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

**Report:** Financial year (FY) report

**Time period:** 1<sup>st</sup> April 2015 to 31<sup>st</sup> March 2016

**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 in the 2015/16 financial year (FY), with trend data from 2010/11.
- 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 2015/16 population rates. These rates will be updated when the mid 2015 population estimates become available.

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- 1243 cases of *C. difficile* have been reported for the 2015/16 FY. This is a 6% decrease in numbers compared to the previous FY. The rate of *C. difficile* per 1,000 hospital admissions has decreased by 5%, from 2.95 to 2.80. (Table 1.1.)
- Compared to the previous FY, 5 of the 8 health boards/trust in Wales have achieved a reduction in numbers of *C. difficile*. (Table 1.1.)
- Compared to the 2010/11 FY, 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 2010/11 FY, 7 of the 8 health boards/trust in Wales have achieved a reduction in numbers of *C. difficile*. (Table 1.1.) Powys Teaching Health Board had some changes in data collection methods over this time period.
- 68% (851) of cases were diagnosed in the 18 acute hospitals, 8% (95) diagnosed in non-acute hospitals and 24% (294) in non-hospital locations. 3 locations were not specified.
- 61% (759) of cases were diagnosed in hospital inpatient locations. The inpatient rate for Wales is 1.71 per 1,000 hospital admissions for this period.
- 57% (713) of *C. difficile* were in female patients and 78% (974) were in patients aged 66+ for the 12 month period.
- The rate of *C. difficile* per 100,000 population has decreased by 6% compared to the previous FY, from 42.63 to 40.20. (Table 1.2.)
- Compared to 2010/11 FY, 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 2014/15 and 2010/11 FYs) and rates per 1,000 hospital admissions and 100,000 population by health board, 2015/16 FY**

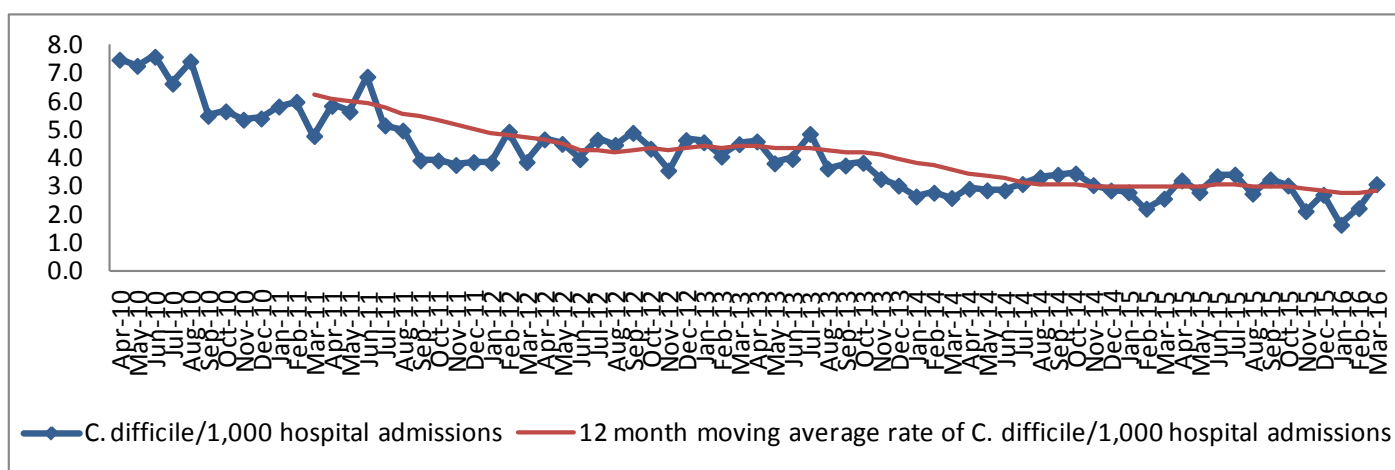
Health board /Trust	Number of <i>C. difficile</i>	% change in number of <i>C. difficile</i> from 2014/15 FY	% change in number of <i>C. difficile</i> from 2010/11 FY	<i>C. difficile</i> /1,000 hospital admissions	<i>C. difficile</i> /100,000 population
<b>ABM</b>	274	5% (261)	-33% (411)	3.23	52.39
<b>Aneurin Bevan</b>	204	-8% (222)	-70% (679)	2.22	35.15
<b>Betsi Cadwaladr</b>	355	-10% (395)	-56% (805)	3.77	51.15
<b>Cardiff and Vale</b>	150	-12% (171)	-72% (527)	2.26	31.12
<b>Cwm Taf</b>	82	-19% (101)	-45% (148)	1.59	27.71
<b>Hywel Dda</b>	151	9% (139)	-20% (188)	2.89	39.32
<b>Powys Teaching</b>	22	5% (21)	100% (11)	12.83	16.58
<b>Velindre</b>	5	-38% (8)	-81% (26)	2.66	N/A
<b>Wales</b>	<b>1243</b>	<b>-6% (1318)</b>	<b>-56% (2795)</b>	<b>2.80</b>	<b>40.20</b>
Wales average	155			3.93	36.20
Wales median	151			2.77	35.15

**Table 1.2. Wales numbers and rates of *C. difficile* per 1,000 hospital admissions and 100,000 population, Apr 10 – Mar 16**

Mth/Yr	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>2015/16 FY</b>	<b>1243</b>	<b>444720</b>	<b>2.80</b>	<b>3092036</b>	<b>40.23</b>
Mar 16	108	35090	3.08	261894	41.24
Feb 16	82	36825	2.23	244997	33.47
Jan 16	62	37817	1.64	261894	23.67
Dec 15	102	37745	2.70	261894	38.95
Nov 15	80	37708	2.12	253446	31.56
Oct 15	115	37962	3.03	261894	43.91
Sep 15	121	37284	3.25	253446	47.74
Aug 15	99	36103	2.74	261894	37.80
Jul 15	132	38641	3.42	261894	50.40
Jun 15	126	37534	3.36	253446	49.71
May 15	101	36186	2.79	261894	38.57
Apr 15	115	35825	3.21	253446	45.37
<b>2014/15 FY</b>	<b>1318</b>	<b>446699</b>	<b>2.95</b>	<b>3092036</b>	<b>42.63</b>
<b>2013/14 FY</b>	<b>1577</b>	<b>442821</b>	<b>3.56</b>	<b>3082412</b>	<b>51.16</b>
<b>2012/13 FY</b>	<b>1934</b>	<b>439792</b>	<b>4.40</b>	<b>3074067</b>	<b>62.91</b>
<b>2011/12 FY</b>	<b>2142</b>	<b>455772</b>	<b>4.70</b>	<b>3063758</b>	<b>69.91</b>
<b>2010/11 FY</b>	<b>2795</b>	<b>448561</b>	<b>6.23</b>	<b>3049971</b>	<b>91.64</b>

\*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 – Mar 16\***



\*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 in the 2015/16 financial year, with trend data from 2010/11 (other than for Powys Health Board where data collection started in Apr 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 2015/16 population rates. These rates will be updated when the mid 2015 population estimates become available.

**Wales MRSA bacteraemia, 2015/16 FY**

- 101 cases of MRSA bacteraemia have been reported for the 2015/16 FY. This is 39% decrease in numbers compared to the previous FY. The rate of MRSA *bacteraemia* per 1,000 hospital admissions has decreased by 39%, from 0.37 to 0.23. (Table 2.1.)
- Compared to the previous FY, 6 of the 8 health boards/NHS Trust in Wales have achieved a reduction in numbers of MRSA bacteraemia. (Table 2.1.)
- Compared to the 2010/11 FY, there has been a 54% decrease in the number of MRSA bacteraemia and a 53% decrease in the rate of MRSA bacteraemia per 1,000 hospital admissions. (Table 2.2.)
- Compared to the 2010/11 FY, 7 of the 7 (data was not collected from Powys Teaching Health Board for this FY) health boards/NHS Trust in Wales have achieved a reduction in numbers of MRSA bacteraemia. (Table 2.2.)
- 98% (99) of cases were diagnosed in the 18 acute hospitals and 2% (2) diagnosed in non-acute hospitals. (Table 2.2.)
- 54% (55) of cases were diagnosed in hospital inpatient locations. The inpatient rate is 0.12 per 1,000 hospital admissions for this period.
- 25% (25) of MRSA bacteraemia were in female patients and 71% (72) were in patients aged 66+ for the 12 month period.
- The rate of MRSA bacteraemia per 100,000 population has decreased by 39% compared to the previous FY, from 5.37 to 3.27. (Table 2.2.)
- Compared to 2010/11 FY, the rate of MRSA bacteraemia per 100,000 population has decreased by 54%. (Table 2.2.)

**Table 2.1. Wales numbers of MRSA bacteraemia, percentage change in numbers (from 2014/15 and 2010/11 FYs) and rates per 1,000 hospital admissions and 100,000 population by health board, 2015/16 FY**

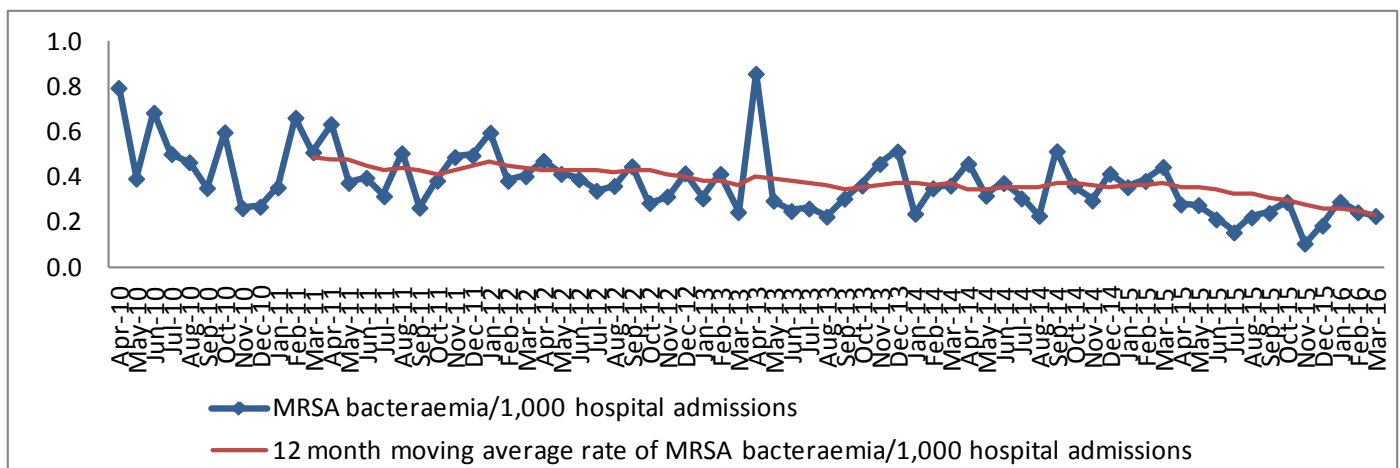
Health board	Number of MRSA bacteraemia	% change in number of MRSA bacteraemia from 2014/15 FY	% change in number of MRSA bacteraemia from 2010/11 FY	MRSA bacteraemia /1,000 hospital admissions	MRSA bacteraemia /100,000 population
<b>ABM</b>	14	-36% (22)	-70% (47)	0.16	2.68
<b>Aneurin Bevan</b>	20	-17% (24)	-9% (22)	0.22	3.45
<b>Betsi Cadwaladr</b>	34	-11% (38)	-38% (55)	0.36	4.90
<b>Cardiff and Vale</b>	13	-70% (44)	-74% (50)	0.20	2.70
<b>Cwm Taf</b>	7	-53% (15)	-65% (20)	0.14	2.37
<b>Hywel Dda</b>	13	-43% (23)	-35% (20)	0.25	3.39
<b>Powys</b>	0	=N/A (0)	N/A	0.00	0.00
<b>Velindre</b>	0	=N/A (0)	-N/A (4)	0.00	N/A
<b>Wales</b>	<b>101</b>	<b>-39% (166)</b>	<b>-54% (218)</b>	<b>0.23</b>	<b>3.27</b>
Wales average	13			0.17	2.78
Wales median	13			0.18	2.70

**Table 2.2. Wales numbers and rates of MRSA bacteraemia per 1,000 hospital admissions and 100,000 population, Apr 10 – Mar 16**

Mth/Yr	Number of MRSA bacteraemia	Number of hospital admissions	MRSA bacteraemia/ 1,000 hospital admissions	Population*	MRSA bacteraemia/ 100,000 population
<b>2015/16 FY</b>	<b>101</b>	<b>444720</b>	<b>0.23</b>	<b>3092036</b>	<b>3.27</b>
Mar 16	8	35090	0.23	261894	3.05
Feb 16	9	36825	0.24	244997	3.67
Jan 16	11	37817	0.29	261894	4.20
Dec 15	7	37745	0.19	261894	2.67
Nov 15	4	37708	0.11	253446	1.58
Oct 15	11	37962	0.29	261894	4.20
Sep 15	9	37284	0.24	253446	3.55
Aug 15	8	36103	0.22	261894	3.05
Jul 15	6	38641	0.16	261894	2.29
Jun 15	8	37534	0.21	253446	3.16
May 15	10	36186	0.28	261894	3.82
Apr 15	10	35825	0.28	253446	3.95
<b>2014/15 FY</b>	<b>166</b>	<b>446699</b>	<b>0.37</b>	<b>3092036</b>	<b>5.37</b>
<b>2013/14 FY</b>	<b>165</b>	<b>442821</b>	<b>0.37</b>	<b>3082412</b>	<b>5.35</b>
<b>2012/13 FY</b>	<b>161</b>	<b>439792</b>	<b>0.37</b>	<b>3074067</b>	<b>5.24</b>
<b>2011/12 FY</b>	<b>199</b>	<b>455772</b>	<b>0.44</b>	<b>3063758</b>	<b>6.50</b>
<b>2010/11 FY</b>	<b>218</b>	<b>448561</b>	<b>0.49</b>	<b>3049971</b>	<b>7.15</b>

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

**Figure 2.1. Wales monthly and 12 month moving average rates of MRSA bacteraemia per 1,000 hospital admissions, Apr 10 – Mar 16\***



\*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 in the 2015/16 financial year, with trend data from 2010/11 (other than for Powys Health Board where data collection started in Apr 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 2015/16 population rates. These rates will be updated when the mid 2015 population estimates become available.



**Wales MSSA bacteraemia, 2015/16 FY**

- 765 cases of MSSA bacteraemia have been reported for the 2015/16 FY. This is 1% increase in numbers compared to the previous FY. The rate of MSSA *bacteraemia* per 1,000 hospital admissions has decreased by 1%, from 1.70 to 1.72. (Table 3.1.)
- Compared to the previous FY, 3 of the 8 health boards/NHS Trust in Wales have achieved a reduction in numbers of MSSA bacteraemia. (Table 3.1.)
- Compared to the 2010/11 FY, there has been a 16% increase in the number of MSSA bacteraemia and a 17% increase in the rate of MSSA bacteraemia per 1,000 hospital admissions. (Table 3.2.)
- Compared to the 2010/11 FY, 3 of the 7 (data was not collected from Powys Teaching Health Board for this FY) health boards/NHS Trust in Wales have achieved a reduction in numbers of MSSA bacteraemia. (Table 3.2.)
- 98% (750) of cases were diagnosed in the 18 acute hospitals, 2% (13) diagnosed in non-acute hospitals and <1% (1) in non-hospital locations.
- 51% (387) of cases were diagnosed in hospital inpatient locations. The inpatient rate is 0.87 per 1,000 hospital admissions for this period.
- 41% (310) of MSSA bacteraemia were in female patients and 50% (384) were in patients aged 66+ for the 12 month period.
- The rate of MSSA bacteraemia per 100,000 population has increased by 1% compared to the previous FY, from 24.55 to 24.74. (Table 3.2.)
- Compared to 2010/11 FY, the rate of MSSA bacteraemia per 100,000 population has increased by 15%. (Table 3.2.)

**Table 3.1. Wales numbers of MSSA bacteraemia, percentage change in numbers (from 2014/15 and 2010/11 FYs) and rates per 1,000 hospital admissions and 100,000 population by health board, 2015/16 FY**

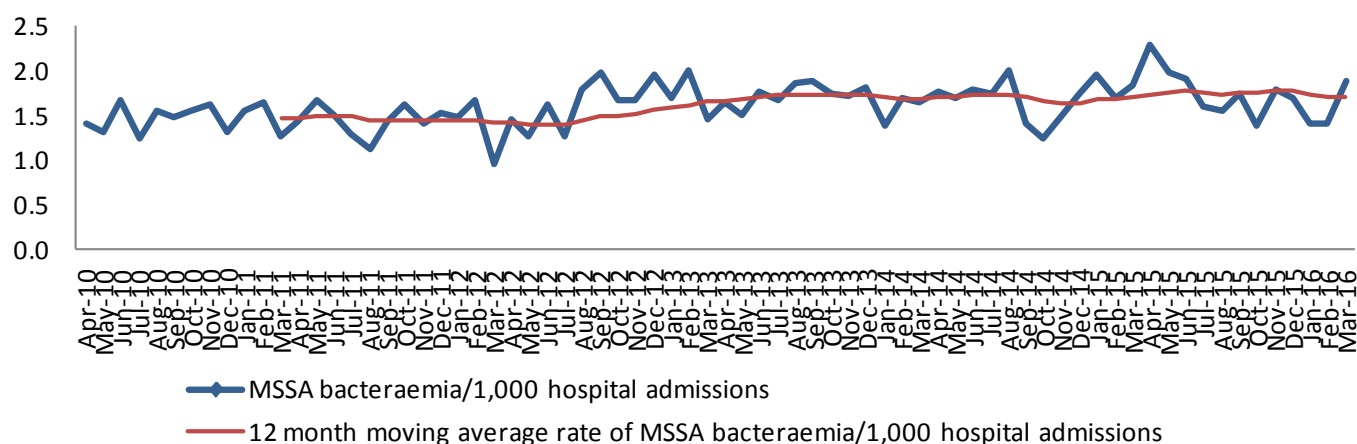
Health board	Number of MSSA bacteraemia	% change in number of MSSA bacteraemia from 2014/15 FY	% change in number of MSSA bacteraemia from 2010/11 FY	MSSA bacteraemia /1,000 hospital admissions	MSSA bacteraemia /100,000 population
<b>ABM</b>	165	12% (147)	36% (121)	1.94	31.55
<b>Aneurin Bevan</b>	93	-15% (110)	-18% (114)	1.01	16.02
<b>Betsi Cadwaladr</b>	134	-5% (141)	4% (129)	1.42	19.31
<b>Cardiff and Vale</b>	140	0% (140)	-10% (155)	2.11	29.05
<b>Cwm Taf</b>	115	17% (98)	135% (49)	2.23	38.86
<b>Hywel Dda</b>	113	-7% (121)	33% (85)	2.16	29.43
<b>Powys</b>	0	=N/A (0)	N/A	0.00	0.00
<b>Velindre</b>	5	150% (2)	-17% (6)	2.66	N/A
<b>Wales</b>	<b>765</b>	<b>1% (759)</b>	<b>16% (659)</b>	<b>1.72</b>	<b>24.74</b>
Wales average	96			1.69	23.46
Wales median	114			2.03	29.05

**Table 3.2. Wales numbers and rates of MSSA bacteraemia per 1,000 hospital admissions and 100,000 population, Apr 10 – Mar 16**

Mth/Yr	Number of MSSA bacteraemia	Number of hospital admissions	MSSA bacteraemia/ 1,000 hospital admissions	Population*	MSSA bacteraemia/ 100,000 population
<b>2015/16 FY</b>	<b>765</b>	<b>444720</b>	<b>1.72</b>	<b>3092036</b>	<b>24.74</b>
Mar 16	66	35090	1.88	261894	25.20
Feb 16	52	36825	1.41	244997	21.22
Jan 16	53	37817	1.40	261894	20.24
Dec 15	64	37745	1.70	261894	24.44
Nov 15	68	37708	1.80	253446	26.83
Oct 15	53	37962	1.40	261894	20.24
Sep 15	65	37284	1.74	253446	25.65
Aug 15	56	36103	1.55	261894	21.38
Jul 15	62	38641	1.60	261894	23.67
Jun 15	72	37534	1.92	253446	28.41
May 15	72	36186	1.99	261894	27.49
Apr 15	82	35825	2.29	253446	32.35
<b>2014/15 FY</b>	<b>759</b>	<b>446699</b>	<b>1.70</b>	<b>3092036</b>	<b>24.55</b>
<b>2013/14 FY</b>	<b>751</b>	<b>442821</b>	<b>1.70</b>	<b>3082412</b>	<b>24.36</b>
<b>2012/13 FY</b>	<b>728</b>	<b>439792</b>	<b>1.66</b>	<b>3074067</b>	<b>23.68</b>
<b>2011/12 FY</b>	<b>651</b>	<b>455772</b>	<b>1.43</b>	<b>3063758</b>	<b>21.25</b>
<b>2010/11 FY</b>	<b>659</b>	<b>448561</b>	<b>1.47</b>	<b>3049971</b>	<b>21.61</b>

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

**Figure 3.1. Wales monthly and 12 month moving average rates of MSSA bacteraemia per 1,000 hospital admissions, Apr 10 – Mar 16\***



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