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

The following is a summary of the ARHAI (Antimicrobial Resistance and Healthcare Associated Infection) Scotland Quarterly Epidemiological Data Report for Quarter 4 (October to December 2020) published on 13th April 2021.

Executive Summary

October – December 2020

Clostridioides difficile Infection (CDI)

- **Total** number of cases of CDIs in NHS Grampian: **28**
  - An **increase** of 4 from the previous quarter (24)
  - 10% of the total across Scotland (278)
  - Rate Healthcare associated NHSG 15.8 NHSS 16.1
    Community associated NHSG 7.5 NHSS 4.3

Escherichia coli bacteraemia (ECB)

- **Total** number of cases of ECBs in NHS Grampian: **78**
  - A **decrease** of 12 from the previous quarter (90)
  - 7.2% of the total across Scotland (1076)
  - Rate Healthcare associated NHSG 39.0 NHSS 40.9
    Community associated NHSG 24.5 NHSS 37.9

Staphylococcus aureus bacteraemia (SAB)

- **Total** cases of SABs in NHS Grampian: **37**
  - A **decrease** of 3 from the previous quarter (40)
  - 9.6% of the total across Scotland (387)
  - Rate Healthcare associated NHSG 19.5 NHSS 18.8
    Community associated NHSG 10.9 NHSS 9.6

Surgical Site Infection (SSI)

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

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

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

Clostridioides difficile Infection (CDI)

- Number of **healthcare associated cases** of CDIs in NHS Grampian: **17**
  - An **increase** of 3 from the previous quarter (14)
  - An incident rate of 15.8 per 100,000 total occupied bed days
  - **Below** the national incident rate (16.1 per 100,000 total occupied bed days)

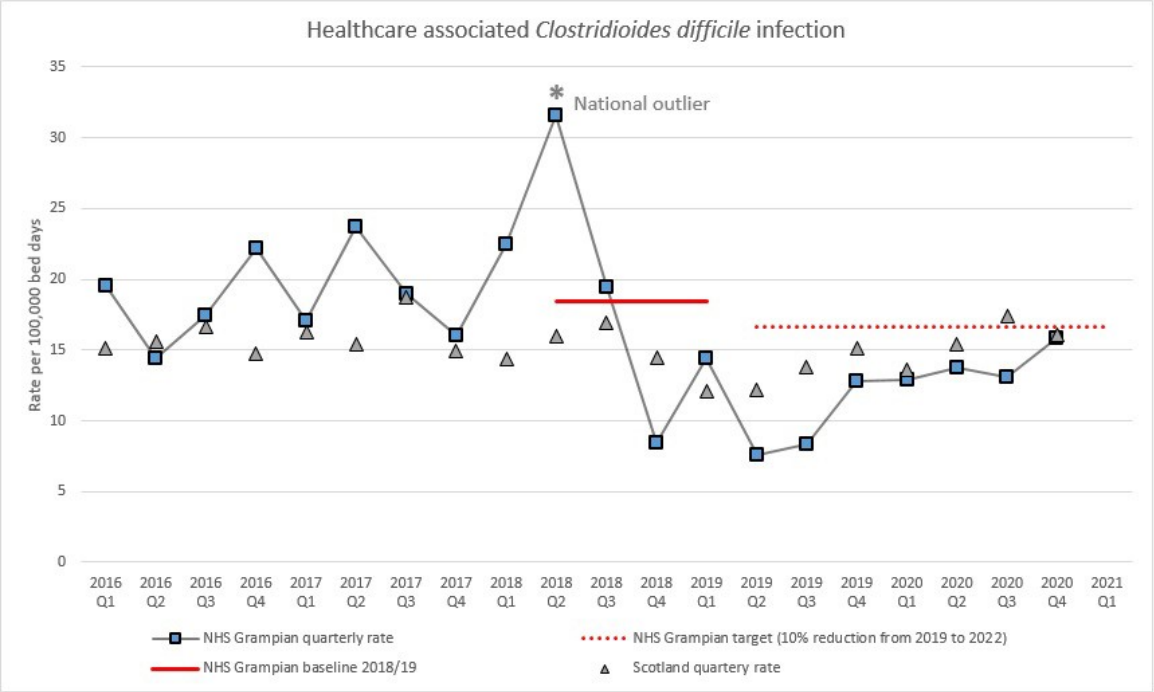

Figure (1a) shows trends in healthcare associated *C. difficile* infection in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q4) NHS Grampian rates of healthcare associated *C. difficile* infection are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report). Locally, NHS Grampian is forecast to meet the Scottish Government target for reducing *C. difficile* infection.

- Number of **community associated cases** of CDIs in NHS Grampian: **11**
  - An **increase** of 1 from the previous quarter (10)
  - An incident rate of 7.5 per 100,000 population
  - **Above** the national incident rate (4.3 per 100,000 population)

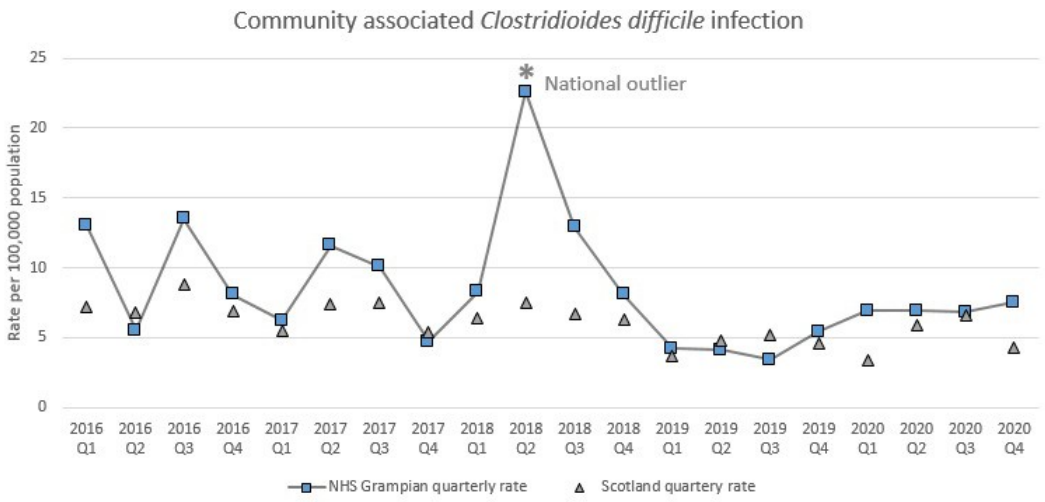

Figure (1b) shows trends in community associated *C. difficile* infection in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q4) NHS Grampian rates of community associated *C. difficile* infection are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report).

Escherichia coli bacteraemia (ECB)

- Number of **healthcare associated cases** of ECBs in NHS Grampian: **42**
  - A **decrease** of 9 from the previous quarter (51)
  - An incident rate of 39.0 per 100,000 total occupied bed days
  - **Below** the national incident rate (40.9 per 100,000 total occupied bed days)

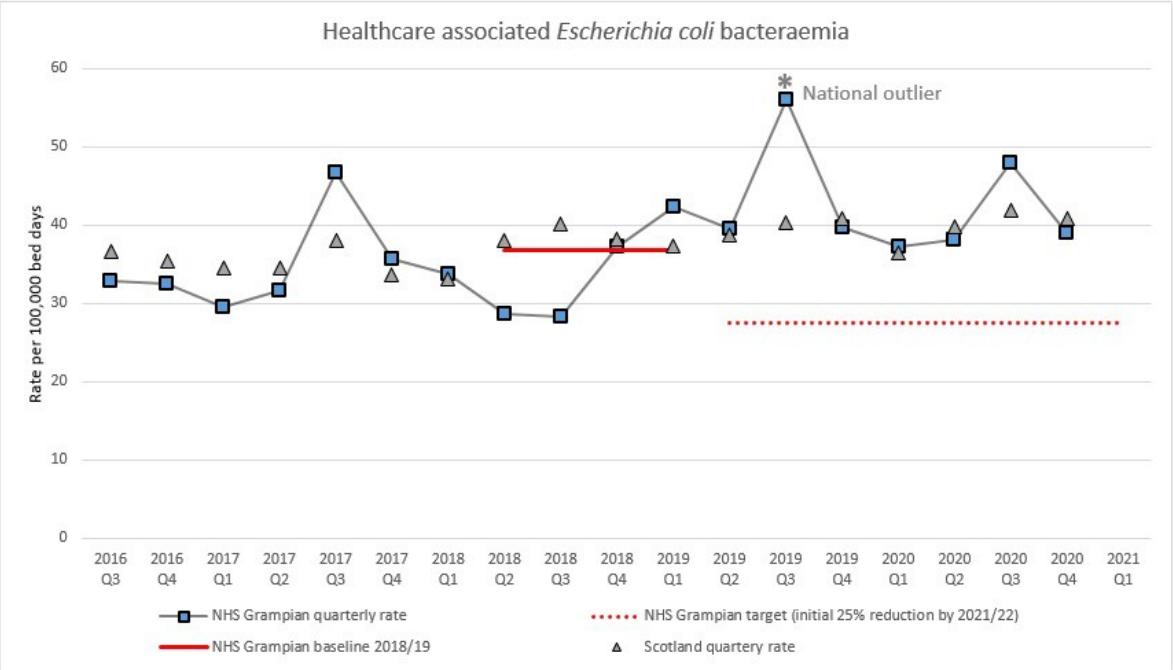

Figure (2a) shows trends in healthcare associated *E. coli* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q4) NHS Grampian rates of healthcare associated *E. coli* bacteraemia are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report). Locally, NHS Grampian like other Health Boards, is not on track to meet the Scottish Government target for reducing *E. coli* bacteraemia. This merits further investigation.

- Number of **community associated cases** of ECBs in NHS Grampian: **36**
  - A **decrease** of 3 from the previous quarter (39)
  - An incident rate of 24.5 per 100,000 population
  - **Below** the national incident rate (37.9 per 100,000 population)

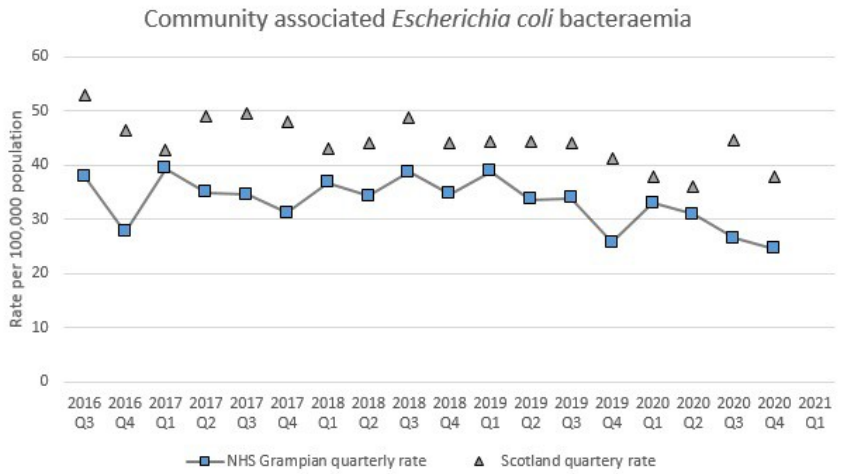

Figure (2b) shows trends in community associated *E. coli* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q4) NHS Grampian rates of community associated *E. coli* bacteraemia are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report).

Staphylococcus aureus bacteraemia (SAB)

- Number of **healthcare associated cases** of SABs in NHS Grampian: **21**
  - A **decrease** of 1 from the previous quarter (22)
  - An incident rate of 19.5 per 100,000 total occupied bed days
  - **Above** the national incident rate (18.8 per 100,000 total occupied bed days)

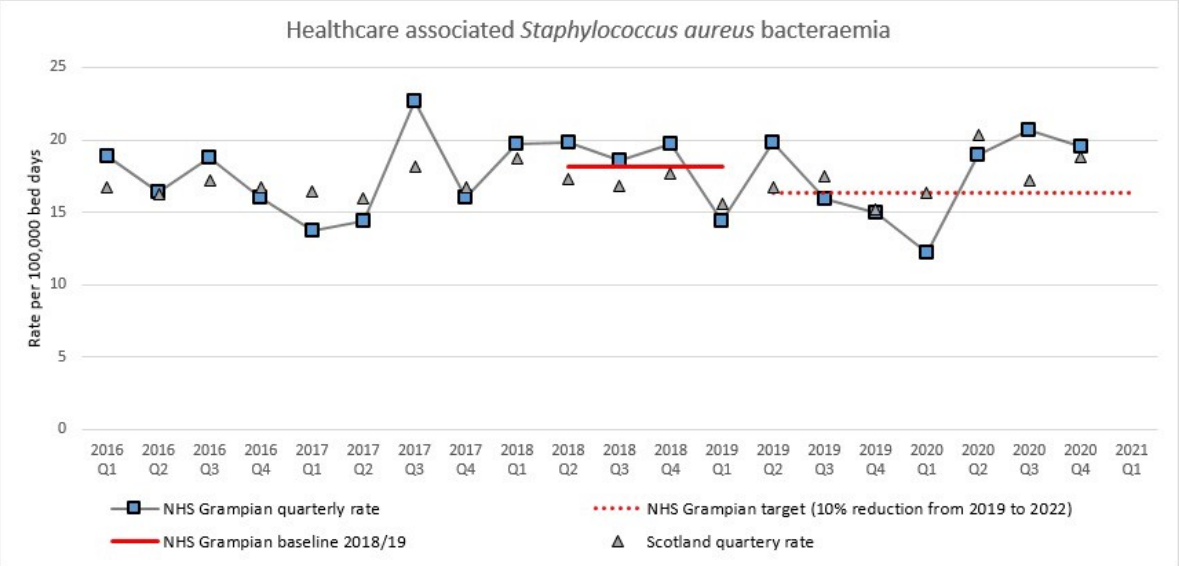

Figure (3a) shows trends in healthcare associated *S. aureus* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q4) NHS Grampian rates of healthcare associated *S. aureus* bacteraemia are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report). Locally, NHS Grampian rates remain static overall.

- Number of **community associated cases** of SABs in NHS Grampian: **16**
  - A **decrease** of 2 from the previous quarter (18)
  - An incident rate of 10.9 per 100,000 population
  - **Above** the national incident rate (9.6 per 100,000 population)

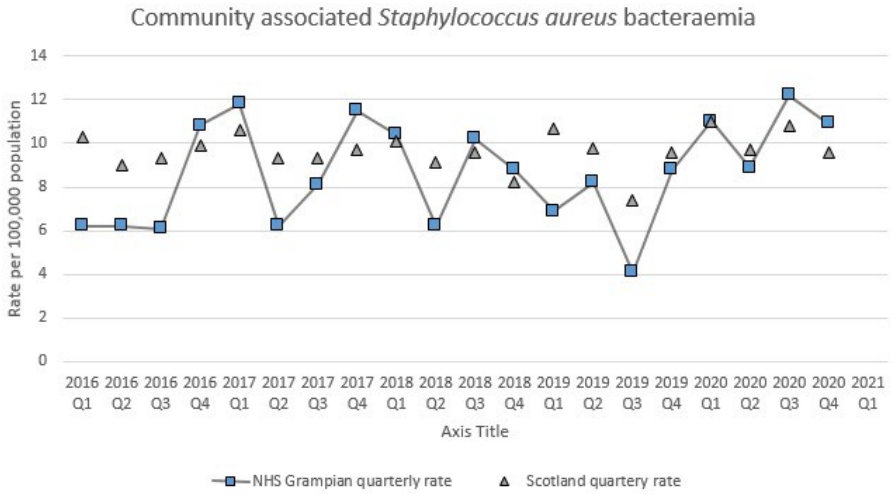

Figure (3b) shows trends in community associated *S. aureus* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q4) NHS Grampian rates of community associated *S. aureus* bacteraemia are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report).

ARHAI Scotland

Antimicrobial Resistance and Healthcare Associated Infection

NHS National Services Scotland

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

October to December 2020

13 April 2021

This is an Official Statistics Publication

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Contents

Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland provides a commentary on quarterly epidemiological data in Scotland for October to December (Q4) 2020 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 October to December 2020

- The total number of CDI cases in patients reported to ARHAI was 278.
- 219 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 16.1 cases per 100,000 total occupied bed days (TOBDs).
- 59 CDI cases were reported as community associated. This corresponds to an incidence rate of 4.3 cases per 100,000 population.
- NHS Ayrshire & Arran 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.
- NHS Ayrshire & Arran were above normal variation for healthcare associated CDI when analysing trends over the past three years.

Escherichia coli bacteraemia (ECB) during October to December 2020

- The total number of ECB cases in patients reported to ARHAI was 1,076.
- 555 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 40.9 cases per 100,000 TOBDs.
- 521 ECB cases were reported as community associated. This corresponds to an incidence rate of 37.9 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 & Arran, NHS Forth Valley and NHS Lanarkshire were above the 95% confidence interval upper limit for community associated ECB in the funnel plot analysis.
- No NHS boards were above normal variation for healthcare or community associated ECB when analysing trends over the past three years.

Staphylococcus aureus bacteraemia (SAB) during October to December 2020

- The total number of SAB cases in patients reported to ARHAI was 387.
- 255 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 18.8 cases per 100,000 TOBDs.
- 132 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 healthcare associated SAB when analysing trends over the past three years.

Surgical Site Infection (SSI) October to December 2020

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 Q4 2020, 278 *Clostridioides difficile* infection (CDI) cases in patients were reported to ARHAI. In the previous quarter there were 317 cases.
- In the clinical surveillance typing scheme (covering severe cases and/or outbreaks) ribotype 023 (16.3%) was the most common ribotype isolated, followed by 005, 015, 020 (all 10.2%), 002, 014, 078 (all 6.1%), and 010, 012, 077, 126 (all 4.1%) out of a total of 49 isolates. The remaining ribotypes comprise a mixture each with a prevalence of less than 3%.
- In the snapshot surveillance (which reflects the general distribution of ribotypes among all CDI cases), ribotype 002 was the most common (16.7%) followed by 015 (10.6%), 005 (9.1%), 020 and 023 (both 7.6%), 014, 078 and 216 (all 4.5%), and 011, 012, 018, 029, 054, 081 and 126 (all 3.0%) out of a total of 66 isolates. The remaining ribotypes comprise a mixture each with a prevalence of less than 3%. All isolates tested (snapshot and clinical) were susceptible to metronidazole and vancomycin.

Healthcare associated infection cases by health board of laboratory

- During Q4 2020, 219 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 16.1 cases per 100,000 total occupied bed days (TOBDs) (Table 1).
- Yearly trends (comparing year-ending December 2019 with year-ending December 2020) show that there was an increase in NHS Dumfries & Galloway, NHS Highland and Scotland overall (Table 2).
- NHS Ayrshire & Arran was above the 95% confidence interval upper limit in the funnel plot analysis (Figure 1).
- NHS Ayrshire & Arran 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 Q4 2020, 59 CDI cases were reported as community associated. This corresponds to an incidence rate of 4.3 cases per 100,000 population. This is a decrease compared to Q3 2020 incidence rate of 6.6 cases per 100,000 population (Table 3).
- Yearly trends (comparing year-ending December 2019 with year-ending December 2020) show that there was no increase or decrease 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: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).[1,2]

NHS Board	Q3 Cases	Q3 Bed Days	Q3 Rate	Q4 Cases	Q4 Bed Days	Q4 Rate
AA	20	97,707	20.5	30	102,772	29.2
BR	2	25,295	7.9	3	27,161	11.0
DG	10	36,727	27.2	8	37,533	21.3
FF	7	75,003	9.3	6	77,486	7.7
FV	10	66,050	15.1	10	70,565	14.2
GJ	1	10,016	10.0	3	11,255	26.7
GR	14	106,471	13.1	17	107,564	15.8
GGC	77	376,935	20.4	62	390,384	15.9
HG	14	59,671	23.5	10	63,656	15.7
LN	27	122,500	22.0	25	127,447	19.6
LO	38	217,934	17.4	29	226,514	12.8
OR	0	2,700	0.0	0	3,055	0.0
SH	2	2,091	95.6	0	2,118	0.0
TY	5	99,019	5.0	15	104,559	14.3
WI	0	4,152	0.0	1	5,151	19.4
Scotland	**227**	**1,302,271**	**17.4**	**219**	**1,357,220**	**16.1**

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 December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).[1,2,3]

NHS Board	YE Q4 19 Cases	YE Q4 19 Bed Days	YE Q4 19 Rate	YE Q4 20 Cases	YE Q4 20 Bed Days	YE Q4 20 Rate
AA	74	443,611	16.7	80	389,793	20.5
BR	17	117,513	14.5	12	101,947	11.8
DG	22	184,346	11.9	33	145,682	22.7 ↑
FF	32	361,726	8.8	25	303,425	8.2
FV	43	305,784	14.1	36	268,373	13.4
GJ	2	47,277	4.2	6	40,338	14.9
GR	57	528,836	10.8	61	440,145	13.9
GGC	265	1,693,580	15.6	253	1,485,198	17.0
HG	37	299,785	12.3	53	244,974	21.6 ↑
LN	86	584,854	14.7	93	490,868	18.9
LO	131	990,795	13.2	122	867,025	14.1
OR	1	13,206	7.6	0	11,041	0.0
SH	5	10,420	48.0	2	8,314	24.1
TY	30	466,505	6.4	35	396,472	8.8
WI	6	27,470	21.8	2	18,860	10.6
Scotland	**808**	**6,075,708**	**13.3**	**813**	**5,212,455**	**15.6** ↑

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: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).[1,2,3,4]

NHS Board	Q3 Cases	Q3 Population	Q3 Rate	Q4 Cases	Q4 Population	Q4 Rate
AA	7	369,360	7.5	8	369,360	8.6
BR	4	115,510	13.8	0	115,510	0.0
DG	6	148,860	16.0	3	148,860	8.0
FF	6	373,550	6.4	2	373,550	2.1
FV	1	306,640	1.3	2	306,640	2.6
GR	10	585,700	6.8	11	585,700	7.5
GGC	10	1,183,120	3.4	11	1,183,120	3.7
HG	8	321,700	9.9	3	321,700	3.7
LN	8	661,900	4.8	4	661,900	2.4
LO	21	907,580	9.2	8	907,580	3.5
OR	2	22,270	35.7	1	22,270	17.9
SH	1	22,920	17.4	1	22,920	17.4
TY	6	417,470	5.7	5	417,470	4.8
WI	0	26,720	0.0	0	26,720	0.0
Scotland	**90**	**5,463,300**	**6.6**	**59**	**5,463,300**	**4.3 ↓**

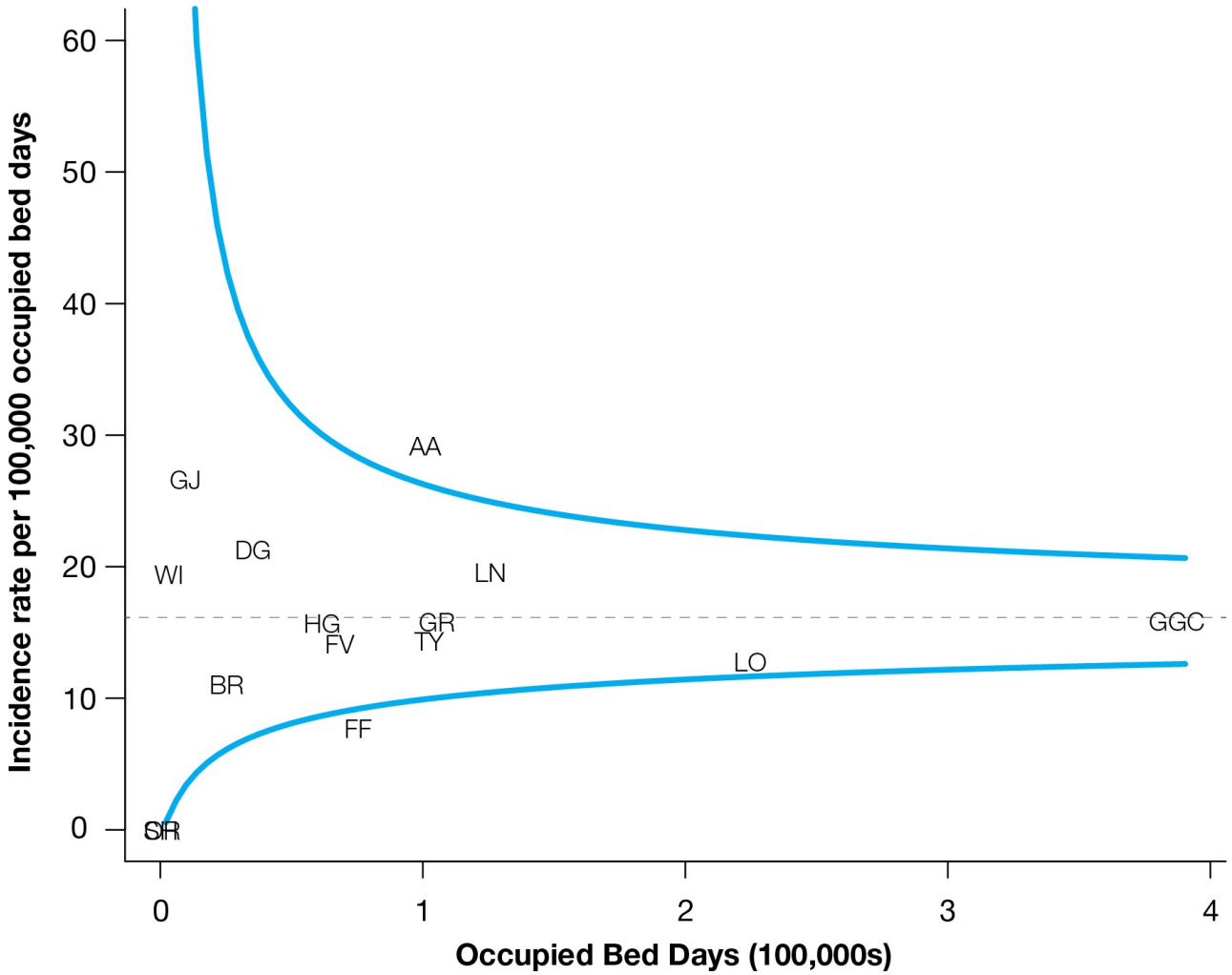
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last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

Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).[1,2]

NHS Board	YE Q4 19 Cases	YE Q4 19 Population	YE Q4 19 Rate	YE Q4 20 Cases	YE Q4 20 Population	YE Q4 20 Rate
AA	22	369,360	6.0	32	369,360	8.7
BR	3	115,510	2.6	7	115,510	6.1
DG	12	148,860	8.1	13	148,860	8.7
FF	15	373,550	4.0	10	373,550	2.7
FV	5	306,640	1.6	6	306,640	2.0
GR	25	585,700	4.3	41	585,700	7.0
GGC	52	1,183,120	4.4	41	1,183,120	3.5
HG	17	321,700	5.3	23	321,700	7.1
LN	37	661,900	5.6	28	661,900	4.2
LO	48	907,580	5.3	54	907,580	5.9
OR	0	22,270	0.0	3	22,270	13.5
SH	0	22,920	0.0	2	22,920	8.7
TY	13	417,470	3.1	13	417,470	3.1
WI	2	26,720	7.5	2	26,720	7.5
Scotland	**251**	**5,463,300**	**4.6**	**275**	**5,463,300**	**5.0**

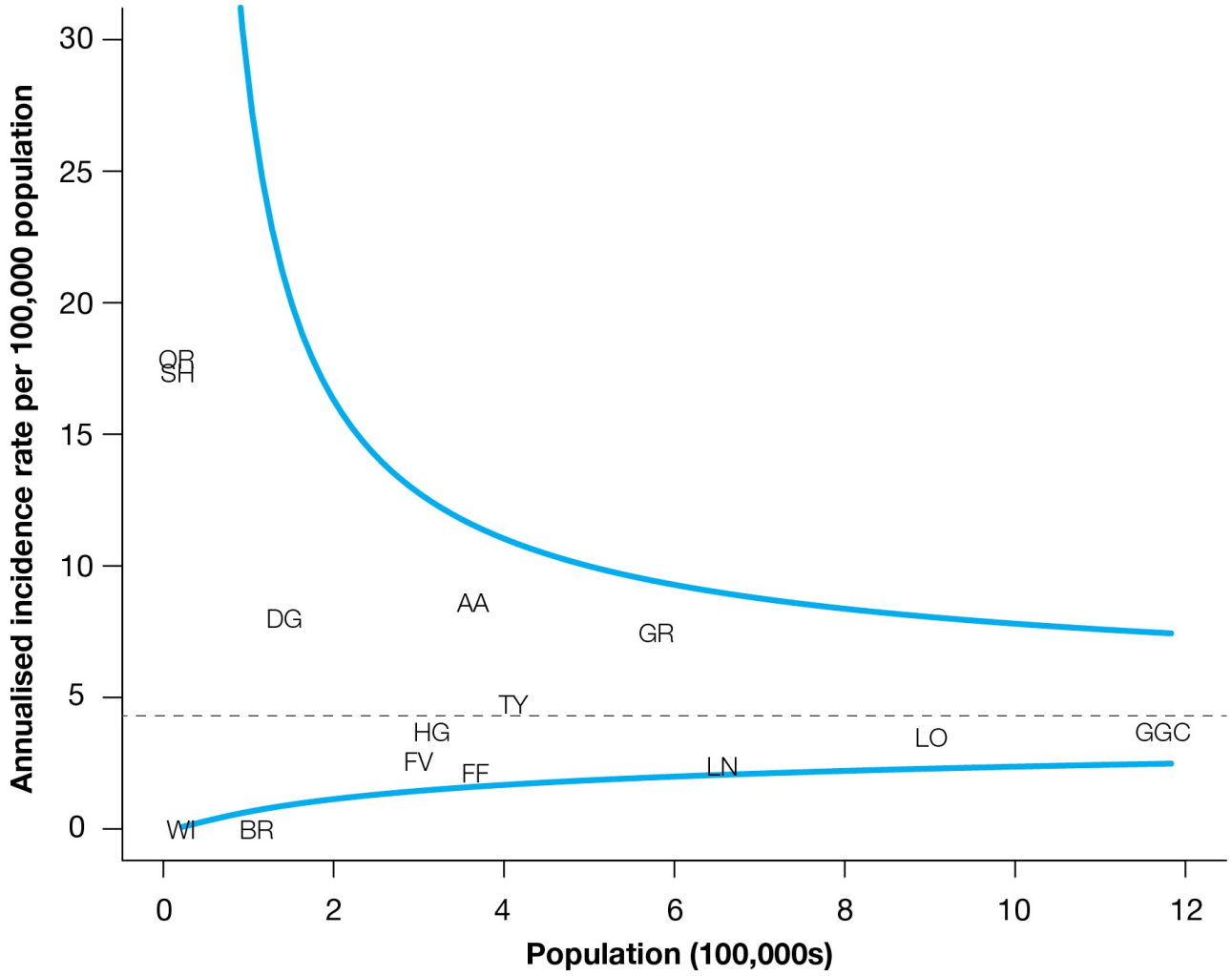
1. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
2. Figures include any updates received following the last publication (see Appendix 2).

Figure 1: Funnel plot of CDI incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q4 2020.[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 Orkney and NHS Shetland 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 Q4 2020.[1,2]



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

Escherichia coli bacteraemia (ECB)

Total Cases for Quarter

- During Q4 2020, 1,076 *Escherichia coli* bacteraemia (ECB) cases in patients were reported to ARHAI. In the previous quarter there were 1,161 cases.

Healthcare associated infection cases by health board of laboratory

- During Q4 2020, 555 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 40.9 cases per 100,000 TOBDs (Table 5).
- Yearly trends (comparing year-ending December 2019 with year-ending December 2020) show that there was no increase or decrease in NHS boards or Scotland overall (Table 6).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 3).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Community associated infection cases by health board of residence

- During Q4 2020, 521 ECB cases were reported as community associated. This corresponds to an incidence rate of 37.9 cases per 100,000 population and is a decrease compared to the Q3 2020 incidence rate of 44.7 cases per 100,000 population (Table 7).
- Yearly trends (comparing year-ending December 2019 with year-ending December 2020) show that there was a decrease in NHS Borders, NHS Greater Glasgow & Clyde, NHS Highland and Scotland overall (Table 8).
- NHS Ayrshire & Arran, NHS Forth Valley and NHS Lanarkshire were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 4).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).[1,2,3]

NHS Board	Q3 Cases	Q3 Bed Days	Q3 Rate	Q4 Cases	Q4 Bed Days	Q4 Rate
AA	60	97,707	61.4	56	102,772	54.5
BR	13	25,295	51.4	12	27,161	44.2
DG	11	36,727	30.0	15	37,533	40.0
FF	34	75,003	45.3	39	77,486	50.3
FV	42	66,050	63.6	40	70,565	56.7
GJ	1	10,016	10.0	1	11,255	8.9
GR	51	106,471	47.9	42	107,564	39.0
GGC	142	376,935	37.7	159	390,384	40.7
HG	19	59,671	31.8	19	63,656	29.8
LN	58	122,500	47.3	57	127,447	44.7
LO	68	217,934	31.2	67	226,514	29.6
OR	1	2,700	37.0	0	3,055	0.0
SH	2	2,091	95.6	3	2,118	141.6
TY	42	99,019	42.4	44	104,559	42.1
WI	3	4,152	72.3	1	5,151	19.4
Scotland	**547**	**1,302,271**	**42.0**	**555**	**1,357,220**	**40.9**

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

Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).[1,2,3]

NHS Board	YE Q4 19 Cases	YE Q4 19 Bed days	YE Q4 19 Rate	YE Q4 20 Cases	YE Q4 20 Bed days	YE Q4 20 Rate
AA	194	443,611	43.7	202	389,793	51.8
BR	46	117,513	39.1	49	101,947	48.1
DG	56	184,346	30.4	51	145,682	35.0
FF	156	361,726	43.1	138	303,425	45.5
FV	143	305,784	46.8	152	268,373	56.6
GJ	10	47,277	21.2	3	40,338	7.4
GR	235	528,836	44.4	178	440,145	40.4
GGC	643	1,693,580	38.0	549	1,485,198	37.0
HG	72	299,785	24.0	67	244,974	27.3
LN	265	584,854	45.3	230	490,868	46.9
LO	348	990,795	35.1	276	867,025	31.8
OR	8	13,206	60.6	2	11,041	18.1
SH	9	10,420	86.4	6	8,314	72.2
TY	198	466,505	42.4	158	396,472	39.9
WI	8	27,470	29.1	8	18,860	42.4
Scotland	**2,391**	**6,075,708**	**39.4**	**2,069**	**5,212,455**	**39.7**

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 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).[1,2,3,4]

NHS Board	Q3 Cases	Q3 Population	Q3 Rate	Q4 Cases	Q4 Population	Q4 Rate
AA	64	369,360	68.9	51	369,360	54.9
BR	8	115,510	27.6	8	115,510	27.6
DG	23	148,860	61.5	23	148,860	61.5
FF	44	373,550	46.9	26	373,550	27.7
FV	56	306,640	72.7	46	306,640	59.7
GR	39	585,700	26.5	36	585,700	24.5
GGC	106	1,183,120	35.6	83	1,183,120	27.9
HG	32	321,700	39.6	21	321,700	26.0
LN	112	661,900	67.3	81	661,900	48.7
LO	83	907,580	36.4	90	907,580	39.5
OR	1	22,270	17.9	2	22,270	35.7
SH	1	22,920	17.4	2	22,920	34.7
TY	39	417,470	37.2	47	417,470	44.8
WI	6	26,720	89.3	5	26,720	74.4
Scotland	**614**	**5,463,300**	**44.7**	**521**	**5,463,300**	**37.9 ↓**

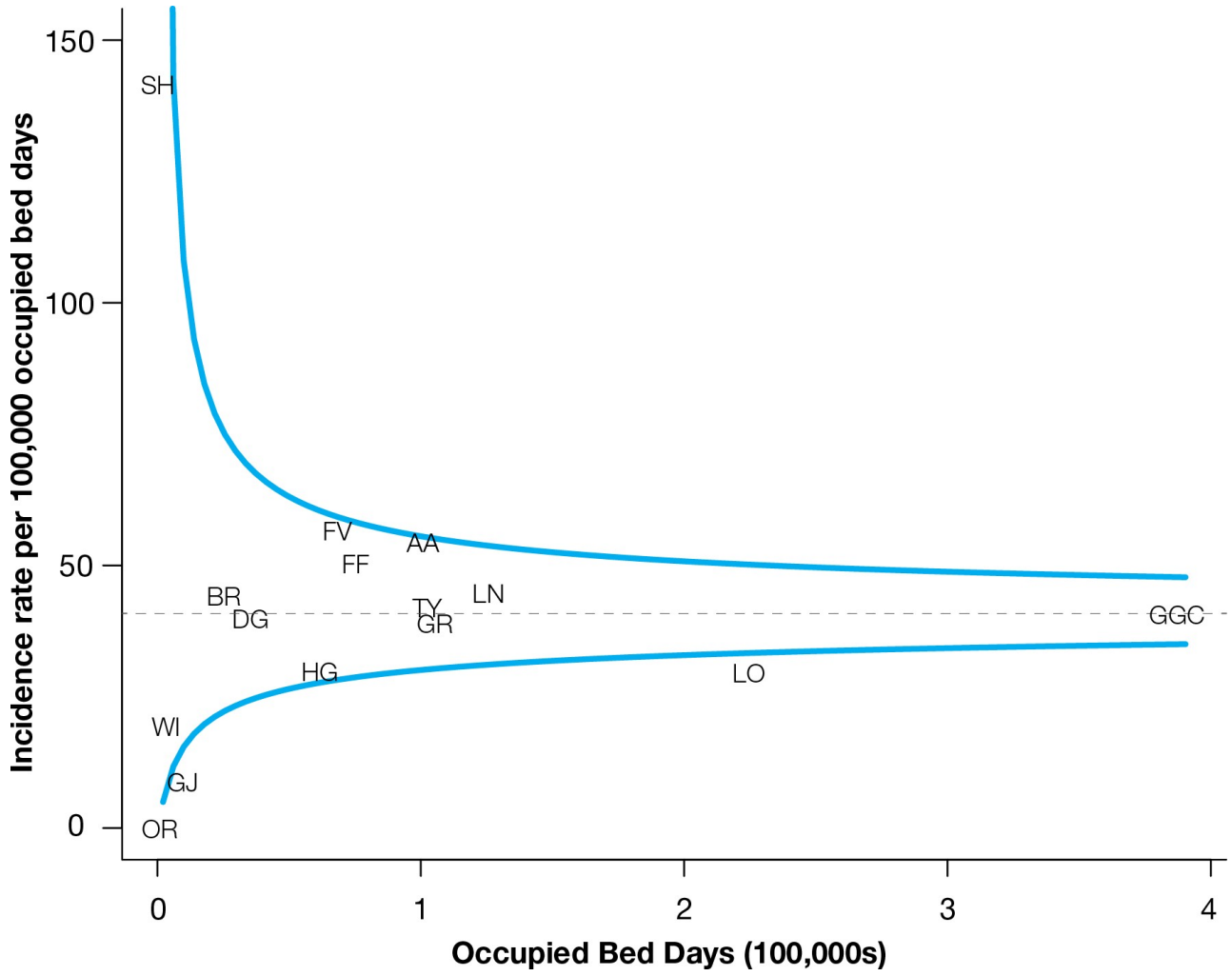
1. Quarterly population rates are based on an annualised population.
2. An arrow denotes statistically significant change.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last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

Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).[1,2,3]

NHS Board	YE Q4 19 Cases	YE Q4 19 Population	YE Q4 19 Rate	YE Q4 20 Cases	YE Q4 20 Population	YE Q4 20 Rate
AA	196	369,360	53.1	212	369,360	57.4
BR	71	115,510	61.5	36	115,510	31.2 ↓
DG	88	148,860	59.1	88	148,860	59.1
FF	132	373,550	35.3	137	373,550	36.7
FV	172	306,640	56.1	170	306,640	55.4
GR	193	585,700	33.0	168	585,700	28.7
GGC	542	1,183,120	45.8	395	1,183,120	33.4 ↓
HG	153	321,700	47.6	99	321,700	30.8 ↓
LN	321	661,900	48.5	339	661,900	51.2
LO	272	907,580	30.0	291	907,580	32.1
OR	15	22,270	67.4	7	22,270	31.4
SH	10	22,920	43.6	6	22,920	26.2
TY	190	417,470	45.5	168	417,470	40.2
WI	21	26,720	78.6	21	26,720	78.6
Scotland	**2,376**	**5,463,300**	**43.5**	**2,137**	**5,463,300**	**39.1 ↓**

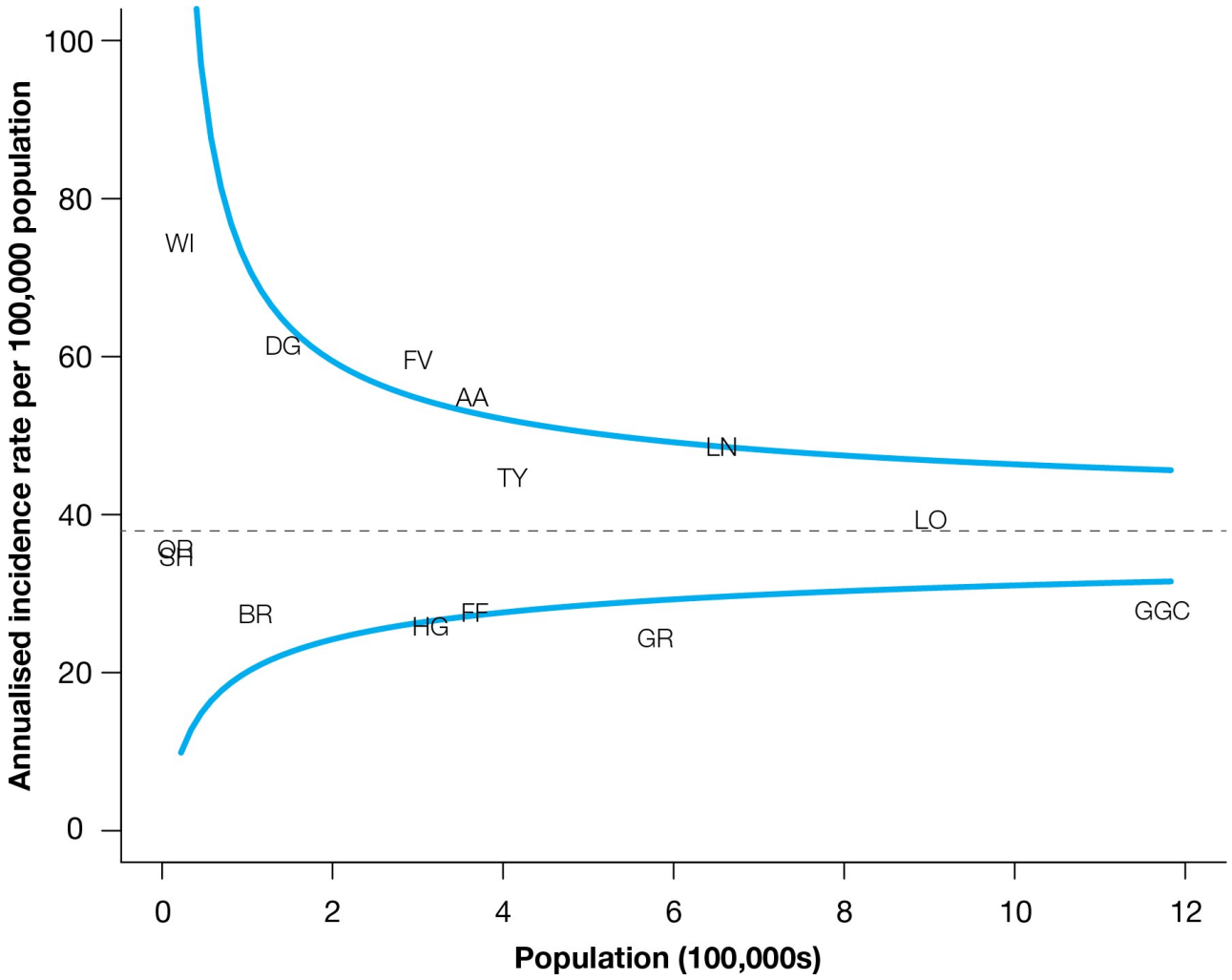
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 3: Funnel plot of ECB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q4 2020.[1]



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

Figure 4: Funnel plot of ECB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q4 2020.[1,2]



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

Staphylococcus aureus bacteraemia (SAB)

Total cases for quarter

- During Q4 2020, 387 *Staphylococcus aureus* bacteraemia (SAB) cases were reported to ARHAI. In the previous quarter there were 373 SAB cases.

Healthcare associated infection cases by health board of laboratory

- During Q4 2020, 255 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 18.8 cases per 100,000 TOBDs (Table 9).
- Yearly trends (comparing year-ending December 2019 with year-ending December 2020) show that there was an increase in NHS Ayrshire and Arran, NHS Borders, NHS Dumfries and Galloway and 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 Q4 2020, 132 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 December 2019 with year-ending December 2020) show that there was an increase in NHS Grampian (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: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).[1,2,3]

NHS Board	Q3 Cases	Q3 Bed Days	Q3 Rate	Q4 Cases	Q4 Bed Days	Q4 Rate
AA	16	97,707	16.4	25	102,772	24.3
BR	2	25,295	7.9	5	27,161	18.4
DG	6	36,727	16.3	5	37,533	13.3
FF	14	75,003	18.7	16	77,486	20.6
FV	11	66,050	16.7	20	70,565	28.3
GJ	2	10,016	20.0	1	11,255	8.9
GR	22	106,471	20.7	21	107,564	19.5
GGC	70	376,935	18.6	78	390,384	20.0
HG	3	59,671	5.0	12	63,656	18.9
LN	24	122,500	19.6	24	127,447	18.8
LO	27	217,934	12.4	25	226,514	11.0
OR	0	2,700	0.0	1	3,055	32.7
SH	1	2,091	47.8	1	2,118	47.2
TY	24	99,019	24.2	20	104,559	19.1
WI	2	4,152	48.2	1	5,151	19.4
Scotland	**224**	**1,302,271**	**17.2**	**255**	**1,357,220**	**18.8**

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

Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).[1,2,3]

NHS Board	YE Q4 19 Cases	YE Q4 19 Bed days	YE Q4 19 Rate	YE Q4 20 Cases	YE Q4 20 Bed days	YE Q4 20 Rate
AA	67	443,611	15.1	83	389,793	21.3 ↑
BR	7	117,513	6.0	15	101,947	14.7 ↑
DG	13	184,346	7.1	23	145,682	15.8 ↑
FF	49	361,726	13.5	45	303,425	14.8
FV	47	305,784	15.4	55	268,373	20.5
GJ	8	47,277	16.9	7	40,338	17.4
GR	86	528,836	16.3	77	440,145	17.5
GGC	326	1,693,580	19.2	292	1,485,198	19.7
HG	42	299,785	14.0	24	244,974	9.8
LN	119	584,854	20.3	93	490,868	18.9
LO	115	990,795	11.6	125	867,025	14.4
OR	4	13,206	30.3	3	11,041	27.2
SH	3	10,420	28.8	4	8,314	48.1
TY	94	466,505	20.1	87	396,472	21.9
WI	8	27,470	29.1	6	18,860	31.8
Scotland	**988**	**6,075,708**	**16.3**	**939**	**5,212,455**	**18.0 ↑**

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

Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).[1,2,3,4]

NHS Board	Q3 Cases	Q3 Population	Q3 Rate	Q4 Cases	Q4 Population	Q4 Rate
AA	15	369,360	16.2	12	369,360	12.9
BR	1	115,510	3.4	4	115,510	13.8
DG	3	148,860	8.0	1	148,860	2.7
FF	6	373,550	6.4	12	373,550	12.8
FV	9	306,640	11.7	12	306,640	15.6
GR	18	585,700	12.2	16	585,700	10.9
GGC	27	1,183,120	9.1	16	1,183,120	5.4
HG	13	321,700	16.1	7	321,700	8.7
LN	16	661,900	9.6	15	661,900	9.0
LO	27	907,580	11.8	26	907,580	11.4
OR	2	22,270	35.7	0	22,270	0.0
SH	0	22,920	0.0	0	22,920	0.0
TY	12	417,470	11.4	10	417,470	9.5
WI	0	26,720	0.0	1	26,720	14.9
Scotland	**149**	**5,463,300**	**10.8**	**132**	**5,463,300**	**9.6**

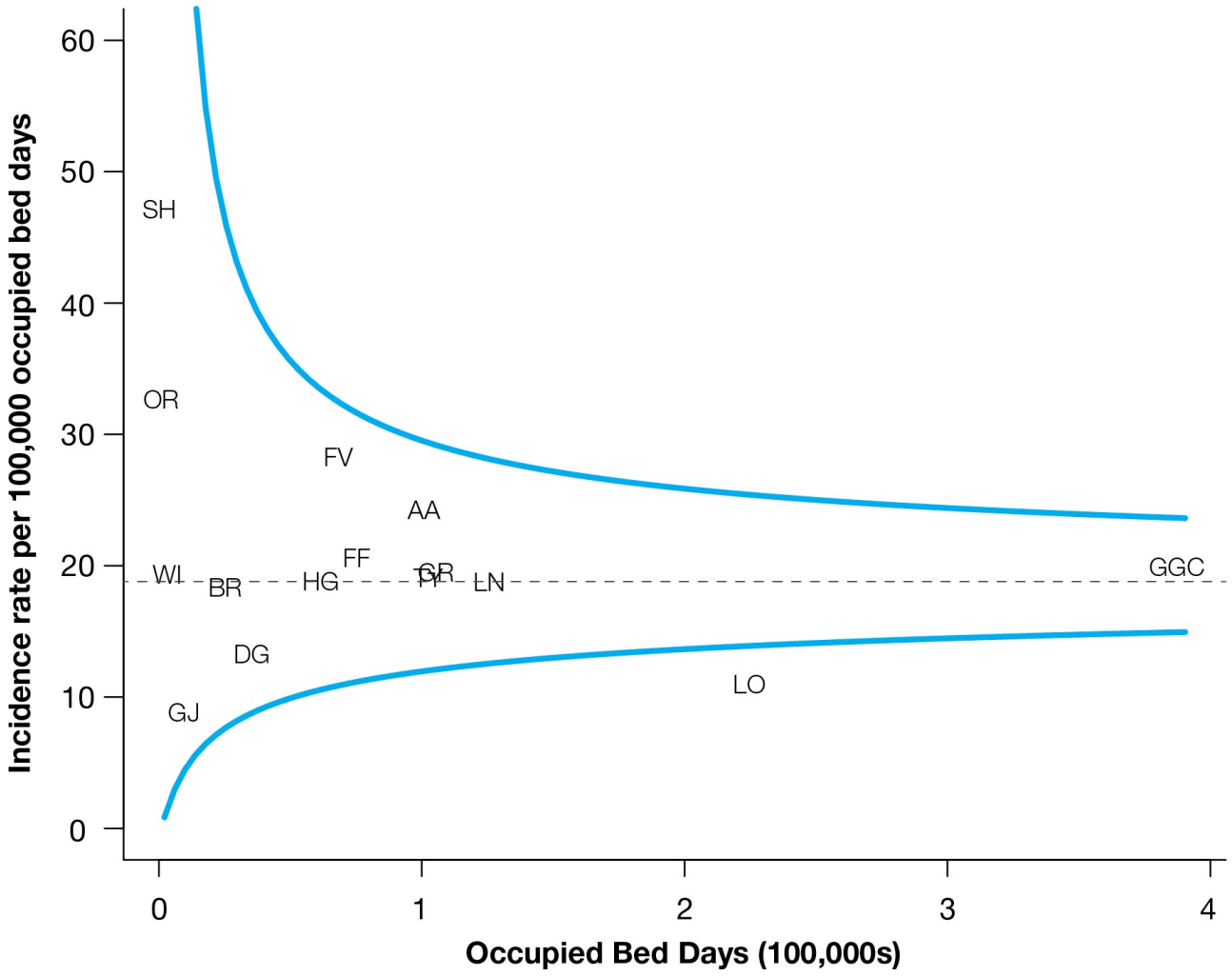
1. Quarterly population rates are based on an annualised population.
2. An arrow denotes statistically significant change.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last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

Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).[1,2,3]

NHS Board	YE Q4 19 Cases	YE Q4 19 Population	YE Q4 19 Rate	YE Q4 20 Cases	YE Q4 20 Population	YE Q4 20 Rate
AA	43	369,360	11.6	55	369,360	14.9
BR	10	115,510	8.7	13	115,510	11.3
DG	17	148,860	11.4	16	148,860	10.7
FF	39	373,550	10.4	37	373,550	9.9
FV	39	306,640	12.7	38	306,640	12.4
GR	41	585,700	7.0	63	585,700	10.8 ↑
GGC	88	1,183,120	7.4	80	1,183,120	6.8
HG	36	321,700	11.2	37	321,700	11.5
LN	55	661,900	8.3	66	661,900	10.0
LO	90	907,580	9.9	100	907,580	11.0
OR	1	22,270	4.5	5	22,270	22.5
SH	5	22,920	21.8	2	22,920	8.7
TY	45	417,470	10.8	46	417,470	11.0
WI	2	26,720	7.5	4	26,720	15.0
Scotland	**511**	**5,463,300**	**9.4**	**562**	**5,463,300**	**10.3**

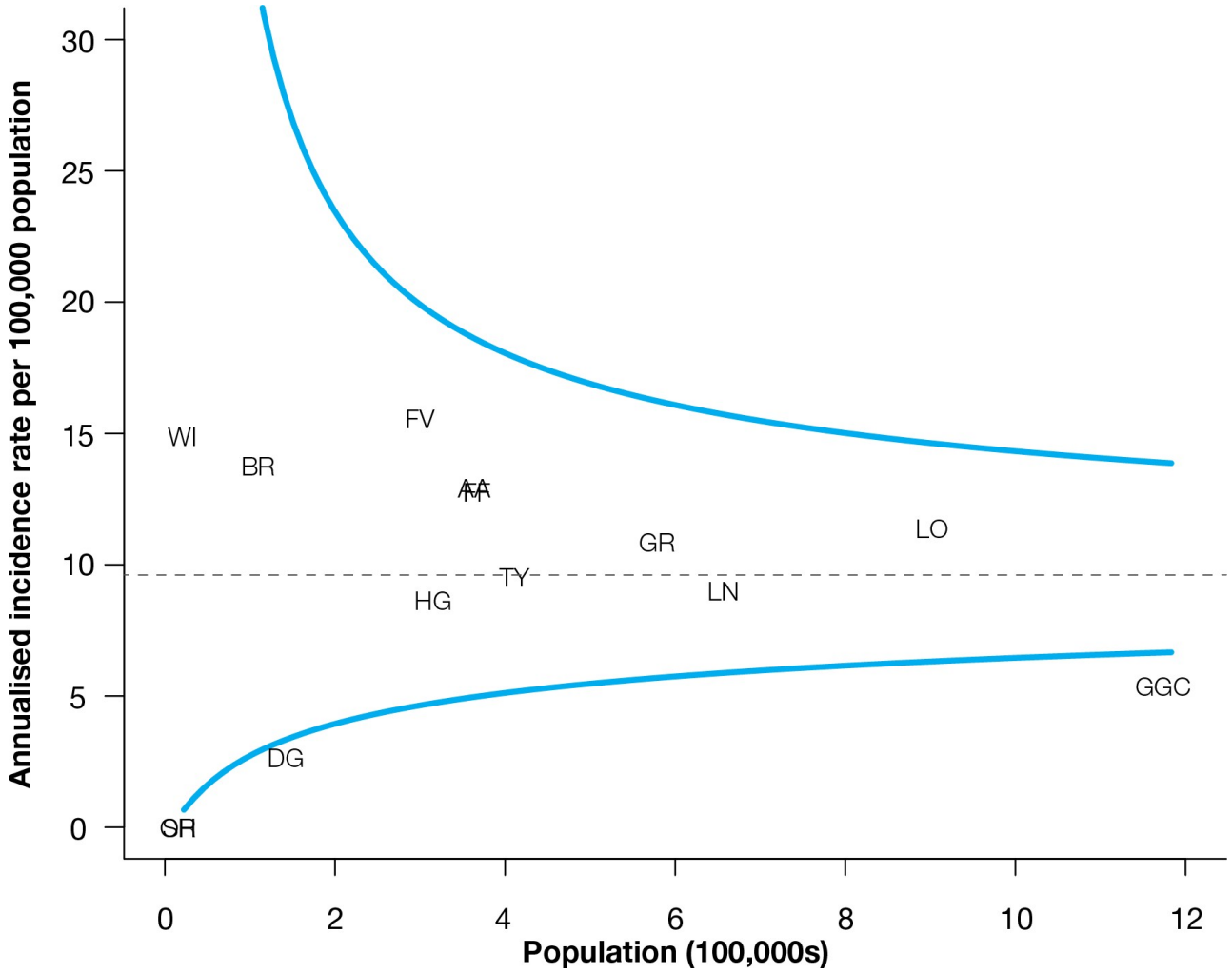
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 5: Funnel plot of SAB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q4 2020.[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 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 Q4 2020.[1,2]



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

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: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).	supplementary data (442 Kb)
Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).	supplementary data (442 Kb)
Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December2020).	supplementary data (442 Kb)
Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).	supplementary data (442 Kb)
Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December 2020).	supplementary data (442 Kb)
Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).	supplementary data (442 Kb)
Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December2020).	supplementary data (442 Kb)
Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).	supplementary data (442 Kb)
Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q3 2020 (July to September 2020) compared to Q4 2020 (October to December2020).	supplementary data (442 Kb)
Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending December 2019 (YE Q4 19) compared to year-ending December 2020 (YE Q4 20).	supplementary data (442 Kb)
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Further Information

Further Information can be found on the HPS website.

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

The next release of this publication will be July 2021.

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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
Name change for *Clostridium difficile* to *Clostridioides difficile*.	October 2018	CDI	A novel genus *Clostridioides* has been proposed for *Clostridium difficile* which will now be known as *Clostridioides difficile*. There are no implications with regards to the natural history of infection, infection prevention and control, or clinical treatment. https://www.sciencedirect.com/science/article/pii/S1075996416300762?via%3Dihub
Addition of healthcare/community case assignment	October 2017	CDI/SAB	An increasing awareness of those infections occurring in community settings has warranted measurement of incidence rates by healthcare setting

			(healthcare settings vs. community settings) to enable interventions to be targeted to the relevant settings.
Use of standardised denominator data for CDI/ECB/SAB	October 2017	CDI/SAB	The 'total occupied bed days' data will be extracted from the ISD(S)1 data collection which contains aggregated information on acute and non-acute bed days including geriatric medicine and long-term stays in real-time. The standardisation of denominator data across the three surveillance programmes could result in slightly less accurate denominators due to inclusion of persons in the denominator who are at slightly lower risk of infection. However, in surveillance programmes developed for the purpose of preventing infection and driving quality improvement in care,

			consistency of the denominators over time tend to be more important than getting a very precise estimate of the population at risk, as the primary aim is to reduce infection to a lower incidence relative to what it was at the initial time of benchmarking.
Reporting of CDI cases aged 15 years and above only	October 2017	CDI	Current Scottish Government Local Delivery Plan Standards are based on the incidence rate in cases aged 15 years and above, therefore the report has been aligned to reflect this. ARHAI will continue to monitor CDI incidence rates in the separate age groups (15-64 years and 65 years and above) internally.
Reporting of total SAB cases only (i.e. Removal of MRSA sub-analysis)	October 2017	SAB	MRSA numbers are becoming too small to carry out statistical analysis. ARHAI will continue to monitor internally.

Addition of year end trends to ECB	October 2018	ECB	This analysis (already included for other reported organisms) is now possible for ECB due the amount of data that has now been collected.
Change in production of Quarterly SPC Charts	April 2020	All sections	Updated method used for calculating exceptions within the SPC charts. The mean, Trigger/warning lines (+2 standard deviations) and upper control limits (+3 standard deviations) presented, are now calculated using the 12 quarters prior to the most recent quarter, as to compare the new rate against an existing baseline.
Changes to data collection in response to COVID-19	July 2020	All sections	A CNO letter sent 25th March 2020 asked NHS Boards to continue to report case numbers and origin of infection data but they would not be required to report risk factor data as would normally be

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

Change from National Waiting Times Centre (NWTC) to NHS Golden Jubilee (GJ)	January 2021	All sections	Labelling updated.

- Report methods and caveats

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

- UK comparisons

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

Appendix 2 – Publication Metadata

Metadata Indicator	Description
Publication title	Quarterly epidemiological data on *Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland
Description	This release provides information on *Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland for the period October to December 2020.
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:* 29/01/2021 *Escherichia coli* Bacteraemia: 26/02/2021 *Staphylococcus aureus* Bacteraemia: 26/02/2021 Surgical Site Infection: Epidemiological data for SSI are not included for this quarter due to the pausing of surveillance to support the COVID-19 response.
Release date	13 April 2021
Frequency	Quarterly
Timeframe of data and timeliness	The latest iteration of data is 31 December 2020, 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
2019 Q2	FV	73,737	77,293
2019 Q2	TY	113,495	113,492
2019 Q3	FV	77,669	72,461
2019 Q3	TY	115,796	115,794
2019 Q4	FV	79,712	75,205
2019 Q4	TY	117,973	117969
2020 Q1	FV	76,312	74,682
2020 Q1	TY	111,519	111,517
2020 Q2	BR	21,568	20,636
2020 Q2	FV	58,320	57,076
2020 Q2	GGC	304,920	304,822
2020 Q2	TY	81,757	81,377
2020 Q3	FV	66,078	66,050
2020 Q3	GGC	377,250	376,935
2020 Q3	TY	99,451	99,019

***Clostridioides difficile* Infection (CDI)**
Data linkage between CDI surveillance data and the Scottish Morbidity Records (SMR01) is used to identify community and healthcare associated CDI cases. Delays in SMR01 data availability at the time of report production means that some cases may be reassigned as either healthcare associated or community associated CDI at a later date (see Methods and Caveats).

Updates to healthcare and community associated CDI data:

NHS Board	Quarter	Previous Healthcare associated CDI cases	Updated Healthcare associated CDI cases	Previous Community associated CDI cases	Updated Community associated CDI cases	Reason
LO	Q2 2020	31	30	18	19	Retrospective data amendment

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

NHS Board	Quarter	Previous Healthcare associated SAB cases	Updated Healthcare associated SAB cases	Previous Community associated SAB cases	Updated Community associated SAB cases	Reason
FF	Q3 2020	15	14	-	-	Retrospective data amendment

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:
http://www.hps.scot.nhs.uk/pubs/detail.aspx?id=3340

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 can assist in the investigation of outbreaks. The surveillance data should inform and support NHS boards in implementing antimicrobial prescribing policies, infection control and prevention interventions. ***Escherichia coli* Bacteraemia (ECB)** The outputs of the surveillance programme are intended to support the NHS boards in controlling and reducing the burden of ECB. Benchmarking against other NHS boards (and other countries) is an important function of the surveillance. In conjunction with other sources of intelligence (including enhanced surveillance data) the outputs of the quarterly surveillance can also help the NHS boards with planning and targeting activities to reduce risk to patient of becoming infected and improve the care of patients (i.e. strategic planning, targeted intervention, care quality improvement). As urinary tract infections are commonly associated with *E. coli* bacteraemia cases, we are collaborating with the Scottish Urinary Tract Infection Network (SUTIN). This will promote collaborative working with our partners within Health and Social Care around change ideas which may reduce the risk of *E. coli* bacteraemia. Work is also being done on improving antimicrobial treatment of people with infections – co-ordinated by the Scottish Antimicrobial Prescribing Group (SAPG) through a network of antimicrobial management teams. ***Staphylococcus aureus* Bacteraemia (SAB)** ARHAI continues to offer support to NHS boards across Scotland to aid their local SAB reduction strategies. A programme of enhanced SAB surveillance commenced in all NHS boards in Scotland on 1 October 2014. This is providing further intelligence to focus future reduction interventions. **Surgical Site Infection (SSI)** SSIs are estimated to double the length of post-operative stay in hospital and significantly increase the cost of care. The national SSIS programme is intended to enhance the quality of patient care with use of data obtained from surveillance to compare incidence of SSI over time and against a benchmark rate and to use this information locally to review and guide clinical practice. **Key to NHS boards** AA = NHS Ayrshire & Arran BR = NHS Borders DG = NHS Dumfries & Galloway FV = NHS Forth Valley FF = NHS Fife GJ = NHS Golden Jubilee GR = NHS Grampian

	GGC = NHS Greater Glasgow & Clyde HG = NHS Highland LN = NHS Lanarkshire LO = NHS Lothian OR = NHS Orkney SH = NHS Shetland TY = NHS Tayside WI = NHS Western Isles
Accuracy	CDI, ECB and SAB data are the product of the Electronic Communication of Surveillance in Scotland (ECOSS). Participating laboratories routinely report all identifications of organisms, infection or microbiological intoxication, unless they are known to be of no clinical or public health importance. The collected data is used for: the identification of single cases of severe disease, outbreaks, and longer term trends in the incidence of laboratory reported infections, enhanced surveillance, health protection, analytical and statistical use. Delays in SMR01 data availability at the time of report production means that some CDI cases may be reassigned at a later date. Therefore, healthcare-associated and community-associated CDI cases in this report are provisional and may change. The enhanced ECB and SAB ECOSS web tool has built-in validation rules that have to be met before the data is submitted. Further checks of the data are made by ARHAI before the data are analysed. CDI validation of collected data entails sending a list of CDI cases extracted from ECOSS and asking for confirmation that the cases represent true CDI cases, i.e., meet the case definition which is defined in the surveillance protocol sent to all the NHS boards and available on the HPS website. The final list of CDI cases is then agreed before publishing. SSI data comes from the Surgical Site Infection Reporting System (SSIRS). Complying with a national minimum dataset and definitions for Surgical Site Infections, enables the data submitted to Health Protection Scotland to be mapped into the national dataset following a rigorous quality assurance process. SSIRS has built-in validation rules and data cannot be submitted until rules are met. SSIRS primary validation checks for incomplete or ambiguous core data fields, for example, if presentation to the surgery is 'emergency' the OPCS code should correspond. Secondary validation includes data checks that can be accepted without completion and/or values that are outside the stated requirements.
Completeness	**ECB/SAB:** Surveillance data are collected using an ECOSS Surveillance Web Tool that allows data collectors in NHS boards to validate ECOSS records as well as additional cases that may not be included in the ECOSS system. This therefore means that completeness is near to 100%. Only cases reviewed in the enhanced surveillance are included in the 'analysis' in the commentary publication. **CDI:** Diagnosis of CDI is confirmed in a patient who is both symptomatic with diarrhoea and whose stool has tested positive using a two-step diagnostic algorithm. Laboratory reports of positive samples are then sent to ECOSS for data extraction. In the community, patients with CDI may have a mild illness that does not require a GP visit, or the symptoms may not be recognised by a GP for a *C. difficile* test request. In hospitals, the chance of a diarrhoea sample not being tested for *C. difficile* is much lower, and patients who have ileus (i.e., CDI but with no diarrhoea) might be missed; however, as a result of ARHAI published guidance on managing

	CDI patients, this is not likely. ARHAI carries out validation with the NHS boards to check that no CDI cases have been missed from ECOSS each quarter. As with most surveillance programmes, completeness will not be 100% but mandatory surveillance, supported by ARHAI through issued guidance on diagnosis of CDI and validation of cases, ensures this is as near to 100% as practically possible. When categorising by healthcare or community, not all cases may be successfully data linked in any one quarter. Therefore, the sum total of the healthcare and community CDI cases may not equal the total number of CDI cases reported to ARHAI. **SSI:** Surveillance coordinators are responsible for completeness and accuracy of data. At hospital level, processes are in placed to ensure all patients included in the standard surveillance have had forms completed (e.g. cross checking with admission or theatre list). ARHAI also compare SSIRS data with data from ISD to a make sure all procedures under surveillance have been included; however, this comparison is only done annually.
Comparability	**CDI / ECB / SAB:** Public Health England report rates per quarter for CDI, ECB and SAB (methods and definitions may differ) – https://www.gov.uk/government/statistics/mrsa-mssa-and-e-coli-bacteraemia-and-c-difficile-infection-quarterly-epidemiological-commentary **SSI:** SSI rates by health board are not published by the rest of UK. Annual numbers are reported by Public Health England - https://www.gov.uk/government/publications/surgical-site-infections-ssi-surveillance-nhs-hospitals-in-england
Accessibility	It is the policy of ARHAI to make its web sites and products accessible according to **published guidelines**.
Coherence and clarity	Tables and charts are accessible via the HPS website at: **https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/**
Value type and unit of measurement	Healthcare associated cases and incidence rates (per 100,000 Total occupied bed days (TOBDs)) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia & *Staphylococcus aureus* bacteraemia. Community associated cases and incidence rates (per 100,000 population) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia & *Staphylococcus aureus* bacteraemia. Number of procedures and Surgical Site Infections and incidence per categories (per 100 procedures) for inpatients and post discharge surveillance.
Disclosure	The HPS protocol on **Statistical Disclosure Protocol** is followed.
Official Statistics designation	Official Statistics
UK Statistics Authority Assessment	Not Assessed
Last published	12 January 2021
Next published	6 July 2021
Date of first publication	7 April 2015

	Prior to this *Clostridioides difficile* infection (first publication - 2 Apr 2008) and *Staphylococcus aureus* bacteraemia (first publication - 3 Apr 2002) were separate reports.
Help email	NSS.HPSHAIIC@nhs.scot
Date form completed	13 April 2021

Appendix 3 – Early access details

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ARHAI is obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:

Scottish Government Health Department

NHS Board Chief Executives

NHS Board Communication leads

Appendix 4 – ARHAI Scotland and Official Statistics

About ARHAI Scotland

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

Official Statistics

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