GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

Caesarean Section Surgical Site Infection Surveillance

2021 Annual Report:

All Wales

Includes data from 01/01/2021 – 31/12/2021

Version 1

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Public Health Wales NHS Trust. Annual All Wales report on Caesarean Section Surgical Site Infection 2021, Wales.

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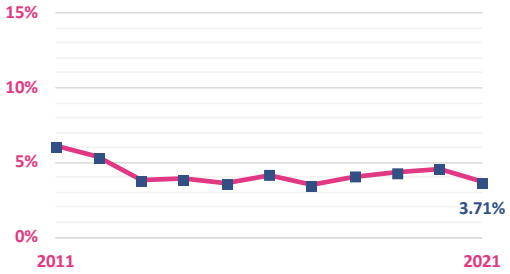
Summary

NOTE: The information in this annual report may differ from that found in the C section quarterly reports. This annual report should be used when quoting annual figures and for comparison across countries.

NOTE: This report contains data for 2019-2021, where the Covid-19 pandemic may have impacted data quality and reporting of C-section SSIs.

SSI rate



1 in 27

mothers had an SSI attributable to their C section procedure

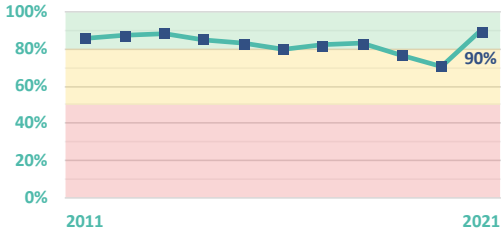
39%

reduction in SSI rate since 2011, which equates to

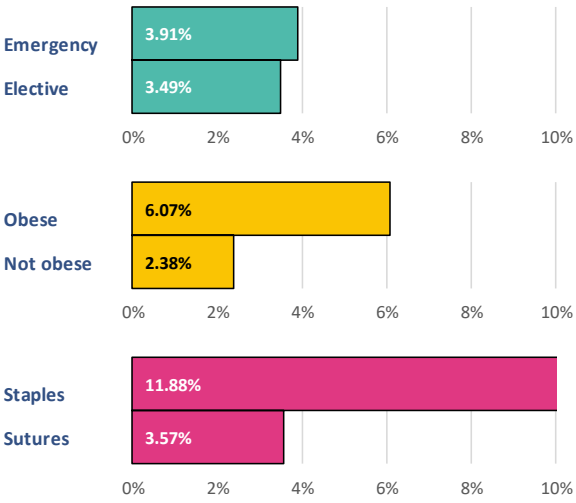
2458

infections prevented (based on 2011 rates)

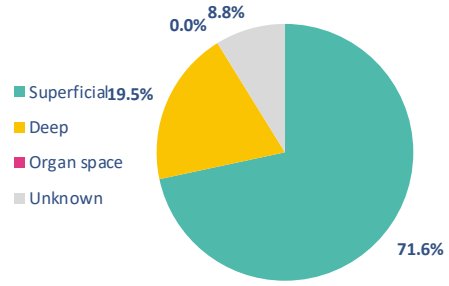
Compliance



Risk factors



Infection type



8000 procedures were performed in 2021 and forms were completed for 99% of these procedures (n=7954). Of these forms, 90% were valid forms that could be used for analysis (n=7174).

There were 266 SSIs reported in 2021, which equates to an SSI rate of 3.7%. 51 of these were complicated infections (deep or organ space), approximately 19% of all infections.

56% of procedures performed in 2021 were emergencies. The SSI rate in emergency procedures was not significantly higher than elective procedures.

Introduction

The Healthcare Associated Infections team at Public Health Wales Health Protection were instructed by the Welsh Government to develop and support the implementation of surveillance following Caesarean section procedures undertaken in NHS hospitals in Wales. This process has been mandatory since January 2006.

Surgical Site Infection (SSI) is an important area for surveillance and remains a complication of surgery where human and financial costs are high (Plowman, 2000) (Jenks, Laurent, McQuarry, & Watkins, 2014). Additionally, most infections are preventable (National Institute for Health and Care Excellence, 2019). An SSI is the second most common infection following a C section, within a group of patients who are generally young, fit and well females (Sykes, Brodribb, McLaws, & McGregor, 2005).

Serious patient consequences can result from SSIs, including pain, suffering and, on some occasions, they require additional surgical interventions (Sykes, Brodribb, McLaws, & McGregor, 2005). It is important to recognise that SSIs can range from a relatively trivial wound discharge with no other complications, to a life-threatening condition. Other clinical outcomes of SSIs include poor scars that are cosmetically unacceptable, persistent pain and itching, restriction of movement and a significant impact on emotional wellbeing.

This report includes data captured both during hospital stay and post-discharge within the community. The surveillance incorporates data collected by clinical teams and midwives and uses internationally agreed definitions (Horan, Gaynes, Martone, Jarvis, & Emori, 1992), allowing Welsh data to be compared with and incorporated into other international databases, such as the ECDC European SSI database. This report details results obtained for surveillance data capture in 2018.

Data interpretation

Surgical site infection (SSI) rates in this report are calculated as the number of infections (inpatient and post-discharge) as a proportion of valid procedures. This is reported as a rate per 100 procedures.

$$SSI\ rate\ = \frac{number\ of\ SSI}{number\ of\ valid\ procedures} \times 100\%$$

A valid procedure is one where an SSI is recorded, or one where there is confirmation of no SSI on both inpatient and post-discharge forms. "Number of procedures" refers only to valid procedures, unless otherwise specified.

In keeping with the regular reports, all SSI rates reported in this document are those that occurred up to 14 days post-procedure. Due to the different discharge policies and treatment plans in place at all health boards, we are confident in the consistency of rates up to 14 days, but we are unable to guarantee consistency between hospitals after this point.

Section 1: Data completeness

Compliance

The proportion of valid forms being returned has improved compared to 2020, with 90% of the expected number of forms being valid, this makes up 90% of all forms received. Due to less hospitals directly reporting procedure numbers for compliance purposes we have had to move back to PEDW figures as the denominator for the majority of our compliance rates.

$$Compliance\ rate = \frac{number\ of\ returned\ forms}{number\ of\ procedures\ reported\ to\ PEDW} \times 100\%$$

$$If\ Compliance\ rate > 1\ then\ Compliance\ rate = \frac{number\ of\ returned\ forms}{mean(number\ of\ procedures\ reported\ in\ previous\ 3\ years)} \times 100\%$$

Table 1 – Coverage of the C section SSI surveillance compared to the expected number of forms.

	2019	2020	2021
Expected number of forms*	7623	7497	8000
Surveillance forms returned	6732	6278	7954
Valid surveillance forms	5844	5301	7174
Forms returned	88%	84%	99%
Valid forms returned	77%	71%	90%

*Total number of procedures performed at hospital, irrespective of whether or not a form was received.

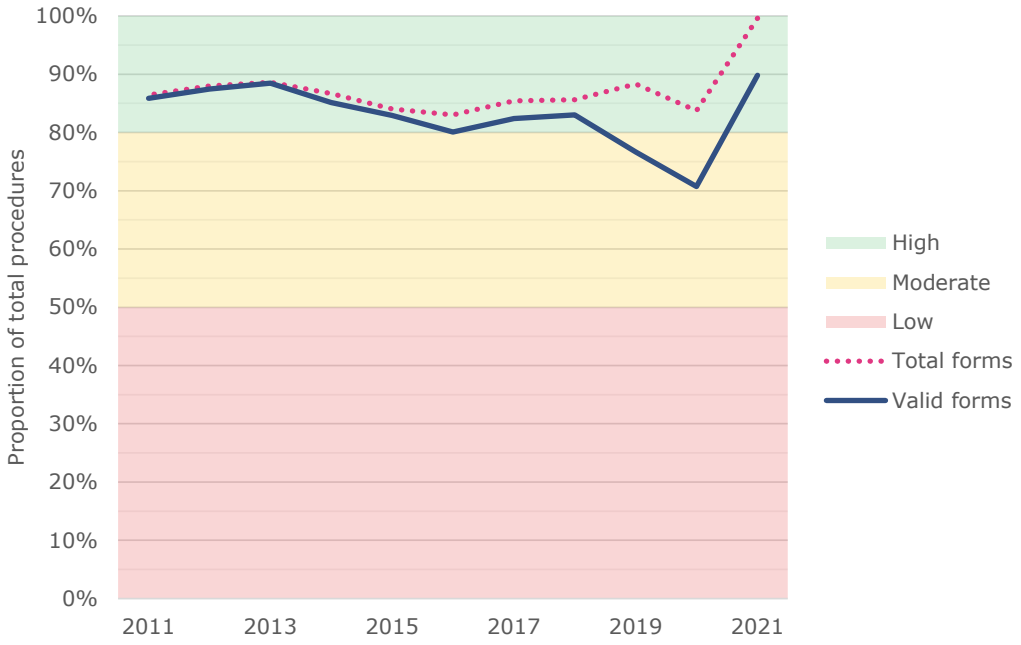


Figure 1 – Trend rate for compliance over the last 10 years, 2011-2021.

Completion rates of surveillance forms

The vast majority of inpatient forms received at Public Health Wales have a completed SSI status field (where either yes or no are selected), with 7863 of forms having a completed SSI field (of 7954 forms, 98.9%). Following on from these inpatient forms, 98.2% of post-discharge forms were received (7807/7954) with the remaining either not sent in at all, or being sent in blank. Of the post discharge forms that were sent in, 91.9% had a completed SSI field.

The additional information on post-discharge SSIs (type and date) is provided in most cases, with only a small number of forms missing this information. The additional information is provided less often in the case of inpatient SSIs, however, the numbers involved are too small to extrapolate any real meaning from them.

Table 2 – Completion rates of the SSI field (along with its associated type and infection date fields), 2021.

Data Item	Expected	Completed	Proportion
Inpatient SSI (Yes/No)	7954	7863	98.9%
If yes, SSI type	26	16	61.5%
If yes, infection date	26	24	92.3%
Post-discharge SSI* (Yes/No)	7807	7174	91.9%
If yes, SSI type	447	423	94.6%
If yes, infection date	447	431	96.4%

Section 2: SSI rate

Incidence of inpatient, post-discharge and overall SSI

The following table provides the SSI rates separated out as an inpatient and a post-discharge rate. A total of 26 inpatient SSIs were recorded, giving an inpatient SSI rate of 0.36%. The vast majority of SSIs (90.2%) occurred following hospital discharge, giving a rate of 3.35%.

The length of hospital stay is shorter now than it was at the start of the surveillance period as more of an emphasis is being placed on community midwifery care, as well as shorter hospitalisations for labour and delivery during the Covid-19 pandemic. As a result, fewer inpatient SSIs are being identified than previously, and these are instead being picked up in the community.

All SSIs are captured up to 14 days post procedure.

Table 3 – Incidence of inpatient and post-discharge SSIs, 2021.

	No. of procedures	SSI	SSI rate (95% CI)
Inpatient	7174	26	0.36% (0.22-0.50)
Post-discharge	7174	240	3.35% (2.93-3.76)
Overall	7174	266	3.71% (3.28-4.17)

Annual SSI rates

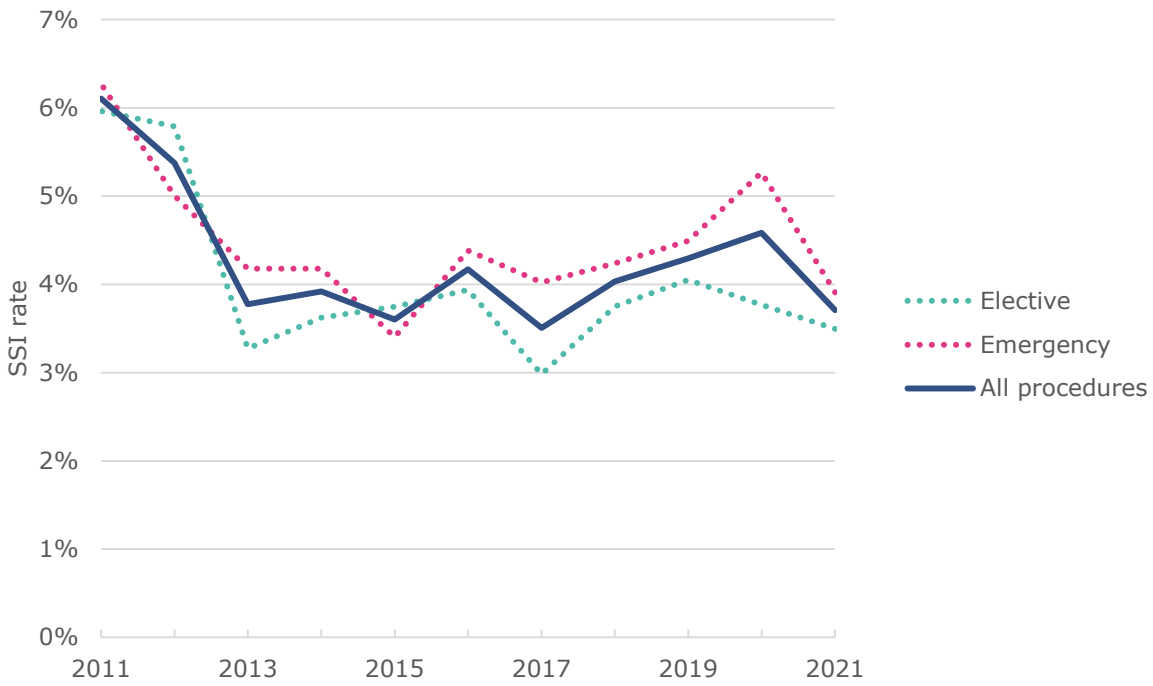


Figure 2 – Overall, elective and emergency SSI rates for 2011-2021

Table 4 – Overall, elective and emergency SSI rates for the last five years. (Unknowns excluded).

Operation type	Year	No. of procedures	SSI	SSI rate (95% CI)
All C-section procedures	2021	7174	266	3.71% (3.27-4.15)
	2020	5301	243	4.58% (4.02-5.15)
	2019	5844	251	4.30% (3.78-4.81)
	2018	7362	297	4.03% (3.58-4.48)
	2017	6700	235	3.51% (3.07-3.95)
Elective	2021	3119	109	3.49% (2.85-4.14)
	2020	2415	91	3.77% (3.01-4.53)
	2019	2641	107	4.05% (3.30-4.80)
	2018	3414	128	3.75% (3.11-4.39)
	2017	3151	94	2.98% (2.39-3.58)
Emergency	2021	4015	157	3.91% (3.31-4.51)
	2020	2867	151	5.27% (4.45-6.08)
	2019	3182	143	4.49% (3.77-5.21)
	2018	3893	165	4.24% (3.61-4.87)
	2017	3456	139	4.02% (3.37-4.68)

The SSI rate across Wales has decreased this year from 4.58% in 2020 to 3.71% in 2021, with an increase in the number of procedures reported to PHW in 2021 compared to 2020, possibly due to the impact of the Covid-19 pandemic on data quality and reporting of SSIs in 2020. The SSI rate back in 2011 was 6.10% and, when using this rate as a baseline, there has been a reduction of 39%. This represents an estimated 2,458 mothers who have been saved from an infection (Figure 2).

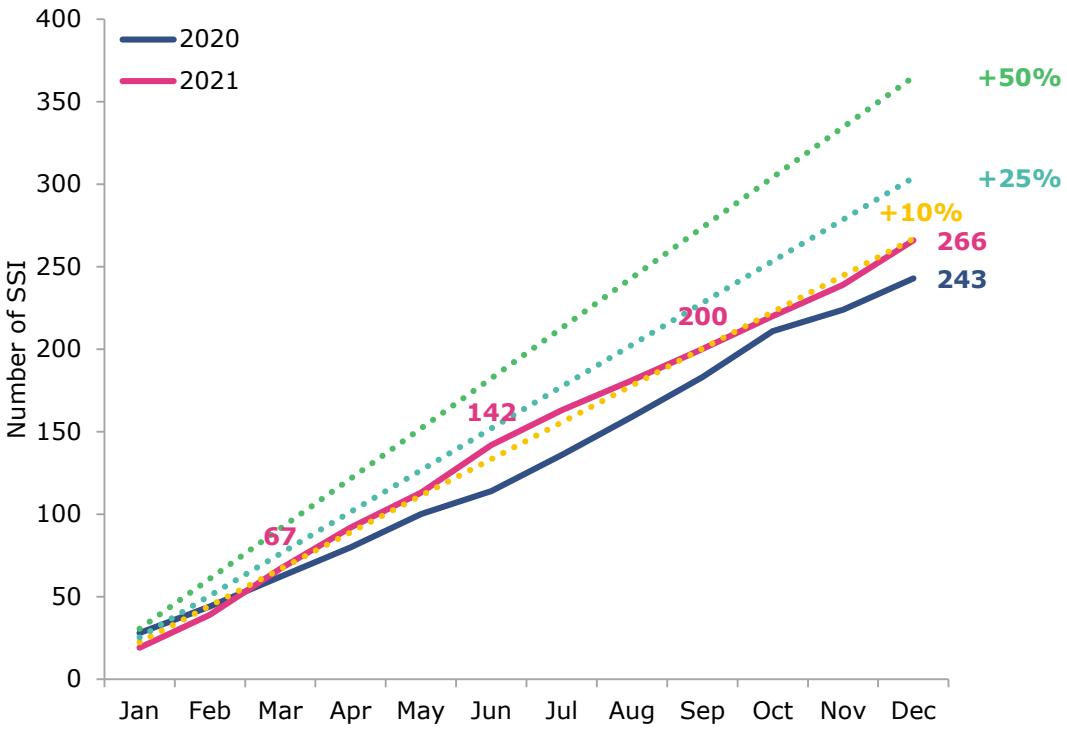


Figure 3 – Cumulative SSI number for 2021, and their relative change compared to the previous year.

Throughout Wales, there were 266 SSIs reported in 2021. When compared to the previous year's 243 SSIs, this is an increase of 9% from the 2020 SSI numbers (i.e. without factoring in the denominator) and means there were 23 more infections in 2021 than in 2020. Cumulative SSI numbers for 2020 and 2021 are found in Figure 3.

Incidence of SSI by infection type

The type of SSI recorded on the surveillance form can be categorised into either superficial, deep seated or organ space infections. These all have specific definitions and diagnostic criteria and remain standardised across Europe. The following tables show the split between different SSI types, and their corresponding rates.

Table 5 – Types of SSI in C section procedures by proportion, 2021.

SSI type	n	%
Superficial infection	187	71.6%
Deep infection	51	19.5%
Organ space infection	0	0.0%
Unknown	23	8.8%

Table 6 – SSI rates broken down by type, 2021.

SSI type	No. of procedures	SSI	SSI rate (95% CI)
Superficial infection	7174	187	2.61% (2.24-2.98)
Deep infection	7174	51	0.71% (0.52-0.91)
Organ space infection	7174	0	0.00% (0.00-0.00)
Unknown	7174	23	0.32% (0.19-0.45)

The split between different types of infection is as expected – the vast majority of infections reported are superficial (71.6%), followed by deep infections (19.5%), and no organ space infections (0.00%).

Section 3: Demographics

This section provides information about the mother which is not affected by the current procedure itself and is known beforehand; namely age, BMI and the number of prior C section procedures.

Incidence of SSI by age

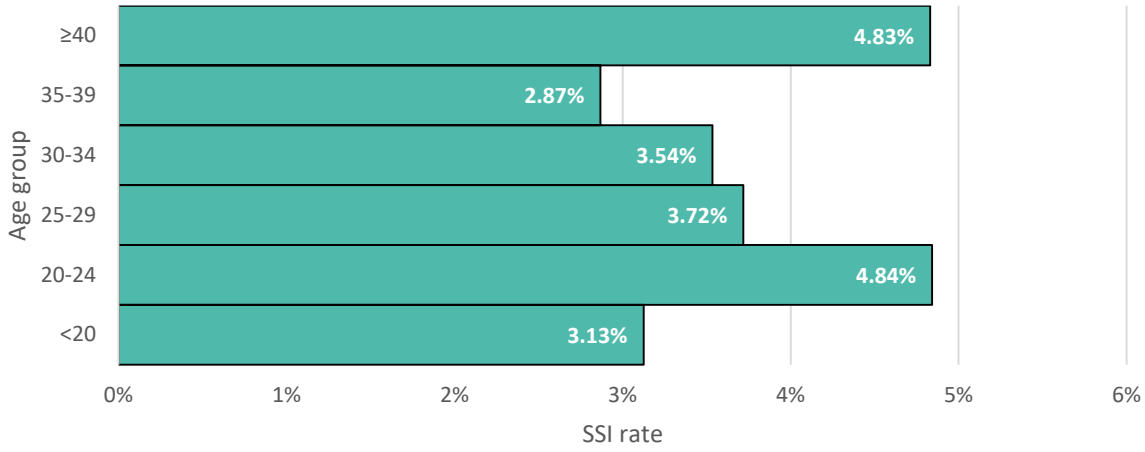


Figure 4 – Graph showing the incidence of SSI by age group, 2021.

Table 7 – Incidence of SSI by age group, 2021.

Age group	No. of procedures	SSI	SSI rate (95% CI)
<20	96	3	3.13% (0.65-8.86)
20-24	764	37	4.84% (3.43-6.61)
25-29	1882	70	3.72% (2.91-4.68)
30-34	2376	84	3.54% (2.83-4.36)
35-39	1499	43	2.87% (2.08-3.84)
≥40	414	20	4.83% (2.98-7.36)
Unknown	143	9	6.29% (2.92-11.61)

In 2021, there was a higher SSI rate in women between the ages of 20-24 (4.84%), and also in the >40 age group (4.83%). The mean age for all procedures was 31.1 but this reduced to 30.5 when only those with an SSI were included. However, age was not a significant factor in the probability of having an SSI (P=0.134).

Incidence of SSI by BMI

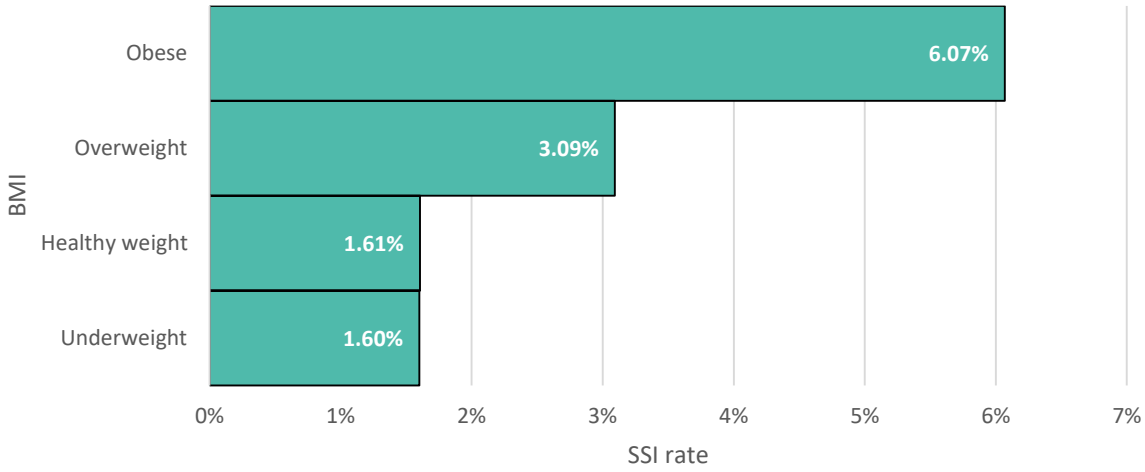


Figure 5 – Graph showing the incidence of SSI by BMI category, 2021.

Table 8 – Incidence of SSI by BMI category, 2021.

BMI		No. of procedures	SSI	SSI rate (95% CI)
Underweight	<18.5	125	2	1.60% (0.19-5.66)
Healthy weight	18.5-24.9	2117	34	1.61% (1.11-2.24)
Overweight	25.0-29.9	2134	66	3.09% (2.40-3.92)
Obese	≥30.0	2587	157	6.07% (5.18-7.06)
Unknown		211	7	3.32% (1.34-6.72)

In 2021, there was a very clear association between BMI and the probability of having an SSI. The mean BMI for all procedures was 28.8 (median 27.3), this went up to 32.9 (median 32) when only those with an SSI were included. When comparing BMI groups, the SSI rate in overweight mothers (including obese mothers) was significantly higher ($P<0.001$), and this was also true when comparing obese mothers to all other BMI groups ($P<0.001$). While the SSI rate in underweight mothers was substantially lower, this group was very small compared to the other groups, so this was not significant ($P=0.206$).

Incidence of SSI by number of previous C sections

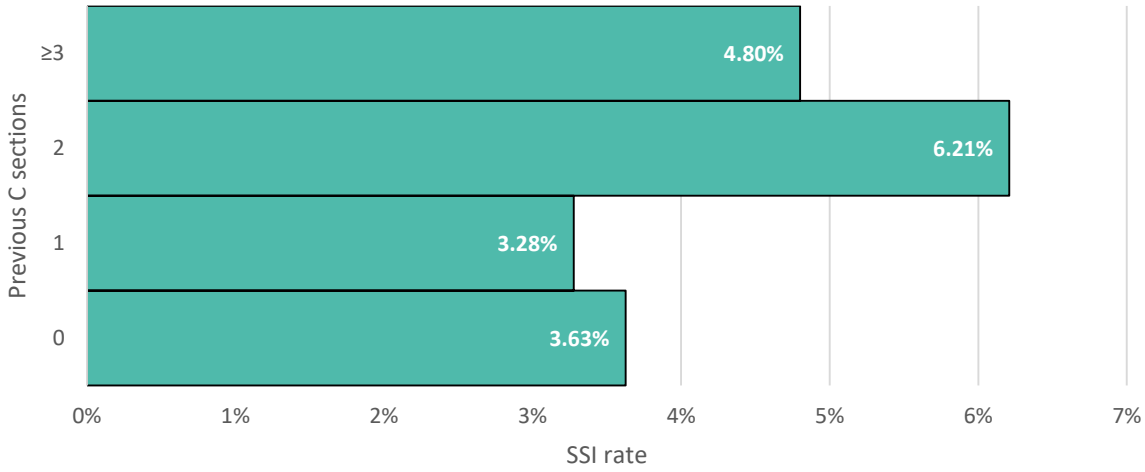


Figure 6 – Graph showing incidence of SSI by the number of previous C sections, 2021.

Table 9 – Incidence of SSI by the number of previous C sections, 2021.

Previous C sections	No. of procedures	SSI	SSI rate (95% CI)
0	4744	172	3.63% (3.11-4.20)
1	1801	59	3.28% (2.50-4.21)
2	451	28	6.21% (4.16-8.85)
≥3	125	6	4.80% (1.78-10.15)
Unknown	51	1	1.96% (0.05-10.45)

When comparing the number of C sections a mother has undergone prior to the current procedure, there are no apparent trends. There is a peak in SSI rate among mother's who had undergone 2 previous C-Section (6.21%), which differs to findings from the previous year, where a higher rate was seen in mothers who had undergone 1 previous C section (5.26% in 2020).

Section 4: Details of the surgical procedure

The following section provides information on the variables relating to the procedure itself (including procedure type, prophylaxis and skin closure).

SSI risk score

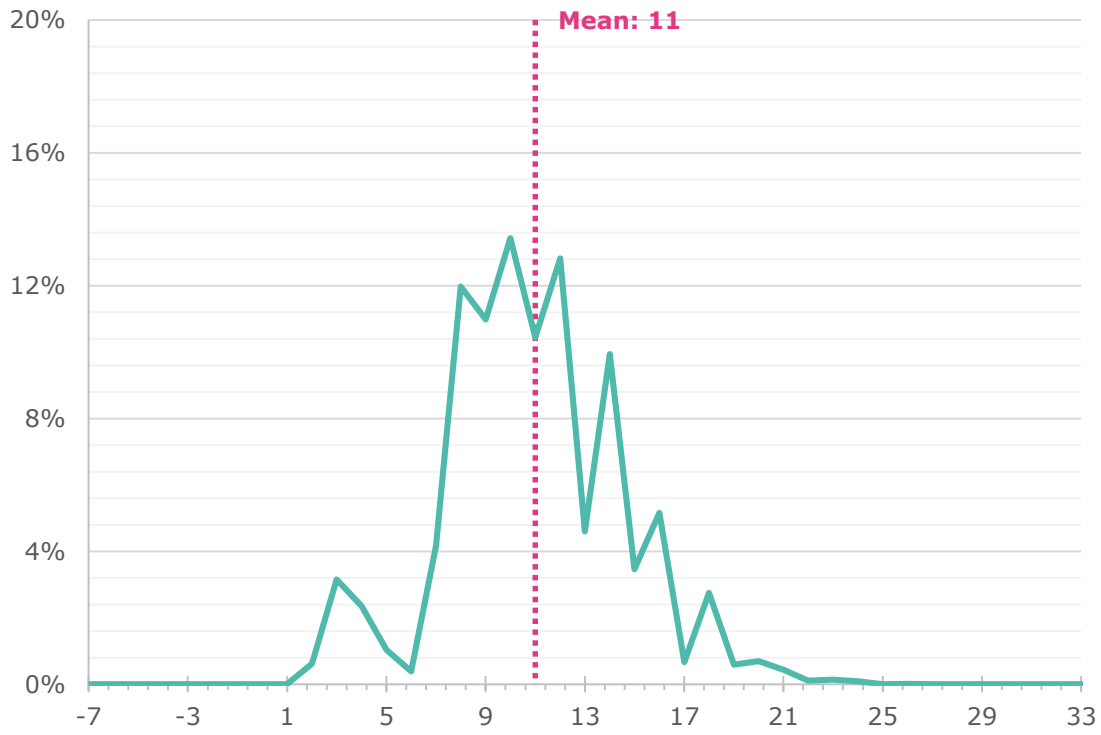


Figure 7 – Graph showing spread of risk score across all procedures (as percentage of all procedures reported). The score has a theoretical range of -7 to 33 for C section procedures in Wales.

The SSI risk score (van Walraven & Musselman, 2013) is based on a number of different factors; including procedure type, wound type, ASA class, BMI and procedure duration[1]. This yields a score that categorises mothers by their risk of developing an SSI (with higher scores equating to higher risk).

In 2021, the mean risk score for all mothers undergoing C section was 11.0 (median of 11). When counting only those who have developed an SSI, the mean risk score increases to 12.4 (median of 12), which means that mothers who developed an SSI had a significantly higher aggregate risk score than those who did not (P<0.001).

While we can see that presence of a combination of risk factors evidently increases risk for the development of an SSI, no individual risk factor is associated with an increased risk of SSI.

[1] There are additional metrics used in the calculation of this score which we are unable to use since they are not reported as part of our surveillance. These are the number of concurrent procedures, type of anaesthetic, smoking status, presence of metastatic cancer or peripheral vascular disease, and use of steroids.

Incidence of SSI by procedure type

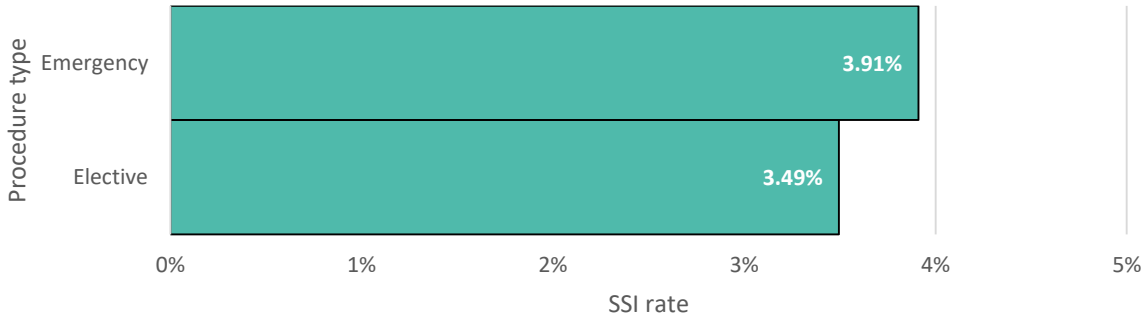


Figure 8 – Graph showing incidence of SSI by type of procedure, 2021.

Table 10 – Incidence of SSI by procedure type, 2021.

Age group	No. of procedures	SSI	SSI rate (95% CI)
Elective	3119	109	3.49% (2.88-4.20)
Emergency	4015	157	3.91% (3.33-4.56)
Unknown	40	0	0.00% (0.00-8.81)

In 2021, the SSI rate in emergency procedures was not significantly higher than in elective procedures (12% increase, P=0.35811). The split of procedures is also fairly even, with 56.3% of procedures being classed as emergencies (CS1, CS2 and CS3) and the remaining 43.7% being classed as elective (CS4).[2]

[2] CS1 – Immediate threat to life of woman or foetus, e.g. cord prolapse, significant placental abruption or maternal cardiorespiratory distress.
CS2 – Late foetal heart rate decelerations, CS pre-booked to avoid vaginal delivery but woman presents in advanced labour.
CS3 – Deteriorating but compensated maternal medical condition.
CS4 – Operation at short notice but no clinical urgency, Elective.

Incidence of SSI by antibiotic prophylaxis

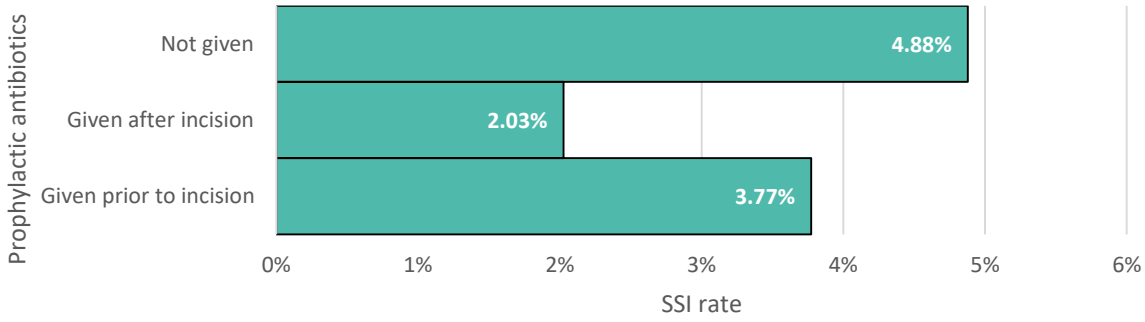


Figure 9 – Graph showing incidence of SSI by timing of prophylactic antibiotics, 2021.

Table 11 – Incidence of SSI by timing of prophylactic antibiotics, 2021.

Prophylactic antibiotics	No. of procedures	SSI	SSI rate (95% CI)
Given prior to incision	6810	257	3.77% (3.33-4.25)
Given after incision	148	3	2.03% (0.42-5.81)
Not given	41	2	4.88% (0.60-16.53)
Unknown	175	4	2.29% (0.63-5.75)

99.4% of mothers were given prophylactic antibiotics and, of these, 97.9% were given prior to surgical incision. In contrast to previous years, there is a higher SSI rate when antibiotics are administered prior incision, but this was not significant (86% increase, P=0.26771). It should be noted that the overall number of procedures where antibiotics were given prior to incision has increased, in line with guidance recommendations. Although there was a higher SSI rate where antibiotics were given prior to incision, the SSI rate has decreased from 4.40% in 2020 to 3.77% in 2021. The SSI rate was highest where prophylactic antibiotics were not given (4.88%), however it should be noted that this makes up a small number of procedures.

We continue to recommend that antibiotics are administered prior to incision where possible, in accordance with NICE guidelines (National Institute for Health and Care Excellence, 2019). It is also worth taking into consideration that the serum half-life of Cefuroxime is 80 minutes, and NICE recommend that a repeat dose is administered when the length of the procedure exceeds this time. (In the case of mothers on second line antibiotics, both Clindamycin and Gentamicin have a serum half-life of two hours).

1st line	If allergic to penicillin
Cefuroxime 1.5g IV	**Clindamycin 600mg IV/PO**
+	**+**
Metronidazole 500mg IV	**Gentamicin 1.5mg/kg IV**

Incidence of SSI by skin closure type

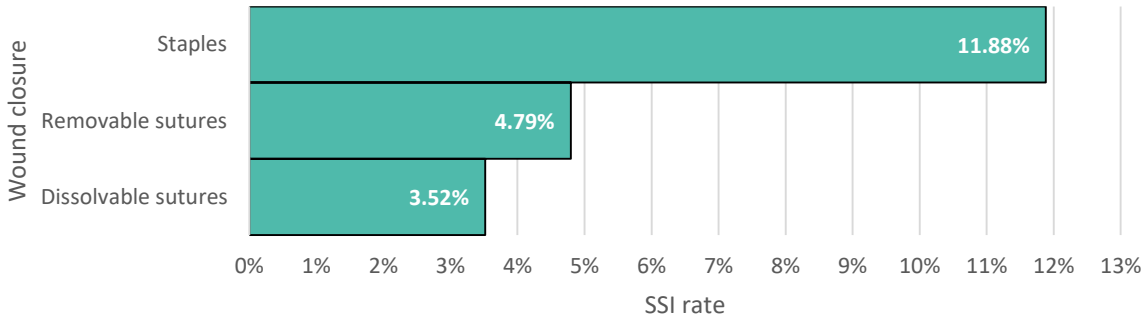


Figure 10 – Graph showing incidence of SSI by type of skin closure used, 2021.

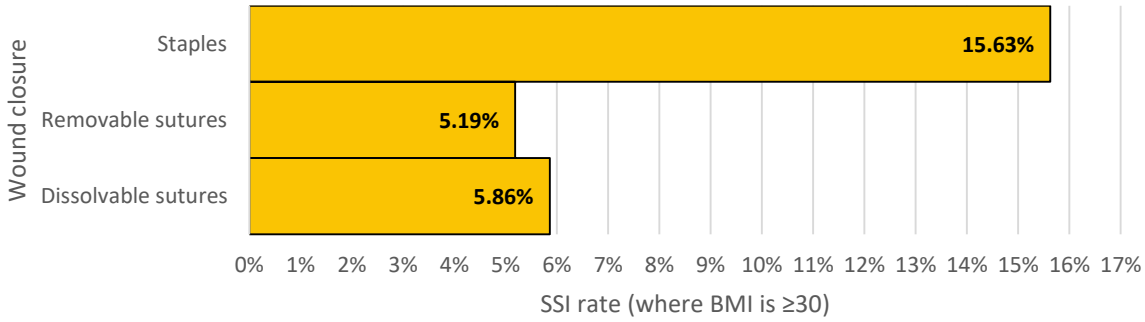


Figure 11 – Graph showing the incidence of SSI by skin closure in mothers with BMI≥30, 2021.

Table 12 – Incidence of SSI by type of skin closure, 2021.

Type of wound closure	No. of procedures	SSI	SSI rate (95% CI)
Sutures (all types)	7002	250	3.57% (3.14-4.01)
Dissolvable sutures	6710	236	3.52% (3.09-3.99)
Removable sutures	292	14	4.79% (2.65-7.91)
Staples	101	12	11.88% (6.29-19.83)
Unknown	71	4	5.63% (1.56-13.80)

Table 13 – Incidence of SSI by type of skin closure in mothers with BMI≥30, 2021.

Type of wound closure	No. of procedures	SSI	SSI rate (95% CI)
Sutures (all types)	2507	146	5.82% (4.91-6.74)
Dissolvable sutures	2372	139	5.86% (4.95-6.88)
Removable sutures	135	7	5.19% (2.11-10.39)
Staples	64	10	15.63% (7.76-26.86)
Unknown	16	1	6.25% (0.16-30.23)

In 2021, the SSI rate when staples were used as a method of skin closure was 233% higher than when sutures were used (P=0.00). This trend is less pronounced when the mother is obese (BMI≥30), with the SSI rate being 168% higher when staples are used. Although this is less pronounced the SSI rate is still significantly higher when staples are used instead of sutures in Mother's whose BMI≥30 (P=0.00117). The overall SSI rate for the use of staples was 11.88% in 2021, whereas the SSI rate for removable sutures was 4.79%.

While it may be argued that staples provide an opportunity for the wound to be inspected as they are being removed, this does not sufficiently explain the relationship with SSI rate as we would expect to see the same pattern with the removable sutures.

Section 5: Post-procedure details and onset of infection

This section deals with the time period after the procedure has occurred and the time to onset of infection.

Length of stay in hospital

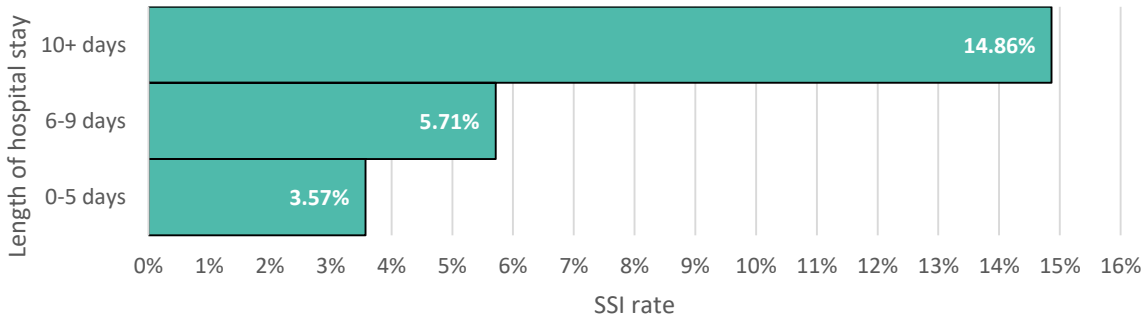


Figure 12 – Graph showing incidence of SSI by length of hospital stay, 2021.

Table 14 – Incidence of SSI by length of hospital stay, 2021.

Length of hospital stay	No. of procedures	SSI	SSI rate (95% CI)
0-5 days	4984	178	3.57% (3.07-4.12)
6-9 days	420	24	5.71% (3.70-8.38)
10+ days	74	11	14.86% (7.66-25.04)
Unknown	1696	53	3.13% (2.35-4.07)

For all patients undergoing a C section, the mean hospital stay following the procedure is 2.3 days (median of 2). When only mothers who have had an SSI are included, this increases to a mean of 2.9 days (median 2). This would suggest that those who have been discharged from the hospital later are more likely to develop an SSI, not because of the length of stay itself, but due to the same factors that resulted in the extended stay. In contrast to the previous year, the length of hospital stay resulted in a significantly higher SSI rate in 2021 (P=0.002), with the highest SSI rate seen where length of hospital stay was 10+ days (14.86%).

Length of midwifery care

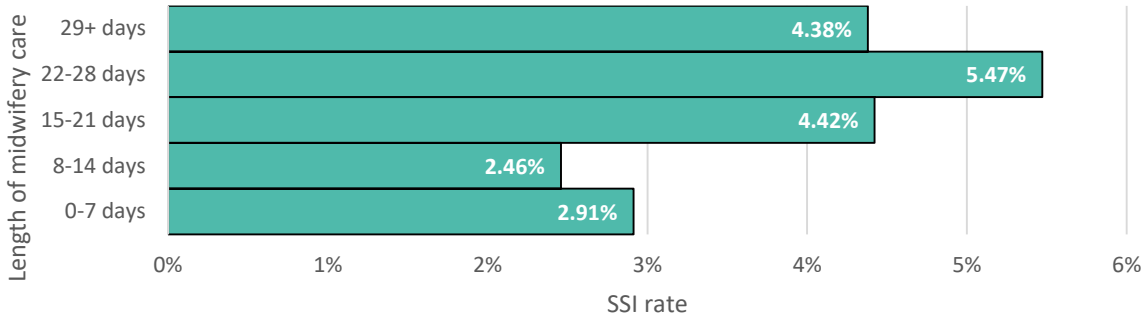


Figure 13 – Graph showing incidence of SSI by length of midwifery care post-procedure, 2021.

Table 15 – Incidence of SSI by length of midwifery care post-procedure, 2021.

Length of midwifery care	No. of procedures	SSI	SSI rate (95% CI)
0-7 days	103	3	2.91% (0.60-8.28)
8-14 days	1627	40	2.46% (1.76-3.33)
15-21 days	1357	60	4.42% (3.39-5.65)
22-28 days	859	47	5.47% (4.05-7.21)
29+ days	822	36	4.38% (3.09-6.01)
Unknown	2406	80	3.33% (2.65-4.12)

NOTE: All SSIs in this report occurred in the first 14 days post-procedure. Even in mothers who spent 29 or more days in care, the SSI rate does not include any SSIs occurring day 15 or later.

Following the procedure, women spend a mean length of 19.2 days under the care of a midwife (median of 17), including both the time spent in the hospital and the time spent at home with regular visits from a community midwife. If there has been an SSI, this rises to a mean of 21.5 days (median of 20), indicating that SSIs are causing women to be under midwifery care for significantly longer than they would be otherwise (P=0.000). In 2021, the SSI rate was higher where length of midwifery care was 22-28 days (5.47%).

Time to onset of infection

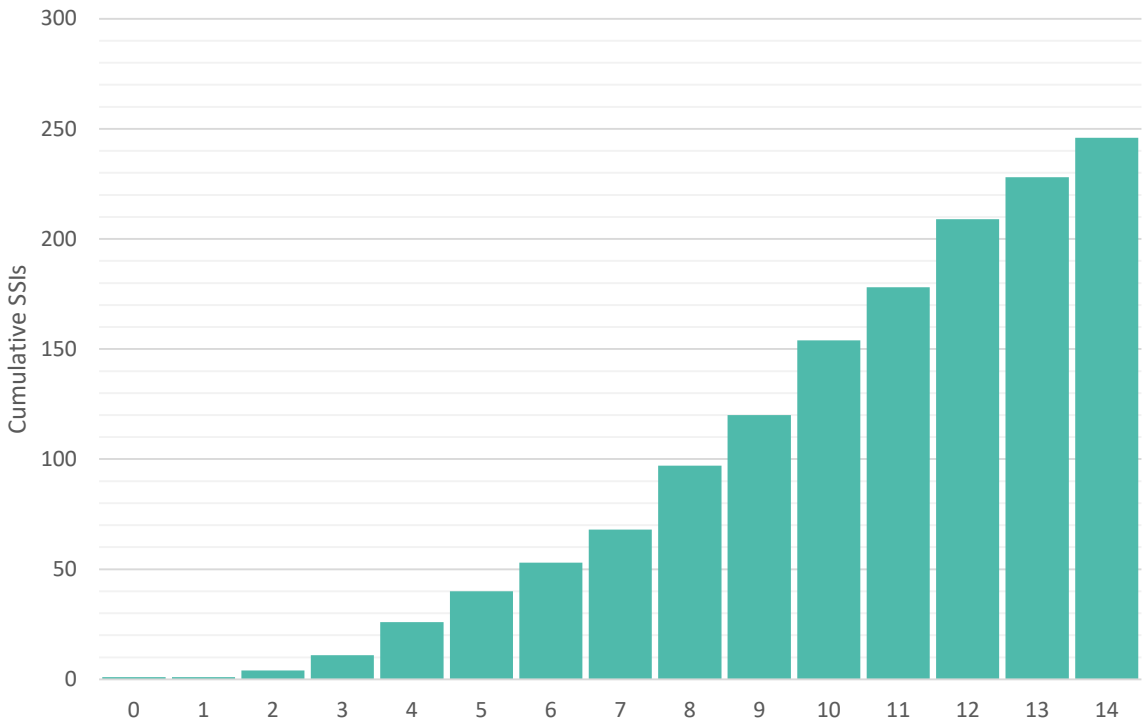


Figure 14 – Graph showing cumulative SSIs up to 14 days post-procedure. Blank infection dates excluded, 2021.

While SSIs can be reported on our forms up to 30 days post-procedure, we are only including those up to 14 days for consistency across Wales. Despite this, we do request that hospitals continue reporting up to 30 days as normal, as infections occurring on days 15-30 are still counted and reported to the European Centre for Disease Prevention and Control (ECDC).

Any SSIs reported without an infection date are counted as occurring on day 0 and are included in the SSI rates. There were 20 (8%) infections where the date of onset was not recorded. Within the first 14 days, the mean time to infection was 9.2 days, with a median of 10. The greatest number of infections were reported on day 10 (n=34).

Anonymised Hospital SSI rates

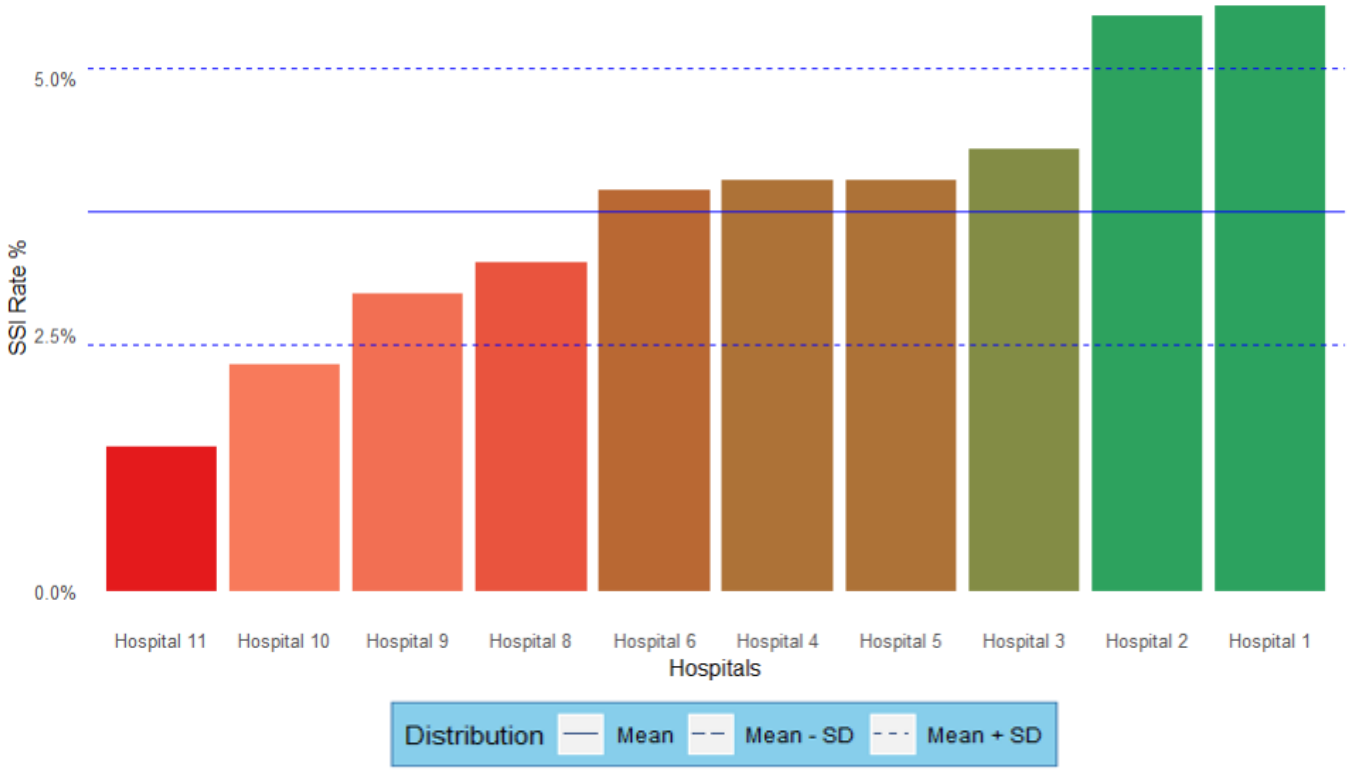


Figure 15 - Anonymised SSI rates for each Hospital participating in the C section surveillance scheme as of 2021, from the lowest to highest rate.

Figure 15 shows anonymised SSI rates for each hospital reporting C section procedures in 2021. The solid blue line represents the mean (3.7%) and the dashed blue lines represent the + and – standard deviation (1.3%). At the highest end the rate is 5.7%, compared to 1.4% at the lowest end. A total of 6 hospitals had an SSI rate above the mean.

Discussion

Compliance with the C section SSI surveillance has improved in 2021 with almost 100% of expected forms being returned (84% in 2020) with an increase in the proportion of valid forms at 90% (71% in 2020). Due to less hospitals directly reporting procedure numbers for compliance purposes we have had to move back to PEDW figures as the denominator for the majority of our compliance rates. There may be an overestimation of compliance due to inaccuracy of the PEDW dataset (i.e. more forms were being submitted than the number of procedures alleged to have occurred). The Covid-19 pandemic also had an impact on data compliance in 2020. An improvement in the number of forms returned and the number of valid forms received is seen in 2021 in comparison.

The overall SSI rate for 2021 was 3.71%, which is a decrease from 4.58% in 2020. The overall reduction over time has decreased to 39% (43% in 2020) and increased in real numbers, representing 2458 infections being prevented for mothers (2353 in 2020). Both elective and emergency procedures have seen a decrease in SSI rates compared to 2020, from 5.27% to 3.91% for emergency procedures and 3.77% to 3.49% for elective procedures.

Across all patient demographics, BMI continues to have the largest impact on SSI rates. Across the years, a general trend has been observed in which higher BMIs are associated with an increased risk of SSI. In 2021, the mean BMI for all procedures was 28.8, when including only procedures that had an SSI associated with them, this increased to 32.9. Obese mothers have an SSI rate of 6.07% while healthy weight mothers have an SSI rate of 1.61%. Younger mothers <20 had an SSI rate of 3.13%, and those between 20 and 24 had an SSI rate of 4.84%. The SSI rate then decreases in each age bracket until we reach the above 40 bracket where the SSI rate is 4.83%. This compares to 3.72%, 3.54% and 2.87% for 25-29, 30-34 and 35-39 respectively. It should be noted that the <20 and >40 age groups are the smallest. No significant relationship was identified between age group and SSI risk.

Since 2015, Public Health Wales has been monitoring the use of staples in post procedure closure. While usage has been decreasing, there is still localised pockets of use. Our data indicated a strong risk of SSI associated with the usage of staples instead of sutures. This increased risk is even more apparent when stratified by BMI. Obese mothers see an SSI rate of 15.63% when staples are used, compared to 5.82% for all types of sutures. While we do acknowledge sutures are a more time consuming process, ***we recommend that staples are not used as a routine method of closure.***

99.4% of mothers in Wales were given antibiotic prophylaxis for their procedure, with 97.9% having it administered prior to incision. In comparison to previous years, the SSI rate was higher where antibiotics were administered prior incision, but this was not significant (P=0.26771). The overall number of procedures where antibiotics were given prior to incision has increased, in line with guidance recommendations. As mentioned in last year's report, hospitals are adopting the recommending antibiotics and those hospitals that differed in dosage of the recommended antibiotics have adopted the recommendation in full. Continuing with the adoption of these recommendations in line with NICE and AWMSG is encouraged.

Inpatient SSIs are still relatively uncommon, decreasing from 12.34% of all infections in 2020 (n =30) to 9.8% in 2021 (n =26). The number of deep infections have increased compared to previous years, with deep SSIs making up 19.5% of all infections (n =51), organ space SSIs remain rare, with 0 organ space infections reported in 2021.

A strong association was seen between time spent in hospital and the occurrence of an SSI in 2021 (P=0.002). The mean hospital stay following the procedure was 2.3 days and increased to 2.9 days when only mothers who have had an SSI were included. There is a higher SSI rate where length of hospital stay was 10+ days (14.86%). The mean time that mothers spent under the care of a midwife was 19.2 days. This mean increased to 21.5 days in the event of an SSI occurrence. A strong association was seen between added time spent under the care of a midwife and the occurrence of an SSI (P=0.000). As always, infection data is captured up to and including 14 days post-operatively. The mean time to infection was 9.2 days, with the most infections reported on day 10 (n =34).

In conclusion, there was a decrease in SSI rate in 2021 compared to 2020, (3.71% from 4.8%), this is a 39% reduction in infection numbers from 2011. In order to maintain these SSI rates, health boards in Wales have continued their excellent work in local infection prevention and the introduction of novel interventional methods. Despite still seeing a regular occurrence of SSIs (1 in 27) in mothers post-surgery, these rates are far below those in 2007/2008. Public Health Wales will continue to work together with all hospitals in Wales to strive to continue the progress we have made and reduce infections further.

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