



Caesarean-Section Surgical Site Infection Surveillance

Annual report Appendix D

Cardiff and Vale University Health Board

Includes data from 01/01/2016 – 31/12/2016

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Section 1: Results

Surveillance form returns

Table 1.1 Number of inpatient, post-discharge and valid forms returned for the surveillance in 2016 for Cardiff and Vale UHB.

No. of inpatient forms returned	No. of expected post-discharge forms	No. of post-discharge forms returned (% forms returned)	No. of valid forms used for data analysis*	% of valid forms used for data analysis*
1106	1106	1075 (97.2)	1071	96.8 (1071-1106)

*Valid forms are forms where the SSI field is completed on the main (inpatient) form, or the infection data is subsequently updated at completion of a post-discharge form. A blank SSI field cannot be assumed to mean there is no infection, so these forms are considered invalid.

$$\% \text{ of valid forms} = \frac{\text{Number of valid forms analysed}}{\text{Number of inpatient forms received}} \times 100$$

Completion rates of surveillance forms

Details on the completion of the SSI field on the inpatient and post-discharge form for all Wales is shown in table 1.2.

The procedure date has not been included as a data item in table 1.2 and 1.3 since all data extractions are based on a record having a procedure date.

Table 1.2 % completion of the SSI field on the C-section surveillance form (inpatient and post-discharge) for Cardiff and Vale UHB.

Data Item	No. completed	No. expected	% complete
Inpatient SSI (Yes/No)	1074	1106	97.1
If Yes, SSI type	5	5	100.0
If Yes, Infection date	5	5	100.0
Post-discharge SSI* (Yes/No)	1071	1074	99.7
If Yes, Infection date	49	50	98.0
If Yes, SSI type	50	50	100.0

*Number expected is based on the number of post-discharge forms received.

Surveillance compliance

Table 1.3 shows the compliance of Wales in the mandatory C-section surveillance for 2016. The table includes the number of surveillance forms returned to Public Health Wales for 2016 and the number of valid surveillance forms returned (as detailed in table 1.1). The compliance figure is derived from the number of valid surveillance forms returned to Public Health Wales divided by the number of C-sections performed at the hospital.

Table 1.3 Coverage of the C-section SSI surveillance compared to procedures reported to PHW in 2016 for Cardiff and Vale UHB.

No. of surveillance forms returned to PHW	No. of valid surveillance forms returned to PHW*	No. of C sections reported to PHW	% compliance
1106	1083	1303	83.1

Figure 1.1 displays the compliance trend for 2008-2016. There was a period of over-compliance during 2012, indicating the possibility of coding issues. The denominator for compliance is now provided by the hospital, rather than clinical coding data in PEDW. As a result the data for 2016 reflects a truer value for compliance.

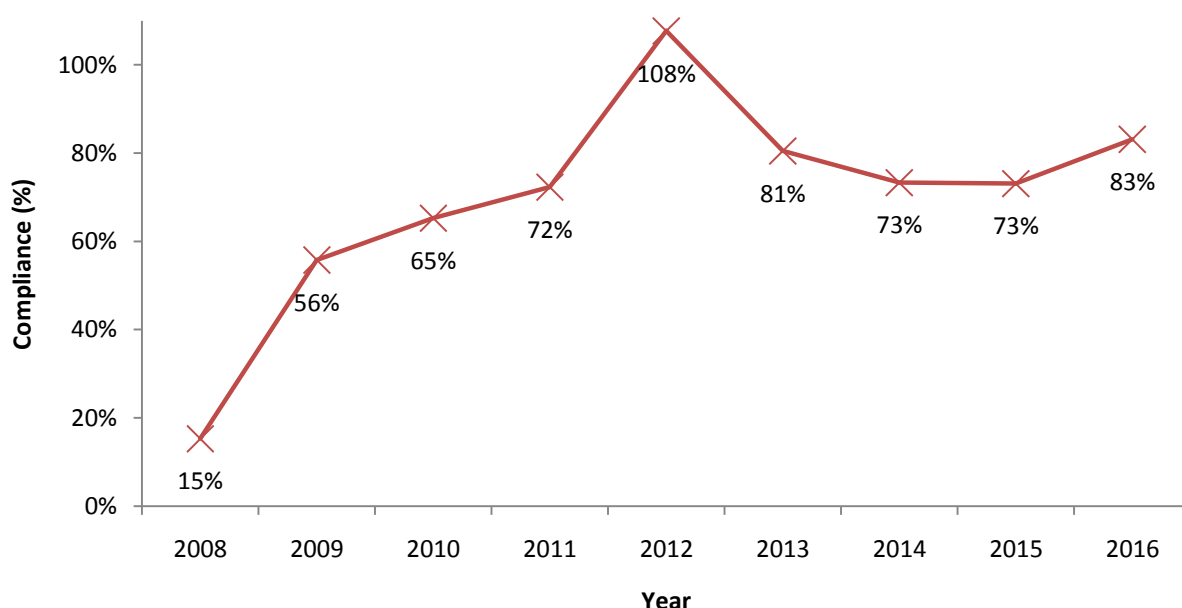


Figure 1.1 Trend rate for compliance from 2008 to 2016 for Cardiff and Vale UHB.

Summary:

96.8% of data received could be used for analysis.

Compliance has increased since 2015, and is currently 83%.

Section 2: SSI rate

SSI rate calculation

Surgical site infection (SSI) rates in this report are calculated as the number of infections (inpatient and post-discharge) divided by the number of valid procedures, and reported as an infection rate per 100 procedures. Since the length of hospital stay after a C-section is generally between two and four days, the majority of SSIs will be captured post-discharge in the community.

Incidence of inpatient, post-discharge and overall SSI

Table 2.1 provides the inpatient and post-discharge SSI rates post C-section surgery. All rates are based on valid forms only.

Table 2.1 Incidence of inpatient and post-discharge SSIs in 2016 for Cardiff and Vale UHB.

	No. of procedures analysed	No. of SSI*	SSI rate (%)* (95% CI)
Inpatient	1066	5	0.47 (0.06-0.88)
Post-discharge	1066	50	4.69 (3.42-5.96)
Overall**	1066	55	5.16 (3.83-6.49)

*Figures based on valid surveillance forms only. This only includes procedures with either an SSI field completed on the inpatient form or where the infection data is updated post-discharge.

**Overall SSI rate is based on the valid forms rule as described in this document, and is not simply based on addition of the inpatient SSIs to the post-discharge SSIs.

Incidence of SSIs over time

It is important to note that initially not all health boards were participating in the surveillance, and some health boards were participating but with low compliance rates. Data became more reliable from 2010 onwards when all health boards were participating. Table 2.2 provides the overall SSI rate for 2010 – 2016 and broken down by elective and emergency procedures. Figure 2.1 provides the SSI trend over the same time period.

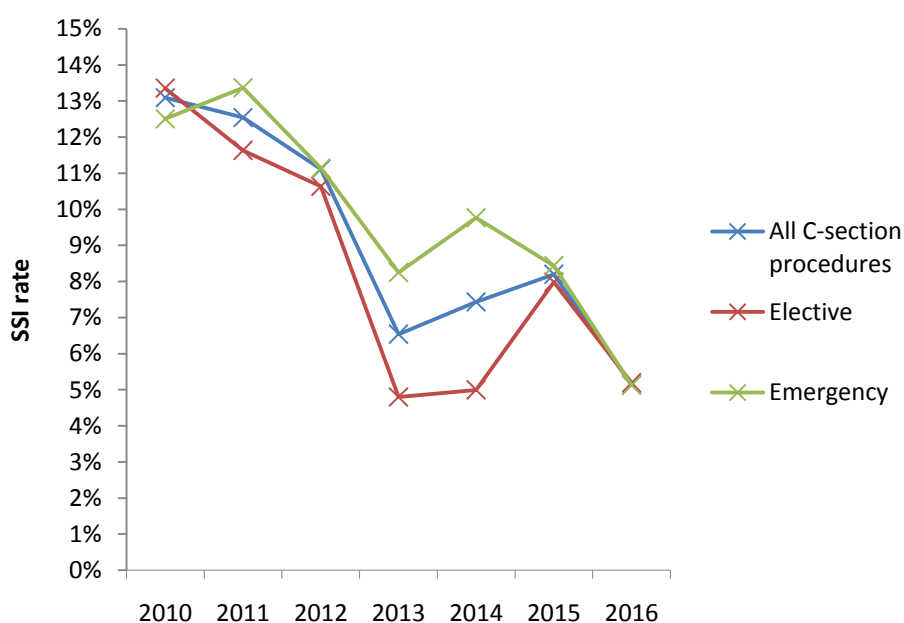


Figure 2.1 Overall, elective and emergency procedures SSI rates for 2010-2016 for Cardiff and Vale UHB.

Table 2.2 Overall SSI rate for 2010-2016 for Cardiff and Vale UHB.

Operation Type	Year	No. Procedures	No. SSI	%SSI (95% CI)
All C-section procedures	2016	1071	55	5.14 (3.81-6.46)
	2015	915	75	8.20 (6.42-9.97)
	2014	848	63	7.43 (5.66-9.19)
	2013	994	65	6.54 (5.00-8.08)
	2012	1044	116	11.11 (9.20-13.02)
	2011	933	117	12.54 (10.42-14.67)
	2010	917	120	13.09 (10.90-15.27)
Elective	2016	539	28	5.19 (3.32-7.07)
	2015	501	40	7.98 (5.61-10.36)
	2014	420	21	5.00 (2.92-7.08)
	2013	479	23	4.80 (2.89-6.72)
	2012	489	52	10.63 (7.90-13.37)
	2011	430	50	11.63 (8.60-14.66)
	2010	397	53	13.35 (10.00-16.70)
Emergency	2016	507	26	5.13 (3.21-7.05)
	2015	403	34	8.44 (5.72-11.15)
	2014	420	41	9.76 (6.92-12.6)
	2013	497	41	8.25 (5.83-10.67)
	2012	539	60	11.13 (8.48-13.79)
	2011	494	66	13.36 (10.36-16.36)
	2010	504	63	12.50 (9.61-15.39)

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, which all have specific definitions. Table 2.3 breaks down the infections by type of SSI. Tables 2.4 and 2.5 show the overall infection rate and the post-discharge infection rate broken down by SSI type.

Table 2.3 Types of SSI for C-section procedures carried out in 2016 for Cardiff and Vale UHB.

SSI type	%
Superficial infections	96.36
Deep seated infections	1.82
Organ/space infections	0.00
Unknown	1.82

Table 2.4 Overall SSI rate (%) broken down by SSI type in 2016 for Cardiff and Vale UHB.

SSI type	No. SSI	% SSI (95% CI)
Superficial infections	53	4.97 (3.67-6.28)
Deep seated infections	1	0.09 (0.00-0.28)
Organ/Space infections	0	0.00 (0.00-0.00)
Unknown	1	0.09 (0.00-0.28)

Table 2.5 Post-discharge SSI rate (%) broken down by SSI type in 2016 for Cardiff and Vale UHB.

SSI type	No. SSI	% SSI (95% CI)
Superficial infections	48	4.50 (3.26-5.75)
Deep seated infections	1	0.09 (0.00-0.28)
Organ/Space infections	0	0.00 (0.00-0.00)
Unknown	1	0.09 (0.00-0.28)

Summary:

The SSI rate following C-section procedures in 2016 was 5.14% compared to 8.2% and 7.43% in 2015 and 2014, respectively.

Most common infection type is superficial (96.3% of infections).

Overall SSI rate, broken down by SSI type: 4.97% superficial, 0.09% deep seated, and 0.00% organ/space infections.

The overall SSI rate, the elective SSI rate and the emergency SSI rate have all decreased from 2015. The decrease is not statistically significant.

Section 3: General demographics

This section gives information about the age groups and BMI of patients and the number of SSIs associated with each category.

Figure 3.1 provides a pyramid plot showing the age and SSI rates and table 3.1 provides the number of SSI by the specified age groups. Table 3.2 displays the number of SSIs by BMI category.

Incidence of SSI by age

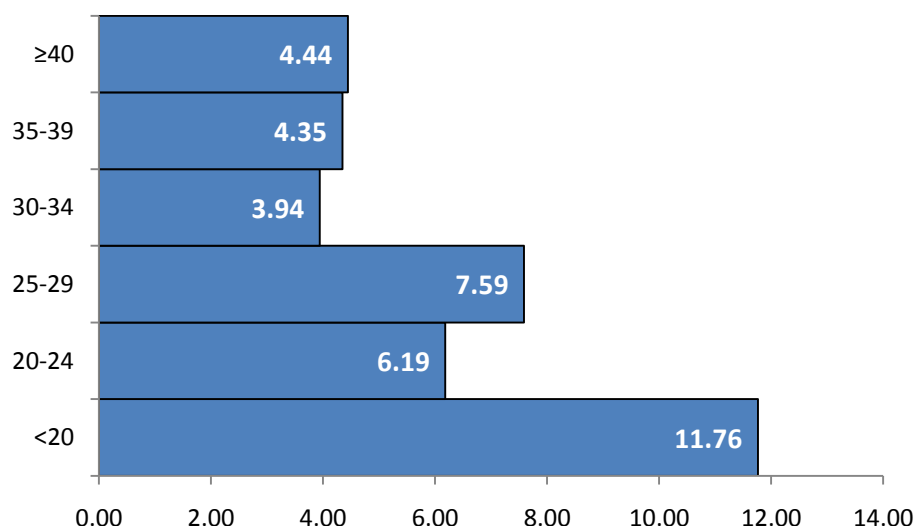


Figure 3.1 Pyramid plot showing age and corresponding SSI rate (%) for Cardiff and Vale UHB.

Table 3.1 C-section SSI by age in 2016. Procedures where age information was not provided were excluded for Cardiff and Vale UHB.

Age group	No. of valid procedures	No. of SSI	% SSI (95% CI)
<20	17	2	11.76 (0.00-27.08)
20-24	97	6	6.19 (1.39-10.98)
25-29	224	17	7.59 (4.12-11.06)
30-34	355	14	3.94 (1.92-5.97)
35-39	276	12	4.35 (1.94-6.75)
≥40	90	4	4.44 (0.19-8.70)

Incidence of SSI by BMI

Table 3.2 C-section SSI rates by BMI in 2016 for Cardiff and Vale UHB. Procedures where BMI information was not provided were excluded.

BMI category		No. of procedures	No. of SSI	% SSI (95% CI)
Underweight	<18.5	8	0	0.00 (0.00-0.00)
Healthy weight	18.5-24.9	333	12	3.60 (1.60-5.61)
Overweight	25.0-29.9	359	12	3.34 (1.48-5.20)
Obese	≥30.0	321	30	9.35 (6.16-12.53)

Summary:

There appears to be no overall trend for SSI rates when comparing between age groups.

There is a general increase in SSI rates as the weight of the patient increases. The SSI rate for obese patients is significantly higher than the SSI rate for health and overweight patients ($p < 0.05$).

Section 4: Details of the surgical procedure

The following section provides SSI rates associated with specific variables, including the type of operation (elective or emergency), use of and timing of antibiotic prophylaxis and skin closure types.

Incidence of SSI following elective and emergency procedures

Table 4.1 C-section SSI in elective and emergency surgical procedures in 2016 for Cardiff and Vale UHB. Procedures where this information was not provided were excluded.

Operation type	No. of procedures	No. of SSI	% SSI (95% CI)
Elective procedure	539	28	5.19 (3.32-7.07)
Emergency procedure	507	26	5.13 (3.21-7.05)

Incidence of SSI by timing of antibiotic prophylaxis

Table 4.2.1 Percentage (%) of C-section procedures by timing of antibiotic prophylaxis in 2016 for Cardiff and Vale UHB. Procedures where no antibiotics given were excluded.

Timing of antibiotic prophylaxis	No. of procedures	%
Prior to incision	951	97.94
After incision	20	2.06

Table 4.2.2 C-section SSI by antibiotic prophylaxis in 2016 for Cardiff and Vale UHB. Procedures where no antibiotic information given were excluded.

Was prophylactic antibiotic given?	No. of procedures	No. of SSI	% SSI (95% CI)
Yes, prior to incision	951	48	5.05 (3.66-6.44)
Yes, after incision	20	1	5.00 (0.00-14.55)
No	5	1	20.00 (0.00-55.06)

Incidence of SSI by wound closure type

Table 4.3 Percentage (%) of C-section procedures by type of skin closure in 2016 for Cardiff and Vale UHB. Procedures where this information was not available were excluded.

Type of wound closure	No. of procedures	%
Dissolvable suture	887	85.3
Removable suture	37	3.6
Staples	116	11.2

Table 4.4 C-section SSI rates by type of skin closure in 2016 for Cardiff and Vale UHB. Procedures where closure type information is missing were excluded.

Type of wound closure	No. Of procedures	No. Of SSI	% SSI (95% CI)
Dissolvable suture	887	45	5.07 (3.63-6.52)
Removable suture	37	2	5.41 (0.00-12.69)
Staples	116	8	6.90 (2.29-11.51)

Summary:

Antibiotic prophylaxis was given to 99.5% of patients.

97.94% of patients received their antibiotic prophylaxis prior to incision, with the remainder receiving antibiotics after incision.

88.8% of wounds were closed with sutures, with the remaining few using staples. Most sutures used were of the dissolvable variety.