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**Surveillance:** *Clostridium difficile* (*C. difficile*) and *Staphylococcus aureus* bacteraemia (MRSA and MSSA)

**Report:** Bi-annual Report

**Time period:** 1<sup>st</sup> April to 30<sup>th</sup> September 2015

**Health Board:** Wales

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## **1. *Clostridium difficile* (*C. difficile*)**

### *C. difficile* surveillance notes for interpretation

- This report presents data on numbers of *C. difficile* in Wales from April to September 2015, with trend data from April 2010.
- Data is mainly collected via Datastore, a data warehouse system used by all microbiology laboratories in Wales. This data is supplemented manually with *C. difficile* specimens from patients in Powys Teaching Health Board where the laboratory used for processing the specimen is in England.
- Data is extracted for the surveillance scheme using the following criteria:
  - The patient is at least 2 years old
  - The sample was not taken from a patient in a private hospital, a privately run dialysis unit or post-mortem
  - The sample had a positive *C. difficile* toxin test, if a single test (either a toxin A and B enzyme immunoassay or a neutralised cell toxicity assay) protocol was in use in the laboratory at the time the investigation was carried out, or a positive glutamate dehydrogenase (GDH) assay combined with a positive *C. difficile* toxin enzyme immunoassay, if a two-stage testing protocol was in use in the laboratory at the time the investigation was carried out.
  - Multiple positive samples from the same patient within a 28 day period are excluded as duplicates
- Hospital admission data has been supplied by NHS Wales Informatics Service (NWIS) from the Patient Episode Database for Wales (PEDW).
- Population data has been extracted from <https://statswales.wales.gov.uk/Catalogue/Population-and-Migration/Population/Estimates>.
- All ages are included in the hospital admission and population numbers used to calculate rates.
- Mid 2014 population estimates have been used to calculate the April – September 2015 population rates. These rates will be updated when the mid 2015 population estimates become available.

**Wales *C. difficile*, Apr – Sep 15**

- 694 cases of *C. difficile* have been reported for the 6 month period. This is a 1% increase in numbers compared to the equivalent period last year. The rate of *C. difficile* per 1,000 hospital admissions has increased by 3%, from 3.07 to 3.17. (Table 1.1.)
- Compared to the equivalent period last year, 4 of the 8 health boards/trust in Wales have achieved a reduction in numbers of *C. difficile*. (Table 1.1.)
- Compared to Apr – Sep 10, there has been a 56% decrease in the number of *C. difficile* and a 55% decrease in the rate of *C. difficile* per 1,000 hospital admissions in Wales. (Table 1.2.)
- Compared to the Apr – Sep 10, 7 of the 8 health boards/trust in Wales have achieved a reduction in numbers of *C. difficile*. (Table 1.3.) Powys Teaching Health Board had some changes in data collection methods over this time period.
- 71% (491) of cases were diagnosed in the 18 acute hospitals, 5% (38) diagnosed in non-acute hospitals and 24% (165) in non-hospital locations.
- 61% (422) of cases were diagnosed in hospital inpatient locations. The inpatient rate for Wales is 1.93 per 1,000 hospital admissions for this period.
- 58% (405) of *C. difficile* were in female patients and 80% (553) were in patients aged 66+ for the 6 month period.
- The rate of *C. difficile* per 100,000 population has increased by 1% compared to the equivalent period last year, from 44.25 to 44.77. (Table 1.2.)
- Compared to Apr – Sep 10, the rate of *C. difficile* per 100,000 population has decreased by 56%. (Table 1.2.)

**Table 1.1. Wales numbers of *C. difficile*, percentage change in numbers (from Apr – Sep 14 and from Apr – Sep 10) and rates per 1,000 hospital admissions and 100,000 population by health board, Apr – Sep 15**

	Number of <i>C. difficile</i>	% change in number of <i>C. difficile</i> from Apr – Sep 14	% change in number of <i>C. difficile</i> from Apr – Sep 10	<i>C. difficile</i> / 1,000 hospital admissions	<i>C. difficile</i> /100,000 population
<b>ABM</b>	152	+6% (143)	-32% (224)	3.64	57.97
<b>Aneurin Bevan</b>	103	-10% (115)	-72% (370)	2.35	35.40
<b>Betsi Cadwaladr</b>	202	+14% (177)	-50% (401)	4.26	58.05
<b>Cardiff and Vale</b>	82	-20% (103)	-77% (352)	2.59	33.93
<b>Cwm Taf</b>	38	-37% (60)	-60% (96)	1.48	25.61
<b>Hywel Dda</b>	101	+36% (74)	-2% (103)	3.77	52.46
<b>Powys Teaching</b>	12	+33% (9)	+71% (7)	15.15	18.04
<b>Velindre</b>	4	-20% (5)	-60% (10)	4.42	N/A
<b>Wales</b>	<b>694</b>	<b>+1% (686)</b>	<b>-56% (1563)</b>	<b>3.17</b>	<b>44.77</b>
Wales average	87	0% (86)	-35% (195)	4.71	40.21
Wales median	92	-2% (89)	-55% (164)	3.70	35.40

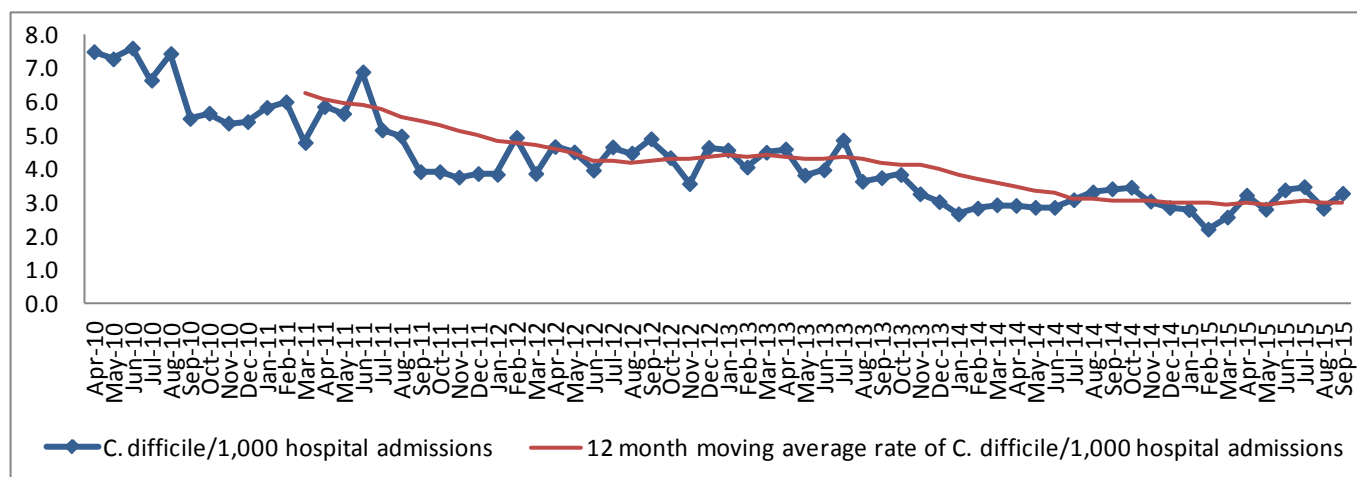
**Wales**

**Table 1.2. Wales numbers and rates of *C. difficile* per 1,000 hospital admissions and 100,000 population, Apr 10 – Sep 15**

	Number of <i>C. difficile</i>	Number of hospital admissions	<i>C. difficile</i> / 1,000 hospital admissions	Population*	<i>C. difficile</i> / 100,000 population
<b>Apr – Sep 15</b>	<b>694</b>	<b>219069</b>	<b>3.17</b>	<b>1550254</b>	<b>44.77</b>
Sep 15	121	36947	3.27	254140	47.61
Aug 15	99	34989	2.83	262611	37.70
Jul 15	132	38022	3.47	262611	50.26
Jun 15	126	37330	3.38	254140	49.58
May 15	101	36047	2.80	262611	38.46
Apr 15	115	35734	3.22	254140	45.25
<b>2014/15 FY</b>	<b>1318</b>	<b>446598</b>	<b>2.95</b>	<b>3092036</b>	<b>42.63</b>
Apr – Sep 14	686	223490	3.07	1550254	44.25
<b>2013/14 FY</b>	<b>1577</b>	<b>437247</b>	<b>3.61</b>	<b>3082412</b>	<b>51.16</b>
Apr – Sep 13	901	219353	4.11	1545428	58.30
<b>2012/13 FY</b>	<b>1934</b>	<b>439792</b>	<b>4.40</b>	<b>3074067</b>	<b>62.91</b>
Apr – Sep 12	998	220574	4.52	1541245	64.75
<b>2011/12 FY</b>	<b>2142</b>	<b>455772</b>	<b>4.70</b>	<b>3063758</b>	<b>69.91</b>
Apr – Sep 11	1214	224821	5.40	1536076	79.03
Apr – Dec 10	2795	448561	6.23	3049971	91.64
Apr – Sep 10	1563	223855	6.98	1529164	102.21

\*Monthly population = (Total population/Number of days in year) x Number of days in month

**Figure 1.1. Wales monthly and 12 month moving average rates of *C. difficile* per 1,000 hospital admissions, Apr 10 – Sep 15\***



\*12 month moving average rates are shown from Mar 11 as this is when the first full FY of data is complete

## **2. MRSA (meticillin-resistant *Staphylococcus aureus*) bacteraemia**

### MRSA bacteraemia surveillance notes for interpretation

- This report presents data on numbers of MRSA from blood cultures (bacteraemia) in Wales from April to September 2015, with trend data from April 2010 (other than for Powys Health Board where data collection started in April 2011).
- Data is mainly collected via Datastore, a data warehouse system used by all microbiology laboratories in Wales. This data is supplemented manually with MRSA bacteraemia specimens from patients in Powys Health Board where the laboratory used for processing the specimen is in England.
- Data is extracted for the surveillance scheme using the following criteria:
  - *Staphylococcus aureus* (*S. aureus*) was identified from a blood culture sample
  - The sample was not taken from a patient in a private hospital, a privately run dialysis unit or post-mortem
  - Multiple positive samples from the same patient within a 14 day period are excluded as duplicates
- *S. aureus* positive blood cultures are assigned as MRSA (meticillin-resistant *S. aureus*) or MSSA (meticillin-sensitive *S. aureus*) on the basis of sensitivity to the antibiotic flucloxacillin
- Hospital admission data has been supplied by NHS Wales Informatics Service (NWIS) from the Patient Episode Database for Wales (PEDW).
- Population data has been extracted from <https://statswales.wales.gov.uk/Catalogue/Population-and-Migration/Population/Estimates>
- Mid 2014 population estimates have been used to calculate the April – September 2015 population rates. These rates will be updated when the mid 2015 population estimates become available.

**Wales MRSA bacteraemia, Apr – Sep 15**

- 51 cases of MRSA bacteraemia have been reported for the 6 month period. This is a 38% decrease in numbers compared to the equivalent period last year. The rate of MRSA bacteraemia per 1,000 hospital admissions has decreased by 38%, from 0.37 to 0.23. (Table 2.1.)
- Compared to the equivalent period last year, 5 of the 8 health boards/trust in Wales have achieved a reduction in numbers of MRSA bacteraemia. 3 health boards had the same number of MRSA bacteraemia for both time periods. (Table 2.1.)
- Compared to Apr – Sep 10, there has been a 57% decrease in the number of MRSA bacteraemia and a 56% decrease in the rate of MRSA bacteraemia per 1,000 hospital admissions in Wales. (Table 2.2.)
- Compared to the Apr – Sep 10, all of the health boards/trust in Wales have achieved a reduction in numbers of MRSA bacteraemia. (Table 2.3.) Powys Teaching Health Board had some changes in data collection methods over this time period.
- All cases were diagnosed in the 18 acute hospitals.
- 61% (31) of cases were diagnosed in hospital inpatient locations. The inpatient rate for Wales is 0.14 per 1,000 hospital admissions for this period.
- 18% (9) of MRSA bacteraemia were in female patients and 73% (37) were in patients aged 66+ for the 6 month period.
- The rate of MRSA bacteraemia per 100,000 population has decreased by 38% compared to the equivalent period last year, from 5.29 to 3.29. (Table 2.2.)
- Compared to Apr – Sep 10, the rate of MRSA bacteraemia per 100,000 population has decreased by 58%. (Table 2.2.)

**Table 2.1. Wales numbers of MRSA bacteraemia, percentage change in numbers (from Apr – Sep 14 and from Apr – Sep 10) and rates per 1,000 hospital admissions and 100,000 population by health board, Apr – Sep 15**

	Number of MRSA bacteraemia	% change in number of MRSA bacteraemia from Apr – Sep 14	% change in number of MRSA bacteraemia from Apr – Sep 10	MRSA bacteraemia /1,000 hospital admissions	MRSA bacteraemia /100,000 population
<b>ABM</b>	8	-38% (13)	-72% (29)	0.19	3.05
<b>Aneurin Bevan</b>	10	=0% (10)	-9% (11)	0.23	3.44
<b>Betsi Cadwaladr</b>	16	-11% (18)	-43% (28)	0.34	4.60
<b>Cardiff and Vale</b>	9	-57% (21)	-59% (22)	0.28	3.72
<b>Cwm Taf</b>	2	-67% (6)	-82% (11)	0.08	1.35
<b>Hywel Dda</b>	6	-57% (14)	-63% (16)	0.22	3.12
<b>Powys Teaching</b>	0	=0% (0)	N/A	0.00	0.00
<b>Velindre</b>	0	=0% (0)	-100% (2)	0.00	N/A
<b>Wales</b>	<b>51</b>	<b>-38% (82)</b>	<b>-57% (119)</b>	<b>0.23</b>	<b>3.29</b>
Wales average	6	-29% (10)	-61% (17)	0.17	2.75
Wales median	7	-25% (12)	-63% (16)	0.21	3.12

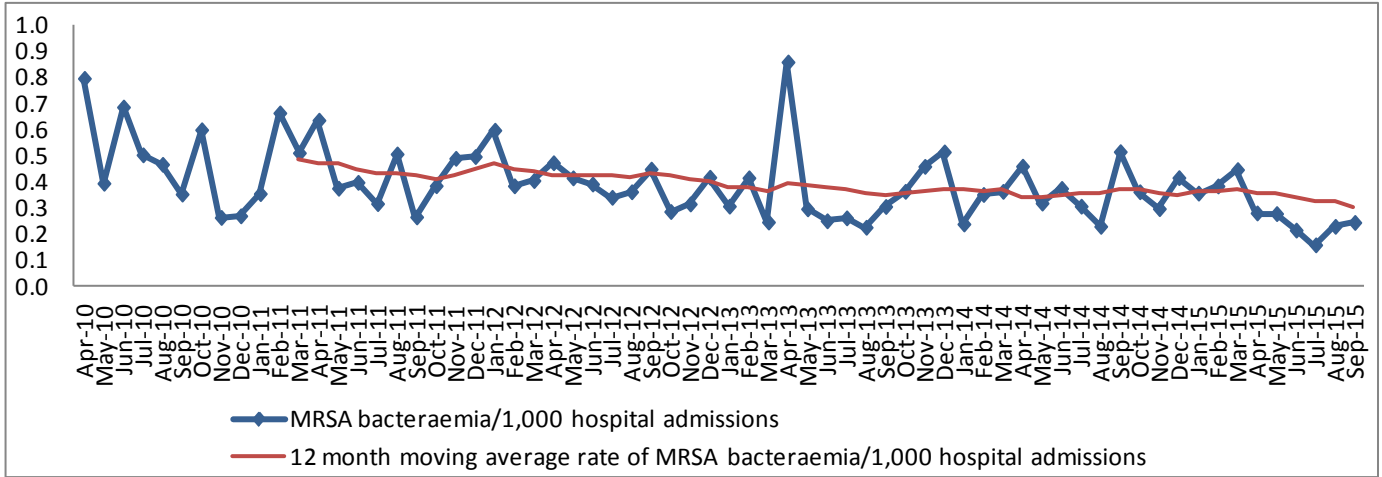
**Table 2.2. Wales numbers and rates of MRSA bacteraemia per 1,000 hospital admissions and 100,000 population, Apr 10 – Sep 15**

	Number of MRSA bacteraemia	Number of hospital admissions	MRSA bacteraemia/ 1,000 hospital admissions	Population*	MRSA bacteraemia/ 100,000 population
<b>Apr – Sep 15</b>	<b>51</b>	<b>219069</b>	<b>0.23</b>	<b>1550254</b>	<b>3.29</b>
Sep 15	9	36947	0.24	254140	3.54
Aug 15	8	34989	0.23	262611	3.05
Jul 15	6	38022	0.16	262611	2.28
Jun 15	8	37330	0.21	254140	3.15
May 15	10	36047	0.28	262611	3.81
Apr 15	10	35734	0.28	254140	3.93
<b>2014/15 FY</b>	<b>166</b>	<b>446598</b>	<b>0.37</b>	<b>3092036</b>	<b>5.37</b>
Apr – Sep 14	82	223490	0.37	1550254	5.29
<b>2013/14 FY</b>	<b>165</b>	<b>437247</b>	<b>0.38</b>	<b>3082412</b>	<b>5.35</b>
Apr – Sep 13	80	219353	0.36	1545428	5.18
<b>2012/13 FY</b>	<b>161</b>	<b>439792</b>	<b>0.37</b>	<b>3074067</b>	<b>5.24</b>
Apr – Sep 12	89	220574	0.40	1541245	5.77
<b>2011/12 FY</b>	<b>199</b>	<b>455772</b>	<b>0.44</b>	<b>3063758</b>	<b>6.50</b>
Apr – Sep 11	93	224821	0.41	1536076	6.05
<b>Apr – Dec 10</b>	<b>218</b>	<b>448561</b>	<b>0.49</b>	<b>3049971</b>	<b>7.15</b>
Apr – Sep 10	119	223855	0.53	1529164	7.78

\*Monthly population = (Total population/Number of days in year) x Number of days in month

**Wales**

**Figure 2.1. Wales monthly and 12 month moving average rates of MRSA bacteraemia per 1,000 hospital admissions, Apr 10 – Sep 15\***



\*12 month moving average rates are shown from Mar 11 as this is when the first full FY of data is complete



### **3. MSSA (meticillin-sensitive *Staphylococcus aureus*) bacteraemia**

#### MSSA bacteraemia surveillance notes for interpretation

- This report presents data on numbers of MSSA from blood cultures (bacteraemia) in Wales from April to September 2015, with trend data from April 2010 (other than for Powys Health Board where data collection started in April 2011).
- Data is mainly collected via Datastore, a data warehouse system used by all microbiology laboratories in Wales. This data is supplemented manually with MSSA bacteraemia specimens from patients in Powys Health Board where the laboratory used for processing the specimen is in England.
- Data is extracted for the surveillance scheme using the following criteria:
  - *Staphylococcus aureus* (*S. aureus*) was identified from a blood culture sample
  - The sample was not taken from a patient in a private hospital, a privately run dialysis unit or post-mortem
  - Multiple positive samples from the same patient within a 14 day period are excluded as duplicates
- *S. aureus* positive blood cultures are assigned as MRSA (meticillin-resistant *S. aureus*) or MSSA (meticillin-sensitive *S. aureus*) on the basis of sensitivity to the antibiotic flucloxacillin
- Hospital admission data has been supplied by NHS Wales Informatics Service (NWIS) from the Patient Episode Database for Wales (PEDW).
- Population data has been extracted from <https://statswales.wales.gov.uk/Catalogue/Population-and-Migration/Population/Estimates>
- Mid 2014 population estimates have been used to calculate the April – September 2015 population rates. These rates will be updated when the mid 2015 population estimates become available.

**Wales MSSA bacteraemia, Apr – Sep 15**

- 409 cases of MSSA bacteraemia have been reported for the 6 month period. This is a 5% increase in numbers compared to the equivalent period last year. The rate of MSSA bacteraemia per 1,000 hospital admissions has increased by 8%, from 1.74 to 1.87. (Table 3.1.)
- Compared to the equivalent period last year, 2 of the 8 health boards/trust in Wales have achieved a reduction in numbers of MSSA bacteraemia. (Table 3.1.)
- Compared to Apr – Sep 10, there has been a 26% increase in the number of MSSA bacteraemia and a 29% increase in the rate of MSSA bacteraemia per 1,000 hospital admissions in Wales. (Table 3.2.)
- Compared to the Apr – Sep 10, 1 of the 8 health boards/trust in Wales have achieved a reduction in numbers of MSSA bacteraemia. (Table 3.3.) Powys Teaching Health Board had some changes in data collection methods over this time period.
- 99% (403) of cases were diagnosed in the 18 acute hospitals, 1% (5) diagnosed in non-acute hospitals and <1% (1) in non-hospital locations.
- 53% (217) of cases were diagnosed in hospital inpatient locations. The inpatient rate for Wales is 0.99 per 1,000 hospital admissions for this period.
- 40% (164) of MSSA bacteraemia were in female patients and 50% (204) were in patients aged 66+ for the 6 month period.
- The rate of MSSA bacteraemia per 100,000 population has increased by 5% compared to the equivalent period last year, from 25.03 to 26.38. (Table 3.2.)
- Compared to Apr – Sep 10, the rate of MSSA bacteraemia per 100,000 population has increased by 24%. (Table 3.2.)

**Table 3.1. Wales numbers of MSSA bacteraemia, percentage change in numbers (from Apr – Sep 14 and from Apr – Sep 10) and rates per 1,000 hospital admissions and 100,000 population by health board, Apr – Sep 15**

	Number of MSSA bacteraemia	% change in number of MSSA bacteraemia from Apr – Sep 14	% change in number of MSSA bacteraemia from Apr – Sep 10	MSSA bacteraemia /1,000 hospital admissions	MSSA bacteraemia /100,000 population
<b>ABM</b>	86	+8% (80)	+54% (56)	2.06	32.80
<b>Aneurin Bevan</b>	46	-23% (60)	-26% (62)	1.05	15.81
<b>Betsi Cadwaladr</b>	70	-3% (72)	+4% (67)	1.48	20.12
<b>Cardiff and Vale</b>	76	+3% (74)	+25% (61)	2.40	31.45
<b>Cwm Taf</b>	63	+34% (47)	+125% (28)	2.45	42.46
<b>Hywel Dda</b>	65	+23% (53)	+35% (48)	2.42	33.76
<b>Powys Teaching</b>	0	0% (0)	N/A	0.00	0.00
<b>Velindre</b>	3	+50% (2)	=0% (3)	3.31	N/A
<b>Wales</b>	<b>409</b>	<b>+5% (388)</b>	<b>+26% (325)</b>	<b>1.87</b>	<b>26.38</b>
Wales average	51	+11% (49)	+31% (46)	1.90	25.20
Wales median	64	+5% (57)	+25% (56)	2.23	31.45

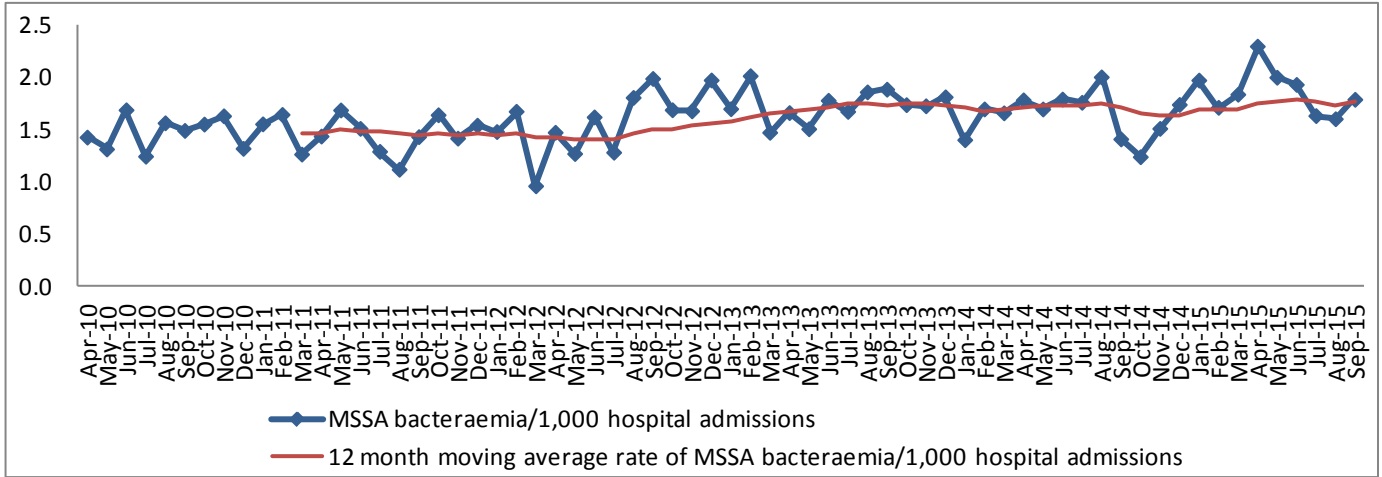
**Table 3.2. Wales numbers and rates of MSSA bacteraemia per 1,000 hospital admissions and 100,000 population, Apr 10 – Sep 15**

	Number of MSSA bacteraemia	Number of hospital admissions	MSSA bacteraemia/ 1,000 hospital admissions	Population*	MSSA bacteraemia/ 100,000 population
<b>Apr – Sep 15</b>	<b>409</b>	<b>219069</b>	<b>1.87</b>	<b>1550254</b>	<b>26.38</b>
Sep 15	65	36947	1.76	254140	25.58
Aug 15	56	34989	1.60	262611	21.32
Jul 15	62	38022	1.63	262611	23.61
Jun 15	72	37330	1.93	254140	28.33
May 15	72	36047	2.00	262611	27.42
Apr 15	82	35734	2.29	254140	32.27
<b>2014/15 FY</b>	<b>759</b>	<b>446598</b>	<b>1.70</b>	<b>3092036</b>	<b>24.55</b>
Apr – Sep 14	388	223490	1.74	1550254	25.03
<b>2013/14 FY</b>	<b>751</b>	<b>437247</b>	<b>1.72</b>	<b>3082412</b>	<b>24.36</b>
Apr – Sep 13	378	219353	1.72	1545428	24.46
<b>2012/13 FY</b>	<b>728</b>	<b>439792</b>	<b>1.66</b>	<b>3074067</b>	<b>23.68</b>
Apr – Sep 12	345	220574	1.56	1541245	22.38
<b>2011/12 FY</b>	<b>651</b>	<b>455772</b>	<b>1.43</b>	<b>3063758</b>	<b>21.25</b>
Apr – Sep 11	317	224821	1.41	1536076	20.64
<b>Apr – Dec 10</b>	<b>659</b>	<b>448561</b>	<b>1.47</b>	<b>3049971</b>	<b>21.61</b>
Apr – Sep 10	325	223855	1.45	1529164	21.25

\*Monthly population = (Total population/Number of days in year) x Number of days in month

**Wales**

**Figure 3.1. Wales monthly and 12 month moving average rates of MSSA bacteraemia per 1,000 hospital admissions, Apr 10 – Sep 15\***



\*12 month moving average rates are shown from Mar 11 as this is when the first full FY of data is complete