Public Health England

Health Protection Report
weekly report

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Further results of childhood influenza vaccination programme released

PHE has released further evidence of the effectiveness of the national seasonal flu vaccination programme in the UK and, in particular, of the role of the universal childhood influenza vaccine programme in protecting children during the 2016/17 season [1]. Last winter was the first during which all healthy children of school-year-1 age and school-year-2 age, across England, were offered the recently-licensed, live attenuated influenza vaccine (LAIV).

Provisional end-of-season estimates of overall influenza vaccine effectiveness against laboratory-confirmed circulating influenza (A and B), in children and adults, was greater than 50% in 2015/16 – consistent with previous estimates of vaccine effectiveness. In those aged 2-17 years who received the LAIV, effectiveness was nearly 58% [2].

PHE notes that similar evidence of LAIV effectiveness has been reported in Finland, in contrast to the USA where it has been reported that LAIV has been less effective.

During the winter of 2014/15 – before the LAIV was offered to the youngest primary school-aged children – pilot programmes were run in a number of areas across England. During that season, in areas where the vaccine was offered to primary school age children, there was not only a 94% reduction in GP influenza-like illness consultation rates in the children themselves (and a 74% reduction in A&E respiratory attendances and a 93% reduction in hospital admissions among children) but also, in the same pilot areas, a 59% reduction in GP consultation rates for influenza-like illness in adults, compared to non-pilot areas [2].

A fuller report on seasonal flu vaccine effectiveness in 2015/16 will be published later in the summer.

References

1. PHE (22 June 2016). Influenza vaccine effectiveness (VE) in adults and children in primary care in the UK: provisional end-of-season results 2015 to 2016.

2. “Child flu vaccine plays important role in annual flu programme”, PHE website news story (23 June 2016).

Reminder on enhanced surveillance for *Legionella longbeachae*

PHE operates enhanced surveillance and microbiological testing for suspected *Legionella longbeachae* cases, as routine legionella urinary antigen testing will not detect these cases.

Eligible cases are patients admitted to intensive care with community-acquired pneumonia and:

- a history of contact with horticultural growth medium in the 14 days prior to onset, and
- negative local tests for legionella urinary antigen, pneumococcal urinary antigens and respiratory pathogen screens.

The PHE Respiratory and Vaccine Preventable Bacteria Reference Unit (Colindale) will undertake to isolate and detect *Legionella longbeachae* in referred specimens meeting these criteria at no cost to the referring laboratory.

Lower respiratory specimens (sputa, bronchoalveolar lavage or lung tissue) may be forwarded directly to the reference laboratory, as per the relevant user manual [1]. Specimens should be clearly marked “Legionella Longbeachae Surveillance”.

Reference

1. PHE (2014). Bacteriology reference department (BRD): user manual.

The dark arts of serology for public heath microbiology: Dhan Samuel Memorial Symposium

With the advent of molecular assays and next generation sequencing the value of serology is today often both under-rated and misunderstood. A symposium held at PHE Colindale on 1 June reviewed the important role serology has played, and continues to play, in the development of public health microbiology.

Serological techniques can be used to identify antibodies to infectious agents in a patient using known antigens, eg measles virus. Paired sera are usually taken from the patient, eg acute-phase and convalescent-phase samples. The sera can be tested using a variety of procedures including enzyme immunoassay (EIA), western blots, latex tests and neutralisation assays.

Professor Maria Zambon, director of Reference Microbiology Services at PHE Colindale, opened the meeting by reviewing the role serology had played in public health responses to emerging respiratory infections such as the SARS, and the avian and H1N1 (2009) flu pandemics. Two further presentations on influenza followed from John MacCaulay (Francis Crick Institute) and Katja Hoschler (PHE Virus Reference Unit).

Presentations covering the development of serological tests or assays developed in response to other disease outbreaks followed: the upsurge of pertussis cases seen in the UK in recent years (discussed by Norman Fry, head of PHE's vaccine-preventable bacteria section); monkey pox outbreaks (by Robin Gopal, clinical and scientific lead, PHE High Containment Microbiology); and, most recently, Ebola in West Africa (by Richard Tedder, head of PHE's Blood Borne Viruses Unit). Tedder described the in-situ development of tests for identifying Ebola patients with previous infection, and the possibilities for treating the infection with passive antibody. A presentation on the newly emerging role of human monoclonals, and their potential use as therapeutic agents for such infections, followed (by David Corti, HUMABS BioMed). The final talk was on the development of new point-of-care assays for measles detection and immunity (by David Brown, locum consultant medical virologist at Colindale).

The Colindale event was organised as a tribute to the PHE scientist Dhan Samuel who died unexpectedly in March 2016, while still in post. Dhan had made significant contributions in all the areas covered by the symposium, not least his being scientific lead on measles point-of-care assays and his work on that disease over many years, both at PHE and with the World Health Organization. The symposium provided an opportunity for his colleagues to share their respect and memories of a highly respected and deeply missed co-worker with all of the presentations referring to particular contributions he had made.

Dhan Samuel had joined PHLS (one of the forerunners of PHE's National Infection Service) at the end of the 1970s, before moving to industry in USA for a few years before returning to the UK and the Public Health Laboratory Service in the mid-1980s. At PHLS, he honed his skills in developing serological reagents for a wide range of pathogens, bacteria, viruses and parasites, as well as putting the reagents together to produce novel diagnostic assay. This type of work requires significant attention to the minutest of detail and often the outcome is not entirely predictable, more of an art than a science, and Dhan was a grand master of the art. The fact that such work is often "hidden" and not fully comprehended by those outside the field led to the unusual title for the symposium.

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Quarterly vaccination coverage statistics for children aged up to five years in the UK (COVER programme): January to March 2016

This report summarises UK quarterly vaccine coverage data for each routine childhood vaccination for children who reached their first, second, or fifth birthday during the evaluation quarter (January to March 2016). Analyses are presented at NHS England local and area team, country and UK levels.

Key points for the fourth quarterly report for 2015/16

- Quarterly UK coverage for DTaP/IPV/Hib3 at one year decreased by 0.6% to 93.7% compared to the previous quarter. This is the first quarterly evaluation below 94% since July to September 2010. England is the only UK country with coverage for DTaP/IPV/Hib3 at this age below the WHO target of 95%, although 14 of the 25 English area teams did achieve the target.

- UK level data for completed two-dose rotavirus vaccine evaluated at one year increased to 90.4% from 89.6%.

- Compared with the previous quarter, MMR coverage at two years increased 0.1% to 92.1% and 91.5% in the UK and England respectively. Coverage at two years in Wales, Northern Ireland and Scotland decreased by 0.3%, 0.4% and 0.6% respectively. All still achieved the WHO 95% target.

- UK coverage of MMR1 exceeded the WHO target of 95%, increasing 0.3% to 95.2% compared to the previous quarter. In England coverage increasing by 0.4% to 94.9% and the three devolved administrations all achieved at least 97%.

- The decrease in coverage of the pre-school booster (DTaP/IPV) for some English area teams is thought to be a data quality issue due to an inconsistency between the information provided by PHE in the COVER user guidance and the information standard and may have resulted in the data extraction of one of the main Child Health Information Systems (CHIS) under-estimating coverage of this booster. This is currently being investigated and the English and UK coverage estimates for this vaccine should be interpreted with caution.

Results for January to March 2016

Children who reached their first birthday in the quarter (born January to March 2015) were scheduled for three doses of the combined 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 January to March 2014) were scheduled to receive their third DTaP/IPV/Hib, second MenC and PCV vaccinations between May and July 2014, and their first measles, mumps, and rubella (MMR) vaccination, a booster dose of Hib and MenC (given as a combined Hib/MenC vaccine) and PCV vaccines at the same visit at 12 months of age, between February and April 2015.

Children who reached their fifth birthday in the quarter (born January to March 2011) were scheduled to receive their third dose DTaP/IPV/Hib and second MenC and PCV vaccinations between May and July 2011. They were also scheduled to receive their first MMR, Hib/MenC booster and PCV booster after their first birthday (January to March 2012) between February and April 2012, and their pre-school diphtheria, tetanus, acellular pertussis, inactivated polio booster (DTaP/IPV) and second dose MMR from January 2014.

Data presented in the appendix to this report describes coverage evaluated at the first, second and fifth birthdays by country and NHS England local and area teams.

Participation and data quality

Data were received from all Health Boards (HBs) in Scotland, Northern Ireland and Wales. In England, Area Teams (ATs) and Child Health Record Departments (CHRDs) provided data.

In England, implementation of a new COVER Information Standard Notice (ISN) by CHIS suppliers is almost complete with 128 and 146 CHISs providing 12 month rotavirus and MenC coverage data respectively, allowing England and UK coverage estimates for these two vaccines for the second consecutive quarter (table 1a). In Scotland, Wales and Northern Ireland the programmes extracting COVER data from CHISs have been modified to reflect these changes for some time and rotavirus and MenC coverage have been reported in the last five quarterly reports. Individual former PCT and local authority (LA) data (available for 146/152 LAs), with any relevant caveats for missing data values, are available here.

This is the last quarterly COVER report to collect data by former PCT for trend comparisons. From April 2016 data will be collected by LA responsible and resident population definitions as described in the information standard published in November 2014 [2].

Recent immunisation programme changes

The Joint Committee on Vaccination and Immunisation (JCVI) have recommended that infants no longer require vaccination against MenC. Therefore, from 1 July 2016, infants should no longer receive the dose of MenC conjugate vaccine currently given at the second primary immunisation visit at around 12 weeks of age. Children will continue to be immunised against MenC via the Hib/MenC vaccine dose given at 12 months of age and the MenACWY conjugate vaccine dose given at around 14 years of age [3]. The last cohort to be evaluated at for MenC at 12 months of age will be those born between January and March 2016, making the January to March 2017 quarterly COVER collection the final one to evaluate MenC at 12 months.

The first routine assessment of MenB vaccine coverage for children at 12 months will be the July to September 2016 quarter (to be published in the COVER report in December 2016). In order to rapidly assess vaccine coverage of this newly implemented immunisation programme, PHE has put in place a temporary sentinel surveillance system. This uses general practice (GP) level MenB vaccine coverage data automatically uploaded via participating GP IT suppliers to the ImmForm website on a monthly basis. Preliminary vaccine coverage estimates have been published for infants aged six months of age and eligible for infant MenB immunisation. MenB coverage for the cohort evaluated at the end of April 2016 was 95.5% for one dose and 87.9% for two doses by six months of age [4].

Coverage at 12 months

One year old children evaluated in the current quarter (born January to March 2015), are the sixth quarterly cohort to have been routinely offered rotavirus vaccine at two and three months, and the eighth quarterly cohort offered only one primary MenC dose at three months of age [5,6]. Compared to the previous quarter, UK coverage increased by 0.8% for rotavirus to 90.4% and decreased by 0.2% for MenC to 95.5% (table 1a) [7].

UK coverage for DTaP/IPV/Hib3 and PCV2 evaluated at 12 months decreased by 0.6% and 0.5% to 93.7% and 93.9% respectively, with decreases observed in all countries (table 1a) [6]. All countries achieved at least 95% for DTaP/IPV/Hib3, PCV2 and MenC, except England which achieved over 93%. Within England, 14 out of 25 ATs achieved at least 95% coverage at 12 months for these three vaccines (table 1a), and all ATs except for Surrey and Sussex, Kent and Medway, and London achieved at least 90% for all three vaccines.

Coverage at 24 months

UK coverage for the primary course (three doses) of DTaP/IPV/Hib at two years of age was 95.7%. Each of the four countries achieved the 95% WHO target. Lancashire (Q47), Kent and Medway (Q67), Surrey and Sussex (Q68) and London (Q71) are the only ATs with DTaP/IPV/Hib3 coverage below 95% (table 2b).

Compared with the previous quarter, UK coverage for Hib/MenC booster decreased by 0.1% to 92.1% and PCV booster decreased 0.3% to 92.0% (table 2a) [6]. UK MMR coverage evaluated at two years increased by 0.1% to 92.1%. Country-level coverage increased by 0.1% to 91.5% in England, by 0.3% to 95.5% in Wales, and by 0.4% to 95.9% in Northern Ireland. In Scotland MMR coverage decreased by 0.6% to 95.0% (table 2a).

Coverage at five years

UK coverage of MMR1 exceeded the WHO target of 95%, increasing 0.3% to 95.2% compared to the previous quarter. In England coverage increasing by 0.4% to 94.9% and the three devolved administrations all achieved at least 97%. Four of the 25 ATs in England failed to achieve at least 95% (table 3b). UK MMR2 coverage increased by 0.5% to 88.8%, and is now back to a similar level reported for the July to September 2015 quarter (table 3a) [7, 8].

UK coverage evaluated at five years for DTaP/IPV/Hib3 decreased by 0.1% compared to the previous quarter to 96.0% and Hib/MenC decreased 0.4% to 93.2%.

The decrease in coverage of the pre-school booster (DTaP/IPV) some English area teams is thought to be a data quality issue due to an inconsistency between the information provided by PHE in the COVER user guidance and the information standard and may have resulted in the data extraction of one of the main Child Health Information Systems (CHIS) under estimating coverage of this booster. This is currently being investigated and the English and UK coverage estimates of this vaccine should be interpreted with caution.

Neonatal hepatitis B vaccine coverage in England: January to March 2016

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 January to March 2015), and coverage of four doses of vaccine in infants who reached two years of age (i.e. those born between January to March 2014) are presented by area team in table 4.

The quality of these data is variable and coverage by area team relies on small numbers. As such, data should be interpreted with caution. Where an area reported no vaccinated children, a check was made to ensure that this was zero reporting rather than absence of available data. Compared with the previous quarter, coverage for three doses by 12 months of age increased by 1% to 91% and decreased by 4% to 69% for those receiving four doses by 24 months (table 4) [6].

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/sites3/page.cfm?orgid=457&pid=54144/

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

References

1. Public Health England. The complete routine immunisation schedule. https://www.gov.uk/government/publications/the-complete-routine-immunisation-schedule
2. Public Health England. Cover of Vaccination Evaluated Rapidly (COVER): Information Standards. https://www.gov.uk/government/publications/cover-of-vaccination-evaluated-rapidly-cover-programme-information-standards
3. Public Health England and NHE England. Removal of the infant dose of meningococcal serogroup C (MenC) conjugate vaccine given at three months from 1 July 2016. https://www.gov.uk/government/publications/menc-vaccination-schedule-planned-changes-from-july-2016
4. Public Health England (2016). Preliminary vaccine coverage estimates for the new meningococcal B (MenB) immunisation programme for England, update to the end of April 2016. Available at https://www.gov.uk/government/publications/meningococcal-b-immunisation-programme-vaccine-coverage-estimates
5. Public Health England. Rotavirus vaccination programme for infants. https://www.gov.uk/government/collections/rotavirus-vaccination-progarmme-for-infants
6. 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).
7. Public Health England (2016). Vaccination coverage statistics for children up to the age of five years in the United Kingdom, October to December 2015. *HPR* **10**(12). Available at https://www.gov.uk/government/statistics/cover-of-vaccination-evaluated-rapidly-cover-programme-2015-to-2016-quarterly-data
8. Public Health England (2015). Vaccination coverage statistics for children up to the age of five years in the United Kingdom, July to September 2015. *HPR* **9**(45). Available at https://www.gov.uk/government/statistics/cover-of-vaccination-evaluated-rapidly-cover-programme-2015-to-2016-quarterly-data

Appendix (Tables 1 to 4)

Table 1a. Completed UK primary immunisations at 12 months by country and English Local Teams: January to March 2016 (*October to December 2015*)

	Country	No. of PCTs/ HBs†	DTaP/IPV/Hib3 %	MenC%	PCV2%	Rota2%
	United Kingdom	**176**	**93.7 (*94.3*)**	**95.5 (*95.7*)**	**93.9 (*94.4*)**	**90.4 (*89.6*)**
	Wales	**7**	**96.3 (*96.9*)**	**97.6 (*97.9*)**	**96.3 (*96.8*)**	**93.9 (*93.7*)**
	Northern Ireland	**4**	**97.1 (*97.3*)**	**98.4 (*98.2*)**	**97.1 (*97.4*)**	**94.8 (*94.3*)**
	Scotland	**14**	**97.0 (*97.3*)**	**97.7 (*97.9*)**	**97.1 (*97.4*)**	**93.4 (*93.4*)**
	England (Total)	**151**	**93.2 (*93.8*)**	**95.1 (*95.2*)**	**93.4 (*93.9*)**	**89.7 (*89.6*)**
LT code	***NHS England Local Teams***					
Q70	Wessex	6	95.7 (*95.7*)	96.8 (*96.7*)	95.3 (*95.7*)	94.3 (*93.4*)
Q71	London	31	88.4 (*89.6*)	91.0 (*90.6*)	88.6 (*89.7*)	85.1 (*86.3*)
Q72	North (Yorkshire & Humber)	15	95.3 (*95.4*)	96.9 (*96.9*)	95.5 (*95.5*)	92.6 (*92.1*)
Q73	North (Lancashire & Grt Manchester)	15	93.6 (*94.0*)	94.6 (*95.1*)	93.6 (*94.6*)	80.3 (*81.2*)
Q74	North (Cumbria & North East)	13	96.4 (*96.9*)	97.2 (*97.5*)	96.9 (*96.6*)	94.0 (*92.9*)
Q75	North (Cheshire & Merseyside)	8	95.1 (*95.2*)	97.4 (*97.1*)	95.1 (*95.3*)	91.6 (*91.4*)
Q76	Midlands & East (North Midlands)	9	95.6 (*96.0*)	97.6 (*97.4*)	95.6 (*95.7*)	93.8 (*91.9*)
Q77	Midlands & East (West Midlands)	12	93.1 (*94.0*)	95.2 (*96.5*)	93.3 (*94.0*)	89.8 (*89.6*)
Q78	Midlands & East (Central Midlands)	8	96.3 (*96.3*)	97.4 (*97.5*)	96.3 (*96.2*)	94.0 (*93.2*)
Q79	Midlands & East (East)	10	95.3 (*95.5*)	97.1 (*96.5*)	95.4 (*95.6*)	92.3 (*91.6*)
Q80	South (South West)	8	94.2 (*94.6*)	96.2 (*96.8*)	94.5 (*94.9*)	88.5 (*88.6*)
Q81	South (South East)	8	88.9 (*89.2*)	92.9 (*91.6*)	89.4 (*89.6*)	85.1 (*85.1*)
Q82	South (South Central)	8	94.7 (*95.4*)	95.7 (*96.5*)	94.6 (*95.2*)	91.3 (*91.9*)

† Primary Care Trusts/health boards.

Table 1b. Completed UK primary immunisations at 12 months NHS England Area Teams: January to March 2016 (*October to December 2015*)

*NHS England Local team code**	English Area Team (AT code)	No. of former PCT's	DTaP/IPV/Hib3%	MenC%[1]	PCV2%	Rota2%[2]
Q70	Wessex (Q70)	6	95.7 (*95.7*)	96.8 (*96.7*)	95.3 (*95.7*)	94.3 *(93.4)*
Q71	London (Q71)	31	88.4 (*89.6*)	91.0 (*90.6*)	88.6 (*89.7*)	85.1 *(86.3)*
Q72	N Yorkshire and Humber (Q50)	5	94.7 (*94.6*)	96.5 (*97.4*)	95.1 (*95.9*)	92.6 *(93.0)*
	S Yorkshire and Bassetlaw (Q51)	5	95.7 (*95.2*)	96.6 (*96.7*)	96.1(*94.5*)	93.6 *(92.0)*
	W Yorkshire (Q52)	5	95.4 (*95.9*)	97.2 (*96.7*)	95.3 (*95.7*)	92.2 *(92.1)*
Q73	Greater Manchester (Q46)	10	94.1 (*94.7*)	96.5 (*96.7*)	94.0 (*95.1*)	80.3 *(81.2)*
	Lancashire (Q47)	5	92.0 (*92.0*)	91.1 (*91.5*)	92.5 (*93.0*)	n/a *(n/a[3])*
Q74	Durham, Darlington and Tees (Q45)	6	96.9 (*96.7*)	98.0 (*98.0*)	96.9 (*96.7*)	97.1 *(96.0)*
	Cumbria, Northumberland, Tyne and Wear (Q49)	7	96.0 (*97.0*)	96.7 (*97.1*)	96.8 (*96.4*)	93.0 *(91.7)*
Q75	Cheshire, Warrington and Wirral (Q44)	4	96.2 (*96.5*)	98.1 (*97.4*)	96.2 (*96.4*)	93.8 *(93.2)*
	Merseyside (Q48)	4	94.2 (*94.0*)	96.8 (*96.8*)	94.0 (*94.3*)	89.6 *(89.7)*
Q76	Derbyshire and Nottinghamshire (Q55)	4	95.1 (*95.5*)	97.4 (*97.0*)	95.1 (*94.9*)	93.2 *(90.0)*
	Shropshire and Staffordshire (Q60)	5	96.4 (*96.8*)	97.8 (*97.8*)	96.2 (*96.6*)	94.4 *(93.5)*
Q77	Arden, Herefordshire and Worcestershire (Q53)	4	96.7 (*96.7*)	98.0 (*97.8*)	96.6 (*96.5*)	93.7 *(92.9)*
	Birmingham and the Black Country (Q54)	8	91.2 (*92.5*)	93.5 (*95.7*)	91.5 (*92.7*)	87.5 *(87.5)*
Q78	Hertfordshire and the S Midlands (Q58)	5	96.6 (*96.5*)	97.4 (*97.3*)	96.6 (*96.4*)	94.2 *(93.6)*
	Leicestershire and Lincolnshire (Q59)	3	95.7 (*96.0*)	97.3 *(97.7)*	95.8 (*96.0*)	93.6 *(92.4)*
Q79	East Anglia (Q56)	5	95.5 (*95.4*)	97.2 (*96.2*)	95.6 (*95.5*)	92.5 *(90.9)*
	Essex (Q57)	5	94.9 (*95.7*)	97.1 (*96.8*)	95.2 (*95.7*)	92.1 *(92.3)*
Q80	Bristol, N Somerset, Somerset and S Gloucestershire (Q65)	4	95.3 (*95.5*)	96.8 (*97.0*)	95.6 (*95.8*)	90.1 *(89.4)*
	Devon, Cornwall, Isles of Scilly (Q66)	4	93.1 (*93.7*)	95.6 (*96.5*)	93.4 (*94.0*)	86.8 *(87.9)*
Q81	Kent and Medway (Q67)	3	89.4 (*90.7*)	93.0 (*92.9*)	89.7 (*90.4*)	84.5 *(85.5)*
	Surrey and Sussex (Q68)	5	88.6 (*88.1*)	92.8 (*90.6*)	89.2 (*89.1*)	85.7 *(84.8)*
Q82	Bath, Gloucestershire, Swindon and Wiltshire (Q64)	4	94.2 (*95.0*)	95.8 (*96.6*)	94.4 (*94.9*)	91.6 *(91.0)*
	Thames Valley (Q69)	4	95.0 (*95.7*)	95.7 (*96.4*)	94.8 (*95.4*)	91.1 *(91.4)*

n/a: accurate estimate not available (see commentary above)

1. Based on coverage data from 146/151 former PCTs, see full tables here

2. Based on coverage data from 128/151 former PCTs, see full tables here

3. Data quality issues reported

* See table 1a for key to local team organisational code

Table 2a. Completed UK primary immunisations at 24 months by country and NHS England local team: January to March 2016 (*October to December 2015*)

Country	No. of former PCTs/ HBs†	DTaP/IPV/Hib3 %	PCV booster %	Hib/MenC %	MMR1 %
United Kingdom	**176**	**95.7 (*95.7*)**	**92.0 (*92.3*)**	**92.1 (*92.2*)**	**92.1 (92.0)**
Wales	**7**	**97.7 (*97.6*)**	**95.9 (*95.6*)**	**95.0 (*95.0*)**	**95.5 (*95.2*)**
Northern Ireland	**4**	**98.3 (*98.3*)**	**96.3 (*96.0*)**	**95.9 (*95.9*)**	**95.9 (*95.5*)**
Scotland	**14**	**97.8 (*98.1*)**	**95.2 (*95.6*)**	**95.4 (*95.7*)**	**95.0 (*95.6*)**
England (Total)	**151**	**95.3 (*95.4*)**	**91.3 (*91.7*)**	**91.5 (*91.7*)**	**91.5 (*91.4*)**
NHS England local teams*					
Q70	6	96.3 (*96.3*)	93.9 (*93.9*)	93.8 (*93.9*)	93.8 (*93.5*)
Q71	13	92.1 (*92.1*)	84.8 (*85.2*)	85.1 (*85.2*)	85.3 (*85.0*)
Q72	15	96.6 (*97.0*)	94.3 (*94.4*)	94.2 (*94.3*)	94.0 (*93.7*)
Q73	15	94.5 (*94.6*)	91.0 (*92.3*)	90.9 (*92.0*)	91.2 (*92.1*)
Q74	13	97.7 (*97.6*)	94.4 (*95.4*)	95.5 (*96.1*)	95.3 (*95.1*)
Q75	8	97.1 (*97.2*)	92.8 (*93.4*)	94.0 (*93.8*)	93.8 (*93.5*)
Q76	9	97.6 (*97.2*)	94.8 (*94.4*)	94.9 (*94.3*)	94.7 (*94.1*)
Q77	12	96.3 (*95.9*)	92.9 (*92.4*)	93.0 (*92.5*)	93.0 (*92.4*)
Q78	8	97.2 (*97.1*)	94.7 (*94.9*)	94.8 (*94.7*)	94.5 (*94.4*)
Q79	10	96.3 (*96.4*)	93.6 (*93.7*)	93.6 (*93.6*)	93.3 (*93.2*)
Q80	8	96.1 (*96.9*)	92.6 (*93.4*)	92.6 (*93.2*)	92.4 (*93.1*)
Q81	8	92.0 (*91.4*)	87.1 (*87.0*)	87.6 (*86.9*)	87.6 (*86.9*)
Q82	8	96.5 (*96.6*)	92.9 (*92.9*)	93.3 (*92.9*)	93.1 (*92.8*)

* See table 1a for key to local team organisational code.

† Primary Care Trusts/health boards

Table 2b. Completed primary immunisations at 24 months by NHS England Area Teams: January to March 2016 (*October to December 2015*)

NHS England Local Team Code*	Area Team code*	No. of former PCTs†	DTaP/IPV/Hib3 %	PCV booster %	Hib/MenC %	MMR1 %
Q70	Q70	6	96.3 (*96.3*)	93.9 (*93.9*)	93.8 (*93.9*)	93.8 (*93.5*)
Q71	Q71	31	92.1 (*92.1*)	84.8 (*85.2*)	85.1 (*85.2*)	85.3 (*85.0*)
Q72	Q50	5	95.9 (*96.9*)	94.4 (*95.1*)	94.1 (*94.4*)	93.9 (*94.1*)
	Q51	5	96.4 (*96.5*)	92.0 (*93.3*)	92.6 (*93.4*)	92.6 (*92.1*)
	Q52	5	97.2 (*97.4*)	95.3 (*94.7*)	95.2 (*94.8*)	95.0 (*94.4*)
Q73	Q46	10	96.2 (*96.8*)	92.5 (*94.0*)	92.2 (*93.6*)	93.0 (*93.7*)
	Q47	5	90.9 (*90.0*)	87.7 (*88.6*)	87.9 (*88.7*)	87.5 (*88.5*)
Q74	Q45	6	97.9 (*97.9*)	93.1 (*95.7*)	95.8 (*96.9*)	95.0 (*94.9*)
	Q49	7	97.7 (*97.5*)	95.2 (*95.2*)	95.4 (*95.5*)	95.4 (*95.2*)
Q75	Q44	4	97.3 (*97.4*)	92.8 (*93.5*)	94.7 (94.9)	94.9 (*94.5*)
	Q48	4	96.8 (*96.9*)	92.9 (*93.2*)	93.3 (*92.7*)	92.6 (*92.6*)
Q76	Q55	4	97.6 (*97.2*)	94.0 (*94.5*)	94.1 (*94.1*)	93.9 (*93.9*)
	Q60	5	97.8 (*97.3*)	95.9 (*94.4*)	95.9 (*94.5*)	95.7 (*94.4*)
Q77	Q53	4	98.1 (*97.9*)	95.4 (*94.9*)	95.8 (*95.2*)	96.3 (*95.8*)
	Q54	8	95.4 (*94.8*)	91.7 (*91.1*)	91.5 (*91.0*)	91.4 (*90.6*)
Q78	Q58	5	97.3 (*97.5*)	95.2 (*95.5*)	95.3 (*95.4*)	95.0 (*94.7*)
	Q59	3	97.1 (*96.4*)	93.8 (*93.7*)	94.0 (*93.4*)	93.8 (*93.9*)
Q79	Q56	5	96.0 (*96.2*)	93.3 (*93.5*)	93.3 (*93.4*)	93.4 (*93.1*)
	Q57	5	96.6 (*96.6*)	93.9 (*93.9*)	94.0 (*93.9*)	93.1 (*93.3*)
Q80	Q65	4	96.6 (*96.6*)	92.8 (*93.3*)	93.0 (*93.3*)	92.4 (*92.9*)
	Q66	4	95.7 (*97.1*)	92.5 (*93.5*)	92.3 (*93.1*)	92.4 (*93.4*)
Q81	Q67	3	94.5 (*93.1*)	88.3 (*88.8*)	88.4 (*89.1*)	88.1 (*88.5*)
	Q68	5	90.3 (*90.2*)	86.1 (*85.7*)	87.0 (*85.5*)	87.2 (*85.9*)
Q82	Q64	4	96.5 (*96.9*)	92.7 (*92.8*)	92.8 (*93.0*)	92.5 (*92.5*)
	Q69	4	96.6 (*96.4*)	93.0 (*92.9*)	93.6 (*92.8*)	93.4 (*92.9*)

* See table 1a and 1b for keys to NHS England local team/Area Team organisational code.

† Former Primary Care Trusts

Table 3a. Completed UK primary immunisations and boosters at five years by country and NHS England local team: January to March 2016 (*October to December 2015*)

Country	Number of PCTs/HBs†	Primary		Booster		
		DTaP/IPV Hib3%	MMR1%	MMR2%	DTaP/IPV%$	Hib/ MenC%
United Kingdom	**176**	**96.0 (*96.1*)**	**95.2 (*94.9*)**	**88.8 (*88.3*)**	**87.6$ (*88.2*)$**	**93.2 (*93.6*)**
Wales	**7**	**96.2 (*96.6*)**	**97.0 (*97.1*)**	**91.4 (*91.9*)**	**92.4 (*92.3*)**	**94.1 (*94.0*)**
N. Ireland	**4**	**97.9 (*98.3*)**	**97.4 (*97.8*)**	**93.4 (*93.1*)**	**94.1 (*93.6*)**	**96.7 (*97.1*)**
Scotland	**14**	**98.3 (*98.0*)**	**97.3 (*97.2*)**	**92.9 (*92.9*)**	**93.5 (*93.5*)**	**96.4 (*95.9*)**
England (Total)	**151**	**95.7 (*95.8*)**	**94.9 (*94.5*)**	**88.2 (*87.6*)**	**86.7$ (*87.4*)$**	**92.8 (*93.3*)**
English Local Teams						
Q70	6	96.4 (*95.8*)	95.3 (*94.3*)	90.3 (*90.2*)	88.9 (*90.6*)	94.1 (*93.8*)
Q71	31	92.3 (*92.6*)	90.6 (*90.5*)	80.4 (*77.6*)	77.4 (*76.5*)	88.2 (*88.7*)
Q72	15	97.2 (*97.0*)	96.8 (*95.9*)	91.6 (*90.8*)	90.5 (*91.5*)	94.3 (*95.3*)
Q73	15	96.2 (*96.7*)	96.2 (*96.4*)	87.7 (*88.4*)	86.6 (*86.8*)	93.3 (*94.0*)
Q74	13	98.3 (*98.1*)	97.6 (*97.1*)	94.5 (*93.1*)	93.6 (*93.6*)	96.5 (*96.4*)
Q75	8	97.0 (*97.1*)	96.8 (*96.8*)	91.0 (*90.9*)	91.5 (*91.5*)	94.9 (*93.9*)
Q76	9	96.9 (*97.5*)	97.2 (*96.3*)	91.1 (*91.0*)	89.4 (*91.4*)	95.4 (*95.9*)
Q77	12	96.7 (*96.2*)	96.2 (*95.6*)	88.9 (*88.8*)	88.1 (*88.1*)	93.3 (*93.4*)
Q78	8	97.1 (*97.4*)	96.1 (*95.8*)	91.2 (*91.8*)	91.3 (*92.6*)	93.7 (*95.2*)
Q79	10	96.5 (*96.3*)	95.6 (*94.4*)	90.6 (*90.1*)	89.8 (*91.0*)	93.6 (*94.2*)
Q80	8	97.3 (*97.4*)	96.0 (*96.5*)	90.5 (*90.7*)	89.5 (*87.5*)	95.4 (*95.7*)
Q81	8	92.3 (*92.4*)	91.9 (*90.0*)	83.0 (*82.1*)	79.7 (*82.0*)	89.0 (*90.1*)
Q82	8	96.7 (*96.7*)	95.8 (*95.8*)	90.5 (*90.6*)	88.9 (*91.0*)	94.4 (*94.6*)

* See table 1a for key to NHS England local team organisational code.

$ The decrease in coverage of the pre-school booster (DTaP/IPV) some English area teams is thought to be a data quality issue due to an inconsistency between the information provided by PHE in the COVER user guidance and the information standard and may have resulted in the data extraction of one of the main Child Health Information Systems (CHIS) under estimating coverage of this booster. This is currently being investigated and the English and UK coverage estimates of this vaccine should be interpreted with caution

3b. Completed primary immunisations and boosters at five years by NHS England Area Team, January to March 2016 (*October to December 2015*)

NHS England local team Code*	Area Team (AT) code*	No. of former PCTs† in AT	Primary		Booster		
			DTaP/IPV Hib3 %	MMR1 %	MMR2 %	DTaP/ IPV %$	Hib/ MenC
Q70	Q70	6	96.4 (*95.8*)	95.3 (*94.3*)	90.3 (*90.2*)	88.9 (*90.6*)	94.1 (*93.8*)
Q71	Q71	31	92.3 (*92.6*)	90.6 (*90.5*)	80.4 (*77.6*)	77.4 (*76.5*)	88.2 (*88.7*)
Q72	Q50	5	97.2 (*96.6*)	96.6 (*95.4*)	91.4 (*90.5*)	91.7 (*90.8*)	94.7 (*94.4*)
	Q51	5	96.9 (*96.4*)	96.5 (*95.0*)	91.8 (*89.2*)	88.8 (*89.8*)	93.2 (*94.5*)
	Q52	5	97.4 (*97.5*)	97.1 (*96.7*)	91.6 (*91.9*)	90.8 (*92.8*)	94.8 (*96.2*)
Q73	Q46	10	96.8 (*97.4*)	96.5 (*96.9*)	90.0 (*91.2*)	89.1 (*89.8*)	93.8 (*94.4*)
	Q47	5	95.1 (*95.4*)	95.6 (*95.4*)	83.1 (*82.5*)	81.4 (*80.6*)	92.3 (*93.1*)
Q74	Q45	6	98.5 (*98.1*)	97.4 (*97.0*)	95.4 (*94.1*)	95.3 (*93.9*)	97.4 (*96.9*)
	Q49	7	98.2 (*98.1*)	97.7 (*97.2*)	94.0 (*92.5*)	92.5 (*93.3*)	95.9 (*96.7*)
Q75	Q44	4	97.2 (*97.0*)	97.0 (*96.6*)	91.9 (*91.4*)	92.6 (*92.2*)	94.6 (*94.7*)
	Q48	4	96.7 (*97.1*)	96.7 (*97.0*)	90.1 (*90.3*)	90.4 (*90.7*)	95.1 (*93.0*)
Q76	Q55	4	97.9 (*97.5*)	97.6 (*96.2*)	90.0 (*90.6*)	88.7 (*91.0*)	94.8 (*95.7*)
	Q60	5	95.6 (*97.6*)	96.7 (*96.6*)	92.4 (*91.6*)	90.3 (*92.0*)	96.2 (*96.0*)
Q77	Q53	4	98.4 (*97.6*)	98.3 (*97.3*)	93.8 (*93.1*)	94.7 (*92.9*)	95.8 (*95.1*)
	Q54	8	95.7 (*95.5*)	95.0 (*94.6*)	86.2 (*86.5*)	84.6 (*85.5*)	91.9 (*92.4*)
Q78	Q58	5	97.1 (*97.4*)	96.1 (*95.4*)	91.5 (*92.0*)	91.9 (*92.8*)	94.3 (*95.7*)
	Q59	3	97.0 (*97.5*)	96.2 (*96.6*)	90.5 (*91.4*)	90.2 (*92.2*)	92.6 (94.2)
Q79	Q56	5	96.2 (*95.6*)	95.2 (*93.8*)	90.8 (*89.4*)	89.0 (*90.4*)	92.2 (92.9)
	Q57	5	96.9 (*97.0*)	96.1 (*95.1*)	90.3 (*91.0*)	91.0 (*91.8*)	95.5 (95.9)
Q80	Q65	4	97.6 (*97.8*)	96.1 (*96.7*)	89.4 (*90.1*)	91.8 (*88.3*)	95.9 (96.3)
	Q66	4	97.1 (*97.1*)	95.9 (*96.3*)	91.4 (*91.3*)	87.4 (*86.7*)	95.0 (95.2)
Q81	Q67	3	95.4 (*95.4*)	94.7 (*93.2*)	85.4 (*82.4*)	82.4 (*82.9*)	92.4 (93.7)
	Q68	5	90.2 (*90.5*)	89.9 (*88.0*)	81.4 (*81.9*)	77.9 (*81.4*)	86.8 (87.7)
Q82	Q64	4	96.9 (*96.9*)	96.4 (*95.9*)	90.7 (*90.7*)	87.6 (*92.6*)	94.1 (95.3)
	Q69	4	96.6 (*96.6*)	95.4 (*95.8*)	90.4 (*90.2*)	89.8 (*90.6*)	94.6 (93.8)

* See table 1a and 1b for keys to NHS England local team/Area Team organisational code .

† Former Primary Care Trusts.

$ The decrease in coverage of the pre-school booster (DTaP/IPV) some English area teams is thought to be a data quality issue due to an inconsistency between the information provided by PHE in the COVER user guidance and the information standard and may have resulted in the data extraction of one of the main Child Health Information Systems (CHIS) under estimating coverage of this booster. This is currently being investigated and the English and UK coverage estimates of this vaccine should be interpreted with caution

Table 4. Neonatal hepatitis B coverage in England by NHS England Area Team January to March 2016 (*October to December 2015*)

Area Team (AT code)*	Former PCT returns with 12 month data	12 month deno-minator	% Coverage at 12 months	Former PCT returns with 24 month data	24 month deno-minator	% Coverage at 24 months
Q44	2 of 4	–	– (*100*)	2 of 4	3	100 (*50*)
Q45	6 of 6	8	100 (*87*)	6 of 6	–	0 (*100*)
Q46	9 of 10	50	78 (*64*)	9 of 10	119	39 (*37*)
Q47	0 of 5	–	– (–)	0 of 5	– (–)	– (–)
Q48	0 of 4	–	– (–)	0 of 4	–	– (*33*)
Q49	7 of 7	3	67 (*83*)	7 of 7	8	100 (*86*)
Q50	5 of 5	6	83 (*100*)	5 of 5	7	29 (*43*)
Q51	5 of 5	19	100 (*100*)	4 of 5	18	100 (*100*)
Q52	5 of 5	22	95 (*97*)	5 of 5	22	100 (*87*)
Q53	2 of 4	12	100 (*100*)	1 of 4	11	100 (*100*)
Q54	6 of 8	30	97 (*100*)	6 of 8	13	46 (*71*)
Q55	4 of 4	8	100 (*100*)	4 of 4	12	83 (*100*)
Q56	5 of 5	6	83 (*80*)	5 of 5	7	100 (*100*)
Q57	3 of 5	5	100 (*100*)	2 of 5	4	75 (*100*)
Q58	5 of 5	24	100 (*100*)	5 of 5	29	97 (*100*)
Q59	2 of 3	13	92 (*0*)	2 of 3	7	86 (*100*)
Q60	5 of 5	5	100 (*100*)	5 of 5	6	83 (*75*)
Q64	4 of 4	8	100 (*100*)	4 of 4	8	88 (*100*)
Q65	4 of 4	6	100 (*100*)	4 of 4	4	100 (*82*)
Q66	4 of 4	1	100 (*100*)	4 of 4	–	– (*100*)
Q67	3 of 3	17	100 (*100*)	3 of 3	6	100 (*100*)
Q68	5 of 5	10	100 (*100*)	5 of 5	6	83 (*40*)
Q69	4 of 4	25	88 (*82*)	4 of 4	23	83 (*73*)
Q70	6 of 6	33	100 (*100*)	5 of 6	14	71 (*100*)
Q71	26 of 31	170	85 (*89*)	25 of 31	168	69 (*77*)
England	**127 of 151**	**481**	91 (*90*)	**122 of 151**	**495**	69 (*73*)

* See table 1b for key to NHS England Area Team organisational code

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