%), 015, 020, 126 (all 8.0%), 026, 050 (both 6.0%), and 013, 023 and 070 (all 4.0%) out of a total of 50 isolates. The remaining ribotypes comprise a mixture each with a prevalence of less than 3%. All clinical surveillance isolates tested were susceptible to metronidazole and vancomycin.
- In the snapshot surveillance (which reflects the general distribution of ribotypes among all CDI cases), ribotype 015 and 078 (both 19.3%) were the most common ribotypes isolated, followed by 005 (8.8%), 023 (7.0%), 002, 020 (both 5.3%), and 013, 050, 072, 126, 137 (all 3.5%) out of a total of 57 isolates. The remaining ribotypes comprise a mixture each with a prevalence of less than 3%. All snapshot surveillance isolates tested were susceptible to both metronidazole and vancomycin.

#### Healthcare associated infection cases by health board where specimen taken

- During Q1 2022, 187 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 2021 with year-ending March 2022) show that there was a decrease in NHS Grampian and in Scotland overall (**Table 2**).
- NHS Highland was above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 1**).

- No NHS boards were above normal variation when analysing trends over the past three years (see [supplementary data](#)).

### Community associated infection cases by health board of residence

- During Q1 2022, 43 CDI cases were reported as community associated. This corresponds to an incidence rate of 3.2 cases per 100,000 population, and is a decrease compared to the Q4 2021 incidence rate of 4.8 cases per 100,000 population ([Table 3](#)).
- Yearly trends (comparing year-ending March 2021 with year-ending March 2022) show that there was no change 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: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).<sup>1,2</sup>**

NHS Board	Q4 Cases	Q4 Bed Days	Q4 Rate	Q1 Cases	Q1 Bed Days	Q1 Rate
AA	26	112,199	23.2	18	112,586	16.0
BR	2	30,470	6.6	1	31,718	3.2
DG	3	44,880	6.7	3	42,386	7.1
FF	4	86,306	4.6	6	85,484	7.0
FV	7	75,758	9.2	9	73,342	12.3
GJ	0	12,615	0.0	0	12,101	0.0
GR	12	125,861	9.5	8	126,203	6.3
GGC	57	416,309	13.7	49	413,693	11.8
HG	14	71,270	19.6	19	70,326	27.0
LN	31	144,693	21.4	22	143,728	15.3
LO	29	245,190	11.8	36	240,326	15.0
OR	0	3,289	0.0	0	3,422	0.0
SH	0	2,344	0.0	2	2,285	87.5
TY	12	116,557	10.3	12	117,130	10.2
WI	1	6,066	16.5	2	6,232	32.1
<b>Scotland</b>	<b>198</b>	<b>1,493,807</b>	<b>13.3</b>	<b>187</b>	<b>1,480,962</b>	<b>12.6</b>

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

2. Figures include any updates received following the last publication (see Appendix 2).

**Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).<sup>1,2,3</sup>**

NHS Board	YE Q1 21 Cases	YE Q1 21 Bed Days	YE Q1 21 Rate	YE Q1 22 Cases	YE Q1 22 Bed Days	YE Q1 22 Rate
AA	88	381,740	23.1	94	435,232	21.6
BR	9	101,260	8.9	8	121,414	6.6
DG	29	138,495	20.9	22	169,643	13.0
FF	29	294,954	9.8	26	336,011	7.7
FV	35	262,177	13.3	31	287,240	10.8
GJ	6	41,573	14.4	0	49,129	0.0
GR	61	422,617	14.4	45	488,979	↓ 9.2
GGC	250	1,457,214	17.2	248	1,639,980	15.1
HG	51	239,591	21.3	62	277,003	22.4
LN	103	476,915	21.6	106	563,870	18.8
LO	128	852,686	15.0	138	959,835	14.4
OR	0	11,031	0.0	0	12,346	0.0
SH	3	7,862	38.2	5	9,110	54.9
TY	33	388,925	8.5	45	451,189	10.0
WI	3	18,297	16.4	3	24,295	12.3
<b>Scotland</b>	<b>828</b>	<b>5,095,337</b>	<b>16.3</b>	<b>833</b>	<b>5,825,276</b>	<b>↓ 14.3</b>

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 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).<sup>1,2,3,4</sup>**

NHS Board	Q4 Cases	Q4 Population	Q4 Rate	Q1 Cases	Q1 Population	Q1 Rate
AA	6	367,990	6.5	2	367,990	2.2
BR	1	115,240	3.4	0	115,240	0.0
DG	5	148,290	13.4	1	148,290	2.7
FF	1	374,130	1.1	2	374,130	2.2
FV	0	305,930	0.0	0	305,930	0.0
GR	5	585,550	3.4	7	585,550	4.8
GGC	11	1,185,240	3.7	7	1,185,240	2.4
HG	4	320,860	4.9	4	320,860	5.1
LN	9	661,960	5.4	7	661,960	4.3
LO	23	912,490	10.0	7	912,490	3.1
OR	0	22,400	0.0	1	22,400	18.1
SH	0	22,870	0.0	0	22,870	0.0
TY	1	416,550	1.0	2	416,550	1.9
WI	0	26,500	0.0	3	26,500	45.9
<b>Scotland</b>	<b>66</b>	<b>5,466,000</b>	<b>4.8</b>	<b>43</b>	<b>5,466,000</b>	<b>↓ 3.2</b>

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).

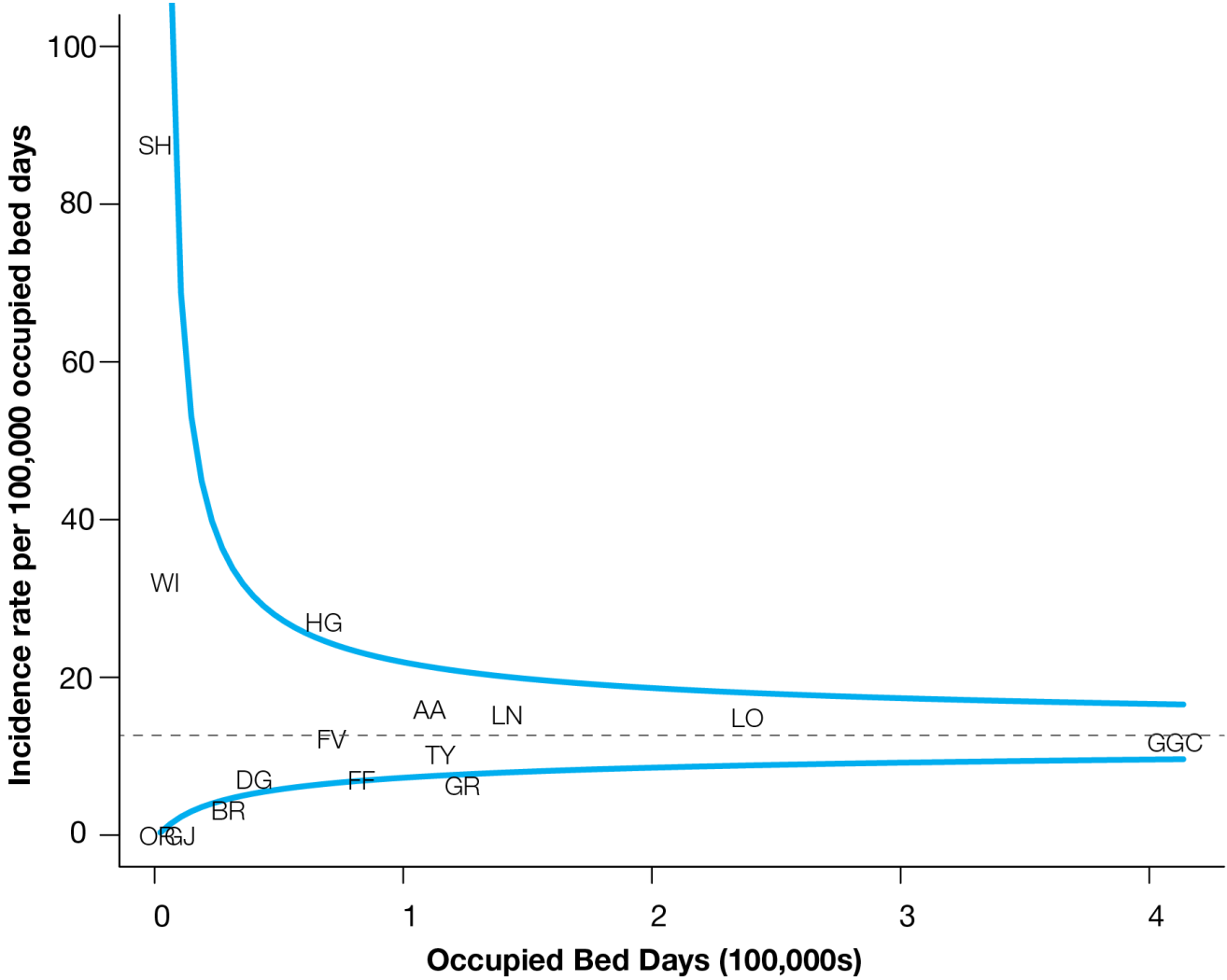
**Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).<sup>1,2</sup>**

<b>NHS Board</b>	<b>YE Q1 21 Cases</b>	<b>YE Q1 21 Population</b>	<b>YE Q1 21 Rate</b>	<b>YE Q1 22 Cases</b>	<b>YE Q1 22 Population</b>	<b>YE Q1 22 Rate</b>
AA	29	367,990	7.9	24	367,990	6.5
BR	4	115,240	3.5	3	115,240	2.6
DG	11	148,290	7.4	17	148,290	11.5
FF	14	374,130	3.7	11	374,130	2.9
FV	4	305,930	1.3	2	305,930	0.7
GR	37	585,550	6.3	23	585,550	3.9
GGC	40	1,185,240	3.4	54	1,185,240	4.6
HG	23	320,860	7.2	20	320,860	6.2
LN	35	661,960	5.3	32	661,960	4.8
LO	56	912,490	6.1	65	912,490	7.1
OR	3	22,400	13.4	3	22,400	13.4
SH	2	22,870	8.7	0	22,870	0.0
TY	15	416,550	3.6	12	416,550	2.9
WI	2	26,500	7.5	4	26,500	15.1
<b>Scotland</b>	<b>275</b>	<b>5,466,000</b>	<b>5.0</b>	<b>270</b>	<b>5,466,000</b>	<b>4.9</b>

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

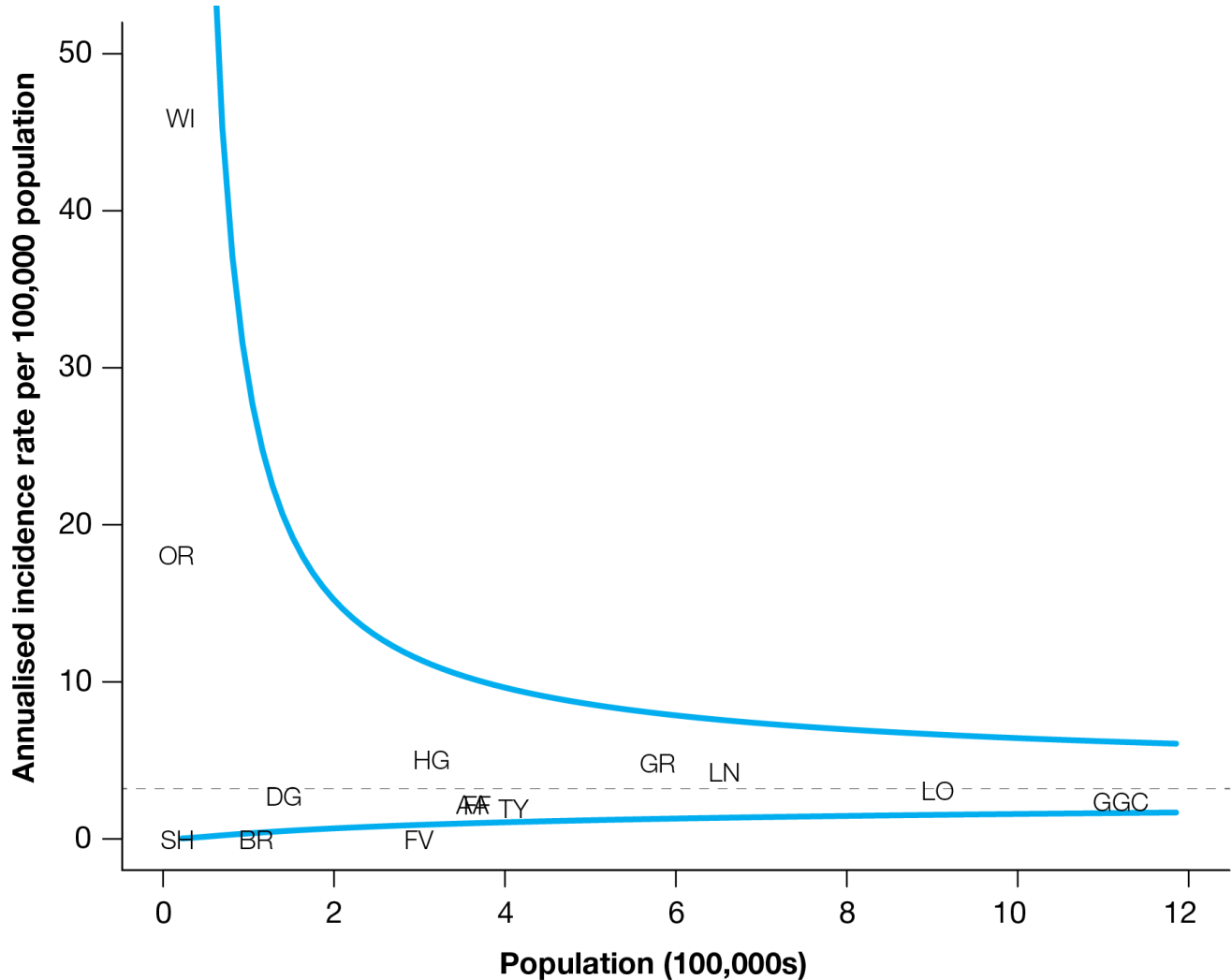
2. Figures include any updates received following the last publication (see Appendix 2).

**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 2022.<sup>1,2</sup>**



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 and NHS Orkney overlap.

**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 2022.<sup>1,2</sup>**



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

## ***Escherichia coli* bacteraemia (ECB)**

### **Total Cases for Quarter**

- During Q1 2022, 980 *Escherichia coli* bacteraemia (ECB) cases in patients were reported to ARHAI. In the previous quarter there were 1,058 cases.

### **Healthcare associated infection cases by health board where specimen taken**

- During Q1 2022, 452 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 30.5 cases per 100,000 TOBDs (**Table 5**).
- Yearly trends (comparing year-ending March 2021 with year-ending March 2022) show that there was a decrease in NHS Greater Glasgow & Clyde, NHS Lanarkshire and in Scotland overall (**Table 6**).
- NHS Forth Valley and NHS Tayside were above the 95% confidence interval upper limit in the funnel plot analysis (**Figure 3**).
- No NHS boards were above normal variation when analysing trends over the past three years (see **supplementary data**).

### **Community associated infection cases by health board of residence**

- During Q1 2022, 528 ECB cases were reported as community associated. This corresponds to an incidence rate of 39.2 cases per 100,000 population (**Table 7**).
- Yearly trends (comparing year-ending March 2021 with year-ending March 2022) show that there was a decrease in NHS Forth Valley, and an increase in NHS Borders and NHS Greater Glasgow & Clyde (**Table 8**).
- NHS Lanarkshire was 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 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).<sup>1,2</sup>**

NHS Board	Q4 Cases	Q4 Bed Days	Q4 Rate	Q1 Cases	Q1 Bed Days	Q1 Rate
AA	55	112,199	49.0	48	112,586	42.6
BR	12	30,470	39.4	6	31,718	18.9
DG	11	44,880	24.5	14	42,386	33.0
FF	29	86,306	33.6	27	85,484	31.6
FV	37	75,758	48.8	38	73,342	51.8
GJ	0	12,615	0.0	0	12,101	0.0
GR	45	125,861	35.8	41	126,203	32.5
GGC	136	416,309	32.7	109	413,693	26.3
HG	23	71,270	32.3	14	70,326	19.9
LN	53	144,693	36.6	41	143,728	28.5
LO	58	245,190	23.7	61	240,326	25.4
OR	0	3,289	0.0	1	3,422	29.2
SH	4	2,344	170.6	1	2,285	43.8
TY	44	116,557	37.7	50	117,130	42.7
WI	2	6,066	33.0	1	6,232	16.0
<b>Scotland</b>	<b>509</b>	<b>1,493,807</b>	<b>34.1</b>	<b>452</b>	<b>1,480,962</b>	<b>30.5</b>

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

2. Figures include any updates received following the last publication (see Appendix 2).



**Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).<sup>1,2,3</sup>**

NHS Board	YE Q1 21 Cases	YE Q1 21 Bed days	YE Q1 21 Rate	YE Q1 22 Cases	YE Q1 22 Bed days	YE Q1 22 Rate
AA	193	381,740	50.6	207	435,232	47.6
BR	48	101,260	47.4	51	121,414	42.0
DG	46	138,495	33.2	62	169,643	36.5
FF	113	294,954	38.3	137	336,011	40.8
FV	143	262,177	54.5	154	287,240	53.6
GJ	3	41,573	7.2	3	49,129	6.1
GR	174	422,617	41.2	171	488,979	35.0
GGC	548	1,457,214	37.6	535	1,639,980	↓ 32.6
HG	69	239,591	28.8	74	277,003	26.7
LN	216	476,915	45.3	202	563,870	↓ 35.8
LO	267	852,686	31.3	281	959,835	29.3
OR	4	11,031	36.3	5	12,346	40.5
SH	7	7,862	89.0	8	9,110	87.8
TY	158	388,925	40.6	198	451,189	43.9
WI	10	18,297	54.7	9	24,295	37.0
<b>Scotland</b>	<b>1,999</b>	<b>5,095,337</b>	<b>39.2</b>	<b>2,097</b>	<b>5,825,276</b>	<b>↓ 36.0</b>

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 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).<sup>1,2,3</sup>**

NHS Board	Q4 Cases	Q4 Population	Q4 Rate	Q1 Cases	Q1 Population	Q1 Rate
AA	59	367,990	63.6	49	367,990	54.0
BR	12	115,240	41.3	15	115,240	52.8
DG	28	148,290	74.9	12	148,290	32.8
FF	37	374,130	39.2	47	374,130	50.9
FV	21	305,930	27.2	27	305,930	35.8
GR	44	585,550	29.8	34	585,550	23.5
GGC	111	1,185,240	37.2	105	1,185,240	35.9
HG	29	320,860	35.9	28	320,860	35.4
LN	76	661,960	45.5	83	661,960	50.9
LO	79	912,490	34.3	83	912,490	36.9
OR	1	22,400	17.7	1	22,400	18.1
SH	4	22,870	69.4	1	22,870	17.7
TY	44	416,550	41.9	41	416,550	39.9
WI	4	26,500	59.9	2	26,500	30.6
<b>Scotland</b>	<b>549</b>	<b>5,466,000</b>	<b>39.8</b>	<b>528</b>	<b>5,466,000</b>	<b>39.2</b>

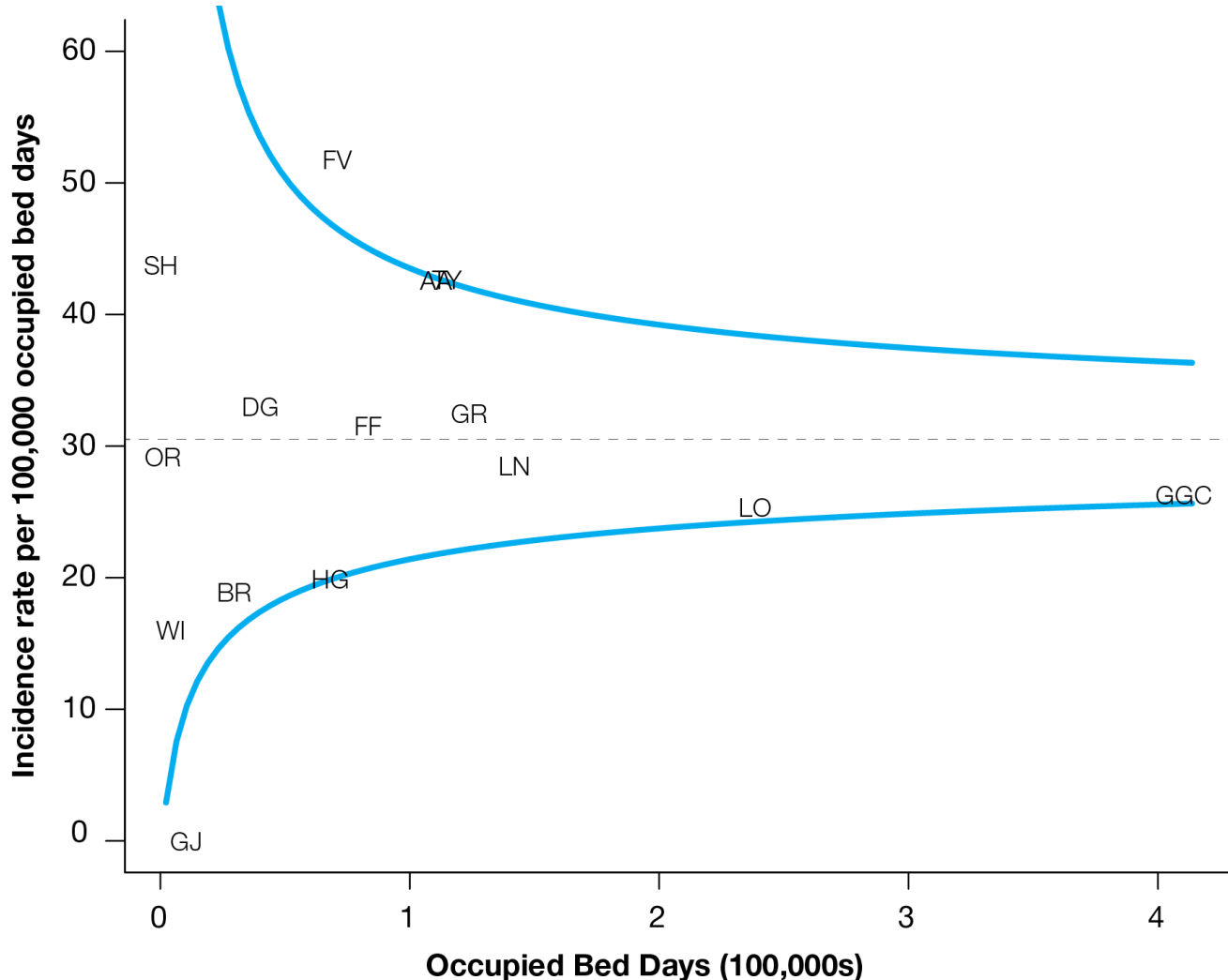
1. Quarterly population rates are based on an annualised population.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

**Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).<sup>1,2,3</sup>**

NHS Board	YE Q1 21 Cases	YE Q1 21 Population	YE Q1 21 Rate	YE Q1 22 Cases	YE Q1 22 Population	YE Q1 22 Rate
AA	207	367,990	56.3	218	367,990	59.2
BR	33	115,240	28.6	55	115,240	↑ 47.7
DG	89	148,290	60.0	87	148,290	58.7
FF	138	374,130	36.9	154	374,130	41.2
FV	169	305,930	55.2	96	305,930	↓ 31.4
GR	167	585,550	28.5	181	585,550	30.9
GGC	391	1,185,240	33.0	467	1,185,240	↑ 39.4
HG	109	320,860	34.0	113	320,860	35.2
LN	321	661,960	48.5	319	661,960	48.2
LO	300	912,490	32.9	321	912,490	35.2
OR	7	22,400	31.2	8	22,400	35.7
SH	5	22,870	21.9	9	22,870	39.4
TY	164	416,550	39.4	169	416,550	40.6
WI	16	26,500	60.4	17	26,500	64.2
<b>Scotland</b>	<b>2,116</b>	<b>5,466,000</b>	<b>38.7</b>	<b>2,214</b>	<b>5,466,000</b>	<b>40.5</b>

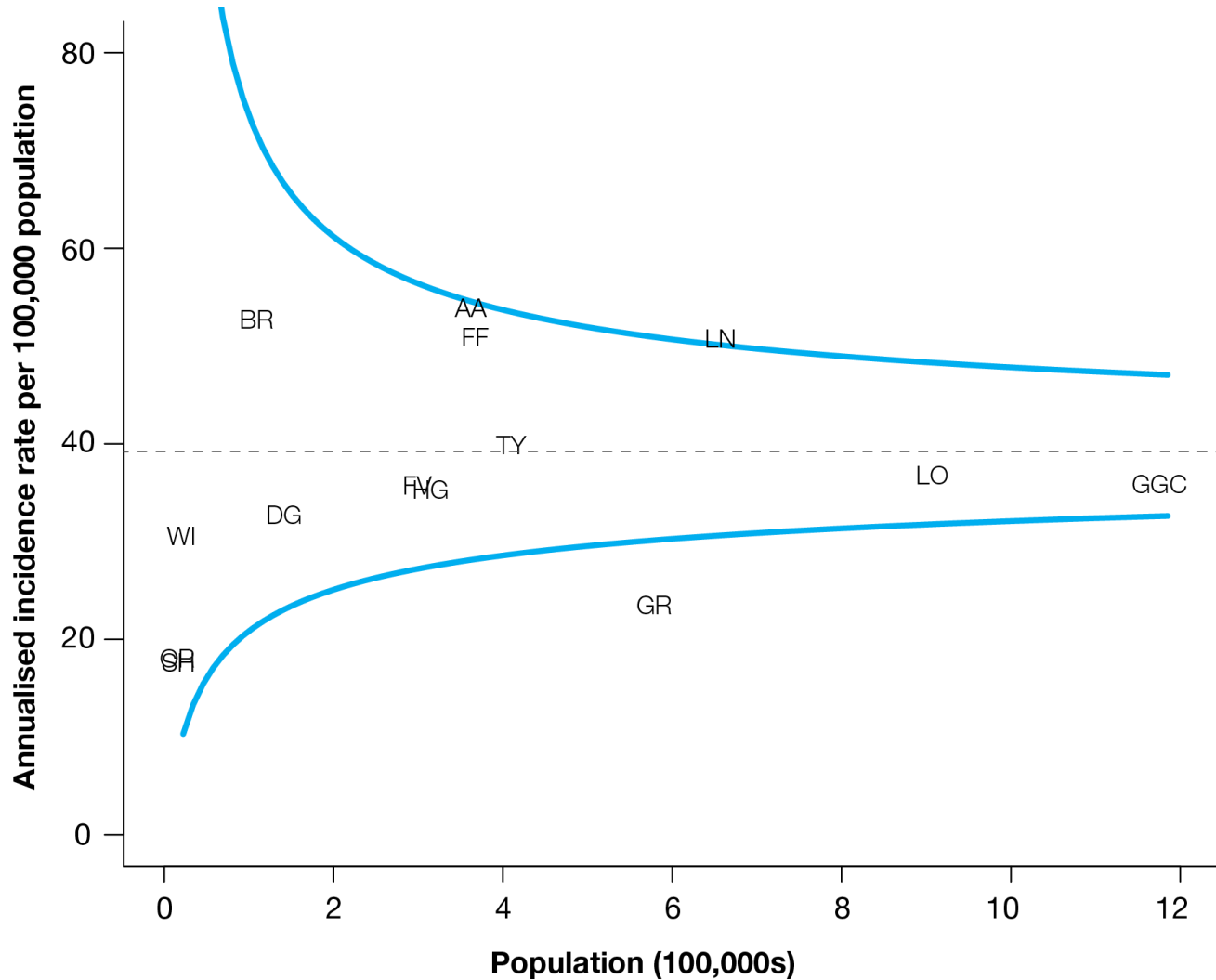
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

**Figure 3: Funnel plot of ECB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q1 2022.<sup>1,2</sup>**



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
2. NHS Ayrshire & Arran and NHS Tayside overlap.

**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 2022.<sup>1,2</sup>**



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
2. NHS Forth Valley and NHS Highland overlap as do NHS Orkney and NHS Shetland.

## ***Staphylococcus aureus* bacteraemia (SAB)**

### **Total cases for quarter**

- During Q1 2022, 371 *Staphylococcus aureus* bacteraemia (SAB) cases were reported to ARHAI. In the previous quarter there were 395 SAB cases.

### **Healthcare associated infection cases by health board where specimen taken**

- During Q1 2022, 241 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 16.3 cases per 100,000 TOBDs (**Table 9**).
- Yearly trends (comparing year-ending March 2021 with year-ending March 2022) show that there was no increase or decrease in NHS boards or 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 health board of residence**

- During Q1 2022, 130 SAB cases were reported as community associated. This corresponds to an incidence rate of 9.6 cases per 100,000 population (**Table 11**).
- Yearly trends (comparing year-ending March 2021 with year-ending March 2022) show that there was an increase in NHS Dumfries & Galloway (**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 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).<sup>1,2</sup>**

NHS Board	Q4 Cases	Q4 Bed Days	Q4 Rate	Q1 Cases	Q1 Bed Days	Q1 Rate
AA	15	112,199	13.4	19	112,586	16.9
BR	4	30,470	13.1	4	31,718	12.6
DG	7	44,880	15.6	10	42,386	23.6
FF	11	86,306	12.7	13	85,484	15.2
FV	16	75,758	21.1	10	73,342	13.6
GJ	2	12,615	15.9	1	12,101	8.3
GR	27	125,861	21.5	23	126,203	18.2
GGC	80	416,309	19.2	72	413,693	17.4
HG	14	71,270	19.6	18	70,326	25.6
LN	24	144,693	16.6	21	143,728	14.6
LO	26	245,190	10.6	25	240,326	10.4
OR	0	3,289	0.0	2	3,422	58.4
SH	1	2,344	42.7	1	2,285	43.8
TY	27	116,557	23.2	21	117,130	17.9
WI	5	6,066	82.4	1	6,232	16.0
<b>Scotland</b>	<b>259</b>	<b>1,493,807</b>	<b>17.3</b>	<b>241</b>	<b>1,480,962</b>	<b>16.3</b>

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

2. Figures include any updates received following the last publication (see Appendix 2).

**Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).<sup>1,2</sup>**

<b>NHS Board</b>	<b>YE Q1 21 Cases</b>	<b>YE Q1 21 Bed days</b>	<b>YE Q1 21 Rate</b>	<b>YE Q1 22 Cases</b>	<b>YE Q1 22 Bed days</b>	<b>YE Q1 22 Rate</b>
AA	76	381,740	19.9	69	435,232	15.9
BR	19	101,260	18.8	21	121,414	17.3
DG	19	138,495	13.7	33	169,643	19.5
FF	48	294,954	16.3	43	336,011	12.8
FV	57	262,177	21.7	53	287,240	18.5
GJ	10	41,573	24.1	11	49,129	22.4
GR	87	422,617	20.6	94	488,979	19.2
GGC	277	1,457,214	19.0	319	1,639,980	19.5
HG	33	239,591	13.8	50	277,003	18.1
LN	98	476,915	20.5	92	563,870	16.3
LO	119	852,686	14.0	131	959,835	13.6
OR	1	11,031	9.1	2	12,346	16.2
SH	4	7,862	50.9	4	9,110	43.9
TY	92	388,925	23.7	98	451,189	21.7
WI	7	18,297	38.3	7	24,295	28.8
<b>Scotland</b>	<b>947</b>	<b>5,095,337</b>	<b>18.6</b>	<b>1,027</b>	<b>5,825,276</b>	<b>17.6</b>

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

2. Figures include any updates received following the last publication (see Appendix 2).



**Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).<sup>1,2,3</sup>**

NHS Board	Q4 Cases	Q4 Population	Q4 Rate	Q1 Cases	Q1 Population	Q1 Rate
AA	12	367,990	12.9	15	367,990	16.5
BR	3	115,240	10.3	5	115,240	17.6
DG	8	148,290	21.4	8	148,290	21.9
FF	8	374,130	8.5	12	374,130	13.0
FV	9	305,930	11.7	9	305,930	11.9
GR	15	585,550	10.2	16	585,550	11.1
GGC	20	1,185,240	6.7	17	1,185,240	5.8
HG	10	320,860	12.4	3	320,860	3.8
LN	17	661,960	10.2	14	661,960	8.6
LO	21	912,490	9.1	19	912,490	8.4
OR	0	22,400	0.0	2	22,400	36.2
SH	1	22,870	17.3	0	22,870	0.0
TY	12	416,550	11.4	9	416,550	8.8
WI	0	26,500	0.0	1	26,500	15.3
<b>Scotland</b>	<b>136</b>	<b>5,466,000</b>	<b>9.9</b>	<b>130</b>	<b>5,466,000</b>	<b>9.6</b>

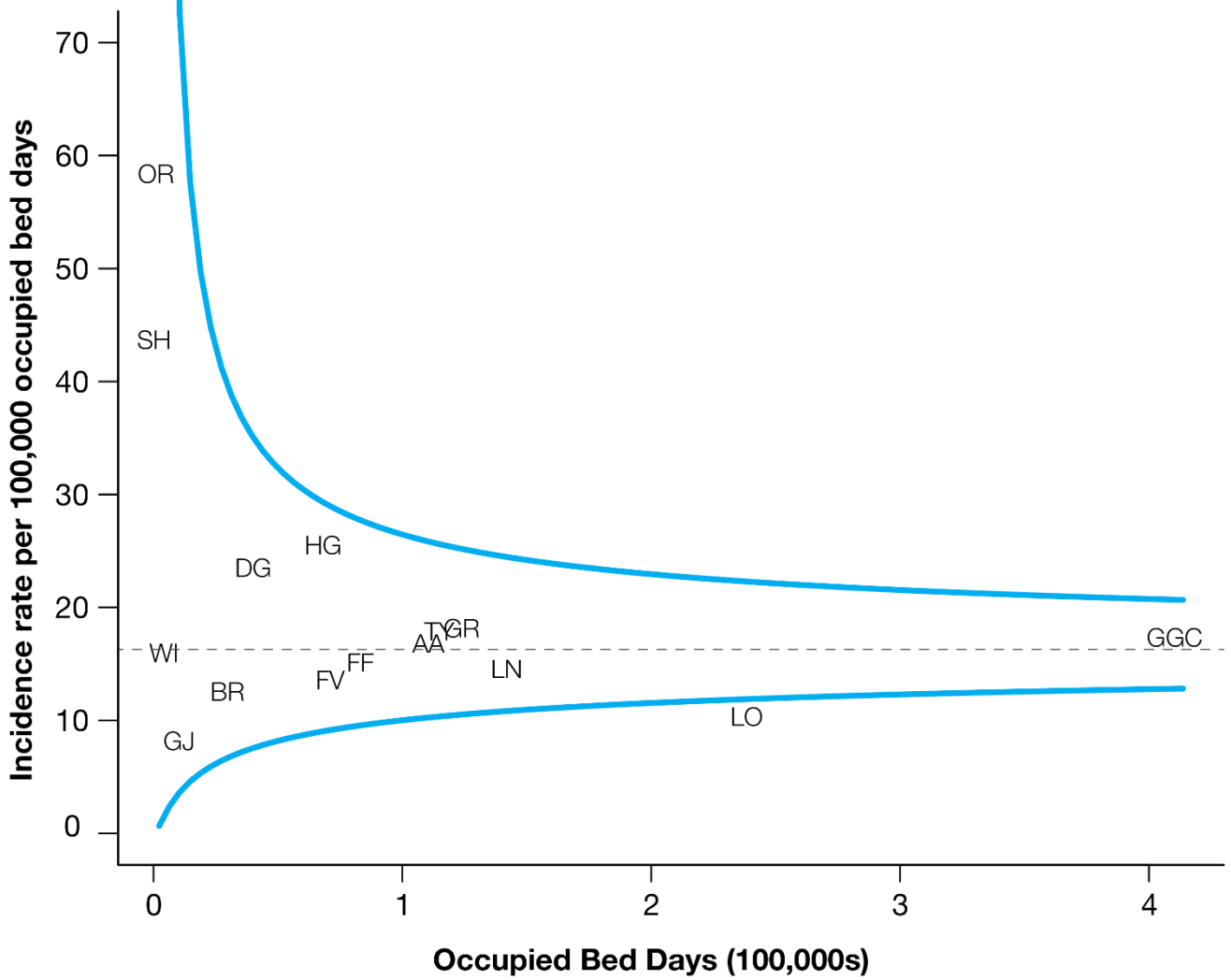
1. Quarterly population rates are based on an annualised population.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

**Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).<sup>1,2,3</sup>**

NHS Board	YE Q1 21 Cases	YE Q1 21 Population	YE Q1 21 Rate	YE Q1 22 Cases	YE Q1 22 Population	YE Q1 22 Rate
AA	49	367,990	13.3	52	367,990	14.1
BR	14	115,240	12.1	17	115,240	14.8
DG	11	148,290	7.4	32	148,290	↑ 21.6
FF	44	374,130	11.8	37	374,130	9.9
FV	40	305,930	13.1	30	305,930	9.8
GR	61	585,550	10.4	61	585,550	10.4
GGC	79	1,185,240	6.7	75	1,185,240	6.3
HG	35	320,860	10.9	32	320,860	10.0
LN	72	661,960	10.9	69	661,960	10.4
LO	94	912,490	10.3	86	912,490	9.4
OR	2	22,400	8.9	2	22,400	8.9
SH	0	22,870	0.0	3	22,870	13.1
TY	46	416,550	11.0	48	416,550	11.5
WI	5	26,500	18.9	2	26,500	7.5
<b>Scotland</b>	<b>552</b>	<b>5,466,000</b>	<b>10.1</b>	<b>546</b>	<b>5,466,000</b>	<b>10.0</b>

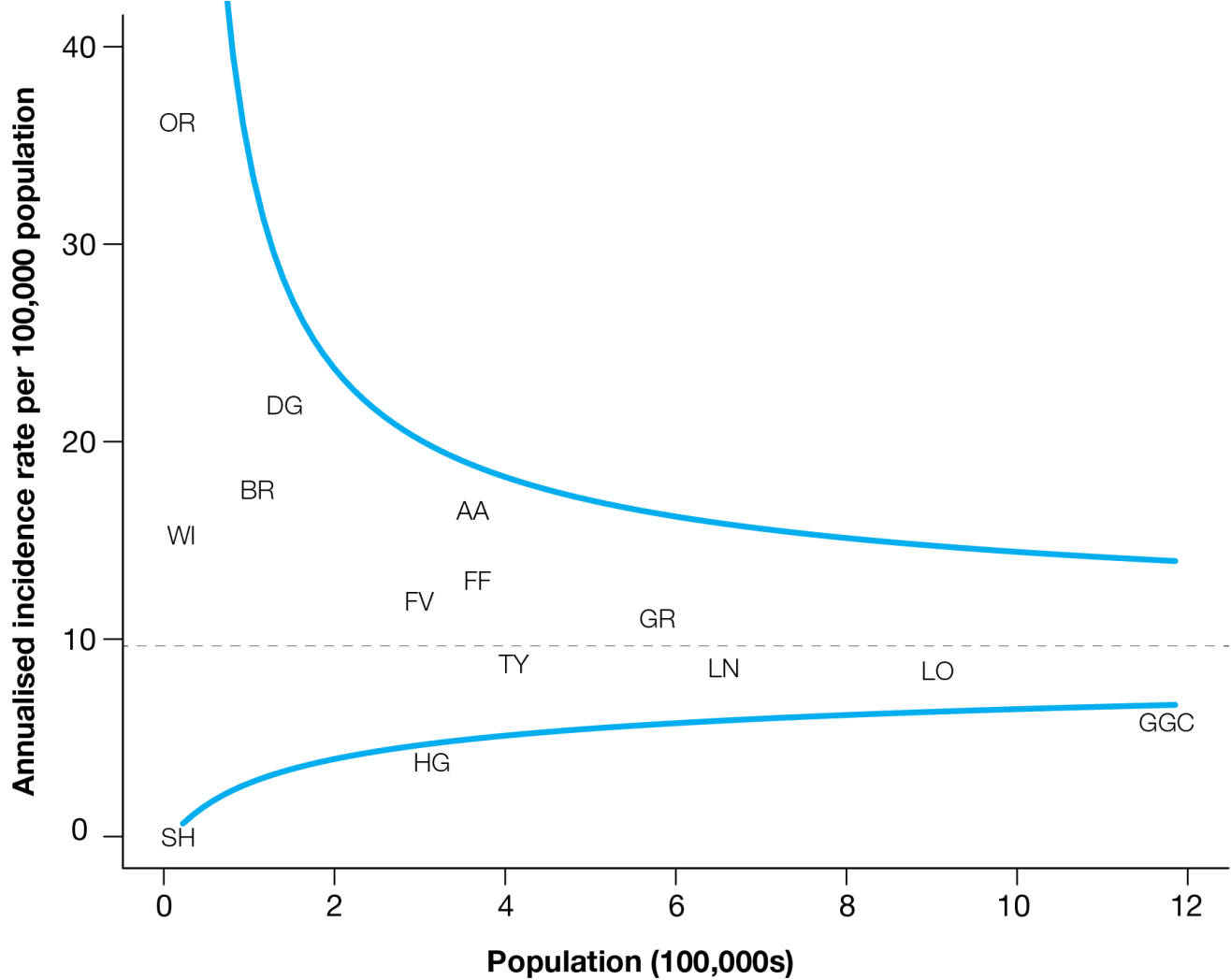
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

**Figure 5: Funnel plot of SAB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q1 2022.<sup>1,2</sup>**



1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & Total occupied bed days: Information Services Division ISD(S)1.
2. NHS Ayrshire & Arran, NHS Grampian and NHS Tayside 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 Q1 2022.<sup>1</sup>**



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

## **Surgical Site Infection (SSI)**

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

## List of Tables

File name	File and size
Table 1: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).	supplementary data (471 Kb)
Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).	supplementary data (471 Kb)
Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).	supplementary data (471 Kb)
Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).	supplementary data (471 Kb)
Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).	supplementary data (471 Kb)
Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).	supplementary data (471 Kb)
Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).	supplementary data (471 Kb)
Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).	supplementary data (471 Kb)
Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).	supplementary data (471 Kb)
Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).	supplementary data (471 Kb)

File name	File and size
<b>Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q4 2021 (October to December 2021) compared to Q1 2022 (January to March 2022).</b>	<b>supplementary data (471 Kb)</b>
<b>Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending March 2021 (YE Q1 21) compared to year-ending March 2022 (YE Q1 22).</b>	<b>supplementary data (471 Kb)</b>

## Contact

**Shona Cairns, Consultant Healthcare Scientist, ARHAI Scotland**

**Laura Imrie, Clinical Lead, ARHAI Scotland**

Phone: 0141 300 1922

Email: [NSS.ARHAIdatateam@nhs.scot](mailto:NSS.ARHAIdatateam@nhs.scot)

## Further Information

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

For more information on types of infections included in this report, please see the [CDI](#), [ECB](#), [SAB](#) and [SSI](#) pages.

The next release of this publication will be October 2022.

## Rate this publication

Please [provide feedback](#) on this publication to help us improve our services.



## Appendices

### Appendix 1 – Background information

#### Revisions to the surveillance

Description of Revision	First report revision applied	Report section(s) revision applies to	Rational for revision
Name change for <i>Clostridium difficile</i> to <i>Clostridioides difficile</i> .	October 2018	CDI	A novel genus <i>Clostridioides</i> has been proposed for <i>Clostridium difficile</i> which will now be known as <i>Clostridioides difficile</i> . There are no implications with regards to the natural history of infection, infection prevention and control, or clinical treatment. <a href="https://www.sciencedirect.com/science/article/pii/S1075996416300762?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S1075996416300762?via%3Dihub</a>
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

Description of Revision	First report revision applied	Report section(s) revision applies to	Rational for revision
			preventing infection and driving quality improvement in care, consistency of the denominators over time tend to be more important than getting a very precise estimate of the population at risk, as the primary aim is to reduce infection to a lower incidence relative to what it was at the initial time of benchmarking.
Reporting of CDI cases aged 15 years and above only	October 2017	CDI	Current Scottish Government Local Delivery Plan Standards are based on the incidence rate in cases aged 15 years and above, therefore the report has been aligned to reflect this. ARHAI will continue to monitor CDI incidence rates in the separate age groups (15-64 years and 65 years and above) internally.
Reporting of total SAB cases only (i.e. Removal of MRSA sub-analysis)	October 2017	SAB	MRSA numbers are becoming too small to carry out statistical analysis. ARHAI will continue to monitor internally.
Addition of year end trends to ECB	October 2018	ECB	This analysis (already included for other reported organisms) is now possible for ECB due the amount of data that has now been collected.
Change in production of Quarterly SPC Charts	April 2020	All sections	Updated method used for calculating exceptions within the SPC charts. The mean, Trigger/warning lines (+2 standard deviations) and upper control limits (+3 standard deviations) presented, are now calculated using the 12 quarters prior to the most recent quarter, as to compare the new rate against an existing baseline.
Changes to data collection in	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			<p>required to report risk factor data as would normally be expected under enhanced/extended surveillance for <i>Staphylococcus aureus</i> bacteraemia (SAB), <i>Escherichia coli</i> bacteraemia (ECB) and <i>Clostridioides difficile</i> infection (CDI).</p> <p>All mandatory and voluntary Surgical Site Infection (SSI) surveillance was paused until further notice.</p>
Change from Health Protection Scotland to ARHAI Scotland	October 2020	All sections	<p>In April 2020, as part of launch of Public Health Scotland, the ARHAI Group within Health Protection Scotland (HPS) became ARHAI Scotland.</p> <p>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.</p>
Change from National Waiting Times Centre (NWTC) to NHS Golden Jubilee (GJ)	January 2021	All sections	Labelling updated.

## Report methods and caveats

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

### UK comparisons

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

### 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 2022.

### Theme

Infections in Scotland

### Topic

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

### Format

Excel workbooks

### Data source(s)

#### ***Clostridioides difficile* infection:**

**Case data source:** Electronic Communication of Surveillance in Scotland (ECOSS)

**Data linkage source:** General / Acute Inpatient and Day Case Scottish Morbidity Records (SMR01)

**Healthcare associated denominator:** Total occupied bed days: Information Services Division ISD(S)1

**Community associated denominator:** National Records of Scotland (NRS) mid-year population estimates

***Escherichia coli* bacteraemia:**

**Case data source:** Electronic Communication of Surveillance in Scotland (ECOSS) Enhanced Surveillance Web Tool

**Healthcare associated denominator:** Total occupied bed days: Information Services Division ISD(S)1

**Community associated denominator:** NRS mid-year population estimates

***Staphylococcus aureus* bacteraemia:**

**Case data source:** Electronic Communication of Surveillance in Scotland (ECOSS) Enhanced Surveillance Web Tool

**Healthcare associated denominator:** Total occupied bed days: Information Services Division ISD(S)1

**Community associated denominator:** NRS mid-year population estimates

**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*: 22/04/2022

*Escherichia coli* Bacteraemia: 02/06/2022

*Staphylococcus aureus* Bacteraemia: 02/06/2022

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

**Release date**

5 July 2022

**Frequency**

Quarterly

**Timeframe of data and timeliness**

The latest iteration of data is 31 March 2022, 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)**

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

Quarter	NHS Board	Previous TOBDs	Updated TOBDs
2021 Q1	FF	78,623	78,592
2021 Q2	FF	79,787	79,728
2021 Q3	FF	84,518	84,493
2021 Q4	FF	86,250	86,306
2021 Q2	GR	115,651	115,650
2021 Q1	SH	2,106	2,062

### **Surgical Site Infection (SSI)**

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

### **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 *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. The number of patients with *E. coli* bacteraemia (ECB) reported to ARHAI has increased continuously since 2009.

New cases of ECB are identified by laboratory testing (via positive blood cultures) and submitted to the national system ECOSS. Only cases of ECB that have been reviewed and confirmed by the NHS boards in the enhanced surveillance system are included in the quarterly commentaries.

### ***Staphylococcus aureus* Bacteraemia (SAB)**

*Staphylococcus aureus* (*S. aureus*) is a Gram positive bacterium which colonises the nasal cavity of about a quarter of the healthy population. This colonisation is usually harmless. However, infection can occur if *S. aureus* breaches the body's defence systems and can cause a range of illnesses from minor skin infections to serious systemic infections such as bacteraemia. Some strains of *S. aureus* produce toxins or show resistance to first line treatments therefore can be more complicated to treat.

Scotland has had a mandatory meticillin resistant *S. aureus* (MRSA) bacteraemia surveillance programme since 2001. The programme was extended to include meticillin sensitive *S. aureus* (MSSA) bacteraemias in 2006 and in 2014 to include enhanced *S. aureus* bacteraemia (SAB) surveillance. Full details of the surveillance methods may be found in the protocol.

### **Surgical Site Infection (SSI)**

A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where the surgery took place. SSI may be superficial infections involving the skin only, while other SSI is more serious and can involve tissues under the skin, organs, or implanted material.

SSI is one of the most common types of healthcare associated infection in Scotland, estimated to account for 16.5% of inpatient healthcare associated infection within NHSScotland, according to Scottish Point Prevalence Survey 2016. Surgical Site Infection Surveillance (SSIS) is mandatory across NHSScotland and all NHS boards participate in SSI surveillance for all inpatient and post discharge surveillance (PDS) for 10 post-operative days for caesarean section procedures and prospective readmission surveillance for hip arthroplasty for 30 post-operative days. Additional new mandatory large bowel and vascular procedures commenced since April 2017. Reporting these procedures will not take place until it is assessed that robust data have been provided by boards.

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

<https://www.hps.scot.nhs.uk/web-resources-container/quarterly-epidemiological-commentary-for-the-surveillance-of-healthcare-associated-infections-in-scotland-methods-caveats/>

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

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

<https://www.hps.scot.nhs.uk/web-resources-container/quarterly-epidemiological-commentary-for-the-surveillance-of-healthcare-associated-infections-in-scotland-production-of-quarterly-exception-reports-sop/>

### **Relevance and key uses of the statistics**

#### ***Clostridioides difficile* Infection (CDI)**

Surveillance data is essential for monitoring trends and assisting in outbreak investigations. Certain strains of *C. difficile* have been associated with more severe disease (e.g. PCR types 027 and 078) and antibiotic resistance has been suggested to be a factor in the emergence and spread of *C. difficile* epidemic types. In addition, the identification of ribotypes 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, we are collaborating with the Scottish Urinary Tract Infection Network (SUTIN). This will promote collaborative working with our partners within Health and Social Care around change ideas which may reduce the risk of *E. coli* bacteraemia. Work is also being done on improving antimicrobial treatment of people with infections – co-ordinated by the Scottish Antimicrobial Prescribing Group (SAPG) through a network of antimicrobial management teams.

### ***Staphylococcus aureus* Bacteraemia (SAB)**

ARHAI continues to offer support to NHS boards across Scotland to aid their local SAB reduction strategies. A programme of enhanced SAB surveillance commenced in all NHS boards in Scotland on 1 October 2014. This is providing further intelligence to focus future reduction interventions.

### **Surgical Site Infection (SSI)**

SSIs are estimated to double the length of post-operative stay in hospital and significantly increase the cost of care. The national SSIS programme is intended to enhance the quality of patient care with use of data obtained from surveillance to compare incidence of SSI over time and against a benchmark rate and to use this information locally to review and guide clinical practice.

### **Accuracy**

CDI, ECB and SAB data are the product of the Electronic Communication of Surveillance in Scotland (ECOSS). Participating laboratories routinely report all identifications of organisms,

infection or microbiological intoxication, unless they are known to be of no clinical or public health importance. The collected data is used for: the identification of single cases of severe disease, outbreaks, and longer term trends in the incidence of laboratory reported infections, enhanced surveillance, health protection, analytical and statistical use.

Delays in SMR01 data availability at the time of report production means that some CDI cases may be reassigned at a later date. Therefore, healthcare-associated and community-associated CDI cases in this report are provisional and may change as more data becomes available.

The enhanced ECB and SAB ECOSS web tool has built-in validation rules that have to be met before the data is submitted. Further checks of the data are made by ARHAI before the data are analysed. CDI validation of collected data entails sending a list of CDI cases extracted from ECOSS and asking for confirmation that the cases represent true CDI cases, i.e., meet the case definition which is defined in the surveillance protocol sent to all the NHS boards and available on the [website](#). The final list of CDI cases is then agreed before publishing.

SSI data comes from the Surgical Site Infection Reporting System (SSIRS). Complying with a national minimum dataset and definitions for Surgical Site Infections, enables the data submitted to Health Protection Scotland to be mapped into the national dataset following a rigorous quality assurance process.

SSIRS has built-in validation rules and data cannot be submitted until rules are met. SSIRS primary validation checks for incomplete or ambiguous core data fields, for example, if presentation to the surgery is 'emergency' the OPCS code should correspond. Secondary validation includes data checks that can be accepted without completion and/or values that are outside the stated requirements.

### **Completeness**

#### **ECB/SAB:**

Surveillance data are collected using an ECOSS Surveillance Web Tool that allows data collectors in NHS boards to validate ECOSS records as well as additional cases that may not be included in the ECOSS system. This therefore means that completeness is near to 100%.

Only cases reviewed in the enhanced surveillance are included in the 'analysis' in the commentary publication.

### **CDI:**

Diagnosis of CDI is confirmed in a patient who is both symptomatic with diarrhoea and whose stool has tested positive using a two-step diagnostic algorithm. Laboratory reports of positive samples are then sent to ECOSS for data extraction. In the community, patients with CDI may have a mild illness that does not require a GP visit, or the symptoms may not be recognised by a GP for a *C. difficile* test request. In hospitals, the chance of a diarrhoea sample not being tested for *C. difficile* is much lower, and patients who have ileus (i.e., CDI but with no diarrhoea) might be missed; however, as a result of ARHAI published guidance on managing CDI patients, this is not likely. ARHAI carries out validation with the NHS boards to check that no CDI cases have been missed from ECOSS each quarter. As with most surveillance programmes, completeness will not be 100% but mandatory surveillance, supported by ARHAI through issued guidance on diagnosis of CDI and validation of cases, ensures this is as near to 100% as practically possible. When categorising by healthcare or community, not all cases may be successfully data linked in any one quarter. Therefore, the sum total of the healthcare and community CDI cases may not equal the total number of CDI cases reported to ARHAI.

### **SSI:**

Surveillance coordinators are responsible for completeness and accuracy of data. At hospital level, processes are in place to ensure all patients included in the standard surveillance have had forms completed (e.g. cross checking with admission or theatre list). ARHAI also compare SSIRS data with data from ISD to make sure all procedures under surveillance have been included; however, this comparison is only done annually.

### **Comparability**

#### **CDI / ECB / SAB:**

Public Health England report rates per quarter for CDI, ECB and SAB (methods and definitions may differ) – <https://www.gov.uk/government/statistics/mrsa-mssa-and-e-coli-bacteraemia-and-c-difficile-infection-quarterly-epidemiological-commentary>

### **SSI:**

SSI rates by health board are not published by the rest of UK. Annual numbers are reported by Public Health England - <https://www.gov.uk/government/publications/surgical-site-infections-ssi-surveillance-nhs-hospitals-in-england>

### **Accessibility**

It is the policy of ARHAI to make its web sites and products accessible according to **published guidelines**.

### **Coherence and clarity**

Tables and charts are accessible via the HPS website at:

<https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

### **Value type and unit of measurement**

Healthcare associated cases and incidence rates (per 100,000 Total occupied bed days (TOBDs)) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia & *Staphylococcus aureus* bacteraemia.

Community associated cases and incidence rates (per 100,000 population) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia & *Staphylococcus aureus* bacteraemia.

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

### **Last published**

5 April 2022

### **Next published**

October 2022

### **Date of first publication**

7 April 2015

Prior to this *Clostridioides difficile* infection (first publication - 2 Apr 2008) and *Staphylococcus aureus* bacteraemia (first publication - 3 Apr 2002) were separate reports.

### **Help email**

**[NSS.ARHAIdatateam@nhs.scot](mailto:NSS.ARHAIdatateam@nhs.scot)**

### **Date form completed**

5 July 2022

## 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’**.