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Rising seasonal flu activity triggers CMO advice on antivirals for treatment and prophylaxis

Latest surveillance data [1] has indicated that influenza is now circulating in the community in England and on 16 December the Chief Medical Officer and Chief Pharmaceutical Officer issued a letter to signal the use of antivirals for the prophylaxis and treatment of influenza, according to NICE guidance [1,2].

Clinical indicators

- the weekly influenza-like illness (ILI) consultation rate in the PHE GP practice sentinel surveillance scheme increased from 6.9 to 9.5 per 100,000 in week 49
- syndromic surveillance indicators for ILI have started to increase across all systems (cold/flu calls through NHS 111, ILI emergency department attendances and GP Out of Hours ILI consultation rates)
- twelve acute respiratory outbreaks have been reported in the past seven days, seven in schools (two virologically tested), one in a nursery (not tested) and four in care homes (none tested)
- the UK Severe Influenza Sentinel Hospital Surveillance Scheme reported 20 new hospitalised cases of confirmed influenza infection admitted in the previous week (18 due to A(H3) or FluA untyped) and the ICU mandatory Surveillance Scheme reported 13 new admissions of confirmed influenza (11 of which were due to Flu A untyped).

Virological surveillance

- the proportion of samples positive for influenza in the PHE DataMart scheme (representing mainly persons hospitalised with acute respiratory illness) has increased to 8.1% from 4.6% the previous week (PHE baseline threshold is 6%). The highest age-specific positivity was in 5-14 year olds (18.8%) and 15-44 year olds (15.0%).

Taken together these findings indicate an increased likelihood that people presenting with an ILI are infected with influenza virus and provide the basis for using antivirals for appropriate patients presenting with ILI in the community. Full details on current flu activity are in Public Health England’s weekly flu report on the GOV.UK website [1].

PHE has reiterated that, although not life-threatening for most people, seasonal flu can be far more serious for those in “at-risk” groups. People aged 65 and over, and people aged under 65 in clinical risk groups (which includes all pregnant women), should be vaccinated against flu.

References

1. PHE weekly national flu report.
2. NICE guidance on the use of antivirals for prophylaxis for influenza.

Trends in mandatory MRSA, MSSA and *E. coli* bacteraemia, and CDI reports: data to end-September 2014

PHE’s latest quarterly epidemiological commentary on trends in reports of *Staphylococcus aureus* (MRSA and MSSA) and *Escherichia coli* bacteraemia, and of *Clostridium difficile* infections (CDI), mandatorily reported by NHS acute Trust hospitals in England up end-September 2014, has been published on the GOV.UK website [1].

The report, including tabular and graphical information, provides data for the July-September 2014 quarter to update the previous report published on 19 September 2014 [1,2]. Some key facts are listed here:

- in the July-September 2014 reporting period, the total number of MRSA bacteraemia reports decreased by 9.4% compared to the same quarter in the previous year, from 201 to 182, continuing the steady decline in MRSA reports over the last eight years
- since the July-September 2013 quarter there has been a 20.7% decrease in the total number of Trust-assigned MRSA bacteraemias (from 92 to 73 reports) and a 17.4% decrease in CCG-assigned bacteraemias (from 109 to 90 reports)
- there was a corresponding decrease in Trust-assigned rates of MRSA bacteraemia (ie reports per 100,000 bed-days) compared to the same quarter in the previous year (from 1.09 to 0.86 per 100,000 bed-days). The CCG-assigned rate – per 100,000 population – decreased from 0.80 to 0.66 over the same time period
- overall, there was a 7.1% increase in the rate of MSSA bacteraemia reports between July-September 2011 and July-September 2014. However, over the same time period was a 6.2% decrease in the rate of Trust-apportioned reports (from 8.54 to 8.01 per 100,000 bed days)

- Trust-apportioned of MSSA bacteraemia rates remained relatively consistent (ranging from 7.7-8.3) between October-December 2012 and July-September 2014, except for the October-December 2013 when the rate dipped to 7.0 per 100,000 bed days. Therefore the increase seen in overall reports was not due to increases in Trust-apportioned reports
- since the start of mandatory *E. coli* bacteraemia surveillance in June 2011, the total number of reported *E. coli* bacteraemias has increased steadily, with seasonal peaks between July-September each year
- the highest rate was in the most recent quarter (July-September 2014) when the rate reached 69.77 per 100,000 population, an increase of 4.3% compared to the same quarter last year
- the first quarter of 2014 saw the lowest number of *Clostridium difficile* infections (CDI) recorded since mandatory reporting began in 2007
- since then, the total number of CDI has increased 32.2%, from 3,006 in January-March to 3,973 in July-September. The total number of CDI for the July-September 2014 quarter has increased by 302 reports (8.2%) compared to the same quarter in the previous year and accounts for the highest number of cases reported in a quarter since October-December 2011; an increase is also observed in the all-reports rate per 100,000 population
- overall, Trust-apportioned CDI decreased by 854 (38.7%) between April-June 2011 and the current quarter (2,206 to 1,352, respectively). But compared with the same quarter the previous calendar year, increased in the two most recent quarters (by 11.1% and 5.8%, respectively)
- the percentage increase in non-Trust apportioned reports between July-September 2013 and July-September 2014 was sharper, with nearly double the percentage increase compared to Trust-apportioned reports (9.5% vs. 5.8%, respectively)
- Trust-apportioned rates of CDI also increased in the July-September 2014 quarter compared to the same quarter in the previous year.

References

1. PHE (11 December 2014). Quarterly epidemiological commentary: mandatory MRSA, MSSA and *E. coli* bacteraemia, and *C. difficile* infection data (up to July to September 2014) [500 KB PDF].
2. See *HPR* **8**(37), 26 September 2104.

New CIDSC information system underpins national AMR strategy

Collection and collation of laboratory reports on human infections – respiratory, enteric, sexually transmissible, healthcare-associated, etc – is a principal activity of the Centre for Infectious Disease Surveillance and Control (CIDSC) at PHE Colindale. In recent years three principal electronic laboratory data repositories have operated – LabBase (the principal database), Amsurv (for antimicrobial resistance reports) and Cosurv (an infectious disease notification system) – which allowed data on particular infections to be centrally collated at CIDSC but was costly to maintain and difficult to quality assure.

After a period of development and testing, these databases have been amalgamated into, and replaced by, a single, web-based system that further automates infectious disease reporting but also opens up new possibilities for health protection professionals and participating laboratories to make fuller use of the data they collect and submit to CIDSC.

SGSS (Second Generation Surveillance System), commissioned on 1 December, comprises a single entry point for the collection of data from all England, Wales and Northern Ireland laboratories and is expected to lead to improved ascertainment of infections, and of infectious disease outbreaks, and to improved quality and speed of data collection.

This applies to most infections of public health significance – from long-surveilled diseases, such as syphilis and TB, to the more-recently recognised hazards of hospital-acquired infections and infections resistant to treatment by antibiotics. In the field of antimicrobial resistance (AMR) in general, and implementation of the government's five year AMR strategy in particular, SGSS/AmSurv will play a key role.

Because SGSS significantly expands CIDSC's capability to capture both infection reports and antibiotic susceptibility test results, it will allow analysis of trends in resistance from a much wider range of clinical sources than previously. In addition SGSS allows analysis that previously was impossible, for instance exceedance alerting to help identify outbreaks.

In future SGSS will be expanded to allow for antimicrobial prescribing data to be collated alongside the infections and AMR data that are available at present. The system will therefore play a key role in implementation of the recently launched English Surveillance Programme for Antimicrobial Utilization and Resistance (ESPAUR) [1]. Consumption of antibiotics is a major driver for the development of resistance in bacteria and SGSS will be in due course provide

information not only on antibiotic resistance trends but also on trends in useage/prescribing, at national and regional level.

Reference

1. English Surveillance Programme for Antimicrobial Utilisation and Resistance first report, *HPR* **8**(39): news, 10 October 2014.

Ebola international epidemiological summary (at 14/12/2014)

Up to the end of 14 December (9 December for Liberia), a total of 18,603 clinically compatible cases (CCC) of Ebola virus disease (EVD) have been reported in the five currently affected countries (Guinea, Liberia, Sierra Leone, the USA and Mali) and three previously affected countries (Nigeria, Spain and Senegal) since December 2013. There have been at least 6,915 deaths, but the true numbers are not known due to continued under-reporting. Case fatality rates remain high across Guinea, Liberia and Sierra Leone where for cases with a definitive outcome the case fatality rate is 70%. For hospitalised patients, the case fatality rate is lower at 60% in Guinea and Sierra Leone, and 58% in Liberia.

The trends in national incidence continue to vary across Guinea, Liberia and Sierra Leone. In Guinea, the trend nationally has fluctuated since September without clear evidence of either upward or downward change. From the latest information available from Liberia (three days of data compared to seven days for Guinea and Sierra Leone), case incidence continues to decline. In Sierra Leone there is some initial evidence that incidence may no longer be increasing. However, transmission remains intense in the northern and western districts. Freetown and the Western Rural area remain the worst affected areas. An operation to intensify efforts to halt disease in these areas has begun with the aim to eradicate disease here within 42 days.

The total number of EVD CCC reported in Mali stands at eight. The last patient tested negative on 6 December, and was discharged from hospital on 11 December. All contacts of infected patients have passed the 21 day observation period. If no new cases arise, Mali will be declared EVD-free on 18 January 2015. The situation in Mali looks encouraging but given the porous nature of the Mali-Guinea border, the risk of further importation of cases is recognised.

To date, a total of 23 EVD cases have been cared for outside of Africa; 18 repatriated cases (hospitalised in USA, Spain, UK, Germany, France, Norway, Switzerland, Italy and the

Netherlands), two imported cases (both diagnosed in USA) and three incidents of local transmission (in Spain and USA).

The table below summarises Ebola virus disease international epidemiological information as at 14 December 2014 (9 December for Liberia).

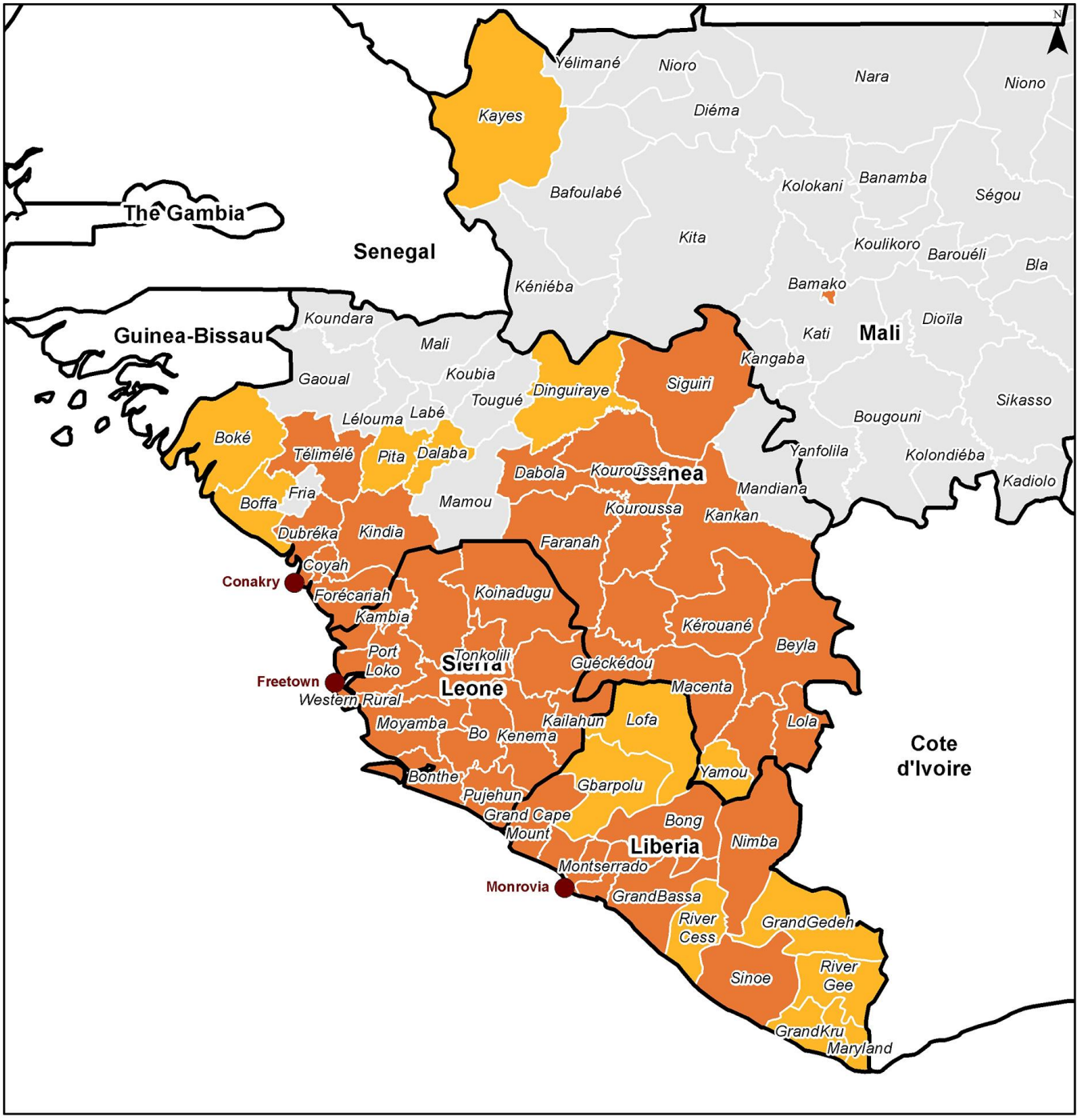
Summary of Ebola virus disease international epidemiological information as of 14 December 2014 (9 December for Liberia)

Country	Total CCCs	Total deaths	Current status
Guineau	2416	1525	Ongoing transmission
Liberia	7797	3290	Ongoing transmission
Sierra Leone	8356	2085	Ongoing transmission
Mali	8	6	Awaiting EVD-free status
Nigeria	20	8	EVD free
Senegal	1	0	EVD free
Spain	1	0	EVD free
USA	4	1	Awaiting EVD-free status
TOTAL	**18,603**	**6915**	

The latest PHE information on the international epidemiological situation can be found in the agency's weekly Ebola Epidemiological Update at: https://www.gov.uk/government/publications/ebola-virus-disease-epidemiological-update.

See also Ebola Outbreak Distribution Map below.

Ebola Outbreak Distribution Map



Capital Cities

Country Boundaries

WHO data as of 14 December (9 December for Liberia)

Transmission in last 21 days by district

Active

No longer active

Unaffected

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Laboratory confirmed cases of pertussis reported to the enhanced pertussis surveillance programme in England during July to September 2014 (Q3/2014)

In England there were 1094 laboratory confirmed cases of pertussis (culture, PCR, serology or oral fluid) reported to the Public Health England (PHE) pertussis enhanced surveillance programme in the third quarter of 2014, from July to September (see table). This was a 35% increase in the number of cases reported during the previous quarter (811 in April to June 2014) and a 3% decrease on cases reported in the same quarter of 2013 (1129 cases between July and September 2013). There were 37 laboratory confirmed cases reported in Wales between July and September 2014, a 32% increase in the number of cases reported in the previous quarter (n=28) and a 31% decrease on the number of cases reported in the same quarter in 2013 (n=54).

Typically pertussis activity peaks in quarter 3 and then declines (see figure). The continued increase observed in each successive quarter between the first quarter of 2011 and third quarter of 2012 was unusual. The HPA declared a national outbreak of pertussis (level 3 incident [1]) in April 2012 and, as a response to the ongoing outbreak and a high number of infant deaths, the Department of Health announced the introduction of a temporary immunisation programme for pregnant women on 28 September 2012 [2]. The most recent PHE figures report that of the mothers due to give birth in August 2014, 55.6% had been immunised with a pertussis containing vaccine in pregnancy in England [3]. From April 2014 the collection of vaccine coverage data has change from a manual to an automated system [4] and data for September to December 2014 will be published in February 2015.

Following the high levels of activity in 2012, confirmed cases of pertussis first fell in the fourth quarter of 2012 and this decrease has continued overall with slight increases in the third quarters of 2013 and 2014, in line with the usual seasonal pattern. The highest number of laboratory confirmed cases in England has persisted in individuals aged 15 years and over whilst disease incidence continues to be highest in infants <3 months. The number of confirmed cases in infants less than 3 months in the third quarter of 2014 (47 cases) were more than double the 21 cases reported in the equivalent quarter in 2013 and 81% higher than the second quarter of 2014 (26). Two deaths were reported in infants with laboratory confirmed pertussis tested between July and September 2014 in England compared to four infant deaths reported in

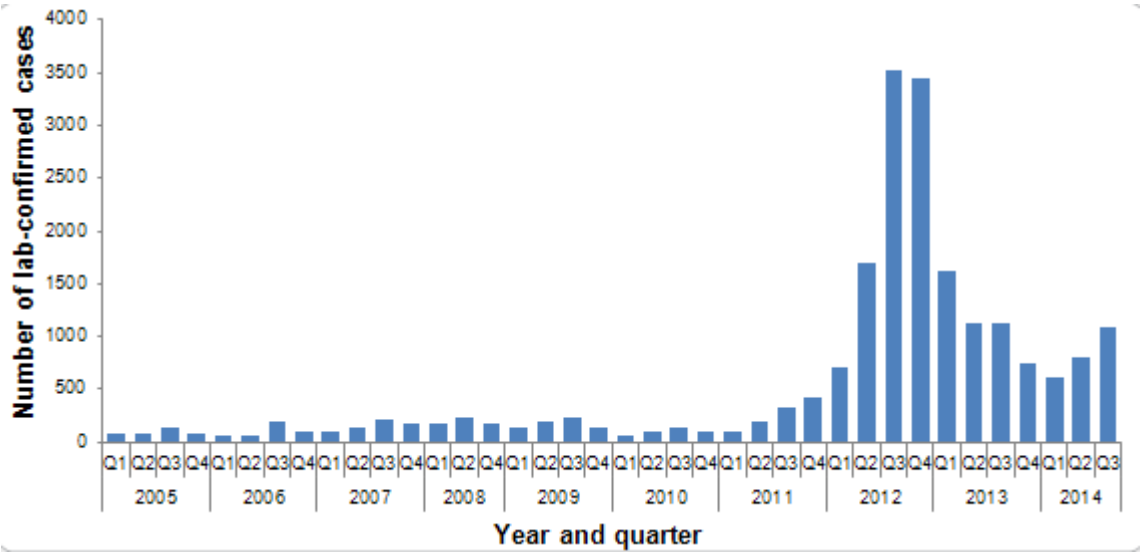
the second quarter of 2014. Data to the end of October 2014 has been published in a previous Health Protection news report [7].

Laboratory-confirmed cases of pertussis by age and testing method in England, July to September 2014.

Age group	Culture	PCR	Serology	Oral fluid only	Total
<3 months	18	29	–	–	47
3-5 months	–	4	–	–	4
6-11 months	4	1	–	–	5
1-4 years	2	2	8	1	13
5-9 years	1	–	24	8	33
10-14 years	–	1	83	15	99
15+ years	7	2	876	8	893
Total	32	39	991	32	1094

These early data in young infants following the introduction of a programme to immunise pregnant women are encouraging as a relatively low incidence has been maintained, with expected seasonal increases. It is important to be aware, however, that raised levels of pertussis persist in older age groups and women should therefore continue to be encouraged to be immunised against pertussis during pregnancy in order to protect their babies from birth. The pertussis immunisation in pregnancy programme in England has shown high levels of protection against pertussis in babies born to vaccinated mothers [5]. The Medicines and Healthcare Products Regulatory Agency also found no safety concerns relating to pertussis vaccination in pregnancy based on a large study of nearly 18,000 vaccinated women with similar rates of normal, healthy births in vaccinated and in unvaccinated women [6].

Total number of laboratory-confirmed pertussis cases per quarter in England, 2005 to 2014 (Q3).



Laboratory investigation

Bordetella pertussis PCR testing for hospitalised cases <1 year old has been offered by the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU) at the Public Health England (PHE) Microbiology Services Division Colindale since 2002. From July 2014, PCR testing for all ages is being rolled out across Lead PHE laboratories in a phased approach [8].

Serological investigation by estimation of anti-pertussis toxin (PT) IgG antibody levels for older children and adults are also provided by the RVPBRU. RVPBRU also encourages submission of all *Bordetella pertussis* isolates for confirmation and national surveillance purposes. The RVPBRU is also offering an oral fluid (OF) testing service for clinically suspected cases reported to local Health Protection Teams, who are aged between 5-16 years (<17yrs) and have been coughing for more than two weeks and have not been immunised against pertussis in the previous year.

References

1. *Health Protection Report* **6**(15), 13 April 2012, http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/hpr/archives/2012/news1512.htm
2. Department of Health: https://www.gov.uk/government/news/pregnant-women-to-be-offered-whooping-cough-vaccination
3. Public Health England: https://www.gov.uk/government/publications/pertussis-vaccine-uptake-in-pregnant-women-october-2012-to-march-2014
4. Public Health England: https://www.gov.uk/government/publications/prenatal-pertussis-vaccine-uptake-surveys-data-collection-via-immform
5. Effectiveness of maternal pertussis vaccination in England: an observational study. Amirthalingam G, Andrews N, Campbell, Ribeiro S, Kara E, Donegan K, *et al*. *The Lancet*, 2014.
6. Donegan K, King B, Bryan P. Safety of pertussis vaccination in pregnant women in UK: observational study. *BMJ* 2014, **349**.
7. Internal PHE communication: Briefing note 2014/07- 29 September 2014
8. *Health Protection Report* **8**(47), 12 December 2014, https://www.gov.uk/government/publications/health-protection-report-volume-8-2014/hpr-volume-8-issue-47-news

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Invasive meningococcal disease (laboratory reports in England): July to September 2014 (Q3/2014)

In England between July and September 2014, a total of 95 cases of invasive meningococcal disease (IMD) were reported to Public Health England (PHE) [1]. This was a 34% decrease from the 144 cases reported in the second quarter of 2014 and one less case than was reported in the equivalent quarter in 2013. Four cases of IMD were reported in this period in Wales.

Of the 95 cases of IMD reported in England; 62% (59) were capsular group B, 25% (24) group W, 8% (8) group Y and 4% (4) group C (MenC). The four IMD cases reported to PHE from Wales were all group B. During the third quarter of 2014 there were no reported cases for capsular groups A, X and Z/E (table 1) in England. Whilst numbers remain low, the observed increase in group W cases has been maintained in infants and those aged 15 years and over and this continues to be monitored. An increase in cases of meningococcal disease in university students also began this quarter resulting in an extension to the MenC vaccination programme for university students until March 2015 [2].

Fifty-three per cent (50/95) of IMD cases reported in England were male. In England, children aged less than one year accounted for 19% (18/95) of IMD reports. The majority of infant cases (56%; [10/18]) were aged between six and 11 months and of these; seven were group B and three were group W. In eight infants with IMD aged between zero and five months, six were cases of group B IMD, with one case each of groups C and Y. Almost a fifth (19%; [18/95]) of cases were in children aged between one and four years of which 94% (17/18) were group B disease and one group W (table 2).

Half of the group B IMD cases (51%; [30/59]) were in children under five years of age. Of the 24 group W cases, more than half (54%; [13/24]) were in adults aged 45 year and older, 21% (5/24) were aged between 15 and 19 years and 17% (4/24) were aged less than five years. Half of the group Y cases were in individuals aged 65 and older (50%; [4/8]) followed by 15 to 19 year old who accounted for 25% (2/8). There were four group C cases and three of these were aged 25 years or older.

Table 1. Invasive meningococcal disease in England by capsular group and laboratory testing method, weeks 27-39 (Q3): 2013 and 2014

Capsular groups ~	Method of diagnosis						Total		Cumulative total	
	Blood and/or CSF isolate		Blood and/or CSF PCR		Other sites culture					
	2013 (Q2)	2014 (Q2)	2013 (Q2)	2014 (Q2)	2013 (Q2)	2014 (Q2)	**2013 (Q3)**	**2014 (Q3)**	**2013 (Q1-3)**	**2014 (Q1-3)**
A	–	–	–	–	–	–	–	–	–	1
B	30	38	39	21	1	–	70	59	416	293
C	3	2	–	2	–	–	3	4	23	22
W	11	21	3	2	–	1	14	24	48	76
Y	6	8	2	–	1	–	9	8	48	53
Ungrouped	–	–	–	–	–	–	–	–	2	5
Ungroupable*	3	–	–	–	–	–	6	–	6	–
Total	**50**	**69**	**44**	**25**	**2**	**1**	**96**	**95**	**543**	**450**

~ Note: No cases capsulargroups X or Z/E were confirmed during any of the periods summarised in the table.

* Ungroupable refers to invasive clinical meningococcal isolates that were non-groupable, while ungrouped cases refers to culture-negative but PCR screen (*ctrA*) positive and negative for the four genogroups [B, C, W and Y] routinely tested for.

Table 2. Invasive meningococcal disease in England by group and age at diagnosis, weeks 27-39 ((Q3): 2014

Age group	B	C	W135	Y	Total
<1 year	13	1	3	1	18
1-4 years	17	–	1	–	18
5-9 years	5	–	–	–	5
10-14 years	1	–	–	–	1
15-19 years	7	–	5	2	14
20-24 years	1	–	–	–	1
25-44 years	4	2	2	1	9
45-64 years	6	1	4	–	11
>=65 years	5	–	9	4	18
Total	59	4	24	8	95

References

1. Data source: Public Heath England Meningococcal Reference Unit.

2. https://www.gov.uk/government/news/freshers-told-its-not-too-late-for-meningitis-c-vaccine

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Uncommon pathogens involved in bacteraemia: England, Wales and Northern Ireland, 2009-2013

The analysis presented in this report is based on data extracted from the Public Heath England (PHE) voluntary surveillance database, LabBase2, on 24 September 2014 for the period between 1 January 2009 to 31 December 2013 in England, Wales, and Northern Ireland. The reports made to PHE provide data on both community and hospital-acquired bacteraemia. This report describes uncommon pathogens (genera with fewer than 50 reports in 2013) identified from blood cultures or blood specimens where the diagnostic method was not stated. Data in this report may differ slightly from data in earlier publications due to inclusion of late reports.

A total of 104,879 bacterial isolates from blood samples were reported by laboratories in England, Wales, and Northern Ireland in 2013. One hundred and four uncommon genera causing bacteraemia were reported in 2013, comprising a total of 734 bacteraemic episodes. Gram-negative organisms accounted for 58.3% of these episodes. By definition of inclusion in this analysis, small numbers of reports preclude robust or meaningful analysis of trends, but of note are the general decreases in *Anaerococcus, Delftia, Alcaligenes, Bordetella* and *Eikenella*, and increases in *Bifidobacterium, Brevibacterium, Dermabacter, Eggerthella, Kocuria, Cardiobacterium, Gardnerella, Kingella* and *Kluyvera*.

Discussion

The purpose of this review is to describe the unusual bacterial genera not included in the monthly bacteraemia reports published in the Health Protection Report. Examining trends in these unusual pathogens can also provides a means of identifying emerging or re-emerging infections [1], providing opportunities for preventive measures or education of frontline clinical staff.

There has been a general improvement in the identification of cultured organisms to the species level by increased use of automated biochemical identification systems, molecular techniques such as 16S ribosomal RNA, and the introduction of MALDI-TOF mass spectrometry in some laboratories. This has increased the accuracy of species identified, and permits robust trend analysis of hitherto difficult to identify species causing significant disease, such as identification of *Kocuria* spp that were previously identified as coagulase-negative staphylococci or micrococci. It should be borne in mind that findings by MALDI-TOF reflect organisms that are

present in the database, therefore non-identification or identification at the genus level is expected to be improved with expansion of the database.

Although these bacteria only account for a very low proportion of total bacteraemia reports, they can be associated with important clinical consequences, such as endocarditis [2]. Infections imported from endemic regions, such as *Brucella* species [4] or *Vibrio cholerae* although rarely diagnosed in this country can cause severe illness in those affected. Others represent opportunistic pathogens causing infection in specific subpopulations, such as *Granulicatella* [4] in immunocompromised patients or *Yersinia* in elderly, or are associated with specific exposures, such as catheter-related bacteraemia due to *Brevibacterium* [5], or infections due to *Erysipelothrix rhusiopathiae* in workers in contact with animals or handling animal products [6].

There has been an increase in reports of bacteraemia caused by *Bifidobacterium* genus in the 5 year period, notably in 2013 (table 1). Reports of bacteraemia caused by members of *Dermabacter* genus have increased sharply in 2013 comparing to previous years (table 1). While *Dermabacter hominis* is commonly found on human skin, it has been isolated from a range of clinical specimens, such as blood cultures, abscesses, and would and eye infections [7]. Marked increase in *Kocuria* reports have been observed during last two years, mostly accounted for by increase in *Kocuria kristinae* and other *Kocuria* species. Similar trends have been observed in other countries [8]. Reports in *Cardiobacterium* have also increased during the five year period, predominantly due to a rise in *Cardiobacterium hominis,* a well-documented cause of endocarditis [9].

Reports of bacteraemia due to *Peptoniphilus* and *Psychrobacter* were noted for the first time in 2012 during the five year period [10]. The number of reports increased since then. Both of these have been reported to cause blood stream infections in patients with underlying morbidities [11,12].

A number of new genera featured in this report, namely *Alistipes*, *Atopobium, Helcococcus, Slackia, Janthinobacterium,* and *Paracoccus*. All of these have been previously recorded to cause bacteraemia in patients with comorbidities or intravenous drug users [13,14,15,16,17, 18].

Rothia and *Burkholderia* were sufficiently common in 2013 to warrant removal from this report. A total of 75 laboratory reports of *Rothia* spp were made in 2013, doubling of episodes compared to 2012. *Burkholderia* exceeded the inclusion criteria by 1 bacteraemia report.

Bacteraemias caused by *Shigella* are rare, and tend to be associated with foreign travel. The slight increase over this 5 year period may be explained by the ongoing outbreak of *Shigella flexneri* in men who have sex with men (this includes invasive infections in the immunosuppressed host) [19].

Whilst the bacteraemia reported to this voluntary surveillance system should, according to national reporting guidelines, reflect clinically significant disease, it should be borne in mind that some of these reports may reflect skin colonisers or contaminants due to difficulties in blood culture sampling or contamination in laboratory processing [20,21]. Inclusion of reports with diagnostic method recorded in the database as unknown should be taken into account in interpreting these data, as some of these reports may not represent bloodstream infections. Improvements in laboratory reporting of diagnostic methods when entering the data into the database would allow the exclusion of these reports without artificially decreasing the number of genuine bacteraemia infections.

If confirmation of unusual bacterial pathogens is required, isolates can be sent to the relevant laboratory within the Bacteriology Reference Department, Reference Microbiology Services, Colindale, Public Health England.

Acknowledgements

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References

1. Akhrass FA, Wohoush IA, Chaftari A-M, Reitzel R, Jiang Y, Ghannoum M, Tarrand J, Hachem R, Raad I. *Rhodococcus* bacteraemia in cancer patients is mostly catheter related and associated with biofilm formation. *PloS One* 2012; **7**(3): e32945.

2. Brouqui P, Raoult D. Endocarditis due to rare and fastidious bacteria. *Clin Microbiol Rev* 2001; **14**: 177-207.

3. Ramin B, MacPherson P. Human brucellosis. *BMJ* 2010; 341: c4545.

4. Senn L, Entenza JM, Greub G, Jaton K, Wenger A, Bille J, Calandra T, Prod'hom G. Bloodstream and endovascular infections due to *Abiotropia defective* and *Granulicatella* species. *BMC Infect Dis* 2006; **6**: 9.

5. Beukinga I, Rodriguez-Villalobos H, Deplano A, Jacobs F, Struelens MJ. Management of long-term catheter-related *Brevibacterium* bacteraemia. *CMI* 2003; **10**: 495-470.

6. Garcia-Restoy E, Espejo E, Bella F, Liebot J. Bacteraemia due to Erysiphelothrix rhusiopathiae in immunocompromised hosts without endocarditis. *Rev Infec Dis* 1991; **13**: 1252-3.

7. Frenandez-Natal I, Saez-Nieto JA, Medina-Pascual MJ, Albersmeier A, Valdezate S, Guerra-Lase JM, Rodriguez H, Marrodan T, Parras T, Tauch A, Soriano F. *Dermabacter hominis*: a usually daptomycin-resistant gram-positive organism infrequently isolated from human clinical samples. *New Microbe New Infect* 2013; **1**: 35–40.

8. Purty S, Saranathan R, Prashanth K, Narayanan K, Asir J, Devi CS, Amarnath SK. The expanding spectrum of human infections caused by *Kocuria* species: a case report and literature review. *Emerging Microbes & Infections* 2013; **2**: e71.

9. Walkty A. *Cardiobacterium hominis* endocarditis: A case report and review of the literature. Can J Infect Dis Med Microbiol. 2005 Sep-Oct; **16**(5): 293–297.

10. Public Health England. Health Protection Report: Uncommon pathogens involved in bacteraemia: England, Wales and Northern Ireland, 2008-2012. 2013. **7**(51). Available from: http://webarchive.nationalarchives.gov.uk/20140714084352/http://hpa.org.uk/hpr/archives/Infections/2013/bacteraemia13.htm

11. Brown K, Chrch D, Lynch T, Gregson D. Bloodstream infections due to *Peptoniphilus* spp.: report of 15 cases. *Clin Microbiol Infect* 2014. DOI: 10.1111/1469-0691.12657. [cited 2014 Nov 26]

12. Leung WK, Chow VC, Chan MC, Ling JM, Sung JJ. Psychrobacter bacteraemia in cirrhotic patient after the consumption of raw geoduck clam. J Infect 2006; **52**(6): 167-71.

13. Fenner L, Roux V, Ananian P, Raoult D. *Allistipes finegoldii* in blood cultures from colon cancer patients. *Emerg Infect Dis* 2007; **13**(8): 1260-62.

14. Angelakis E, Roux V, Raoult D, Drancourt M. Human case of *Atopobium rimae* bacteremia. *Emerg Infect Dis* 2009; **15**(2). [cited 2014 Nov 26]. Available from: http://wwwnc.cdc.gov/eid/article/15/2/pdfs/07-1399.pdf

15. Woo PCY, Tse H, Wong SSY, Tse CWS, Fung AMY, Tam DMW, Lau SKP, Yuen KY. Life-threating invasive *Helcococcus kunzii* infections in intravenous-drug users and *ermA*-mediated erythromycin resistance. *J Clin Microbiol* 2005; **43**(12): 6205-08.

16. Kukki J, Huttner HB, Lee DH, Jantsch J, Janka R, Ostgathe C. Polymicrobial feculent meningitis with detection of *Slackia exigua* in the cerebrospinal fluid of a patient with advanced rectal carcinoma. 2011; **29**(35): 852-54.

17. Patijanasoontorn B, Boonma P, Wilailackana C, Sitthikesorn J, Lumbiganon P, Chetchotisakd P, Noppawinyoowong C, Simajareuk K. Hospital acquired *Janthinobacterium lividum* septicemia in Srinagarind hospital. *I Med Assoc Thai* 1992; **75**(2): 6-10.

18. Funke G, Frodl R, Sommer H. First comprehensively documented case of *Paracoccus yeei* infection in a human. *J Clin Microbiol* 2004; **42**(7): 3366-8.

19. Borg ML, Modi A, Tostmann A, Gobin M, Cartwright J, Quigley C, Crook P, Boxall N, Paul J, Cheasty T, Gill N, Hughes G, Simms I, Oliver I.Ongoing outbreak of *Shigella flexneri* serotype 3a in men who have sex with men in England and Wales, data from 2009-2011.Euro Surveill. 2012 Mar 29; **17**(13)

20. El Zimaity D, Harrison GA, Keen AP, Price S, Evans SE, Lewis AM *et al. Ochrobactrum anthropic* pseudobacteraemia. *J Infect* 2001; **43**: 217-8.

21. PHLS. *Ochrobactrum anthropic* pseudobacteraemias. *Commun Dis Rep CDR Wkly* 2001; 11.

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Polymicrobial bacteraemia and fungaemia in England, Wales and Northern Ireland, 2013

The analyses presented in this report are based on data extracted from the Public Health England (PHE) voluntary surveillance database, LabBase2, on 4 November 2014 for the period between 1 January 2009 to 31 December 2013 in England, Wales, and Northern Ireland.

This report covers voluntary reports of poly- and monomicrobial bacteraemia and fungaemia made to PHE, and the analyses are limited to blood culture specimens reported on LabBase2.

The data presented here differ in some instances from data in earlier publications due to inclusion of late reports. Rates were calculated using 2013 mid-year resident population estimates based on the 2011 census for England, Wales, and Northern Ireland [1].

Geographical analyses of cases are presented at the level of the Public Health Centre areas (15) created in April 2013 when Public Health England was established rather than the Government Office regions (9) used on in previous reports.

This report contains analyses on 5-year trends, age and sex distribution, and geographical distribution of cases of polymicrobial bacteraemia and fungaemia.

Key points

- Trends in reporting are shown from 2009 to 2013 including total bacteraemia and fungaemia, total number of patient episodes, and number of polymicrobial patient episodes.
- There were 97,699 patient episodes in 2013 reported in England, Wales, and Northern Ireland, of which 8,509 (8.7%) were identified as polymicrobial and 89,190 (91.3%) monomicrobial infections. This represents 2.3% increase in the total number of patient episodes of bacteraemia compared to 2012 (95,515).
- Of 8,509 polymicrobial episodes reported, 7,414 (87.1%) involved two different organisms, 954 (11.2%) involved three different organisms, and 141 (1.6%) involved four or more organisms.
- There were 8,509 polymicrobial episodes reported, of which 8,375 (98.4%) were polybacteraemia, and 134 (1.6%) polyfungaemia reports.
- Overall, the number of patient episodes of bloodstream infections increased by 3.7% between 2009 and 2013 (94,190 episodes in 2009 and 97,699 episodes in 2013), although there was a dip in 2010, when 92,867 episodes were reported (1.4% decrease between 2009 and 2010).The number of polymicrobial patient episodes fluctuated between 2009 and 2013; there has been a decline between 2009 (8,220 episodes (8.7% of total number of patient episodes)) and 2010 (7,550 episodes (8.1% of total number of patient episodes)), and the numbers increased thereafter (7,864 episodes in 2011, 8,221 episodes in 2012, and 8,509 episodes in 2013; 8.4%, 8.6%, and 8.7% of total number of patient episodes, respectively)

Methods

Episodes of polymicrobial bloodstream infections are defined as the isolation of two or more different organisms from the same blood culture. Data for this report were obtained from PHE's national database ("LabBase2") on 4 November 2014. Microbiology laboratories in England, Wales, and Northern Ireland voluntarily submit microbiology data to LabBase2 on an ongoing basis. Specimen data reported to LabBase2 are based on each individual organism that has been identified in the specimen. If more than one organism is identified from a single patient specimen, then each organism is given a *different* unique identifying number in LabBase2; none of these records are linked. Consequently, the identification of patient episodes during which two or more different organisms are present requires identifying specimen records with identical values for the following variables: specimen date, laboratory, patient date of birth, gender, and patient soundex code.

The incidence of polymicrobial episodes was calculated using estimated mid-year 2013 residential population denominators for England, Wales, and Northern Ireland [1]. Regional analysis was performed with reference to the PHE centres boundaries introduced on 1 April 2012. Confidence limits were calculated using commercial software Stata™ [3].

The rates of polymicrobial episodes in this report should be interpreted with caution as the data are derived from voluntary reports. In addition, it is possible that some reports may reflect a contaminant in the cultures rather than a true polymicrobial infection, so the real rates may be lower than reported.

Trends in total reports: 2009 to 2013

- 97,699 patient episodes involving either bacteraemia and/or fungaemia were identified from reports received from laboratories in England, Wales, and Northern Ireland in 2013 (Table 1). This represented an overall increase of 3.7% in the number of patient episodes recorded in 2009 (94,190 episodes), and steady increase (1.4% between 2010 and 2011, and 2011 and 2012, and 2.3% between 2012 and 2013) from 2010 onwards (92,867, 94,165, and 96,515 episodes in 2010, 2011, and 2012, respectively).
- Based on positive blood cultures reported in 2013, 8,509 patient episodes (8.7% of all patient episodes) were identified as polymicrobial and 89,190 were identified as monomicrobial.
- The highest percentage of all patient episodes considered as polymicrobial infections occurred in 2009 and 2013 (8.7% both), with steady increasing trend between 2010 and 2013 (8.1% in 2010, 8.4% in 2011, and 8.6% in 2012).

Table 1. Trends in reports of bacteraemia and fungaemia in England, Wales and Northern Ireland: 2009 to 2013*

	2009	2010	2011	2012	2013
Total reported bacteraemia†	101,848	99,737	101,315	103,101	105,686
Total reported fungaemia†	1,784	1,798	1,881	1,826	1,785
Number of patient episodes	94,190	92,867	94,165	95,515	97,699
Number of polymicrobial patient episodes	8,220	7,550	7,864	8,221	8,509
Percentage of patient episodes that are polymicrobial	8.7	8.1	8.4	8.6	8.7

* Data extracted on 4 November, 2014.

†Total reports can include multiple records for individual patient; i.e. in a polymicrobial infection, there is a separate record for each organism isolated from that patient.

Total reports: 2013

- Of the 8,509 polymicrobial patient episodes in 2013, 7,414 involved two different organisms, 954 involved three different organisms, and 141 involved four or more organisms (Table 2).
- The most frequently reported organisms involved in polymicrobial infections were coagulase-negative staphylococci (Table 3) comprising 38.1% of these infections, followed by *Escherichia* species (34.1%), and non-pyogenic streptococci (25.2%). This is a change to previous year, when *Escherichia* species were the most commonly reported pathogen in polymicrobial infections [2].
- The most frequently reported pathogen in monomicrobial bloodstream infections (Table 3) belonged to *Escherichia* genus, of which 99.97% (28,117 reports) were *Escherichia coli*, 0.02% (5 reports) to *Escherichia* sp unclassified, 0.01% (2 reports) to *Escherichia vulneris*, and <0.01% (1 report) *Escherichia hermanni*.
- The 8,509 polymicrobial patient episodes involved 105 different genera (Table 4).
- There were 8,375 polybacteraemia episodes reported, representing 98.4% of all polymicrobial patient episodes, of which 7,298 involved two different organisms, 942 involved three different organisms, and 135 involved four or more organisms.

Table 2. Number of organisms involved in polymicrobial infectious episodes, 2013*

Number of organisms	Episodes	%
Two	7,414	87.1
Three	954	11.2
Four	118	1.4
Five	19	0.2
More than five	4	0.0

* Data extracted on 4 November, 2014.

Table 3. The 10 most frequently reported genera/organisms in polymicrobial and monomicrobial bacteraemic episodes, 2013*

Rank	Polymicrobial	Rank	Monomicrobial
1	*Staphylococcus, coagulase negative*	1	*Escherichia***
2	*Escherichia***	2	*Staphylococcus, coagulase negative*
3	*Streptococcus, non-pyogenic*	3	*Staphylococcus aureus*
4	*Enterococcus*	4	*Streptococcus, non-pyogenic*
5	*Klebsiella*	5	*Klebsiella*
6	*Coliform*	6	*Streptococcus, pyogenic*
7	*Staphylococcus aureus*	7	*Enterococcus*
8	*Pseudomonas*	8	*Pseudomonas*
9	*Proteus*	9	*Proteus*
10	*Enterobacter*	10	*Enterobacter*

* Data extracted on 4 November, 2014.
** *Escherichia coli* in at least 99% of patient episodes

Table 4. Organisms reported in monomicrobial and polymicrobial bacteraemia and fungaemia, England, Wales, and Northern Ireland: 2013*

	Bloodstream infections					
	Monomicrobial			Polymicrobial		
Organism	n†	%‡	Rank	n†	%‡	Rank
*Escherichia***	28,125	31.53	1	2,902	34.11	2
Staphylococcus, coagulase negative	13,202	14.80	2	3,239	38.07	1
Staphylococcus aureus	8,595	9.64	3	808	9.50	7
Streptococcus, non-pyogenic	6,921	7.76	4	2,142	25.17	3
Klebsiella	5,151	5.78	5	1,423	16.72	5
Streptococcus, pyogenic	4,383	4.91	6	380	4.47	11
Enterococcus	3,818	4.28	7	1,786	20.99	4
Pseudomonas	2,953	3.31	8	697	8.19	8
Proteus	2,036	2.28	9	526	6.18	9
Enterobacter	1,491	1.67	10	464	5.45	10
Candida	1,451	1.63	11	252	2.96	13
Bacteroides	947	1.06	12	193	2.27	16
Micrococcus	797	0.89	13	114	1.34	22
Propionibacterium	740	0.83	14	120	1.41	21
Serratia	703	0.79	15	130	1.53	19
Clostridium	687	0.77	16	258	3.03	12
Citrobacter	569	0.64	17	200	2.35	15
Acinetobacter	537	0.60	18	214	2.51	14
Haemophilus	534	0.60	19	74	0.87	25
Diphtheroids	451	0.51	20	174	2.04	17
Corynebacterium	444	0.50	21	148	1.74	18
Salmonella	423	0.47	22	10	0.12	47
Coliform	371	0.42	23	858	10.08	6
Bordetella	369	0.41	24	0	-	-
Stenotrophomonas	329	0.37	25	123	1.45	20
Bacillus	275	0.31	26	107	1.26	24
Morganella	249	0.28	27	113	1.33	23
Moraxella	178	0.20	28	34	0.40	30

Organism	Bloodstream infections					
	Monomicrobial			Polymicrobial		
	n†	%‡	Rank	n†	%‡	Rank
Campylobacter	159	0.18	29	10	0.12	47
Neisseria	150	0.17	30	47	0.55	28
Mycobacterium	144	0.16	31	11	0.13	46
Fusobacterium	128	0.14	32	22	0.26	38
Listeria	121	0.14	33	7	0.08	50
Peptostreptococcus	99	0.11	34	25	0.29	36
Aerococcus	85	0.10	35	63	0.74	27
Staphylococcus	76	0.09	36	17	0.20	42
Aeromonas	73	0.08	37	67	0.79	26
Lactobacillus	71	0.08	38	26	0.31	35
Pasteurella	69	0.08	39	9	0.11	48
Achromobacter	66	0.07	40	11	0.13	46
Prevotella	65	0.07	41	21	0.25	39
Pantoea	63	0.07	42	22	0.26	38
Actinomyces	59	0.07	43	30	0.35	32
Gemella	58	0.07	44	38	0.45	29
Providencia	58	0.07	44	28	0.33	33
Streptococcus	54	0.06	45	32	0.38	31
Rothia	51	0.06	46	24	0.28	37
Lactococcus	48	0.05	47	27	0.32	34
Borrelia	47	0.05	48	0	-	-
Burkholderia	44	0.05	49	6	0.07	51
Raoultella	36	0.04	50	19	0.22	41
Ochrobactrum	36	0.04	50	14	0.16	44
Brevibacterium	33	0.04	51	8	0.09	49
Veillonella	28	0.03	52	20	0.24	40
Leuconostoc	26	0.03	53	15	0.18	43
Rhizobium	25	0.03	54	7	0.08	50
Hafnia	23	0.03	55	12	0.14	45
Kluyvera	23	0.03	55	7	0.08	50
Chryseobacterium	22	0.02	56	10	0.12	47
Eggerthella	21	0.02	57	11	0.13	46
Brevundimonas	21	0.02	57	9	0.11	48
Cryptococcus	17	0.02	58	2	0.02	55
Capnocytophaga	16	0.02	59	4	0.05	53
Granulicatella	16	0.02	59	4	0.05	53
Roseomonas	15	0.02	60	6	0.07	51
Bifidobacterium	15	0.02	60	5	0.06	52
Kingella	14	0.02	61	2	0.02	55
Abiotrophia	13	0.01	62	4	0.05	53
Shigella	13	0.01	62	2	0.02	55
Alcaligenes	12	0.01	63	5	0.06	52
Gardnerella	12	0.01	63	3	0.04	54
Dermabacter	10	0.01	64	6	0.07	51
Cardiobacterium	10	0.01	64	1	0.01	56
Kocuria	9	0.01	65	4	0.05	53

Organism	Bloodstream infections					
	Monomicrobial			Polymicrobial		
	n†	%‡	Rank	n†	%‡	Rank
Rhodococcus	9	0.01	65	1	0.01	56
Yersinia	9	0.01	65	1	0.01	56
Arcanobacterium	8	0.01	66	6	0.07	51
Flavobacterium	8	0.01	66	0	-	-
Rhodotorula	7	0.01	67	5	0.06	52
Anaerobiospirillum	7	0.01	67	2	0.02	55
Phialophora	7	0.01	67	0	-	-
Ralstonia	6	0.01	68	2	0.02	55
Psychrobacter	5	0.01	69	1	0.01	56
Arthrobacter	5	0.01	69	0	-	-
Fusarium	5	0.01	69	0	-	-
Leptospira	5	0.01	69	0	-	-
Microsporum	4	0.00	70	5	0.06	52
Eubacterium	4	0.00	70	4	0.05	53
Peptococcus	4	0.00	70	2	0.02	55
Exophiala	4	0.00	70	1	0.01	56
Anaerococcus	4	0.00	70	0	-	-
Brucella	4	0.00	70	0	-	-
Shewanella	4	0.00	70	0	-	-
Trichosporon	4	0.00	70	0	-	-
Aggregatibacter	3	0.00	71	4	0.05	53
Eikenella	3	0.00	71	4	0.05	53
Leptotrichia	3	0.00	71	2	0.02	55
Peptoniphilus	3	0.00	71	2	0.02	55
Sphingobacterium	3	0.00	71	2	0.02	55
Globicatella	3	0.00	71	1	0.01	56
Leclercia	3	0.00	71	1	0.01	56
Microbacterium	3	0.00	71	1	0.01	56
Actinobacillus	3	0.00	71	0	-	-
Delftia	3	0.00	71	0	-	-
Erysipelothrix	3	0.00	71	0	-	-
Myroides	3	0.00	71	0	-	-
Nocardia	3	0.00	71	0	-	-
Pediococcus	3	0.00	71	0	-	-
Comamonas	2	0.00	72	4	0.05	53
Saccharomyces	2	0.00	72	3	0.04	54
Chryseomonas	2	0.00	72	1	0.01	56
Dialister	2	0.00	72	1	0.01	56
Geotrichum	2	0.00	72	1	0.01	56
Parvimonas	2	0.00	72	1	0.01	56
Aspergillus	2	0.00	72	0	-	-
Chromobacterium	2	0.00	72	0	-	-
Gordonia	2	0.00	72	0	-	-
Helcococcus	2	0.00	72	0	-	-
Pneumocystis	2	0.00	72	0	-	-
Rahnella	2	0.00	72	0	-	-

Organism	Bloodstream infections					
	Monomicrobial			Polymicrobial		
	n†	%‡	Rank	n†	%‡	Rank
Ruminococcus	2	0.00	72	0	-	-
Stomatococcus	1	0.00	73	3	0.04	54
Sphingomonas	1	0.00	73	2	0.02	55
Acremonium	1	0.00	73	1	0.01	56
Rhizopus	1	0.00	73	1	0.01	56
Actinobaculum	1	0.00	73	0	-	-
Agrobacterium	1	0.00	73	0	-	-
Alistipes	1	0.00	73	0	-	-
Atopobium	1	0.00	73	0	-	-
Bilophila	1	0.00	73	0	-	-
Buttiauxella	1	0.00	73	0	-	-
Edwardsiella	1	0.00	73	0	-	-
Elizabethkingia	1	0.00	73	0	-	-
Ewingella	1	0.00	73	0	-	-
Facklamia	1	0.00	73	0	-	-
Malassezia	1	0.00	73	0	-	-
Mobiluncus	1	0.00	73	0	-	-
Paecilomyces	1	0.00	73	0	-	-
Paenibacillus	1	0.00	73	0	-	-
Paracoccus	1	0.00	73	0	-	-
Penicillium	1	0.00	73	0	-	-
Pseudallescheria	1	0.00	73	0	-	-
Streptobacillus	1	0.00	73	0	-	-
Streptomyces	1	0.00	73	0	-	-
Trichoderma	1	0.00	73	0	-	-
Vibrio	1	0.00	73	0	-	-
Wolinella	1	0.00	73	0	-	-
Collinsella	0	-	-	1	0.01	56
Desulfovibrio	0	-	-	1	0.01	56
Janthinobacterium	0	-	-	1	0.01	56
Slackia	0	-	-	1	0.01	56
Total	**89,190**	**100**		**8,509**	**100**	

* Data extracted on 4 November, 2014.

** *Escherichia coli* in at least 99% of patient episodes

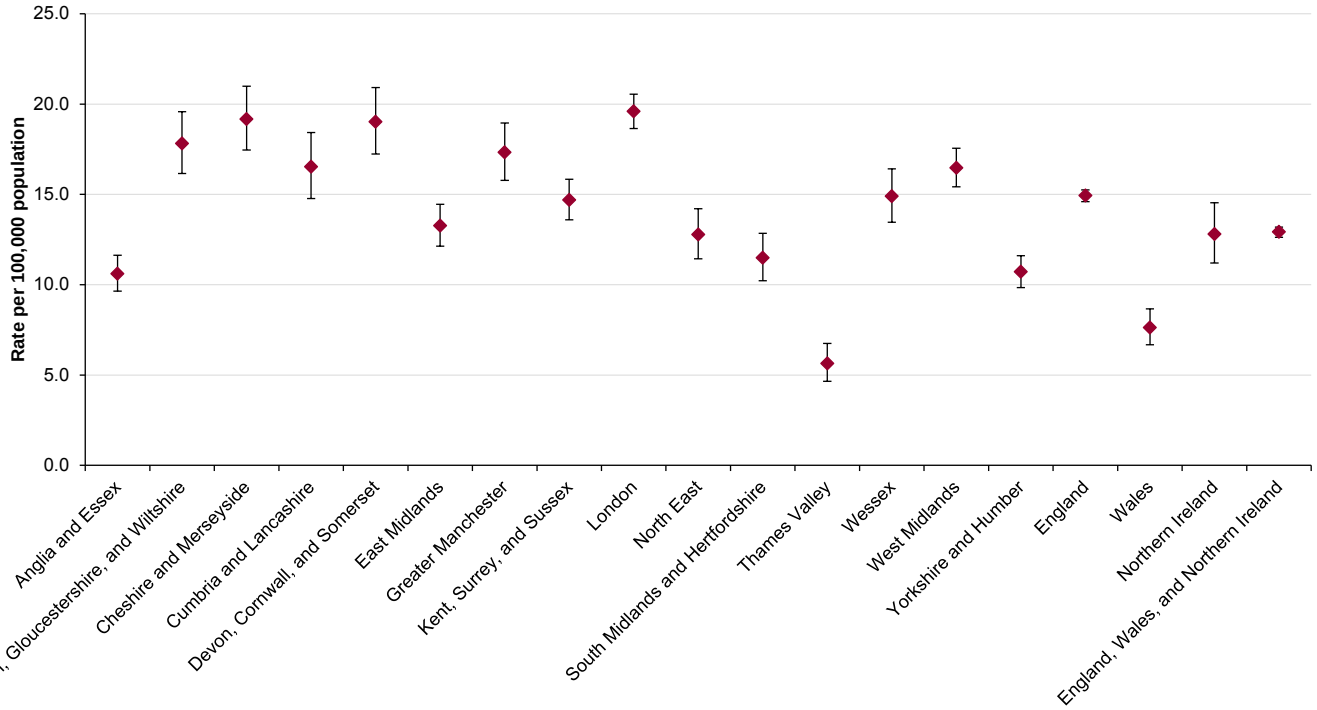
† Number of reports.

‡Percentage of total number of monomicrobial or polymicrobial episodes

Regional distribution

- The overall rate of polymicrobial episodes in England, Wales, and Northern Ireland was 12.91 per 100,000 population in 2013 (Figure 1). By country, the reported rates (per 100,000 population) were 14.92, 7.62, and 12.79, respectively. The rates in England and Northern Ireland were higher than those in 2012 of 14.52 (albeit this was a small increase) and 11.30, respectively, while the rate in Wales was lower in comparison to 2012 (8.20 per 100,000). Notably, point estimates for Wales and Northern Ireland have relatively wide confidence intervals. Similar pattern was described in the previous report [2].
- Within England, the lowest rate of polymicrobial episodes was recorded for the Thames Valley, Anglia and Essex, and Yorkshire and Humber (5.63, 10.60, and 10.70 per 100,000) PHE centres. The highest rates were observed in London, Cheshire and Merseyside, and Devon, Cornwall, and Somerset (19.58, 19.16, and 19.01 per 100,000, respectively) PHE centres. Caution should be taken when comparing these infection rates with those in previous reports due to differences in geographical distribution of reporting laboratories (only concerns PHE centres infection rates).

Figure 1. Regional distribution of polymicrobial bacteraemia/ fungaemia episodes (per 100,000 population) in England, Wales, and Northern Ireland: 2013*

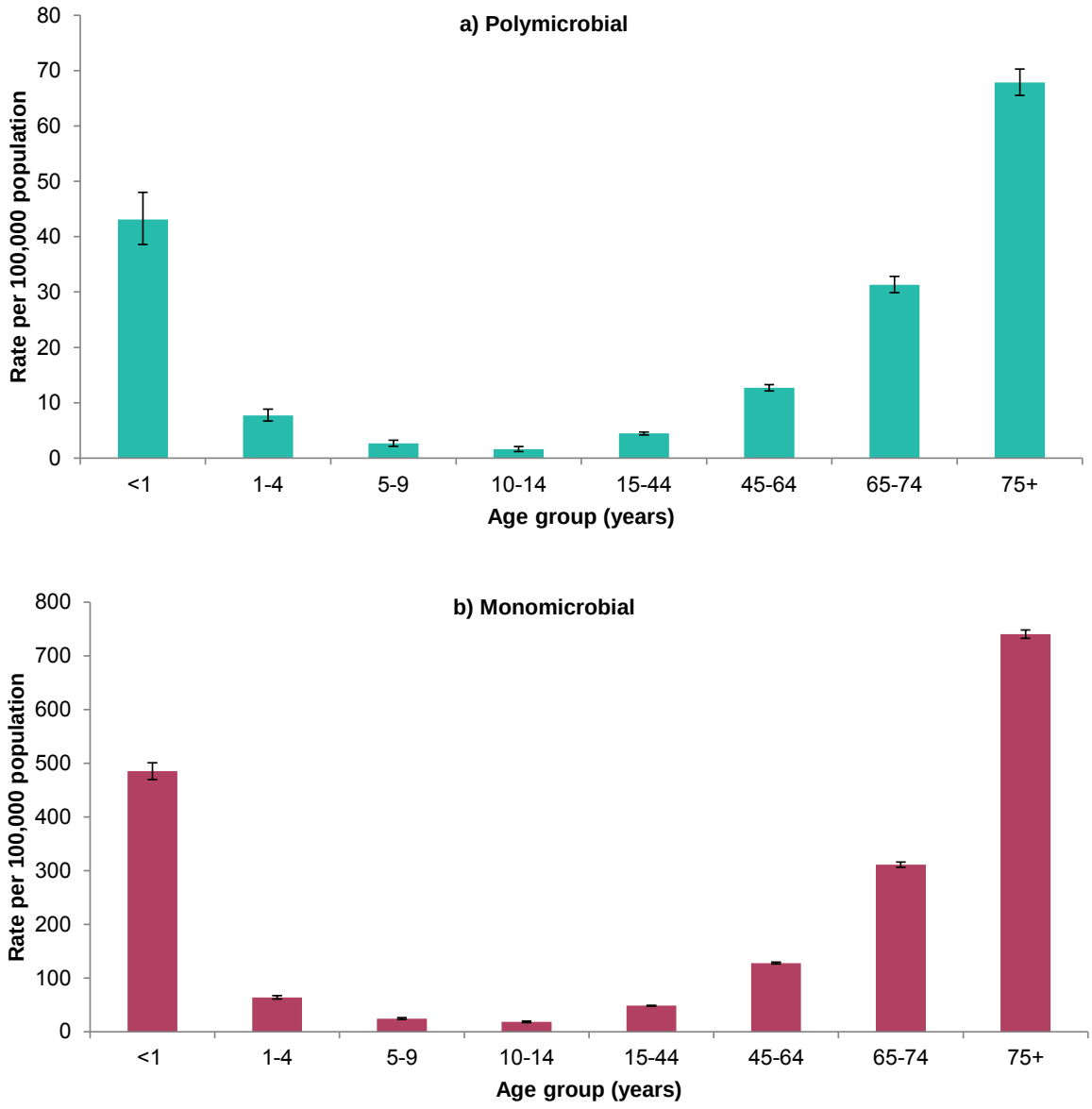


*Data extracted on 4 November, 2014.

Age distribution

- The age distribution of poly- and monomicrobial bacteraemia and fungaemia for 2013 is presented in Figure 2. The highest rate of polymicrobial bacteraemia was observed for those aged 75 years and over (67.87 per 100,000), followed by those aged less than one year (43.11 per 100,000). The lowest rate was recorded for those aged ten to fourteen years (1.60 per 100,000), followed by those aged five to nine years (2.64 per 100,000). This is broadly similar to the pattern observed previously [2].
- Similarly, rates of monomicrobial bacteraemia were also highest amongst the oldest and youngest age groups, with those aged 75 and over and those less than one year having the highest rates at 740.24 and 485.07 per 100,000, respectively. The lowest rates were recorded for those aged ten to fourteen years and five to nine years at 18.36 and 24.38 per 100,000, respectively.

Figure 2. Age-specific rates of polymicrobial (a) and monomicrobial (b) episodes, England, Wales, and Northern Ireland: 2013*



*Data extracted on 4 November, 2014.

Discussion

- The total numbers of patient episodes, bacteraemias, and polymicrobial patient episodes was highest in 2013 (97,699; 105,686; 8,509, respectively). The steady increase in these reports was observed from 2010. The number of fungaemia reports was lower than in the previous year by 2.2% (1,826 and 1,785 in 2012 and 2013, respectively), and the lowest in the four consecutive years (Table 1). The observed year-on-year increase in reports from 2010 onwards may be due an increase in reporting or increasing *Escherichia coli* bloodstream infections [4, 5].
- Similarly to previous years, the majority of polymicrobial bloodstream infections in 2013 were due to bacterial infections (98.4%).
- *Escherichia* spp were the most common organisms found in monomicrobial, and second most common organisms found in polymicrobial infections, after being the most common organisms found in the latter in 2012 [2]. Coagulase-negative staphylococci were the most ubiquitous organisms found in polymicrobial infections in 2013, with the total reports increasing by 16.18% from the previous year.
- The country level rates for England and Northern Ireland shown increase compared to 2012 (14.92 and 12.79 per 100,000, and 14.52 and 11.30 per 100,000, respectively), with the former being on steady increase since 2010 and the latter since 2011 (13.60 and 13.89 per 100,000 in 2010 and 2011, and 11.5 and 10.52 per 100,000 in 2010 and 2011, respectively). The polymicrobial bloodstream infection rates in Wales were the lowest since 2010 at 7.62 per 100,000.
- As seen in previous years, the highest poly- and monomicrobial bloodstream infections were observed in the youngest (<1 year) and the oldest (74 years and over) age groups (Figure 2). This may to a certain degree reflect the susceptibility of the very young and the elderly to infection, however further investigation is required,

It should be borne in mind that the incidence of the different genera and lately the less well known genera is the reflection of changing laboratory technology and the widespread use of MALDI-TOF. The incidence of the various genera may be therefore biased by the lab methodology used to identify organisms.

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)
3. StataCorp. 2013. *Stata Statistical Software: Release 13*. College Station, TX: StataCorp LP.
4. PHE. Healthcare Associated Infections and Antimicrobial Resistance. Extension of mandatory surveillance to *E. coli* bloodstream infection, June 2011.
5. PHE. Voluntary surveillance of *Escherichia coli* bacteraemia in England, Wales and Northern Ireland: 2009-2013. Health Protection Report [serial online] 2014; 8(19).

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Pneumococcal Polysaccharide Vaccine (PPV) coverage report, England, April 2013 to March 2014

Coverage of PPV in adults aged 65 years and over, vaccinated any time up to and including 31 March 2014, was 68.9%, compared with 69.1% in 2013. The proportion of adults aged 65 years receiving vaccine in the last 12 months was 13.7%, compared to 14.4% in 2013. ***Almost a third (32.8%) of 65 year olds received the vaccine any time up to and including 31 March 2014.*** *For the first time coverage is presented here by NHS England Area Team, and individual Clinical Commissioning Group level data will also shortly be available.*

Introduction

Pneumococcal disease is a significant cause of morbidity and mortality. Certain groups, namely young children, the elderly and people who are in clinical risk groups, are at risk of severe pneumococcal disease.

In the UK, a pneumococcal immunisation programme for older people was introduced in August 2003 [1]. In the first year of the programme, all people aged 80 years or above were offered a single dose of Pneumococcal Polysaccharide Vaccine (PPV) and this was extended to include all people aged 75 years and over in April 2004. Since April 2005 all people aged 65 years and over have been offered the vaccine.

PPV contains purified capsular polysaccharide from each of 23 capsular types of pneumococcus (PPV23) [2]. Most healthy adults develop a good antibody response to a single dose of PPV by the third week following immunisation. (Children younger than two years of age show poor antibody responses to immunisation with PPV, hence pneumococcal conjugate vaccine [PCV] is used in the childhood immunisation programme.)

Public Health England (PHE) monitors coverage of the PPV immunisation programme through an annual survey administered via the ImmForm* website. The survey measures the proportion of those aged 65 and over who have received PPV at any time and the proportion who received PPV during the previous year, providing an opportunity to assess the delivery and evaluate the coverage of the immunisation programme.

The data presented in this report describe vaccine coverage for the ninth year of the PPV programme in adults aged 65 years and over. Data for previous years are available online [3].

* ImmForm is the system used by PHE to record vaccine coverage data for some immunisation programmes and to provide vaccine ordering facilities for the NHS (https://www.immform.dh.gov.uk/SignIn.aspx?ReturnUrl=%2f).

Methods

Annual PPV coverage data are automatically extracted from GP practice records to the ImmForm website, via GP IT suppliers. This is the first year that the submission of data for this programme has been completely automated. The 2014 survey opened to GP IT suppliers on the 1 April 2014 for submission of data. GP IT suppliers had 22 working days (inclusive) to submit data to end of April 2014. EMIS were only able to make a data submission on 18 August 2014 however due to the large number of submissions from this supplier, PHE agreed to accept this late submission.

Formal approval from the Review of Central Returns (ROCR) Steering Committee was obtained for the collection of this data from the NHS (under reference number ROCR/OR/0114/004VOLU.3).

The survey assessed the coverage of PPV (the number of patients registered on the date the data are extracted [denominator] and the number of patients registered who have received the pneumococcal vaccine [numerator]). These data were collected for the time period up to and including 31 March 2014 as well as within the previous 12 months only (ie between 1 April 2013 and 31 March 2014). The data are delineated by the following age bands:

- 65 years and over (overall)
- 65 years only
- 66 to 74 years
- 75 years and over

Previously data have been presented by Strategic Health Authority and Primary Care Trust. However in order to reflect the organisational change in the NHS which came into effect on 1 April 2013 [4], in this report we present data by NHS England Area Team. More detailed tables by Area Team and Clinical Commissioning Group (CCG) will shortly be available on the new GOV.UK website page "Pneumococcal polysaccharide vaccine (PPV): vaccine coverage estimates".

Results

In total 7,393/7,956 (92.9%) GP practices reported PPV coverage data in 2014, a slight increase on the 91.2% (7,313/8,021) of practices reporting in 2013. This proportion ranged by Area Team from 82.3% (Greater Manchester) to 99.4% (West Yorkshire).

PPV coverage for England in 2013/14 (table 1 and table 2) is in line with figures reported in preceding years (figures 1 and 2). The stable cumulative coverage of just under 70% observed in the 65+ years age group in the last five years results from; a gradual increase in coverage in the 75+ year olds, a gradual decline in coverage in the 66 to 74 years age groups, and stable coverage in the 65 year olds (figure 1).

Table 1. Percentage of GP practices reporting and vaccination coverage for patients who received PPV anytime up to 31 March 2014 by age group for each Area Team in England

Area Team (code)	% of GP practices reporting	Aged 65 and over	Aged 65 only	Aged 66 to 74	Aged 75+
Cheshire, Warrington and Wirral (Q44)	94.1	70.9	34.6	65.1	82.3
Durham, Darlington and Tees (Q45)	97.7	68.5	35.5	61.8	80.6
Greater Manchester (Q46)	82.3	68.0	33.2	62.3	79.7
Lancashire (Q47)	97.8	69.7	35.7	64.0	80.7
Merseyside (Q48)	83.0	71.7	39.4	67.4	80.7
Cumbria, Northumberland, Tyne and Wear (Q49)	90.5	72.3	37.3	66.5	83.4
N Yorkshire and Humber (Q50)	93.2	71.0	36.3	64.0	83.2
S Yorkshire and Bassetlaw (Q51)	92.6	70.7	37.0	64.5	82.2
W Yorkshire (Q52)	99.4	70.8	36.3	64.9	82.2
Arden, Herefordshire and Worcestershire (Q53)	94.4	69.8	34.2	63.5	81.7
Birmingham and Black Country (Q54)	93.5	66.1	30.2	58.9	77.6
Derbyshire and Notts. (Q55)	98.6	72.8	38.7	67.5	83.2
East Anglia (Q56)	94.2	70.4	35.6	63.8	82.1
Essex (Q57)	98.2	65.7	28.5	58.2	78.8
Hertfordshire and the S Midlands (Q58)	95.5	69.3	30.7	63.0	81.6
Leicestershire and Lincolnshire (Q59)	99.2	69.6	35.4	63.3	81.3
Shropshire and Staffordshire (Q60)	88.5	66.8	30.3	60.4	79.5
Bath, Gloucestershire, Swindon and Wiltshire (Q64)	96.4	69.7	31.8	62.8	82.1
Bristol, N Somerset, Somerset and S Gloucestershire (Q65)	95.6	69.8	32.1	63.1	81.7
Devon, Cornwall and Scilly Isles (Q66)	93.1	68.7	33.3	62.1	80.5
Kent and Medway (Q67)	84.3	69.3	28.5	63.8	81.2
Surrey and Sussex (Q68)	95.3	66.9	28.0	58.6	79.6
Thames Valley (Q69)	94.2	71.2	32.3	65.0	83.2
Wessex (Q70)	90.7	71.2	32.6	64.3	83.2
London (Q71)	92.6	63.6	27.0	56.4	76.2
England	**92.9**	**68.9**	**32.8**	**62.4**	**80.8**
England denominator	**7,956**	**8,989,225**	**576,614**	**4,302,254**	**4,110,357**

Table 2. Percentage of GP practices reporting and vaccination coverage for patients who received PPV between 1 April 2013 and 31 March 2014 by age group for each Area Team in England

Area Team (code)	% of GP practices reporting	Aged 65 and over	Aged 65 only	Aged 66 to 74	Aged 75+
Cheshire, Warrington and Wirral (Q44)	94.1	4.5	14.7	5.7	1.8
Durham, Darlington and Tees (Q45)	97.7	4.3	13.4	5.6	1.6
Greater Manchester (Q46)	82.3	3.9	10.6	5.0	1.7
Lancashire (Q47)	97.8	3.4	11.8	4.4	1.0
Merseyside (Q48)	83.0	4.2	14.8	5.3	1.5
Cumbria, Northumberland, Tyne and Wear (Q49)	90.5	4.0	14.4	5.3	1.1
N Yorkshire and Humber (Q50)	93.2	4.1	17.1	5.2	1.1
S Yorkshire and Bassetlaw (Q51)	92.6	3.8	13.5	5.0	1.1
W Yorkshire (Q52)	99.4	4.2	15.3	5.5	1.2
Arden, Herefordshire and Worcestershire (Q53)	94.4	4.4	15.9	5.8	1.3
Birmingham and Black Country (Q54)	93.5	3.4	9.1	4.7	1.5
Derbyshire and Notts. (Q55)	98.6	3.8	16.9	4.7	1.0
East Anglia (Q56)	94.2	4.4	18.7	5.6	1.2
Essex (Q57)	98.2	3.6	12.7	4.8	1.1
Hertfordshire and the S Midlands (Q58)	95.5	3.9	13.0	5.3	1.1
Leicestershire and Lincolnshire (Q59)	99.2	4.1	17.0	5.2	1.0
Shropshire and Staffordshire (Q60)	88.5	3.8	12.5	5.0	1.2
Bath, Gloucestershire, Swindon and Wiltshire (Q64)	96.4	4.1	14.4	5.3	1.4
Bristol, N Somerset, Somerset and S Gloucestershire (Q65)	95.6	3.6	13.8	4.8	0.9
Devon, Cornwall and Scilly Isles (Q66)	93.1	4.8	16.1	6.1	1.9
Kent and Medway (Q67)	84.3	3.7	11.7	5.0	1.1
Surrey and Sussex (Q68)	95.3	3.5	11.4	4.9	1.1
Thames Valley (Q69)	94.2	4.5	15.3	6.0	1.4
Wessex (Q70)	90.7	3.8	14.8	5.1	1.0
London (Q71)	92.6	3.9	9.5	5.2	1.7
England	**92.9**	**4.0**	**13.7**	**5.2**	**1.3**
England denominator	**7,956**	**8,989,225**	**576,614**	**4,302,254**	**4,110,357**

Figure 1. Percentage PPV coverage – ever vaccinated, by age group, England, 2005/06 to 2013/14

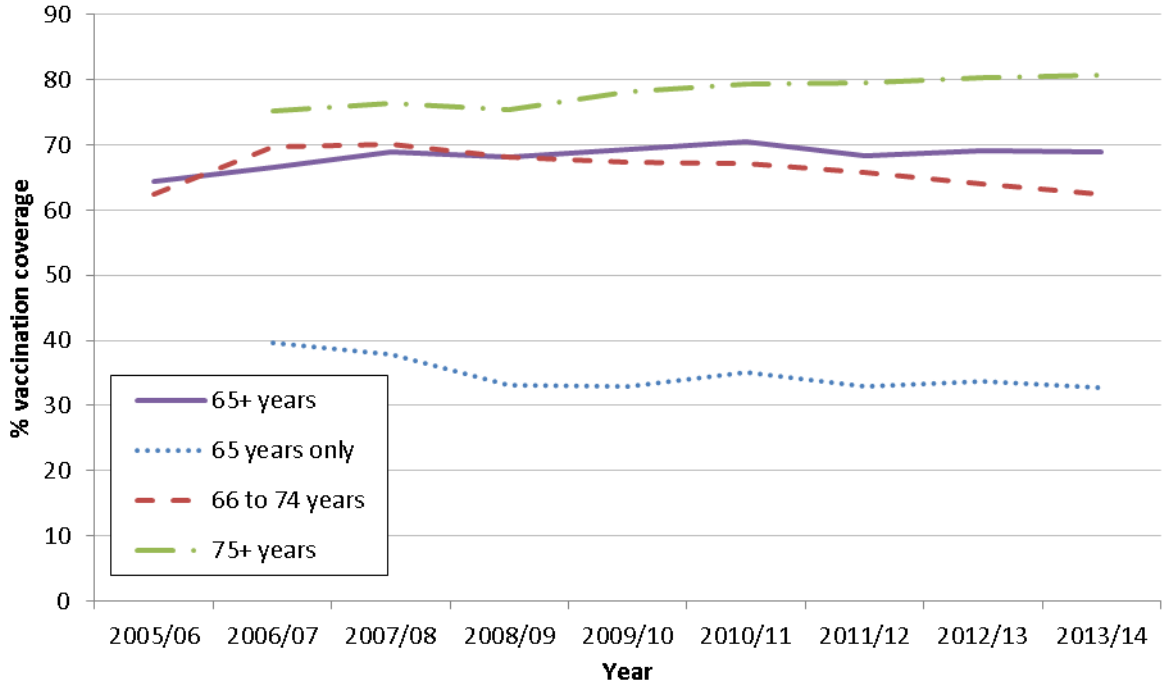
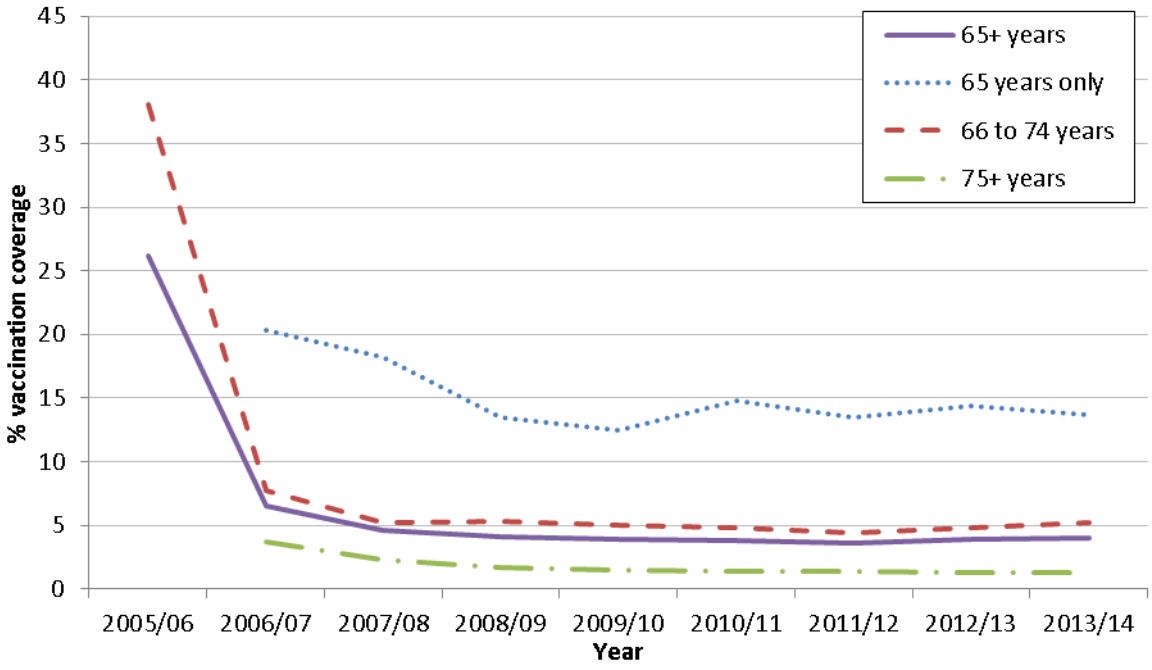


Figure 2. Percentage PPV coverage in the last 12 months, by age group, England, 2005/06 to 2013/14



The percentage of patients vaccinated in the previous 12 months has remained stable over the last five years. Almost a third (32.8%) of 65 years olds received the vaccine any time up to and including the 31 March 2014, however only 13.7% received the vaccine in the last 12 months. This is because a sizable proportion of these patients were eligible for the PPV vaccine before the age of 65 years due to their inclusion in specific clinical risk groups [2].

Coverage of PPV received anytime up to 31 March 2014 ranged by Area Team (table 1) from:

- 63.6% (London) to 72.8% (Derbyshire and Nottinghamshire) for 65 years and over
- 27.0% (London) to 39.4% (Merseyside) for 65 years only
- 56.4% (London) to 67.5% (Derbyshire and Nottinghamshire) for 66 to 74 years
- 76.2% (London) to 83.4% (Cumbria, Northumberland, Tyne and Wear) for 75 years and over.

Coverage of PPV received between 1 April 2013 and 31 March 2014 ranged by Area Team (table 2) from:

- 3.4% (Lancashire and Birmingham and the Black Country) to 4.8% (Devon, Cornwall and Isles of Scilly) for 65 years and over
- 9.1% (Birmingham and the Black Country) to 18.7% (East Anglia) for 65 years only
- 4.4% (Lancashire) to 6.1% (Devon, Cornwall and Isles of Scilly) for 66 to 74 years
- 0.9% (Bristol, North Somerset, Somerset and South Gloucestershire) to 1.9% (Devon, Cornwall and Isles of Scilly) for 75 years and over.

Data issues/limitations

Although one GP IT supplier provided data late, the 2014 survey was otherwise completed without any major problems; automated data extractions enabled data submission to take place with a minimal burden on service providers. The pneumococcal vaccine uptake collection is a snapshot of vaccine coverage among the eligible GP registered population at the time of data extraction. The data will therefore exclude patients who received the vaccine but have subsequently died and patients who have since moved. Patients who are vaccinated but have not had their electronic patient record updated by the time of data extraction, will also not be included. The data include patients who have been vaccinated by another healthcare provider (provided their electronic record is updated before the data are extracted). Vaccine uptake surveys provided by ImmForm are not designed to support GP payment schemes.

Discussion

This is the first year that the submission of data for this programme has been completely automated. Despite this, the proportion of GP practices participating in the PPV survey continues to be high, achieving levels over 90% for the third successive year.

The impact of the PPV programme on the incidence of vaccine-type invasive pneumococcal disease in patients aged 65 years and over has not been evident in surveillance data given the vaccine's modest effectiveness and its existing use in risk groups prior to the start of the programme in older adults [5]. However, there is evidence of individual protection against the serotypes covered by PPV23.

In the United States, as in the UK, PPV is offered to adults aged 65 years and over: in 2012 coverage in this age group (vaccinated any time up to survey point) was 59.9% [6], lower than the equivalent coverage (68.9%) in England.

The data presented in this report indicate that many of those eligible for PPV vaccination do not receive the vaccine in the first year that they become eligible. However, increasing vaccine coverage in the older age groups demonstrates that vaccination is being given opportunistically in primary care to those aged over 65 years.

PPV can be given at the same time as the seasonal influenza vaccine, which is also recommended for adults aged 65 years and over. Coverage of the seasonal influenza programme in this age group has been above 73% for the past three seasons [7] suggesting that at least similar coverage could be achieved for PPV, a one-off vaccine available throughout the year. A further opportunity for offering this vaccine is also now available for adults eligible for the shingles vaccine (currently offered to those who are 70 years old on the 1 September 2014, with a catch-up available for those aged 78 and 79 on 1 September 2014 [8]). The recent experience with the shingles programme has further demonstrated that is feasible to successfully deliver an additional vaccine, targeted to a specific age group, alongside the influenza programme.

References

1. Department of Health, Chief Medical Officer (2003). PL CMO (2003)6: Adult immunisation update. Available at: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Professionalletters/Chiefmedicalofficerletters/DH_4032608

2. Public Health England (2013). Pneumococcal: the green book, chapter 25. Last updated 4 December 2013. Available at: https://www.gov.uk/government/publications/pneumococcal-the-green-book-chapter-25

3. Public Health England. Pneumococcal Polysaccharide Vaccination (PPV) uptake. Available at: http://webarchive.nationalarchives.gov.uk/20140714084352/http:/www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Pneumococcal/PPVUptake/

4. Office for National Statistics. English Health Geography. Available at: http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/health/english-health-geography/index.html

5. Andrews NJ, Waight PA, George RC, Slack MPE, Miller E (2012). Impact and effectiveness of 23-valent pneumococcal polysaccharide vaccine against invasive pneumococcal disease in the elderly in England and Wales. Vaccine 30: 6802-6808.

6. Centers for Disease Control and Prevention (2014). Noninfluenza Vaccination Coverage Among Adults — United States, 2012. MMWR Weekly 63(05): 95-102. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6305a4.htm

7. Public Health England. Influenza: the green book, chapter 19. Last updated 5 November 2014. Available at: https://www.gov.uk/government/publications/influenza-the-green-book-chapter-19

8. Public Health England (2014). Who is going to be eligible for the shingles vaccination in 2014/15? Vaccine Update 213. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/287657/213_March2014_08_accessible.pdf

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Quarterly vaccination coverage statistics for children aged up to five years in the UK (COVER programme): July to September 2014

Commentary on the second quarterly report (July to September 2014) for 2014/15

This report presents quarterly coverage data for children in the UK who reached their first, second, or fifth birthday during the evaluation quarter (July to September 2014).

Those reaching one year of age in the quarter (born July to September 2013) are the first cohort to have been routinely offered rotavirus vaccine at two and three months, and the second quarterly cohort offered only one primary MenC dose at three months of age [1].

In Scotland, Northern Ireland and Wales the programmes extracting COVER data from Child Health Information Systems (CHISs) have been modified to reflect these changes. Data presented in this report shows that coverage of one dose of MenC is similar to, or higher than, the other vaccines evaluated at one year in those countries (98% in Scotland, 96.6% in Northern Ireland, and 96.1% in Wales). Coverage of two doses of rotavirus vaccine evaluated at one year is also high – in Northern Ireland rotavirus coverage was 96.3%, in Scotland 92.3%, and in Wales 89.2% (table 1a).

In England a new *Information Standards Notice* (ISN) for the COVER programme was approved by the Standardisation Committee for Care Information (SCCI) in September and published in November 2014 [2]. CHIS IT suppliers are still making the necessary changes to their systems and currently only nine Area Teams (ATs) are able to supply one dose MenC vaccine coverage data for their area, although in all of these areas coverage was similar to or exceeded that of other vaccines evaluated at one year. As a consequence we are not able to produce MenC vaccine coverage at one year for England or the UK (table 1a). This is a technical rather than a delivery issue which should resolve once all CHIS IT suppliers comply with the ISN.

Similarly, only one AT is able to produce rotavirus vaccine coverage data for all former PCTs in their area from CHIS. However, in order to rapidly assess rotavirus vaccine coverage, PHE introduced a temporary sentinel collection via ImmForm to extract monthly coverage data directly from GP practices in England for children who had just reached the upper age for receiving the vaccine (25 weeks) [3]. This early evaluation of vaccine coverage has provided assurance that the vaccine has been well accepted in England. Monthly coverage estimates at the national and AT levels have been published, and for children born between July and September 2013 (aged 25 weeks in January to March 2014) coverage was around 86%, rising to 88% for children born between April and March 2014 [4]. This collection will remain in place until routine COVER rotavirus data are available for all areas.

UK coverage of all antigens evaluated at two years decreased marginally this quarter, between 0.1% and 0.2%, when compared to the previous quarter [5]. Primary DTaP/IPV/Hib3 coverage is now 96.2%, PCV and Hib/MenC boosters are 92.7%, and measles, mumps, and rubella (MMR) is 92.7%. Scotland and Northern Ireland achieved at least 95% coverage for MMR, PCV booster and Hib/MenC booster, as did four of the 25 ATs in England.

UK coverage for all antigens evaluated at 12 months and 24 months is around 0.5% lower than in the same quarter last year [6]. Coverage at five years remained very similar to the last quarter and to the same quarter last year [1,6] (table 3a).

COVER data in England from April 2013

From April 2013, the responsibility for commissioning and coordinating immunisation programmes transferred to NHS England [7]. Population vaccination coverage is a key indicator included in the Public Health Outcomes Framework (PHOF) (Indicator 3.3) [8] with reporting expected for the Local Authority (LA) resident population.

COVER reports present data by English Area Teams (AT) (tables 1a-4a) while former Strategic Health Authority tabulations are provided for historical comparisons (tables 1b-4b).

From April 2014 England COVER data became Official Statistics and is subject to the code of practice associated with such data [10].

New COVER Information Standards Notice and COVER user guide published

A new *Information Standards Notice* (ISN) for the COVER programme was approved by the Standardisation Committee for Care Information (SCCI) in September and published by the Health and Social Care Information Centre (HSCIC) in November 2014 [2]. PHE published a new COVER User Guide, aimed at all those submitting COVER data, to support the implementation of the ISN. All these documents can be found here: https://www.gov.uk/government/publications/cover-of-vaccination-evaluated-rapidly-cover-programme-information-standards.

The ISN provides detailed instruction for Child Health Information System (CHIS) IT suppliers and all data providers on the:

- geographies required for data output (new LA resident output, continuation of PCT responsible population output for trend). This will bring COVER in line with expectations of reporting of population vaccination coverage for the PHOF [8];
- changes to the routine childhood immunisation schedule (primary MenC reduced from two to one dose, the introduction of Rotavirus immunisation at two and three months). The final sentence in the description section of the ISN states, '*…the implementation completion date of 01/10/15 is the full conformance date. Care providers and suppliers should aim on a best endeavours basis to achieve earlier implementation, in particular in respect of rotavirus and Meningitis C, to enable the commencement of national surveillance*.'
- inclusion of neonatal BCG coverage to be evaluated at 12 months for those areas offering a universal programme;
- inclusion of a field for MenB vaccine reporting – this will only become active should the vaccine be procured at a cost-effective price and a national programme implemented;
- need to refine the definition of completed doses for age-dependent vaccines in the COVER request parameters to ensure information on children who were immunised outside the UK is captured accurately.

The HSCIC alerted IT system suppliers of the publication of the new COVER ISN in November 2014. The PHE national COVER team is raising awareness of the new ISN via PHE's *Vaccine Update*, DH's *Children, Families and Maternity e-bulletin* and the NHS England Area Team Bulletin. COVER data providers and NHS England Screening and Immunisation Teams have been contacted directly to keep them informed with developments. Area Teams have been asked to contact local CHIS suppliers and other stakeholders to alert them to the new ISN and engage with them to ensure compliance is achieved for all aspects.

Results for July to September 2014

Children who reached their first birthday in the quarter (born July to September 2013) were scheduled for three doses of diphtheria, tetanus, acellular pertussis, polio, and *Haemophilus influenzae* type b vaccine (DTaP/IPV/Hib vaccine), two doses of pneumococcal conjugate vaccine (PCV), one dose of meningococcal serogroup C conjugate vaccine (MenC vaccine) at three months of age and two doses of rotavirus vaccine at two and three months of age [1].

Children who reached their second birthday in the quarter (born July to September 2012) were scheduled to receive their third DTaP/IPV/Hib, second MenC and PCV vaccinations between November 2012 and January 2013, and their first MMR vaccination, a booster dose of Hib and MenC vaccine (given as a combined Hib/MenC vaccine) and PCV vaccine at the same visit at 12 months of age, between August and October 2013 [11].

Children who reached their fifth birthday in the quarter (born July to September 2009) were scheduled to receive their third dose DTaP/IPV/Hib and second MenC and PCV vaccinations between November 2010 and January 2011. They were also scheduled to receive their first MMR between August and October 2010 and their pre-school diphtheria, tetanus, acellular pertussis, inactivated polio booster and second dose MMR from October 2012. Children born between July and September 2009 were scheduled to receive Hib/MenC booster vaccine at 12 months and PCV booster vaccine at 13 months.

Participation and data quality

Data were received from all Health Boards (HBs) in Scotland, Northern Ireland and Wales. In England, ATs and Child Health Record Departments (CHRDs) submitted data for all former PCTs. Six out of 31 former PCTs in London reported data quality issues this quarter which were related to changes in information flows or incomplete data for unregistered children; consequently all data for one former London PCT and the 24 month data for another have been excluded from this report. Three former PCTs in Kent and Medway and one in Surrey and Sussex reported data quality issues related to the introduction of new CHIS IT systems.

Across England there are some challenges with maintaining data flows for the PCT level collection as these organisations formally ceased to exist on 1 April 2013. Some CHISs have moved to extracting data at the Clinical Commission Group (CCG) level and we have aggregated these returns to produce a PCT report, based on postcode. Many CHISs are still not able to provide accurate LA resident population coverage data; however, where LAs are coterminous with a former PCT boundary, coverage data for the PCT responsible population will approximate to the LA responsible population. Twenty-eight of the 41 LAs that are not coterminous with PCT boundaries are currently not able to provide LA responsible population data.

Children evaluated in the current quarter (born July to September 2013), are the first cohort to have been routinely offered two doses of rotavirus vaccine at two and three months of age, and the second to be exclusively offered one dose of MenC at three months of age. In Scotland, Wales and Northern Ireland the programmes extracting COVER data from Child Health Information Systems (CHISs) have already been modified to reflect these changes and coverage is presented in table 1a.

In England, some CHIS IT suppliers required the publication of the ISN to make the appropriate changes to their COVER data extraction report. As a consequence only nine ATs are currently able to supply one dose MenC vaccine coverage data for most former PCTs in their area and so MenC vaccine coverage at one year is not published for England or the UK (table 1a). This is a technical rather than a delivery issue and, as evidenced by the areas that have made the change, MenC coverage is expected to be similar to DTaP/IPV/Hib3 and PCV2 coverage at one year (table 1a).

Only one AT is able to produce rotavirus vaccine coverage data for all former PCTs in their area from CHIS. However, in order to rapidly assess rotavirus vaccine coverage, PHE introduced a temporary sentinel collection via ImmForm to extract monthly coverage data directly from GP practices in England for children who had just reached the upper age for receiving the vaccine (25 weeks) [3]. This early evaluation of vaccine coverage has provided assurance that the vaccine has been well accepted in England. This collection will remain in place until routine COVER rotavirus data are available for all areas.

Coverage at 12 months

UK coverage at 12 months for DTaP/IPV/Hib3 decreased 0.1% to 94.3% and PCV2 decreased 0.2% to 94.0%) (table 1a) when compared to the previous quarter [5]. Country-specific minimum coverage levels achieved for DTaP/IPV/Hib3 and PCV2 evaluated at 12 months show that Scotland and Northern Ireland achieved at least 97% coverage, Wales at least 94%, and England at least 93%. Within England 16 out of 25 ATs achieved at least 95% coverage at 12 months (table 1a).

UK coverage of one dose of MenC at 12 months cannot be calculated this quarter (see commentary above), however, accurate data were provided by all HBs in Scotland, Wales, Northern Ireland and from nine English ATs (Q44, Q47, Q53, Q60, Q64, Q65, Q66, Q69 and Q70). At the country and English AT level (where data are available) MenC coverage ranged from 95.7% in Thames Valley (Q69) to 98.2% in Shropshire and Staffordshire (Q60), and was similar to or exceeded coverage of other vaccines evaluated at 12 months (table 1a).

Coverage of two doses of rotavirus vaccine, evaluated at 12 months, was available for the first time this quarter for the devolved administrations. The highest coverage, 96.3%, was reported in Northern Ireland, Scotland achieved 92.3% and in Wales 89.2% was reported. Although English data were not available through COVER, rotavirus coverage estimates have been published at the national and AT levels using data from the ImmForm GP practice-based sentinel collection. Monthly coverage data for children who had just reached the upper age for receiving the vaccine (25 weeks) was around 86% for children born between July and September 2013 [4], rising to 88% for children born between April and March 2014 [4].

Table 1a. Completed primary immunisations at 12 months by country and English Area Team: July to September 2014 (*April to June 2014*)

Country and English Area Team (AT code)	Number of PCTs/HBs†	DTaP/IPV/Hib3 %	MenC%	PCV2%	Rota2%
United Kingdom	**175**	**94.3** *(94.4)*	**n/a** *(n/a)*	**94.0** (*94.2*)	**n/a**
Wales	**7**	**94.6** (*96.2*)	**96.1** (*97.1*)	**94.0** (*95.7*)	**89.2**
Northern Ireland	**4**	**97.6** (*97.0*)	**96.6** (*n/a*)	**97.6** (*96.8*)	**96.3**
Scotland	**14**	**97.5** (*97.3*)	**98.0** (*98.1*)	**97.5** (*97.5*)	**92.3**
England (Total)	**150***	**93.9** (*93.9*)	n/a (*n/a*)	**93.5** (*93.7*)	**See commentary**
English Area Teams					
Cheshire, Warrington and Wirral (Q44)	4	96.4 (*96.4*)	97.5 (*97.0*)	96.6 (*96.5*)	n/a
Durham, Darlington and Tees (Q45)	6	96.6 (*96.4*)	n/a (*n/a*)	96.1 (*97.4*)	n/a
Greater Manchester (Q46)	10	95.7 (*96.0*)	n/a (*n/a*)	95.4 (*95.7*)	n/a
Lancashire (Q47)	5	89.7 (*91.8*)	96.8[1] (*n/a*)	88.2 (*90.7*)	n/a
Merseyside (Q48)	4	93.1 (*93.6*)	n/a (*n/a*)	93.3 (*93.9*)	n/a
Cumbria, Northumberland, Tyne and Wear (Q49)	7	97.1 (*96.2*)	n/a (*n/a*)	96.9 (*96.1*)	n/a
N Yorkshire and Humber (Q50)	5	96.6 (*96.3*)	n/a (*n/a*)	96.7 (*96.5*)	n/a
S Yorkshire and Bassetlaw (Q51)	5	95.4 (*95.4*)	n/a (*n/a*)	95.3 (*95.0*)	n/a
W Yorkshire (Q52)	5	96.3 (*96.2*)	n/a (*n/a*)	96.1 (*95.9*)	n/a
Arden, Herefordshire and Worcestershire (Q53)	4	96.6 (*96.6*)	98.0 (*n/a*)	96.1 (*95.9*)	n/a
Birmingham and the Black Country (Q54)	8	93.1 (*92.5*)	n/a (*n/a*)	93.3 (*92.4*)	n/a
Derbyshire and Nottinghamshire (Q55)	4	95.3 (*95.4*)	n/a (*n/a*)	94.7 (*94.8*)	n/a
East Anglia (Q56)	5	95.0 (*95.6*)	n/a (*n/a*)	94.6 (*95.3*)	n/a
Essex (Q57)	5	95.8 (*95.6*)	n/a (*n/a*)	95.7 (*95.3*)	n/a
Hertfordshire and the S Midlands (Q58)	5	96.6 (*97.0*)	n/a (*n/a*)	96.5 (*96.7*)	n/a
Leicestershire and Lincolnshire (Q59)	3	96.4 (*96.5*)	n/a (*n/a*)	96.3 (*96.4*)	n/a
Shropshire and Staffordshire (Q60)	5	96.9 (*97.3*)	98.3 (*96.9*)	96.8 (*97.3*)	n/a
Bath, Gloucestershire, Swindon and Wiltshire (Q64)	4	95.6 (*96.1*)	97.0 (*97.1*)	95.5 (*96.0*)	n/a
Bristol, N Somerset, Somerset and S Gloucestershire (Q65)	4	96.0 (*96.2*)	97.4 (*97.6*)	95.9 (*96.4*)	n/a
Devon, Cornwall, Isles of Scilly (Q66)	4	95.3 (*95.6*)	97.7[2] (*97.3*)	94.9 (*95.3*)	n/a
Kent and Medway (Q67)	3	90.7 (*90.9*)	n/a (*n/a*)	87.3 (*91.0*)	n/a
Surrey and Sussex (Q68)	5	88.7 (*90.4*)	n/a (*n/a*)	88.8 (*90.5*)	n/a
Thames Valley (Q69)	4	95.2 (*95.7*)	95.7 (*n/a*)	94.5 (*95.4*)	n/a
Wessex (Q70)	6	95.2 (*95.7*)	96.1[3] (*96.8*)	95.1 (*95.8*)	n/a
London (Q71)	30*	89.6 (*88.6*)	n/a (*n/a*)	89.1 (*88.3*)	n/a

† Primary Care Trusts/health boards.
n/a accurate estimate not available (see commentary above)
* Data for one PCT excluded
1. Based on coverage data from 4 of 5 PCTs.
2. Based on coverage data from 3 of 4 PCTs
3. Based on coverage data from 5 of 6 PCTs

Table 1b. UK completed primary immunisations at 12 months by former Strategic Health Authority, England: July to September 2014 (*April to June 2014*)

Former English Strategic Health Authorities (SHAs)	PCT/HB†	DTaP/IPV /Hib3 %	MenC%	PCV2%
North East	12	97.0(*96.6*)	n/a (*n/a*)	96.6 (*97.0*)
North West	24	94.2 (*94.8*)	n/a (*n/a*)	93.9 (*94.5*)
Yorkshire and Humber	14	96.1 (*96.0*)	n/a (*n/a*)	96.0 (*95.8*)
East Midlands	9	96.2 (*96.3*)	n/a (*n/a*)	95.9 (*96.0*)
West Midlands	17	94.9 (*94.7*)	n/a (*n/a*)	94.8 (*94.5*)
East of England	13	95.6 (*95.9*)	n/a (*n/a*)	95.4 (*95.6*)
London	30*	89.6 (88.6)	n/a (*n/a*)	89.1 (*88.3*)
South Central	9	95.4 (*95.8*)	n/a (*n/a*)	95.0 (*95.6*)
SE Coast	8	89.6 (*90.6*)	n/a (*n/a*)	88.2 (*90.7*)
South West	14	95.6 (*95.9*)	n/a (*n/a*)	95.3 (*95.9*)

† Primary Care Trusts/health boards
* Data for one PCT excluded
n/a = accurate estimate not available (see commentary above)

Coverage at 24 months

UK coverage of DTaP/IPV/Hib3 at 24 months decreased by 0.1% to 96.2% compared to the previous quarter [5]. Surrey and Sussex (Q68) and London (Q71) are the only ATs with DTaP/IPV/Hib3 coverage below the 95% target at 92.7% and 92.2% respectively (table 2a).

Compared to the previous quarter, UK coverage for PCV and HibMenC boosters decreased by 0.1% to 92.8% and 92.7% respectively, and MMR1 coverage at 24 months decreased by 0.2% to 92.7% (table 2a) [5]. Country-specific comparisons for minimum coverage levels achieved for these three vaccines evaluated at 24 months show that Scotland and Northern Ireland achieved at least 95% coverage, Wales at least 94% and England at least 92%. Within England four ATs achieved at least 95% for all three vaccines (table 2a).

Table 2a. Completed primary immunisations at 24 months by country and English Area Team: July to September 2014 (*April to June 2014*)

Country and English Area Team (AT code*)	PCT/HB†	DTaP/IPV/Hib3 %	PCV booster %	Hib/MenC %	MMR1 %
United Kingdom	**174**	**96.1** (*96.3*)	**92.7** (*92.9*)	**92.7** (*92.8*)	**92.6** (*92.9*)
Wales	**7**	**97.1** (*98.10*	**94.9** (*96.1*)	**94.3** (*95.4*)	**95.2** (*96.3*)
Northern Ireland	**4**	**98.7** (*98.9*)	**96.6** (*96.2*)	**96.5** (*96.3*)	**96.4** (*96.4*)
Scotland	**14**	**98.3** (*98.2*)	**96.0** (*95.6*)	**96.0** (*95.8*)	**95.7** (*95.3*)
England (Total)	**149**	**95.9** (*95.9*)	**92.3** (*92.4*)	**92.2** (*92.3*)	**92.2** (*92.4*)
English Area Teams					
Q44	4	97.8 (*97.8*)	95.1 (*95.0*)	95.3 (*95.9*)	96.0 (*96.0*)
Q45	6	97.6 (*98.3*)	95.8 (*96.2*)	96.0 (*96.0*)	94.3 (*95.3*)
Q46	10	97.5 (*97.2*)	94.3 (*94.4*)	93.8 (*93.9*)	94.5 (*94.4*)
Q47	5	93.3 (*95.8*)	89.9 (*90.1*)	89.9 (*89.9*)	92.8 (*93.3*)
Q48	4	95.5 (*96.5*)	92.7 (*93.7*)	92.6 (*93.6*)	91.9 (*93.3*)
Q49	7	98.3 (*98.7*)	96.3 (*96.4*)	96.4 (*96.7*)	96.2 (*96.2*)
Q50	5	97.2 (*97.4*)	95.0 (*95.5*)	94.4 (*94.9*)	94.7 (*95.4*)
Q51	5	97.3 (*97.1*)	94.1 (*92.9*)	94.7 (*94.1*)	93.2 (*92.6*)
Q52	5	97.4 (*97.5*)	95.3 (*95.4*)	95.2 (*95.7*)	94.7 (*95.0*)
Q53	4	98.4 (*98.1*)	96.2 (*95.5*)	95.1 (*94.8*)	96.3 (*95.8*)
Q54	8	95.6 (*95.2*)	91.9 (*92.4*)	91.3 (*91.7*)	91.4 (*92.1*)
Q55	4	97.1 (*97.6*)	93.2 (*94.2*)	93.7 (*94.7*)	93.1 (*93.9*)
Q56	5	96.6 (*96.4*)	93.7 (*93.6*)	93.7 (*93.9*)	93.2 (*93.1*)
Q57	5	97.1 (*97.1*)	95.2 (*95.0*)	95.6 (*95.5*)	94.6 (*94.1*)
Q58	5	97.3 (*97.3*)	95.2 (*95.0*)	95.6 (*95.4*)	94.8 (*94.7*)
Q59	3	97.3 (*97.4*)	94.4 (*95.3*)	94.2 (*95.4*)	93.9 (*95.3*)
Q60	5	98.4 (*97.7*)	95.7 (*96.4*)	95.2 (*95.7*)	95.4 (*95.8*)
Q64	4	97.4 (*97.3*)	95.5 (*95.0*)	94.8 (*93.7*)	95.3 (*94.9*)
Q65	4	97.7 (*97.8*)	95.0 (*94.2*)	94.5 (*93.7*)	94.6 (*94.2*)
Q66	4	96.5 (*97.0*)	93.4 (*94.4*)	92.6 (*93.6*)	93.3 (*94.3*)
Q67	3	96.1 (*96.2*)	88.2 (*88.2*)	89.1 (*88.6*)	87.4 (*87.4*)
Q68	5	91.7 (*91.9*)	87.8 (*88.2*)	87.3 (*87.8*)	87.3 (*88.2*)
Q69	4	96.2 (*96.3*)	93.1 (*93.1*)	92.8 (*93.4*)	92.7 (*93.6*)
Q70	6	96.8 (*97.0*)	94.6 (*94.5*)	94.1 (*93.8*)	94.3 (*94.0*)
Q71	29	92.2 (*92.2*)	85.8 (*86.3*)	86.2 (*86.6*)	86.5 (*86.8*)

* See table 1a for key to Area Team organisational code
† Primary Care Trusts/health boards

Table 2b. Completed primary immunisations at 24 months by former Strategic Health Authority, England: July to September 2014 (*April to June 2014*)

Former English Strategic Health Authorities (SHAs)	PCT/HB†	DTaP/IPV /Hib3 %	PCV booster %	Hib/MenC %	MMR1 %
North East	12	98.0 (*98.3*)	96.0 (*96.3*)	96.2 (*96.3*)	95.2 (*95.7*)
North West	24	96.5 (*97.0)*	93.5 (*93.7*)	93.3 (*93.6*)	94.1 (*94.4*)
Yorkshire and Humber	14	97.3 (*97.4*)	94.9 (*94.8*)	94.8 (*95.1*)	94.3 (*94.5*)
East Midlands	8	97.4 (*97.6*)	94.4 (*95.0*)	94.5 (*95.3*)	94.0 (*94.8*)
West Midlands	17	97.0 (*96.6*)	94.0 (*94.2*)	93.2 (*93.5*)	93.7 (*94.0*)
East of England	13	96.9 (*96.9*)	94.4 (*94.4*)	94.8 (*94.9*)	93.9 (*93.9*)
London	29	92.2 (*92.2*)	85.6 (*86.3*)	86.2 (*86.6*)	86.5 (*86.8*)
South Central	9	96.4 (*96.4*)	93.9 (*93.7*)	93.4 (*93.5*)	93.7 (*93.7*)
SE Coast	8	93.5 (*94.2*)	88.0 (*88.2*)	88.0 (*88.1*)	87.3 (87.9)
South West	14	97.1 (*97.5*)	94.6 (*94.5*)	94.0 (*93.6*)	94.3 (*94.3*)

† Primary Care Trusts/health boards

Coverage at five years

UK coverage remained the same for all antigens evaluated at five years compared to the previous quarter and at least 95% coverage was achieved for the primary course of DTaP/IPV/Hib for all countries and all but two English ATs (Surrey and Sussex (Q68), and London (Q71)) [5] (tables 3a).

UK coverage of MMR1 at five years remains at 94.9% for a second quarter, the highest coverage ever recorded. All countries and all English ATs achieved at least 90%. Scotland, Northern Ireland, Wales and 19 English ATs achieved at least 95% coverage for MMR1 and 17 achieved at least 90% for MMR2 at five years (tables 3a).

All devolved administrations and all but seven English ATs achieved at least 90% coverage of the DTaP/IPV booster.

Table 3a. UK completed primary immunisations and boosters at five years by country and English Area Team: July to September 2014 (*April to June 2014*)

ENGLAND Area Team (AT) code*	Number of PCTs in AT	Primary		Booster		
		DTaP/IPV Hib %	MMR1 %	MMR2 %	DTaP/ IPV %	Hib/ MenC
United Kingdom	**175**	**96.0** (*96.1*)	**94.9** (*94.9*)	**89.3** (*89.2*)	**89.4** (*89.4*)	**93.0** (*93.0*)
Wales	**7**	**96.4** (*97.3*)	**96.3** (*96.8*)	**92.6** (*92.8*)	**92.9** (*93.5*)	**93.2** (*94.3*)
N. Ireland	**4**	**97.7** (*98.6*)	**97.2** (*97.7*)	**92.9** (*92.9*)	**93.9** (*93.7*)	**96.2** (*96.7*)
Scotland	**14**	**98.4** (*98.5*)	**97.7** (*97.5*)	**93.9** (*93.2*)	**94.6** (*94.1*)	**96.4** (*96.3*)
England (Total)	**149**	**95.7** (*95.8*)	**94.5** (*94.5*)	**88.5** (*88.5*)	**88.6** (*88.6*)	**92.6** (*92.5*)
English Area Teams						
Q44	4	96.7 (*96.8*)	95.9 (*95.8*)	91.3 (90.6)	91.7 (*91.1*)	93.4 (*93.7*)
Q45	6	98.0 (*97.7*)	96.4 (*95.8*)	93.6 (*94.1*)	94.3 (*93.6*)	96.0 (*96.0*)
Q46	10	97.1 (*97.3*)	96.7 (*96.5*)	92.3 (*93.1*)	92.3 (*93.0*)	93.1 (*92.9*)
Q47	5	96.3 (*96.4*)	96.5 (*96.3*)	87.1 (*88.0*)	84.4 (*84.8*)	93.4 (*93.8*)
Q48	4	96.0 (*9648*)	95.4 (*97.3*)	88.1 (*89.6*)	88.0 (*89.9*)	93.1 (*95.1*)
Q49	7	97.8 (*98.1*)	96.9 (*97.1*)	93.6 (*94.0*)	94.2 (*94.4*)	94.5 (*94.9*)
Q50	5	96.5 (*97.1*)	95.8 (*96.5*)	92.3 (*93.0*)	92.9 (*93.3*)	93.0 (*93.2*)
Q51	5	96.9 (*96.7*)	95.7 (*95.7*)	90.6 (*90.0*)	91.3 (*90.7*)	95.7 (*95.2*)
Q52	5	97.3 (*97.9*)	96.6 (*96.9*)	92.8 (*93.1*)	93.2 (*93.4*)	95.8 (*96.6*)
Q53	4	97.3 (*97.3*)	97.2 (*96.6*)	93.9 (*92.8*)	94.7 (*94.1*)	91.8 (*92.6*)
Q54	8	95.8 (*96.3*)	94.5 (*94.8*)	87.7 (*87.9*)	88.3 (*88.5*)	91.2 (*92.4*)
Q55	4	98.1 (*97.7*)	96.1 (*96.5*)	90.9 (*91.2*)	91.6 (*92.2*)	94.7 (*94.4*)
Q56	5	95.7 (*96.0*)	93.5 (*94.1*)	89.4 (*89.5*)	90.1 (*91.1*)	92.7 (*93.4*)
Q57	5	97.1 (*96.7*)	95.2 (*94.9*)	92.0 (*91.6*)	93.2 (*92.7*)	95.7 (*95.3*)
Q58	5	96.3 (*96.6*)	95.1 (*95.3*)	91.5 (*91.7*)	92.7 (*92.6*)	94.3 (*94.4*)
Q59	3	97.3 (*97.2*)	96.2 (*95.8*)	91.4 (*91.6*)	94.7 (*94.5*)	94.5 (*95.8*)
Q60	5	97.6 (*97.8*)	96.5 (*96.8*)	92.8 (*92.5*)	93.6 (*93.8*)	95.3 (*96.3*)
Q64	4	97.0 (*97.6*)	96.6 (*96.5*)	91.3 (*92.0*)	92.3 (*93.6*)	93.9 (*94.6*)
Q65	4	97.7 (*97.9*)	96.1 (*96.7*)	91.1 (*91.9*)	92.2 (*93.3*)	93.8 (*94.1*)
Q66	4	96.6 (*97.4*)	95.5 (*95.1*)	91.4 (*89.3*)	92.4 (*91.1*)	93.2 (*93.0*)
Q67	3	94.9 (*95.5*)	92.9 (*93.2*)	81.3 (*82.3*)	82.2 (*83.3*)	92.6 (*93.6*)
Q68	5	91.9 (92.6)	90.0 (90.4)	82.8 (*83.1*)	83.3 (*85.1*)	88.7 (*86.8*)
Q69	4	95.8 (*95.5*)	95.0 (*94.5*)	89.9 (*91.5*)	89.5 (*90.4*)	93.4 (*93.8*)
Q70	6	96.2 (*96.0*)	94.6 (*94.6*)	90.8 (*91.0*)	91.5 (*91.8*)	92.9 (*93.0*)
Q71	29	92.4 (*92.1*)	91.3 (*90.9*)	80.8 (*79.9*)	78.2 (*77.3*)	88.1 (*87.6*)

* See table 1a for key to Area Team organisational code.

3b. Completed primary immunisations and boosters at five years by former Strategic Health Authority, England: July to September 2014 (*April to June 2014*)

Former English SHAs	PCT/ HB †	Primary		Booster		
		DTaP/IPV /Hib3 %	MMR1%	MMR2 %	DTaP/ IPV %	Hib/ MenC
North East	12	98.0 (*98.0*)	96.7 (*96.5*)	93.5 (*94.1*)	94.2 (*94.3*)	95.6 (*95.7*)
North West	24	96.7 (*96.9*)	96.3 (*96.5*)	90.6 (*91.2*)	90.1 (*90.7*)	93.1 (*93.5*)
Yorkshire and Humber	14	97.0 (*97.4*)	96.2 (*96.5*)	92.2 (*92.3*)	92.8 (*92.7*)	95.0 (*95.3*)
East Midlands	8	97.6 (*97.4*)	96.1 (*96.1*)	91.4 (*91.6*)	93.3 (*93.4*)	94.7 (*95.0*)
West Midlands	17	96.7 (*96.9*)	95.7 (*95.8*)	90.7 (*90.4*)	91.4 (*91.9*)	92.4 (*93.4*)
East of England	13	96.3 (*96.3*)	94.5 (*94.6*)	90.7 (*90.7*)	91.6 (*92.0*)	94.0 (*94.2*)
London	29	92.4 (*92.1*)	91.3 (*90.9*)	80.8 (*79.9*)	78.2 (*77.3*)	88.1 (*87.6*)
South Central	9	95.7 (*95.7*)	94.7 (*94.9*)	90.0 (*91.2*)	90.2 (*90.9*)	92.9 (*93.3*)
SE Coast	8	93.1 (*93.8*)	91.1 (*91.5*)	82.2 (*82.8*)	82.9 (*84.4*)	90.6 (*89.5*)
South West	14	97.2 (*97.5*)	96.0 (*95.8*)	91.4 (*91.1*)	92.4 (*92.6*)	93.8 (*94.0*)

† Primary Care Trusts/health boards

Neonatal hepatitis B vaccine coverage in England: July to September 2014

Vaccine coverage data in England for three doses of hepatitis B vaccine, in infants born to hepatitis B surface antigen (HBsAg) positive mothers, who reached the age of one year in this quarter (i.e. those born between July to September 2013), and coverage of four doses of vaccine in infants who reached two years of age (i.e. those born between July to September 2012) are presented by Area Team in table 4a below. Table 4b shows coverage by SHA for historical comparison [5].

PHE received 12 month coverage and 24 month coverage returns for 132 (82%) former PCTs respectively. The quality of these data is variable and should be interpreted with caution. Where a zero was reported a check was made to ensure that this was a true zero rather than due to no data being available. Sixteen of the 25 ATs were able to provide data for the whole patch (table 4a).

12 month coverage of three doses of Hep B in England increased by 4% to 87% when compared to last quarter and is now back to the level reported in the January to March 2014 quarter [5,12] and coverage of four doses increased by 7% to 79% at 24 months.

Table 4a. Neonatal hepatitis B coverage in England by English Area Team: July to September 2014 (*April to June 2014*)

Area Team (AT code)	PCT returns with 12 month data	12 month deno-minator	Coverage at 12 months	PCT returns with 24 month data	24 month deno-minator	Coverage at 24 months
Q44	4 of 4	7	100 (*100*)	4 of 4	5	100 (*83*)
Q45	6 of 6	5	100 (–)	6 of 6	7	100 (-)
Q46	8 of 10	52	77 (*53*)	8 of 10	104	40 (*46*)
Q47	2 of 5	2	0 (–)	2 of 5	0	- (–)
Q48	3 of 4	7	86 (*100*)	3 of 4	9	100 (*70*)
Q49	7 of 7	4	100 (*100*)	7 of 7	5	100 (*100*)
Q50	5 of 5	1	100 (*100*)	5 of 5	3	100 (100)
Q51	4 of 5	16	100 (*100*)	4 of 5	9	100 (*96*)
Q52	5 of 5	20	100 (*100*)	5 of 5	31	97 (*100*)
Q53	4 of 4	13	100 (*100*)	4 of 4	8	100 (*100*)
Q54	7 of 8	31	42 (*63*)	7 of 8	39	67 (*44)*
Q55	4 of 4	16	94 (*90*)	4 of 4	9	67 (*100*)
Q56	5 of 5	16	75 (*63*)	5 of 5	9	100 (*100*)
Q57	5 of 5	17	71 (*100*)	5 of 5	8	88 (*55*)
Q58	5 of 5	23	100 (*100*)	5 of 5	29	93 (*100*)
Q59*	0 of 3	–	– (*33*)	0 of 3	–	– (*53*)
Q60	5 of 5	12	100 (*100)*	5 of 5	12	100 (*100*)
Q64	4 of 4	5	100 (*100*)	4 of 4	10	100 (*64*)
Q65	4 of 4	5	100 (*100)*	4 of 4	2	50 (*20*)
Q66	4 of 4	1	100 (*100*)	4 of 4	1	100 *(50*)
Q67	3 of 3	10	40 (*13*)	3 of 3	6	50 (*75*)
Q68	2 of 5	6	100 (*67*)	2 of 5	10	90 (*20*)
Q69	4 of 4	24	100 (*100*)	4 of 4	27	93 (*91*)
Q70	4 of 6	3	67 (*100*)	4 of 6	2	50 (*0*)
Q71	28 of 31	241	93 (*87*)	28 of 31	243	87 (*79*)
England	**132 of 151**	**537**	**87 (*83*)**	**132 of 151**	**588**	**79 *(72)***

Notes:

" – " indicates "no data available" for the denominator but "not applicable" for coverage; see table 1a for key to Area Team organisational code.

* System for collecting Hep B coverage data changing so unable to provide data for this quarter but will be available in future evaluations

Table 4b. Neonatal hepatitis B coverage in England by former Strategic Health Authority: July to September 2014 (*April to June 2014*)

English SHAs	PCT returns with 12 month data	12 month deno-minator	Coverage at 12 months	PCT returns with 24 month data	24 month deno-minator	Coverage at 24 months
North East	12 of 12	9	100 (*100*)	12 of 12	12	100 *(100)*
North West	18 of 24	68	78 (*58*)	18 of 24	118	48 *(49)*
Yorkshire and Humber	14 of 14	37	100 (*100*)	14 of 14	43	98 *(98)*
East Midlands	5 of 9	20	95 (*74*)	5 of 9	14	79 *(72)*
West Midlands	16 of 17	56	68 (*76*)	16 of 17	59	78 *(63)*
East of England	13 of 13	47	81 (*93*)	13 of 13	35	91 *(87)*
London	28 of 31	241	93 (*87*)	28 of 31	243	87 *(79)*
South Central	7 of 9	30	100 (*100*)	7 of 9	34	94 *(90)*
SE Coast	5 of 8	16	63 *(27)*	5 of 8	16	75 *(59)*
South West	14 of 14	13	92 (*100*)	14 of 14	14	86 *(50)*
England	**132 of 151**	**537**	**87 (*83*)**	**132 of 151**	**588**	**79 *(72)***

Relevant links for country-specific coverage data

England
http://www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles/immunisation

Northern Ireland
http://www.publichealthagency.org/directorate-public-health/health-protection/vaccination-coverage

Scotland
http://www.isdscotland.org/Health-Topics/Child-Health/Immunisation/

Wales
http://www.wales.nhs.uk/sitesplus/888/page/43510

Other relevant links
https://www.gov.uk/government/collections/immunisation

References

1. Department of Health/Public Health England/NHS England. Changes to the schedule for meningococcal serogroup C conjugate vaccine (NHS England/PHE/DH letter, 7 May 2013).
2. Health and Social Care Information Centre (2014) http://www.isb.nhs.uk/documents/isb-0089/amd-8-2014/index_html.
3. DH and PHE guidance, 30 April, 2013. National immunisation programme: planned changes for 2013 to 2014. https://www.gov.uk/government/publications/national-immunisation-programme-planned-changes-for-2013-to-2014
4. Public Health England (2014). National rotavirus immunisation programme: preliminary data for England, October 2013 to September 2014. https://www.gov.uk/government/publications/rotavirus-immunisation-programme-vaccine-coverage-estimates
5. Public Health England (2014). Vaccination coverage statistics for children up to the age of five years in the United Kingdom, April to June 2014. *HPR* **8**(37). Available at https://www.gov.uk/government/statistics/cover-of-vaccination-evaluated-rapidly-cover-programme-2014-to-2015-quarterly-data.
6. Public Health England (2013). Vaccination coverage statistics for children up to the age of five years in the United Kingdom, July to September 2013. HPR 7(50). Available at http://webarchive.nationalarchives.gov.uk/20140629102627/http://www.hpa.org.uk/hpr/archives/2013/hpr50-5113.pdf
7. Department of Health. National screening and immunisation programmes. Letter setting out the agreement between the Department of Health, Public Health England and the NHS Commissioning Board 23 August 2012. Available from: http://www.dh.gov.uk/health/2012/08/screening-immunisation-programmes/
8. Public Health Outcomes Framework 2013 to 2016 and technical updates. Available from: https://www.gov.uk/government/publications/healthy-lives-healthy-people-improving-outcomes-and-supporting-transparency.
9. Public Health England. Cover of vaccination evaluated rapidly (COVER) programme 2012 to 2013: quarterly figures. Available from https://www.gov.uk/government/statistics/cover-of-vaccination-evaluated-rapidly-cover-programme-2012-to-2013-quarterly-figures
10. UK Statistics Authority. Code of Practice for Official Statistics. January 2009. Available at http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html
11. Department of Health. Vaccinations at 12 and 13 months of age. Letter from the Chief Medical Officer (interim), the Chief Nursing Officer and the Chief Pharmaceutical Officer 17 November 2010. PL/CMO/2010/3, PL/CNO/2010/4, PL/CPHO/2010/2.
12. Public Health England (2014). Vaccination coverage statistics for children up to the age of five years in the United Kingdom, January to March 2014. HPR 8(25). Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/346139/hpr2514_cover.pdf