UK Health Security Agency

Surveillance of surgical site infections in NHS hospitals in England

April 2024 to March 2025

Contents

Key points

The main points of the report are that:

- in the financial year 2024 to 2025, 190 NHS hospitals (122 NHS trusts) and 8 independent sector (IS) NHS treatment centres submitted surveillance data for 146,411 surgical operations to the UK Health Security Agency (UKHSA) Surgical Site Infection (SSI) Surveillance Service
- surveillance data was submitted across 17 surgical categories, with 122,965 operations in mandatory categories, and 23,446 operations in voluntary categories – 1,250 inpatient and readmission-detected SSIs were reported across all procedures in 2024 to 2025
- 2 NHS trusts did not meet the mandatory surveillance participation requirements in 2024 to 2025
- cardiac (non-coronary artery bypass graft, CABG) and spinal surgery had the highest degree of continuous surveillance (participation in all 4 surveillance quarters) among participating hospitals (88% and 71% respectively)
- 5 trusts were identified as high outliers for the mandatory orthopaedic surveillance categories (one in hip replacement and reduction of long bone fracture and 3 in repair of neck of femur)
- 2 of 10 categories showed a decrease in the risk of inpatient and readmission SSI when assessed over the most recent 10-year period
- median time to infection was 9 and 19 days for operations excluding and including prosthetic implants, respectively
- Enterobacterales continued to make up the highest proportion of causative organisms across all surgical categories for both superficial (32.0%) and deep incisional or organ and space (28.0%) SSIs
- the proportion of superficial SSIs caused by meticillin-resistant *Staphylococcus aureus* (MRSA) increased (2.3% to 3.3%) compared to the previous financial year, with the same increase observed for meticillin-sensitive *Staphylococcus aureus* (MSSA) superficial infections (15.9% to 19.0%) and deep or organ and space infections (17.5% to 18.9%)
- the proportion of patients given post discharge questionnaire (PDQ) increased to 53% in the financial year 2024 to 2025 and those completing it (of given) remained stable at 83%

Hospital participation and surgical volumes

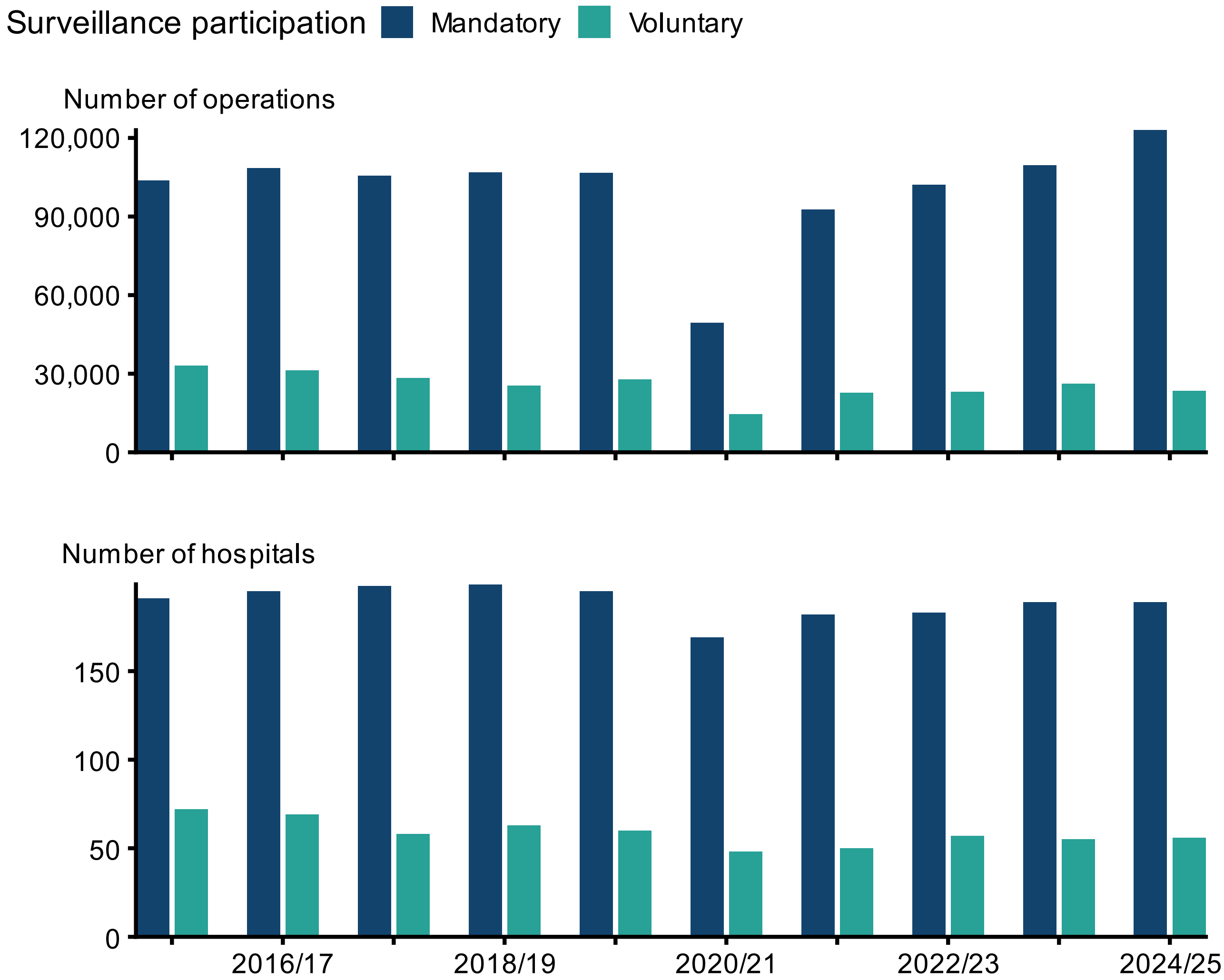
The UKHSA SSI Surveillance Service (SSISS) has accumulated surveillance data for almost 3.5 million operations and 62,000 SSIs since its inception in 1997.

Overall, 190 NHS hospitals representing 122 NHS trusts (of 134 acute NHS trusts in England) and an additional 8 IS NHS treatment centres participated in the SSISS data collection in the financial year 2024 to 2025. The number of hospitals contributing data increased (190) in comparison to 2023 to 2024 (189) and trusts decreased (124 previously). Surveillance data was submitted for 146,411 operations and 1,250 SSIs. Overall, the total number of operations submitted to the SSISS increased by 7.9% from 135,751 in financial year 2023 to 2024 to 146,411 in 2024 to 2025. Of these operations, 122,965 (84%) were orthopaedic operations submitted as part of mandatory surveillance and 23,446 operations submitted as part of voluntary surveillance spanning 13 other surgical categories. Compared to the financial year 2023 to 2024, the number of operations submitted for mandatory orthopaedic surveillance increased by 12.2% (from 109,623 operations), while voluntary surveillance showed a decrease of 10.3% (from 26,128 operations, Figure 1).

The number of surgical operations reported to SSISS decreased during the COVID-19 pandemic due to a combination of deferral of non-urgent surgery, cancellations, staff sickness, and reduced operating theatre capacity (1 to 3). There has been a year-on-year increase in the number of submitted operations for mandatory surgical categories since financial year 2021 to 2022. The number of submitted operations in 2024 to 2025 was 15.3% higher than pre-pandemic (financial year 2019 to 2020, 106,630 operations) for mandatory categories but lower for voluntary categories (15.9% lower than 27,873 operations).

Hospitals are required to report surgical volumes and inpatient and readmission infections for at least one quarter per financial year per trust in at least one orthopaedic category (see Background information section for further details) (4). As a result, the number of participating hospitals is highest in the mandatory categories of surveillance (hip: 148 hospitals, knee replacement: 143 hospitals, repair of neck of femur: 81 hospitals and reduction of long bone fracture: 21 hospitals) in the financial year 2024 to 2025. Participation in voluntary surgical categories in financial year 2024 to 2025 was the highest for large bowel surgery (17 hospitals), followed by breast surgery (15 hospitals) and spinal surgery (14 hospitals).

Figure 1. Annual participation in SSISS voluntary and mandatory surveillance, NHS hospitals England, April 2015 to March 2025

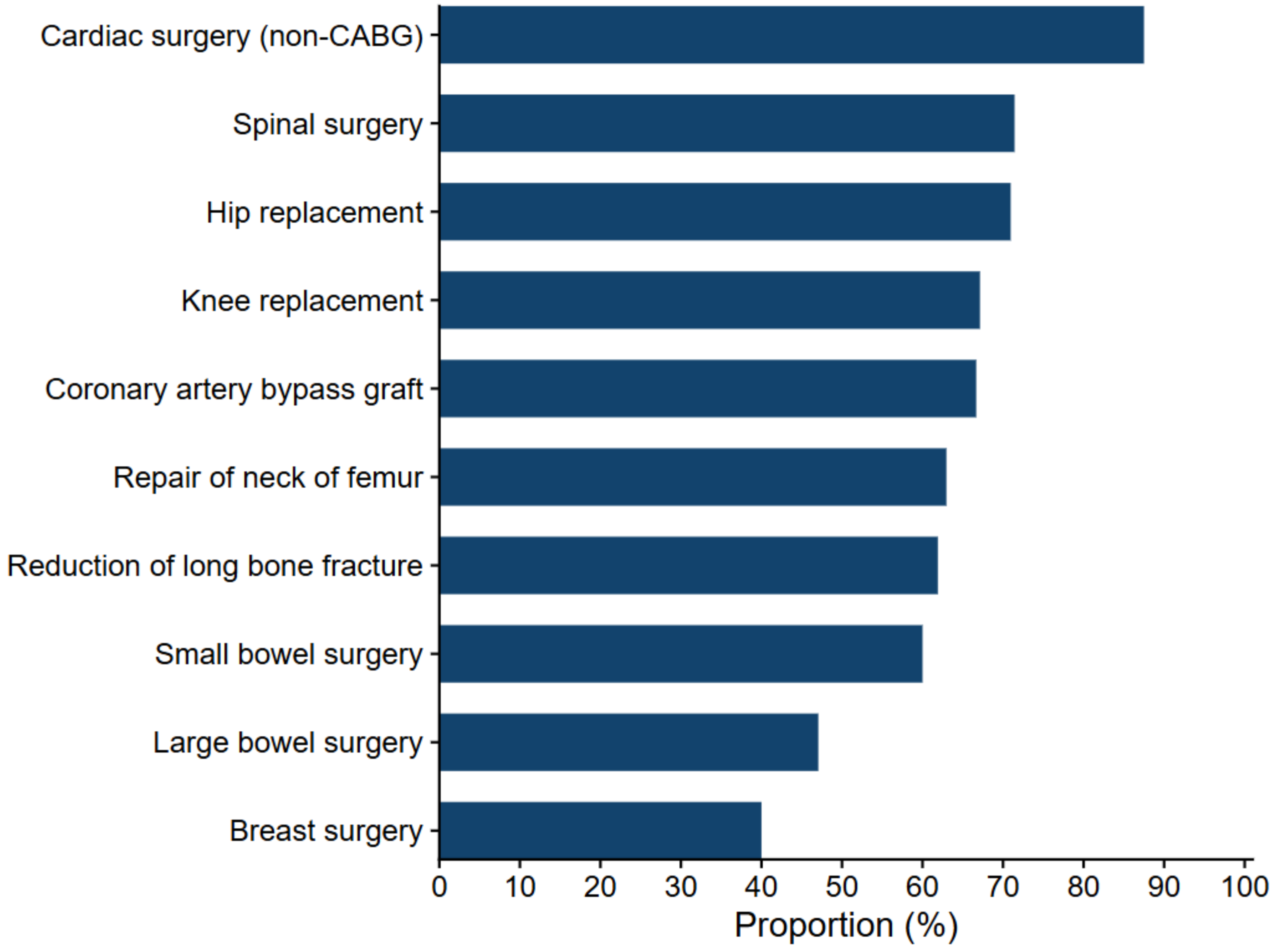


See data table 1 in accompanying data tables spreadsheet.

Figure 2 shows the proportion of hospitals carrying out continuous surveillance by surgical category during financial year 2024 to 2025. Seven surgical categories with fewer than 5 participating hospitals (abdominal hysterectomy, bile duct, liver or pancreatic surgery, cholecystectomy, cranial, gastric, limb amputation, and vascular surgery) were excluded from this analysis.

Of the voluntary categories, cardiac non-CABG (87.5%) and spinal surgery (71.4%) had the highest proportion of hospitals carrying out continuous surveillance in 2024 to 2025. Over two-thirds of participating hospitals in hip (70.9%) and knee (67.1%) replacement carried out continuous surveillance in financial year 2024 to 2025. This was an increase from the previous financial year where 64.5% of hospitals undertook continuous surveillance in hip replacement and 62.8% of hospitals in knee replacement.

Figure 2. Proportion of hospitals undertaking continuous surveillance, by surgical category, NHS hospitals England, April 2024 to March 2025



See data table 2 in accompanying data tables spreadsheet.

Patient and surgical characteristics

Data completeness for key patient and surgical characteristics, most of which are mandated for collection, was high (90% and above; see Appendix 1 and Appendix 2). Data completeness was similar to the previous financial year. The average data completeness varied across all surgical categories and patient and surgical-related fields; it ranged from 85.6% for limb amputation to 99.3% for abdominal hysterectomy in 2024 to 2025

The completion of American Society of Anesthesiologists' (ASA) score varied between categories, ranging from 84.3% for cranial surgery and 100% for cholecystectomy and bile duct, liver or pancreatic surgery, as hospitals may use an alternative assessment score for certain categories (for example cardiac (non-CABG) and CABG). Height and weight fields are optional for collection, which means the completeness of body mass index (BMI) was low compared to mandatory fields and varied by category (between 0% for bile duct, liver and pancreatic surgery and cholecystectomy up to 96.1% for abdominal hysterectomy and vascular surgery). Overall completeness of BMI was 63.7% in financial year 2024 to 2025, the same as the previous financial year (63.7%). BMI was available for 50% or more of submitted records for 13 of 17 surgical categories, an increase from the previous year (12).

Table 1a and Table 1b show the distribution of key patient and surgical characteristics. Collection of these characteristics is important to help hospitals better understand their results by identifying factors which might be contributing to an increased SSI risk in their patients. Data for surgical categories with less than 5 participating hospitals (abdominal hysterectomy, bile duct, liver or pancreatic surgery, cholecystectomy, cranial surgery, gastric surgery, limb amputation and vascular surgery) should be interpreted with caution. Data for financial year 2024 to 2025 was similar to the previous financial year with small increase in proportion of male patients undergoing cardiac (non-CABG) (67.7% versus 63.3%) and CABG operations (83.5% versus 80.4%). Similarly, an increase in the proportion of patients with wound class dirty or contaminated undergoing large bowel surgery was observed when comparing current to previous financial year (25.2% versus 18.5%). The proportion of patients undergoing an emergency operation decreased for cardiac (non-CABG) (2.8% versus 1.6%) and large bowel surgery (6.3% versus 4.7%), while it increased for repair of neck of femur (0.5% versus 2.5%) and small bowel surgery (2.1% versus 7.1%) between 2023 to 2024 and 2024 to 2025.

Surgical complexity (as indicated by ASA score, surgery duration, patients undergoing multiple operations through the same incision and total length of stay) varied little between 2023 to 2024 and 2024 to 2025, with small proportional changes. The percentage of patients undergoing operations for multiple surgical categories decreased for 5 of the 10 categories, with the greatest decrease for small (22.6% and 14.0%) and large bowel surgery (14.9% and 10.0%) between 2023 to 2024 and 2024 to 2025. The greatest increase was observed for patients undergoing breast (5.8% and 11.5%) and CABG surgery (20.4% and 25.4%) between the last 2 financial years. Between financial year 2023 to 2024 and 2024 to 2025, the median total length of stay remained the same or decreased for all surgical categories except for CABG surgery (9 days to 10 days, respectively). During the same period, the largest increase in median operation duration of surgery was observed for large bowel (192 min to 204 min) and CABG (240 min to 245 min) surgery (Table 1b).

An elevated BMI has been shown to increase the likelihood of developing an SSI (5, 6). Overall, there was only a marginal difference in median BMI amongst patients undergoing most of the 17 surgical categories except for small bowel surgery (reduction of 7.5%) between 2023 to 2024 and 2024 to 2025. In financial year 2024 to 2025, knee replacement had the highest proportion of patients who were obese (57.5%, BMI greater than or equal to 30 kg/m^2), similar to the previous financial year (56.8%). Gastric surgery was the second highest (48.5%) and abdominal hysterectomy the third highest (47.6%) (Appendix 3).

The median patient BMI for hip replacement was 28.7 kg/m^2 (IQR=25.3 to 31.6 kg/m^2) and for knee replacement, 31.0 kg/m^2 (IQR=27.4 to 35.1 kg/m^2), similar to the previous financial year. The median BMI decreased marginally in 5 out of 17 surgical categories. In patients undergoing cardiac (non-CABG) and cranial surgery, the median BMI increased in patients having elective and emergency surgery. However, completion of BMI data was variable by surgical category (Appendix 2) and by hospital and should be interpreted with caution.

Completion of BMI remained the same in the current financial year in comparison to the previous year (63.7%). BMI is important to consider when assessing high hospital outliers, especially where BMI thresholds are applied by Integrated Care Boards commissioning surgery (7).

The highest proportion of paediatric (under 18 years) data submitted in 2024 to 2025 in comparison to 2023 to 2024 was for spinal surgery (12.4% versus 11.5% of operations) followed by cardiac surgery (non-CABG) (5.9% versus 4.7%), and reduction of long bone fracture (5.2% versus 4.9%), (Appendix 3).

Table 1a. Patient-related characteristics by surgical category, NHS hospitals England, April 2024 to March 2025

Surgical category	Median age, IQR (years)	Male (%)	BMI ≥ 30 kg/m² (%)	ASA ≥ 3 (%)
Abdominal hysterectomy	51 (43 to 60)	not applicable	47.6	18.0
Bile duct, liver or pancreatic surgery	64 (55 to 75)	56.0	no data	47.2
Breast surgery	60 (50 to 69)	0.9	35.8	16.7
Cardiac surgery (non-CABG)	66 (55 to 73)	67.7	30.6	98.0
Cholecystectomy	58 (42 to 69)	41.3	no data	29.6
CABG	67 (60 to 73)	83.5	36.0	99.2
Cranial surgery	58 (46 to 68)	56.5	34.5	43.2
Gastric surgery	63 (52 to 71)	48.2	48.5	51.7
Hip replacement	70 (62 to 77)	40.0	41.2	33.4
Knee replacement	70 (63 to 77)	43.5	57.5	32.1
Large bowel surgery	66 (55 to 76)	50.6	28.5	49.1

Surgical category	Median age, IQR (years)	Male (%)	BMI ≥ 30 kg/m^2 (%)	ASA ≥ 3 (%)
Limb amputation	67 (61 to 75)	79.9	23.9	91.6
Reduction of long bone fracture	67 (44 to 82)	40.2	21.5	49.0
Repair of neck of femur	83 (77 to 89)	32.1	9.5	83.2
Small bowel surgery	62 (50 to 73)	52.5	21.5	55.9
Spinal surgery	57 (38 to 70)	45.8	40.5	31.3
Vascular surgery	72 (64 to 79)	71.5	28.7	86.6

Abbreviations
IQR = interquartile range
BMI = body mass index
ASA = American Society of Anesthesiologists

Table 1b. Surgery-related characteristics by surgical category, NHS hospitals England, April 2024 to March 2025

Surgical category	Wound contaminated or dirty (%)	Median surgery duration, IQR (minutes)	Median total length of stay, IQR (days)	Pre-op stay more than one day (%)	Emergency surgery (%)	Multiple surgical categories (%)	Antibiotic prophylaxis not given (%)	Implant present (%)
Abdominal hysterectomy	9.7	108 (85 to 139)	2 (1 to 3)	1.0	0.0	35.2	0.5	0.0
Bile duct, liver or pancreatic surgery	0.0	308.5 (186.5 to 443)	7 (4 to 13)	8.8	0.5	37.3	0.5	1.6
Breast surgery	0.0	73 (49 to 103)	0 (0 to 1)	0.1	0.1	11.5	20.3	8.5
Cardiac surgery (non-CABG)	0.0	239 (195 to 302)	9 (7 to 16)	26.2	1.6	37.8	0.9	95.4
Cholecystectomy	0.4	97 (67 to 218)	1 (0 to 6)	9.3	0.0	27.1	0.8	1.2
CABG	0.0	245 (208 to 290)	10 (7 to 16)	49.2	1.1	25.4	0.7	78.5
Cranial surgery	3.5	129 (73 to 196)	4 (3 to 10)	17.8	8.0	0.4	4.2	51.6
Gastric surgery	4.8	218.5 (149 to 400.5)	6 (2 to 10)	7.2	0.0	9.9	7.8	1.5
Hip replacement	0.1	81 (63 to 102)	2 (1 to 4)	3.6	0.2	1.2	0.7	100.0
Knee replacement	0.1	79 (62 to 99)	2 (1 to 3)	0.6	0.0	0.1	0.6	100.0
Large bowel surgery	25.2	204 (147 to 284)	7 (4 to 13)	15.6	4.7	10.0	1.3	4.9
Limb amputation	0.0	70.5 (40 to 106)	25 (14 to 32)	60.9	0.6	0.6	5.7	0.0
Reduction of long bone fracture	6.3	94 (68 to 131)	8 (2 to 18)	34.5	0.1	13.0	2.9	97.7
Repair of neck of femur	0.0	70 (56 to 89)	13 (9 to 21)	31.2	2.6	0.2	1.5	100.0
Small bowel surgery	59.6	116 (84 to 166)	8 (4 to 18)	28.3	7.1	14.0	2.4	1.4
Spinal surgery	0.1	130 (87 to 194)	2 (1 to 7)	8.9	2.2	0.8	1.2	42.6

Surgical category	Wound contaminated or dirty (%)	Median surgery duration, IQR (minutes)	Median total length of stay, IQR (days)	Pre-op stay more than one day (%)	Emergency surgery (%)	Multiple surgical categories (%)	Antibiotic prophylaxis not given (%)	Implant present (%)
Vascular surgery	0.6	199 (139 to 295)	4 (2 to 9)	20.0	5.8	3.4	0.8	74.6

Abbreviations
IQR = interquartile range
BMI = body mass index
ASA = American Society of Anesthesiologists

The primary indication for patients undergoing hip and knee replacement is shown in Table 2. Osteoarthritis continues to be the main reason why patients undergo joint replacement surgery (hip: 85.4%; knee: 92.9%). The proportion of replacement surgeries carried out as a result of trauma or fracture decreased slightly for hip (4.5% versus 5.2%) and remained the same for knee (0.3%) in comparison to last year. The proportion of operations due to revision decreased for hip (from 7.7% to 6.8%) and marginally increased for knee (from 5.0% to 5.2%) between financial year 2023 to 2024 and 2024 to 2025.

Table 2. Primary indication for hip replacement (N=43,752 [note 1]) and knee replacement (N=50,049 [note 1]) surgery, NHS hospitals England, April 2024 to March 2025

	Indication for surgery	Hip replacement: number of operations	Hip replacement: proportion (%)	Knee replacement: number of operations	Knee replacement: proportion (%)
Primary	Osteoarthritis	37,360	85.4	46,484	92.9
	Inflammatory joint disease	351	0.8	346	0.7
	Avascular necrosis	509	1.2	17	< 0.1
	Trauma or fracture	1,949	4.5	144	0.3
	Other	595	1.4	445	0.9
	Total	**40,764**	**93.2**	**47,436**	**94.8**
Revision	Infection	324	0.7	294	0.6
	Fracture	522	1.2	156	0.3
	Other	1,983	4.5	1,949	3.9
	Unknown	159	0.4	214	0.4
	Total	**2,988**	**6.8**	**2,613**	**5.2**

Note 1: total does not include patients who had missing data for primary indication (hip: n=874, knee: n=1,453).

SSI risk

Inpatient and readmission SSI risk

Table 3 presents the SSI risk (cumulative incidence) and incidence density by surgical category. Five years' of data (April 2020 to March 2025) was used to produce national benchmarks.

Inpatient and readmission SSI risk varied greatly depending on the type of surgical procedure. The surgical categories with the highest risk of infection were large bowel surgery at 8.3% (95% CI: 7.8 to 8.8), and small bowel at 8.0% (6.8 to 9.3). Large bowel surgery has historically been the category of surgery with the highest risk. In the latest financial year, the risk of SSI associated with large bowel surgery remained similar to previous year (2023 to 2024: 8.5%, 7.9 to 9.0). These are operations carried out at body sites with high levels of bacterial contamination, contributing to a higher risk of SSI.

Hip (0.5%; (0.4 to 0.5), and knee (0.4%; (0.3 to 0.4)) replacement carried the lowest SSI risk.

Overall, there was a small year-on-year fluctuation in the risk of SSI across multiple categories of surgery. Given the small degree of change, these differences may be due to random variation in risk. Ten-year trends in SSI risk presented later in the report provide indicators of long-term changes in the SSI risk over time.

A large proportion of SSIs were captured through readmission surveillance for operations associated with short post-operative stays (0 to 3 days), such as hip or knee replacement, abdominal hysterectomy, breast, spinal and vascular surgery. The proportion of SSI captured by readmission surveillance ranged from 43.6% for vascular surgery to 100% for breast surgery in financial year 2024 to 2025, emphasising the importance of post-discharge surveillance.

SSI incidence density accounts for the differences in length of hospital stay in measure of frequency calculations for inpatient SSIs. The incidence density of in-hospital detected SSIs per 1,000 post-operative patient-days varied from 0.0 (95% CI 0.0 to 0.5) and 0.1 (95% CI 0.1 to 0.1) for breast surgery and knee replacement, to 7.1 (95% CI 6.6 to 7.6) per 1,000 inpatient days for large bowel surgery. Of note, while bile duct, liver or pancreatic surgery had higher incidence density than large bowel surgery, the estimate was based on a single participating hospital.

There were 2 categories with fewer than 5 participating hospitals included in the benchmark in the current financial year, the same number as the previous financial year (2023 to 2024).

Table 3. Inpatient and readmission SSI risk by surgical category, NHS hospitals England, April 2020 to March 2025

Surgical category	Number of participating hospitals	Number of operations	Inpatient and readmission: number of SSIs	Inpatient and readmission: SSI risk (%) 95% CI	Inpatient only: number of SSIs	Inpatient only: incidence density (per 1,000 patient days) 95% CI
Abdominal hysterectomy	6	1,229	22	1.8 (1.1 to 2.7)	13	3.3 (1.7 to 5.6)
Bile duct, liver or pancreatic surgery	1	688	167	24.3 (21.1 to 27.7)	143	19.0 (16.1 to 22.4)
Breast surgery	25	12,914	83	0.6 (0.5 to 0.8)	0	0.0 (0.0 to 0.5)
Cardiac surgery (non-CABG)	11	16,720	190	1.1 (1.0 to 1.3)	126	0.6 (0.5 to 0.8)
Cholecystectomy	3	786	38	4.8 (3.4 to 6.6)	25	5.7 (3.7 to 8.4)
CABG	15	26,297	727	2.8 (2.6 to 3.0)	402	1.8 (1.6 to 1.9)
Cranial surgery	6	5,870	111	1.9 (1.6 to 2.3)	46	1.0 (0.7 to 1.3)
Gastric surgery	5	1,266	37	2.9 (2.1 to 4.0)	33	3.2 (2.2 to 4.5)
Hip replacement	177	176,330	804	0.5 (0.4 to 0.5)	145	0.2 (0.2 to 0.2)

Surgical category	Number of participating hospitals	Number of operations	Inpatient and readmission: number of SSIs	Inpatient and readmission: SSI risk (%) 95% CI	Inpatient only: number of SSIs	Inpatient only: incidence density (per 1,000 patient days) 95% CI
Knee replacement	170	179,524	656	0.4 (0.3 to 0.4)	58	0.1 (0.1 to 0.1)
Large bowel surgery	29	11,019	914	8.3 (7.8 to 8.8)	750	7.1 (6.6 to 7.6)
Limb amputation	5	724	29	4.0 (2.7 to 5.7)	25	1.8 (1.2 to 2.7)
Reduction of long bone fracture	36	17,615	156	0.9 (0.8 to 1.0)	68	0.4 (0.3 to 0.5)
Repair of neck of femur	111	103,329	803	0.8 (0.7 to 0.8)	456	0.3 (0.3 to 0.3)
Small bowel surgery	9	1,963	157	8.0 (6.8 to 9.3)	138	5.9 (5.0 to 7.0)
Spinal surgery	19	27,835	291	1.0 (0.9 to 1.2)	82	0.6 (0.5 to 0.7)
Vascular surgery	5	2,615	55	2.1 (1.6 to 2.7)	31	1.6 (1.1 to 2.3)

Abbreviations
CI = confidence interval.

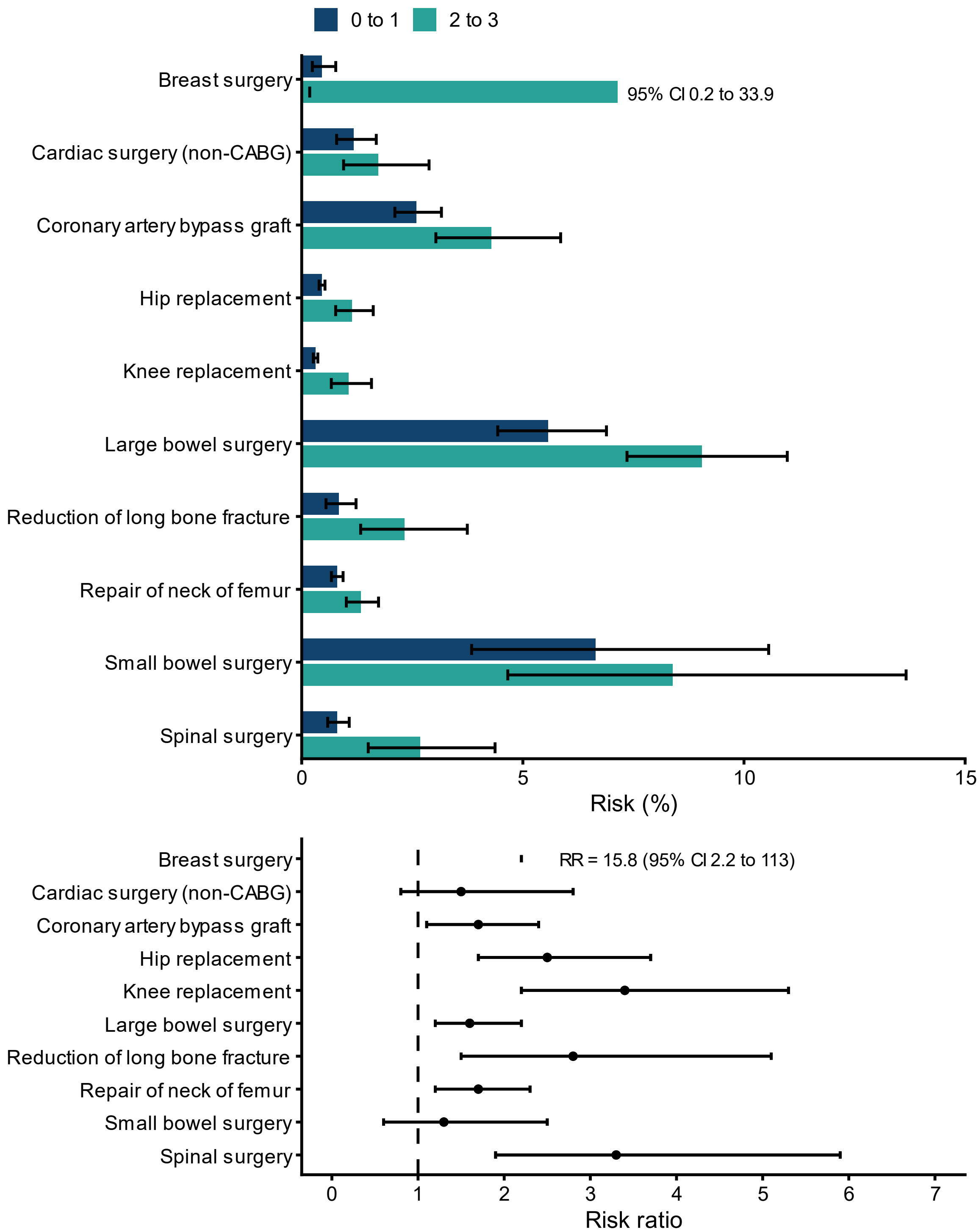
Risk factors for SSI

Participating hospitals are encouraged to assess their hospital's SSI risk stratified by important patient and surgery-related characteristics. The National Healthcare Safety Network (NHSN) risk index is used to account for potentially important differences in patient population. The risk index assigns a cumulative score from 0 to 3 based on the presence of the following risk factors: ASA score of 3 or higher, operation duration greater than 'T-time' (as defined by the 75th percentile for the category of surgery), and a contaminated or dirty wound.

Risk ratios (RR) were calculated to compare the risk between risk index groups. A RR greater than 1 indicates an increased SSI risk. Where the confidence intervals do not include the measure of no difference (RR = 1), it is considered unlikely that any observed difference in SSI risk occurred by chance.

Figure 3a shows the SSI risk for financial year 2024 to 2025 across surgical categories for patients whose operation was deemed at relatively low risk of SSI (NHSN risk index 0 or 1) compared to patients with a higher risk of SSI after surgery (risk index 2 or 3). In all categories of surgery except for cardiac (non-CABG) and small bowel surgery, patients who underwent operations with a higher NHSN risk index were more likely to experience infection than those with a lower risk index. However, it is important to note that these risk ratios have not been adjusted for other factors that might explain the observed increase in relative risk (Figure 3a).

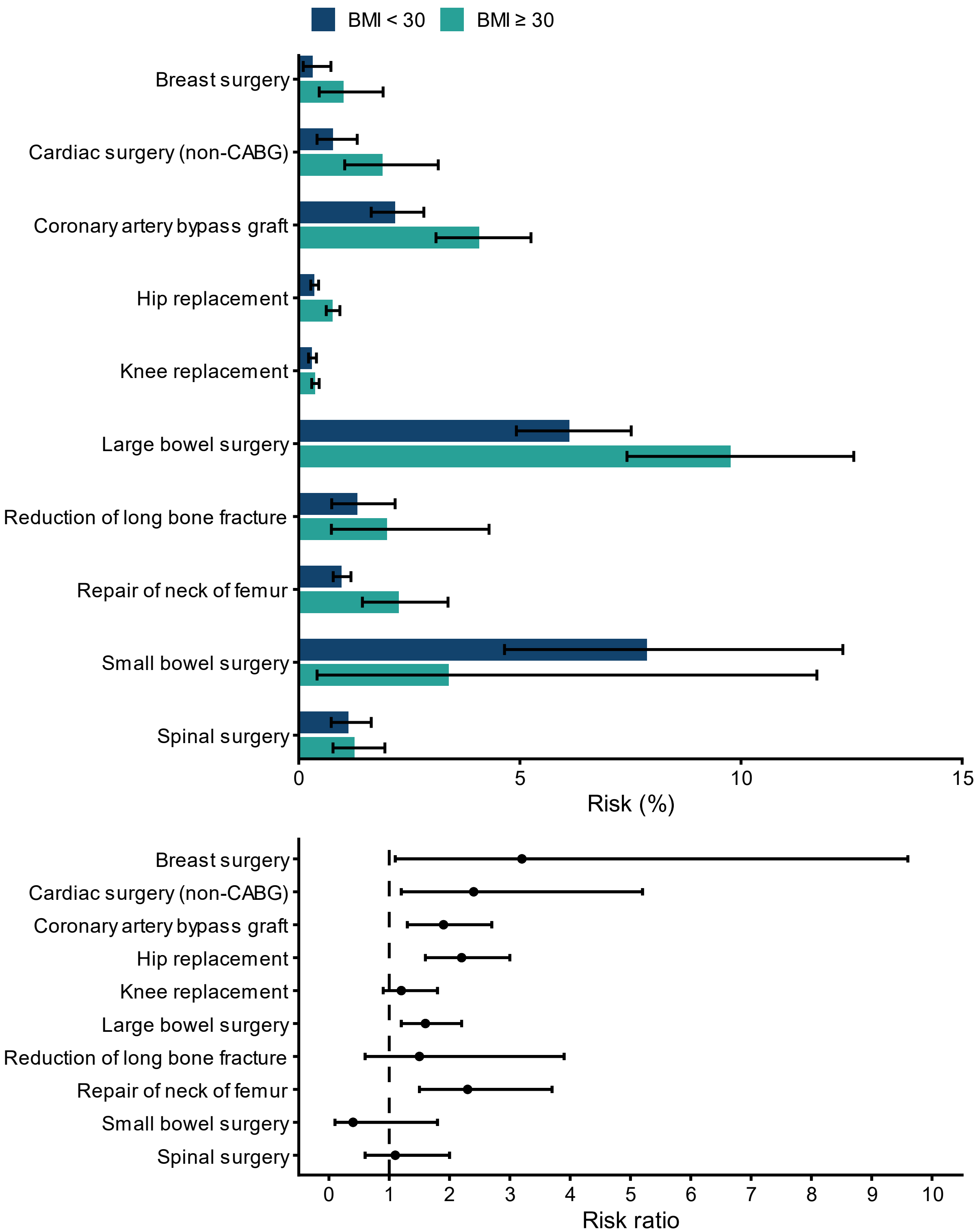
Figure 3a. Inpatient and readmission SSI risk by NHSN risk index, NHS hospitals England, April 2024 to March 2025 [note 1]



Note 1: categories with less than 5 participating hospitals were excluded.
See data table 3a in accompanying data tables spreadsheet.

An elevated BMI has been shown to increase the risk of developing an SSI, particularly among CABG patients (5, 6). Figure 3b shows the unadjusted SSI risk for financial year 2024 to 2025 across surgical categories for patients who had BMI equal to or greater than 30 kg/m^2 compared to those with BMI less than 30 kg/m^2. In 6 out of 10 assessed categories of surgery (except knee replacement, reduction of long bone fracture, small bowel and spinal surgery), an increased risk of SSI was seen for patients with BMI equal to or higher than 30 kg/m^2 relative to the patients with BMI less than 30 kg/m^2

Figure 3b. Inpatient and readmission SSI risk by patient body mass index, NHS hospitals England, April 2024 to March 2025 [note 1]



Note 1: categories with less than 5 participating hospitals were excluded.
See data table 3b in accompanying data tables spreadsheet.

Table 4 shows SSI risk by primary indication for hip replacement and knee replacement surgery. For both prosthetic joint surgeries, revision operations carried a higher SSI risk than primary operations (hip: 1.0% versus 0.5%; knee: 0.7% versus 0.3%). The SSI risk for patients undergoing hip replacement due to trauma or fracture increased from 0.2% (95% CI: 0.1 to 0.5) in 2023 to 2024 to 0.7% (0.4 to 1.1) in 2024 to 2025. During the same period, knee replacement due to trauma or fracture increased from 0% (0 to 2.6) to 0.7% (0 to 3.8). Between 2023 to 2024 and 2024 to 2025, there were decreases in SSI risk among patients undergoing revision operations due to fracture in hip (2.3% (1.2 to 3.9) to 1.1% (0.4 to 2.5)) and knee replacement (2.7% (0.6 to 7.6) to 0.6% (0 to 3.5)).

These year-on-year changes should be interpreted with caution due to overlapping confidence intervals signifying the potential role of random variation in the observed differences.

Table 4. Inpatient and readmission SSI risk by primary indication for joint replacement surgeries, NHS hospitals England, April 2024 to March 2025 [note 1]

	Indication for surgery	Hip replacement: number of operations	Hip replacement: number of SSI	Hip replacement: SSI risk (%), 95% CI	Knee replacement: number of operations	Knee replacement: number of SSI	Knee replacement: SSI risk (%), 95% CI
Primary	Osteoarthritis	37,360	172	0.5 (0.4 to 0.5)	46,484	146	0.3 (0.3 to 0.4)
	Inflammatory joint disease	351	1	0.3 (0.0 to 1.6)	346	1	0.3 (0.0 to 1.6)
	Avascular necrosis	509	2	0.4 (0.0 to 1.4)	17	0	0.0 (0.0 to 19.5)
	Trauma or fracture	1949	13	0.7 (0.4 to 1.1)	144	1	0.7 (0.0 to 3.8)
	Other	595	52	0.3 (0.0 to 1.2)	445	5	1.1 (0.4 to 2.6)
	Total	**40,764**	**190**	**0.5 (0.4 to 0.5)**	**47,436**	**153**	**0.3 (0.3 to 0.4)**
Revision	Infection	324	6	1.9 (0.7 to 4.0)	294	7	2.4 (1.0 to 4.8)
	Fracture	522	6	1.1 (0.4 to 2.5)	156	1	0.7 (0.0 to 3.8)

	Indication for surgery	Hip replacement: number of operations	Hip replacement: number of SSI	Hip replacement: SSI risk (%), 95% CI	Knee replacement: number of operations	Knee replacement: number of SSI	Knee replacement: SSI risk (%), 95% CI
	Other	1,983	17	0.9 (0.5 to 1.4)	1,949	5	1.1 (0.4 to 2.6)
	Unknown	159	2	1.3 (0.2 to 4.5)	214	0	0.0 (0.0 to 1.7)
	Total	**2,664**	**31**	**1.0 (0.7 to 1.5)**	**2,613**	**19**	**0.7 (0.4 to 1.1)**

Note 1: totals do not include patients who had missing data for primary indication (hip: 874, knee:1,453).

Abbreviations
CI = confidence interval.

Social determinants of health

Ethnicity

There is a compelling body of evidence that health patterns and access to health services vary between social groups, and highlighting some of these differences can help address health inequalities. Discerning the causes of health inequalities is complex as many factors are interlinked, and therefore out of the scope of this report (8).

In assessing analyses of SSI risk distribution by patient ethnicity, results for 'Other' ethnicity group should be also interpreted with caution due to this being a heterogenous group including dissimilar individuals (2021 census lists 68 subcategories for the 'Other' high-level ethnic group). The SSI risk by category and ethnic group was based on 5-year data between April 2020 and March 2025. Of the 586,801 operations reported to the SSISS during this period, 5.3% did not link to HES data (see Quality and methodology information report for detailed methodology), while 2.2% had the ethnic group recorded in HES as 'not known' or 'not stated'. During this period, the most commonly recorded ethnicity was White (86.6%), followed by Asian (3.6%), Black (1.5%), Mixed (0.5%) and Other (0.3%) ethnicity.

Table 5 shows the proportion of patients by ethnic group and surgical category. Across all surgical categories the proportion of patients of White ethnicity ranged from 72.9% (CABG and abdominal hysterectomy) to 91.3% for limb amputation surgery. The proportion of non-white patients varied by surgical category, with the highest proportion observed in CABG (Asian 18.7%, Black 2.1%), cranial surgery (Asian 6.4%, Black 5.3%), and cardiac surgery (non-CABG) (Asian 8.1%, Black 3.0%). The highest proportion of records with missing or unknown ethnicity was found in abdominal hysterectomy (17.2%) and hip replacement (9.6%).

Table 5. Patient distribution by ethnic group and surgical category, NHS hospitals England, April 2020 to March 2025

Surgical category	Asian number (%)	Black number (%)	Other ethnicity number (%)	Mixed or multiple ethnicity number (%)	White number (%)	Missing or unknown number (%)	Total number (%)
Abdominal hysterectomy	47 (3.8)	56 (4.6)	8 (0.7)	11 (0.9)	896 (72.9)	211 (17.2)	1,229 (100)
Bile duct, liver or pancreatic surgery	8 (1.1)	7 (1.0)	2 (0.3)	3 (0.4)	639 (91.3)	41 (5.9)	700 (100)
Breast surgery	269 (2.1)	129 (1.0)	59 (0.5)	98 (0.8)	11,703 (90.6)	657 (5.1)	12,915 (100)
Cardiac surgery (non-CABG)	1,348 (8.1)	504 (3.0)	122 (0.7)	171 (1.0)	13,549 (81.0)	1,026 (6.1)	16,720 (100)
Cholecystectomy	21 (2.7)	23 (2.9)	4 (0.5)	7 (0.9)	687 (87.4)	44 (5.6)	786 (100)
CABG	4,921 (18.7)	540 (2.1)	266 (1.0)	249 (0.9)	19,194 (72.9)	1,164 (4.4)	26,334 (100)
Cranial surgery	376 (6.4)	310 (5.3)	56 (1.0)	69 (1.2)	4,805 (81.9)	254 (4.3)	5,870 (100)
Gastric surgery	17 (1.3)	16 (1.3)	3 (0.2)	15 (1.2)	1,153 (91.0)	63 (5.0)	1,267 (100)
Hip replacement	1,681 (1.0)	2,356 (1.3)	343 (0.2)	791 (0.4)	154,286 (87.5)	16,875 (9.6)	176,332 (100)
Knee replacement	9,362 (5.2)	3,572 (2.0)	430 (0.2)	947 (0.5)	151,049 (84.1)	14,166 (7.9)	179,526 (100)

Surgical category	Asian number (%)	Black number (%)	Other ethnicity number (%)	Mixed or multiple ethnicity number (%)	White number (%)	Missing or unknown number (%)	Total number (%)
Large bowel surgery	164 (1.5)	119 (1.1)	47 (0.4)	75 (0.7)	9,895 (89.7)	729 (6.6)	11,029 (100)
Limb amputation	15 (2.1)	16 (2.2)	2 (0.3)	2 (0.3)	661 (91.3)	28 (3.9)	724 (100)
Reduction of long bone fracture	311 (1.8)	189 (1.1)	113 (0.6)	144 (0.8)	15,940 (90.5)	918 (5.2)	17,615(100)
Repair of neck of femur	1,217 (1.2)	338 (0.3)	218 (0.2)	265 (0.3)	95,345 (92.3)	5,950 (5.8)	103,333 (100)
Small bowel surgery	38 (1.9)	25 (1.3)	10 (0.5)	15 (0.8)	1,769 (89.8)	114 (5.8)	1,971 (100)
Spinal surgery	1,274 (4.6)	850 (3.1)	96 (0.3)	345 (1.2)	24,038 (86.4)	1,232 (4.4)	27,835 (100)
Vascular surgery	7 (0.3)	4 (0.2)	3 (0.1)	10 (0.4)	2,371 (90.7)	220 (8.4)	2,615 (100)

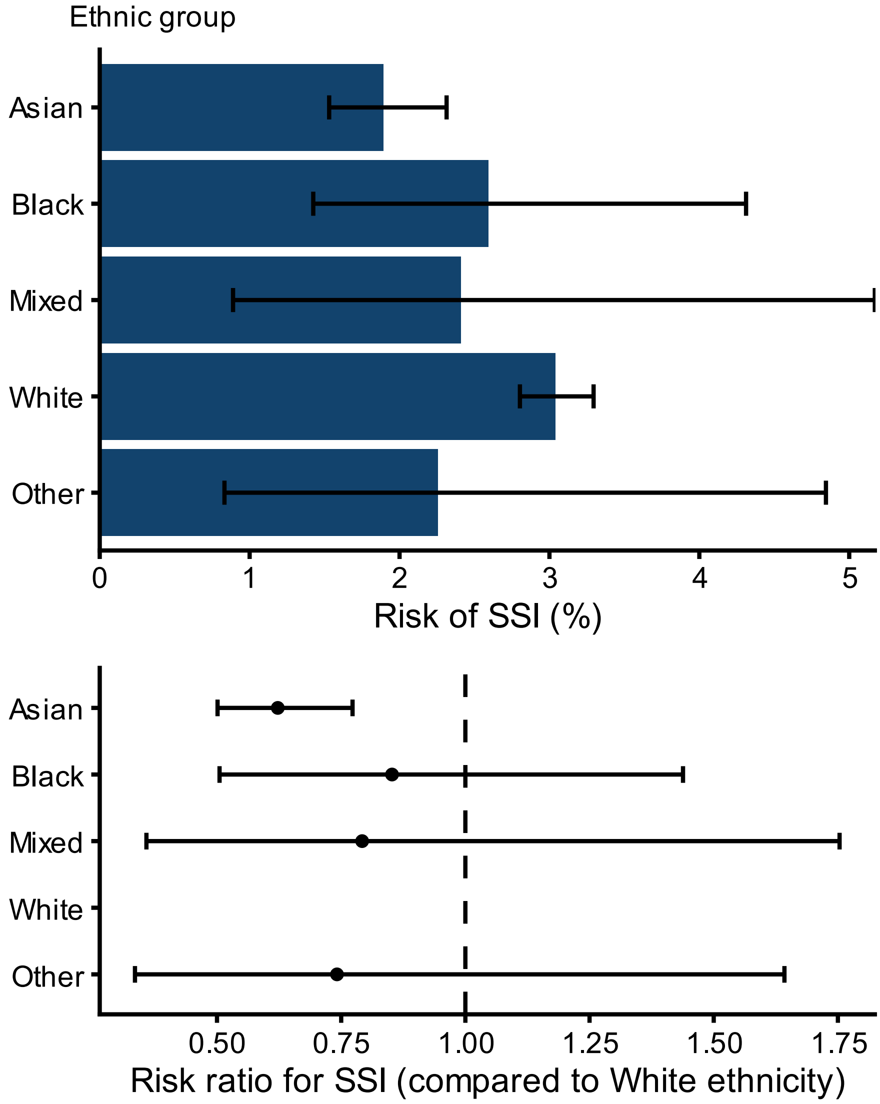
Figures 4a and 4b show SSI risk and risk ratios in a selection of surgical categories comparing risk between ethnic groups (using White ethnicity as the reference group). Only categories with more than 5 hospitals participating during the 5-year period were included in the analysis. These comparisons lack statistical power due to the very low surgical volumes in some of the non-white ethnic groups (Table 5). Therefore, care should be taken when interpreting these results. The risk ratios are also unadjusted estimates, which means the estimates do not account for other factors which may play a role in explaining some of the differences such as underlying co-morbidities.

There was some evidence that, compared to people of White ethnicity, patients of Asian ethnicity had lower SSI risk in CABG surgery (RR 0.62; 0.50 to 0.77, Figure 4a) and higher SSI risk in large bowel surgery (1.55; 1.04 to 2.33, Figure 4b).

There was no evidence for differences in SSI risk by ethnicity for other categories of surgery although it is likely that these analyses were affected by the low numbers of operations when stratified by ethnic group (see Table 5).

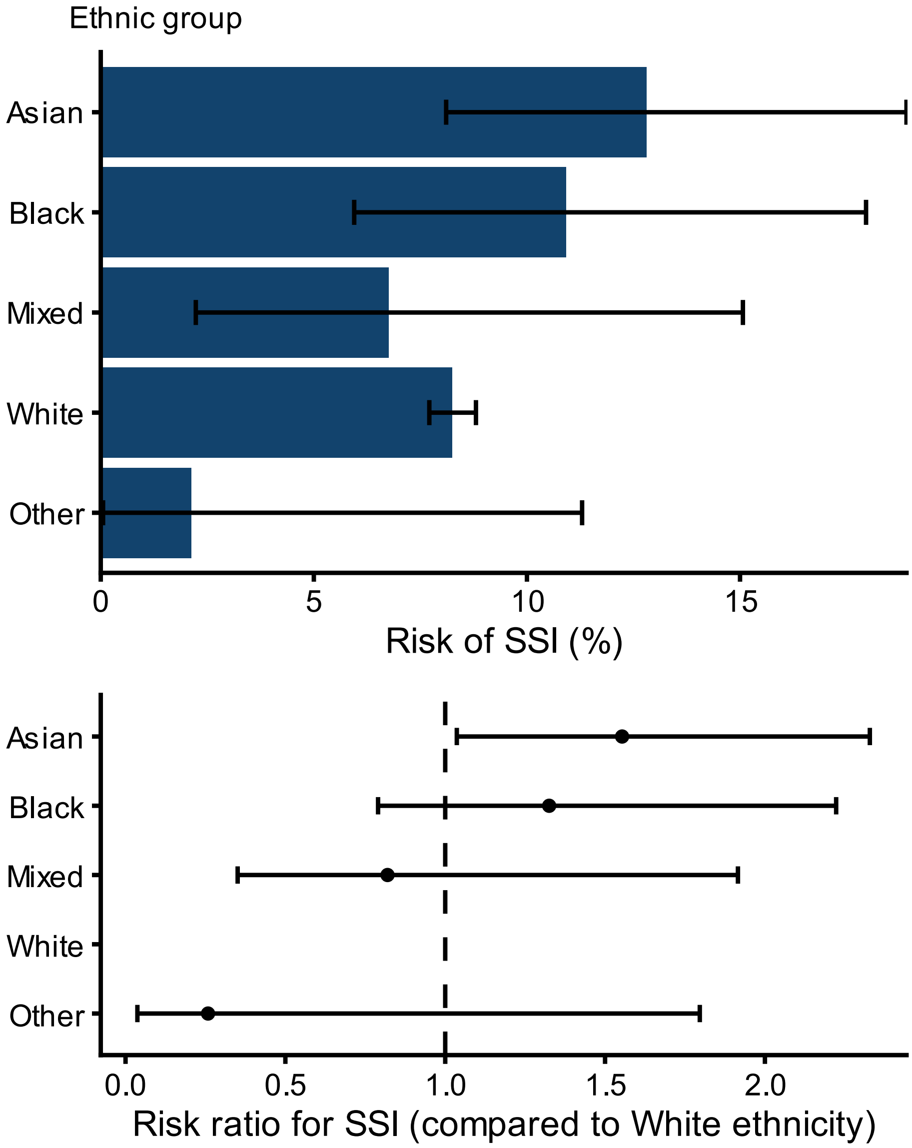
A previous study showed differences in the unadjusted risk of SSI according to patient ethnicity, but with this difference diminished after adjusting for IMD and patient and surgery-related risk factors (9). Based on 5-year data between April 2020 and March 2025, there was some indication of an increased risk of SSI for non-White ethnic groups compared to White patients, however confidence intervals overlapped in all of these meaning statistical significance for these differences was not reached.

Figure 4a. Risk of SSI in patient undergoing CABG surgery by ethnic group, NHS hospitals England, April 2020 to March 2025



See data table 4a in accompanying data tables spreadsheet.

Figure 4b. Risk of SSI in patient undergoing large bowel surgery by ethnic group, NHS hospitals England, April 2020 to March 2025



See data table 4b in accompanying data tables spreadsheet.

IMD

Index of multiple deprivation is a weighted composite measure of location-based socioeconomic deprivation consisting of 7 domains assigned to lower-super output areas (LSOA) equating to around 1,500 residents or 650 households. An individual patient's risk of SSI is not expected to be directly linked to the IMD score of the area they reside in, but it can be a helpful indication of circumstances that may impact their risk of SSI (see Quality and methodology information report for linkage details).

The proportion of SSISS records between 2020 to 2021 and 2024 to 2025 with missing IMD score fluctuated by surgical category between 1.1% for breast surgery and 8.6% for hip replacement (Appendix 4).

Figures 5a to i provided in Appendix 4 show SSI risk by IMD deciles in a selection of surgical categories based on hospital participation (minimum of 5 hospitals submitted data in the current financial year).

As observed for the SSI risk by ethnicity, the confidence intervals for SSI risk by IMD deciles for all surgical categories overlapped indicating larger uncertainty around true difference between deciles. There was a high degree of variation in the risk of SSI by deprivation decile group amongst surgical categories. There was some suggestion of a higher SSI risk among people resident in areas with greater relative deprivation (IMD deciles 1 to 3) in 7 out of 10 categories. However, the lack of statistical significance for these differences due to overlapping confidence intervals made it difficult to discern meaningful differences.

Trends in SSI risk

Figures 6a to j show 10-year trends in annual SSI incidence (risk) for all surgical categories. SSI incidence is broken down by detection method: inpatient, readmission and combined inpatient and readmission. Trend analyses were not performed for surgical categories with fewer than 5 participating hospitals in the most recent financial year. It is important to note that annual trends use crude SSI incidence and do not account for potential changes in risk factors for SSI over time, hospital participation or other factors affecting healthcare delivery such as length of inpatient stay.

Over the past 10 years, inpatient and readmission SSI incidence following hip and knee replacement has been decreasing from financial year 2015 to 2025 (Figure 6a and Figure 6b). In the current financial year, SSI risk remained stable for hip replacement (0.50%; 0.43 to 0.57) and knee replacement (0.34%; 0.29 to 0.39) in comparison to the previous year. The trend for SSI risk following reduction of long bone fracture has shown greater variability over the years with notable peaks in financial years 2018 to 2019 (1.02%; 0.65 to 1.51) and 2023 to 2024 (1.41%; 1.05 to 1.85, Figure 6c) and it since decreased to 1.13% (0.82 to 1.52). The SSI risk for repair of neck of femur (Figure 6d) remained relatively stable over the 10-year period with no statistically significant difference between financial year 2015 to 2016 (1.03%; 0.89 to 1.18) and 2024 to 2025 (0.89%; 0.77 to 1.02).

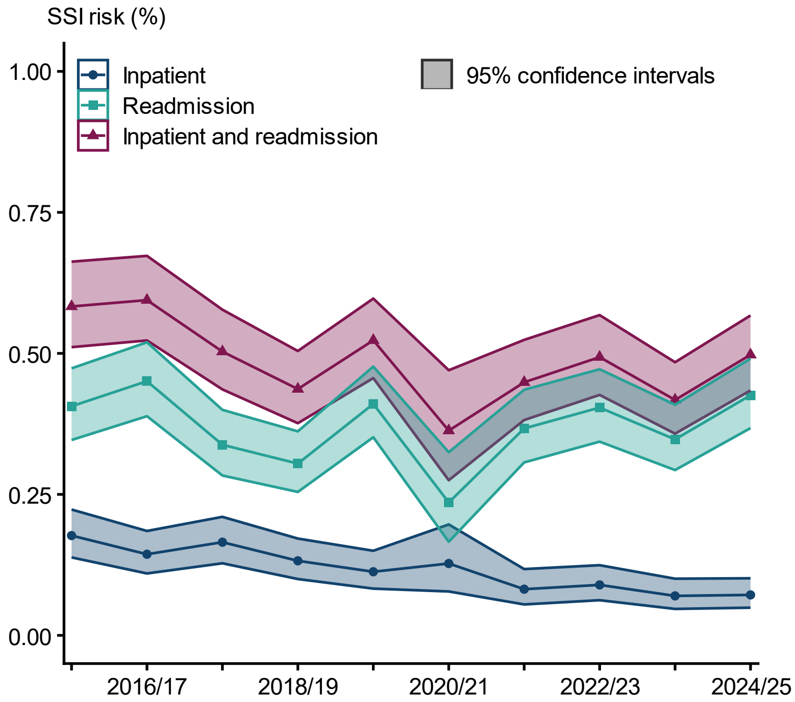
Figure 6e shows a 10-year trend for CABG with peaks at 3.84% (3.37 to 4.34) in financial year 2016 to 2017 and 3.24% (2.82 to 3.70) in 2019 to 2020; the SSI risk has shown year-on-year increase from 1.96% (1.53 to 2.47) in 2020 to 2021 to 3.00% (2.54 to 3.52) in 2024 to 2025. This included infections at vein harvesting sites and the sternum. Cardiac surgery (non-CABG) also shows fluctuating 10-year trend in annual SSI risk reaching a peak at 1.72% (1.32 to 2.19) in financial year 2016 to 2017, before decreasing to a low of 0.84% (0.56 to 1.22) in 2022 to 2023 and increasing marginally since then to 1.25% (0.90 to 1.68) in the latest financial year. (Figure 6f).

For large bowel surgery (Figure 6g) the SSI risk decreased slightly between 2023 to 2024 (8.85%; 7.77 to 10.03) and 2024 to 2025 financial year (7.02%; 6.05 to 8.09). The SSI risk for small bowel surgery in this financial year (7.60%; 5.26 to 10.65) remained similar to the previous year (8.14%; 5.60 to 11.35) (Figure 6h)

The SSI risk after spinal surgery (Figure 6i) has decreased steadily from its peak at 1.79% (1.51 to 2.11) in financial year 2015 to 2016 to 0.90% (0.67 to 1.18) in 2021 to 2022 and remained stable thereafter (0.97%; 0.74 to 1.24 in 2024 to 2025). The SSI risk following breast surgery fluctuated during the 10-year period with peaks observed in 2017 to 2018 at 1.12% (0.81 to 1.51) and 2023 to 2024 at 0.89% (0.6 to 1.28) (Figure 6j).

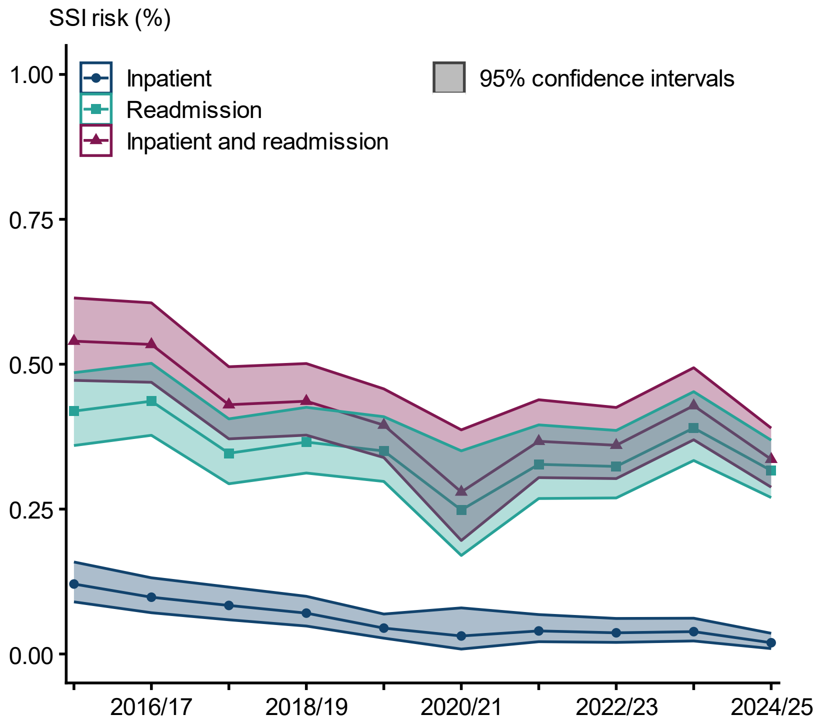
Ten-year trends in the annual inpatient and readmission SSI risk between 2015 to 2016 and 2024 to 2025 showed a declining trend in 2 of 10 assessed surgical categories (knee replacement and spinal surgery). Since last year, one out of 10 surgical categories showed a decreasing trend in SSI risk (knee replacement) with the rest of the assessed categories remaining stable. The fluctuation in trend for most categories assessed may be due to changes in infection prevention control measures implemented during the COVID-19 pandemic. Changes in trends of SSI risk post-pandemic were similar to changes in trends observed in mandatory reporting of bacteraemia and *Clostridium difficile* infections (10).

Figure 6a. Trends in annual SSI risk for hip replacement, NHS hospitals England, April 2015 to March 2025



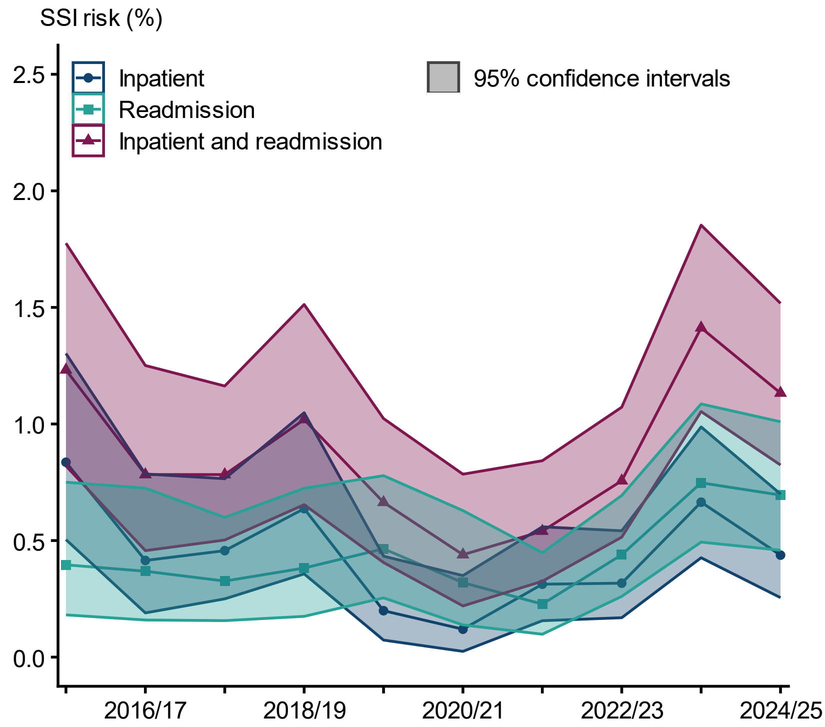
See data table 6a in accompanying data tables spreadsheet.

Figure 6b. Trends in annual SSI risk for knee replacement, NHS hospitals England, April 2015 to March 2025



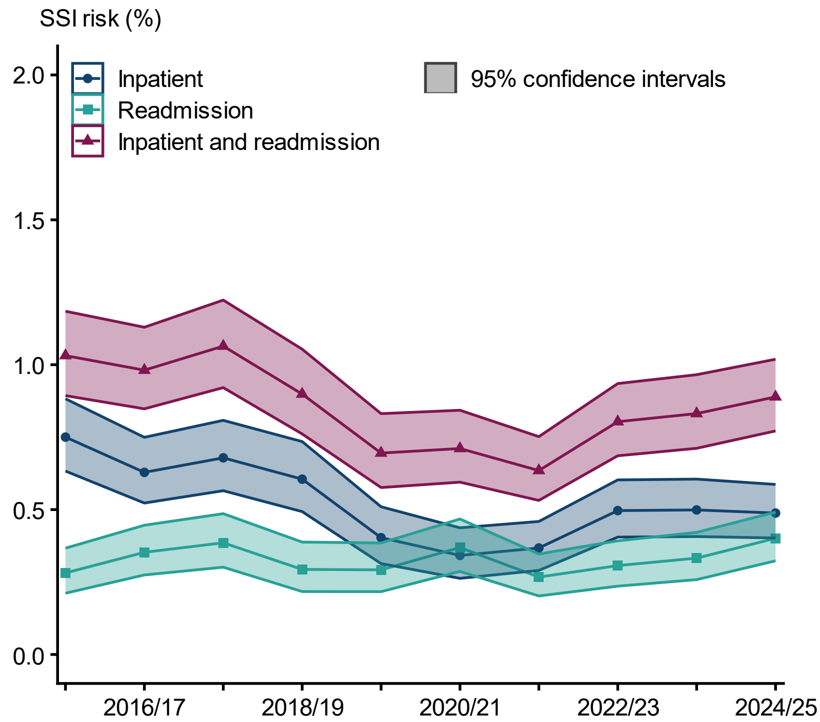
See data table 6b in accompanying data tables spreadsheet.

Figure 6c. Trends in annual SSI risk for reduction of long bone fracture, NHS hospitals England, April 2015 to March 2025



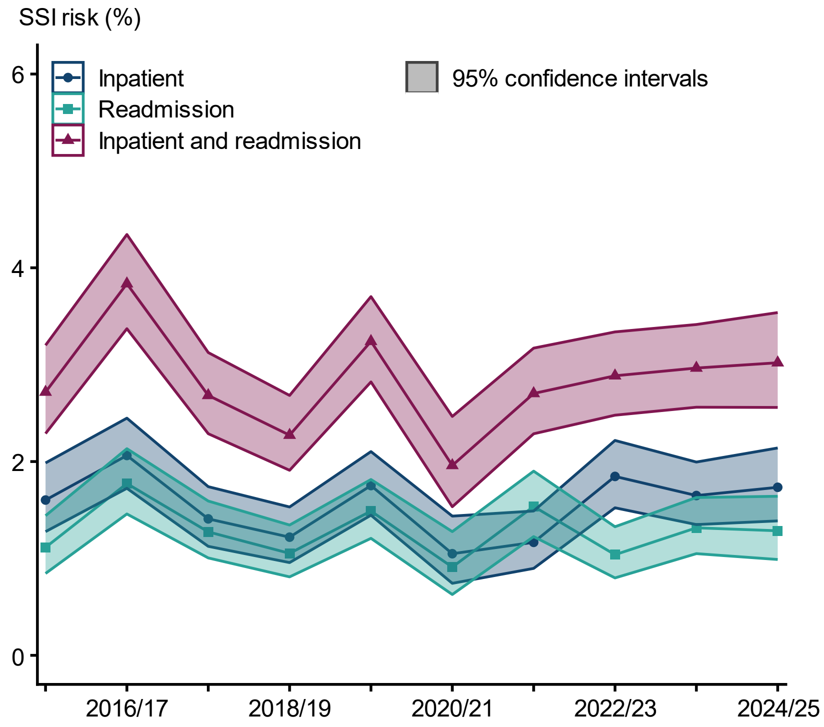
See data table 6c in accompanying data tables spreadsheet.

Figure 6d. Trends in annual SSI risk for repair of neck of femur, NHS hospitals England, April 2015 to March 2025



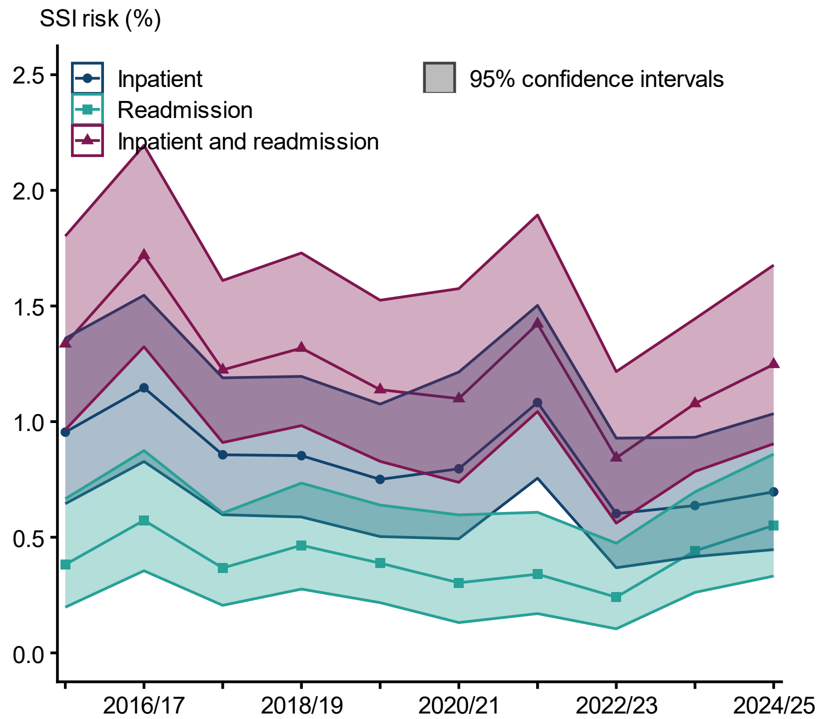
See data table 6d in accompanying data tables spreadsheet.

Figure 6e. Trends in annual SSI risk for coronary artery bypass graft (CABG) surgery, NHS hospitals England, April 2015 to March 2025



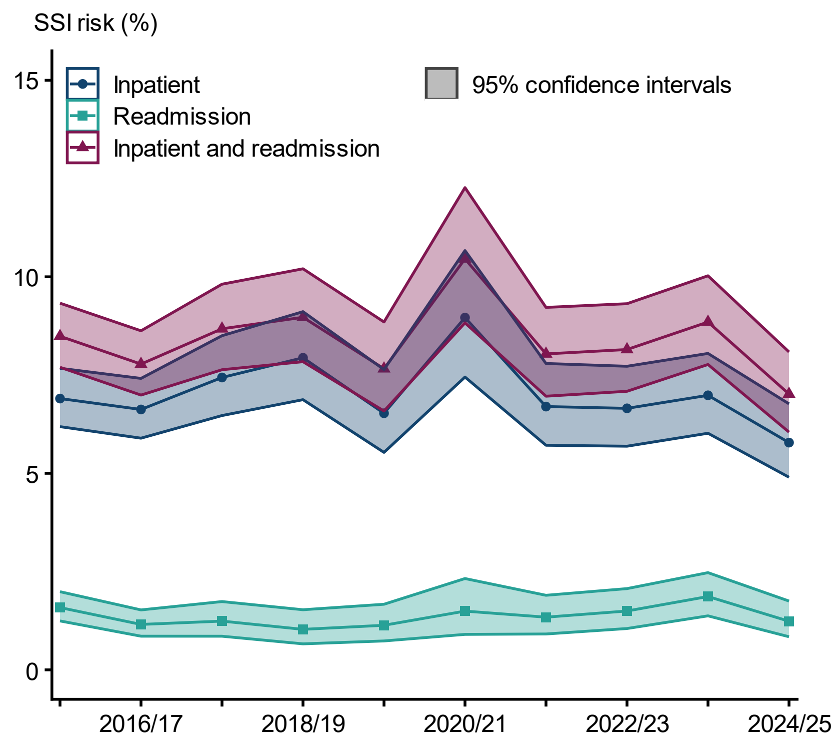
See data table 6e in accompanying data tables spreadsheet.

Figure 6f. Trends in annual SSI risk for cardiac (non-CABG) surgery, NHS hospitals England, April 2015 to March 2025



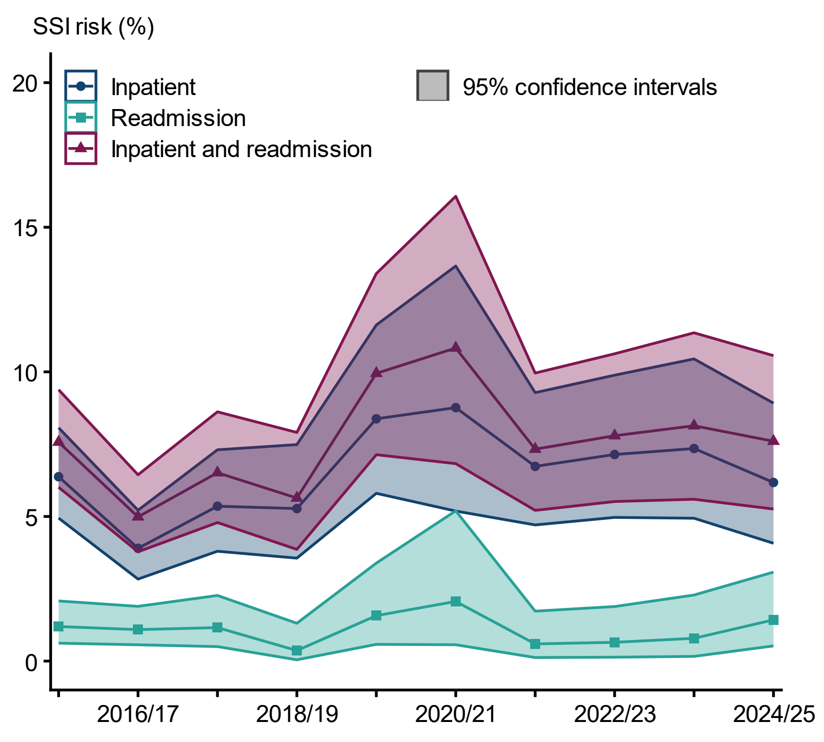
See data table 6f in accompanying data tables spreadsheet.

Figure 6g. Trends in annual SSI risk for large bowel surgery, NHS hospitals England, April 2015 to March 2025



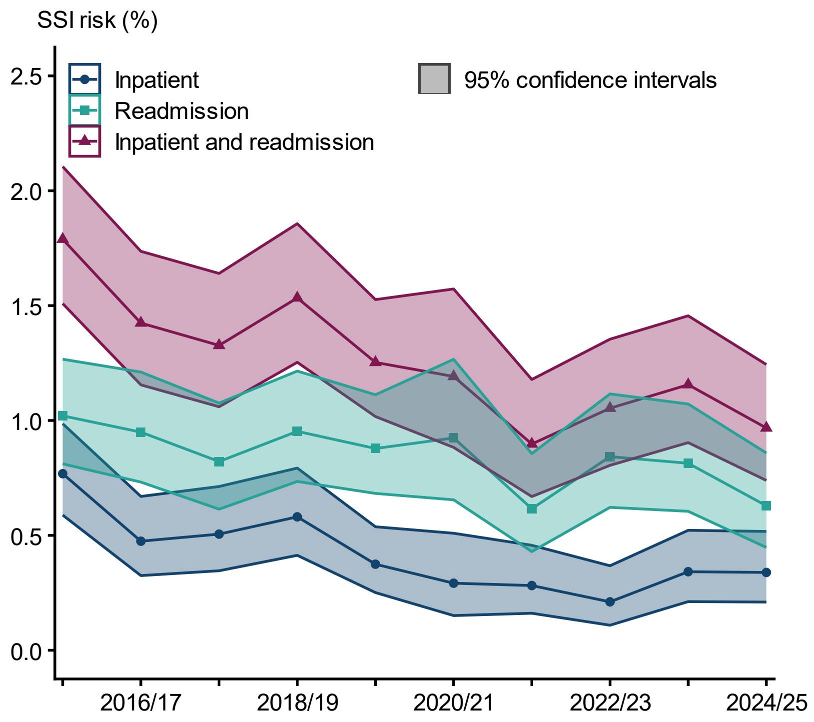
See data table 6g in accompanying [data tables](#) spreadsheet.

Figure 6h. Trends in annual SSI risk for small bowel surgery, NHS hospitals England, April 2015 to March 2025



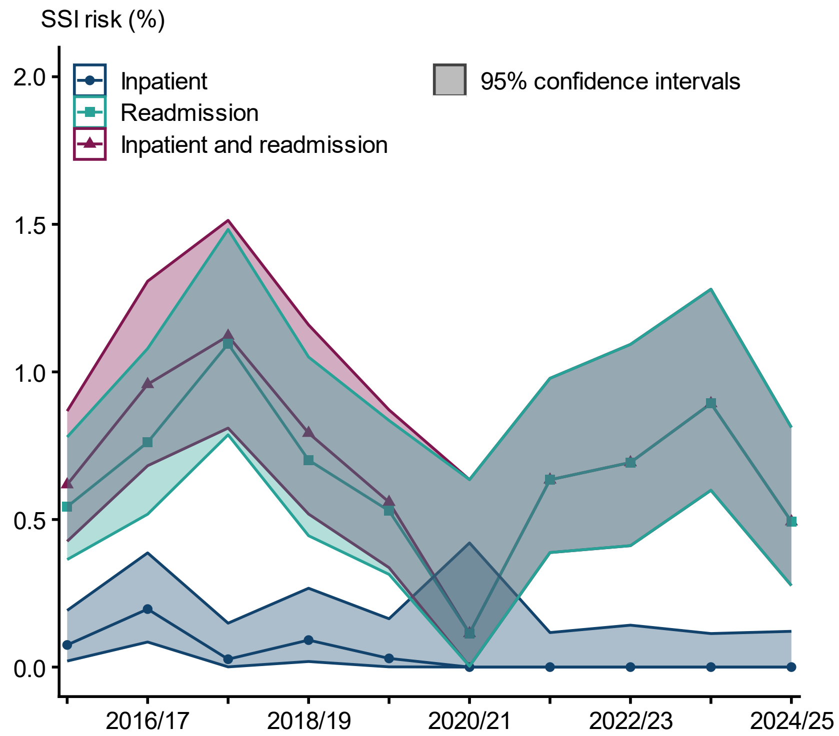
See data table 6h in accompanying [data tables](#) spreadsheet.

Figure 6i. Trends in annual SSI risk for spinal surgery, NHS hospitals England, April 2015 to March 2025



See data table 6i in accompanying data tables spreadsheet.

Figure 6j. Trends in annual SSI risk for breast surgery, NHS hospitals England, April 2015 to March 2025



See data table 6j in accompanying data tables spreadsheet.

Variation in SSI risk between hospitals

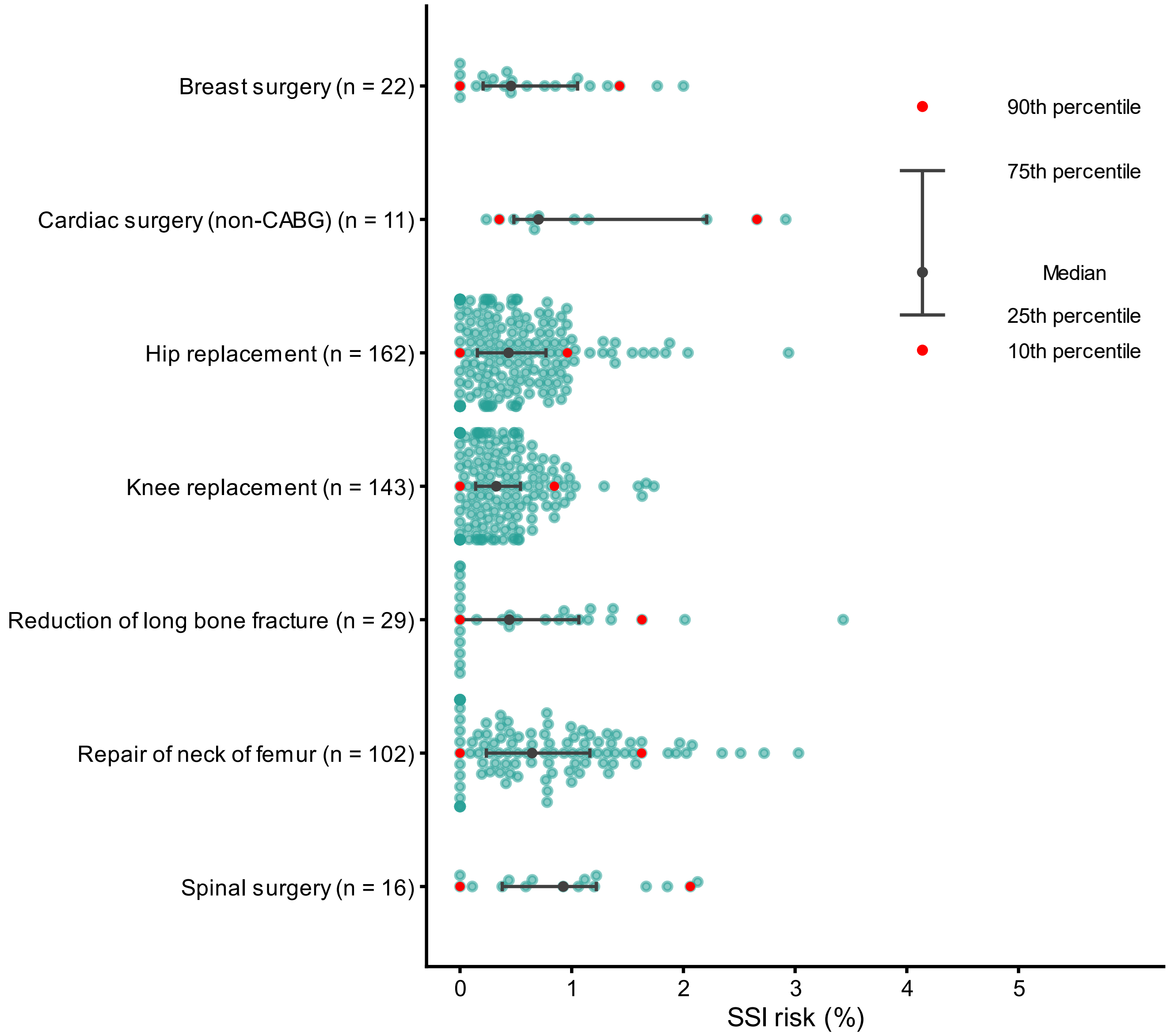
Figures 7a and b show the distribution of the SSI risk, based on 5 years' of cumulative data, across participating hospitals by surgical category using bee-swarm plots. Each green circle represents a participating hospital. Black circles represent median SSI risk for a respective surgical category with 'whiskers' extending to the left and right defining the expected range of results between 25th and 75th percentile. Red dots depict the 10th and 90th percentile to represent the extreme ends of the distribution and highlight hospital outliers, which fall outside this range.

Similar to previous years, large bowel surgery showed the greatest variability with hospital SSI risk ranging from 0% to 38.1%, which could in part be due to variation in emergency surgeries but may also indicate room for improvement in infection prevention, and case ascertainment. Hip and knee replacement showed the least variation, with most hospitals hovering around the median. However, high outlier hospitals can still be identified for these categories.

Of the 9 surgical categories with more than 10 participating hospitals, 4 had a narrower interquartile range (difference between the 25th and 75th percentiles) than the previous financial year, indicating decreasing variation. All of the remaining 5 surgical categories had a wider interquartile range. When the current interquartile range was compared to the previous year, cardiac (non-CABG) surgery had the greatest percentage increase (158% increase) meaning there was more variation seen this year in the SSI risk across hospitals. This is in contrast to CABG surgery that had the greatest percentage decrease (26.3% decrease) in interquartile range between financial year 2023 to 2024 and 2024 to 2025.

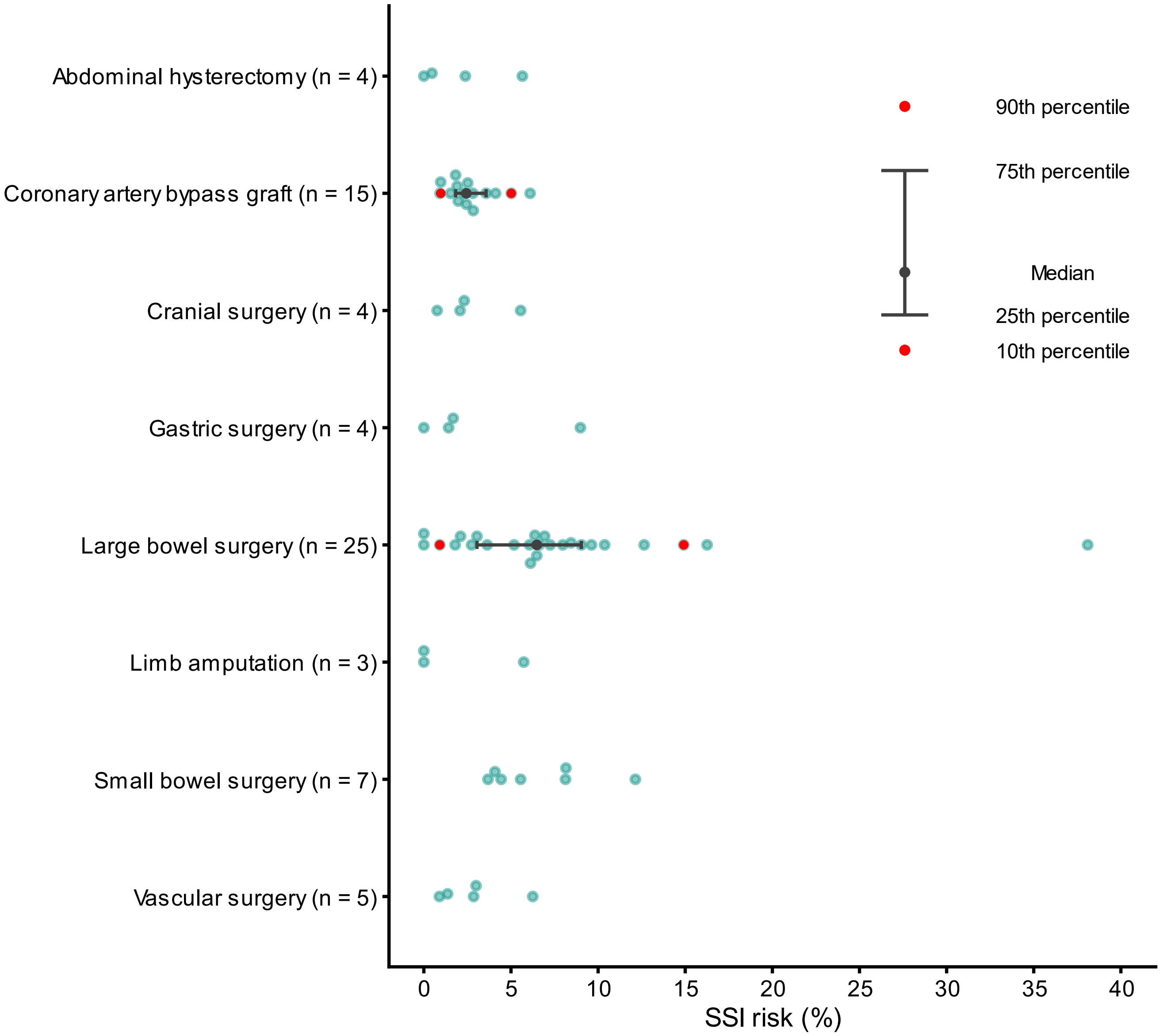
Figure 7. Distribution of inpatient and readmission SSI risk by surgical category [note 1], NHS hospitals England [note 2], April 2020 to March 2025

7a. Low SSI risk surgical categories



See data table 7a in accompanying data tables spreadsheet.

7b. High SSI risk surgical categories



Note 1: categories with fewer than 10 hospitals participating within this time period are presented as a distribution without median and 25th and 75th percentiles.

Note 2: NHS hospitals with less than 95 operations for hip replacement, knee replacement or abdominal hysterectomy are excluded from analysis for that category. NHS hospitals with less than 45 operations for any other category are excluded from analysis for that category.

See data table 7b in accompanying data tables spreadsheet.

Outlier assessment

In addition to the annual outlier analysis, the SSISS team also undertake quarterly outlier analysis for mandatory and voluntary surgical categories after each data submission deadline and hospitals with SSI risk above 90th percentile or below 10th percentile receive an outlier notification letter. Hospitals have an option of further in-depth analyses considering risk factors in the data set.

In financial year 2024 to 2025, 2 NHS trust performing orthopaedic surgery did not comply with the mandatory requirements for participation in the SSISS. These trusts were notified by letter. For the mandatory orthopaedic categories, outliers are assessed at the end of each financial year across all NHS trusts and treatment centres using funnel plots to account for differences in surgical volume.

Figures 8a to 8d show funnel plots displaying variation in the SSI risk among trusts in financial year 2024 to 2025 for orthopaedic categories. The cumulative incidence of SSI per 100 operations is plotted against the number of operations for each participating NHS trust or treatment centre. The upper and lower 95% confidence limits (red lines) define the 'limits' of expected variation. Trusts lying outside these limits are considered outliers. The 99% confidence limits (dashed lines) are presented to represent the expected variation within which 99% of results should fall. The 95% confidence limits represent warning lines, whereas falling outside of the 99% confidence limits would signify the need for more immediate action.

Results showed similar variation across trusts and grouping around the national benchmark for hip and knee replacement surgery in financial year 2024 to 2025 compared to the previous financial year. Compared to financial year 2023 to 2024, there was also slightly more variation in SSI risk for repair of neck of femur surgery.

In financial year 2024 to 2025, statistical high outliers (falling above the 95% upper confidence limits) were identified amongst 3 NHS acute trusts or treatment centres participating in hip replacement (one provider), reduction of long bone fracture (one provider) and repair of neck of femur (3 providers, one of which was above the 99% confidence limits). Five NHS acute trusts or treatment centres were identified as statistical low outliers (falling below the 95% lower confidence limits) in 2024 to 2025 (one for hip replacement, 2 for knee replacement and 2 for repair of neck of femur). One of the 5 providers notified as high outliers this financial year was also a high outlier in the same category last financial year, and one of the 5 providers deemed low outliers was also a low outlier in the same category in the previous financial year.

Low outlier status may be indicative of low case ascertainment but could also reflect exceptional patient care. Annual trust outlier assessments are unadjusted for differences in the patient population and important risk factors.

Hospitals who receive outlier notifications are encouraged to investigate possible reasons for higher-than-expected risks of infection. This would include examination of surveillance data at a more granular level through web-based hospital reports which include risk-stratified data, reviewing IPC policies and surgical practice, such as the use of prophylactic antimicrobials and contacting the SSIS team for further support.

As part of this report, SSI risk results by NHS acute trust (and NHS treatment centres) for the last 2 financial years (2023 to 2024 and 2024 to 2025) are published in separate accompanying tables.

Annual trust-level results for hip and knee replacement surgery are also made available through UKHSA's public reporting tool, Fingertips. The tool also allows users to group results by trust type (namely, teaching, non-teaching, and specialty) or NHS sub-region and compare to a corresponding overall group average.

Figure 8a. Distribution of inpatient and readmission SSI risk for hip replacement, NHS acute trusts and treatment centres England, April 2024 to March 2025

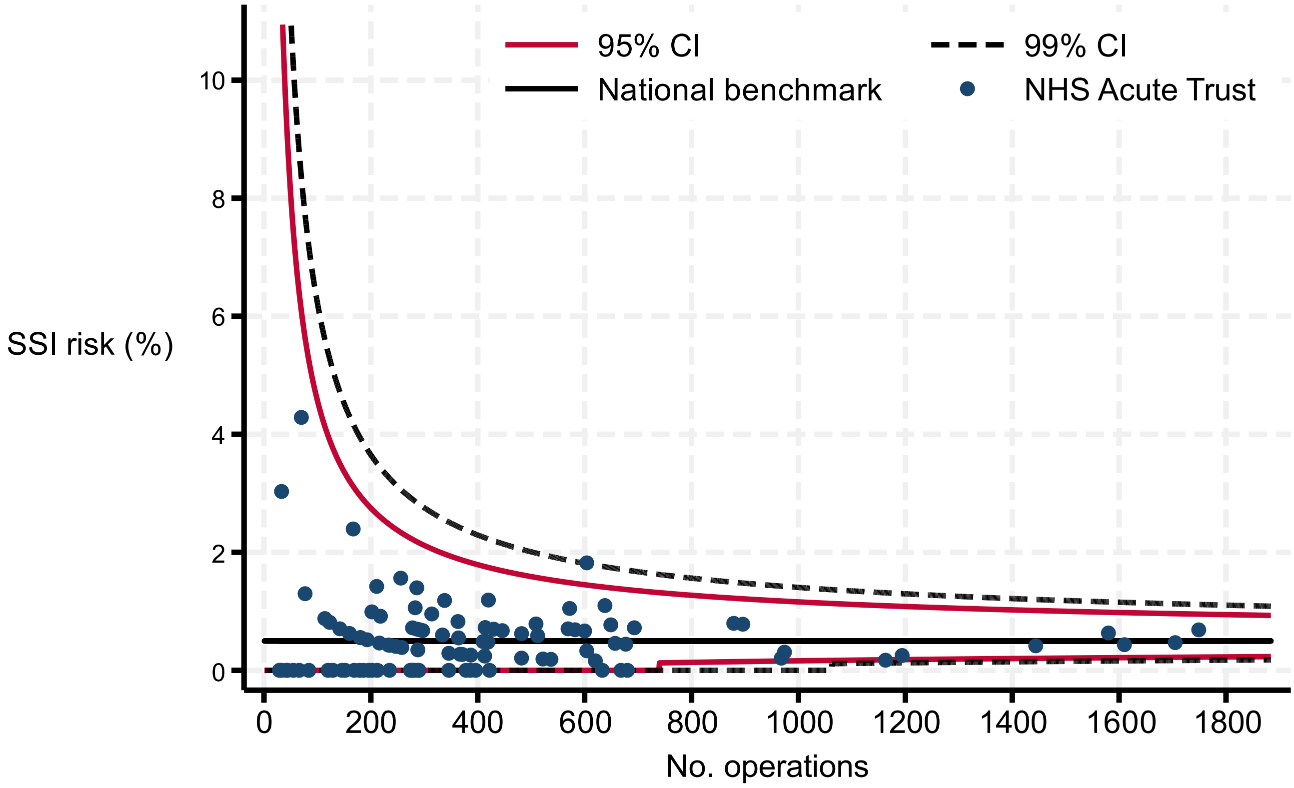


Figure 8b. Distribution of inpatient and readmission SSI risk for knee replacement, NHS acute trusts and treatment centres England, April 2024 to March 2025

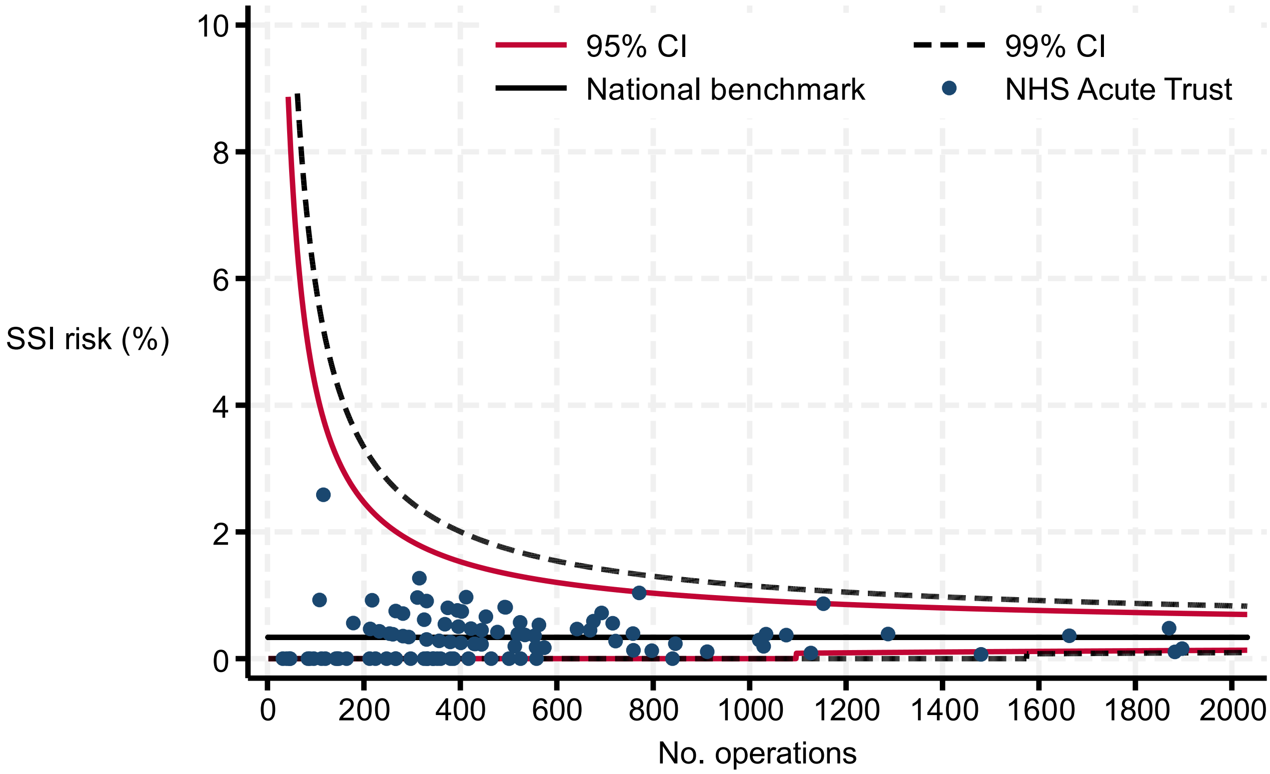


Figure 8c. Distribution of inpatient and readmission SSI risk for reduction of long bone fracture, NHS acute trusts and treatment centres England, April 2024 to March 2025

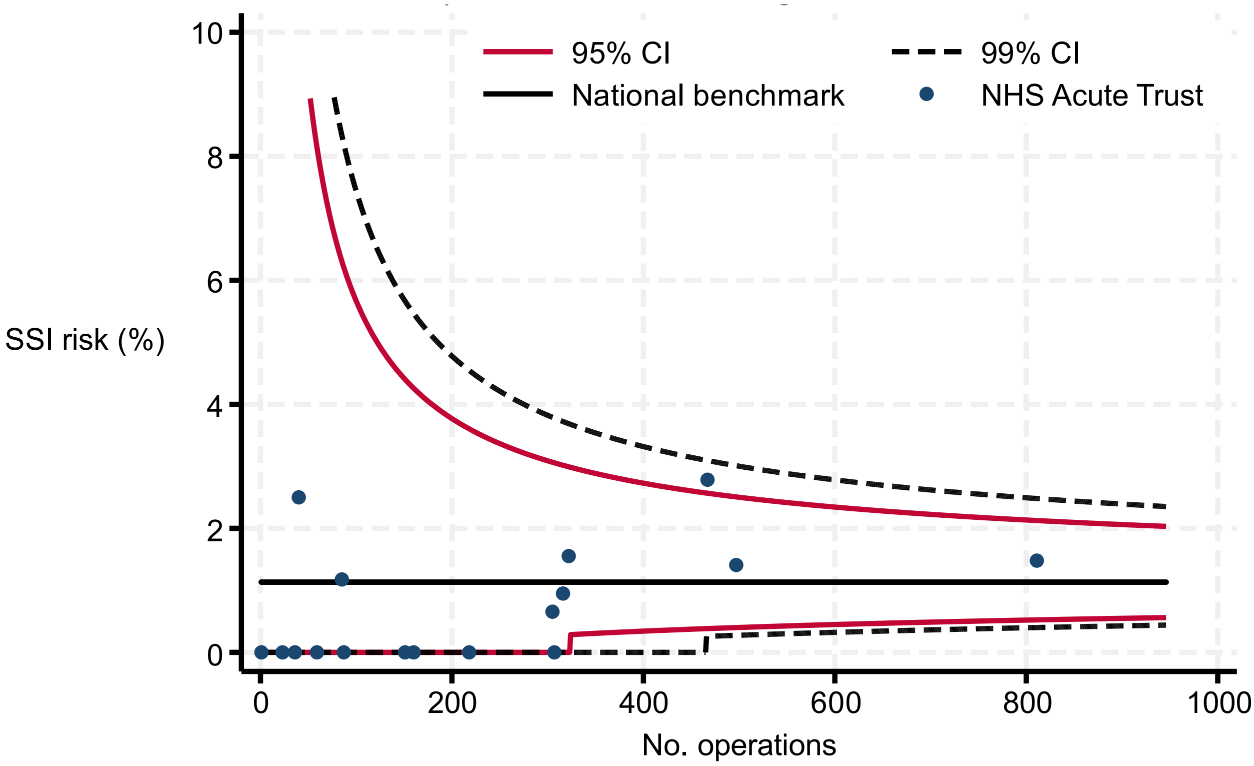
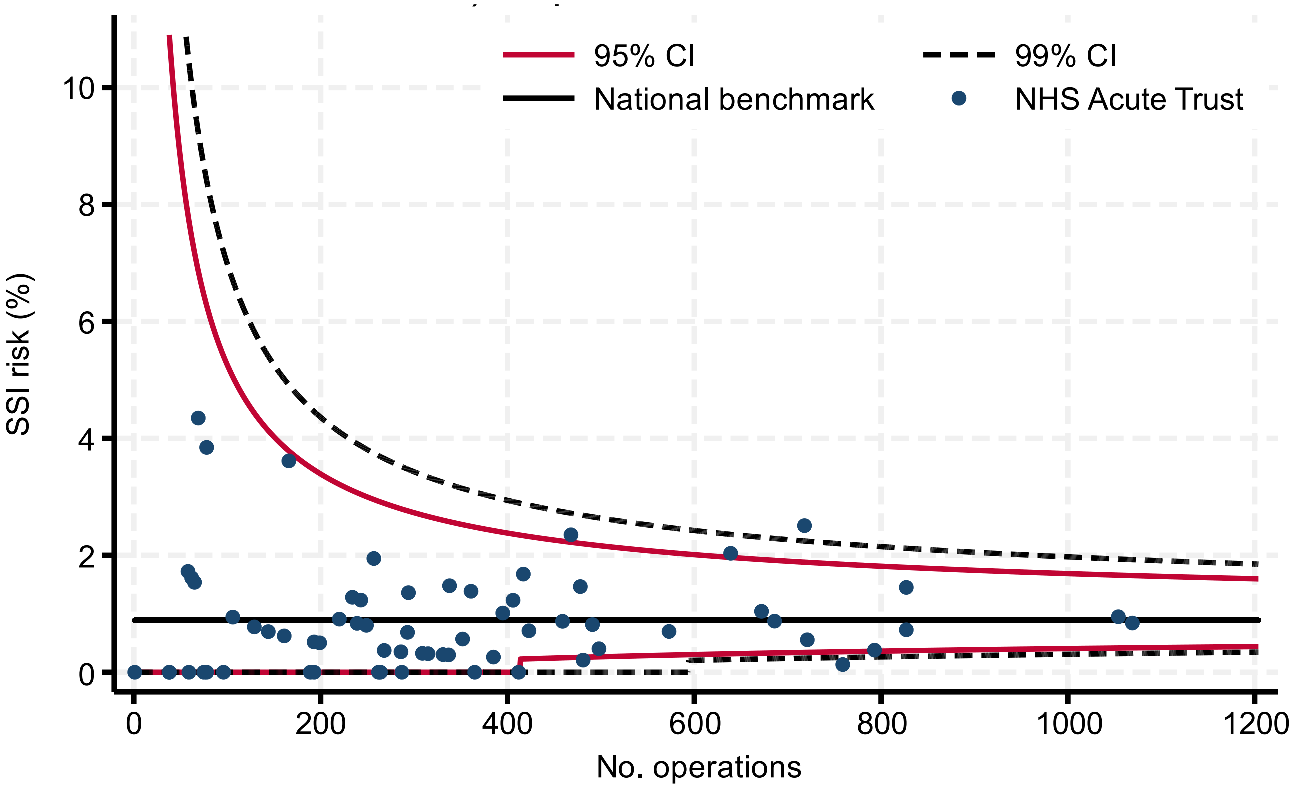


Figure 8d. Distribution of inpatient and readmission SSI risk for repair of neck of femur, NHS acute trusts and treatment centres England, April 2024 to March 2025



Characteristics of SSIs

Focus of SSI

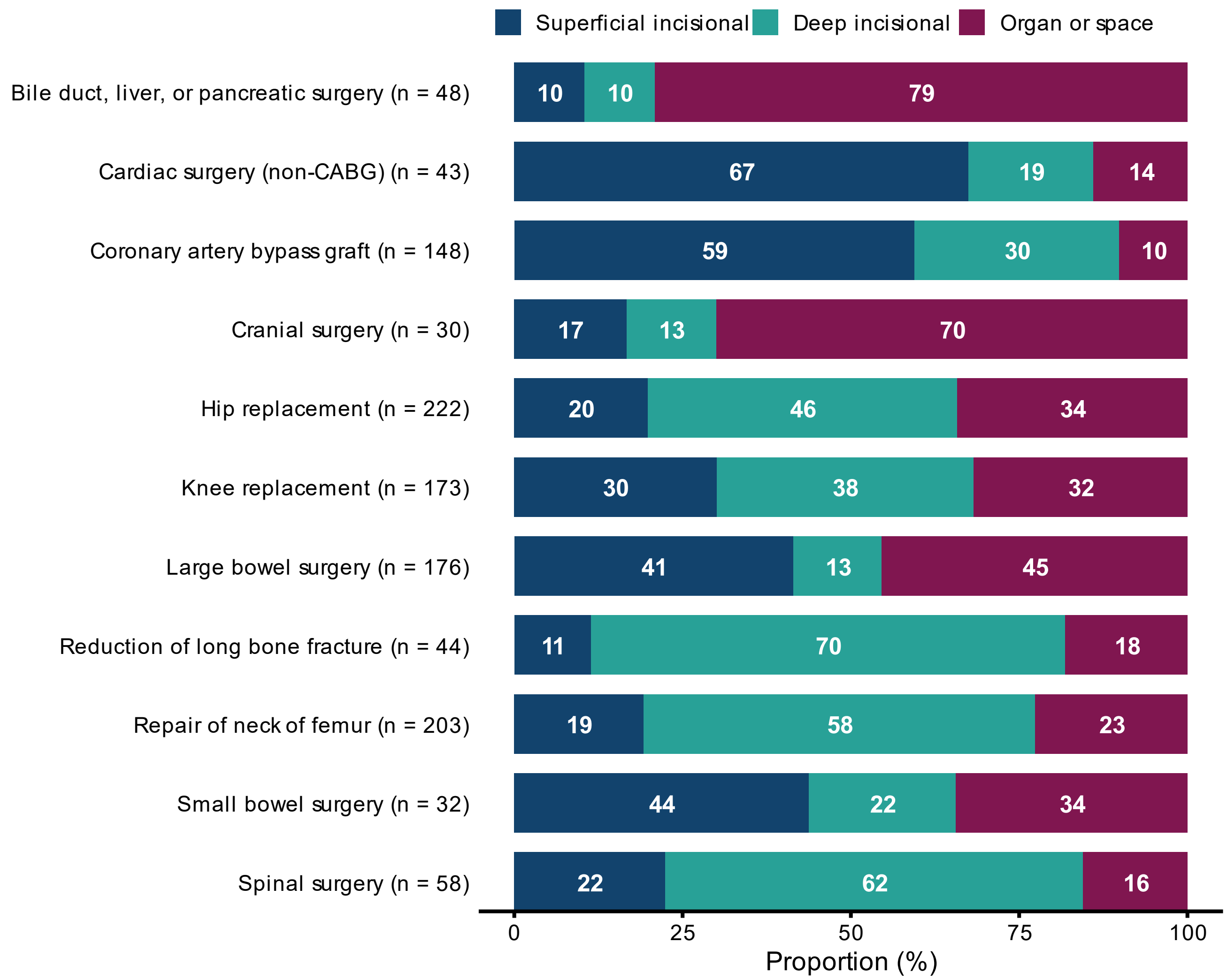
Figure 9 shows the distribution of SSI types (superficial, deep incisional or organ and space) by surgical category in financial year 2024 to 2025, where the number of inpatient and readmission detected SSIs per category was ≥30. The distribution of type of infection varied by surgical category and may be attributed to differences in length of stay in hospital and follow-up care. Surgical categories with a shorter stay in hospital see relatively more readmission-detected SSIs, which increases the proportion of more serious wound complications. Patients undergoing operations with a longer stay in hospital will undergo regular wound reviews so that infections may be more likely to be detected and treated earlier during the inpatient stay, and therefore may be more likely to be less severe.

In financial year 2024 to 2025, cardiac (non-CABG) and CABG surgery had the highest proportions of superficial incisional infections (67.4% and 59.5%, respectively). Compared to previous reports in financial year 2023 to 2024, the proportion of superficial SSIs following hip replacement increased (19.8% and 14.8%), deep SSIs decreased (45.9% and 52.1%) and organ or space SSIs remained stable (34.2% and 33.1%). The opposite was observed for the proportion of superficial and deep incisional SSIs in patients undergoing knee replacement between financial year 2023 to 2024 (superficial: 30.1%, deep: 38.2%, organ or space: 31.8%) and 2024 to 2025 (superficial: 19.9%, deep: 43.7%, deep organ or space: 36.5%).

There has been an increase in the proportion of deep incisional SSIs in patients undergoing reduction of long bone fracture (50.0% to 70.5%) and spinal surgery (48.6% to 62.1%) since the previous financial year.

Among the 11 categories, the highest proportion of organ or space SSIs was following bile duct, liver or pancreatic surgery (79.2%) followed by cranial (70%,) and large bowel surgery (45.5%). The proportion of organ or space SSIs following CABG increased between previous and this financial year from 5.4% to 10.1%.

Figure 9. Proportion of SSI type for inpatient and readmission-detected SSIs by surgical category, NHS hospitals England, April 2024 to March 2025



See data table 9 in accompanying data tables spreadsheet.

Time to infection

Figure 10 shows the distribution of time to infection for inpatient and readmission SSIs (superficial, deep incisional or organ and space) by presence or absence of implant (a non-human foreign body that is placed permanently in the patient during operation and is not routinely manipulated for diagnostic or therapeutic purposes) and surgical category in last 5-year period (financial years 2020 to 2021 and 2024 to 2025), where the number participating hospitals per category was ≥5. Note that some surgical categories include both, operations with and without an implant and therefore they are displayed in both figures.

The distribution of time to infection varied by surgical category and is affected by the time of follow up after surgery that differs according to presence or absence of an implant (patients are followed up for up to 30 days for operations without an implant and for superficial infections for operations with an implant or up to one year for deep or organ/space infections after operations with an implant). Infections with a date of onset beyond these follow up limits were excluded as not meeting SSI definitions.

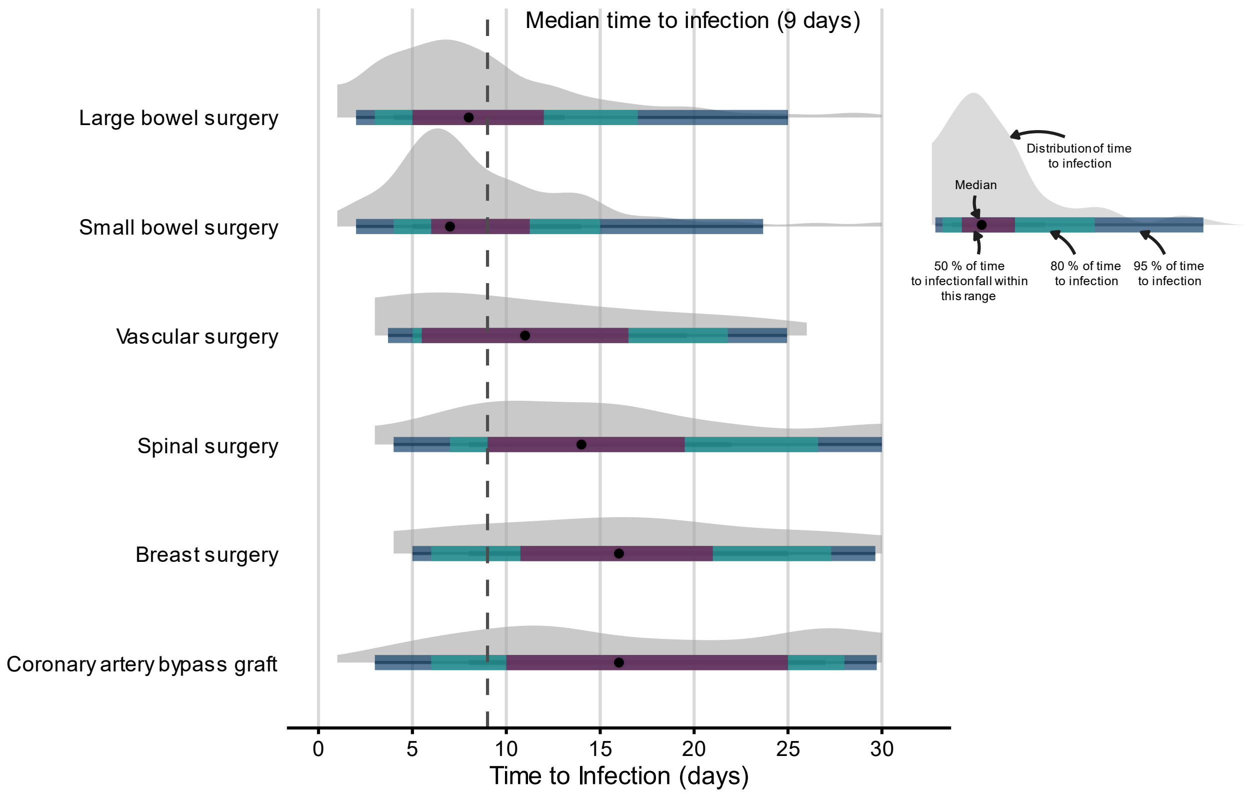
The median time to infection across all categories was 9 days for procedures without an implant and 19 days for procedures including implant. For procedures without an implant, the shortest median time to infection was for surgical categories with higher wound contamination, namely small bowel (7 days) and large bowel (8 days) surgery with the opposite being observed in breast (16 days) and CABG (16 days) surgery. The median time to infection in procedures including an implant was the shortest in large bowel (10 days) and vascular (11 days) surgery and the longest for orthopaedic categories (reduction of long bone fracture (20 days), repair of neck of femur (20 days), hip replacement (22 days) and knee replacement (25 days)) and breast surgery (30 days).

The IQR for time to infection was 8 days (6 to 14 days) for surgical categories where an implant was not used and 18 days (12 to 30 days) in procedures involving an implant.

Breast surgery with an implant showed the widest distribution in time-to-infection, with 95th centile of 253.4 days.

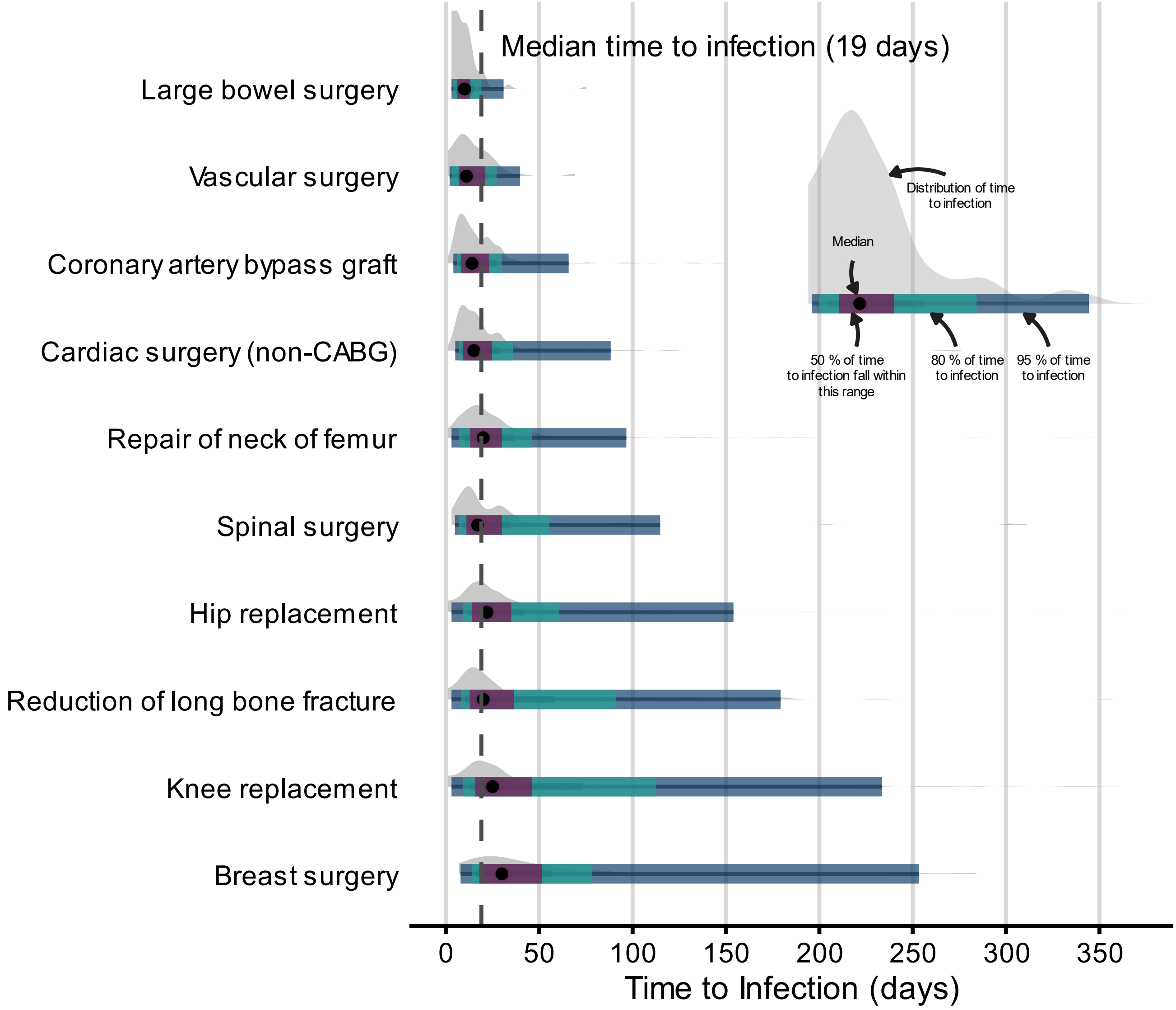
Figure 10. Time to infection for inpatient and readmission-detected SSIs by surgical category, NHS hospitals England, April 2020 to March 2025

10a. Operations without an implant



See data table 10a in accompanying data tables spreadsheet.

10b. Operations with an implant



See data table 10b in accompanying data tables spreadsheet.

Causative micro-organisms

Figure 11 shows 10-year trends in microbial aetiology of inpatient and readmission-detected superficial and deep incisional or organ and space SSIs across all surgical categories. During this period there were 12,299 inpatient and readmission-detected SSIs reported, 73.5% (N=9,040) of which had accompanying microbiological confirmation. This proportion has increased from 68.7% in financial year 2015 to 2016 to 75.4% in 2024 to 2025. Positive microbiology is not essential to meet the UKHSA SSI case definition provided there are other clinical indicators. Hospital surveillance staff have the option to provide information on up to 3 causative organisms per SSI. Hence, data presented here represents the proportion of infections in which an organism was detected and not the proportion of infections caused by a given organism.

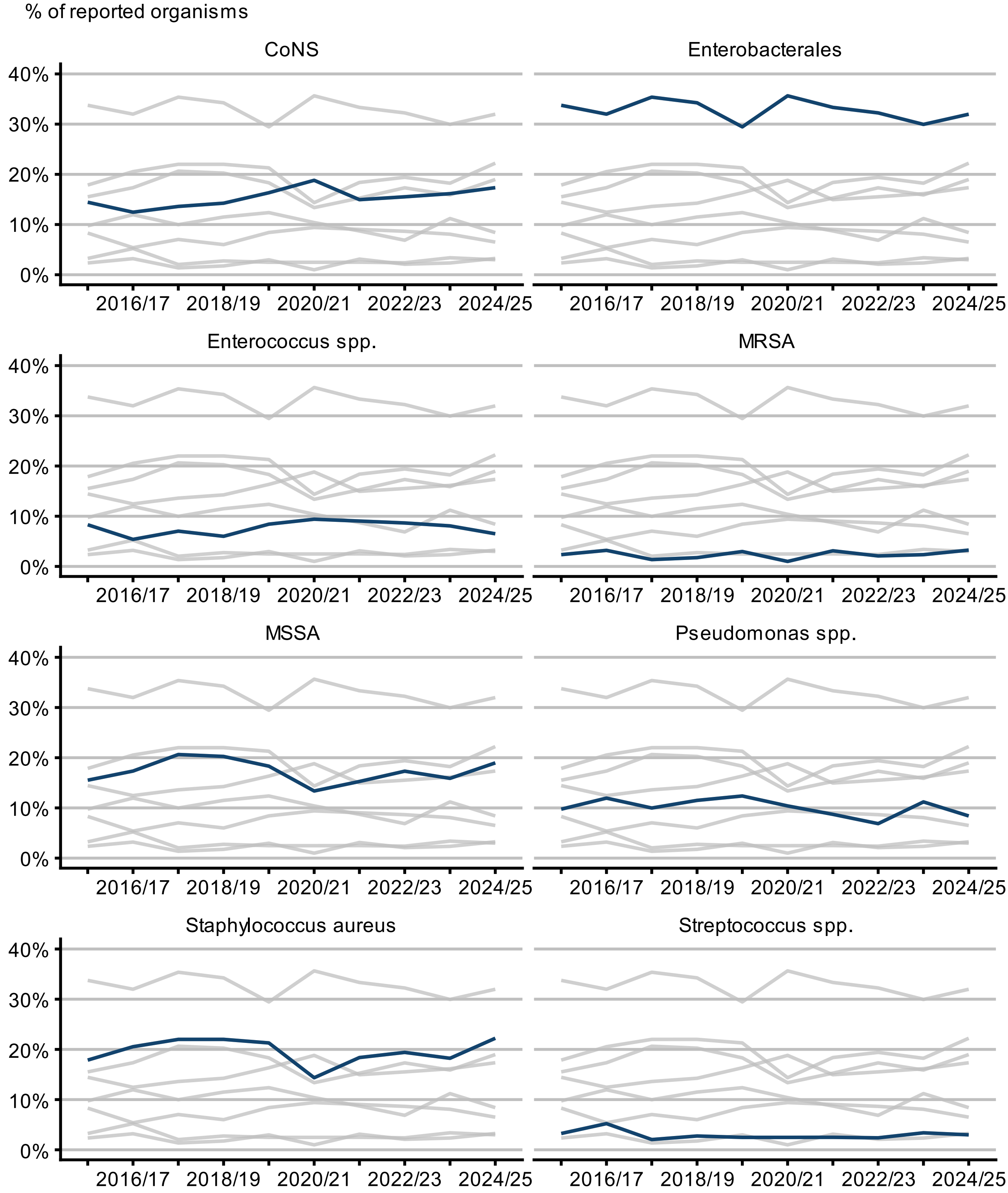
Enterobacterales remain the most commonly reported organisms for all SSIs in financial year 2024 to 2025 but showed a decreasing 10-year trend for superficial and deep incisional and organ and space SSIs. Enterobacterales were indicated in 32% of superficial SSIs (total number of isolates is 369) and 28% of deep incisional or organ and space SSIs (total number of isolates is 1,041) in 2024 to 2025. The most common Enterobacterales species was *Escherichia coli*. The second most prevalent organism was *Staphylococcu*s *aureus* (*S. aureus*) for both superficial SSIs (22.2%) and deep incisional or organ and space SSIs (21.3%). *S. aureus* increased marginally for both superficial SSIs (from 18.2% to 22.2%) and deep incisional or organ and space SSIs (19.9% to 21.3%) between financial years 2023 to 2024 and 2024 to 2025.

Meticillin-sensitive *S. aureus* (MSSA) was more common than meticillin-resistant *S. aureus* (MRSA) in both superficial and deep incisional or organ and space infections (85.4% and 88.7% versus 14.6% and 11.3%, respectively). The proportion of MRSA reports increased slightly for superficial SSIs between the previous financial year and the current financial year (from 2.3% to 3.3%), while it remained stable for deep incisional and organ or space SSIs (2.3% to 2.4%). The proportion of infections for which MSSA was reported as a causative organism increased from 15.9% to 19.0% for superficial and from 17.5% to 18.9% for deep incisional or organ and space infections between the latest 2 financial years.

For superficial SSIs, the proportion of MRSA (3.3%) and MSSA (19.0%) in 2024 to 2025 was slightly higher than pre-pandemic (2019 to 2020) (MRSA: 3.0%, MSSA: 18.3%). The opposite was observed for deep or organ and space (2024 to 2025: MRSA: 2.4%, MSSA: 18.9%, 2019 to 2020: MRSA: 2.5%, MSSA: 21.8%).

Figure 11. Micro-organisms reported in inpatient and readmission SSIs, all surgical categories, NHS hospitals England, April 2015 to March 2025

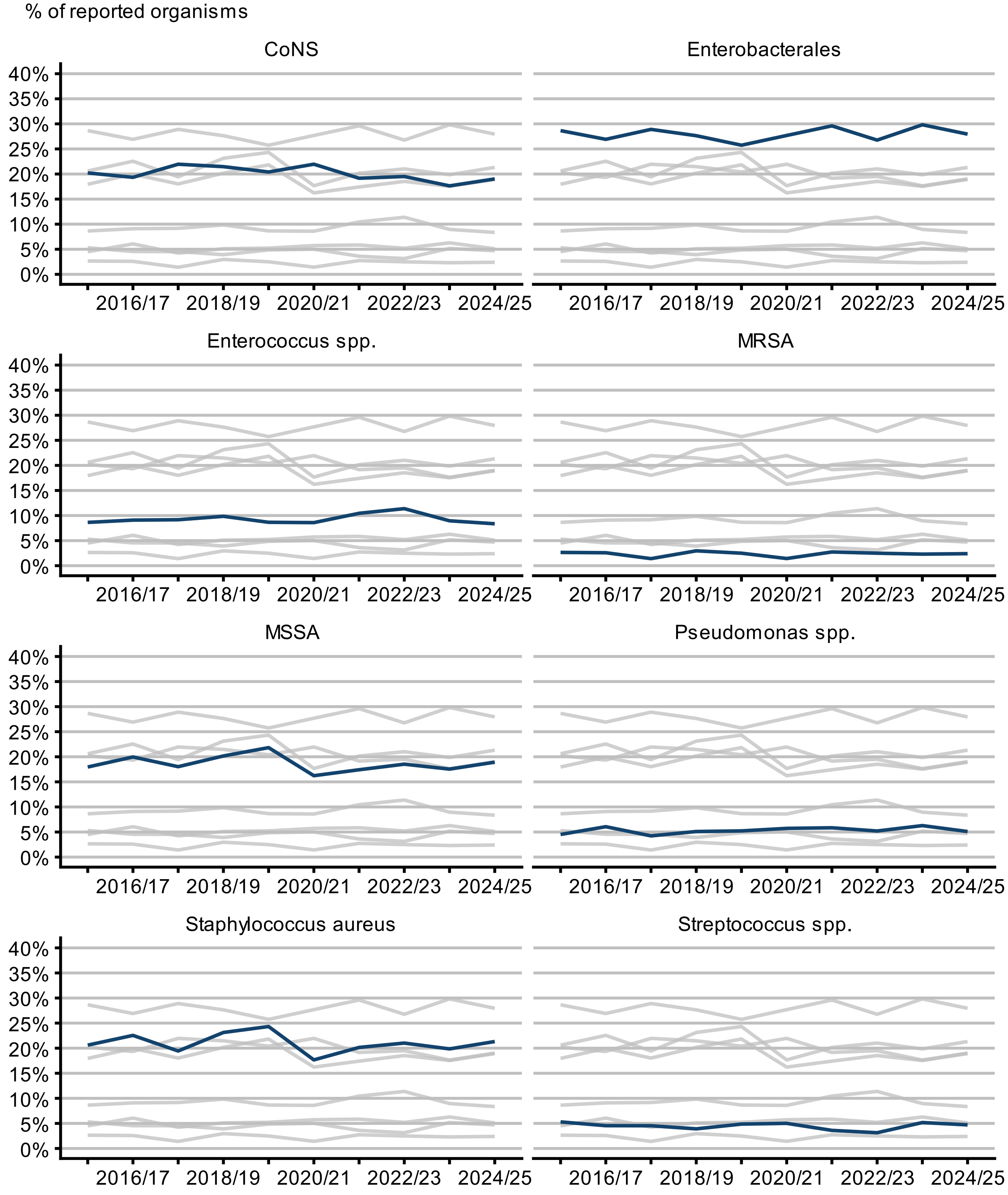
11a. Superficial SSIs



See data table 11a in accompanying data tables spreadsheet.

Note 1: *Staphylococcus aureus* proportion consisting of MRSA and MSSA.

11b. Deep incisional or organ and space SSIs



See data table 11b in accompanying [data tables] spreadsheet

[Tables 6a to 6b] provide a breakdown of the distribution of organisms reported in inpatient and readmission-detected SSIs by surgical category for superficial and deep incisional or organ and space SSIs. Five years of data was used for these analyses (April 2020 to March 2025) to increase sample sizes.

Between April 2020 and March 2025, there were 2,509 monomicrobial (63.5%) and 1,442 polymicrobial (36.5%) inpatient and readmission SSIs.

In the current financial year, MSSA was the most commonly reported organism in superficial and deep incisional or organ and space monomicrobial SSIs in patients undergoing hip replacement (superficial: 47.1%, deep or organ and space: 40.2%), knee replacement (superficial: 53.1%, deep or organ and space 41.5%) and spinal surgery (superficial: 53.7%, deep or organ and space 43.1%). Coagulase-negative Staphylococci (CoNS) made up almost a quarter of monomicrobial organisms associated with deep incisional or organ and space SSIs for 2 of the 6 categories assessed including repair of neck of femur (27.5%) and CABG (25.0%). Compared to deep incisional or organ and space SSIs, superficial SSIs reported a smaller proportion of CoNS causative microorganisms, except for CABG surgery (33.6%).

Enterobacterales were most prevalent in large bowel surgery SSIs, contributing to 54.6% of superficial SSIs and 63.0% of deep or organ and space SSIs. Compared to the previous financial year, the proportion of superficial SSIs with Enterobacterales isolates following CABG surgery decreased (24.2% versus 18.8%), while the proportion of deep incisional or organ and space SSIs increased (21.2% versus 25.0%).

Polymicrobial superficial SSIs (cases with more than one organism reported as causing SSI) were most common in large bowel surgery (38.7%), hip replacement (37.8%) and CABG (34.1%), while polymicrobial deep incisional or organ and space SSIs were most common in large bowel surgery (66.5%), CABG (45.9%) and repair of neck of femur (38.7%). Around a third to a half of superficial, deep incisional or organ and space polymicrobial infections involved a combination of Gram-positive and Gram-negative organisms across all surgical categories (superficial: from 38.7% for hip replacement to 54.5% for knee replacement and CABG, deep: from 33.3% for spinal surgery to 56.5% for large bowel surgery).

The proportion of polymicrobial SSIs with combinations of Gram-negative bacteria was highest for large bowel surgery for superficial SSIs (20.2%) and spinal surgery for deep incisional or organ and space SSIs (17.8%). For hip replacement, Gram-positive only combinations dominated in both superficial (45.2%) and deep incisional or organ and space SSIs (45.3%). Gram-positive combinations were also most common in deep incisional or organ and space infections for knee replacement (45.3%). The proportion of Gram-positive only species combinations in superficial SSIs decreased for hip replacement between 2023 to 2024 and 2024 to 2025 (hip: 61.9% to 45.2%).

The UK 5-year (2019 to 2024) national action plan (NAP) for antimicrobial resistance set out to reduce healthcare-associated Gram-negative bloodstream infections (BSI) by 50% (11).
In addition, the 2024 to 2029 UK 5-year NAP set out the target to prevent any increases in Gram-negative bloodstream infections in humans from the 2019 to 2020 financial year

baseline by 2029 (12). Given this concern, it is important that we continue to monitor the proportion of SSI caused by Gram-negative bacteria such as Enterobacterales. In financial year 2024 to 2025, superficial SSIs and deep incisional or organ and space SSIs showed a decreasing 10-year trend in the proportion of Enterobacterales SSIs, which highlights the need for ongoing surveillance. (12)

In financial year 2024 to 2025, the proportion of SSIs from which MRSA was isolated increased for superficial but not deep incisional or organ and space infections in contrast to the proportion of SSIs caused by MSSA which increased in both foci of infections. The proportion of MRSA in deep or organ and space infections remained below pre-pandemic levels.

Capture of microbial aetiology continues to play a key role in prevention of SSI through optimising choice of antibiotic prophylaxis in surgery and may result in downstream reduction of bacteraemia caused by SSI.

Table 6a. Micro-organisms reported as causing inpatient and readmission detected SSIs (superficial SSIs), all surgical categories [note 1], NHS hospitals, England, April 2020 to March 2025

	Hip replacement number (%)	Knee replacement number (%)	Repair of neck of femur number (%)	Large bowel number (%)	Spinal surgery number (%)	CABG number (%)
Reported causative organism						
Monomicrobial						
Meticillin-sensitive *S. aureus*	24 (47.1)	34 (53.1)	29 (33.7)	14 (9.9)	22 (53.7)	24 (16.1)
Meticillin-resistant *S. aureus*	6 (11.8)	3 (4.7)	7 (8.1)	1 (0.7)	0 (0.0)	3 (2.0)
Coagulase-negative staphylococci	1 (2.0)	10 (15.6)	15 (17.4)	7 (5.0)	7 (17.1)	50 (33.6)
Enterobacterales	8 (15.7)	4 (6.3)	20 (23.3)	77 (54.6)	7 (17.1)	28 (18.8.)
Pseudomonas	4 (7.8)	2 (3.1)	6 (7.0)	17 (12.1)	33 (7.3)	21 (14.1)
Streptococcus	3 (5.9)	3 (4.7)	0 (0.0)	4 (2.8)	0 (0.0)	1 (0.7)
Enterococcus	2 (3.9)	3 (4.7)	4 (4.7)	9 (6.4)	0 (0.0)	3 (2.0)
Other bacteria	2 (3.9)	4 (6.3)	5 (5.8)	5 (3.5)	1 (2.4)	11 (7.4)

	Hip replacement number (%)	Knee replacement number (%)	Repair of neck of femur number (%)	Large bowel number (%)	Spinal surgery number (%)	CABG number (%)
Reported causative organism						
Fungi including *Candida* spp.	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)	0 (0.0)	3 (2.0)
Acinetobacter spp.	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.3)
Anaerobic bacilli	1 (2.0)	1 (1.6)	0 (0.0)	5 (3.5)	1 (2.4)	2 (1.3)
Anaerobic cocci	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)	0 (0.0)	1 (0.7)
Total monomicrobial	51 (100)	64 (100)	86 (100)	141 (100)	41 (100)	149 (100)
Polymicrobial						
Gram-positive combinations only	14 (45.2)	6 (27.3)	7 (23.3)	2 (2.2)	4 (40.0)	9 (11.7)
Gram-negative combinations only	0 (0.0)	1 (4.5)	6 (20.0)	18 (20.2)	2 (20.0)	12 (15.6)
Gram positive and gram-negative combinations	12 (38.7)	12 (54.5)	11 (36.7)	47 (52.8)	4 (40.0)	42 (54.5)
Other	5 (16.1)	3 (13.6)	6 (20.0)	22 (24.7)	0 (0.0)	14 (18.2)

	Hip replacement number (%)	Knee replacement number (%)	Repair of neck of femur number (%)	Large bowel number (%)	Spinal surgery number (%)	CABG number (%)
Reported causative organism						
Total polymicrobial	31 (100)	22 (100)	30 (100)	89 (100)	10 (100)	77 (100)
Total cases [note 2]	82 (100)	86 (100)	116 (100)	230 (100)	51 (100)	226 (100)

Note 1: total cases are specific to this analysis and refers to those with available microbiology information.

Note 2: total cases for combined monomicrobial and polymicrobial specimen.

Table 6b. Micro-organisms reported as causing inpatient and readmission detected SSIs (deep and organ space SSIs), all surgical categories [note 1], NHS hospitals, England, April 2020 to March 2025

	Hip replacement number (%)	Knee replacement number (%)	Repair of neck of femur number (%)	Large bowel number (%)	Spinal surgery number (%)	CABG number (%)
Reported causative organism						
Monomicrobial						
Meticillin-sensitive *S. aureus*	148 (40.2)	129 (41.5)	58 (21.9)	4 (4.9)	50 (43.1)	35 (26.5)
Meticillin-resistant *S. aureus*	15 (4.1)	12 (3.9)	20 (7.5)	0 (0.0)	2 (1.7)	2 (1.5)
Coagulase-negative staphylococci	60 (16.3)	57 (18.3)	73 (27.5)	4 (4.9)	22 (19.0)	33 (25.0)

	Hip replacement number (%)	Knee replacement number (%)	Repair of neck of femur number (%)	Large bowel number (%)	Spinal surgery number (%)	CABG number (%)
Reported causative organism						
Enterobacterales	77 (20.9)	45 (14.5)	51 (19.2)	51 (63.0)	23 (19.8)	33 (25.0)
Pseudomonas	12 (3.3)	7 (2.3)	17 (6.4)	2 (2.5)	4 (3.4)	9 (6.8)
Streptococcus	27 (7.3)	30 (9.6)	10 (3.8)	4 (4.9)	0 (0.0)	1 (0.8)
Enterococcus	18 (4.9)	9 (2.9)	12 (4.5)	7 (8.6)	3 (2.6)	4 (3.0)
Other bacteria	8 (2.2)	20 (6.4)	18 (6.8)	0 (0.0)	8 (6.9)	6 (4.5)
Fungi including *Candida* spp.	1 (0.3)	0 (0.0)	0 (0.0)	4 (4.9)	0 (0.0)	8 (6.1)
Acinetobacter spp.	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)
Anaerobic bacilli	2 (0.5)	1 (0.3)	5 (1.9)	5 (6.2)	2 (1.7)	0 (0.0)
Anaerobic cocci	0 (0.0)	1 (0.3)	1 (0.4)	0 (0.0)	2 (1.7)	0 (0.0)

	Hip replacement number (%)	Knee replacement number (%)	Repair of neck of femur number (%)	Large bowel number (%)	Spinal surgery number (%)	CABG number (%)
Reported causative organism						
Total monomicrobial	368 (100)	311 (100)	265 (100)	81 (100)	116 (100)	132 (100)
Polymicrobial						
Gram-positive combinations only	77 (45.3)	53 (45.3)	56 (33.5)	8 (5.0)	17 (37.8)	21 (18.8)
Gram-negative combinations only	22 (12.9)	14 (12.0)	21 (12.6)	20 (12.4)	8 (17.8)	18 (16.1)
Gram positive and gram-negative combinations	63 (37.1)	42 (35.9)	82 (49.1)	91 (56.5)	15 (33.3)	56 (50.0)
Other	8 (4.7)	8 (6.8)	8 (4.8)	42 (26.1)	5 (11.1)	17 (15.2)
Total polymicrobial	170 (100)	117 (100)	167 (100)	161 (100)	45 (100)	112 (100)
Total cases [note 2]	538 (100)	428 (100)	432 (100)	242 (100)	161 (100)	244 (100)

Note 1: total cases are specific to this analysis and refers to those with available microbiology information.
Note 2: total cases for combined monomicrobial and polymicrobial specimen.

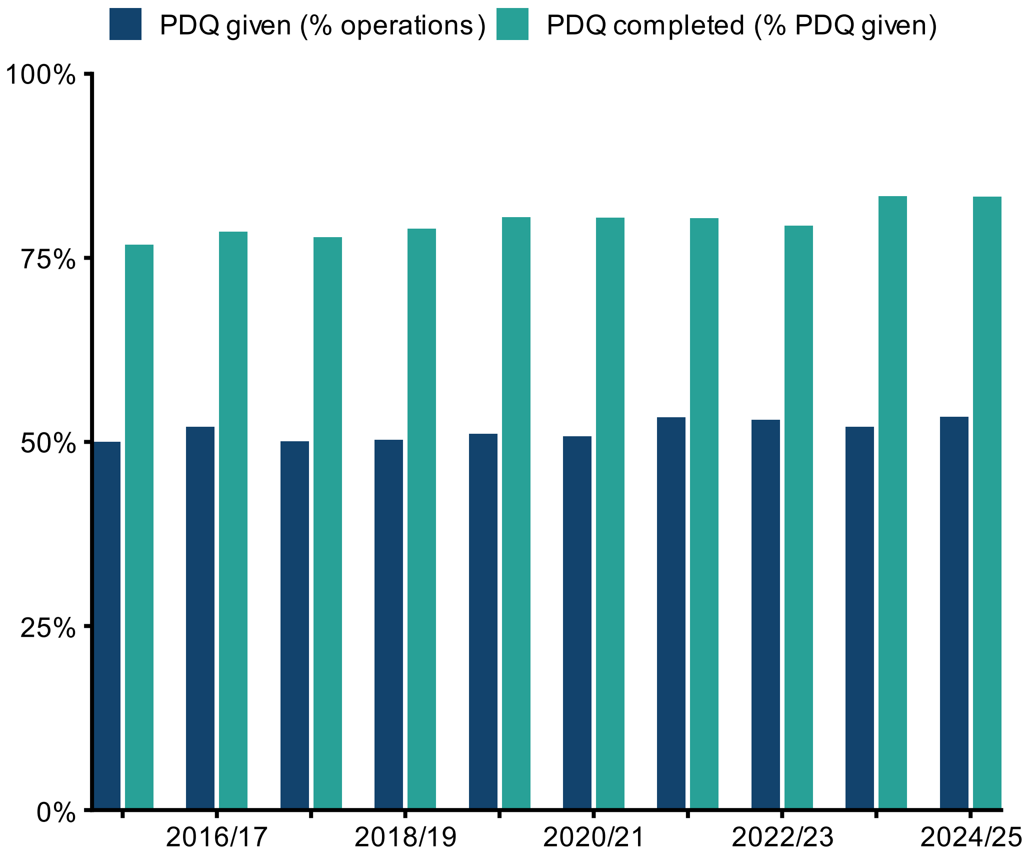
Patient post-discharge questionnaire (PDQ)

Post-discharge questionnaires are used to capture SSIs managed outside of hospital settings to provide a more sensitive measure of SSI incidence. Whilst SSIs detected via PDQ are not included in the data used for this report, as this is an optional SSI detection method and not all hospitals use this to monitor SSI risk, we describe trends in uptake of PDQs (13).

Figure 12 shows PDQs given as a percentage of the number of operations, and the proportion of PDQs completed as a percentage of the number given (2015 to 2025). The proportion of patients under surveillance who were given a PDQ indicates the coverage of total operations by PDQ surveillance. This proportion increased from 50.0% in financial year 2015 to 2016 to 53.4% in 2024 to 2025.

The proportion of PDQs completed of those given increased from 76.8% in 2015 to 2016 to 83.3% in 2024 to 2025, showing that where PDQs are given there is a high response rate. Given that not all hospitals are utilising PDQs, the overall proportion of operations with a completed PDQ was less than half over the past 10 years although showing a steady increase from 38.4% to 44.5% (between 2015 to 2016 and 2024 to 2025).

Figure 12. Uptake and completion of PDQs as a proportion of all operations and where PDQ given, by financial year, NHS hospitals England, April 2015 to March 2025



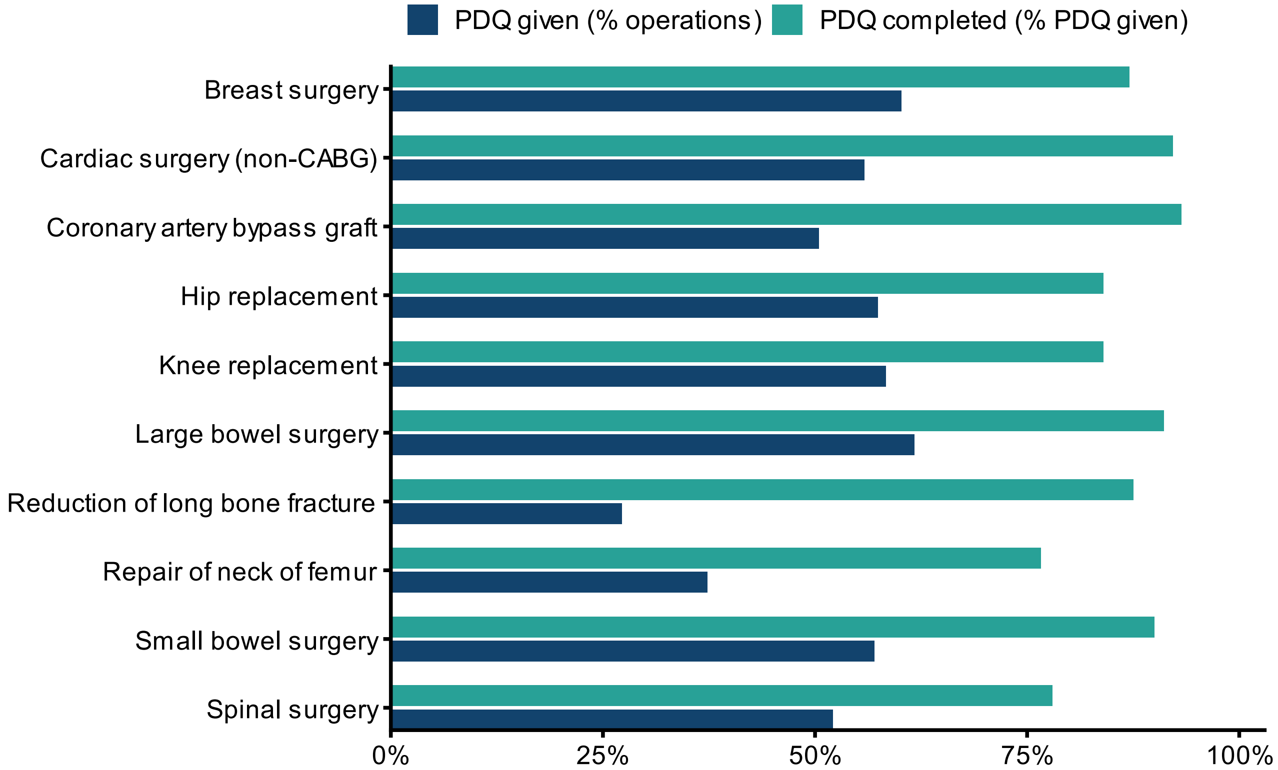
See data table 12 in accompanying data tables spreadsheet.

Figure 13 shows the proportion of PDQs given (as a percentage of operations) and PDQs completed (as a percentage of PDQs given) among categories with more than 5 participating hospitals in financial year 2024 to 2025. The proportion of operations with a PDQ given ranged from 27.2% for reduction of long bone fracture to 61.7% for large bowel surgery. Categories with shorter lengths of stay (median 0 to 3 days) including hip (57.4%) and knee replacement (58.4%), spinal surgery (52.1%), and breast surgery (60.2%) had higher uptake of PDQs. The proportion of PDQs completed (of PDQ given) was above 70% for all categories, the highest being for CABG surgery (93.2%).

As the provision and completion of PDQs is not mandatory, albeit strongly recommended for operations with short length post-operative stay, SSIs detected through PDQs are not currently included in our main analyses. The PDQ is currently paper-based or administered by phone and therefore comes with an administrative overhead. Despite this, over 50% of operations were administered a PDQ illustrating the value hospitals and SSISS place in obtaining more comprehensive estimate of the SSI burden, particularly for categories with short length of stay. The PDQ would also be particularly useful to tertiary referral centres and independent sector hospitals to detect SSIs that may be lost to follow-up due to the patients having a higher likelihood of being readmitted to their local NHS hospitals via A&E due to post-operative complications.

An electronic PDQ (ePDQ) is in private beta phase of development and is expected to increase hospital uptake of PDQ surveillance by reducing the administrative burden and increase response rates by patients. The ePDQ will provide hospitals with a more sensitive SSI measure when looking at trends in their data over time.

Figure 13. Uptake of PDQs as a proportion of all operations and completion of PDQs where PDQ given, by category, NHS hospitals England, April 2024 to March 2025



See data table 13 in accompanying data tables spreadsheet.

Hospital perspectives

Insights from peers provide an opportunity for hospitals to share and learn from each other. The following submission reflects 2 hospitals' experiences of using SSI surveillance data to improve patient outcomes and developing tools to reduce data collection burden.

Revisiting basic care and enhancing preoperative washes for spinal patients at ward level

Great Ormond Street Hospital (GOSH) has historically reported high rates of SSIs following spinal surgery, having been identified as a high outlier through the UKHSA national surveillance programme. Between 2017 and 2018, significant improvements were made, particularly maintaining normothermia throughout the surgical pathway. However, as SSIs are known to be multifactorial in origin, further efforts were undertaken in 2019 to assess and improve the quality of basic care practices for spinal surgery patients. A systematic in-house review detected inconsistencies in the delivery of pre-operative washes. While these are crucial for reducing skin bacterial load and thus lowering infection risk, the standard and effectiveness of washes varied. This article outlines the identified challenges and steps taken to standardise and enhance preoperative washing practices at GOSH.

Steps taken to address the issue

All spinal patients at GOSH are admitted either the day before or on the day of surgery. As a specialist paediatric hospital managing a complex patient cohort, many of whom have significant comorbidities including incontinence and reduced mobility, ensuring optimal preoperative skin cleanliness is essential. Historically, preoperative washes were carried out by parents or carers. Although well-intentioned, this approach resulted in variability, with individual practices not always aligning with clinical standards.

In response to continuous SSISS monitoring and feedback and based on the One Together toolkit for SSI reduction, the spinal Advanced Nurse Practitioner (ANP) proposed implementation of a standardised preoperative wash protocol. This included active support from nursing or healthcare assistant staff to guide and monitor the process. Staff were trained to assist families with cleansing the patient's skin and hair using either plain soap and/or antiseptic solutions, as appropriate, but always mindful of the patient's specific needs and limitations.

Outcome and challenges

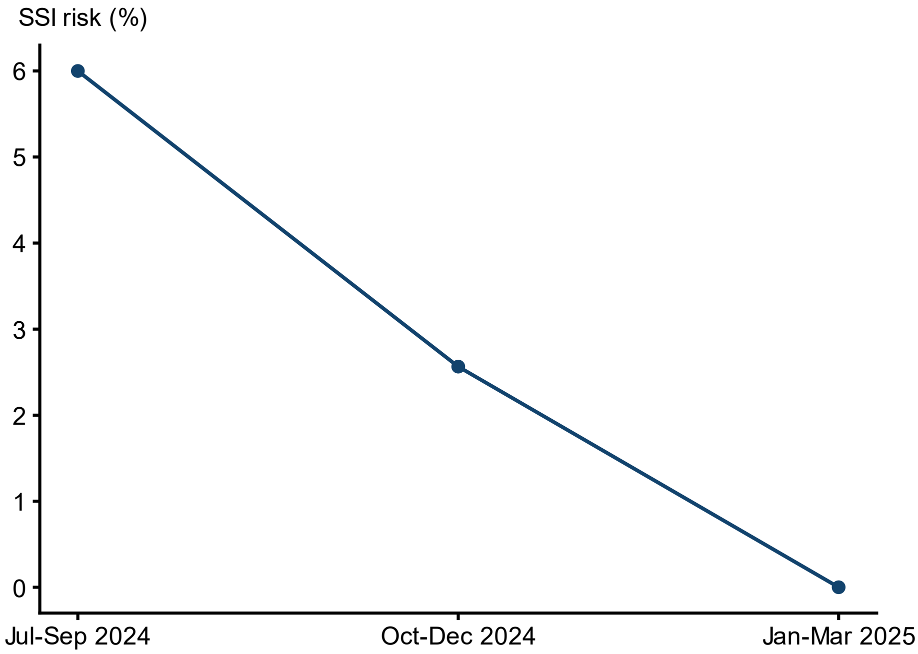
While preoperative washes were already routine, the intervention focused on improving quality and consistency. Nursing staff enhanced this process by providing structured support and closer monitoring, while still promoting independence and dignity for both patients and families. As a result, all spinal patients now receive a standardised wash at ward level – documented on the preoperative checklist, including the time of the wash and the cleaning agent used – before being transferred to theatre on a trolley equipped with active warming devices, helping maintain normothermia while awaiting surgery.

Implementing basic care interventions, such as standardised preoperative washing, can be challenging, particularly within the busy and complex environment of a large paediatric hospital. Like many NHS trusts, GOSH faces pressures including staffing constraints and the need to accommodate families from diverse cultural backgrounds with varying beliefs and expectations. Despite these challenges, the nursing team demonstrated exceptional adaptability, ensuring that care was both inclusive and of a consistently high standard. The success of this initiative speaks to the dedication and flexibility of frontline staff who championed these changes.

Learning and next steps

Since introducing enhanced preoperative washing alongside temperature management measures, GOSH's spinal SSI rates have steadily declined compared to pre-2017 levels. Notably, GOSH recorded zero SSIs between January and June 2025 (Figure 14, April to June 2025 quarter not displayed), a remarkable achievement given the unchanged complexity of the patient cohort. We believe this positive outcome is linked to reducing variation in practice, particularly around the combined temperature regulation and consistent preoperative washing. This progress was only possible through a collaborative, multidisciplinary approach. Clinical nurse practitioners, ward sisters, educators, and IPC teams all played key roles in supporting and educating staff at ward level.

Figure 14. Trends in inpatient and readmission SSI risk for spinal surgery, Great Ormond Street Hospital, July 2024 to March 2025



Supported by the UKHSA, GOSH continues indispensable SSI surveillance to review all aspects of the patient surgical pathway to identify and mitigate SSI risks, contributing to reduction of antibiotic usage and overall cost of care. It is only thanks to the continuous surveillance cycle that deviances can be detected, and actions put in place. SSI Surveillance remains a cornerstone of our approach. In partnership with the UKHSA, we reaffirm our commitment to monitoring SSI rates and continuously evaluating practice. By doing so, we aim to sustain and build upon these improvements, ensuring safer surgical outcomes for all our patients.

Managing surgical wounds under patient-initiated follow-up (PIFU) using a digital platform

A Surgical wound Care Assessment and Review (SCAR) Clinic initiative was implemented at West Suffolk Hospital Foundation Trust (WSHFT). This quality improvement project utilises patient-initiated follow-up (PIFU) principles combined with a digital communication tool to improve post-operative wound management including SSI surveillance, currently non mandatory for general surgery. The initiative aims to empower patients, improve their experience, reduce emergency department visits, and enhance equity of service access in a medium-sized district general hospital setting.

SSIs represent a significant cause of post-operative morbidity and place a substantial burden on healthcare resources. The colorectal surgical care practitioner (SCP) was appointed as the trust's SSI surveillance champion in 2018, leading to a service improvement project focusing on digitalizing data collection and empowering patients via PIFU pathways. The SCAR clinic initiative was developed as part of WSHFT's response to the Get It Right First Time national audit. The project was inspired by the cohort study evaluating the burden of wounds to the UK's National Health Service in 2017 to 2018 by Julian Guest et al., which highlighted the NHS's £8.3 billion annual expenditure on wound care, 81% of which occurs in the community with 14% related to surgical wounds (14).

The SCAR clinic officially launched in October 2019, paused during the COVID-19 pandemic, and resumed in 2023. In collaboration with private industry, a digital communication tool (DCT) was acquired, and a pilot study was implemented on an elective surgical ward in 2024. The clinic is now fully integrated into the surgical Same Day Emergency Care (SDEC) service to provide comprehensive wound assessment and management for colorectal, hernia and cholecystectomy patients. Shoulder surgery was included as part of extending the service to trauma and orthopaedic department in the future.

Patient Initiated Electronic Referral (PIER) system pilot

A six-month pilot of the PIER system began in August 2024. Eligible post-operative patients were onboarded to a web-based mobile application, which collected patient-generated health data (PGHD) including wound photos and symptom reports (pain, redness, swelling, odour, and warmth). The data is triaged via a traffic light system, alerting healthcare professionals (HCPs) to wound severity, enabling telemedicine or face-to-face interventions.

Fifty-nine patients participated, with 2 exclusions. Procedures included large bowel resections (57%), open hernia repairs (30%), laparoscopic cholecystectomy (11%), and shoulder surgery (2%). The infection rate was 8.2%, with a readmission rate of 2% (figures 15 and 16).

Figure 15. Combined HCP's input and PGHD reports

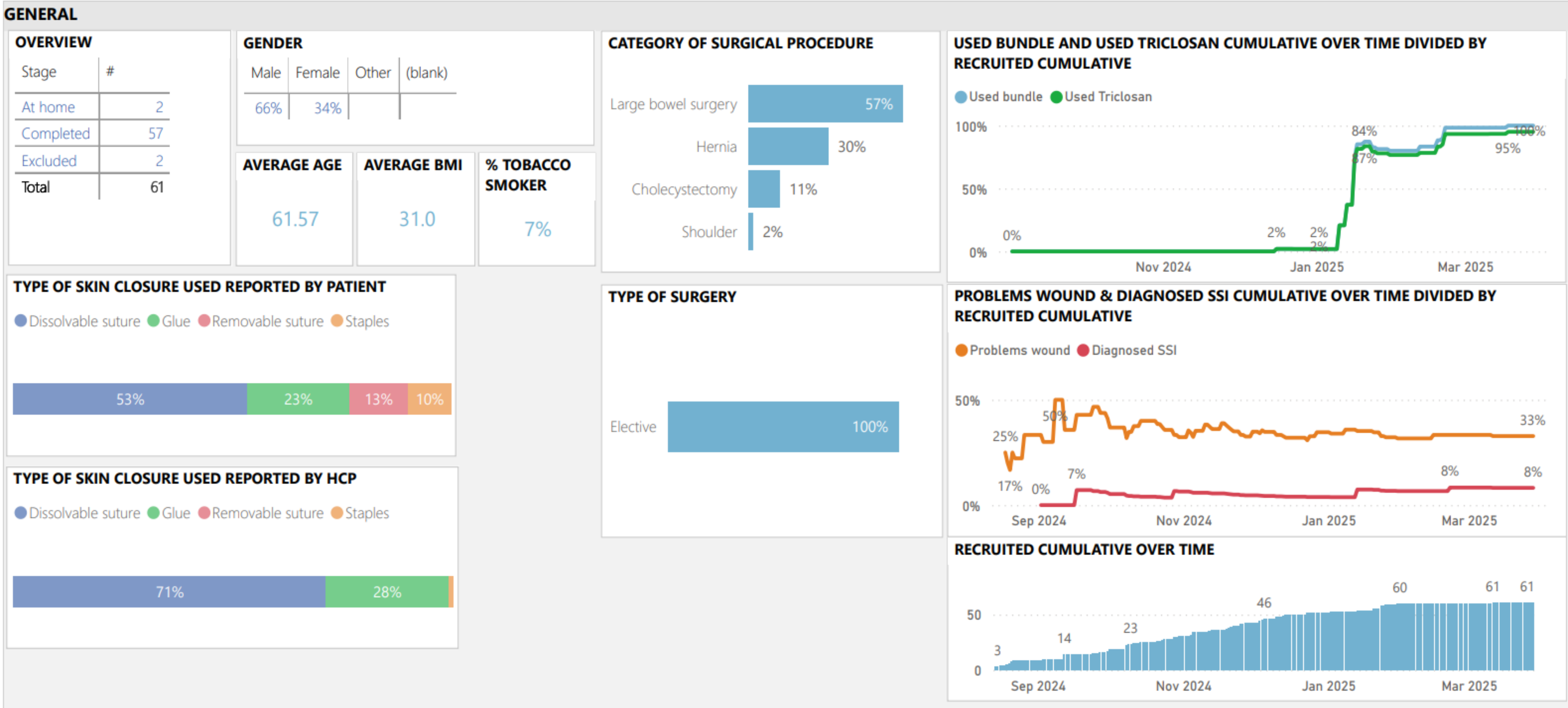
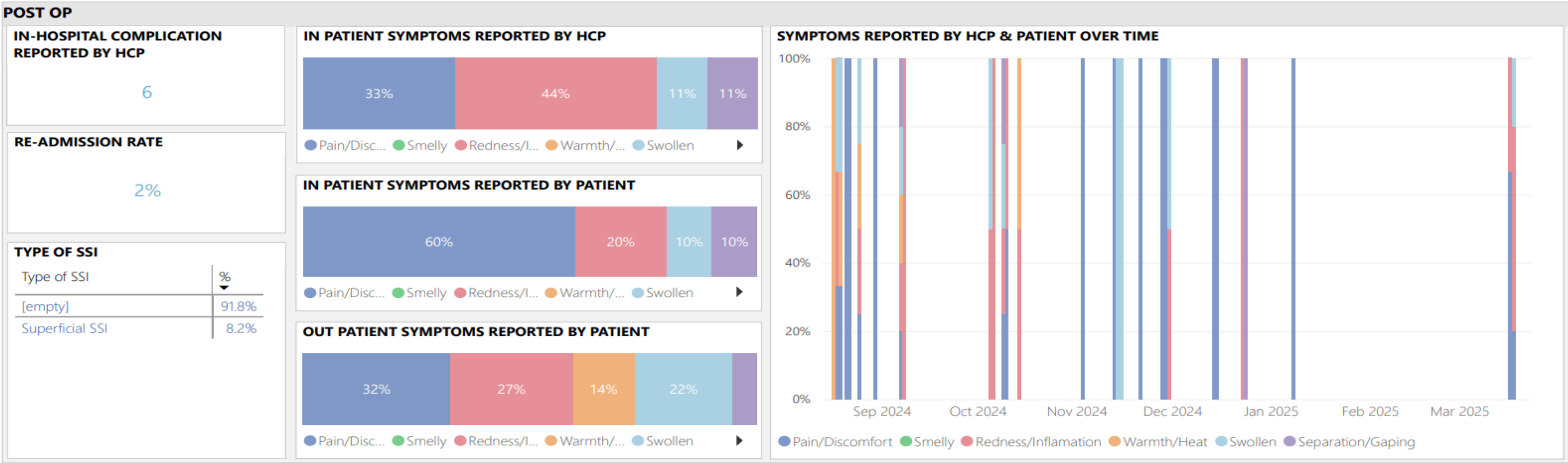


Figure 16. Combined HCP and PGHD reports including 31 days daily active surveillance reporting or ASR



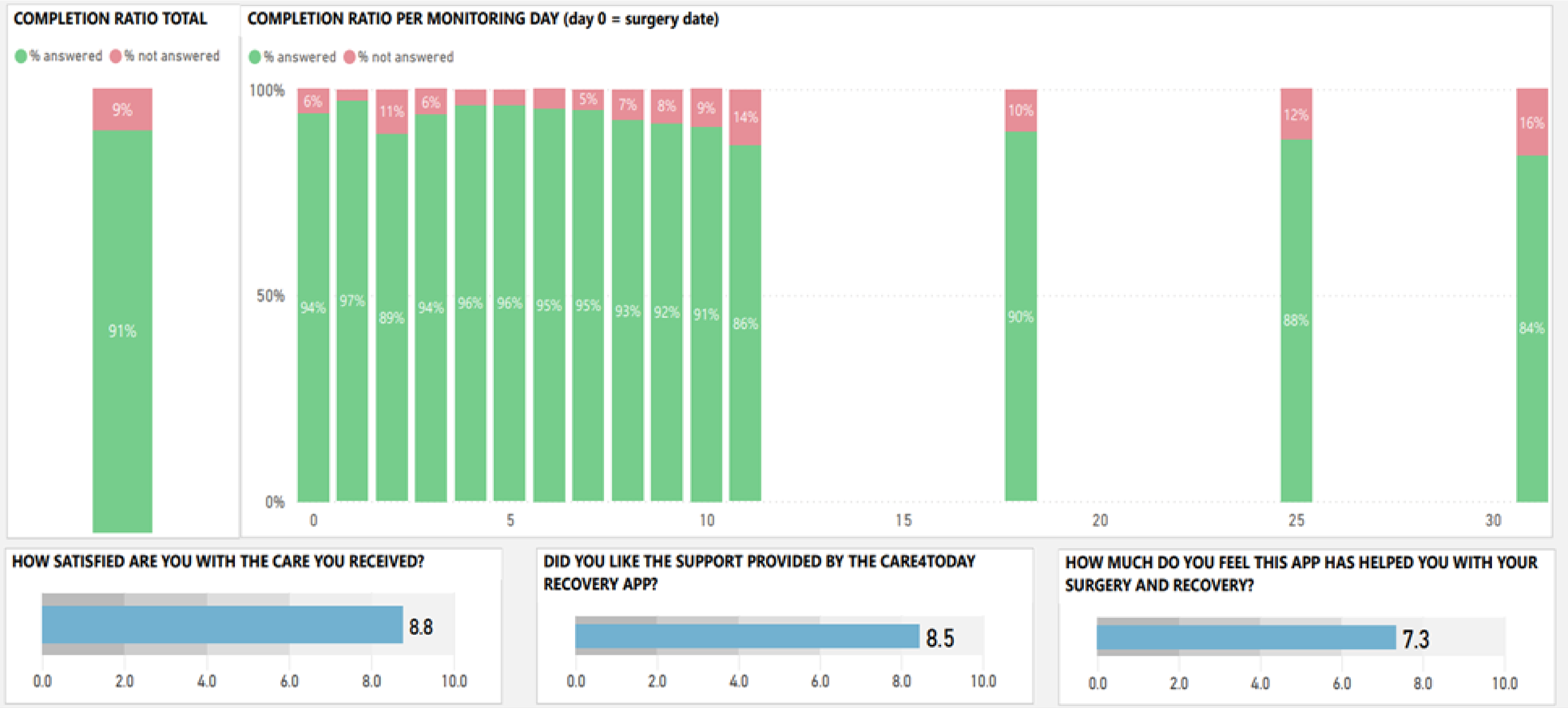
PATIENT ADHERANCE AND SATISFACTION

ASRs PER MONITORING DAY (day 0 = surgery date)

ASR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
In-Patient Tab: Patient has had any troubles with their wound	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0
No SSI occured for this patient	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
Patient does not understand or did not get discharge guidance	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Patient has been re-admitted to hospital with infection of the surgical wound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Patient has bleeding wound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Patient has submitted a photo of their wound	0	1	1	1	0	0	1	0	1	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Total	5	32	17	21	14	15	18	13	16	13	16	15	10	6	4	4	4	5	10	10	4	8	4	3	4	14	10	3	3	3	3	103

The application completion rate reached 91%. Patient satisfaction scores averaged 88%, with 85% appreciating the app's support and 73% acknowledging its positive impact on recovery during the PIER system pilot (Figure 17).

Figure 17. Overall mobile application completion ratio including daily monitoring ratio for 31 days and patient satisfaction survey



Moreover, SCAR clinic received referrals from colorectal consultants and nurse specialists, with additional input from surgical registrars and general practitioners. Patient feedback yielded a 93% satisfaction score from June 2023 to April 2024.

Conclusion

The SCAR clinic's integration of PIFU with a digital platform enhances patient autonomy, streamlines SSI surveillance, and reduces unnecessary hospital visits. Real-time data collection and triaging promote early wound complication detection and timely intervention. Patient feedback affirms the acceptability and effectiveness of the system.

Further research is needed to evaluate long-term outcomes and expand implementation across other surgical disciplines.

The SCAR clinic initiative demonstrates that digital PIFU pathways can safely and effectively manage post-operative surgical wounds, improve patient experience, and optimise healthcare resources in a district general hospital setting.

Glossary

ASA score
Patient's pre-operative physical status scored by the anaesthetist according to the American Society of Anesthesiologists' classification of physical status. There are 5 ASA scores, ranging from A1 denoting normally healthy patient to A5 denoting moribund patient with little chance of survival.

Confidence intervals
Confidence intervals are used to show where the true range of results might lie. Ninety-five percent confidence intervals are used throughout to provide a guide to the precision of the estimate based on the denominator, number of operations (or days of follow-up), with narrower intervals representing greater confidence in the estimate and broader confidence intervals representing lower certainty in the estimate. Given the same sampling, the estimate will fall within the confidence intervals 19 times out 20. The funnel plots use both 95% and 99% confidence limits to represent the limits of expected variation among trusts and establish a threshold for 'warning' of an unexpected result and needing to take 'action'. A 99% confidence range is wider but is offset with a lower margin of error (1%).

Cumulative incidence
The total number of SSIs as a proportion of the total number of patients undergoing a procedure in the same category of surgery per 100 operations (%).

Hospital Episode Statistics (HES)
Curated data product containing details about admissions, outpatient appointments and historical accident and emergency attendances at NHS hospitals in England.

Index of Multiple Deprivation (IMD)
Relative measure of area-based deprivation formed by combining 7 domains of deprivation (income, employment, education, skills and training, health and disability, crime, barriers to housing services) at a level of lower-super output areas (population size of about 1,500 residents or 650 households).

Incidence density
The total number of SSIs (identified through inpatient surveillance) divided by the total number of days of inpatient follow-up expressed as the number of SSIs per 1,000 days of patient follow-up.

Independent sector NHS treatment centres
Centres that provide services to NHS patients but are owned and run by organisations outside the NHS. They perform common elective (non-emergency) surgeries, diagnostic procedures and tests in an effort to help the NHS reduce waiting times.

NHSN Risk Index
The Centers for Disease Control and Prevention National Healthcare Safety Network (NHSN) Risk Index assesses a patient's risk of developing an SSI based on the presence of 3 key risk

factors (ASA score, duration of operation, and wound class). Patients are assigned a cumulative score from 0 to 3 based on the following: an ASA score of 3 or more, duration of surgery exceeding the 75th percentile, and a contaminated or dirty wound class. A score of 3 would indicate a high risk of SSI for a patient after an operation.

NHS trust

Healthcare providers. In the context of this report these comprise one or more acute care hospitals providing surgical services.

Risk ratio

A measure of the risk of a certain event happening in one group compared to the risk of the same event happening in another group. A risk ratio of one means there is no difference between the 2 groups in terms of their risk, based on whether or not they were exposed to a certain factor or possess a certain risk factor. A risk ratio of less than 1 usually means that being exposed to a certain factor or possessing a certain risk factor decreases the risk of infection. A risk ratio greater than 1 means that being exposed to a certain factor or possessing a certain risk factor increases the risk of infection.

Surveillance

Epidemiological surveillance is the ongoing and systematic collection, analysis, and interpretation of health data in the process of describing and monitoring a health event. This information is used for planning, implementing, and evaluating public health interventions and programs. Surveillance data is used both to determine the need for public health action and to assess the effectiveness of programs (15).

T-time

T-time represents the expected duration for a particular surgical procedure based on the 75th percentile for the duration of all such operations, rounded to the nearest hour. T-times for all surgical categories are as follows:

Table 7. T-time for surgical categories

Surgical category	T-time (hours)
Abdominal hysterectomy	2
Bile duct, liver, or pancreatic surgery	5
Breast surgery	3
Cholecystectomy	2
Cardiac surgery (non-CABG)	5
Coronary artery bypass graft	5
Cranial surgery	4
Gastric surgery	3
Hip replacement	2

Surgical category	T-time (hours)
Knee replacement	2
Large bowel surgery	3
Limb amputation	1
Reduction of long bone fracture	2
Repair of neck of femur	1.5 [note 1]
Small bowel surgery	3
Spinal surgery	3
Vascular surgery	3

Note 1: T-time derived from SSISS data.

Wound class

This describes the degree of wound contamination at the time of the operation, based on an international standard classification system. The classification ranges from W1 denoting a clean uninfected wound outside the respiratory, alimentary, and genital or urinary tract to W4 denoting dirty or infected wounds and include operations in which acute inflammation with pus is encountered or in which perforated viscera are found.

Data sources and methodology

SSISS data collection

The UKHSA SSISS protocol outlines a standard methodology, including case definitions and case finding methods, which all participating hospitals must adhere to (16). Hospitals participating in UKHSA's national SSI surveillance programme are strongly encouraged to have staff attend the UKHSA SSISS quarterly training before starting surveillance in order to maintain the quality of surveillance data.

Surveillance data is collected prospectively on a quarterly basis and include all eligible patients undergoing surgery in pre-selected surgical categories during each 3-month period (quarter). Patients are followed up to identify SSIs for 30 days after surgery for non-implant procedures and for one year for procedures involving a prosthetic implant. A set of demographic and surgery-related data is collected for each eligible procedure and submitted to the UKHSA SSISS via a secure web-based application.

Further information on data sources and methodology can be found in the QMI report.

Background information

Surgical Site Infection Surveillance Service

This report summarises data submitted by NHS hospitals and independent sector (IS) NHS treatment centres in England to the national SSI Surveillance Service (SSISS), UK Health Security Agency (UKHSA, previously Public Health England (PHE)). The aim of the national surveillance program is to enhance the quality of patient care by encouraging hospitals to use data obtained from the surveillance to compare their rates of SSI over time and against a national benchmark and to use this information to review and guide clinical practice.

The SSISS provides an infrastructure for hospitals to collect data on 17 surgical categories spanning general surgery, cardiothoracic, neurosurgery, gynaecology, vascular, gastroenterology and orthopaedics. Surveillance is targeted at open surgical procedures, which carry a higher risk of infection than minimally invasive (‘keyhole’) procedures (17, 18); however laparoscopic-assisted procedures are included for some categories.

The SSISS was established by the Public Health Laboratory Service (PHLS, a predecessor of UKHSA) in 1997. From April 2004, NHS trusts performing orthopaedic surgery have been mandated by the Department of Health and Social Care (DHSC) to carry out surveillance for a minimum of 3 consecutive months per financial year in at least one of 4 orthopaedic categories: hip replacement, knee replacement, repair of neck of femur or reduction of long bone fracture (4). NHS trusts that do not carry out orthopaedic surgery are exempt from mandatory participation and can report on other types of surgery if they choose to do so. NHS hospital participation in other categories remains voluntary. Private healthcare hospitals were mandated to publish SSI risk data by Competition and Markets Authority in 2014 (19).

This report includes surveillance data submitted to the SSISS based on surgery which took place from 1 April 2015 to 31 March 2025, with a focus on the latest financial year (2024 to 2025), and a comparison to the previous financial year (2023 to 2024).

Further information and contact details

Feedback and contact information

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Acknowledgments

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We extend our thanks to all staff across NHS for their continued efforts in collecting surveillance data as well as NHS Information Centre for access to HES data.

Appendix 1

Table 8. Requirements for data fields that inform patient and surgery-related characteristics

Characteristic	Requirement
Patient age	Calculated from mandatory date of birth and date of operation data fields
Patient sex	Mandated for submission, however “unknown” is an available response option
Patient BMI	Calculated from optional height and weight data fields
Patient ASA score	Mandated for submission, however “unknown” is an available response option
Wound class	Mandated for submission, however “unknown” is an available response option
Operation duration	Mandated for submission
Pre-operative stay	Calculated from mandatory date of admission and date of operation data fields
Elective surgery	Mandated for submission, however “missing” is an available response option
Trauma surgery	Mandated for submission, however “missing” is an available response option
Primary indication for surgery	Mandated for submission, however “unknown” is an available response option
Antibiotic prophylaxis given	Mandated for submission, however “unknown” is an available response option

Appendix 2

Table 9a. Data completeness for patient characteristic variables, NHS hospitals England, April 2024 to March 2025

Surgical category	Number of hospitals	Number of operations	Age (%)	Sex (%)	BMI [note 1] (%)	ASA score (%)
Abdominal hysterectomy	4	383	100.0	100.0	96.1	97.4
Bile duct, liver or pancreatic surgery	1	193	100.0	100.0	0.0	100.0
Breast surgery	15	3,043	100.0	100.0	82.0	95.2
Cardiac surgery (non-CABG)	8	3,447	100.0	100.0	75.9	95.2
Cholecystectomy	1	247	100.0	100.0	0.0	100.0
Coronary artery bypass graft	12	4,901	100.0	100.0	79.2	94.8
Cranial surgery	4	971	100.0	100.0	77.7.0	84.3
Gastric surgery	3	332	100.0	100.0	72.6	97.3
Hip replacement	148	44,626	100.0	100.0	70.5	99.0
Knee replacement	143	51,502	100.0	100.0	71.4	99.2
Large bowel surgery	17	2,508	100.0	100.0	77.4	97.1
Limb amputation	3	174	100.0	100.0	64.9	89.1
Reduction of long bone fracture	21	3,885	100.0	100.0	41.1	97.5
Repair of neck of femur	81	22,952	100.0	100.0	46.6	97.4
Small bowel surgery	5	421	100.0	100.0	64.6	96.9
Spinal surgery	14	6,202	100.0	100.0	71.2	99.3
Vascular surgery	4	624	100.0	100.0	92.8	98.2

Note 1: optional data entry field.

Abbreviations

BMI = body mass index
ASA = American Society of Anesthesiologists
op = operation
CI = confidence interval

Table 9b. Data completeness for surgical characteristic variables, NHS hospitals England, April 2024 to March 2025

Surgical category	Wound class (%)	Operation duration (%)	Pre-op stay (%)	Elective surgery (%)	Trauma surgery [note 1] (%)	Primary indication (%)	Antibiotic prophylaxis (%)
Abdominal hysterectomy	100.0	100.0	100.0	100.0	100.0	not applicable	99.7
Bile duct, liver or pancreatic surgery	100.0	100.0	100.0	100.0	100.0	not applicable	100.0
Breast surgery	100.0	100.0	100.0	100.0	99.6	not applicable	92.2
Cardiac surgery (non-CABG)	100.0	99.8	100.0	100.0	97.8	not applicable	97.5
Cholecystectomy	100.0	100.0	100.0	100.0	100.0	not applicable	100.0
Coronary artery bypass graft	98.5	99.8	100.0	99.7	93.9	not applicable	98.3
Cranial surgery	100.0	100.0	100.0	100.0	72.0	not applicable	98.8
Gastric surgery	100.0	100.0	100.0	100.0	99.7	not applicable	97.0
Hip replacement	99.3	100.0	100.0	100.0	2.4	98.0	95.8

Surgical category	Wound class (%)	Operation duration (%)	Pre-op stay (%)	Elective surgery (%)	Trauma surgery [note 1] (%)	Primary indication (%)	Antibiotic prophylaxis (%)
Knee replacement	98.3	100.0	100.0	100.0	2.6	97.2	94.3
Large bowel surgery	100.0	100.0	100.0	100.0	93.1	not applicable	99.6
Limb amputation	100.0	100.0	100.0	100.0	100.0	not applicable	100.0
Reduction of long bone fracture	99.9	100.0	100.0	100.0	95.9	not applicable	92.5
Repair of neck of femur	99.4	100.0	100.0	100.0	2.3	99.2	97.3
Small bowel surgery	100.0	100.0	100.0	100.0	100.0	not applicable	99.5
Spinal surgery	100.0	100.0	100.0	100.0	71.3	not applicable	89.7
Vascular surgery	86.4	99.0	100.0	100.0	100.0	not applicable	98.6

Note 1: optional data entry field.

Abbreviations

BMI = body mass index
ASA = American Society of Anesthesiologists
op = operation
CI = confidence interval

Appendix 3

Table 10. Median BMI and proportion of paediatric patients by surgical category, NHS hospitals England, April 2024 to March 2025

Surgical category	Patient to related characteristic: Median BMI, IQR (kg/m^2)	Patient-related characteristic: Paediatric patients (%)
Abdominal hysterectomy	29.7 (25.6 to 35.0)	0.0
Bile duct, liver or pancreatic surgery	no data	0.0
Breast surgery	27.5 (23.8 to 32.1)	0.2
Cardiac surgery (non-CABG)	27.4 (24.1 to 31.1)	5.9
Cholecystectomy	no data	0.4
Coronary artery bypass graft	28.1 (25.3 to 31.6)	0.0
Cranial surgery	27.7 (24.2 to 32.2)	0.3
Gastric surgery	29.4 (25.6 to 36.1)	0.0
Hip replacement	28.7 (25.2 to 32.8)	0.1
Knee replacement	31.0 (27.4 to 35.1)	0.0
Large bowel surgery	26.9 (23.6 to 30.5)	0.2
Limb amputation	24.8 (21.6 to 29.1)	0.0
Reduction of long bone fracture	25.5 (22.3 to 29.2)	5.2
Repair of neck of femur	23.0 (20.3 to 26.4)	0.1
Small bowel surgery	25.9	0.7

Surgical category	Patient to related characteristic: Median BMI, IQR (kg/m^2)	Patient-related characteristic: Paediatric patients (%)
	(22.2 to 29.4)	
Spinal surgery	28.4 (24.4 to 32.8)	12.4
Vascular surgery	27.0 (24.0 to 30.6)	0.2

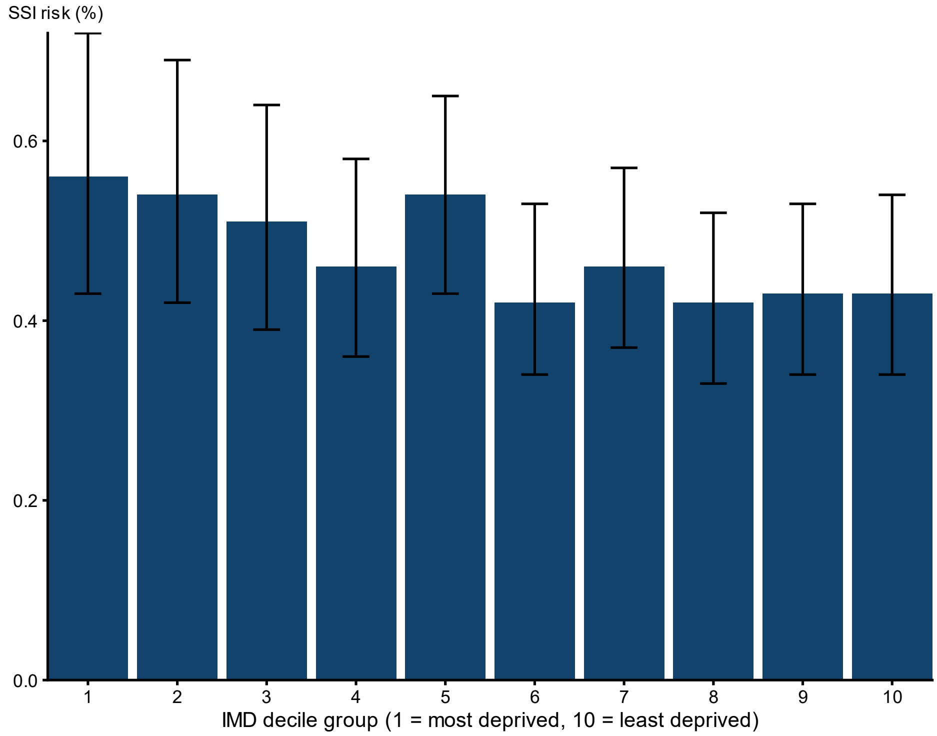
Abbreviations
BMI = body mass index
IQR = interquartile range

Appendix 4

Table 11. Proportion of records with missing IMD by surgical category, NHS hospitals England, April 2020 to March 2025

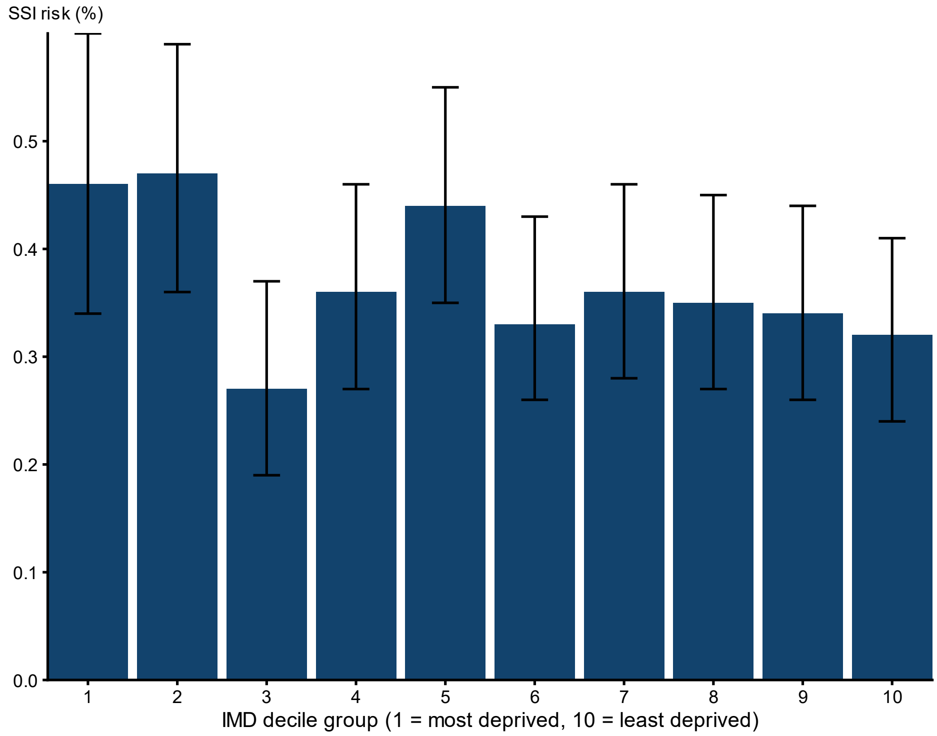
Surgical category	Missing: number	Missing: (%)
Abdominal hysterectomy	245	19.9
Bile duct, liver or pancreatic surgery	45	6.1
Breast surgery	139	1.1
Cardiac surgery (non-CABG)	1,162	6.8
Cholecystectomy	20	2.5
Coronary artery bypass graft	857	3.2
Cranial surgery	213	3.5
Gastric surgery	24	1.9
Hip replacement	15,271	8.6
Knee replacement	13,509	7.5
Large bowel surgery	428	3.8
Limb amputation	24	3.92
Reduction of long bone fracture	701	3.8
Repair of neck of femur	3,790	3.6
Small bowel surgery	78	3.9
Spinal surgery	2,454	8.6
Vascular surgery	269	10.1

Figure 5a. Risk of SSI in patients undergoing hip replacement by IMD decile, NHS hospitals England, April 2020 to March 2025



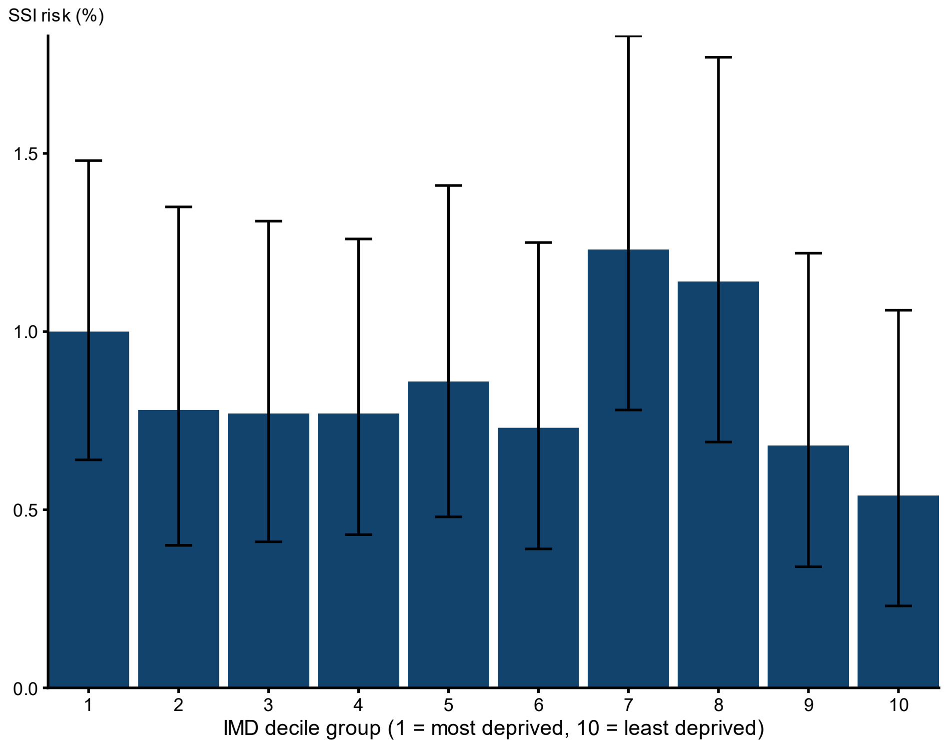
See data table 5a in accompanying data tables spreadsheet.

Figure 5b. Risk of SSI in patients undergoing knee replacement by IMD decile, NHS hospitals England, April 2020 to March 2025



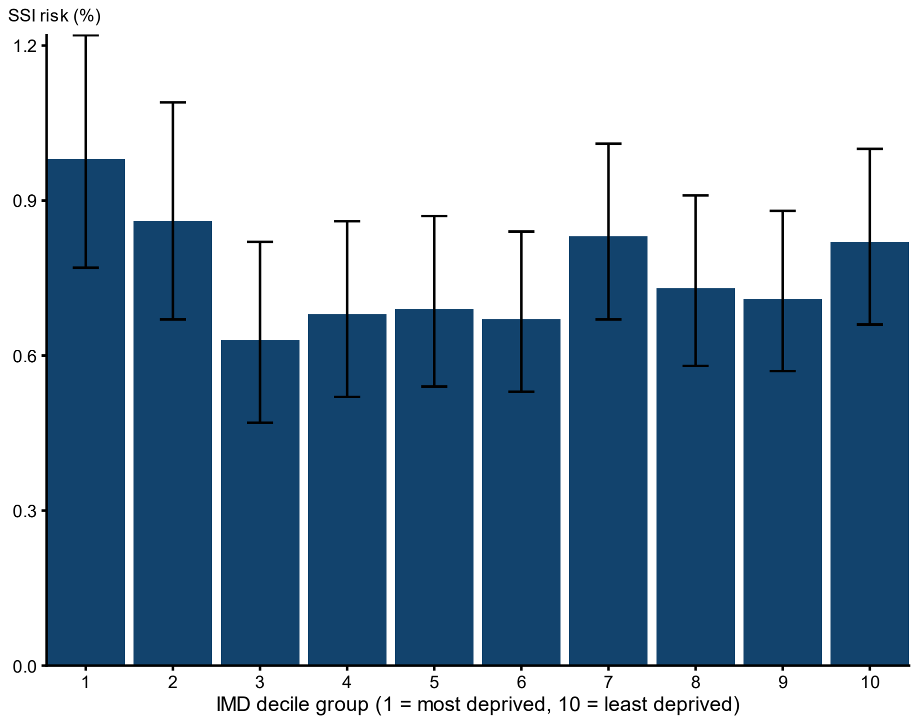
See data table 5b in accompanying data tables spreadsheet.

Figure 5c. Risk of SSI in patients undergoing reduction of long bone fracture by IMD decile, NHS hospitals England, April 2020 to March 2025



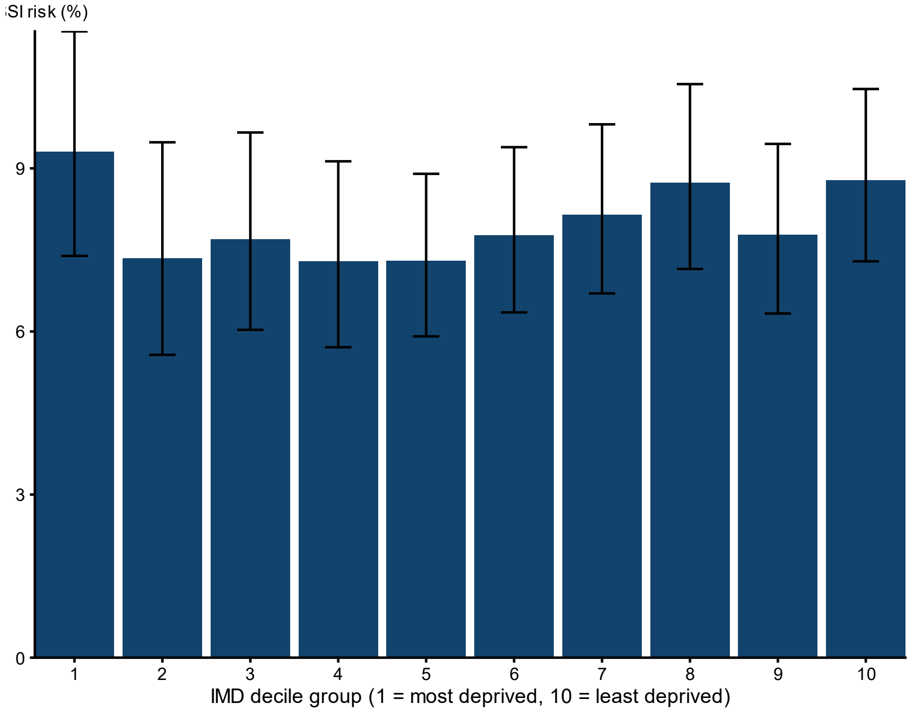
See data table 5c in accompanying data tables spreadsheet.

Figure 5d. Risk of SSI in patients undergoing repair of neck of femur by IMD decile, NHS hospitals England, April 2020 to March 2025



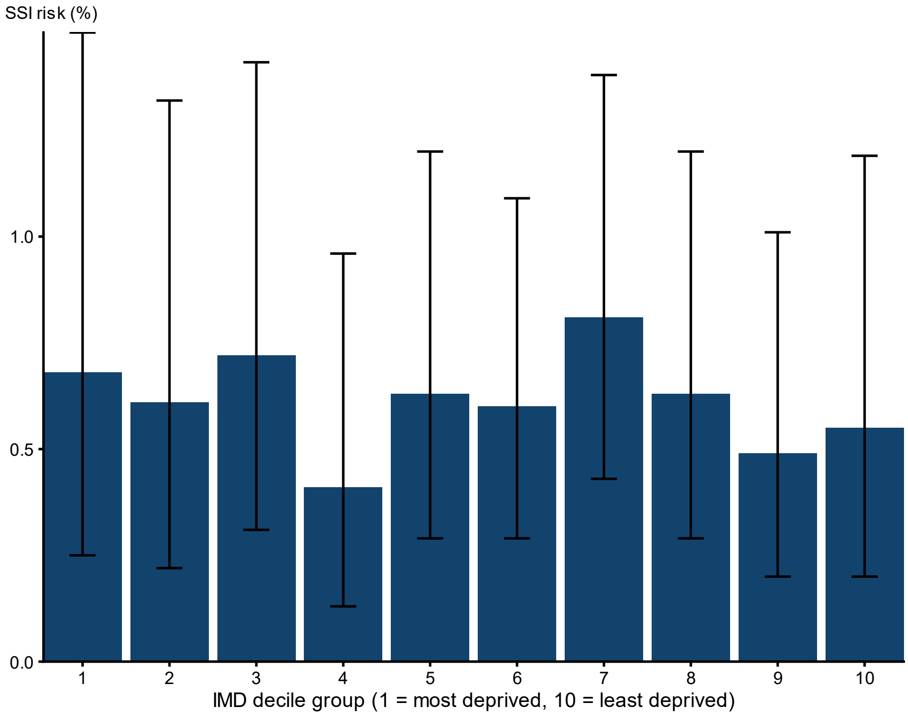
See data table 5d in accompanying data tables spreadsheet.

Figure 5e. Risk of SSI in patients undergoing large bowel surgery by IMD decile, NHS hospitals England, April 2020 to March 2025



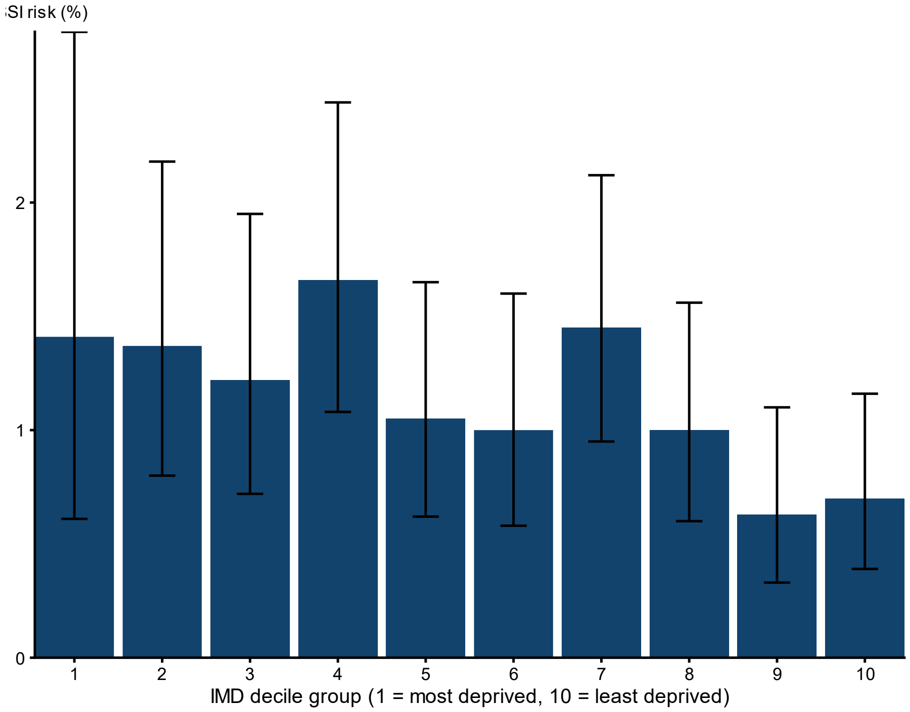
See data table 5e in accompanying [data tables] spreadsheet.

Figure 5f. Risk of SSI in patients undergoing breast surgery by IMD decile, NHS hospitals England, April 2020 to March 2025



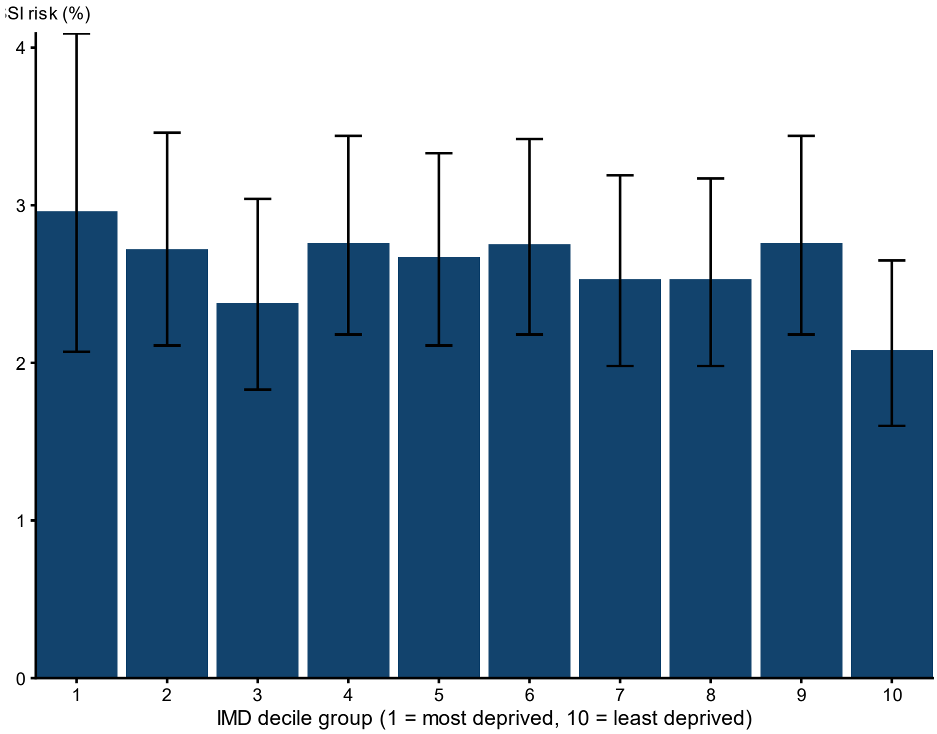
See data table 5f in accompanying [data tables] spreadsheet.

Figure 5g. Risk of SSI in patients undergoing cardiac surgery (non-CABG) by IMD decile, NHS hospitals England, April 2020 to March 2025



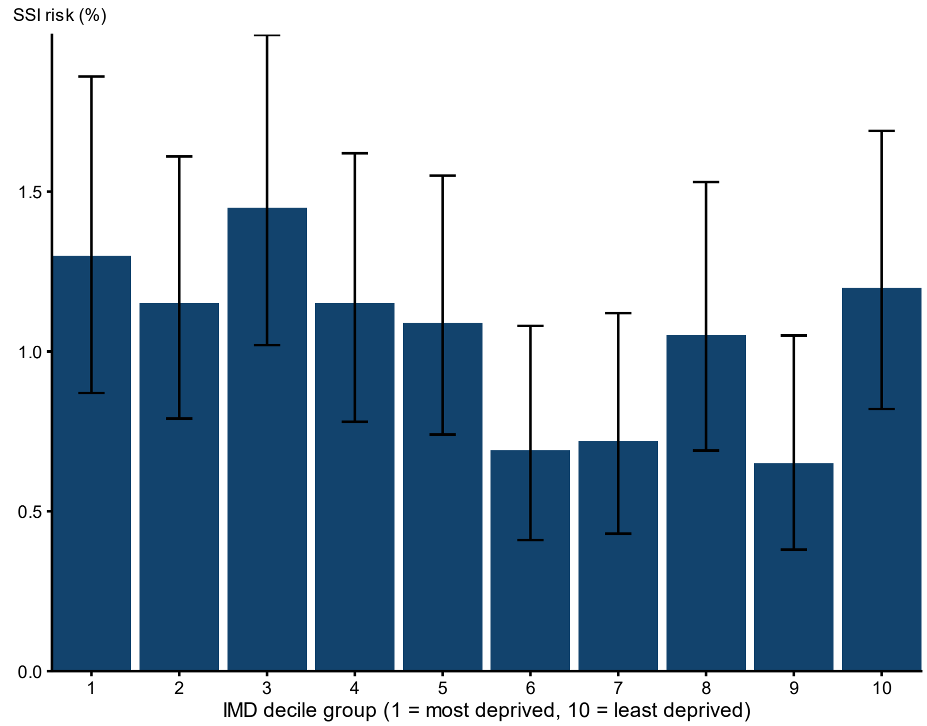
See data table 5g in accompanying data tables spreadsheet.

Figure 5h. Risk of SSI in patients undergoing CABG surgery by IMD decile, NHS hospitals England, April 2020 to March 2025



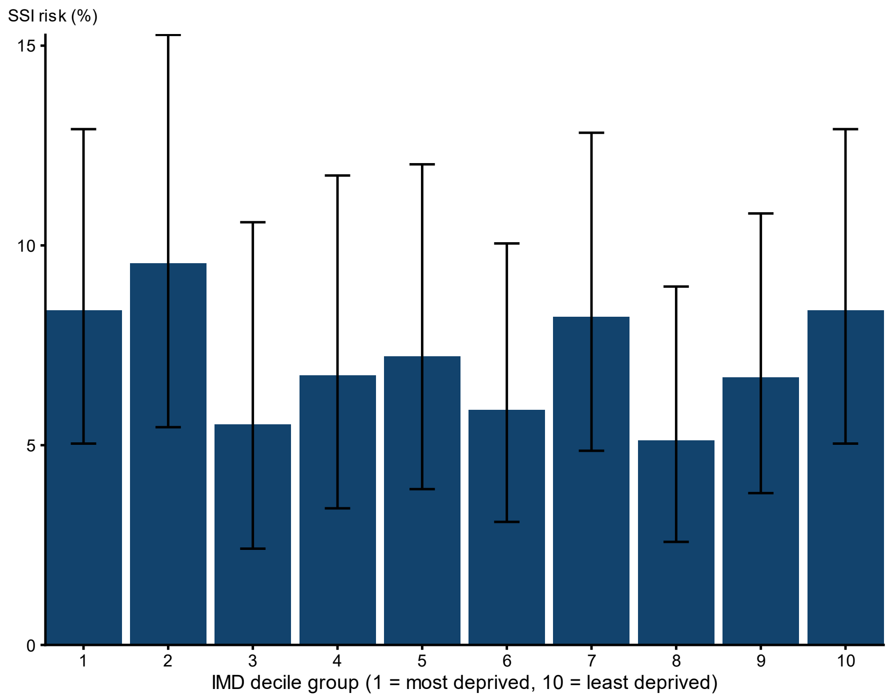
See data table 5h in accompanying data tables spreadsheet.

Figure 5i. Risk of SSI in patients undergoing spinal surgery by IMD decile, NHS hospitals England, April 2020 to March 2025



See data table 5i in accompanying data tables spreadsheet.

Figure 5j. Risk of SSI in patients undergoing small bowel surgery by IMD decile, NHS hospitals England, April 2020 to March 2025



See data table 5j in accompanying data tables spreadsheet.

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