



## Infection report

Volume 8 Number 15 Published on: 17 April 2014

### Bacteraemia

## Voluntary surveillance of *Enterococcus* spp. causing bacteraemia in England, Wales and Northern Ireland: 2013

These analyses are based on data extracted from the Public Health England (PHE) voluntary surveillance database, LabBase2, on 31 March 2014 for the period 2009-2013. The data presented here differ in some instances from data in earlier publications due to the inclusion of late reports.

Rates were calculated using 2012 mid-year resident population estimates based on the 2011 census for England, Wales, and Northern Ireland [1,2]. Regional analyses were made based on the geographic location of the reporting laboratory with reference to the Government Office Regions introduced in April 2002 rather than the Public Health Centre areas created in April 2013 when Public Health England was established; this is due to the availability of data in this breakdown at the time of producing the report. Future reports will include data presented by PHE Centre.

The report includes analyses of the trends, age and sex distribution, and geographical distribution of cases of enterococcal bacteraemia and the antimicrobial susceptibility of isolates.

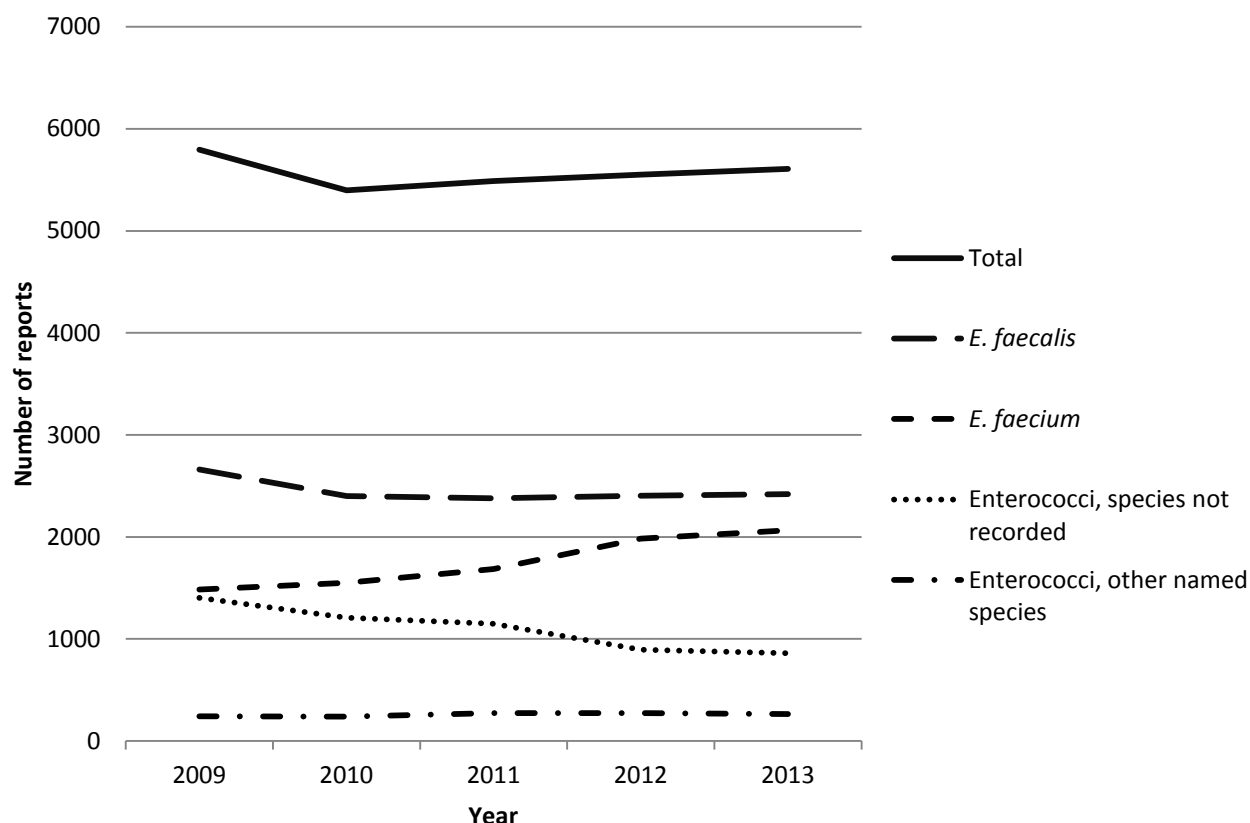
### Key points

- The total number of enterococcal bacteraemia reports fluctuated without particular trend, from 5794 in 2009 to 5608 in 2013.
- The overall rate of enterococcal bacteraemia in England, Wales and Northern Ireland in 2013 was 9.54 cases per 100,000.
- Northern Ireland had the highest rate of *Enterococcus* spp. bacteraemia in 2013, with a rate of 12.63 per 100,000.
- Between 2009 and 2013 there was a 39% increase in the number of reports of bacteraemia due to *Enterococcus faecium* (from 1486 in 2009 to 2066 in 2013). There was a 9.8% decrease in the number of reports of *Enterococcus faecalis* (from 2662 in 2009 to 2402 in 2010).
- Most cases of *E. faecalis* bacteraemia occurred in patients less than one year old and in those over 64 years old.
- Most cases of *E. faecium* bacteraemia occurred in patients over 64 years old.
- Increasing levels of resistance to high-level gentamicin, vancomycin and teicoplanin were observed for *E. faecium* isolates.

## Trends in episode numbers

The total number of enterococcal bacteraemia reports fluctuated between 5794 in 2009 and 5608 in 2013 (figure 1). Between 2008 and 2012 the proportion of isolates identified to species level increased from 74% to 85%. Over the five-year period, there was a 39% increase in the number of reports of *Enterococcus faecium* bacteraemia, from 1486 in 2009 to 2066 in 2013 mirroring the increase in the proportion of isolates identified to species level. In contrast, there was a 9.8% decrease in the number of reports of *Enterococcus faecalis* bacteraemia, from 2662 in 2009 to 2402 in 2010, with the yearly numbers of reports remaining relatively stable from 2010 to 2013.

**Figure 1. Laboratory reports of enterococcal bacteraemia in England, Wales and Northern Ireland: 2009–2013**



**Table 1. Reports of enterococcal bacteraemia by species, England, Wales and Northern Ireland: 2009–2013**

	2009		2010		2011		2012		2013	
	count	%	count	%	count	%	count	%	count	%
Total	5794	100	5397	100	5489	100	5552	100	5608	100
Enterococci, species not recorded	1403	24	1207	22	1148	21	894	16	860	15
Enterococci, other named species	243	4	238	4	275	5	272	5	263	5
<i>E. faecalis</i>	2662	46	2402	45	2380	43	2403	43	2419	43
<i>E. faecium</i>	1486	26	1550	29	1686	31	1983	36	2066	37

## Age and sex distribution

For both *E. faecalis* and *E. faecium*, high rates of bacteraemia were observed in the over 64 age group. High rates were also observed in the under one year old age group for *E. faecalis* but not *E. faecium*. For both organisms, higher rates of bacteraemia were observed in men than in women.

Figure 2. Age and sex distribution of *E. faecalis* bacteraemia rates, England, Wales and Northern Ireland 2013

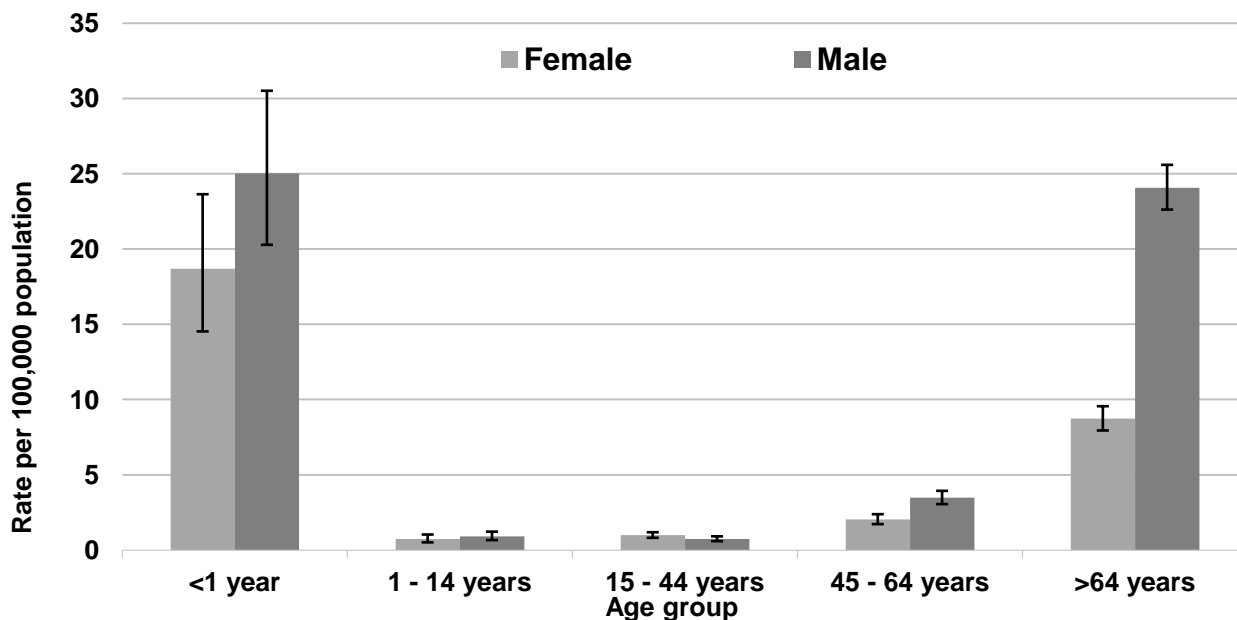
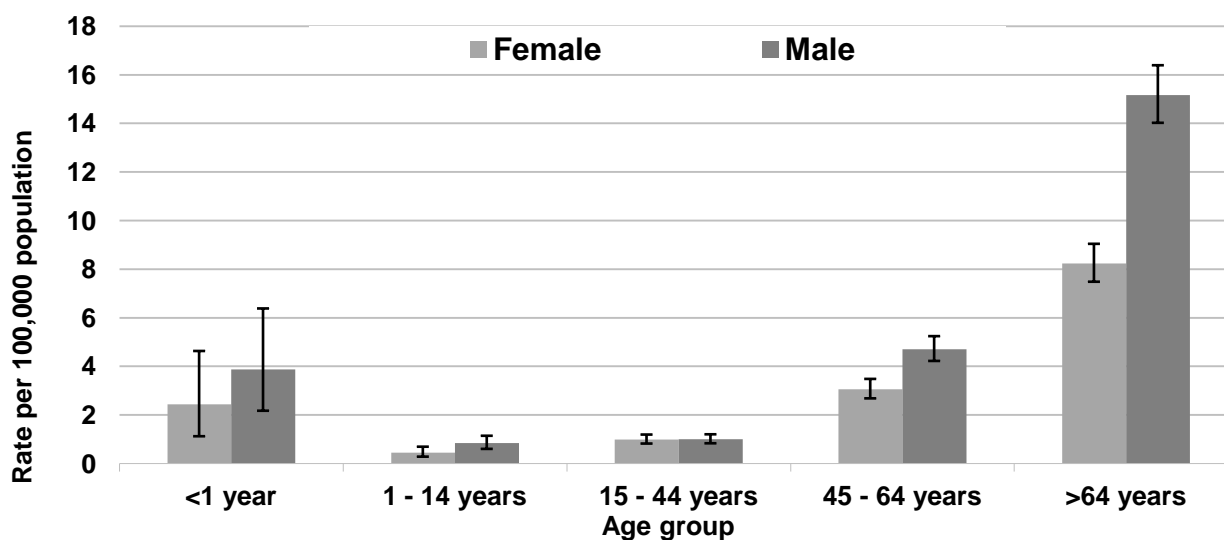


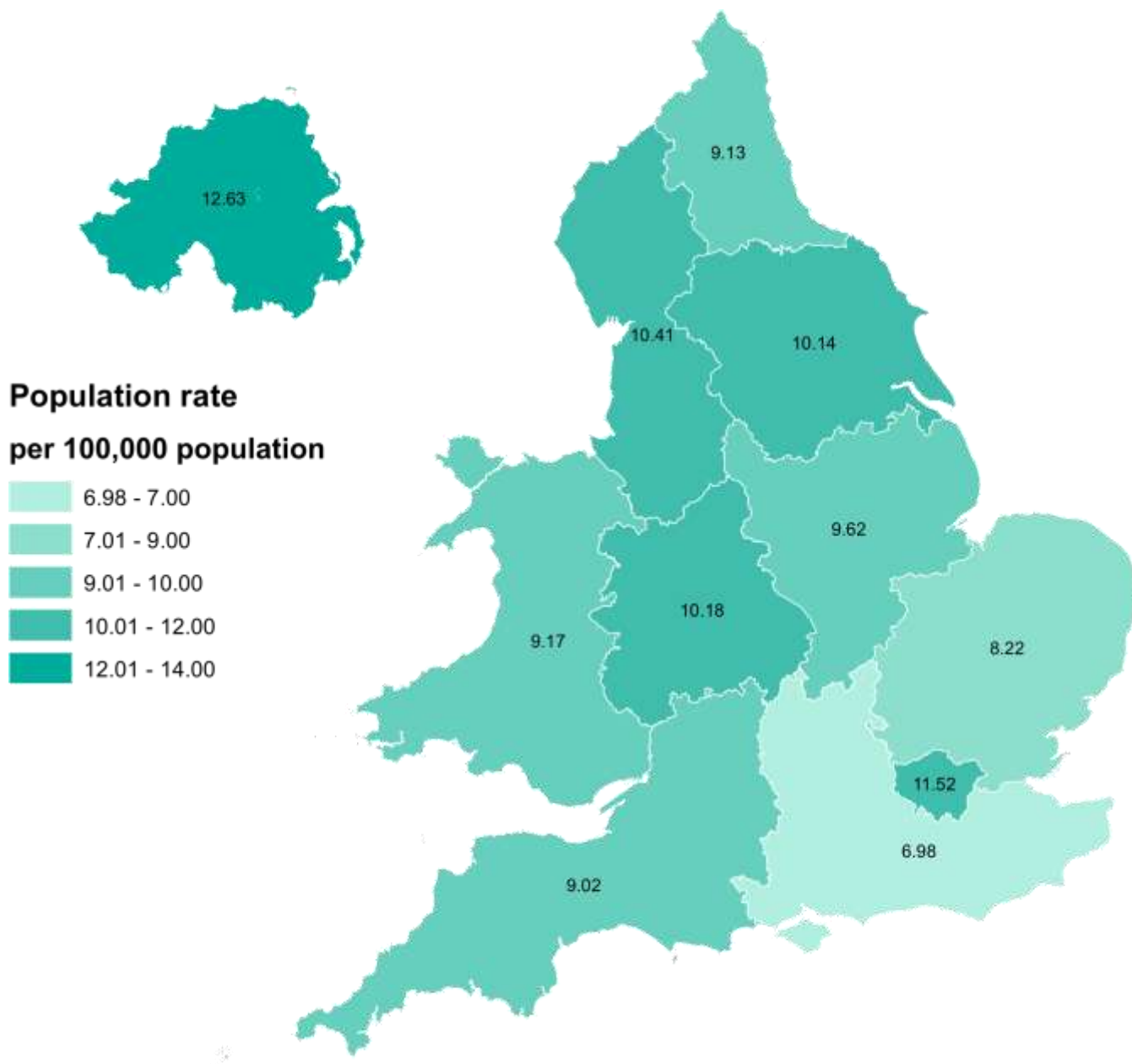
Figure 3. Age and sex distribution of *E. faecium* bacteraemia rates, England, Wales and Northern Ireland 2013



## Geographic distribution

The overall rate of enterococcal bacteraemia for England, Wales and Northern Ireland was 9.54 per 100,000, which is consistent with previous years. The highest rates were observed in Northern Ireland (12.63 cases per 100,000), London (11.52 per 100,000) and the North West (10.41 per 100,000, figure 4).

**Figure 4. Region-specific rates of *Enterococcus* spp. bacteraemia, England, Wales and Northern Ireland, 2013**



## Antimicrobial susceptibility data

Five-year trends for the antibiotic susceptibility of *E. faecalis* and *E. faecium* for England, Wales and Northern Ireland are shown in tables 2 and 3. There was a steady decline in the proportion of *E. faecalis* isolates that were reported as resistant to amoxicillin (6% in 2009 to 3% in 2013). However, non-susceptibility to amoxicillin in *E. faecalis* has never been confirmed in the UK, suggesting that isolates reported as non-susceptible to amoxicillin have either been misidentified or that the test results were erroneously classified as resistant.

Analysis of available antimicrobial susceptibility test results showed that the proportion of *E. faecium* isolates reported as resistant rose for high-level gentamicin (50% in 2009 to 60% in 2013), vancomycin (19% in 2009 to 25% in 2013) and teicoplanin (17% in 2009 to 25% in 2013). However, the proportion of isolates where the data reported indicated that testing for high-level gentamicin resistance had been undertaken was relatively low (11%), although this may be a reporting artefact..

Isolates with the dominant mechanisms of acquired vancomycin resistance in enterococci are either cross-resistant to teicoplanin (due to acquisition of VanA) or remain susceptible to teicoplanin (due to VanB). The percentage of *E. faecalis* isolates resistant to vancomycin is lower than expected in comparison to the percentage of isolates non-susceptible to teicoplanin, which is almost certainly an artefact due to some laboratories reporting susceptibility data for teicoplanin and not vancomycin. Resistance to teicoplanin has never been confirmed in enterococci that are susceptible to vancomycin.

The proportions of both *E. faecalis* and *E. faecium* tested against linezolid rose between 2009 and 2013. Over this period, the proportion of tested isolates that were resistant to linezolid fell for *E. faecalis* (from 2% in 2009 to 0% in 2013) and remained level at 1% for *E. faecium*.

**Table 2. Antibiotic susceptibility data for reports of *E. faecalis* bacteraemia, England, Wales and Northern Ireland: 2009 to 2013**

	2009		2010		2011		2012		2013	
	No. tested	% resistant	No. tested	% resistant	No. tested	% resistant	No. tested	% resistant	No. tested	% resistant
Amoxicillin	2109	6%	1967	5%	1994	5%	2047	4%	2065	3%
High level Gentamicin	325	33%	329	32%	357	25%	372	29%	435	30%
Vancomycin	2119	2%	1963	1%	1954	3%	2025	1%	2037	1%
Teicoplanin	1550	3%	1501	3%	1502	3%	1584	2%	1608	1%
Linezolid	768	2%	940	1%	1084	1%	1219	0%	1386	0%
Total reports:	2662		2402		2380		2403		2419	

**Table 3. Antibiotic susceptibility data for reports of *E. faecium* bacteraemia, England, Wales and Northern Ireland: 2009 to 2013**

	2009		2010		2011		2012		2013	
	No. tested	% resistant	No. tested	% resistant	No. tested	% resistant	No. tested	% resistant	No. tested	% resistant
Amoxicillin	1177	89%	1276	90%	1458	90%	1694	93%	1753	92%
High level Gentamicin	168	50%	191	54%	186	56%	245	59%	334	60%
Vancomycin	1254	19%	1323	17%	1475	18%	1746	21%	1815	25%
Teicoplanin	935	17%	1068	15%	1206	17%	1467	21%	1495	25%
Linezolid	550	1%	751	1%	964	1%	1243	1%	1353	1%
Total reports:	1486		1550		1686		1983		2066	

## References

1. Office for National Statistics. Mid-year population estimates for England and Wales, 2012 (2012 Census-based). ONS. 2013 (available at <http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-england-and-wales/mid-2012/mid-2012-population-estimates-for-england-and-wales.html>)
2. Northern Ireland Statistics and Research Agency. Mid-year population estimates for Northern Ireland, 2012. NISRA. 2013 (available at [http://www.nisra.gov.uk/archive/demography/population/midyear/MYE\\_2012\\_Report.pdf](http://www.nisra.gov.uk/archive/demography/population/midyear/MYE_2012_Report.pdf))
3. Public Health England. Voluntary surveillance of Enterococcus spp. causing bacteraemia in England, Wales and Northern Ireland: 2012. London: Public Health England; 2013.

## Acknowledgements

These reports would not be possible without the weekly contributions from microbiology colleagues in laboratories across England, Wales, and Northern Ireland, without whom there would be no surveillance data. The support from colleagues within Public Health England, and the Antimicrobial Resistance and Healthcare Associated Infections (ARMHAI) Reference Unit, in particular, is valued in the preparation of the report. Feedback and specific queries about this report are welcome and can be sent to [hcai.amrdepartment@phe.gov.uk](mailto:hcai.amrdepartment@phe.gov.uk).