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

The following is a summary of the ARHAI (Antimicrobial Resistance and Healthcare Associated Infection) Scotland Quarterly Epidemiological Data Report for Quarter 3 (July to September 2020) published on 12th January 2021.

Executive Summary

July – September 2020

Clostridioides difficile Infection (CDI)

- **Total** number of cases of CDIs in NHS Grampian: **24**
  - An **increase** of 1 from the previous quarter (23)
  - 7.5% of the total across Scotland (317)

Escherichia coli bacteraemia (ECB)

- **Total** number of cases of ECBs in NHS Grampian: **90**
  - An **increase** of 9 from the previous quarter (81)
  - 7.8% of the total across Scotland (1161)

Staphylococcus aureus bacteraemia (SAB)

- **Total** cases of SABs in NHS Grampian: **40**
  - An **increase** of 9 from the previous quarter (31)
  - 10.7% of the total across Scotland (374)

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: **14**
  - An **increase** of 1 from the previous quarter (13)
  - An incident rate of 13.1 per 100,000 total occupied bed days
  - **Below** the national incident rate (17.4 per 100,000 total occupied bed days)

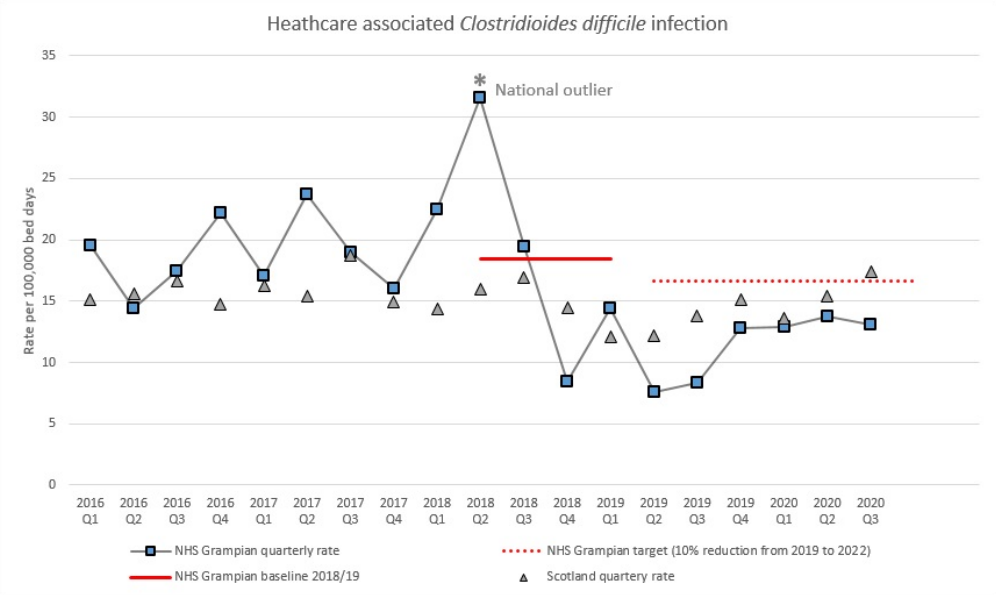

Figure (1a) shows trends in healthcare associated *C. difficile* infection in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q3) NHS Grampian rates of healthcare associated *C. difficile* infection are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report). Locally, NHS Grampian is forecast to meet the Scottish Government target for reducing *C. difficile* infection from 2019 to 2022.

- Number of **community associated cases** of CDIs in NHS Grampian: **10**
  - The **same** number of cases as in the previous quarter (10)
  - An incident rate of 6.8 per 100,000 population
  - **Above** the national incident rate (6.6 per 100,000 population)

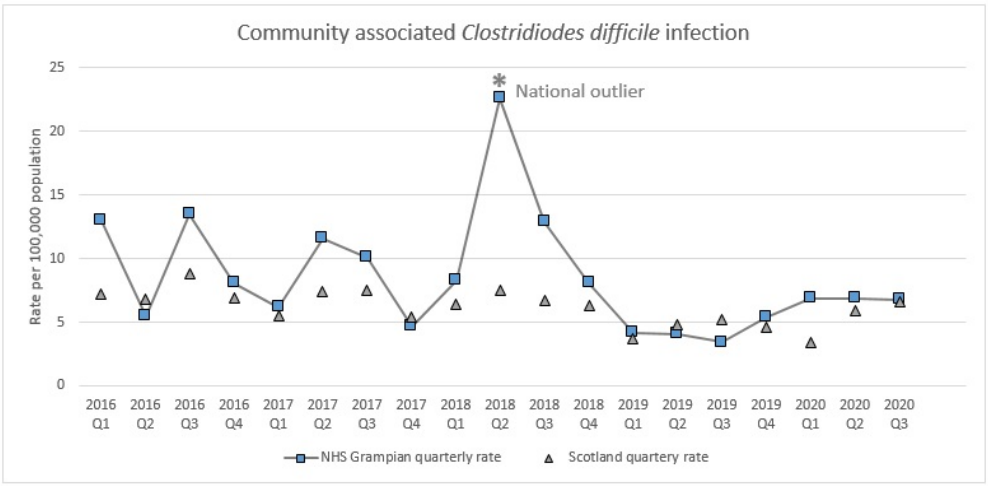

Figure (1b) shows trends in community associated *C. difficile* infection in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q3) NHS Grampian rates of community associated *C. difficile* infection are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report).

Escherichia coli bacteraemia (ECB)

- Number of **healthcare associated cases** of ECBs in NHS Grampian: **51**
  - An **increase** of 15 from the previous quarter (36)
  - An incident rate of 47.9 per 100,000 total occupied bed days
  - **Above** the national incident rate (42.0 per 100,000 total occupied bed days)

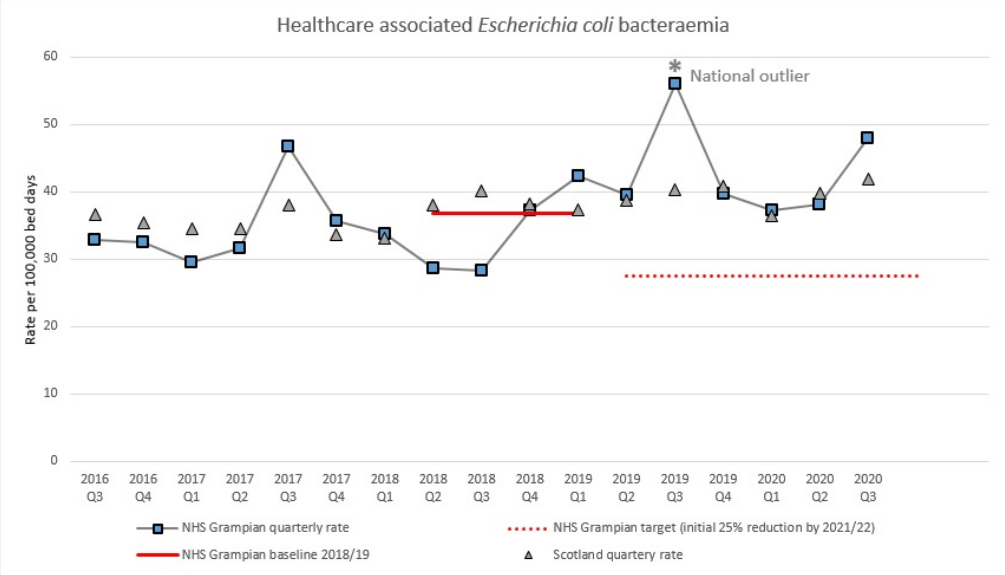

Figure (2a) shows trends in healthcare associated *E. coli* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q3) NHS Grampian rates of healthcare associated *E. coli* bacteraemia are statistically within the limits of normal variation compared to the Scottish 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: **39**
  - A **decrease** of 6 from the previous quarter (45)
  - An incident rate of 26.5 per 100,000 population
  - **Below** the national incident rate (44.7 per 100,000 population)

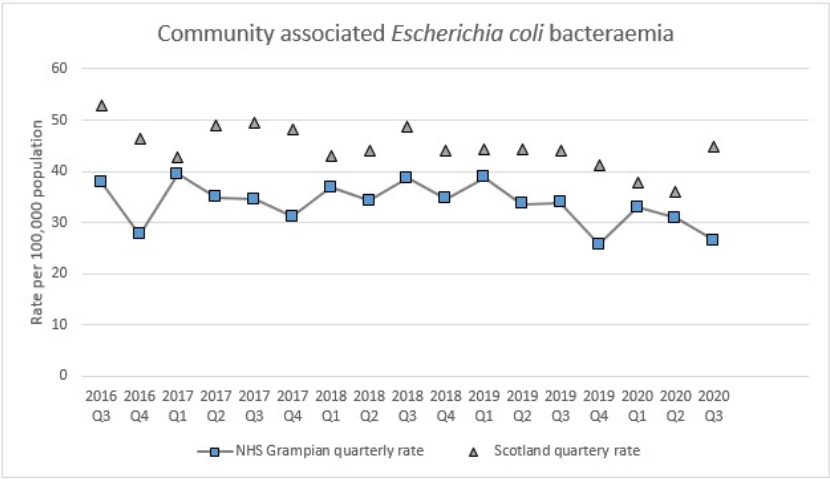

Figure (2b) shows trends in community associated *E. coli* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q3) NHS Grampian rates of community associated *E. coli* bacteraemia are statistically within the limits of normal variation compared to the Scottish average (see full Health Protection Scotland report).

Staphylococcus aureus bacteraemia (SAB)

- Number of **healthcare associated cases** of SABs in NHS Grampian: **22**
  - An **increase** of 4 from the previous quarter (18)
  - An incident rate of 20.7 per 100,000 total occupied bed days
  - **Above** the national incident rate (17.3 per 100,000 total occupied bed days)

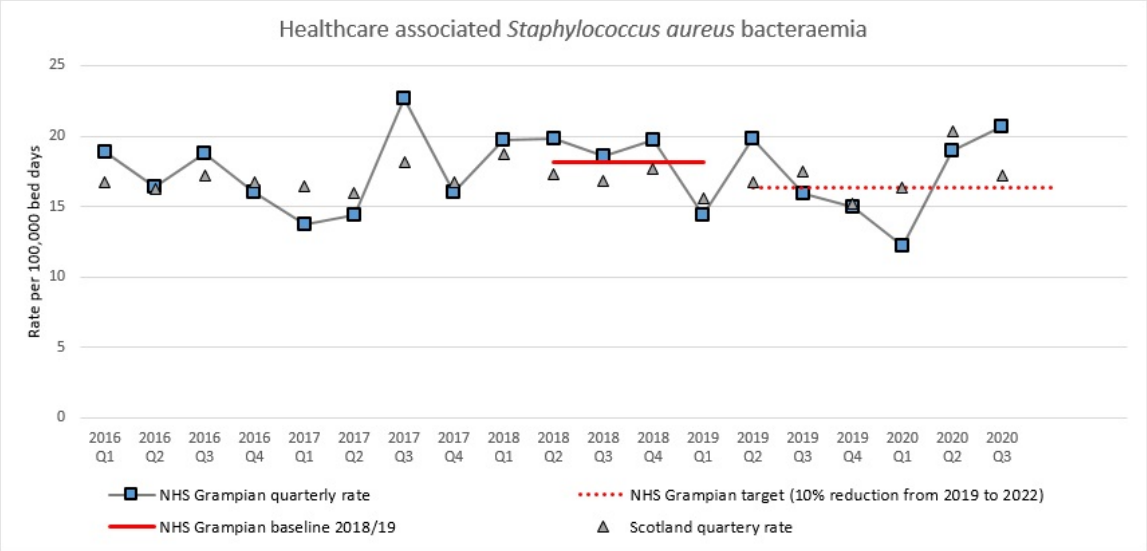

Figure (3a) shows trends in healthcare associated *S. aureus* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q3) NHS Grampian rates of healthcare associated *S. aureus* bacteraemia are statistically within the limits of normal variation compared to the 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: **18**
  - An **increase** of 5 from the previous quarter (13)
  - An incident rate of 12.2 per 100,000 population
  - **Above** the national incident rate (10.8 per 100,000 population)

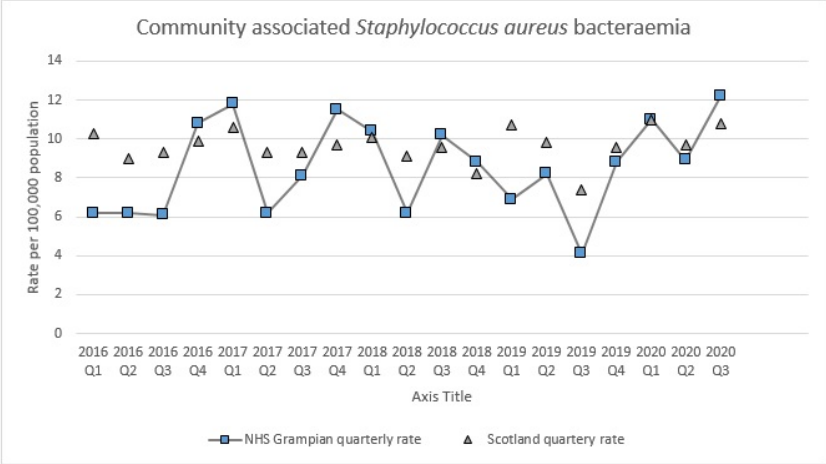

Figure (3b) shows trends in community associated *S. aureus* bacteraemia in NHS Grampian and Scotland from 2016 to date. In the latest quarterly data (2020 Q3) NHS Grampian rates of community associated *S. aureus* bacteraemia are statistically within the limits of normal variation compared to the Scottish 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

July to September 2020

12 January 2021

This is an Official Statistics Publication

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

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Contents

Introduction

Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland provides a commentary on quarterly epidemiological data in Scotland for July to September (Q3) 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 July to September 2020

- The total number of CDI cases in patients reported to ARHAI was 317.
- 227 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 17.4 cases per 100,000 total occupied bed days (TOBDs).
- 90 CDI cases were reported as community associated. This corresponds to an incidence rate of 6.6 cases per 100,000 population.
- No NHS boards were above the 95% confidence interval upper limit for healthcare or community associated CDI in the funnel plot analysis.
- No NHS boards were above normal variation for healthcare or community associated CDI when analysing trends over the past three years.

Escherichia coli bacteraemia (ECB) during July to September 2020

- The total number of ECB cases in patients reported to ARHAI was 1,161.
- 547 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 42.0 cases per 100,000 TOBDs.
- 614 ECB cases were reported as community associated. This corresponds to an incidence rate of 44.7 cases per 100,000 population.
- NHS Ayrshire & Arran and NHS Forth Valley 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 July to September 2020

- The total number of SAB cases in patients reported to ARHAI was 374.
- 225 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 17.3 cases per 100,000 TOBDs.
- 149 SAB cases were reported as community associated. This corresponds to an incidence rate of 10.8 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) July to September 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 Q3 2020, 317 *Clostridioides difficile* infection (CDI) cases in patients were reported to ARHAI. In the previous quarter there were 246 cases.
- In the clinical surveillance typing scheme (covering severe cases and/or outbreaks) ribotype 015 (17.2%) was the most common ribotype isolated, followed by 005 (10.3%), 023, 020, 002, (all 8.6%), 078, 072 (both 5.2%), and 464, 126, 087, 050 (all 3.4%), out of a total of 58 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 015 was the most common (14.8%) followed by 002 (13.1%), 005 (11.5%), 011 and 050 (both 6.6%), 078, 020 and 023 (all 4.9%), and 014 and 216 (both 3.3%) out of a total of 61 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 Q3 2020, 227 CDI cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 17.4 cases per 100,000 total occupied bed days (TOBDs) (Table 1).
- Yearly trends (comparing year-ending September 2019 with year-ending September 2020) show that there was an increase in Scotland overall (Table 2).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 1).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Community associated infection cases by health board of residence

- During Q3 2020, 90 CDI cases were reported as community associated. This corresponds to an incidence rate 6.6 cases per 100,000 population (Table 3).
- Yearly trends (comparing year-ending September 2019 with year-ending September 2020) show that there was a decrease in NHS Greater Glasgow and Clyde. (Table 4).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 2).
- No NHS boards were above normal variation when analysing trends over the past three years. (see supplementary data).

Table 1: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).[1,2]

NHS Board	Q2 Cases	Q2 Bed Days	Q2 Rate	Q3 Cases	Q3 Bed Days	Q3 Rate
AA	13	81,868	15.9	20	97,707	20.5
BR	4	21,568	18.5	2	25,295	7.9
DG	3	27,088	11.1	10	36,727	27.2
FF	5	63,241	7.9	7	75,003	9.3
FV	7	58,320	12.0	10	66,078	15.1
GJ	1	8,152	12.3	1	10,016	10.0
GR	13	94,592	13.7	14	106,471	13.1
GGC	49	304,920	16.1	77	377,250	20.4
HG	13	50,361	25.8	14	59,671	23.5
LN	21	100,174	21.0	27	122,500	22.0
LO	31	182,151	17.0	38	217,934	17.4
OR	0	2,102	0.0	0	2,700	0.0
SH	0	1,591	0.0	2	2,091	95.6
TY	7	81,757	8.6	5	99,451	5.0
WI	0	3,200	0.0	0	4,152	0.0
Scotland	**167**	**1,081,085**	**15.4**	**227**	**1,303,046**	**17.4**

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 September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).[1,2,3]

NHS Board	YE Q3 19 Cases	YE Q3 19 Bed Days	YE Q3 19 Rate	YE Q3 20 Cases	YE Q3 20 Bed Days	YE Q3 20 Rate
AA	74	442,850	16.7	71	398,522	17.8
BR	14	119,289	11.7	12	105,133	11.4
DG	28	181,688	15.4	31	154,607	20.1
FF	31	361,481	8.6	31	317,647	9.8
FV	45	316,823	14.2	39	280,422	13.9
GJ	1	47,383	2.1	4	40,742	9.8
GR	51	527,311	9.7	61	465,840	13.1
GGC	262	1,681,203	15.6	261	1,524,877	17.1
HG	40	298,222	13.4	51	255,227	20.0
LN	86	580,162	14.8	93	510,747	18.2
LO	125	996,159	12.5	136	889,646	15.3
OR	2	14,134	14.2	0	10,901	0.0
SH	3	10,248	29.3	4	8,869	45.1
TY	31	463,656	6.7	28	410,700	6.8
WI	4	27,339	14.6	4	20,593	19.4
Scotland	**797**	**6,067,948**	**13.1**	**826**	**5,394,473**	**15.3 ↑**

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

Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).[1,2,3,4]

NHS Board	Q2 Cases	Q2 Population	Q2 Rate	Q3 Cases	Q3 Population	Q3 Rate
AA	8	369,360	8.7	7	369,360	7.5
BR	0	115,510	0.0	4	115,510	13.8
DG	2	148,860	5.4	6	148,860	16.0
FF	1	373,550	1.1	6	373,550	6.4
FV	2	306,640	2.6	1	306,640	1.3
GR	10	585,700	6.9	10	585,700	6.8
GGC	13	1,183,120	4.4	10	1,183,120	3.4 ↓
HG	9	321,700	11.3	8	321,700	9.9
LN	13	661,900	7.9	8	661,900	4.8
LO	18	907,580	8.0	21	907,580	9.2
OR	0	22,270	0.0	2	22,270	35.7
SH	0	22,920	0.0	1	22,920	17.4
TY	2	417,470	1.9	6	417,470	5.7
WI	1	26,720	15.1	**0**	26,720	0.0
Scotland	**79**	**5,463,300**	**5.8**	**90**	**5,463,300**	**6.6**

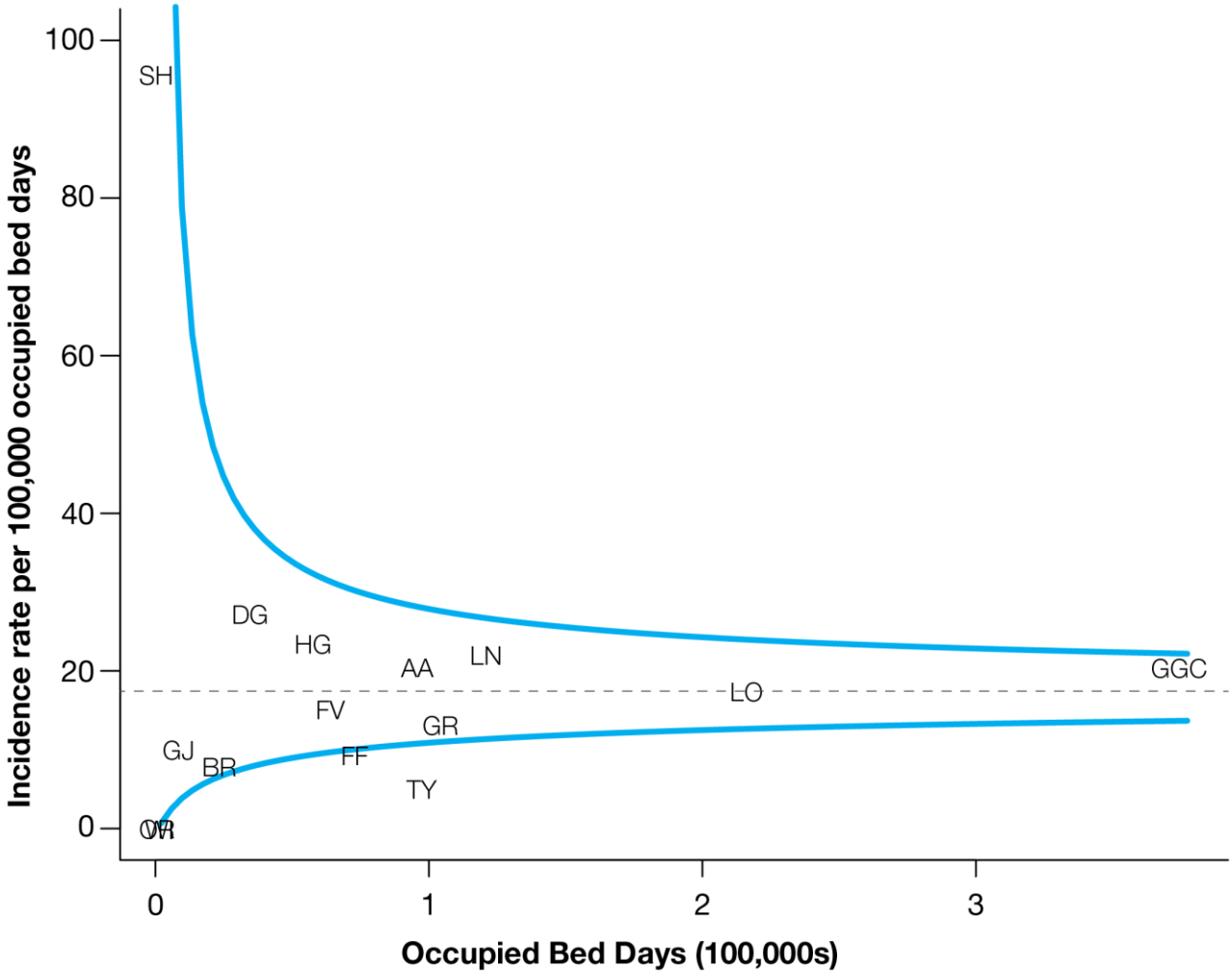
1. An arrow denotes statistically significant change.
2. Quarterly population rates are based on an annualised population.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last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

Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).[1,2,3]

NHS Board	YE Q3 19 Cases	YE Q3 19 Population	YE Q3 19 Rate	YE Q3 20 Cases	YE Q3 20 Population	YE Q3 20 Rate
AA	21	369,360	5.7	30	369,360	8.1
BR	2	115,510	1.7	9	115,510	7.8
DG	10	148,860	6.7	12	148,860	8.1
FF	18	373,550	4.8	12	373,550	3.2
FV	7	306,640	2.3	4	306,640	1.3
GR	29	585,700	5.0	38	585,700	6.5
GGC	64	1,183,120	5.4	40	1,183,120	3.4
HG	21	321,700	6.5	23	321,700	7.1
LN	36	661,900	5.4	36	661,900	5.4
LO	52	907,580	5.7	56	907,580	6.2
OR	1	22,270	4.5	2	22,270	9.0
SH	0	22,920	0.0	1	22,920	4.4
TY	12	417,470	2.9	12	417,470	2.9
WI	1	26,720	3.7	3	26,720	11.2
Scotland	**274**	**5,463,300**	**5.0**	**278**	**5,463,300**	**5.1**

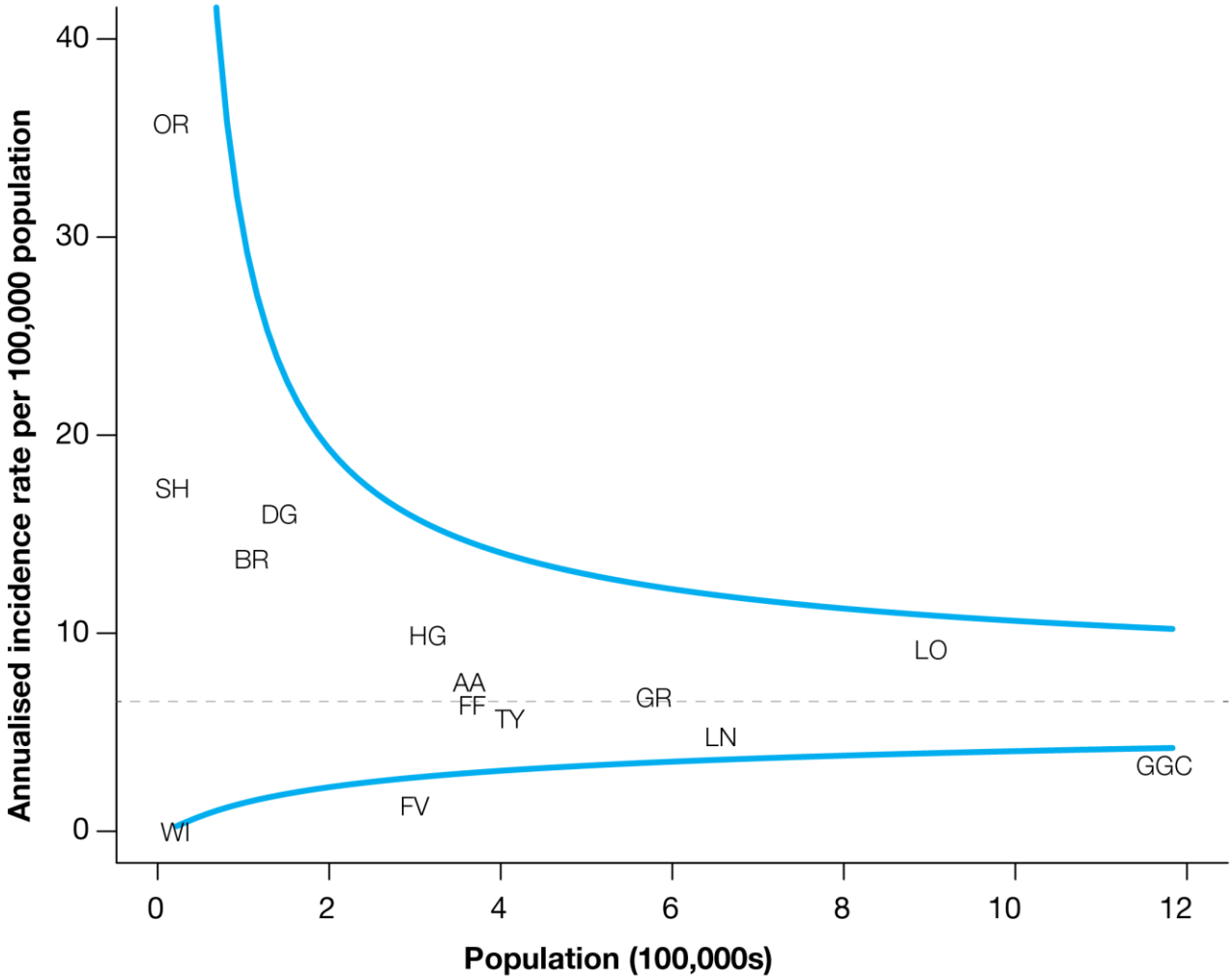
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 1: Funnel plot of CDI incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q3 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 Western Isles 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 Q3 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 Q3 2020, 1,161 *Escherichia coli* bacteraemia (ECB) cases in patients were reported to ARHAI. In the previous quarter there were 917 cases.

Healthcare associated infection cases by health board of laboratory

- During Q3 2020, 547 ECB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 42.0 cases per 100,000 TOBDs (Table 5).
- Yearly trends (comparing year-ending September 2019 with year-ending September 2020) show that there was an increase in NHS Forth Valley (Table 6).
- NHS Ayrshire & Arran and NHS Forth Valley 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 Q3 2020, 614 ECB cases were reported as community associated. This corresponds to an incidence rate of 44.7 cases per 100,000 population and is an increase compared to the Q2 2020 incidence rate of 35.9 cases per 100,000 population (Table 7).
- Yearly trends (comparing year-ending September 2019 with year-ending September 2020) show that there was a decrease in NHS Borders, NHS Greater Glasgow & Clyde 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: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).[1,2,3]

NHS Board	Q2 Cases	Q2 Bed Days	Q2 Rate	Q3 Cases	Q3 Bed Days	Q3 Rate
AA	36	81,868	44.0	60	97,707	61.4
BR	14	21,568	64.9	13	25,295	51.4
DG	10	27,088	36.9	11	36,727	30.0
FF	23	63,241	36.4	34	75,003	45.3
FV	33	58,320	56.6	42	66,078	63.6
GJ	1	8,152	12.3	1	10,016	10.0
GR	36	94,592	38.1	51	106,471	47.9
GGC	125	304,920	41.0	142	377,250	37.6
HG	13	50,361	25.8	19	59,671	31.8
LN	51	100,174	50.9	58	122,500	47.3
LO	57	182,151	31.3	68	217,934	31.2
OR	0	2,102	0	1	2,700	37.0
SH	0	1,591	0	2	2,091	95.6
TY	28	81,757	34.2	42	99,451	42.2
WI	2	3,200	62.5	3	4,152	72.3
Scotland	**429**	**1,081,085**	**39.7**	**547**	**1,303,046**	**42.0**

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

Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).[1,2,3]

NHS Board	YE Q3 19 Cases	YE Q3 19 Bed days	YE Q3 19 Rate	YE Q3 20 Cases	YE Q3 20 Bed days	YE Q3 20 Rate
AA	188	442,850	42.5	192	398,522	48.2
BR	43	119,289	36.0	51	105,133	48.5
DG	53	181,688	29.2	54	154,607	34.9
FF	146	361,481	40.4	154	317,647	48.5
FV	134	316,823	42.3	150	280,422	53.5 ↑
GJ	10	47,383	21.1	3	40,742	7.4
GR	231	527,311	43.8	189	465,840	40.6
GGC	644	1,681,203	38.3	541	1,524,877	35.5
HG	65	298,222	21.8	66	255,227	25.9
LN	260	580,162	44.8	250	510,747	48.9
LO	349	996,159	35.0	304	889,646	34.2
OR	7	14,134	49.5	3	10,901	27.5
SH	8	10,248	78.1	6	8,869	67.7
TY	200	463,656	43.1	168	410,700	40.9
WI	9	27,339	32.9	9	20,593	43.7
Scotland	**2,347**	**6,067,948**	**38.7**	**2,140**	**5,394,473**	**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: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).[1,2,3,4]

NHS Board	Q2 Cases	Q2 Population	Q2 Rate	Q3 Cases	Q3 Population	Q3 Rate
AA	45	369,360	49.0	64	369,360	68.9
BR	7	115,510	24.4	8	115,510	27.6
DG	22	148,860	59.4	23	148,860	61.5
FF	36	373,550	38.8	44	373,550	46.9
FV	29	306,640	38.0	56	306,640	72.7
GR	45	585,700	30.9	39	585,700	26.5
GGC	111	1,183,120	37.7	106	1,183,120	35.6
HG	26	321,700	32.5	32	321,700	39.6
LN	70	661,900	42.5	112	661,900	67.3
LO	48	907,580	21.3	83	907,580	36.4
OR	1	22,270	18.1	1	22,270	17.9
SH	2	22,920	35.1	1	22,920	17.4
TY	41	417,470	39.5	39	417,470	37.2
WI	5	26,720	75.3	6	26,720	89.3
Scotland	**488**	**5,463,300**	**35.9**	**614**	**5,463,300**	**44.7 ↑**

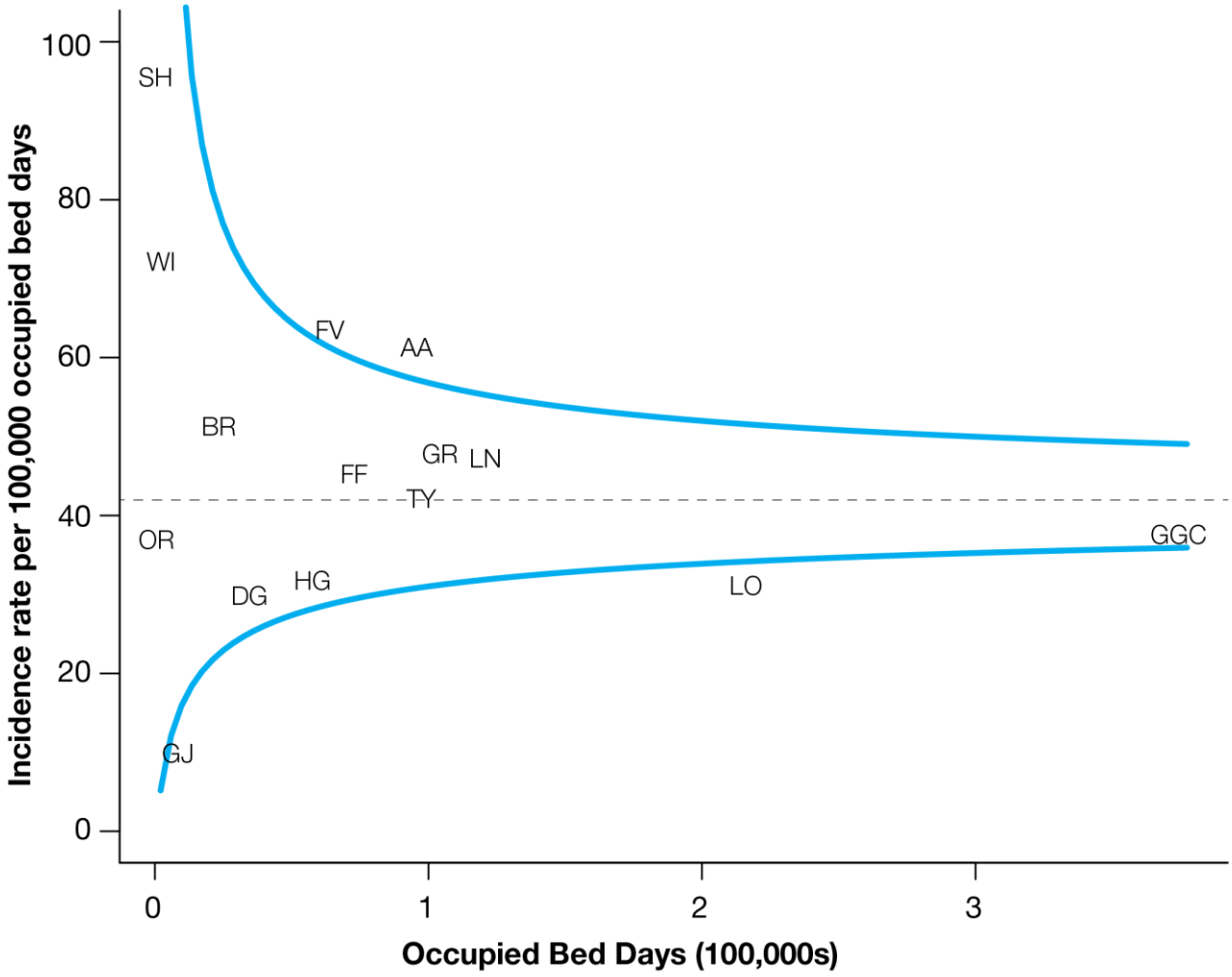
1. Quarterly population rates are based on an annualised population.
2. An arrow denotes statistically significant change.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last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

Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).[1,2,3]

NHS Board	YE Q3 19 Cases	YE Q3 19 Population	YE Q3 19 Rate	YE Q3 20 Cases	YE Q3 20 Population	YE Q3 20 Rate
AA	204	369,360	55.2	202	369,360	54.7
BR	70	115,510	60.6	40	115,510	34.6 ↓
DG	90	148,860	60.5	86	148,860	57.8
FF	144	373,550	38.5	145	373,550	38.8
FV	156	306,640	50.9	177	306,640	57.7
GR	206	585,700	35.2	170	585,700	29.0
GGC	567	1,183,120	47.9	437	1,183,120	36.9 ↓
HG	136	321,700	42.3	121	321,700	37.6
LN	336	661,900	50.8	331	661,900	50.0
LO	280	907,580	30.9	264	907,580	29.1
OR	16	22,270	71.8	7	22,270	31.4
SH	7	22,920	30.5	8	22,920	34.9
TY	178	417,470	42.6	175	417,470	41.9
WI	21	26,720	78.6	21	26,720	78.6
Scotland	**2,411**	**5,463,300**	**44.1**	**2,184**	**5,463,300**	**40.0 ↓**

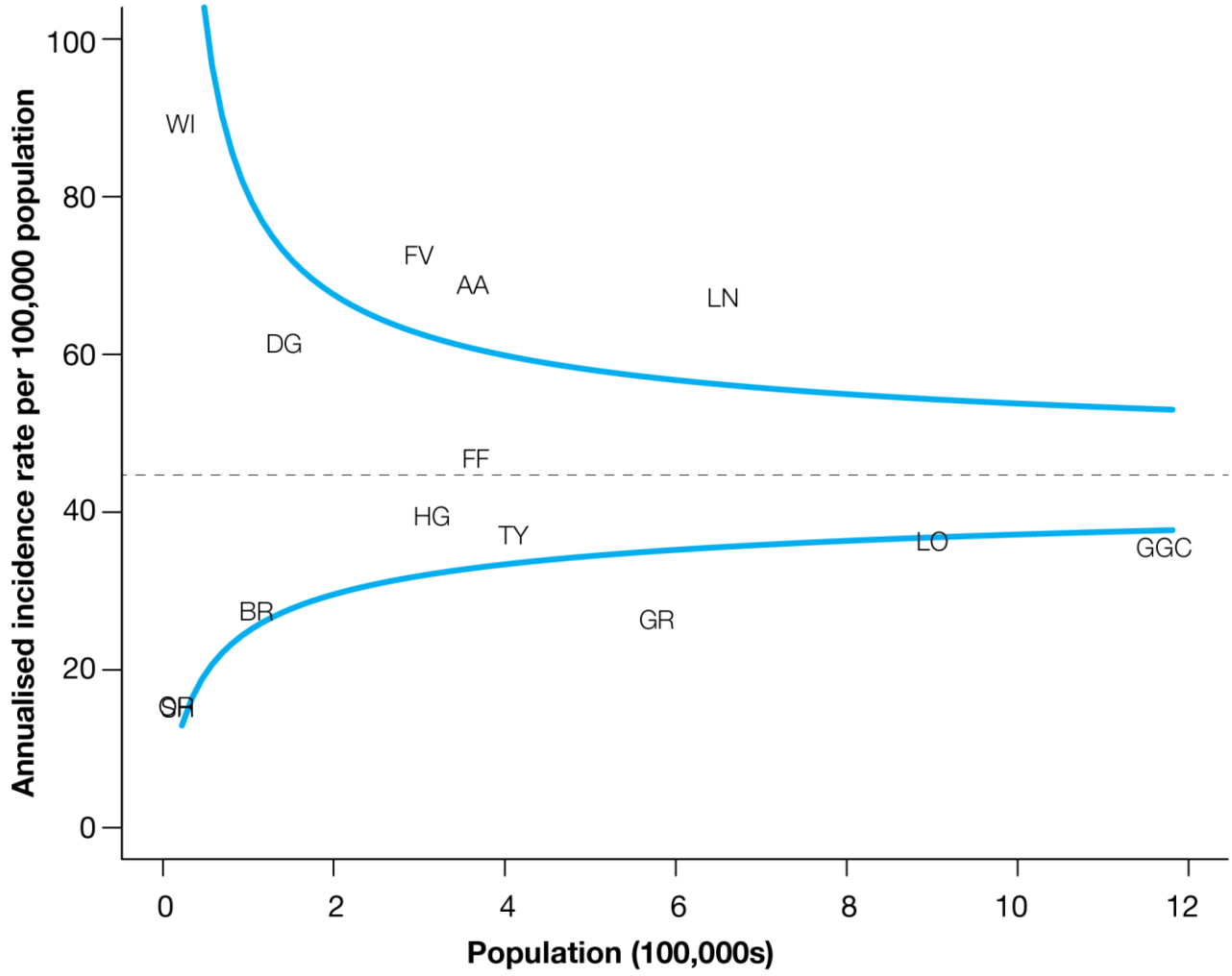
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 3: Funnel plot of ECB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q3 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 Q3 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 Q3 2020, 374 *Staphylococcus aureus* bacteraemia (SAB) cases were reported to ARHAI. In the previous quarter there were 351 SAB cases.

Healthcare associated infection cases by health board of laboratory

- During Q3 2020, 225 SAB cases were reported to ARHAI as healthcare associated. This corresponds to an incidence rate of 17.3 cases per 100,000 TOBDs (Table 9).
- Yearly trends (comparing year-ending September 2019 with year-ending September 2020) show that there was an increase in NHS Tayside and a decrease in NHS Highland (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 Q3 2020, 149 SAB cases were reported as community associated. This corresponds to an incidence rate of 10.8 cases per 100,000 population (Table 11).
- Yearly trends (comparing year-ending September 2019 with year-ending September 2020) show that there was an increase in Scotland overall (Table 12).
- No NHS boards were above the 95% confidence interval upper limit in the funnel plot analysis (Figure 6).
- No NHS boards were above normal variation when analysing trends over the past three years (see supplementary data).

Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).[1,2,3]

NHS Board	Q2 Cases	Q2 Bed Days	Q2 Rate	Q3 Cases	Q3 Bed Days	Q3 Rate
AA	23	81,868	28.1	16	97,707	16.4
BR	5	21,568	23.2	2	25,295	7.9
DG	4	27,088	14.8	6	36,727	16.3
FF	4	63,241	6.3	15	75,003	20.0
FV	16	58,320	27.4	11	66,078	16.6
GJ	3	8,152	36.8	2	10,016	20.0
GR	18	94,592	19.0	22	106,471	20.7
GGC	69	304,920	22.6	70	377,250	18.6
HG	3	50,361	6.0	3	59,671	5.0
LN	16	100,174	16.0	24	122,500	19.6
LO	30	182,151	16.5	27	217,934	12.4
OR	0	2,102	0.0	0	2,700	0.0
SH	2	1,591	125.7	1	2,091	47.8
TY	24	81,757	29.4	24	99,451	24.1
WI	2	3,200	62.5	2	4,152	48.2
Scotland	**219**	**1,081,085**	**20.3**	**225**	**1,303,046**	**17.3**

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

Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).[1,2,3]

NHS Board	YE Q3 19 Cases	YE Q3 19 Bed days	YE Q3 19 Rate	YE Q3 20 Cases	YE Q3 20 Bed days	YE Q3 20 Rate
AA	68	442,850	15.4	74	398,522	18.6
BR	9	119,289	7.5	12	105,133	11.4
DG	16	181,688	8.8	20	154,607	12.9
FF	55	361,481	15.2	40	317,647	12.6
FV	56	316,823	17.7	43	280,422	15.3
GJ	11	47,383	23.2	7	40,742	17.2
GR	92	527,311	17.4	76	465,840	16.3
GGC	345	1,681,203	20.5	283	1,524,877	18.6
HG	46	298,222	15.4	22	255,227	8.6 ↓
LN	113	580,162	19.5	99	510,747	19.4
LO	118	996,159	11.8	132	889,646	14.8
OR	4	14,134	28.3	3	10,901	27.5
SH	3	10,248	29.3	4	8,869	45.1
TY	81	463,656	17.5	97	410,700	23.6 ↑
WI	7	27,339	25.6	6	20,593	29.1
Scotland	**1,024**	**6,067,948**	**16.9**	**918**	**5,394,473**	**17.0**

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: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).[1,2,3,4]

NHS Board	Q2 Cases	Q2 Population	Q2 Rate	Q3 Cases	Q3 Population	Q3 Rate
AA	13	369,360	14.2	15	369,360	16.2
BR	5	115,510	17.4	1	115,510	3.4
DG	4	148,860	10.8	3	148,860	8.0
FF	13	373,550	14.0	6	373,550	6.4
FV	11	306,640	14.4	9	306,640	11.7
GR	13	585,700	8.9	18	585,700	12.2
GGC	14	1,183,120	4.8	27	1,183,120	9.1
HG	9	321,700	11.3	13	321,700	16.1
LN	16	661,900	9.7	16	661,900	9.6
LO	20	907,580	8.9	27	907,580	11.8
OR	0	22,270	0.0	2	22,270	35.7
SH	0	22,920	0.0	0	22,920	0.0
TY	11	417,470	10.6	12	417,470	11.4
WI	3	26,720	45.2	0	26,720	0.0
Scotland	**132**	**5,463,300**	**9.7**	**149**	**5,463,300**	**10.8**

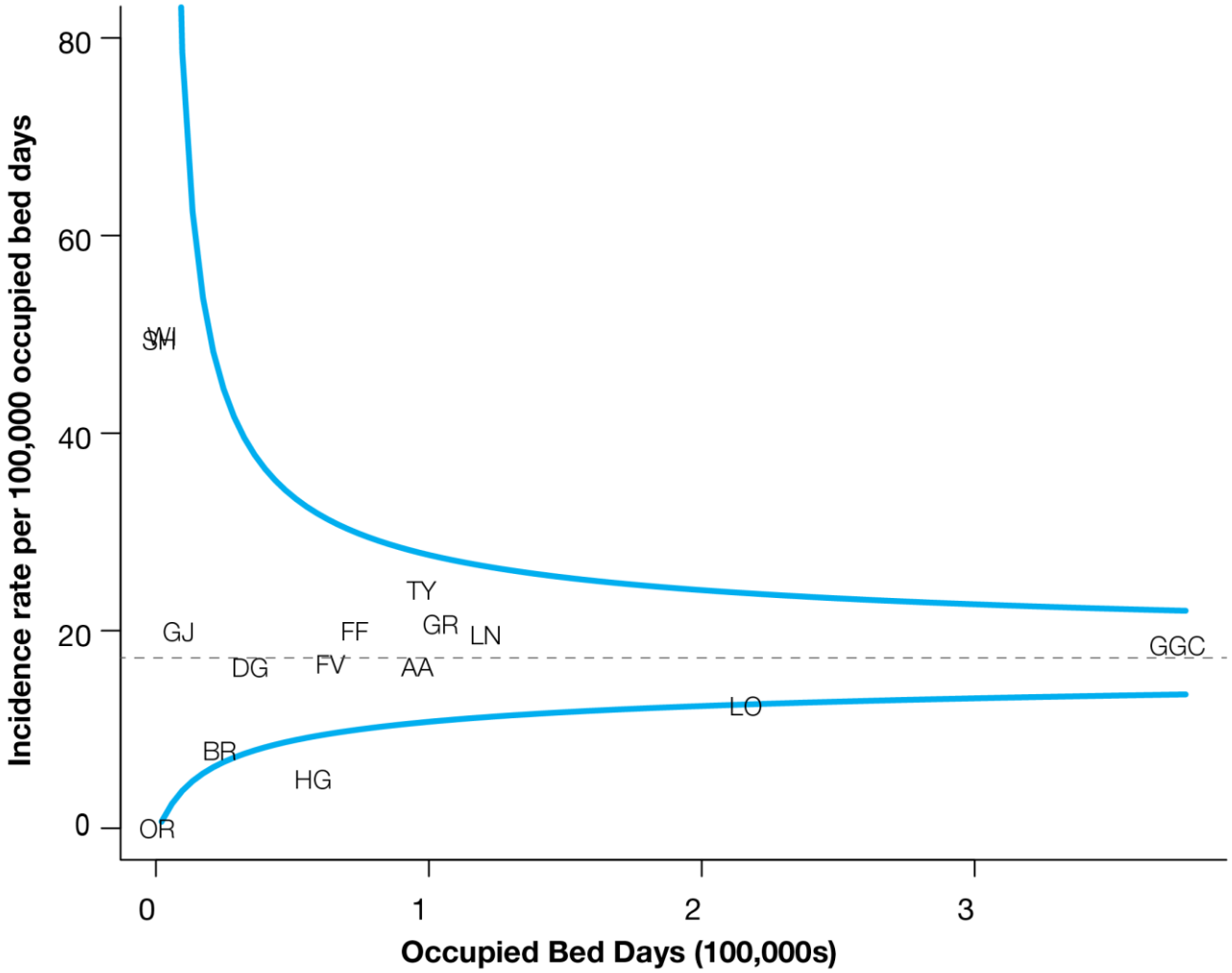
1. Quarterly population rates are based on an annualised population.
2. An arrow denotes statistically significant change.
3. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
4. Figures include any updates received following the last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

Table 12: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).[1,2,3]

NHS Board	YE Q3 19 Cases	YE Q3 19 Population	YE Q3 19 Rate	YE Q3 20 Cases	YE Q3 20 Population	YE Q3 20 Rate
AA	41	369,360	11.1	52	369,360	14.1
BR	11	115,510	9.5	11	115,510	9.5
DG	18	148,860	12.1	17	148,860	11.4
FF	43	373,550	11.5	33	373,550	8.8
FV	29	306,640	9.5	40	306,640	13.0
GR	41	585,700	7.0	60	585,700	10.2
GGC	82	1,183,120	6.9	86	1,183,120	7.3
HG	29	321,700	9.0	40	321,700	12.4
LN	53	661,900	8.0	67	661,900	10.1
LO	93	907,580	10.2	95	907,580	10.5
OR	2	22,270	9.0	5	22,270	22.5
SH	4	22,920	17.5	3	22,920	13.1
TY	42	417,470	10.1	50	417,470	12.0
WI	4	26,720	15.0	3	26,720	11.2
Scotland	**492**	**5,463,300**	**9.0**	**562**	**5,463,300**	**10.3 ↑**

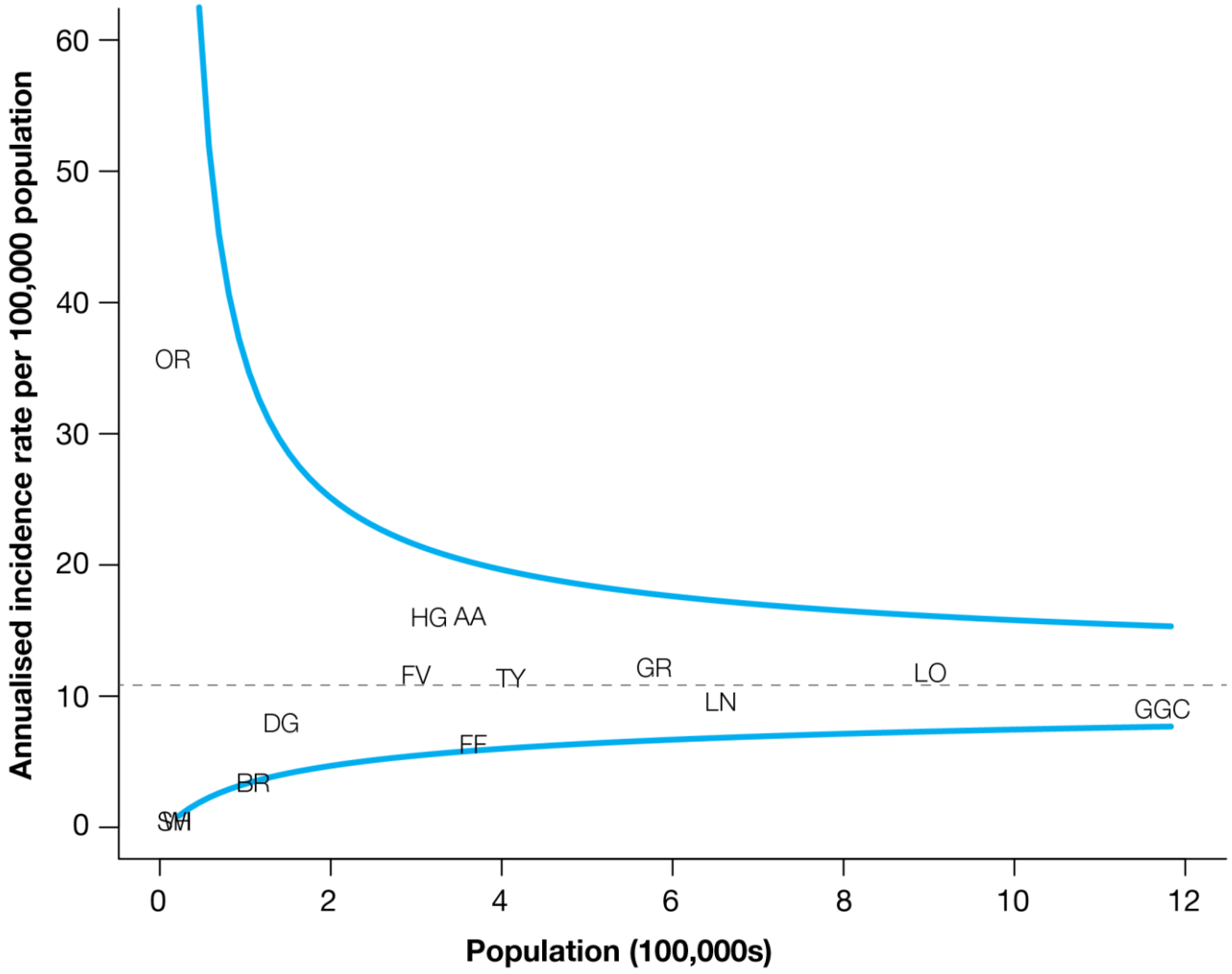
1. An arrow denotes statistically significant change.
2. Source of data is Electronic Communication of Surveillance in Scotland (ECOSS) & NRS mid-year population estimates.
3. Figures include any updates received following the last publication (see Appendix 2).

Figure 5: Funnel plot of SAB incidence rates (per 100,000 TOBD) in healthcare associated infection cases for all NHS boards in Scotland in Q3 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 Shetland and NHS Western Isles overlap.

Figure 6: Funnel plot of SAB incidence rates (per 100,000 population) in community associated infection cases for all NHS boards in Scotland in Q3 2020.[1,2]



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

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: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).	supplementary data (439 Kb)
Table 2: CDI cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).	supplementary data (439 Kb)
Table 3: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).	supplementary data (439 Kb)
Table 4: CDI cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).	supplementary data (439 Kb)
Table 5: ECB cases and incidence rates (per 100,000 TOBD) for healthcare associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).	supplementary data (439 Kb)
Table 6: ECB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).	supplementary data (439 Kb)
Table 7: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).	supplementary data (439 Kb)
Table 8: ECB cases and incidence rates (per 100,000 population) for community associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).	supplementary data (439 Kb)
Table 9: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).	supplementary data (439 Kb)
Table 10: SAB cases and incidence rates (per 100,000 TOBDs) for healthcare associated infection cases: year-ending September 2019 (YE Q3 19) compared to year-ending September 2020 (YE Q3 20).	supplementary data (439 Kb)
Table 11: SAB cases and incidence rates (per 100,000 population) for community associated infection cases: Q2 2020 (April to June 2020) compared to Q3 2020 (July to September 2020).	supplementary data (439 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 April 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 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 less 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. Future versions of this report will be updated to reflect this branding

			change. This change will therefore be instated for the next publication in October 2020.
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	Commentary on quarterly epidemiological data on *Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland
Description	This release provides information on *Clostridioides difficile* infection, *Escherichia coli* bacteraemia, *Staphylococcus aureus* bacteraemia and Surgical Site Infection in Scotland for the period July to September 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:* 26/11/2020 *Escherichia coli* Bacteraemia: 02/12/2020 *Staphylococcus aureus* Bacteraemia: 02/12/2020 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	12 January 2021
Frequency	Quarterly
Timeframe of data and timeliness	The latest iteration of data is 30 September 2020, therefore 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
No Retrospective Amendments to Bed Days			

***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
GGC	Q2 2020	48	49	-	-	Retrospective data amendment
LN	Q2 2020	-	-	14	13	Retrospective data amendment

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

The following updates have been made to the ECB case numbers:

NHS Board	Quarter	Previous Healthcare associated ECB cases	Updated Healthcare associated ECB cases	Previous Community associated ECB cases	Updated Community associated ECB cases	Reason
HG	Q2 2020	14	13	25	26	Retrospective data amendment
DG	Q2 2020	9	10	23	22	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**
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	6 October 2020
Next published	13 April 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	**mailto:NSS.HPSHAIIC@nhs.scot**
Date form completed	12 January 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 NHSScotland.

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**'.