Public Health England

Health Protection Report
weekly report

Volume 8 Numbers 36 Published on: **19 September 2014**

Current News / Diary

- **Annual update on voluntarily reported candidaemia published**
- **BBVs and healthcare workers: fifth biennial conference**
- **Colindale symposium: TB for non-TB specialists**

Infection Reports

Bacteraemia/HCAI

- **Voluntary surveillance of candidaemia in England, Wales and Northern Ireland: 2013**

Volume 8 Number 36 Published on: **19 September 2014**

Annual update on voluntarily reported candidaemia published

In England, Wales and Northern Ireland the overall rate of *Candida* species blood infections was three per 100,000 population in 2013, according to the annual report published in the Infection Reports section of this issue of *HPR* [1].

In 2013, 49% of candidaemia were reported as *Candida albicans* and 26% as *C. glabrata*. The rate of candidaemia was highest in those aged 75 years and over, a pattern reflected in the top three reported candida species: *C. albicans* (4.6/100,000 population), *C. glabrata* (3.7) and *C. parapsilosis* (0.7).

Antifungal susceptibility data for 2013 are also included in the report.

Reference

1. "Voluntary surveillance of candidaemia in England, Wales and Northern Ireland: 2013", *HPR* **8**(36): bacteraemia, 19 September 2014.

BBVs and healthcare workers: fifth biennial conference, Cardiff, December 2014

PHE, the Faculty of Occupational Medicine, the Infection Protection Society, with support from Public Health Wales and the Welsh Government, are co-organisers of the 5th biennial "POINTERS" conference (Prevention of Occupational Infection, Treatment and Exposure Reporting Strategies) to be held in Cardiff from 11 to 12 December 2014 [1].

The conference is the only UK event dedicated to the theme of prevention and control of Bloodborne Viruses (BBVs) among healthcare workers. The programme focuses not only on the prevention of healthcare worker exposures to BBVs but also on improving the reporting, follow-up and management of exposures and occupationally-acquired BBV infections.

Previous POINTERS events were primarily concerned with the prevention of needlestick injuries in HCWs and the risk of acquiring HIV, hepatitis B and/or hepatitis C. The focus of this year's event is broader, including a wider range of infections relevant to HCWs and sources of infection other than needlestick injuries.

The 2014 POINTERS programme [2], while including the prevention of needlestick injuries and exposures to BBVs as principal themes, also includes sessions on tuberculosis, influenza and Viral Haemorrhagic Fever. Other presentations will cover the latest data generated by the UK Significant Occupational Exposure Surveillance System, and information on the new UKAP Occupational Monitoring Health Register for Infected Healthcare Workers.

References

1. "POINTERS" 5th conference, 11-12 December, Cardiff, Wales. Conference brochure. [http://www.rcpath.org/Resources/RCPath/Migrated%20Resources/Documents/Other/5th_POINTERS_Conference_11121214_EXTMTG.pdf]
2. Outline programme. [https://www.eventsforce.net/FITWISE/media/uploaded/EVFITWISE/event_230/POINTERS%202014%20Programme%20from%205th%20Sept.pdf]

Colindale symposium: TB for non-TB specialists

A one-day symposium for non-TB specialists will be held at PHE-Colindale (north-west London), on Thursday, 2 October, intended for primary/community/social care professionals, NHS A&E and ward staff, prison and detention centre healthcare professionals and others requiring a refresher course on tuberculosis. The programme covers: incidence trends; aetiology, pathogenesis and clinical aspects; diagnosis, treatment and management; outbreak investigation; and principles of infection control.

Online registration is available at: https://www.phe-protectionservices.org.uk/ .

Further information: Yvette Howell, Education and Training Coordinator: 020 8327 7427 (direct line); email: yvette.howell@phe.gov.uk.

Public Health England

Health Protection Report
weekly report

Infection report

Volume 8 Number 36 Published on: 19 September 2014

Voluntary surveillance of candidaemia in England, Wales and Northern Ireland: 2013

These analyses are based on data extracted from the Public Health England (PHE) voluntary microbiology surveillance database, LabBase2, on 6 May 2014 for the period 2009 to 2013. Data presented may differ from previous reports due to the inclusion of late reports.

Population rates were calculated using mid-year resident population estimates based on the 2011 census for England, Wales and Northern Ireland [1]. English sub-national geographical analyses were based on the residential location of the patient with reference to PHE Centre geographies; Wales and Northern Ireland were each analysed as a whole.

The report includes analyses on the trend, age and sex distribution, geographical distribution and the antimicrobial susceptibility in reported cases of candidaemia.

Key points

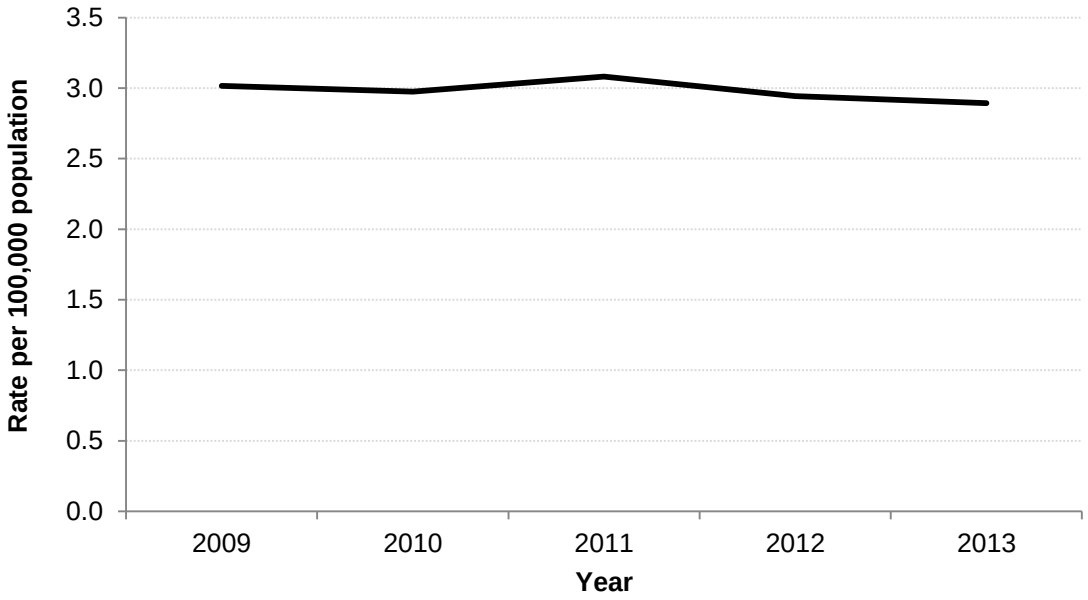
- the incidence remained steady between 2009 and 2013 at 3 per 100,000 population
- Northern Ireland reported the highest rate per 100,000 population per year (5.2) in 2013, followed by Wales (3.2) and then England (2.8)
- in 2013 the highest rate within England was in the Greater Manchester PHE Centre area (3.9/100,000 population per year) and the lowest reported in Thames Valley (1.6)
- between 2009 and 2013 the PHE Centre area, in England, with the greatest increase in incidence was Cheshire and Merseyside (34%; 2.7 to 3.6/100,000)
- reports of *Candida* spp. isolated from blood have fallen slightly in 2013 to 1700 representing a 1% decrease since 2009 in England, Wales and Northern Ireland
- forty-nine per cent of candidaemia were reported *as Candida albicans* and 26% as *Candida glabrata* in 2013
- reports of *C. glabrata* fungaemia increased by 18% between 2009 and 2013
- a reduction in candidaemia infection rates in infants under one year of age was observed between 2012 and 2013; 8.0 to 6.1/100,000 in males and 6.5 to 4.7 in female infants; sustaining a reduction seen each year since 2009
- in 2013 the rate of candidaemia was highest in those aged 75 years and over (15.8 and 6.1 in males and females respectively), a pattern reflected in the top three reported *Candida* species; *C. albicans* (4.6/100,000 population), *C. glabrata* (3.7/100,000) and *C. parapsilosis* (0.7)
- the proportion of candidaemia reports with antifungal susceptibility results in 2013 was 39% , this is higher than reported in all previous years
- in 2013, the proportion of *C. albicans* fungaemia isolates resistant to amphotericin B was 1%, fluconazole 2%, flucytosine 2% and voriconazole was <1%
- the proportion of resistant *C. glabrata* fungaemia isolates in 2013 remained steady or reduced compared with 2012

Trends

The incidence of *Candida* species isolated from blood specimens in England, Wales and Northern Ireland remained steady at around 3 per 100,000 population per year between 2009 and 2013 (figure 1). *Candida* spp. accounted for 1.7% of monomicrobial bloodstream infections in 2012; making it the tenth most commonly reported monomicrobial bloodstream infection-causing organism [2].

Between 2012 and 2013 there was a 1% decrease in candidaemia reports (1719 and 1700 reports respectively; table 2); a contrast to a 1% increase observed in all fungaemia reported to LabBase2 between 2009 and 2013.

Figure 1. Five year trend in candidaemia reports per 100,000 population in England Wales and Northern Ireland; 2009 to 2013



Geographical distribution

In 2013 the overall rate of candidaemia for England, Wales and Northern Ireland was 2.9 cases/100,000 population; the rate was highest in Northern Ireland with 5.2 per 100,000 population, followed by Wales (3.2/100,000) and England (2.8; figure 2). Candidaemia incidence in Wales has decreased by 15% from 2012 (3.7) but overall a 38% increase has been reported since 2009 (2.3). Northern Ireland reported an 11% increase on 2012 (4.7) but the 5 year trend shows that overall there was no change (5.2; table 1).

The English PHE Centre area with the highest reported rate in 2013 was Greater Manchester (3.9/100,000 population), and the area with this greatest increase in incidence between 2009 and 2013 was also in the North West of England, Cheshire and Merseyside (34% increase; 2.7 to 3.6/100,000). Lowest incidences observed were for Thames Valley (1.6), Yorkshire and Humber (1.9) and the North East (2.4) in 2013.

Figure 2. Geographical distribution of candidaemia rates per 100,000 population in England, Wales and Northern Ireland; 2013

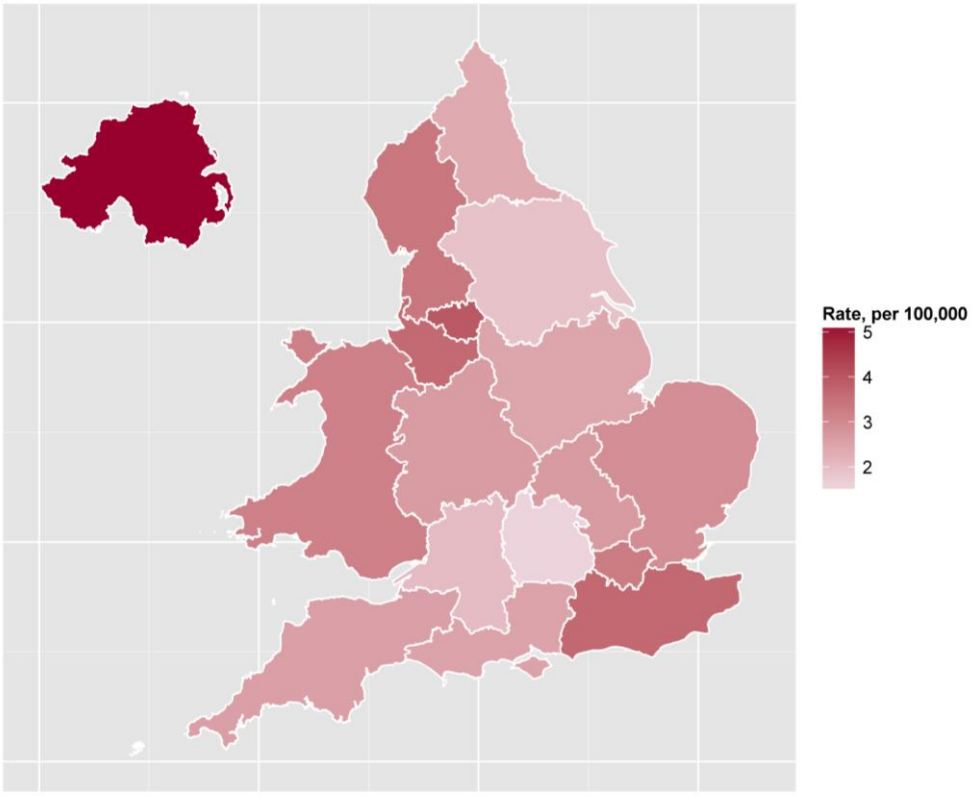


Table 1. Five year reporting rate trend by Public Health England Centre and country in England Wales and Northern Ireland; 2009 to 2013

	Rate per 100,000 population				
PHE Centre	**2009**	**2010**	**2011**	**2012**	**2013**
London	3.9	3.6	3.2	3.4	3.3
South Midlands and Hertfordshire	3.2	2.3	2.5	3.0	2.7
East Midlands	3.2	3.2	3.4	3.0	2.5
Anglia and Essex	2.8	3.3	3.5	3.0	2.9
West Midlands	3.0	2.7	3.0	2.2	2.6
Cheshire and Merseyside	2.7	3.4	3.9	3.8	3.6
Cumbria and Lancashire	2.6	1.9	2.9	2.6	3.4
Greater Manchester	4.2	3.9	3.8	4.0	3.9
North East	2.1	2.3	2.9	2.6	2.4
Yorkshire and Humber	2.1	2.2	2.0	1.9	1.9
Avon Gloucestershire and Wiltshire	2.2	2.4	2.7	2.5	2.0
Devon Cornwall and Somerset	2.7	2.9	2.0	2.3	2.6
Wessex	2.2	2.3	2.9	2.4	2.5
Kent Surrey and Sussex	3.6	2.8	3.2	3.3	3.6
Thames Valley	2.5	1.7	2.3	1.9	1.6
England	**3.0**	**2.8**	**3.0**	**2.8**	**2.8**
Northern Ireland	**5.2**	**6.3**	**5.5**	**4.7**	**5.2**
Wales	**2.3**	**3.2**	**3.4**	**3.7**	**3.2**
E, W, NI	**3.0**	**3.0**	**3.1**	**2.9**	**2.9**

Species distribution

In 2013, 96% (1627/1700) of *Candida* spp. isolates from blood were identified to species level (table 2); this is a slight improvement on the previous year where 94% were identified at species level. Just under half were identified as *C. albicans* (49%; 831), a decline since 2009 (52%). There has been an 8% decrease in number of *C. albicans* fungaemia reported between 2009 and 2013.

The second most frequently reported *Candida* species from BSI was *C. glabrata* (26%; 448). The proportion of *Candida* BSI identified as *C. glabrata* increased each year from 2009 (381; 22%). An 18% increase in numbers of *C. glabrata* BSI has been reported over the time period. Increases have also been seen in the some of the other *Candida* species (*C. dubliniensis* and *C. guilliermondii*).

Table 2. Reports of candidaemia by species in England, Wales and Northern Ireland; 2009 to 2013

	2009		2010		2011		2012		2013	
	count	**%**	**count**	**%**	**count**	**%**	**count**	**%**	**count**	**%**
***Candida* spp.**	**1720**	**100%**	**1710**	**100%**	**1787**	**100%**	**1719**	**100%**	**1700**	**100%**
C. albicans (stellatoidea)	900	52%	873	51%	873	49%	831	48%	831	49%
C. glabrata	381	22%	412	24%	443	25%	425	25%	448	26%
C. parapsilosis	170	10%	157	9%	170	10%	168	10%	172	10%
C. tropicalis	63	4%	64	4%	70	4%	70	4%	61	4%
C. krusei	26	2%	23	1%	25	1%	23	1%	22	1%
C. lusitaniae	27	2%	20	1%	32	2%	31	2%	21	1%
C. guilliermondii	7	0%	6	0%	27	2%	22	1%	16	1%
C. dubliniensis	4	0%	6	0%	9	1%	10	1%	12	1%
C. famata	6	0%	5	0%	8	0%	4	0%	7	0%
C. ciferrii	2	0%	1	0%	0	0%	0	0%	2	0%
C. kefyr (pseudotropicalis)	5	0%	11	1%	5	0%	5	0%	2	0%
C. pelliculosa	1	0%	1	0%	1	0%	1	0%	1	0%
C. navariensis	0	0%	1	0%	0	0%	0	0%	0	0%
Candida spp., other named	30	2%	27	2%	27	2%	30	2%	32	2%
Candida spp., sp. not recorded	98	6%	103	6%	97	5%	99	6%	73	4%

Age and sex distribution

In line with previous reports, candidaemia rates were highest in infants and the elderly, and rates were higher in men than women. The highest rates were reported in those aged 75 years and above at 10.2 per 100,000 population (6.1 in females and 15.8 in males; figure 3), and the lowest in those aged 10 to 14 years (0.3/100,000; males 0.2, females 0.3).

Infection rates in infants (under one year) have continued the decreasing trend noted in the last report, from 8.0 in 2012 to 6.1 in 2013 in male infants, and 6.5 to 4.7/100,000 in female infants [3]. The relative age distribution was similar between the three most frequently reported *Candida* species from fungaemia in 2013, with high rates being observed in those aged 75 years and over and infants (figure 4). The exception is in *C. glabrata* fungaemia where the rate of infection in infants is low, accounting for <1% reports (0.1/100,000).

Figure 3. Rate per 100,000 population candidaemia by age and sex in England, Wales and Northern Ireland; 2013

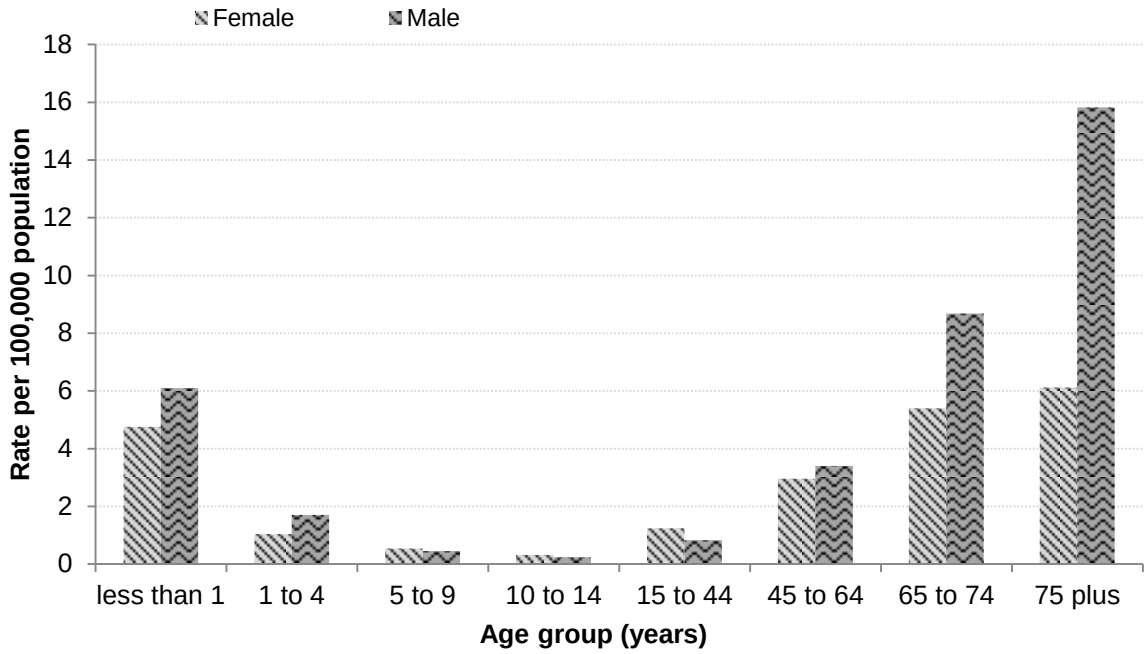
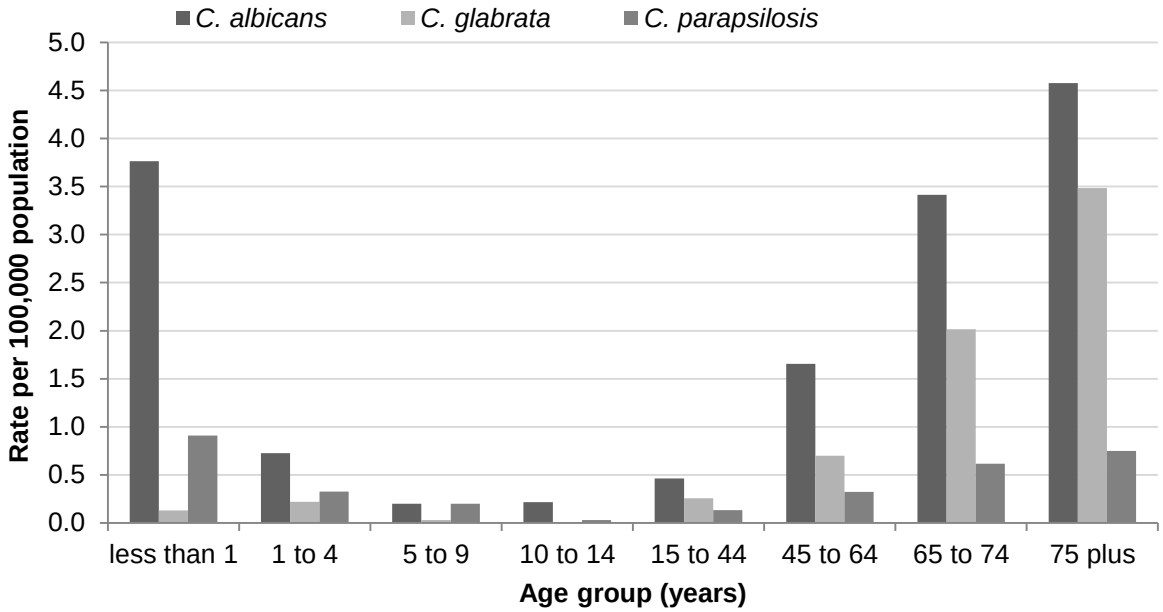


Figure 4. Population rate by age group for BSI caused by *C. albicans*, *C. glabrata* and *C. parapsilosis* in England, Wales and Northern Ireland; 2013



Antifungal susceptibility

The prevalence of non-susceptibility is calculated by dividing the number of isolates reported as intermediate (reduced susceptibility) or resistant (non-susceptible) by the total number of isolates tested against a given antifungal agent. Candidaemia reports in LabBase2 provided susceptibility results to one or more of the following agents – amphotericin B, caspofungin, fluconazole, flucytosine, and voriconazole.

The proportion of candidaemia reports with susceptibility testing data has increased each year, from 5% in 2009 to 39% in 2013 (44% in England). The increase in test reporting may be in part due to the increased awareness following the production of guidelines in 2012 recommending antifungal susceptibility testing for all *Candida* species isolated from blood [4]. The proportion of

isolates reported as tested against antifungals varied geographically in 2013, ranging from 2% in Wales (2/98) and Northern Ireland (2/95) to 74% and 70% in Cheshire and Merseyside (65/88) and Greater Manchester (75/107) respectively.

Overall, 37% of *C. albicans* fungaemia reports were accompanied by antifungal test result information in 2013 (41% in England), an increase on 33% of reports in 2012. The proportion of *C. albicans* BSI in 2013 reported as resistant to the most commonly tested antifungals ranged from <1% to 2% (table 3).

The proportion of *C. glabrata* fungaemia reports which were reported as resistant to an antifungal in 2013 remained steady or reduced slightly compared to 2012 (table 4), however there was a large reduction in fluconazole non-susceptibility in *C. glabrata* observed between 2011 and 2012. This reduction is most likely explained by laboratories using revised Clinical and Laboratory Standards Institute (CLSI) breakpoints since 2012, which would lead those isolates previously classified as 'susceptible' and those reported as being 'intermediate' (reduced susceptibility) to being reported in a single category of 'susceptible-dose-dependent' but with the advice to always use high-dose fluconazole [5]. A reduction in *C. glabrata* fluconazole intermediate reports has indeed been seen since 2012, in 2009 17% of *C. glabrata* BSI were reported as 'intermediate' to fluconazole, 26% in 2010 and 25% in 2011, reducing to 13% and 11% reported as 'intermediate' for fluconazole susceptibility in 2012 and 2013 respectively.

Table 3. Antifungal susceptibility for *C. albicans* fungaemia reports in England, Wales and Northern Ireland; 2009 to 2013

	2009		2010		2011		2012		2013	
Antifungal agent	**No. tested**	**% resistant (% R)***	**No. tested**	**%R***	**No. tested**	**%R***	**No. tested**	**%R***	**No. tested**	**%R***
Amphotericin B	25	0%	118	<1%	174	<1%	220	<1%	253	1%
Caspofungin	16	0%	60	0%	60	0%	60	0%	60	0%
Fluconazole	39	0%	174	1%	208	2%	265	1%	293	2%
Flucytosine	17	0%	115	<1%	161	4%	192	4%	219	2%
Voriconazole	29	3%	133	0%	183	0%	237	<1%	276	<1%
Total *C. albicans*	900		873		873		831		831	

* Reported as reduced- or non-susceptible

Table 4. Antifungal susceptibility for *C. glabrata* fungaemia reports in England, Wales and Northern Ireland; 2009 to 2013

	2009		2010		2011		2012		2013	
Antifungal agent	**No. tested**	**% resistant (% R)***	**No. tested**	**%R***	**No. tested**	**%R***	**No. tested**	**%R***	**No. tested**	**%R***
Amphotericin B	21	0%	69	0%	115	2%	146	3%	162	<1%
Caspofungin	12	0%	49	2%	49	2%	49	2%	49	2%
Fluconazole	29	38%	81	40%	126	48%	166	22%	184	22%
Flucytosine	17	0%	60	2%	96	0%	126	2%	132	<1%
Voriconazole	27	4%	77	5%	121	11%	158	6%	161	11%
Total *C. glabrata*	381		412		443		425		448	

* Reported as reduced- or non-susceptible

There is growing concern regarding the shift towards increased numbers of more drug resistant *Candida* species being identified [6]. Although antifungal test reporting is improving, it remains below 50% reported to LabBase2. Consequently, changes in the reported prevalence of drug

resistance cannot be interpreted with confidence. Antibacterial resistance is a matter of considerable concern and it is important that antifungal resistance is also monitored carefully [7].

The observed non-susceptibility prevalences may be biased by selective testing of patients failing to respond to therapy. The effect of this bias is amplified by low levels of susceptibility testing. The effect of this bias would be to over-estimate the true prevalence of non-susceptibility.

For advice on treatment of fungal infections or for reference mycology services including species identification and confirmation of sensitivity testing results, laboratories can contact or submit isolates to the PHE Mycology Reference Laboratory in Bristol [8].

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 PHE Mycology Reference Laboratory, in particular, is valued in the preparation of this report. Feedback and any specific enquiries regarding this report should be sent to hcai.armdepartment@phe.gov.uk.

Suggested citation

Data found in the Health Protection Report publication should be cited as: PHE. Voluntary surveillance of candidaemia in England, Wales and Northern Ireland: 2013. Health protection Report [serial online] 2014 [date cited]; 8(37): Infection Report

References

1. Office for National Statistics (ONS) mid-year population estimates for England, Wales and Northern Ireland
2. PHE. Surveillance of polymicrobial bacteraemia and fungaemia in England, Wales and Northern Ireland: 2012. *Health Protection Report* [serial online] 2014; **8**(3): infection report.
3. PHE. Voluntary surveillance of candidaemia in England, Wales and Northern Ireland: 2012. *Health Protection Report* [serial online] 2013; **7**(37-38): infection report
4. Cuenca-Estrella M, Verweij PE, Arendrup C, *et al*.. ESCMID* guideline for the diagnosis and management of *Candida* diseases 2012: diagnostic procedures. *Clin Microbiol Infect*. 2012; **18** (suppl. 7): 9-18
   *European Society for Clinical Microbiology and Infectious Diseases
5. Pfaller MA, Andes D, Diekema DJ, *et al.*. Wild-type MIC distributions, epidemiological cutoff values and species-specific clinical breakpoints for fluconazole and Candida: Time for harmonization of CLSI and EUCAST broth microdilution methods. *Drug Resist Updat.* 2010; **13**:180-195
6. Pfaller, MA. Antifungal Drug Resistance: Mechanisms, Epidemiology, and Consequences for Treatment. *The American Journal of Medicine*. (2012) **125**, S3-S13
7. Davies, SC. Annual Report of the Chief Medical Officer, Volume 2, 2011, Infections and the rise of antimicrobial resistance*. London: Department of Health* (2013)
8. Mycology Reference Laboratory (Mycology RL) Bristol