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New NICE guideline on antimicrobial stewardship

The National Institute for Health and Clinical Excellence has published a new guideline on antimicrobial stewardship that includes recommendations for systems, processes and interventions aimed at ensuring effective antimicrobial medicine use across the health and care sector and slowing the emergence of antimicrobial resistance [1].

Recent PHE research illustrates that four in 10 people with a cough or symptoms of a cold, and six in 10 people with a throat infection, had taken antibiotics, despite the fact that these conditions are usually self-limiting and antibiotic prescriptions are not required [2].

Antimicrobial stewardship (AMS) programmes aim to reduce inappropriate prescribing and optimise antibiotic use and are crucial to combatting antimicrobial resistance (AMR), as highlighted in the UK five-year AMR strategy [3]. The NICE guideline highlights the role of toolkits in such programmes, including the “TARGET” and “SSTF” toolkits developed under the auspices of the English Surveillance Programme for Antimicrobial Usage and Resistance (ESPAUR) set up to collate data on antibiotic use in primary and secondary care and investigate possible correlations with antimicrobial resistance trends and infection rates.

The Treat Antibiotics Responsibly, Guidance, Education, Tools toolkit (TARGET) for primary care was developed by PHE and RCGP [4]. TARGET is designed for use by the whole primary care team within general practice or out-of-hours settings. It aims to help to influence prescribers’ and patients’ personal attitudes, social norms and perceived barriers to optimal antibiotic prescribing and use. Its resources can be used to fulfil continuing professional development and appraisal requirements. TARGET has been updated following a recent evaluation, including the development of a clinical e-learning module to support implementation.

The Start Smart Then Focus AMS toolkit (SSTF) is a summary of evidence-based AMS practice for use in secondary care settings [5]. It provides information on strategies to improve antibiotic use within secondary care and suggested audit topics to improve practice. Implementing SSTF can help local organisations to demonstrate compliance with the Department of Health code of practice on infection control [6]. ESPAUR’s first annual report last year established a baseline of 48% of Acute Trusts with SSTF action plans in place [7]. ESPAUR collaborated with experts in the field to update SSTF in March this year, based on user consultation and newly published evidence.

To further support AMS, PHE has developed, piloted and published a protocol by which Acute Trusts may validate their antimicrobial prescribing data [8]. Completion of the validation process forms part of the NHS England Quality Premium for Clinical Commissioning Groups in 2015/16. The Quality Premium aims to reduce total prescribing and broad spectrum prescribing in primary care, and is measured by NHS England and PHE. Antimicrobial prescribing and stewardship competencies have also been developed and published by PHE and ARHAI to inform the development of standards, guidance and training in this area [9].

The NICE AMS guidance highlights the PHE prescribing competencies, and the TARGET and SSTF toolkits, as key interventions for changing prescribing practice [10]. These tools can be used to help organisations fulfil many aspects of the new NICE guidance. In partnership with NHS England and Health Education England, PHE also issued a Patient Safety Alert on AMS to coincide with publication of the NICE guidance [11]. The alert calls on healthcare providers to ensure they have AMS strategies/action plans in place and are completing audits as recommended in the AMS toolkits.

Engaging the public and professionals on the prudent use and prescription of antibiotics is essential. For this purpose, PHE developed the Antibiotic Guardian campaign to which over 13,000 individuals have responded, making a pledge to protect antibiotics; further pledges are invited at antibioticguardian.com/ [12].

References

1. NICE (18 August 2015). Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use (guideline NG15).
2. "Entrenched misconceptions about antibiotics revealed in new survey", PHE press release 18 November 2014.
3. UK five-year antimicrobial resistance strategy 2013 to 2018, DH website, 10 September 2013.
4. TARGET Antibiotics Toolkit, RCGP website.
5. Start Smart - Then Focus Antimicrobial Stewardship Toolkit for English Hospitals (March 2015)
6. DH. The Health and Social Care Act 2008: code of practice on the prevention and control of infections and related guidance (updated July 2015)
7. ESPAUR (October 2014). English surveillance programme antimicrobial utilisation and resistance (ESPAUR) 2014 report.
8. PHE (March 2015). Antimicrobial consumption data: validation protocol for NHS acute trusts.
9. PHE (October 2013). Antimicrobial prescribing and stewardship competencies.
10. NICE antimicrobial stewardship guideline NG15: Implementation: getting started.
11. PHE/NHS (18 August 2015). Patient Safety Alert stage two - resources: addressing antimicrobial resistance through implementation of an antimicrobial stewardship programme.
12. Antibiotic Guardian website: antibioticguardian.com/.

EVD: international epidemiological summary (at 16 August 2015)

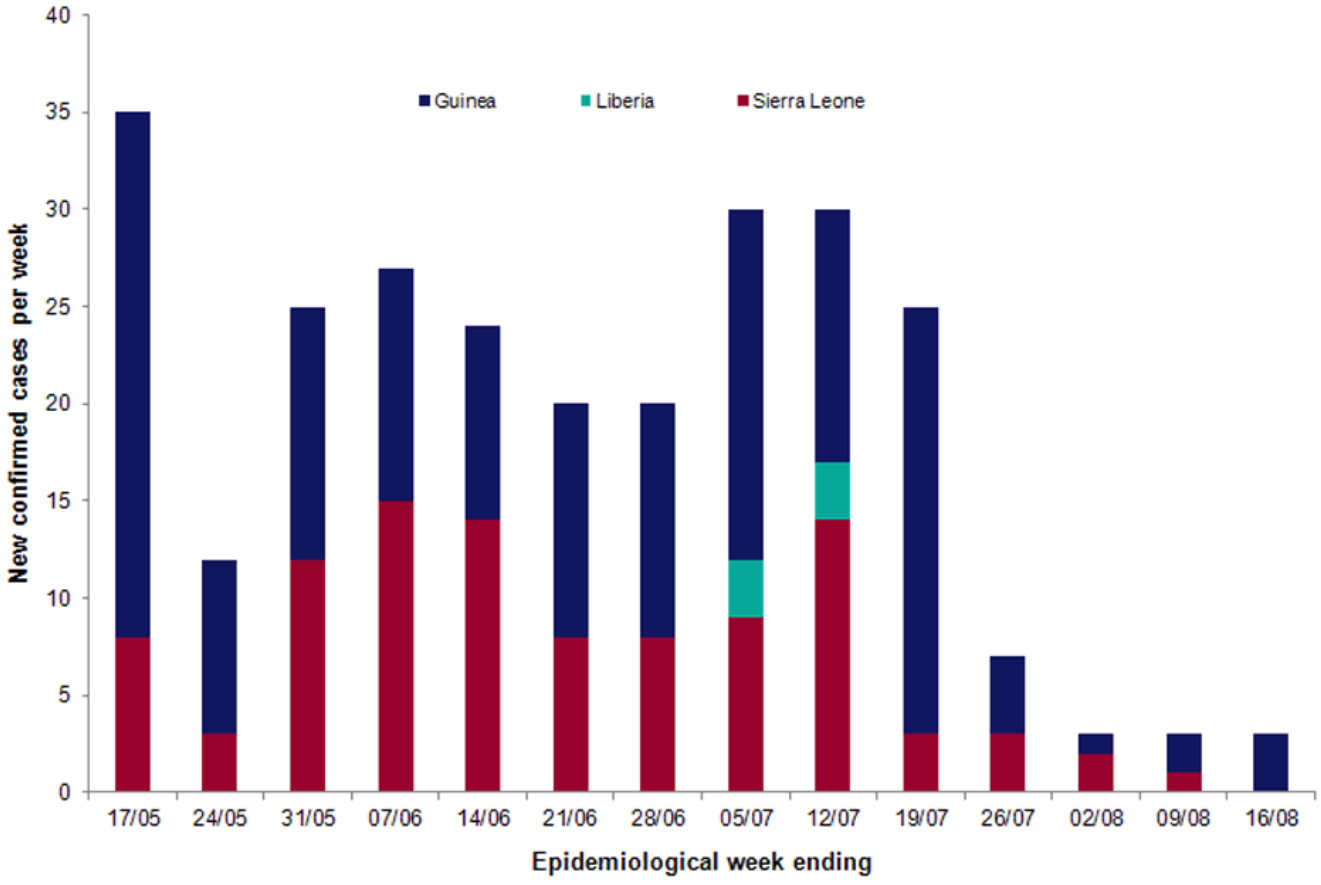
While the outbreak of Ebola virus disease (EVD) continues in West Africa, reports of new confirmed cases have remained below double figures for four consecutive weeks.

As of 16 August 2015, a total of 27,988 clinically compatible cases of EVD (15,220 confirmed), including 11,299 deaths, have been reported associated with the outbreak.

In the last two weeks, a total of six confirmed have been reported in the still-affected countries: five in Guinea and one in Sierra Leone. For the week ending 16 August, Sierra Leone reported no new confirmed cases, the first time this has occurred since the start of the outbreak. No new cases have been reported in Sierra Leone since 7 August and in Liberia since 12 July 2015.

While the decrease in new cases is encouraging, the risk of further transmission and an increase in case numbers in the coming weeks remains.

Figure 1. Number of new confirmed cases reported per week (17 May to 16 August 2015) in affected countries in West Africa



More detailed information is available from the weekly Ebola Epidemiological Update. An Ebola Outbreak Distribution Map indicates the currently affected areas in Guinea, Liberia and Sierra Leone.

Countries currently or previously affected by EVD as at 16 August 2015

Country		Total CCCs¥	Total CCs	Total deaths	New CCCs¥ reported in preceding week*	New confirmed cases in preceding week*	Current status (Date declared EVD free)
Guinea		3,786	3,332	2,524	-1	3	Active transmission
Liberia	Outbreak 1	10,666	3,151	4,806	–	–	Declared over 9 May 2015**
	Outbreak 2	6	6	2	0	0	28 days since last case tested negative for second time §
Sierra Leone		13,494	8,697	3,952	63	0	Active transmission
Italy		1	1	0	0	0	EVD free (20 July 2015)
UK		1	1	0	0	–	EVD free (7 March 2015)
Nigeria		20	19	8	0	–	EVD free (19 Oct 2014)
Senegal		1	1	0	0	–	EVD free (17 Oct 2014)
Spain		1	1	0	0	–	EVD free (2 Dec 2014)
Mali		8	7	6	0	–	EVD free (18 Jan 2015)
USA		4	4	1	0	–	Considered EVD free^ (23 Oct 2014^)
TOTAL		**27,988**	**15,220**	**11,229**	**62**	**3**	**–**

Data sources: WHO Ebola Situation Report 19 August 2015 (data to 16 August).

¥ Clinically compatible cases (CCC) represents a combination of suspected, probable and confirmed cases. CCC totals are under constant revision and reclassification as suspect cases are confirmed or discounted.

§ As of 20 August 2015.

***** The reporting period is one week: 9 August to 16 August (WHO latest Ebola situation report 19 August 2015).

****** Liberia was declared EVD free on 9 May, 2015, following 42 days without a case with the country entering a three-month period of enhanced surveillance. On 29 June, routine surveillance confirmed a new case in Margibi County, with five further cases in registered contacts reported since that date. The origin of infection is currently under investigation; preliminary evidence from genomic sequencing suggests that the most likely origin of transmission is a re-emergence of the virus from a survivor within Liberia.

^ More than 42 days have passed since last case tested negative. For further information, see: Ebola Epidemiological Update.

Infection reports / Enteric

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Voluntary surveillance of *Staphylococcus aureus* bacteraemia in England, Wales and Northern Ireland: 2007-2014

These analyses are based on data relating to diagnoses of *Staphylococcus aureus* (*S. aureus*) bloodstream infections during 2007 – 2014 in England, Wales and Northern Ireland (EWNI) extracted from Public Health England's (PHE) voluntary surveillance database Second Generation Surveillance System (SGSS).

SGSS comprises a communicable disease reporting module (CDR; formerly CoSurv/LabBase2) and an antimicrobial resistance module (AMR; formerly AmSurv). Most analyses presented here are based on data extracted from the CDR module of SGSS data on 17 July 2015.

The data presented here will differ in some instances from those in earlier publications partly due to the inclusion of late reports.

Rates of bacteraemia laboratory reports were calculated using mid-year resident population estimates for the respective year and geography [1,2]. Geographical analyses were based on the residential postocode of the patient if known (otherwise the GP postocode if known or, failing that, the postcode of the laboratory) with cases in England being assigned to the catchment area of one of 15 local PHE centres (PHECs) formed from administrative local authority boundaries.

The report includes analyses of the trends, patient demographic and geographical distribution, level of ascertainment, and antibiotic susceptibility among these bacteraemia episodes.

Key points

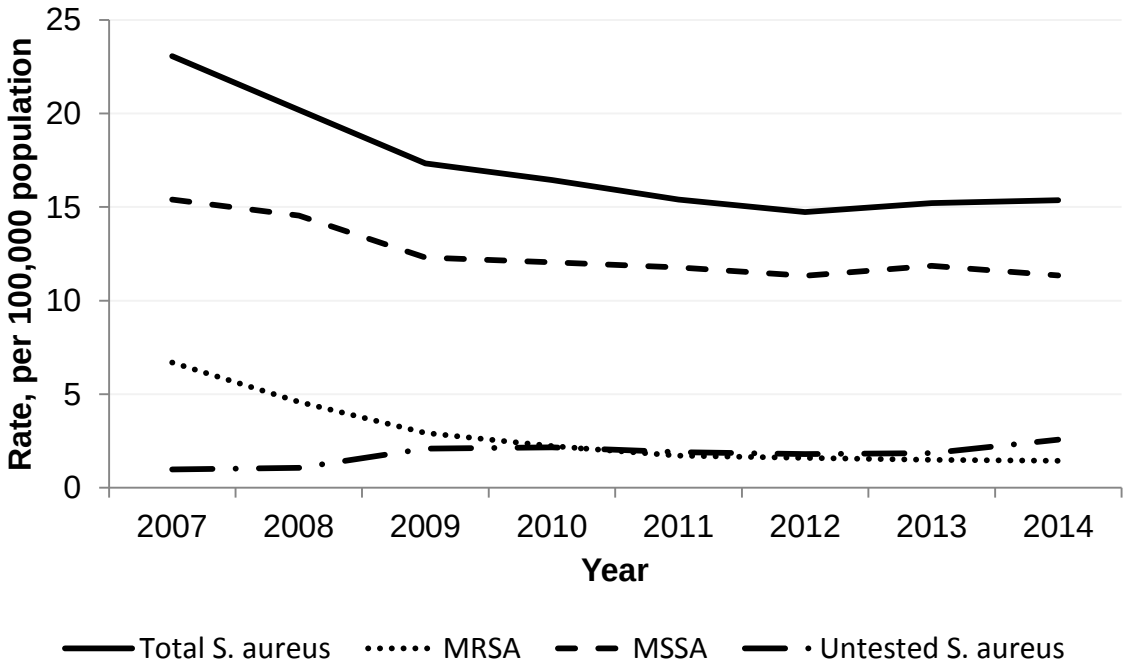
- There were 9,100 *S. aureus* bacteraemia reports in 2014, comprising 8374 from England, 481 from Wales and 245 from Northern Ireland, representing a 1.7% increase in the number of *S. aureus* laboratory reports compared with 2013 (8944 reports). Similarly, the total number of all bacteraemia episodes also increased by 2.8% from 103,808 (2013) to 106,708 (2014).
- The incidence rates of total *S. aureus*, meticillin susceptible *S. aureus* (MSSA), and meticillin resistant (MRSA) was 15.4, 11.4 and 1.4 per 100,000 population in 2014, a decrease of 33.4%, 26.3% and 78.5%, respectively between 2007 and 2014.
- In 2014, the rate of MRSA bacteraemia per 100,000 population was highest in Northern Ireland (2.3), followed by England (1.4) and Wales (0.8), while the rate of MSSA bacteraemia per 100,000 population was highest in England (11.8), followed by Northern Ireland (10.7) and Wales (4.6).
- Within England, the highest incidence rate of MRSA bacteraemia was observed in Greater Manchester (2.9/100,000) and London (2.0/100,000), while Cheshire and Merseyside and Devon, Cornwall and Somerset reported the highest incidence of MSSA bacteraemias (17.6/100,000 and 15.5/100,000, respectively).
- In 2014, the MRSA bacteraemia rates per 100,000 population were highest amongst the elderly (>75 years). Males had higher bacteraemia rates than females in all age groups except for 1-4 and 15-44 years old.
- MSSA bacteraemia rates were the highest in those over 75 and below 1 year, with rates being higher in males in all age groups.
- Between 2010 and 2014, non-susceptibility of MRSA isolates to ciprofloxacin decreased from 90.4% to 70.5%, erythromycin from 67.6% to 56.1% and mupirocin from 9.6% to 6.2%, while it increased to fusidic acid from 13.5% to 18.0%.
- Resistance of MSSA isolates to erythromycin increased from 11.5% (2010) to 13.8% (2014).
- Comparison of voluntary reporting with the mandatory surveillance dataset showed a case ascertainment rate of 89.5% for MRSA and 62.2% for MSSA in 2014. The latter could reflect increased percentage of missing meticillin susceptibility data.

Trends in episode numbers and rates

There were 9,100 *S. aureus* bacteraemia reports made to the voluntary laboratory surveillance in 2014. This represents an increase of 1.7% from the 8,944 reports in 2013. In 2014, there were 853 (9.4%) reports of meticillin resistant *S. aureus* (resistance to meticillin, oxacillin, cloxacillin and cefoxitin). This is a small decrease (2.7%) from the previous year (877 reports). Similarly, the number of MSSA reports decreased by 3.6% from 6973 to 6725 between 2013 and 2014. Caution should be executed when interpreting these figures as 16.5% (1,522) of *S. aureus* bacteraemia reports were missing meticillin susceptibility data in 2014. This is a significantly large increase in comparison to 2007, when only 4.2% (548) reports had these data missing. Non-reporting of meticillin susceptibility has been increasing since then. The highest year-on-year increase in non-reporting was observed in England, in particular Greater Manchester, Kent, Surrey and Sussex and North East, and Northern Ireland in 2014.

The rate of all *S. aureus*, MRSA and MSSA bacteraemia per 100,000 in England, Wales and Northern Ireland decreased by 33.4%, 78.5% and 26.3%, respectively between 2007 and 2014 (Figure 1). However, the overall *S. aureus* bacteraemia rate per 100,000 population increased by 3.2% and 0.9% between 2012 and 2013 and again between 2013 and 2014, respectively.

Figure 1. Total *S. aureus*, MRSA, MSSA, and untested *S. aureus* bacteraemia rates per 100,000 population (England, Wales, and Northern Ireland): 2007-2014*



*Data extracted on 17 July 2015

Geographical distribution

The overall rate of *S. aureus* bacteraemia in England, Wales and Northern Ireland was 15.4 per 100,000 population in 2014. This was 6.6% decrease since 2010 (16.4/100,000) and 0.9% increase since 2013 (15.2/100,000). The *S. aureus* bacteraemia rate in England increased by 4.2% (14.8/100,000 to 15.4/100,000) between 2013 and 2014, while the rate in Wales and Northern Ireland decreased by 23.6% (19.1/100,000 to 13.3/100,000) and 30.4% (20.4/100,000 to 15.6/100,000).

The overall rate of MRSA bacteraemia per 100,000 population in England, Wales and Northern Ireland has been steadily decreasing between 2010 and 2014 (2.2 to 1.4) (Table 1a). The infection rate has decreased in most regions except for Avon, Gloucestershire and Wiltshire (increased from 1.5/100,000 to 1.9/100,000) and South Midlands and Hertfordshire (increased from 1.1/100,000 to 1.2/100,000) between 2010 and 2014. Northern Ireland (2.3/100,000) and England (1.4/100,000) were the countries with the highest rate of infection in 2014. Regionally, the highest MRSA bacteraemia rates were in Greater Manchester (2.9/100,000), London (2.0/100,000) and Avon, Gloucestershire and Wiltshire (1.9/100,000) in 2014. Regions with the lowest incidence included North East (0.7/100,000), Yorkshire and Humber (0.8/100,000) and Devon, Cornwall and Somerset (0.9/100,000) (Figure 2a).

Table 1b and Figure 2b show region- specific 5 year (2010-2014) MSSA bacteraemia rate and MSSA bacteraemia rate in 2014, respectively. The overall infection rate in England, Wales and Northern Ireland was 11.4 per 100,000 population in 2014, with England having the highest country rate of 11.8/100,000, followed by Northern Ireland (10.7/100,000) and Wales (4.6/100,000). Regions with the highest rate included Cheshire and Merseyside (17.6/100,000), Devon, Cornwall and Somerset (15.5/100,000) and Cumbria and Lancashire (14.0/100,000) in 2014. Regions with the lowest incidence included Thames Valley (8.4/100,000), London (9.6/100,000) and Yorkshire and Humber (9.8/100,000).

Table 1a. MRSA bacteraemia rate per 100,000 population by PHE Centre (England, Wales, and Northern Ireland): 2010-2014*

Region		Rate, per 100,000 population				
		2010	2011	2012	2013	2014
London	London	2.8	1.9	2.9	2.0	2.0
	South Midlands and Hertfordshire	1.1	1.0	0.5	0.9	1.2
	East Midlands	2.1	1.6	0.9	1.3	1.2
	Anglia and Essex	2.1	1.5	1.4	1.2	1.8
Midlands	West Midlands	2.4	1.8	1.4	1.2	1.3
	Cheshire and Merseyside	2.3	2.3	1.5	1.9	1.7
	Cumbria and Lancashire	1.9	1.1	0.9	1.2	1.1
	Greater Manchester	3.4	2.3	2.0	2.2	2.9
	North East	1.9	1.0	1.6	1.3	0.7
Northern	Yorkshire and Humber	1.4	1.0	1.1	1.1	0.8
	Avon, Gloucestershire and Wiltshire	1.5	1.5	1.9	1.0	1.9
	Devon, Cornwall and Somerset	1.9	1.6	1.3	0.9	0.9
	Wessex	1.6	1.2	1.1	0.7	1.0
	Kent, Surrey and Sussex	2.2	2.2	1.4	1.8	1.2
Southern	Thames Valley	1.5	1.7	0.5	1.9	1.2
England	**England**	**2.1**	**1.6**	**1.5**	**1.4**	**1.4**
Northern Ireland	**Northern Ireland**	**6.2**	**5.0**	**4.0**	**4.0**	**2.3**
Wales	**Wales**	**2.2**	**1.7**	**1.8**	**1.1**	**0.8**
England, Wales and Northern Ireland		**2.2**	**1.7**	**1.6**	**1.5**	**1.4**

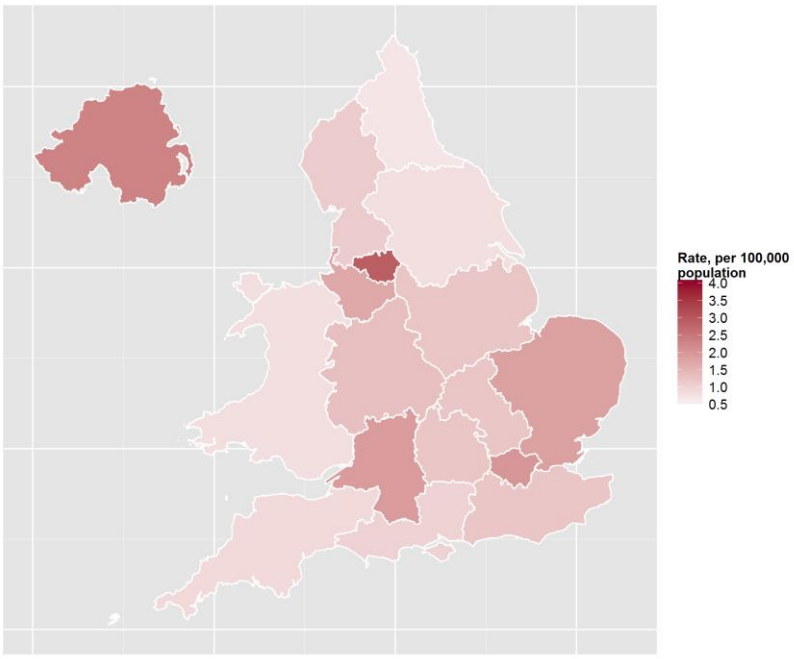
*Data extracted on 17 July 2015

Table 1b. MSSA bacteraemia rate per 100,000 population by PHE Centre (England, Wales and Northern Ireland): 2010-2014*

Region		Rate, per 100,000 population				
		2010	2011	2012	2013	2014
London	London	11.1	9.8	9.9	10.5	9.6
	South Midlands and Hertfordshire	8.4	8.2	8.7	7.8	9.9
	East Midlands	14.6	15.4	13.4	12.6	13.3
	Anglia and Essex	12.8	13.0	11.5	11.9	11.6
Midlands	West Midlands	14.6	13.7	12.8	13.6	13.2
	Cheshire and Merseyside	17.3	17.5	15.8	17.9	17.6
	Cumbria and Lancashire	13.4	11.7	12.8	15.0	14.0
	Greater Manchester	16.5	15.8	15.3	15.4	13.1
	North East	9.4	11.8	13.3	15.1	13.2
Northern	Yorkshire and Humber	12.6	10.6	9.5	9.5	9.8
	Avon, Gloucestershire and Wiltshire	7.5	7.4	7.6	8.9	10.9
	Devon, Cornwall and Somerset	17.9	15.7	13.5	15.7	15.5
	Wessex	11.2	10.8	11.4	11.0	10.1
	Kent, Surrey and Sussex	9.4	11.3	11.9	12.8	11.7
Southern	Thames Valley	9.0	9.5	7.7	8.8	8.4
England	**England**	**12.3**	**12.0**	**11.5**	**12.1**	**11.8**
Northern Ireland	**Northern Ireland**	**15.4**	**15.3**	**16.4**	**15.0**	**10.7**
Wales	**Wales**	**5.2**	**6.0**	**5.6**	**5.7**	**4.6**
England, Wales and Northern Ireland		**12.0**	**11.8**	**11.3**	**11.9**	**11.4**

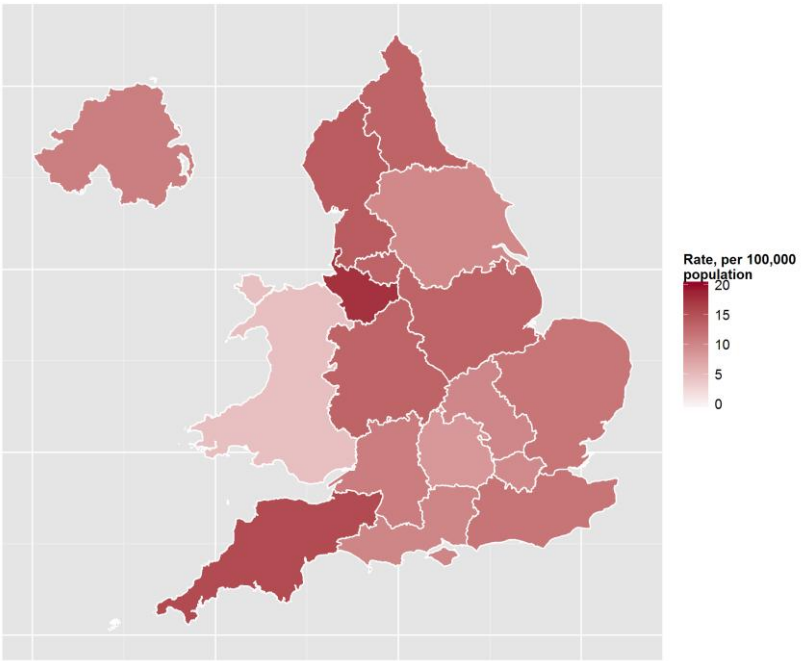
*Data extracted on 17 July 2015

Figure 2a. Geographical distribution of MRSA bacteraemia rates per 100,000 population (England, Wales and Northern Ireland): 2014*



*Data extracted on 17th July 2015

Figure 2b. Geographical distribution of MSSA bacteraemia rates per 100,000 population (England, Wales and Northern Ireland): 2014*



*Data extracted on 17 July 2015

Age and sex distribution

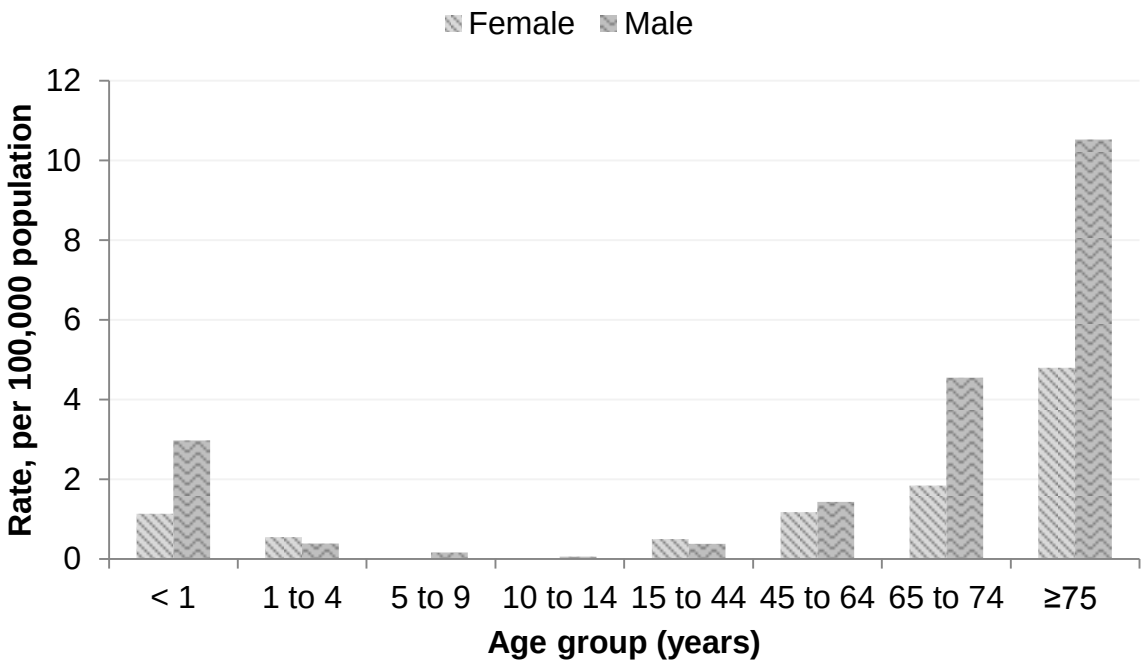
Figures 3a and 3b show age and sex distribution of MRSA and MSSA bacteraemia reports in 2014.

The highest rate of MRSA bacteraemia was observed in older age groups, namely in those over 75 years old (combined rate 7.2/100,000) and 65-74 years old (combined rate 3.2/100,000) and those below 1 (combined rate 2.1/100,000) (Figure 3a). On general, the infection incidence was higher in males than females with the exception of 1-4 (0.4/100,000 vs 0.5/100,000, respectively) and 15-44 (0.4/100,000 vs 0.5/100,000, respectively) age groups.

Similarly, the highest rate of MSSA bacteraemia was reported in those over 75 (combined rate 45.9/100,000), followed by those below 1 (combined rate 37.9/100,000) and 65-74 years old (combined rate 20.8/100,000) (Figure 3b). Males had higher infection rate across all age categories in comparison to females, with the bacteraemia rate being twice as high in males than females for age groups 45-64 (15.5/100,000 vs 7.0/100,000), 65-74 (28.2/100,000 vs 14.0/100,000) and over 75 (65.5/100,000 vs (31.9/100,000).

These overall patters in MRSA and MSSA bacteraemia rates have been described in previous years and are comparable to those seen in the mandatory surveillance data [3, 4].

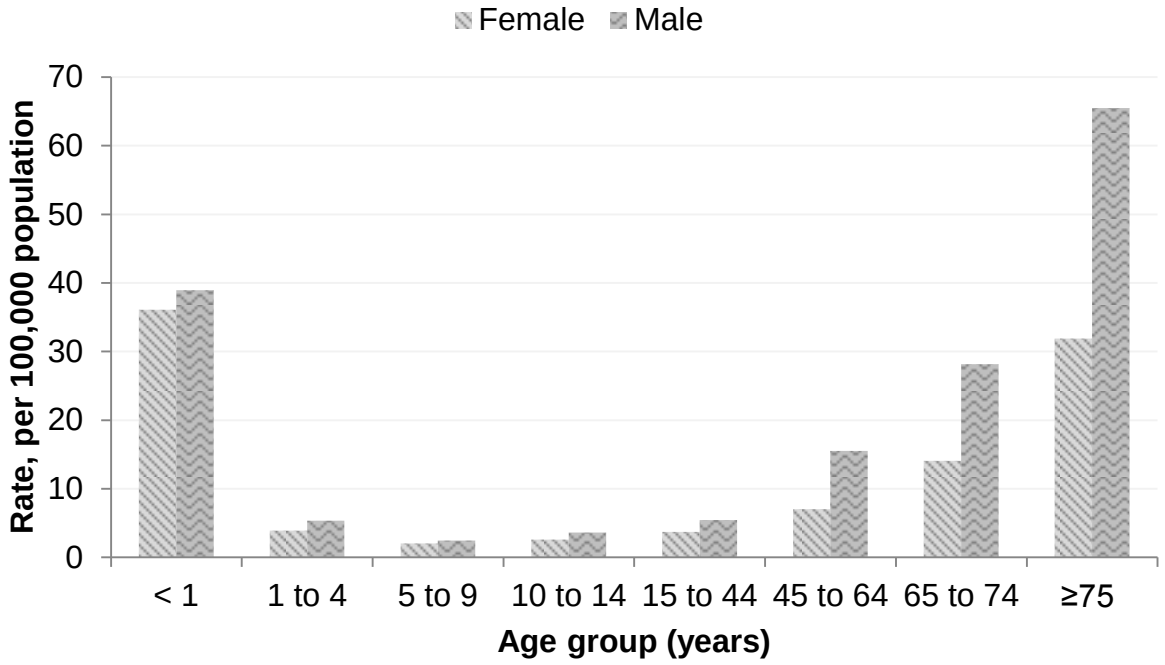
Figure 3a. MRSA age and sex rates† per 100,000 population (England, Wales and Northern Ireland): 2014*



† Rates were calculated using 2013 OSN mid-year population estimates

*Data extracted on 17 July 2015

Figure 3b. MSSA age and sex rates† per 100,000 population (England, Wales and Northern Ireland): 2014*



† Rates were calculated using 2013 OSN mid-year population estimates

*Data extracted on 17 July 2015

Antimicrobial susceptibility

The two most common Healthcare-Associated MRSA clones in the UK are the epidemic strains EMRSA-15 and EMRSA-16, which are usually resistant to ciprofloxacin and erythromycin [5]. Most voluntarily reported MRSA were resistant to these antibiotics, suggesting that EMRSA-15 and -16 continued to account for most of the MRSA bacteraemia reported under this scheme. Analysis of data from the British Society for Antimicrobial Chemotherapy Survey [6] shows that the proportion of EMRSA-16 decreased among all MRSA, while the proportion of EMRSA-15 increased between 2001 and 2007 [5]. A recent molecular epidemiological study of MRSA bacteraemia in England has shown that EMRSA-15, albeit still predominant, is declining and this has been associated with increase in clonal diversity. Furthermore, CC5 has replaced EMRSA-16 as the second most frequent lineage [7].

Tables 2a and 2b present trends in resistance to key antimicrobials for MRSA and MSSA between 2010 and 2014.

MRSA bacteraemia isolates had a high proportion (>70%) of susceptibility test results reported for majority of key antibiotics, except for linezolid (54%), erythromycin (57%), tigecycline (15%) and daptomycin (21%) in 2014. Similar patterns were observed for MSSA susceptibility test results, with lower reporting for vancomycin (62%), teicoplanin (55%), linezolid (60%), tigecycline (12%) and daptomycin (15%).

Ciprofloxacin resistance decrease in MRSA isolates by 19.9% between 2010 (90.4%) and 2014 (70.5%). Similar trend was observed in MSSA isolates during this 5 year period (7.5% in 2010 and 6.4% in 2014). Fluoroquinolone resistance is relatively stable in EMRSA-15 and -16, thus these changes in prevalence may be due to penetration by different clones [8].

Non-susceptibility to macrolides decreased in MRSA isolates by 8.0% between 2013 (64.0%) and 2014 (56.1%) and by 11.6% between 2010 (67.6%) and 2014 in comparison to MSSA isolates, where the macrolide resistance increased by 2.1% since 2013 (11.7%) and by 2.3% since 2010 (11.5%) (13.8% in 2014).

Mupirocin resistance in MRSA decreased between 2010 (9.6%) and 2014 (6.2%), while the resistance in MSSA isolates remained stable at around 1% during the same period.

Resistance to fusidic acid fluctuated between 13.5% and 20.4% in MRSA and between 12.7% and 13.7% in MSSA between 2010 and 2014.

Similarly, non-susceptibility to rifampicin in MRSA as well as MSSA showed no clear upward or downward trend between 2010 and 2014, being broadly around 2-7% and 2%, respectively.

Laboratories are asked to send any isolates suspected to have intermediate of full glycopeptides resistance, or resistance to newer agents used to treat staphylococcal infections (daptomycin, linezolid and tigecycline) to PHE's Antimicrobial Resistance and Healthcare Associated Infections (AMRHAI) Reference Unit, Colindale [9] for characterisation, including exploring the emergence and spread of new clones.

In 2014, resistance to vancomycin, tigecycline, linezolid and daptomycin remained low at 1% or less in MRSA and MSSA, though it is notable that AMRHAI observes small numbers of isolates where mutational resistance to linezolid or daptomycin has been selected during therapy, and occasional isolates with the *cfr* gene, a transferable linezolid resistance mechanism.

Table 2a. Antibiotic susceptibility for MRSA bacteraemia in England, Wales and Northern Ireland: 2010-2014*

	2010		2011		2012		2013		2014	
	No. Tested	% Resistant	No. Tested	% Resistant	No. Tested	% Resistant	No. Tested	% Resistant	No. Tested	% Resistant
Gentamicin	1,088	9.1	847	10.2	782	10.7	758	9.5	726	10.7
Ciprofloxacin	1,005	90.4	784	87.5	751	87.0	695	81.9	692	70.5
Linezolid	645	0.2	526	0.8	550	0.4	509	0.0	461	0.2
Erythromycin	992	67.6	784	59.6	601	63.9	567	64.0	487	56.1
Rifampicin	1,069	4.0	809	6.6	740	2.0	688	5.2	687	3.1
Mupirocin	995	9.6	789	7.0	744	8.6	678	8.1	679	6.2
Fusidic acid	1,091	13.5	851	16.8	806	14.9	763	20.4	717	18.0
Total Reports	**1,284**		**999**		**937**		**877**		**853**	

* Data extracted on 17 July 2015

Table 2b. Antibiotic susceptibility for MSSA bacteraemia in England, Wales and Northern Ireland: 2010-2014*

	2010		2011		2012		2013		2014	
	No. Tested	% Resistant	No. Tested	% Resistant	No. Tested	% Resistant	No. Tested	% Resistant	No. Tested	% Resistant
Gentamicin	5,753	1.0	5,887	0.9	5,778	1.3	6,067	1.3	5,782	1.4
Ciprofloxacin	4,813	7.5	4,872	7.6	4,952	7.2	5,164	6.9	4,975	6.4
Linezolid	2,918	0.1	3,358	0.1	3,714	0.1	4,205	0.0	4,058	0.1
Erythromycin	5,299	11.5	5,266	12.3	5,164	11.8	5,306	11.7	4,841	13.8
Rifampicin	5,179	1.7	5,259	1.5	5,270	1.9	5,586	2.1	5,375	1.7
Mupirocin	4,509	0.9	4,667	0.5	4,775	0.6	5,084	0.9	4,933	1.0
Fusidic acid	5,969	12.7	6,056	12.1	5,991	12.6	6,168	13.7	5,903	13.5
Total Reports	**6,926**		**6,824**		**6,619**		**6,973**		**6,725**	

*Data extracted on 17 July 2015

Ascertainment: Comparison of MRSA and MSSA positive specimens from the voluntary laboratory reporting scheme versus MRSA and MSSA infections from the mandatory surveillance scheme in England

The following data compare MRSA and MSSA bacteraemias reported to the voluntary laboratory surveillance scheme with those reported to the mandatory surveillance scheme. In order for the data to be comparable, the MSSA laboratory reports from the voluntary surveillance scheme have been limited to January 2011 onwards, when MSSA mandatory surveillance commenced. All voluntary bacteraemia reportes were limited to those from England only (Wales and Northern Ireland do not take part in the English mandatory surveillance scheme).

The number of MRSA bacteraemia reports under voluntary and mandatory reporting schemes show similar decreasing trend (Table 3a), however, while the numbers of infection reports to the mandatory surveillance decreased by 52.1% between 2010 and 2014, it was only 34.0% under the voluntary scheme. There was a discord between MSSA bacteraemia reports between the two schemes between 2011 and 2014 (Table 3b); the number of reports increased year-on-year between 2012 and 2014 (8,737 in 2012, 9,143 in 2013, and 9,717 in 2014) under the mandatory scheme, while it decreased in 2014 (6,132 in 2013 and 6,044 in 2014) under the voluntary scheme.
The case ascertainment of MRSA bacteraemia reports to the voluntary scheme improved between 2010 and 2014 reaching its highest percentage in 2014 at 89.5%. Case ascertainment of MSSA reported to the voluntary scheme fluctuated between 2011 (68.1%) and 2014 (62.2%), with the highest ascertainment obtained in 2011.

Table 3a. Ascertainment of MRSA data for the mandatory and voluntary reporting schemes in England: 2010- 2014*

Year	Voluntary reports	Mandatory reports	% Ascertainment
2010	1,060	1,631	65.0
2011	816	1,187	68.7
2012	753	934	80.6
2013	736	908	81.1
2014	700	782	89.5

* Data extracted on 17 & 20 July 2015

Table 3b. Ascertainment of MSSA data for the mandatory and voluntary reporting schemes in England: 2011- 2014*

Year	Voluntary reports	Mandatory reports	% Ascertainment
2011	5,985	8,783	68.1
2012	5,762	8,737	65.9
2013	6,132	9,143	67.1
2014	6,044	9,717	62.2

* Data extracted on 17 & 20 July 2015

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