Public Health England

Health Protection Report
weekly report

Volume 8 Numbers 37 Published on: **26 September 2014**

Current News / Diary

Infection Reports

HCAI

Immunisation

Volume 8 Number 37 Published on: **26 September 2014**

Impact of first infant vaccination programme in England for rotavirus confirmed

The first full year's data on the impact of the newly-introduced national infant immunisation programme on rotavirus in England have confirmed the earlier indications that the programme has been exceptionally successful.

The programme was launched in summer 2013, ahead of the 2013/14 season, recruiting under-one-year-olds into a two-dose regime, the first dose being given at six weeks.

Whereas the first-eight-months results on laboratory-confirmed cases showed an overall reduction of 67% compared with the 14-year, pre-programme average [1], the first full-year's data has indicated a 71% reduction was achieved.

The full-year laboratory data was presented at the second PHE annual conference earlier this month [2]. The as-yet unpublished full-year data suggest that the seasonal (Autumn) peak in confirmed, all-age rotavirus cases was effectively eliminated in 2013/14, despite the fact that only under-one-year olds were vaccinated, indicating that the "herd immunity" impact of the programme was significant: the rotavirus disease incidence was manifested also in in 2-5 year-olds, and in adults.

Significant reductions were also seen in numbers of GP-reported cases and in those reported by A&E departments. Sentinel surveillance analysis of levels of testing also confirmed that the reduction in lab-confirmed cases was a true reflection of reduced disease incidence and not the result of reduced levels of testing.

References

1. "Early evidence of the impact of the national rotavirus IP", *HPR* **8**(12): immunisation, 28 March 2014.
2. "The early impact of rotavirus vaccine", Shamez Ladhani, Second PHE annual conference, Warwick, 16 September 2014.

Annual report on tuberculosis surveillance in the UK

The latest UK annual TB report [1] shows a small decline in the number of TB cases notified and the rate of TB in the UK in 2013, compared to 2012. Following a decline in TB incidence throughout most of the twentieth century, the rate of TB in the UK increased from the early 1980s until the mid-2000s, and have been at a high but relatively stable ever since [2]. The incidence of TB in the UK remains high compared to most other Western European countries, with 7,892 cases reported in 2013, an incidence of 12.3 per 100,000 population.

TB continues to disproportionately affect the most deprived communities, with 70% of all TB cases coming from the 40% most deprived areas. TB is concentrated in large urban centres, with rates in London, Leicester, Birmingham, Luton, Manchester and Coventry more than three times the national average. Almost three quarters of TB cases (73%) were born outside the UK; only 15% of these were recent migrants. The rate of TB amongst the non-UK born population was 18 times the rate in the UK born, at 70 per 100,000. More than a quarter (28%) of patients with pulmonary TB started treatment more than four months after symptom onset.

The proportion of TB cases with resistance to isoniazid has fluctuated over the past decade, and remains at the same level in 2013 as in 2004. The proportion of cases with MDR-TB has remained stable at 1.6% over the past three years. The majority of cases with MDR-TB were born outside the UK (87%); with the highest number of cases from India, Pakistan and Somalia, and the highest proportions were in those from the Ukraine, Lithuania, Latvia and Sierra Leone.

In 2013, 82% of culture confirmed cases from the UK had their strains typed at 23 loci or more. Between January 2010 and December 2013, 54% (8,890/16,602) of cases with isolates typed were in in 1,854 molecular clusters. The proportion of UK born cases that clustered was higher than the proportion of non-UK born cases that clustered. There was considerable variation in lineage by country of birth.

The proportion of drug sensitive cases with an expected treatment duration of less than 12 month who had completed treatment by 12 months has improved gradually over the past decade, reaching 83% of those notified in 2013. The proportion of drug sensitive cases who died has decreased over the last 10 years, to stabilise at 5% in 2011 and 2012. Drug sensitive cases with at least one social risk factor have worse treatment outcomes than those without; 6% of those notified in 2012 died and 7% were lost to follow up. The proportion of drug resistant TB cases who completed treatment by 24 months was low (48%), with many still on treatment (23%) or lost to follow up (19%).

Public Health England and NHS England will shortly publish the Collaborative TB Strategy for England 2015-2020 [3], which sets out the improvements that need to be achieved across 10 key areas to bring about a sustained decline in TB in England, and the mechanisms by which these should be achieved. Improvements in TB control across the country, particularly among the most vulnerable groups, will require the social and economic determinants of the disease to be addressed, in addition to the provision of strong and effective public health and clinical services.

References

1. Tuberculosis in the UK: 2014 report, Public Health England, 2014: https://www.gov.uk/government/publications/tuberculosis-tb-in-the-uk
2. Tuberculosis Update, Health Protection Agency, 2013: http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138493033
3. See: "Collaborative tuberculosis strategy for England 2014 to 2019 launched", HPR 8(12), 28 March 2014: news.

PHE surveillance and health data products user survey

Public Heath England is carrying out a survey to inform the development of its surveillance and health data outputs: health protection data, health profiles, health improvement data tools, etc. This includes products such as *Health Protection Report*.

An online questionnaire is available (until 8 October) at: Surveillance and Health Data Products User Survey. The fourth page of the survey includes *HPR* in a list of PHE surveillance products about which views are specifically requested. *HPR* subscribers are encouraged to participate.

HPR is now published on the GOV.UK domain: the landing page for issues published during 2014 (volume 8) is:
https://www.gov.uk/government/publications/health-protection-report-volume-8-2014.

Back issues published in earlier years on the now-decommissioned hpa.org.uk website can be retrieved from:
http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/hpr/archives/

Health professionals wanting to locate guidance documents relating to infections – particularly information on less common infections that is not yet available on the gov.uk site – can still browse the legacy site's Infections A to Z (at as mid-July 2014) via:
http://webarchive.nationalarchives.gov.uk/20140714084352/http://hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/.

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HCAI

Trends in mandatory *Staphylococcus aureus* (MRSA and MSSA) and *Escherichia coli* bacteraemia, and *Clostridium difficile* infection (CDI) data for England up to April-June 2014

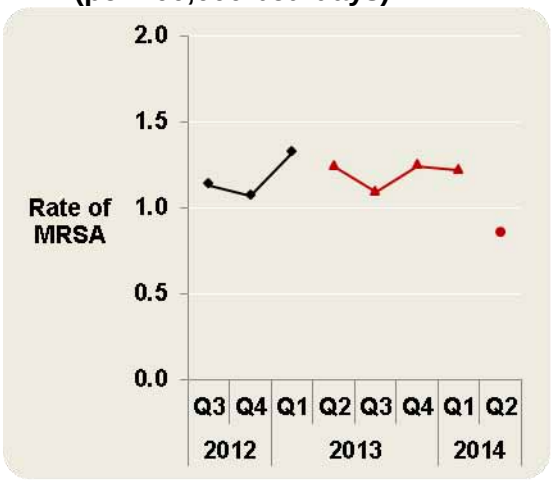
This quarterly epidemiological commentary describes recent trends for mandatory surveillance of *Staphylococcus aureus* (MRSA and MSSA [1]) and *E. coli* [2] bacteraemia, and *Clostridium difficile* infections [3] reported by NHS acute Trust hospitals in England up to April-June 2014

MRSA bacteraemia

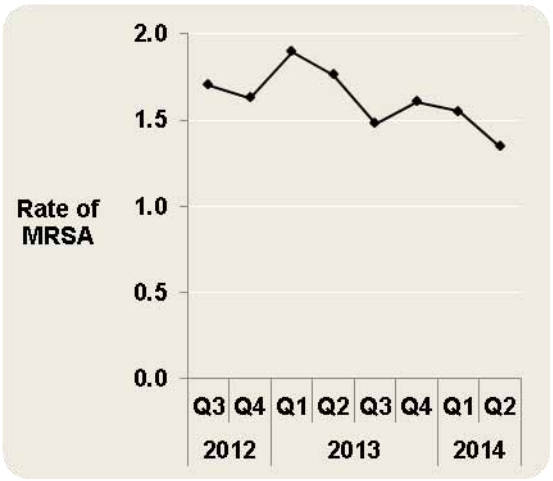
- Since April 2013 all NHS organisations reporting positive cases of MRSA bacteraemia have been required to complete a Post Infection Review (PIR). MRSA bacteraemia cases since April 2013 are published by PIR assignment rather than apportionment.
- As of April 2014, NHS England introduced a new category for the PIR assignment of MRSA bacteraemia cases, acknowledging the increasingly complex nature of the MRSA bacteraemias being reported. Assignment to a "third party" through the arbitration process can now be made for cases with a specimen date post 1 April 2014.
- The total number of MRSA bacteraemia reports has decreased by nearly a quarter (23.6%) compared to the same period last year (237 reports in Q2 2013 vs. 181 reports in Q2 2014), see table 1a.
- There has been a 12.1% decrease between Q1 2014 and Q2 2014 in the overall number of MRSA bacteraemias (see figure 1b). Both Trust assigned and CCG assigned reports have decreased since Q1 2014 from 106 reports to 74 reports (30.1%) and from 100 reports to 94 reports (6.0%), respectively. However, since the start of Q2 2014, a third party option has been available for assignment and 7.2% of MRSA bacteraemias were assigned to a third party during Q2 2014. It is of note that the percentage decrease in Trust assigned cases was much greater between Q1 and Q2 2014 than that assigned to CCGs (30.2% vs. 6.0%, respectively). It is too early to tell if this greater decrease in Trust assigned MRSA bacteraemia is an actual decrease or whether it is an artefact of the additional option (third party) in PIR assignment.

Figure 1: Quarterly rates of MRSA bacteraemia, July 2012- June 2014

a) Trust apportioned/assigned* rate (per 100,000 bed-days)



b) All reports (per 100,000 population)



***Note:** From Q2 2013, MRSA cases have been reported by assignment rather than apportionment. This is reflected in figure 1a where Trust assigned rates (per 100,000 bed days) are presented as red triangles from Q2 2013 to Q1 2014, while Trust apportioned rates are presented as black diamonds (Q3 2012 to Q1 2013). From Q2 2014, PIR assignment of MRSA cases have had an additional option for assignment (third party cases), thus the time series has again been interrupted. Trust assigned rates (per 100,000 bed days) from April 2014 are presented as red circles.*
Please refer to table 1b for Trust assigned, CCG assigned and Third Party assigned cases and rates.

Table 1a: MRSA bacteraemia counts and rates by quarter, January 2011 - June 2014

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2011	**Q1**	149	1.70	333	2.54
	Q2	148	1.71	319	2.41
	Q3	103	1.21	266	1.99
	Q4	105	1.21	269	2.01
2012	**Q1**	117	1.32	262	1.97
	Q2	94	1.10	224	1.68
	Q3	96	1.13	229	1.70
	Q4	92	1.07	219	1.63
2013	**Q1**	116	1.32	252	1.90
	Q2	N/A	N/A	237	1.76
	Q3	N/A	N/A	201	1.48
	Q4	N/A	N/A	218	1.61
2014	**Q1**	N/A	N/A	206	1.55
	Q2	N/A	N/A	181	1.35

Table 1b: MRSA bacteraemia counts and rates by PIR assignment*, April 2013-June 2014

Year and quarter		Trust assigned reports	Trust assigned rates (per 100,000 bed-days)	CCG assigned reports	CCG assigned rates (per 100,000 population)	Third Party reports	Third Party assigned rates (per 100,000 population)
2013	Q2	107	1.24	130	0.97	N/A	N/A
	Q3	92	1.09	109	0.80	N/A	N/A
	Q4	107	1.25	111	0.82	N/A	N/A
2014	Q1	106	1.22	100	0.75	N/A	N/A
	Q2	74	0.86	94	0.70	13	0.10

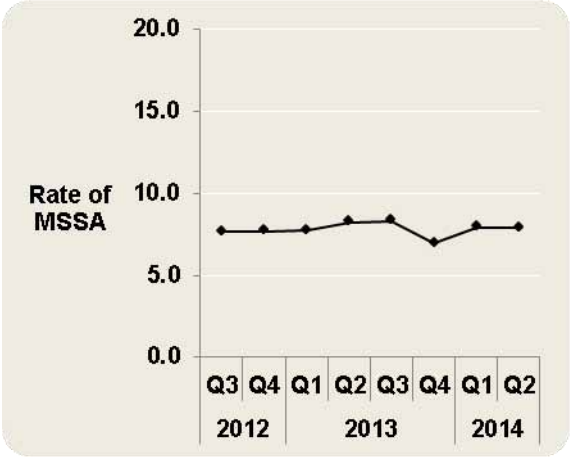
***Note:** Not all PIRs have been finalised 4%, (n=7) are still provisional assignments.*

MSSA bacteraemia

- Trust apportioned rates of MSSA bacteraemia were relatively stable between Q1 2011 (when mandatory surveillance began) and Q3 2013 (range 7.64 to 8.37 per 100,000 bed days, table 2); however, there was a 16.3% decrease between Q3 2013 and Q4 2013, with the rate of Trust apportioned MSSA reaching a low of 6.95 per 100,000 bed days. Post Q4 2013, the rate of Trust apportioned MSSA has increased by more than 13% but there has been little evidence of a continued increase.
- The all reports rate in Q2 2014 is the same as Q2 2013; however, like the Trust apportioned rates, the all reports rate saw some fluctuation between these time periods, with a 5.6% decrease between Q3 2013 and Q4 2013 (from 17.26 to 16.30 per 100,000 population, respectively) with a rebound to 18.10 per 100,000 population (representing an 11.0% increase from Q4 2013) in Q1 2014. There has subsequently been a 4.8% decrease between Q1 2014 and Q2 2014 (figure 2b).
- Overall, between Q2 2011 and Q2 2014 there has been a slight decrease of 2% in the Trust apportioned rates of MSSA bacteraemia; however, over the same time period there has been a 4% increase in the all reports rate (table 2).

Figure 2: Quarterly rates of MSSA bacteraemia, July 2012- June 2014

a) Trust apportioned rate (per 100,000 bed-days)



b) All reports (per 100,000 population)

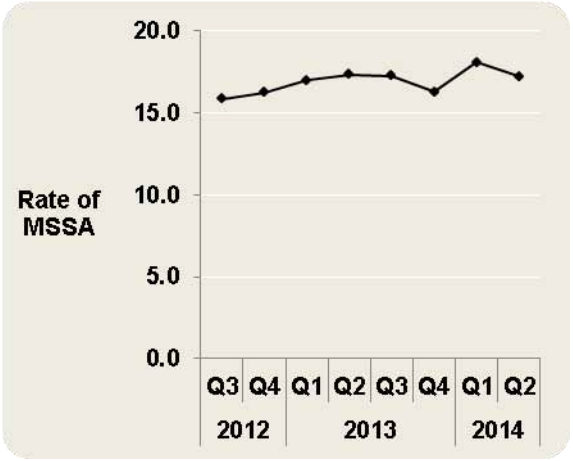


Table 2: MSSA bacteraemia counts and rates by quarter, January 2011- June 2014

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2011	**Q1**	735	8.37	2,199	16.79
	Q2	698	8.07	2,191	16.55
	Q3	725	8.54	2,226	16.63
	Q4	703	8.12	2,167	16.19
2012	**Q1**	728	8.20	2,183	16.41
	Q2	711	8.29	2,238	16.83
	Q3	648	7.64	2,131	15.85
	Q4	663	7.70	2,186	16.26
2013	**Q1**	678	7.73	2,257	16.99
	Q2	711	8.26	2,329	17.34
	Q3	700	8.30	2,344	17.26
	Q4	596	6.95	2,213	16.30
2014	**Q1**	689	7.93	2,404	18.10
	Q2	680	7.90	2,315	17.24

Escherichia coli bacteraemia

- Mandatory *E. coli* bacteraemia surveillance commenced in June 2011. There has been an increasing trend in the all reports rate of *E. coli* bacteraemia since its inception; however, there has been some observed fluctuation quarter-to-quarter. For the 12 full quarters of data on *E. coli* bacteraemia (since Q3 2011), the lowest rates are reported in Q4 and Q1, while the highest are in Q3, of any four-quarter period (running from Q3 2011 to Q2 2014) (table 3, figure 3).

Figure 3: Quarterly rates of *E. coli* bacteraemia reports per 100,000 population, July 2012- June 2014

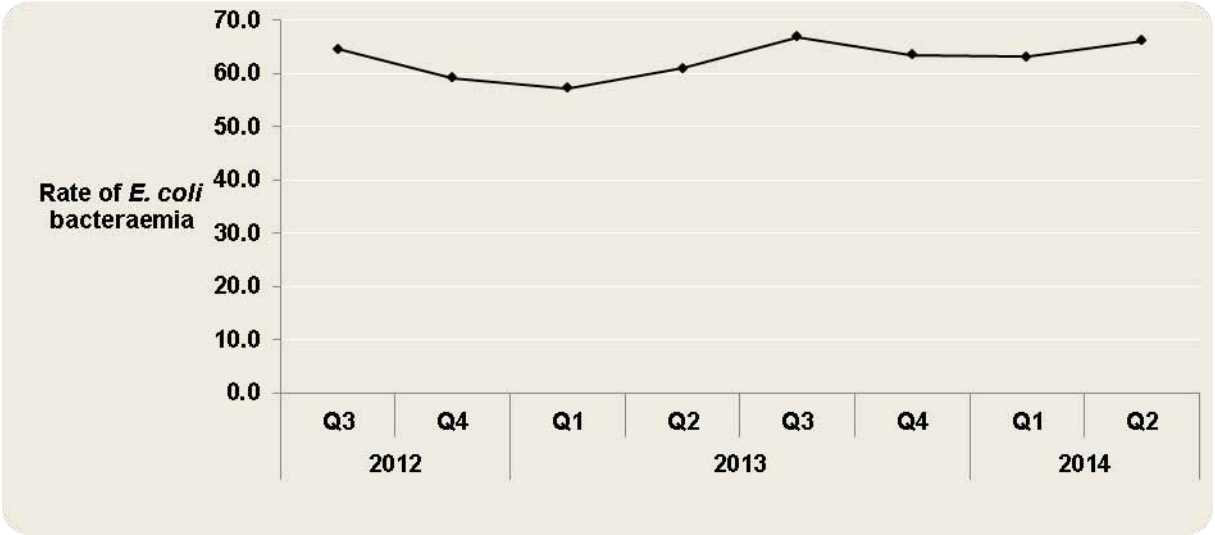


Table 3: Quarterly counts and rates of all *E. coli* bacteraemia reports by quarter, July 2011- June 2014

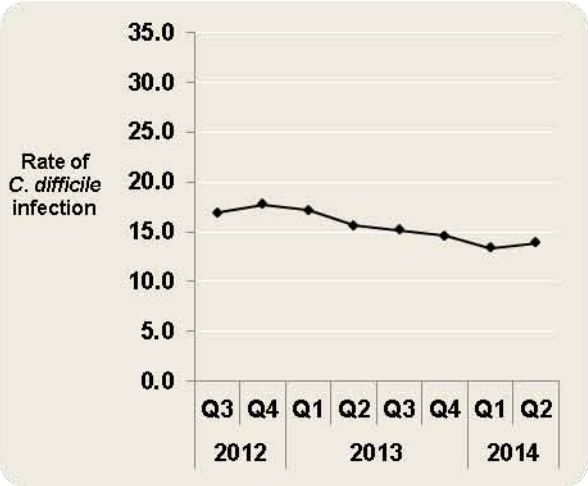
Year and quarter		Total *E. coli* bacteraemia reports	Rate (per 100,000 population)
2011	**Q3**	8,275	61.82
	Q4	8,098	60.50
2012	**Q1**	7,698	57.88
	Q2	8,074	60.71
	Q3	8,676	64.52
	Q4	7,957	59.18
2013	**Q1**	7,602	57.24
	Q2	8,193	61.01
	Q3	9,079	66.87
	Q4	8,623	63.51
2014	**Q1**	8,380	63.09
	Q2	8,886	66.17

Clostridium difficile infection

- Across the 8 quarters between Q3 2012 and Q2 2014, the rate of Trust apportioned *Clostridium difficile* infections (CDI) per 100,000 bed days has decreased by 17.7% from 16.91 to 13.91. Over the same period, the rate of total CDI cases per 100,000 population experienced a smaller percentage decrease, of 11.0%, from 29.54 to 26.28 (figure 4).
- Trust apportioned reports have declined by 49.2% through the 14 quarters between Q1 2011 and Q2 2014, from 2,358 reports to 1,197 reports, respectively (table 4). As with the rates of CDI, there has been an overall decrease in the total number of CDI reports between Q1 2011 and Q2 2014; however, this percentage reduction is less than that observed for the Trust apportioned reports of CDI during the same time period: 28.8% from 4,833 in Q1 2011 to 3,439 in Q2 2014 (table 4).
- However, while there has been an overall reduction in the all reports counts and rates of CDI between Q1 2011 and Q2 2014, there has been a substantial increase in the all reports counts (14.4%) and rates (13.1%) of CDI between the last two quarters (Q1 2014 and Q2 2014). A smaller increase in Trust apportioned reports (3.3%) and their corresponding rates (4.2%) were also observed over the same time period (see table 4).

Figure 4: Quarterly rates of *C. difficile* infection in patients aged 2 years and over, July 2012- June 2014

a) Trust apportioned reports (per 100,000 bed-days)



b) All reports (per 100,000 population)

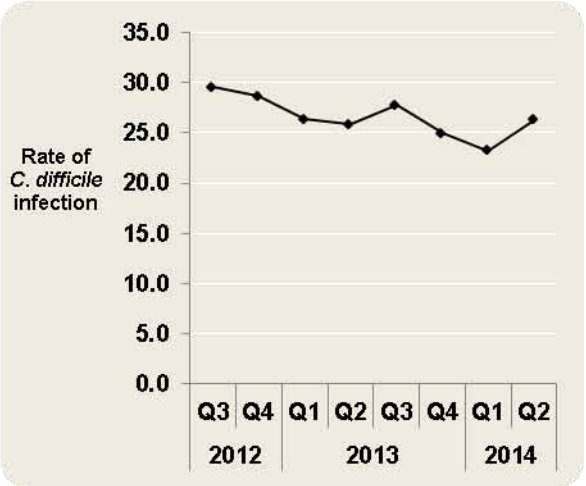


Table 4: *C. difficile* infection counts and rates in patients aged 2 years and over by quarter, January 2011- June 2014

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2011	**Q1**	2,358	26.86	4,833	37.87
	Q2	2,206	25.51	4,967	38.49
	Q3	2,046	24.10	4,994	38.28
	Q4	1,824	21.07	4,350	33.34
2012	**Q1**	1,613	18.18	3,711	28.64
	Q2	1,517	17.68	3,656	28.22
	Q3	1,433	16.91	3,870	29.54
	Q4	1,527	17.74	3,756	28.67
2013	**Q1**	1,503	17.14	3,412	26.36
	Q2	1,347	15.65	3,386	25.87
	Q3	1,278	15.16	3,671	27.75
	Q4	1,249	14.56	3,298	24.93
2014	**Q1**	1,159	13.34	3,006	23.23
	Q2	1,197	13.91	3,439	26.28

Notes:

MRSA bacteraemia PIR assigned reports: From the 1 of April 2013 to 31 March 2014, all MRSA bacteraemia cases reported via the HCAI Data Capture System (DCS) were assigned to either an acute Trust or a CCG through the completion of a Post Infection Review (PIR). A case is deemed to be Trust assigned where the completed PIR indicates that an acute Trust is the organisation best placed to ensure that any lessons learned are actioned. As of 1 April 2014, NHS England introduced a new category for the PIR assignment of MRSA bacteraemia cases; assignment to a "third party" through the arbitration process. Therefore, MRSA bacteraemias with a specimen date post 1 April 2014 are now assigned to an acute Trust, a CCG or a third party through the PIR process. Further information on the PIR process can be found on the following webpage:
http://www.england.nhs.uk/ourwork/patientsafety/zero-tolerance/

MSSA bacteraemia Trust apportioned reports: include patients who are (i) in-patients, day-patients, emergency assessment patients or not known; AND (ii) have had a specimen taken at an acute Trust or not known; AND (iii) specimen is on or after day 3 of the admission (admission date is considered day '1').

CDI Trust apportioned reports: include patients who are (i) in-patients, day-patients, emergency assessment patients or not known; AND (ii) have had a specimen taken at an acute Trust or not known; AND (iii) specimen is on or after day 4 of the admission (admission date is considered day '1').

Total reports: These are all the cases reported by an acute Trust. They consist of both Trust apportioned reports and reports NOT apportioned to the acute Trust.

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Invasive meningococcal disease (laboratory reports in England): April to June 2014 (Q2/2014)

In England between April and June 2014, a total of 143 cases of invasive meningococcal disease (IMD) were reported to Public Health England [1]. This was a 29% decrease from the 202 cases reported in the second quarter of 2013 and a 32% decrease from the 211 cases reported in the first quarter of 2014. Ten cases of IMD were reported in this period in Wales.

Of the 143 cases of IMD reported in England: 71% (101) were capsular group B, 13% (19) group W, 8% (12) group Y, 6% (8) group C, one was a case of group A and two cases were ungrouped. Of the 10 MD cases reported to PHE from Wales: seven were capsular group B, two group Y, and one group W. During the second quarter of 2014 there were no reported cases for capsular groups X and Z/E (table 1) in England or Wales. Whilst numbers remain low, a recent increase in group W cases has been observed in infants and those aged 15 years and over and this continues to be monitored.

Fifty-six per cent (79/140) of IMD cases reported in England were female. In England, children aged less than one year accounted for 24% (35/143) of IMD reports. The majority of infant cases (57% [20/35]) were aged between six and 11 months and of these; 17 were group B, two were group W and one group Y. In 15 infants with IMD aged between zero and five months, 11 were cases of group B IMD, with one case each of groups C, W and Y and one was ungrouped. Almost a fifth (18% [26/143]) of cases were in children aged between one and four years of which 96% (25/26) were group B disease and one group W (table 2). More than half of the group B IMD cases (52% [53/101]) were in children under five years of age. Of the 19 group W cases, half (53% [10/19]) were in adults aged 45 and 21% (4/19) were aged less than five years. Similarly the majority of group Y cases were in individuals aged 45 and older (58% [7/12]).

Table 1. Invasive meningococcal disease in England by capsular group and laboratory testing method, weeks 14-26 (Q2): 2013 and 2014

Capsular groups ~	Method of diagnosis						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 (Q1-2)**	**2014 (Q1-2)**
A	–	–	–	1	–	–	–	1
B	60	43	93	55	2	3	346	233
C	10	6	2	1	–	1	20	18
W	14	15	2	4	2	–	34	52
Y	12	10	2	1	–	1	39	45
Ungrouped	–	–	–	2	–	–	2	5
Ungroupable*	3	–	–	–	–	–	6	–
Total	**99**	**74**	**99**	**64**	**4**	**5**	**447**	**354**

~ Note: No cases capsulargroups A or X 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 14-26 (Q2): 2014

Age group	A	B	C	W	Y	Ungrouped	Total
<1 year	–	28	1	3	2	1	35
1-4 years	–	25	–	1	–	–	26
5-9 years	–	5	1	–	–	1	7
10-14 years	–	3	–	–	–	–	3
15-19 years	–	5	–	3	–	–	8
20-24 years	1	11	–	1	1	–	14
25-44 years	–	4	3	1	2	–	10
45-64 years	–	9	2	1	3	–	15
>=65 years	–	11	1	9	4	-	–
Total	1	101	8	19	12	2	143

Reference

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

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

Commentary on the first quarterly report (April to June) for 2014/15

UK coverage of antigens evaluated at one year of age remains high at 94.4% for DTaP/IPV/Hib3 and 94.2% for PCV2. As reported in the last three COVER reports, the removal of the second dose of MenC at four months has impacted on the quality of MenC2 coverage evaluations [1-4]. Children evaluated in the current quarter (born April to June 2013), are the first cohort to have been exclusively offered one dose of MenC at three months of age. In Scotland, Wales and six English Area Teams (ATs) the programmes extracting COVER data from Child Health Information Systems (CHISs) have been modified to reflect this and one dose MenC coverage is similar to, or higher than, the other vaccines evaluated at one year in those areas (table 1a). CHISs serving the rest of England and all of Northern Ireland are currently unable to supply this information as the extract still counts two doses as a completed primary MenC course. This will be rectified now that the revised information standard has been approved and is due to be published shortly. The publication of the standard will mandate CHIS IT suppliers to make this change. Until then it will not be possible to publish primary MenC coverage for these areas and as a consequence we have not published MenC coverage at one year for England, Northern Ireland or the UK. 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).

UK coverage of all antigens evaluated at two years decreased marginally this quarter when compared to January to March 2014 data. Primary DTaP/IPV/Hib3 dropped by 0.1% to 96.3%, PCV and Hib/MenC boosters dropped by 0.2% to 92.9% and 92.8% respectively, and MMR dropped by 0.3% to 92.9%. All three devolved administrations achieved at least 95% coverage for MMR, PCV booster and Hib/MenC booster, as did seven of the 25 ATs in England.

MMR coverage at five years reached 94.9% for the first dose and 89.2% for the second dose. This is the highest quarterly MMR coverage achieved at this age in the UK with coverage for the first dose almost hitting the 95% WHO target. In addition, modest increases of 0.1 to 0.4% were also observed for the other vaccinations evaluated at five years (table 3a).

Earlier this week the Health and Social Care Information Centre (HSCIC) published annual coverage data for the UK childhood immunisation programme in the 2013/14 annual immunisation statistics. UK coverage for one dose of MMR vaccine at 24 months and five years increased by 0.4% and 0.3% respectively to 93.1% and 94.6% with a more substantial increase for MMR2 at five years, up 0.8% to 89% when compared to the previous year [5,6]. This is the highest annual MMR coverage achieved since evaluation of the two-dose programme began in 1998. Coverage of other vaccines evaluated at 12 months, 24 months and five years, showed a slight decrease ranging from 0.1 to 0.4%. [5,6]

COVER data in England from April 2013

From April 2013, commissioning and coordination of immunisation programmes is the responsibility of NHS England [7]. Given the transfer of responsibility for public health, however, to local authorities (LAs) on 1 April 2013, population vaccination coverage is included in the Public Health Outcomes Framework (PHOF) (Indicator 3.3) [8]. In line with all the PHOF indicators, it is expected that population vaccination coverage is collected for LA resident population. As the former Primary Care Trusts (PCT) coverage collections in the NHS were based around responsible population (i.e. patients who are registered with a GP in the PCT or unregistered patients who resided in the PCT area) and many of the LAs and former PCTs are coterminous the current COVER data are collected by former PCT and LA responsible populations.

Since April 2013, the quarterly request parameters for COVER data in England have been simplified in line with the PHOF outcome sub-indicators [8] and are requested in two formats, (i) by PCT responsible population to allow for continuity with historical data (until April 2015) and (ii) by LA responsible population (or resident population if available). Individual PCT, and where available, LA data are published on the PHE website [9]. COVER reports present data by English Area Teams (tables 1a-4a) while former Strategic Health Authority tabulations are provided for historical comparisons (tables 1b-4b).

An updated information standard for the COVER surveillance scheme has been approved and will be published soon. This will give instruction on a new collection of coverage data for the LA resident population, and the continuation of the collection by former PCT responsible population for historical comparison during the period of transition to ensure data quality. It will also address the recent changes to the routine childhood immunisation schedule including the introduction of rotavirus vaccination, the change to the Meningitis C vaccination schedule, the potential introduction of the Meningitis B vaccination if the vaccine can be procured at a cost effective price, the need to collect data for the selective neonatal Bacillus Calmette–Guérin (BCG) immunisation, and the 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.

Results for April to June 2014

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

Children who reached their first birthday in the quarter (born April to June 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 [4].

Children who reached their second birthday in the quarter (born April to June 2012) were scheduled to receive their third dose primary vaccinations between August and October 2012, and their first measles, mumps, and rubella (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 May and July 2013 [10].

Children who reached their fifth birthday in the quarter (born April to June 2009) were scheduled to receive their third dose DTaP/IPV/Hib and second MenC and PCV vaccinations between August and October 2010. They were also scheduled to receive their first MMR between May and July 2010 and their pre-school diphtheria, tetanus, acellular pertussis, inactivated polio booster and second dose MMR from July 2012. Children born between April and June 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. London reported data quality issues for nine out of 31 former PCT returns this quarter due to problems related to changes in information flows or incomplete data for unregistered children and the 12 month data for one former PCT has been omitted from this report. Kent and Medway AT reported data quality issues for the 24 month coverage in all three former PCTs which are thought to have arisen after the introduction of a new CHIS. North Yorkshire and Humber AT was unable to provide data for Hib/MenC at five years for one former PCT return in their patch.

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. Coverage returns for 24 of the 41 LAs that are not coterminous with PCT boundaries are currently not able to provide LA responsible population.

Children evaluated in the current quarter (born April to June 2013), are the first cohort to have been exclusively offered one dose of MenC at three months of age. In Scotland, Wales and six English ATs the programmes extracting COVER data from Child Health Information Systems (CHISs) have been modified to reflect this and one dose MenC coverage is similar to, or higher than, the other vaccines evaluated at one year in those areas (table 1a). CHISs serving the rest of England and all of Northern Ireland are currently unable to supply this information as the extract still counts two doses as a completed primary MenC course. This will be rectified when the revised information standard is published and CHIS IT suppliers are mandated to make this change [3]. Until then it will not be possible to publish primary MenC coverage for these areas and as a consequence we have not published MenC coverage at one year for England, Northern Ireland or the UK. 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).

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

Coverage at 12 months

UK coverage at 12 months for DTaP/IPV/Hib3 (94.4%) and PCV2 (94.2%) (table 1a) was sustained when compared the previous quarter [3]. Country-specific minimum coverage levels achieved for DTaP/IPV/Hib3 and PCV2 evaluated at 12 months show that Scotland achieved at least 97% coverage, Northern Ireland at least 96%, Wales at least 95%, and England at least 93%. Within England 18 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 and from six English ATs (Q44, Q60, Q64, Q65, Q66, Q70). At the country/AT level MenC coverage ranged from 98.1% in Scotland to 96.9% in Shropshire and Staffordshire (Q60), and exceeded coverage of other vaccines evaluated at 12 months (except in Q60) (table 1a).

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

Country and English Area Team (AT code)	Number of PCTs/HBs†	DTaP/IPV/Hib3 %	MenC2 %	PCV2 %
United Kingdom	**175**	**94.4** *(94.4)*	n/a *(n/a)*	**94.2** (*94.2)*
Wales	**7**	**96.2** (*96.3*)	**97.1** (*n/a)*	**95.7** (*96.0*)
Northern Ireland	**4**	**97.0** (*96.7*)	n/a (*n/a)*	**96.8** (*96.8*)
Scotland	**14**	**97.3** (*97.4*)	**98.1** (*n/a*)	**97.5** (*97.5*)
England (Total)	**150***	**93.9** (*94.0*)	n/a (*n/a*)	**93.7** (*93.7*)
English Area Teams				
Cheshire, Warrington and Wirral (Q44)	4	96.4 (*96.9*)	97.0 (*n/a*)	96.5 *(97.3*)
Durham, Darlington and Tees (Q45)	6	96.4 (*96.8*)	n/a (*n/a*)	97.4 (*96.3*)
Greater Manchester (Q46)	10	96.0 (*96.5*)	n/a (*n/a*)	95.7 (*96.1*)
Lancashire (Q47)	5	91.8 (*91.5*)	n/a (*n/a*)	90.7 (*90.4*)
Merseyside (Q48)	4	93.6 (*94.5*)	n/a (*n/a*)	93.9 (*94.6*)
Cumbria, Northumberland, Tyne and Wear (Q49)	7	96.2 (*96.7*)	n/a (*n/a*)	96.1 (*96.5*)
N Yorkshire and Humber (Q50)	5	96.3 (*96.0*)	n/a (*n/a*)	96.5 (*95.8*)
S Yorkshire and Bassetlaw (Q51)	5	95.4 (*94.9*)	n/a (*n/a*)	95.0 (*94.4*)
W Yorkshire (Q52)	5	96.2 (*96.4*)	n/a (*n/a*)	95.9 (*96.1*)
Arden, Herefordshire and Worcestershire (Q53)	4	96.6 (*97.1*)	n/a (*n/a*)	95.9 (*96.9*)
Birmingham and the Black Country (Q54)	8	92.5 (*93.3*)	n/a (*n/a*)	92.4 (*93.2*)
Derbyshire and Nottinghamshire (Q55)	4	95.4 (*96.1*)	n/a (*n/a*)	94.8 (*95.6*)
East Anglia (Q56)	5	95.6 (*95.2*)	n/a (*n/a*)	95.3 (*94.8*)
Essex (Q57)	5	95.6 (*95.7*)	n/a (*n/a*)	95.3 (*95.7*)
Hertfordshire and the S Midlands (Q58)	5	97.0 (*96.8*)	n/a (*n/a*)	96.7 (*96.5*)
Leicestershire and Lincolnshire (Q59)	3	96.5 (*96.9*)	n/a (*n/a*)	96.4 (*96.5*)
Shropshire and Staffordshire (Q60)	5	97.3 (*96.9*)	96.9 (*n/a*)	97.3 (*97.0*)
Bath, Gloucestershire, Swindon and Wiltshire (Q64)	4	96.1 (*95.6*)	97.1 (*n/a*)	96.0 (*95.5*)
Bristol, N Somerset, Somerset and S Gloucestershire (Q65)	4	96.2 (*96.4*)	97.6 (*n/a*)	96.4 (*96.5*)
Devon, Cornwall, Isles of Scilly (Q66)	4	95.6 (*96.1*)	97.3 (*n/a*)	95.3 (*96.0*)
Kent and Medway (Q67)	3	90.9 (*90.6*)	n/a (*n/a*)	91.0 (*90.5)*
Surrey and Sussex (Q68)	5	90.4 (*90.0*)	n/a (*n/a*)	90.5 (*89.8)*
Thames Valley (Q69)	4	95.7 (*94.4*)	n/a (*n/a*)	95.4 (*94.1*)
Wessex (Q70)	6	95.7 (*95.1*)	96.8 (*n/a*)	95.8 (*95.1*)
London (Q71)	30*	88.6 (*89.1*)	n/a (*n/a*)	88.3 (*88.7*)

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

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

Former English Strategic Health Authorities (SHAs)	PCT/HB†	DTaP/IPV /Hib3 %	MenC%	PCV2%
North East	12	96.6 (*96.6*)	n/a (*n/a*)	97.0 (*96.3*)
North West	24	94.8 (*95.3*)	n/a (*n/a*)	94.5 (*95.0*)
Yorkshire and Humber	14	96.0 (*95.9*)	n/a (*n/a*)	95.8 (*95.6*)
East Midlands	8	96.3 (*96.6*)	n/a (*n/a*)	96.0 (*96.2*)
West Midlands	17	94.7 (*95.2*)	n/a (*n/a*)	94.5 (*95.1*)
East of England	13	95.9 (*95.9*)	n/a (*n/a*)	95.6 (*95.6*)
London	30*	88.6 (*89.1*)	n/a (*n/a*)	88.3 (*88.7*)
South Central	9	95.8 (*95.0*)	n/a (*n/a*)	95.6 (*94.8*)
SE Coast	8	90.6 (*90.2*)	n/a (*n/a*)	90.7 (*90.1*)
South West	14	95.9 (*95.7*)	n/a (*n/a*)	95.9 (*95.7*)

† 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 96.3% compared to the previous quarter. Surrey and Sussex (Q68) and London (Q71) are the only ATs with DTaP/IPV/Hib3 coverage below the 95% target at 92.9% and 92.2% respectively (table 2a).

Compared to the previous quarter, UK coverage for PCV and Hib/MenC boosters decreased by 0.2% to 92.8% and 92.8% respectively, and UK MMR1 coverage at 24 months decreased by 0.3% to 92.8% (table 2a) [3]. Country-specific comparisons for minimum coverage levels achieved for these three vaccines evaluated at 24 months show that Scotland, Wales and Northern Ireland achieved at least 95% coverage and England at least 92%. Within England seven ATs achieved at least 95% (table 2a).

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

Country and English Area Team (AT code*)	PCT/HB†	DTaP/IPV/Hib3 %	PCV booster %	Hib/MenC %	MMR1 %
United Kingdom	**176**	**96.3** (*96.4*)	**92.9** (*93.1*)	**92.8** (*93.0*)	**92.9** (*93.2*)
Wales	**7**	**98.1** (*97.8*)	**96.1** (*96.3*)	**95.4** (*95.4*)	**96.3** (*96.7*)
Northern Ireland	**4**	**98.9** (*98.5*)	**96.2** (*96.1*)	**96.3** (*96.3*)	**96.4** (*96.1*)
Scotland	**14**	**98.2** (*98.1*)	**95.6** (*95.8*)	**95.8** (*96.0*)	**95.3** (*95.8*)
England (Total)	**151**	**95.9** (*96.1*)	**92.4** (*92.6*)	**92.3** (*92.5*)	**92.4** (*92.7*)
English Area Teams					
Q44	4	97.8 (*97.4*)	95.0 (*94.7*)	95.9 (*95.3*)	96.0 (*95.1*)
Q45	6	97.8 (*98.3*)	96.2 (*95.9*)	96.0 (*96.2*)	95.3 (*94.8*)
Q46	10	97.2 (*97.4*)	94.4 (*95.1*)	93.9 (*95.0*)	94.4 (*95.2*)
Q47	5	95.8 (*95.3*)	90.1 (*90.2*)	89.9 (*89.6*)	93.3 (*93.0*)
Q48	4	96.5 (*97.0*)	93.7 (*94.1*)	93.6 (*94.0*)	93.3 (*93.5*)
Q49	7	98.7 (*98.2*)	96.4 (*96.1*)	96.7 (*96.2*)	96.2 (*96.2*)
Q50	5	97.4 (*97.3*)	95.5 (*95.2*)	94.9 (*94.5*)	95.4 (*95.0*)
Q51	5	97.1 (*97.2*)	92.9 (*93.8*)	94.1 (*95.1*)	92.6 (*93.6*)
Q52	5	97.5 (*97.7*)	95.4 (*96.2*)	95.7 (*96.4*)	95.0 (*95.8*)
Q53	4	98.1 (*98.3*)	95.5 (*96.5*)	94.8 (*94.9*)	95.8 (*96.6*)
Q54	8	95.2 (*95.3*)	92.4 (*92.5*)	91.7 (*91.4*)	92.1 (*91.9*)
Q55	4	97.6 (*97.6*)	94.2 (*94.6*)	94.7 (*94.7*)	93.9 (*94.2*)
Q56	5	96.4 (*96.6*)	93.6 (*94.0*)	93.9 (*94.2*)	93.1 (*93.5*)
Q57	5	97.1 (*97.3*)	95.0 (*95.5*)	95.5 (*96.2*)	94.1 (*95.3*)
Q58	5	97.3 (*97.7*)	95.0 (*95.7*)	95.4 (*95.9*)	94.7 (*94.9*)
Q59	3	97.4 (*97.3*)	95.3 (*95.3*)	95.4 (*95.2*)	95.3 (*94.9*)
Q60	5	97.7 (*98.1*)	96.4 (*96.7*)	95.7 (*96.2*)	95.8 (*96.6*)
Q64	4	97.3 (*97.3*)	95.0 (*95.2*)	93.7 (*93.8*)	94.9 (*94.9*)
Q65	4	97.8 (*97.5*)	94.2 (*94.5*)	93.7 (*93.9*)	94.2 (*94.2*)
Q66	4	97.0 (*97.3*)	94.4 (*94.3*)	93.6 (*93.6*)	94.3 (*94.4*)
Q67	3	96.2 (*97.0*)	88.2 (*92.5*)	88.6 (*91.2*)	87.4 (*89.2*)
Q68	5	92.9 (*91.8*)	88.2 (*86.1*)	87.8 (*86.4*)	88.2 (*87.7*)
Q69	4	96.3 (*96.2*)	93.1 (*92.4*)	93.4 (*92.9*)	93.6 (*93.3*)
Q70	6	97.0 (*96.8*)	94.4 (*94.5*)	93.8 (*94.0*)	94.0 (*94.3*)
Q71	31	92.2 (*93.1*)	86.3 (*86.3*)	86.6 (*86.5*)	86.8 (*87.2*)

* 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: April to June 2014 (*January to March 2014*)

Former English Strategic Health Authorities (SHAs)	PCT/HB†	DTaP/IPV /Hib3 %	PCV booster %	Hib/MenC %	MMR1 %
North East	12	98.3 (*98.3*)	96.3 (*96.0*)	96.3 (*96.2*)	95.7 (*96.0*)
North West	24	97.0 (*97.0*)	93.7 (*94.1*)	93.6 (*94.0*)	94.4 (*94.6*)
Yorkshire and Humber	14	97.4 (*97.3*)	94.8 (*95.3*)	95.1 (*95.5*)	94.5 (*95.0*)
East Midlands	8	97.6 (*97.6*)	95.0 (*95.3*)	95.3 (*95.2*)	94.8 (*94.9*)
West Midlands	17	96.6 (*96.8*)	94.2 (*94.6*)	93.5 (*93.5*)	94.0 (*94.3*)
East of England	13	96.9 (*97.2*)	94.4 (*95.0*)	94.9 (*95.4*)	93.9 (*94.4*)
London	31	92.2 (*93.1*)	86.3 (*86.3*)	86.6 (*86.5*)	86.8 (*87.2*)
South Central	9	96.4 (*96.3*)	93.7 (*93.4*)	93.5 (*93.5*)	93.7 (*93.8*)
SE Coast	8	94.2 (*93.9*)	88.2 (*88.7*)	88.1 (*88.3*)	87.9 (88.3)
South West	14	97.5 (*97.4*)	94.5 (*94.6*)	93.6 (*93.7*)	94.3 (*94.4*)

† Primary Care Trusts/health boards

Coverage at five years

UK coverage of all antigens evaluated at five years were marginally higher than in the previous quarter and at least 95% coverage was achieved for the primary course DTP/Pol3 for all countries and all but two English ATs (Surrey and Sussex (Q68), and London (Q71)) [3] (tables 3a).

UK coverage of MMR1 at five years is the highest ever recorded, increasing by 0.2% to 94.9%. All countries and all English ATs achieved at least 90%. Scotland, Northern Ireland, Wales and 17 English ATs achieved at least 95% coverage for MMR1 and at least 90% for MMR2 at five years (tables 3a).

Coverage of UK DTaP/IPV booster increased by 0.1% to 89.4%. All devolved administrations and all but six English ATs achieved at least 90% coverage.

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

ENGLAND Area Team (AT) code*	Number of PCTs in AT	Primary		Booster		
		DTaP/IPV Hib %	MMR1 %	MMR2 %	DTaP/ IPV %	Hib/ MenC
United Kingdom	**176**	**96.1** (*96.0*)	**94.9** (*94.7*)	**89.2** (*88.9*)	**89.4** (*89.3*)	**93.0** (*92.6*)
Wales	**7**	**97.3** (*97.3*)	**96.8** (*97.0*)	**92.8** (*93.0*)	**93.5** (*93.9*)	**94.3** (*93.8*)
N. Ireland	**4**	**98.6** (*97.9*)	**97.7** (*97.4*)	**92.9** (*92.8*)	**93.7** (*94.0*)	**96.7** (*96.3*)
Scotland	**14**	**98.5** (*98.3*)	**97.5** (*97.5*)	**93.2** (*93.4*)	**94.1** (*94.2*)	**96.3** (*95.9*)
England (Total)	**151**	**95.8** (*95.7*)	**94.5** (*94.2*)	**88.5** (*88.2*)	**88.6** (*88.5*)	**92.5** (*92.1*)
English Area Teams						
Q44	4	96.8 (*96.8*)	95.8 (*95.5*)	90.6 (90.6)	91.1 (*91.5*)	93.7 (*93.9*)
Q45	6	97.7 (*97.7*)	95.8 (*95.6*)	94.1 (*92.6*)	94.4 (*93.6*)	96.0 (*95.9*)
Q46	10	97.3 (*96.8*)	96.5 (*96.0*)	93.1 (*92.6*)	93.0 (*92.6*)	92.9 (*91.3*)
Q47	5	96.4 (*96.3*)	96.3 (*95.9*)	88.0 (*89.4*)	84.8 (*88.1*)	93.8 (*94.0*)
Q48	4	96.4 (*96.8*)	97.3 (*97.8*)	89.6 (*91.4*)	89.9 (*90.6*)	95.1 (*94.0*)
Q49	7	98.1 (*98.0*)	97.1 (*97.3*)	94.0 (*93.7*)	94.4 (*94.6*)	94.9 (*95.0*)
Q50	5	97.1 (*96.7*)	96.5 (*95.3*)	93.0 (*91.3*)	93.3 (*92.0*)	93.2 (*93.7*)
Q51	5	96.7 (*96.9*)	95.7 (*95.5*)	90.0 (*90.3*)	90.7 (*91.1*)	95.2 (*95.3*)
Q52	5	97.9 (*97.7*)	96.9 (*96.6*)	93.1 (*92.8*)	93.4 (*93.4*)	96.6 (*96.4*)
Q53	4	97.3 (*97.6*)	96.6 (*96.8*)	92.8 (*94.0*)	94.1 (*95.0*)	92.6 (*92.0*)
Q54	8	96.3 (*96.0*)	94.8 (*94.7*)	87.9 (*87.8*)	88.5 (*88.1*)	92.4 (*92.1*)
Q55	4	97.7 (*97.5*)	96.5 (*95.8*)	91.2 (*90.8*)	92.2 (*91.6*)	94.4 (*94.1*)
Q56	5	96.0 (*95.7*)	94.1 (*93.8*)	89.5 (*88.6*)	91.1 (*90.1*)	93.4 (*92.6*)
Q57	5	96.7 (*96.6*)	94.9 (*94.5*)	91.6 (*90.8*)	92.7 (*92.4*)	95.3 (*95.2*)
Q58	5	96.6 (*96.3*)	95.3 (*94.8*)	91.7 (*91.6*)	92.6 (*93.1*)	94.4 (*94.5*)
Q59	3	97.2 (*97.0*)	95.8 (*95.1*)	91.6 (*90.2*)	94.5 (*94.7*)	95.8 (*93.6*)
Q60	5	97.8 (*98.1*)	96.8 (*96.9*	92.5 (*93.2*)	93.8 (*94.2*)	96.3 (*96.3*)
Q64	4	97.6 (*96.3*)	96.5 (*95.1*)	92.0 (*89.7*)	93.6 (*91.7*)	94.6 (*93.7*)
Q65	4	97.9 (*97.4*)	96.7 (*95.8*)	91.9 (*90.9*)	93.3 (*91.8*)	94.1 (*92.9*)
Q66	4	97.4 (*96.8*)	95.1 (*95.5*)	89.3 (*91.0*)	91.1 (*91.1*)	93.0 (*93.0*)
Q67	3	95.5 (*96.2*)	93.2 (*92.9*)	82.3 (*84.4*)	83.3 (*85.6*)	93.6 (*93.3*)
Q68	5	92.6 (91.3)	90.4 (89.4)	83.1 (*80.7*)	85.1 (*81.3*)	86.8 (*84.6*)
Q69	4	95.5 (*95.8*)	94.5 (*94.9*)	91.5 (*89.5*)	90.4 (*88.9*)	93.8 (*93.2*)
Q70	6	96.0 (*95.5*)	94.6 (*94.2*)	91.0 (*90.1*)	91.8 (*90.5*)	93.0 (*91.8*)
Q71	31	92.1 (*92.7*)	90.9 (*90.7*)	79.9 (*80.0*)	77.3 (*78.0*)	87.6 (*87.5*)

* 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: April to June 2014 (*January to March 2014*)

Former English SHAs	PCT/ HB †	Primary		Booster		
		DTaP/IPV /Hib3 %	MMR1%	MMR2 %	DTaP/ IPV %	Hib/ MenC
North East	12	98.0 (*98.0*)	96.5 (*96.5*)	94.1 (*93.1*)	94.3 (*94.1*)	95.7 (*95.6*)
North West	24	96.9 (*96.7*)	96.5 (*96.3*)	91.2 (*91.5*)	90.7 (*91.4*)	93.5 (*92.8*)
Yorkshire and Humber	14	97.4 (*97.2*)	96.5 (*96.0*)	92.3 (*91.9*)	92.7 (*92.5*)	95.3 (*95.4*)
East Midlands	8	97.4 (*97.2*)	96.1 (*95.4*)	91.6 (*90.8*)	93.4 (*93.3*)	95.0 (*94.0*)
West Midlands	17	96.9 (*97.0*)	95.8 (*95.8*)	90.4 (*90.8*)	91.9 (*91.5*)	93.4 (*93.2*)
East of England	13	96.3 (*96.1*)	94.6 (*94.3*)	90.7 (*90.1*)	92.0 (*91.6*)	94.2 (*94.0*)
London	31	92.1 (*92.7*)	90.9 (*90.7*)	79.9 (*80.0*)	77.3 (*78.0*)	87.6 (*87.5*)
South Central	9	95.7 (*95.8*)	94.9 (*94.7*)	91.2 (*90.0*)	90.9 (*89.8*)	93.3 (*92.7*)
SE Coast	8	93.8 (*93.2*)	91.5 (*90.8*)	82.8 (*82.2*)	84.4 (*83.0*)	89.5 (*88.1*)
South West	14	97.5 (*96.6*)	95.8 (*95.1*)	91.1 (*90.3*)	92.6 (*91.3*)	94.0 (*92.9*)

† Primary Care Trusts/health boards

Neonatal hepatitis B vaccine coverage in England: April to June 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 April to June 2013), and coverage of four doses of vaccine in infants who reached two years of age (i.e. those born between April to June 2012) are presented by Area Team in table 4a below. Table 4b shows coverage by SHA for historical comparison [3].

PHE received 12 month coverage and 24 month coverage returns for 124 (82%) and 122 (81%) 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. Fifteen 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 decreased by 4% to 83% when compared to last quarter and coverage of four doses decreased by 13% to 72% at 24 months. However, the last quarter's 24 month data was uncommonly high (85%) and this quarter's figure is closer to coverage estimates recorded earlier in 2013 [1-3].

Table 4a. Neonatal hepatitis B coverage in England by English Area Team: April to June 2014 (*January to March 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	2	100 (*100*)	4 of 4	6	83 (*100*)
Q45	2 of 6	0	– (–)	2 of 6	0	– (-)
Q46	8 of 10	60	53 (*85*)	7 of 10	103	46 (*92*)
Q47	2 of 5	0	– (–)	2 of 5	2	0 (–)
Q48	4 of 4	5	100 (*100*)	4 of 4	10	70 (*57*)
Q49	7 of 7	5	100 (*100*)	7 of 7	5	100 (*100*)
Q50	5 of 5	3	100 (*50*)	5 of 5	2	100 (100)
Q51	5 of 5	24	100 (*86*)	4 of 5	23	96 (*100*)
Q52	5 of 5	22	100 (*88*)	5 of 5	25	100 (*96*)
Q53	3 of 4	6	100 (*100*)	3 of 4	7	100 (*100*)
Q54	4 of 8	19	63 (*85*)	4 of 8	27	44 (*83*)
Q55	4 of 4	10	90 (*83*)	4 of 4	10	100 (*100*)
Q56	4 of 5	8	63 (*83*)	4 of 5	9	100 (*93*)
Q57	5 of 5	13	100 (*86*)	5 of 5	11	55 (*73*)
Q58	5 of 5	34	100 (*100*)	5 of 5	27	100 (*91*)
Q59	2 of 3	9	33 (*11*)	2 of 3	19	53 (*89*)
Q60	5 of 5	4	100 (*100*)	5 of 5	7	100 (*100*)
Q64	4 of 4	3	100 (*100*)	4 of 4	11	64 (*33*)
Q65	4 of 4	2	100 (*100*)	4 of 4	5	20 (*67*)
Q66	4 of 4	1	100 (*100*)	4 of 4	2	50 (*-*)
Q67	3 of 3	8	13 (*20*)	3 of 3	12	75 (*46*)
Q68	3 of 5	3	67 (*100*)	3 of 5	5	20 (*78*)
Q69	4 of 4	29	100 (*100*)	4 of 4	23	91 (*94*)
Q70	5 of 6	9	100 (*73*)	5 of 6	1	0 (*100*)
Q71	23 of 31	191	87 (*89*)	23 of 31	191	79 (*81*)
England	**124 of 151**	**470**	**83 (*87*)**	**122 of 151**	**543**	**72 *(85)***

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

Table 4b. Neonatal hepatitis B coverage in England by former Strategic Health Authority: April to June 2014 (*January to March 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	8 of 12	5	100 (*100*)	8 of 12	5	100 *(100)*
North West	19 of 24	67	58 (*87*)	18 of 24	121	49 *(90)*
Yorkshire and Humber	14 of 14	49	100 *(85*)	13 of 14	50	98 *(97)*
East Midlands	8 of 9	27	74 (*62)*	8 of 9	32	72 *(92)*
West Midlands	12 of 17	29	76 (*94*)	12 of 17	41	63 *(96)*
East of England	12 of 13	42	93 (*91*)	12 of 13	38	87 *(92)*
London	23 of 31	191	87 (*89*)	23 of 31	191	79 *(81)*
South Central	8 of 9	40	100 (*98*)	8 of 9	30	90 *(91)*
SE Coast	6 of 8	11	27 *(64*)	6 of 8	17	59 *(59)*
South West	14 of 14	9	100 (*83*)	14 of 14	18	50 *(50)*
England	**124 of 151**	**470**	**83 *(87)***	**122 of 151**	**543**	**72 *(85)***

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. 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

2. Public Health England (2014). Vaccination coverage statistics for children up to the age of five years in the United Kingdom, October to December 2014. *HPR* **8**(12). Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/346235/hpr1214_cover.pdf

3. 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

4. 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).

5. HSCIC. NHS Immunisation Statistics, England - 2012-13. September 2013. Available at http://www.hscic.gov.uk/catalogue/PUB11665

6. HSCIC. NHS Immunisation Statistics, England - 2013/14. September 2014. Available at http://www.hscic.gov.uk/pubs/immstats1314

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. 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.

11. UK Statistics Authority. Code of Practice for Official Statistics. January 2009. Available at http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html

Public Health England

Health Protection Report
weekly report

Infection report

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Laboratory confirmed cases of pertussis reported to the enhanced pertussis surveillance programme in England during April to June 2014 (Q2/2014).

In England there were 811 laboratory confirmed cases of pertussis (culture, PCR, serology or oral fluid) reported to the Public Health England (PHE) pertussis enhanced surveillance programme in the second quarter of 2014, from April to June (table 1). This was a 34% increase in the number of cases reported during the previous quarter (603 in January to March 2014) and a 28% decrease on cases reported in the same quarter of 2013 (1120 cases between April and June 2013). There were 28 laboratory confirmed cases reported in Wales between April and June 2014, a 56% increase in the number of cases reported in the previous quarter (n=18) and a 43% decrease on the number of cases reported in the same quarter in 2013 (n=49).

Typically pertussis activity peaks in quarter 3 and then declines (figure 1). 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, 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 January, February and March 2014, 60.7%, 59.7% and 58.9% respectively had been immunised with a pertussis containing vaccine in pregnancy in England [3]. From April 2014 coverage data has been collected electronically [4] and data for 2014 Q2 and Q3 will be published later this year.

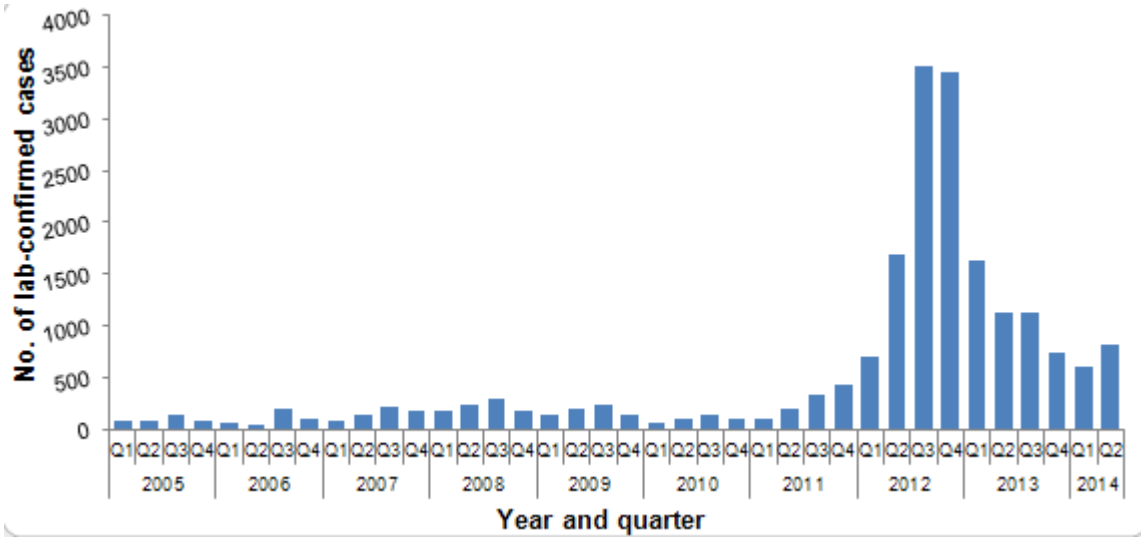
Following the high levels of activity in 2012, confirmed cases of pertussis first fell in the fourth quarter of 2012 and this decrease has continued overall with slight increases in the third quarter of 2013 and in Q2 of 2014, in line with the usual seasonal pattern. The highest number of laboratory confirmed cases in England has persisted in individuals aged 15 years and over whilst disease incidence continues to be highest in infants <3 months. Confirmed cases in infants less than 3 months were similar in the second quarter of 2014 (26 cases) and the equivalent quarter in 2013 (25 cases) and 117% higher than the first quarter of 2014 (12 cases). Four deaths were reported in infants with laboratory confirmed pertussis tested between April and June 2014 in England.

Table 1. Laboratory-confirmed cases of pertussis by age and testing method in England, April to June 2014.

Age group	Culture	PCR	Serology	Oral fluid only	Total
<3 months	14	11	1	–	26
3-5 months	1	–	–	–	1
6-11 months	–	1	1	–	2
1-4 years	1	2	6	–	9
5-9 years	1	1	29	6	37
10-14 years	1	–	79	9	89
15+ years	3	10	628	6	647
Total	21	25	744	23	811

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 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].

Figure 1. Total number of laboratory-confirmed pertussis cases per quarter in England, 2005 to 2014 (Q2).



Laboratory investigation

Bordetella pertussis PCR (for hospitalised cases <1 year old) and serological investigation by estimation of anti-pertussis toxin (PT) IgG antibody levels for older children and adults are provided by the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU) at the Public Health England (PHE) Microbiology Services Division Colindale. The PCR service for hospitalised infants under one year requires either a pernasal swab or nasopharyngeal aspirate to be sent as soon as possible post-onset; for the pertussis serology service for older children and adults not less than 400 µl of separated serum should be sent at least 2-3 weeks post-onset. Serology testing is not suitable for any individual who has been immunised against pertussis in the last year. The laboratory 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. A PCR community testing pilot for all age groups began at the end of May 2013 and requires a nasopharyngeal swab, throat swab and OF swab to be sent to RVPBRU for testing; this continues in participating areas. From 1 July 2014, community PCR testing using nasopharyngeal swabs was introduced for patients of any age presenting within the first three weeks of onset of symptoms.

Further information is available in the PHE Microbiology Services Colindale Bacteriology Reference Department User Manual at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/340615/BRDW0078.01_Bacteriology_Reference_Dept_User_Manual_.pdf

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. doi:10.1016/S0140-6736(14)60686-3.
6. Donegan K, King B, Bryan P. Safety of pertussis vaccination in pregnant women in UK: observational study. *BMJ* 2014, **349**: g4219.