



Health Protection Report

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Laboratory confirmed number of mumps cases in England and Wales – update to end of April 2009

Since the beginning of 2009 the number of confirmed mumps cases has risen sharply [1] and 2,886 cases have been confirmed in the period January to April in 2009. This exceeds the annual totals for the previous two years (1,476 and 2,440 cases respectively). However, the number of notified cases for the same period in 2009 is only a quarter of that reported during the first four months of the 2005 epidemic year (see figure 1) [2].

During 2009, cases have been confirmed in all regions in England and Wales, with the North West, South East and South West regions reporting the highest numbers (see table). The proportion of oral fluid sample tests that are positive for IgM or viral RNA is currently 50% nationally [3]. An additional 187 reports (6.7%) with raised IgG have been included in the confirmed cases. These cases probably represent reinfections in individuals with some pre-existing immunity (either natural or vaccine acquired).

Since 2004 to date, the majority of the confirmed cases were linked with outbreaks in universities and the proportion of cases of university age remains high (table and figure 2). Although it is recommended that new entrants to universities and colleges should have had two doses of MMR before commencing their studies [4], many of the confirmed cases were found to have been unvaccinated or to have received only one dose. This is because individuals born between 1985 and 1989 were not eligible for the two-dose MMR schedule.

Evidence of waning immunity after vaccination has been shown in university outbreaks in the USA [5]. In the UK, analysis of protection from vaccination in 2004-5 has suggested there was evidence of declining protection, particularly in those who had only received one dose of vaccine. However, individual protection from vaccination remained high in those who had two doses even though follow up was only for around five years [6]. Therefore, it is recommended that university students who have not received two doses of MMR should complete the course.

Confirmed cases of mumps by age group and region, England and Wales: January – April 2009

Region	Age group								Total
	<1	1-4	5-9	10-14	15-19	20-24	25+	NK	
North East	–	3	1	2	38	54	42	–	140
North West	–	3	3	23	168	181	84	4	466
Yorkshire & Humber	–	–	2	12	70	82	32	1	199
East Midlands	–	–	2	8	70	69	34	3	186
West Midlands	–	3	3	2	58	81	32	1	180
East of England	–	–	4	15	80	89	37	2	227
London	–	4	10	21	74	149	86	3	347
South East	–	5	5	11	161	242	106	–	530
South West	–	4	7	19	148	226	98	3	505
Wales	–	1	–	9	32	36	26	1	105
Not known	–	–	–	–	1	–	–	–	1
Total*	0	23	37	122	900	1209	577	18	2886

*Includes samples (oral fluid, serum and other) with detectible IgM, viral RNA or raised IgG levels.

Figure 1. Mumps notifications (five weekly moving averages), England and Wales , July – June

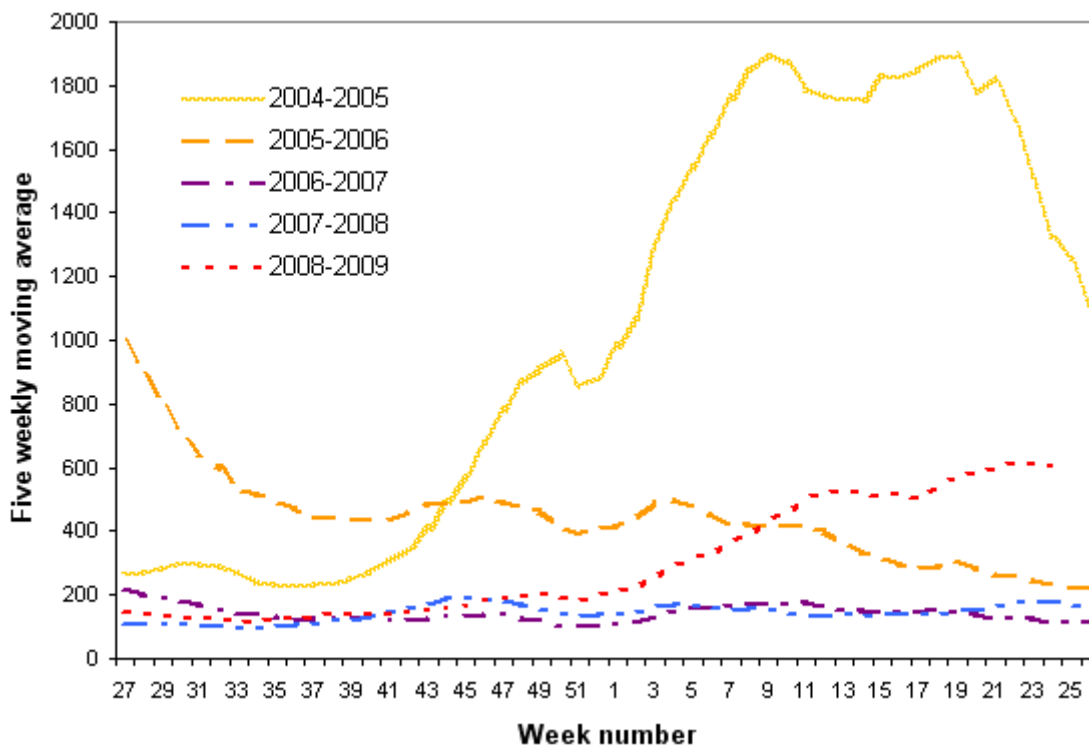
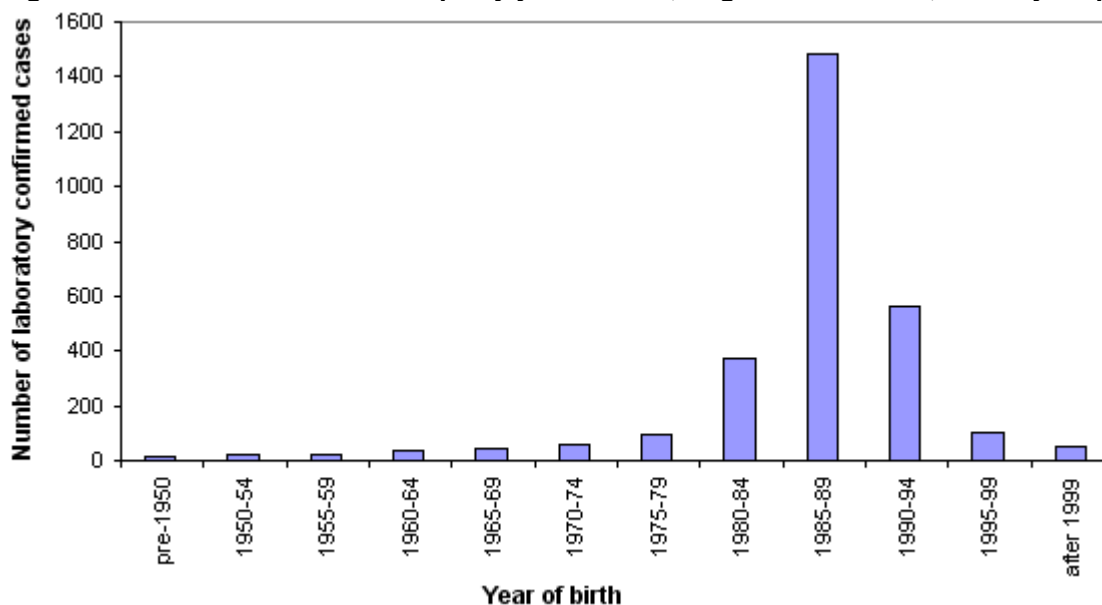


Figure 2. Confirmed cases of mumps by year of birth, England and Wales, January – April



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3. Mumps notifications (confirmed cases), England and Wales, 1995 – 2009 by quarter. HPA website: Mumps/Epidemiological data.

4. DH. *Immunisation against infectious disease* ("the Green Book"). Available at: http://www.dh.gov.uk/en/PublicHealth/HealthProtection/Immunisation/Greenbook/DH_4097254.
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 6. Cohen C, White JM, Savage EJ, Glynn JR, Choi Y, Andrews N, et al. Vaccine effectiveness estimates, 2004–2005 mumps outbreak, England. *Emerg Infect Dis* [serial online] 2007; Jan. [accessed 11 June 2009]. Available from <http://www.cdc.gov/ncidod/EID/13/1/12.htm>.
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Continuing antimicrobial resistance in gonorrhoea – GRASP 2008 report

Increasingly widespread resistance to anti-microbial agents in gonococcal isolates circulating in the United Kingdom is recorded in the latest report of the Gonococcal Resistance to Antimicrobials Surveillance Programme [1].

Gonorrhoea is the second most common bacterial, sexually-transmitted infection (STI) in the UK and tends to be particularly prevalent among specific population sub-groups including young adults, black ethnic groups and men who have sex with men (MSM). The annual GRASP report records trends in prevalence of the disease in the UK and trends in resistance of gonococcal isolates to specific antimicrobials.

The 2007 report [2] had identified emerging and continuing resistance to a number of antimicrobial agents including ciprofloxacin, penicillin, tetracycline and azithromycin, and the increasing problem of antimicrobial resistance is again a main theme of the 2008 report.

The greatest burden of antimicrobial-resistant gonorrhoea continues to be among men who have sex with men (MSM), highlighting the need to raise awareness and target interventions in this group.

The 2008 report also notes that an apparent outbreak of high-level resistance to penicillin and tetracycline, associated with sexual contact abroad, that had emerged in 2007, was ongoing in 2008.

The apparent drift towards higher minimum inhibitory concentrations (MICs) in third generation cephalosporins, the current recommended therapies for treatment of gonorrhoea, was reported as a key concern in 2008 – particularly as a number of isolates are now classified as being of reduced susceptibility to cefixime and, less frequently, to ceftriaxone. Acknowledging that difficulties are associated with comparing resistance rates between countries, the report notes that gonococcal isolates displaying reduced susceptibility to third generation cephalosporins are particularly prevalent in Asia and have also been documented in Australia, the USA and some European countries. Treatment failures have been reported with cefixime, cefdinir and ceftibuten.

References

1. HPA. *GRASP 2008 report: trends in antimicrobial resistant gonorrhoea*, June 2009. Available at: http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1245914959952.
 2. "Recent trends and emerging resistance in gonorrhoea – annual GRASP report for 2007", *Health Protection Report* [serial online] 2008; **2**(37): news, <http://www.hpa.org.uk/hpr/archives/2008/news3708.htm#grasp>.
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A/H1N1 ('swine-lineage'): UK situation at 26 June 2009

During the week-ending Friday 26 June [1], the ninth week of the UK outbreak, the number of confirmed UK cases of infection with the novel, swine-lineage influenza virus A/H1N1 rose to 4250.

The highest number of cases have been recorded in London (985) and the West Midlands (1516).

Table 1: Confirmed cases by Region and Devolved Administration, United Kingdom as reported by 26 June 2009

Region where sample was tested *	Confirmed cases 26 June (19 June)
East of England	205 (72)
East Midlands	63 (18)
London	985 (338)
North East	34 (26)
North West	55 (35)
South East	323 (127)
South West	88 (23)
West Midlands	1516 (748)
Yorkshire & Humberside	95 (44)
Total England	3364 (1431)
Northern Ireland	24 (13)
Scotland	850 (537)
Wales	12 (3)
TOTAL UK	4250 (1984)

* Current testing arrangements mean that the regional breakdown of figures reflects the regional laboratory where samples are tested which may not always be in the region where the patient lives (as a result there may be some small variations in regional figures as cases are reassigned to their home regions).

HPA guidance

The Swine Influenza pages on the Agency website include sections on:

- Advice for the public (<http://www.hpa.org.uk/swineflu/public>);
- Information for health professionals (<http://www.hpa.org.uk/swineflu/professionals>);
- Epidemiological data (<http://www.hpa.org.uk/swineflu/epidata>);
- Press releases and media updates (<http://www.hpa.org.uk/swineflu/press>);
- Key links (<http://www.hpa.org.uk/swineflu/links>).

Among significant changes within the Information for Health Professionals pages, the following sections have been updated:

- Case definition and classification of cases (updated 25 June);
- Case investigation and management, including treatment (updated 26 June);
- Information on schools and community/institutional settings (updated 22 June).

Reference

1. "Update on confirmed swine flu cases", (HPA press release of 19 June 2009). HPA website: National Press Releases.

Infection reports

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Immunisation

- ▶ **COVER programme: January to March 2009**
 - ▶ **Laboratory confirmed cases of pertussis reported to the enhanced pertussis surveillance programme in 2008**
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COVER programme: January to March 2009

This report of the COVER programme presents quarterly coverage data for children in the United Kingdom (UK) who reached their first, second or fifth birthday during the evaluation quarter, January to March 2009.

Children who reached their first birthday in the quarter (born January to March 2008) were the seventh quarterly birth cohort to have been scheduled to receive their primary vaccinations according to the new schedule introduced on 4 September 2006 [1] (three doses diphtheria, tetanus, acellular pertussis, polio, and *Haemophilus influenzae* type b vaccine (DTaP/IPV/Hib vaccine) two doses each of meningococcal serogroup C conjugate vaccine (MenC vaccine) and pneumococcal conjugate vaccine (PCV), completing between May and July 2008.

Children who reached their second birthday in the quarter (born January to March 2007) would have been scheduled to receive their third dose primary vaccinations between May and July 2007 and first measles, mumps, and rubella (MMR) vaccination between February and July 2008. These children are the sixth quarterly birth cohort to be routinely scheduled to receive a booster dose of Hib and MenC vaccine (given as a combined Hib/MenC vaccine) at 12 months, and a PCV vaccine at 13 months of age [1].

Children who reached their fifth birthday in the quarter (born January to March 2004) would have been scheduled to receive their third dose primary vaccinations between May and July 2004, their first MMR between February and July 2005, their pre-school diphtheria, tetanus, acellular pertussis, inactivated polio (DTaP/IPV) booster and second dose MMR from May 2007 onwards, and a catch-up dose of a Hib-containing vaccine from September 2007 [2].

Methods

Methods of data collection for COVER, sentinel MMR coverage and neonatal hepatitis B vaccination coverage are described on the HPA website at:

<http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListDate/Page/1209454766294?p=1209454766294>.

Results

Data were received from all Health Boards (HBs) in Scotland and Northern Ireland, Administrative Regions (ARs) in Wales, and all but one of Primary Care Trusts (PCTs) in England. This is the second quarter (since January to March 2004) that all 31 London PCTs have submitted a return. However, ongoing data quality concerns mean that there is a continued need for caution when evaluating the vaccination programme in London. Caveats have been issued by eight London PCTs; for three of these and four other PCTs unreliable data for some antigens have been excluded from the analysis presented in this report. One PCT in the South East Coast region and one in Yorkshire and Humber have also issued data quality caveats. Additionally, data for one PCT in the North West region that recently moved to a new child health system has not been included in this report.

Coverage at 12 months

UK coverage at 12 months for DTaP/IPV/Hib3 and PCV2 increased by 0.2% to 92.6% and 92.1% respectively compared with the previous quarter, and MenC2 increased by 0.3% to 92.1% (table 1) [3]. Country-specific comparisons at 12 months show Scotland and Northern Ireland achieved at least 97% coverage and Wales at least 95% for all three immunisations. In England, three regions (North East, West Midlands and South West) achieved 94% coverage for all three immunisations, and London was the only English region to report coverage below 91% for any immunisation at 12 months (table 1) [3].

70 of the 172 participating PCTs/HBs/ARs (41%) achieved at least 95% coverage at 12 months for DTaP/IPV/Hib3 and PCV2 vaccine. 65 (38%) achieved 95% for two doses of MenC vaccine.

Table 1. Completed primary immunisations (all antigens) by 12 months: January to March 2009

Strategic Health Authorities (SHAs)/Country	PCT/HB/AR*† (total)	DTaP/IPV/Hib3 %	MenC2 %	PCV2 %
English SHAs				
North East	12 (12)	94.9	94.5	94.3
North West	23 (24)	93.9	93.6	93.6
Yorkshire and the Humber	14 (14)	93.4	92.8	92.6
East Midlands	9 (9)	94.1	93.6	93.6
West Midlands	17 (17)	94.4	94.2	94.5
East of England	14 (14)	94.1	93.4	93.6
London	31 (31)	82.7	81.3	81.4
South Central	9 (9)	94.9	93.8	94.6
South East Coast	8 (8)	91.6	91.4	91.1
South West	14 (14)	94.9	94.7	94.9
England (Total)	151 (152)	91.8	91.2	91.3
Wales	3 (3)	96.0	95.7	95.8
Northern Ireland	4 (4)	97.1	97.0	97.0
Scotland	14 (14)	97.2	97.1	97.2
United Kingdom	172 (173)	92.6	92.1	92.1

* Primary Care Trusts/health boards/administrative regions

† Number of trusts reporting DTaP/IPV/Hib3 coverage

Coverage at 24 months

Compared to the previous quarter, UK MMR coverage increased by 1.0% with all countries and all English regions showing improvement. Half of the English regions reported coverage increasing by over 1% with the greatest improvement in London (1.9% increase) [3] (table 2). UK PCV booster coverage, reported for the sixth time this quarter, increased by 1.7% to 85.8% and Hib/MenC booster increased by 1.9% to 88.6% when compared to the previous quarter (table 2) [3]. London reported the greatest increase in PCV coverage (4.9%) and Yorkshire and Humber had the greatest increase in Hib/MenC (5.5%) with London reporting the next highest increase of 3.3%.

UK coverage for DTaP/IPV/Hib at 24 months increased by 0.5% to 94.7%, and infant MenC increased by 0.7% to 93.2%. Country-specific comparisons for these two immunisations show Scotland, Northern Ireland and Wales still achieved at least 95%, whilst in England coverage was 94.1% for DTaP/IPV/Hib (eight regions achieved at least 95%) and 92.7% for infant MenC coverage (seven regions achieved at least 95%) (table 2) [3].

95% coverage at 24 months was achieved by 114 of the 172 PCTs/HBs/ARs (66%) for DTaP/IPV/Hib3, by 111/172 (65%) for MenC, by 16 for the PCV booster, and 15 for the Hib/MenC booster, and by three Scottish Health Board and three English PCTs for MMR.

Table 2. Completed primary immunisations (all antigens) by 24 months: January to March 2009

Strategic Health Authorities (SHAs)/Country	PCT/HB/AR*† (total)	DTaP/IPV /Hib3 %	Infant MenC%	PCV Booster%	Hib/MenC%	MMR1%
English SHAs						
North East	12 (12)	96.5	96.5	89.2	92.7	89.0
North West	23 (24)	95.7	94.0	87.4	90.1	88.8
Yorkshire and the Humber	14 (14)	95.7	95.9	87.5	91.4	87.6
East Midlands	9 (9)	95.9	95.9	87.9	90.3	87.7
West Midlands	17 (17)	96.7	95.0	88.8	91.4	89.1
East of England	14 (14)	95.7	95.8	86.0	91.5	85.6
London	31 (31)	86.7	82.7	73.4	75.7	76.7
South Central	9 (9)	96.6	95.0	88.5	91.6	89.3
Sth. East Coast	8 (8)	93.5	92.3	84.0	87.5	84.3
South West	14 (14)	95.8	95.3	87.8	90.4	88.5
England (Total)	151 (152)	94.1	92.7	84.7	87.9	85.6
Wales	3 (3)	97.3	95.9	88.6	92.7	89.6
North. Ireland	4 (4)	98.2	95.9	91.8	91.3	90.8
Scotland	14 (14)	98.0	96.1	93.8	93.7	92.9
United Kingdom	172 (173)	94.7	93.2	85.8	88.6	86.5

* Primary Care Trusts/health boards/administrative regions.

† Number of trusts reporting DTaP/IPV/Hib3 coverage

Coverage at five years

All countries and English regions, except for London, achieved 90% coverage for DTP/Pol3, Hib3 and MenC, with Scotland and two English regions (North East and South West) reporting at least 95% coverage for all three immunisations (table 3).

Compared to the previous quarter, UK MMR1 coverage increased by 0.6% to 90.4%, with Scotland and Northern Ireland achieving at least 95%. UK MMR2 coverage increased by 2.2% to 81% [3]. In England, coverage increased by 2.6% for MMR2 to 80% and by 3.3% to 82.5% for DTaP/IPV coverage; for both booster vaccines coverage increased in all regions. In London, MMR2 coverage increased by 5.5% (data from 4 PCTs excluded) and for DTaP/IPV coverage increased by 8.7% (data from 6 PCTs has been excluded from these estimates due to problems with child health systems). Despite this, London coverage is still lower than corresponding values for other English regions and in particular, pre-school booster coverage for MMR2 and DTaP/IPV is at least 10% lower than other regions.

Table 3. Completed primary immunisations and boosters (all antigens) by 5 years: October to December 2008

Strategic Health Authorities (SHAs)/country	PCT/HB/AR* † (total)	Primary				Pre-school booster	
		DTP/Pol3 %	Hib3 %	MenC %	MMR1 %	MMR2 %	DTaP/IPV %
English SHAs							
North East	12 (12)	96.7	96.3	97.0	93.7	86.4	89.1
North West	23 (24)	95.6	94.1	94.4	93.2	83.9	86.0
Yorks. & Humber	14 (14)	95.1	94.6	95.1	92.4	82.5	83.8
East Midlands	9 (9)	95.3	94.9	95.6	91.6	84.0	86.6
West Midlands	17 (17)	95.9	95.0	94.9	92.3	84.4	88.0
East of England	14 (14)	94.3	93.8	94.4	88.7	80.1	83.5
London	31 (31)	82.7	81.5	80.9	81.2	66.7**	65.2 ††
South Central	9 (9)	93.5	93.0	92.9	90.5	80.7	84.9
Sth. East Coast	8 (8)	92.3	92.5	91.6	88.3	76.8	81.4
South West	14 (14)	96.5	95.8	95.9	92.7	84.3	88.4
England (total)	151 (152)	92.8	92.2	92.1	89.6	80.0	82.5
Wales	3 (3)	96.1	95.2	93.6	92.0	83.4	88.4
North'n Ireland	4 (4)	97.0	93.6	94.5	95.6	89.7	91.6
Scotland	14 (14)	98.4	97.6	97.6	95.6	87.2	89.6
Unit'd Kingdom	172 (173)	93.5	92.8	92.7	90.4	81.0	83.7

* Primary Care Trusts/health boards/administrative regions.

† Number of trusts reporting DTP/Pol3 coverage.

** Unreliable data from four PCTs excluded.

†† Unreliable data from six PCTs excluded.

MMR sentinel surveillance scheme coverage in England

For methods of data collection see

<http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListDate/Page/1209454766294?p=1209454766294>

Data collected from March 2009 to May 2009 for children in the four age cohorts is summarised in table 4, and ranged from 70.1 to 72.2% at 16 months, 82.1 to 82.7% at 20 months, 85.3% to 85.9% at 24 months, and 89.5% to 90.4% at 36 months.

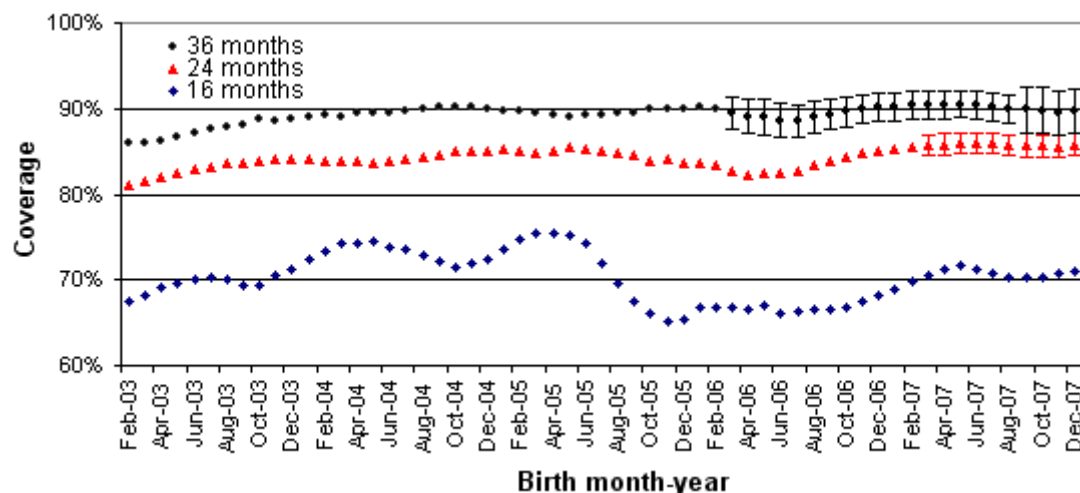
Table 4. Monthly sentinel estimates of measles, mumps and rubella (MMR) coverage at 16, 20, 24 and 36 months: March 2009 to May 2009

Evaluation month	Proportion of children vaccinated at each age				
	Number of PCT/trusts	16 months	20 months	24 months	36 months
March 2009	34	70.1	82.1	85.3	89.5
April 2009	35	71.0	82.7	85.9	90.4
May 2009	34	72.2	82.3	85.7	89.8

The figure shows observed and projected MMR coverage at 16, 24 and 36 months in England for birth cohorts from October 2002 to December 2007. Projections of coverage at 24 and 36 months were made using the most recent coverage data for the same birth cohort and an estimate of the proportion, p , of those unvaccinated at each earlier age who were subsequently vaccinated by the later age. The proportion was estimated using the most recent 18 months data where final coverage was known. 95% confidence intervals were calculated based on the variability of p in the past data.

The estimates of p were as follows: 50.8% for 16 to 24 months, 64.5% for 16 to 36 months, 21.2% for 20 to 24 months, 45.8% for 20 to 36 months and 33.3% for 24 to 36 months. Projections make the assumption that p remains constant over the period of the projection, however, this assumption is likely to be affected by the current MMR catch-up campaign and therefore the projections will probably be under-estimated. Data at 20 months is not shown to simplify the graph as the line is close to that plotted for the 24 month data.

Observed and projected MMR coverage at 16, 24, and 36 months by birth year and month in England



Note. Data shown are five-month moving averages. Projections are shown with 95% confidence intervals

Neonatal hepatitis B vaccine coverage data in England

The data presented in table 5 represents coverage for three doses of hepatitis B vaccine in those infants born to hepatitis B surface antigen-(HBsAg)-positive mothers who reached the age of one year in this quarter (ie those born between January and March 2008), and coverage of four doses of vaccine in infants who reached two years of age (i.e. those born between January to March 2007).

Table 5. Neonatal hepatitis B coverage in England: October to December 2008

Region	Returns with 12 month data	12 month denominator	Coverage at 12 months	Returns with 24 month data	24 month denominator	Coverage at 24 months
North East	6 (12)	11	100%	7(12)	8	25%
North West	17 (24)	17	71%	17 (24)	30	47%
Yorkshire & the Humber	12 (14)	34	88%	12 (14)	28	79%
East Midlands	7 (9)	13	77%	7 (9)	9	44%
West Midlands	13 (17)	41	63%	13 (17)	54	28%
East of England	12 (14)	43	77%	12 (14)	55	80%
London	25 (31)	320	64%	25 (31)	383	41%
South Central	7 (9)	41	95%	7 (9)	26	81%
Sth. East Coast	6 (8)	4	100%	6 (8)	8	50%
South West	11 (14)	11	9%	11 (14)	17	0%
Total	116(152)	535	69%	117 (152)	618	46%

Data were received from 116/152 (76%) PCTs in England, 6% fewer than reported in the last quarter [3]. Some of the returns may relate to only part of the PCT due to mergers [4]. Coverage in England for three doses in those aged one year increased 2% to 69% [3] (Table 5). Coverage in England for four doses in those aged 24 months increased by 5% to 46% compared to the last quarter [3].

Commentary

The increase in a range of childhood immunisations rates over the last three quarters may indicate the positive impact that the Vital Signs immunisation indicators [5] is having. In addition, the ongoing MMR catch-up programme targeting all unvaccinated children up to 18 years of age in England, announced by the Chief Medical Officer in August 2008 [6], may be impacting on MMR coverage for children up to five years of age. Local efforts to increase MMR coverage in all unvaccinated children followed the widely reported rise in measles incidence across England and Wales during 2008 when a total of 1383 cases were reported, with continued activity in 2009 (626 cases to the end of April) [7].

UK MMR coverage at 24 months is now 86.5%, up 1% compared to the previous quarter and at a level last recorded in January to March 2001 [3, 8]. This upward trend was observed in all countries (except N Ireland) and all English regions, particularly in London, South Central and the East of England regions where increases of 1.9%, 1.6% and 1.5% respectively were reported.

UK coverage of two doses of MMR at five years of age also increased, up 2.2% to 81.0%, achieving the highest level recorded since the COVER programme started evaluating MMR2 in April to June 1998 [9]. Again, increased coverage was observed in all English regions, particularly in London where a 5.5% rise to 66.7% was reported. MMR2 coverage data in London was calculated using data from 27 of the 31 PCTs; data from four PCTs was excluded due to quality concerns indicating there is a continued need for caution when evaluating the vaccination programme in London. UK coverage of at least one dose of MMR at aged five increased by 0.6% to 90.4%; coverage in Scotland and Northern Ireland exceeded 95% [3].

Children reaching their second birthday in the quarter (born January to March 2007) were the sixth quarterly birth cohort recorded by COVER to be offered (at 12 months and 13 months respectively) the new booster Hib/MenC and PCV vaccines, introduced in September 2006. UK coverage for both booster vaccines evaluated at 24 months continues to increase; PCV coverage was up 1.7% to 85.8%, and Hib/MenC booster was up 1.9% to 88.6% compared to the previous quarter's estimates [3].

Increases were also observed in UK coverage for the pre-school booster (DTaP/IPV) at five years (up 2.8% to 83.7%), for DTaP/IPV/Hib at 24 months (up 0.5% to 94.7%) and infant MenC (up 0.7% to 93.2%), and for all antigens at 12 months (up between 0.2% and 0.3%).

Relevant links for country-specific coverage data are as follows:

England

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

Northern Ireland

<http://www.cdscni.org.uk/surveillance/Coveragestats/default.asp>

Scotland

<http://www.show.scot.nhs.uk/scieh/>

Wales

<http://www.wales.nhs.uk/sites/page.cfm?OrgID=368&PID=2278>

Other relevant links

http://www.hpa.org.uk/infections/topics_az/cover/default.htm

<http://www.mmrthefacts.nhs.uk/>

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Laboratory confirmed cases of pertussis reported to the enhanced pertussis surveillance programme in 2008

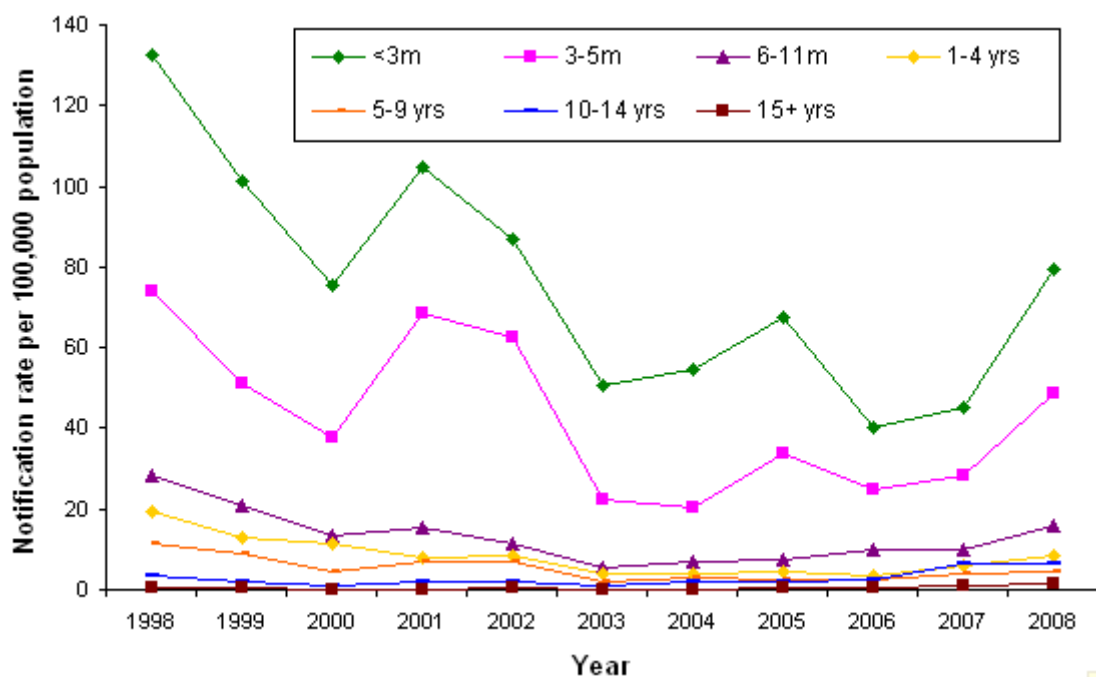
There were 903 laboratory confirmed cases of pertussis (culture, PCR, serology) reported to the pertussis enhanced surveillance programme in 2008 (table 1). This represents a 46% increase on the 618 cases reported in 2007 [1].

Table 1. Laboratory confirmed cases of pertussis in England and Wales in 2008, by quarter

Quarter	Culture	PCR only	Serology only	Serology and PCR	Grand total
1	37	11	129	–	177
2	50	19	176	–	245
3	72	36	195	1	304
4	9	14	154	–	177
Total	168	80	654	1	903

Since mid-2006 there has been greater use of serology testing compared to previous years due to both increasing awareness of pertussis occurring in older children and adults [2], and increased awareness of the availability of this diagnostic method [3]. In 2008 serology confirmations made up 72% of laboratory confirmed cases. Culture and PCR confirmations have also increased compared to 2007 (by 50% and 90% respectively). These increases can be seen in Figure 1 in the <6 month age groups in particular and are in line with 3-4 year cyclical peaks observed in previous years. Careful monitoring of these age groups continues.

Figure 1. Whooping cough notification rates in England and Wales 1998-2008, by age group



Note: rates calculated using ONS population estimates; the 2007 population estimate was used for 2008 rate calculations.

The laboratory test used is dependent on the age of the patient and the stage of the illness; this is reflected in the distribution seen in table 2. Culture has high specificity but loses sensitivity as the time post-onset of illness increases. PCR testing is offered for acutely ill children aged less than one year old admitted to a paediatric intensive care unit or paediatric ward with respiratory illness compatible with pertussis [4]. In contrast, serology testing is offered for samples taken more than two weeks after onset for any individuals with prolonged cough. However, as recent vaccination (primary and pre-school booster) can confound the serological results, these investigations are not usually recommended for infants within one year of immunisation (primary or pre-school booster).

Table 2. Age distribution of laboratory-confirmed cases of pertussis in England and Wales in 2008

Age group	Culture	PCR only	Serology only	Serology and PCR	Grand total
<3 months	113	62	3	–	178
3-5 months	23	14	–	1	38
6-11 months	7	–	1	–	8
1-4 years	6	3	18	–	27
5-9 years	–	–	24	–	24
10-14 years	6	1	126	–	133
15+ years	13	–	482	–	495
Total	168	80	654	1	903

Note: 20 of the <3 month-old and 2 of the 3-5 month culture-confirmed cases were also confirmed by PCR but are listed in the “culture” column only. PCR provides a rapid diagnosis but the submission of all presumptive *B. pertussis* isolates is encouraged for confirmation of identity and to allow further characterisation for epidemiological purposes.

PCR and serology services are provided by the Centre for Infection's Respiratory and Systemic Infection Laboratory (RSIL). Further information is available on the HPA website at <http://www.hpa.org.uk/cfi/rsil/bordetella.htm>.

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Emergencies

Training and related emergency response activities of the HPA

As part of its core function, the Health Protection Agency works with national and international partners to ensure that health care professionals are able to respond to emergencies, including the deliberate or accidental release of chemical, biological, radiological or nuclear substances. Emergency preparedness specialists embedded throughout the agency play an important role in training and exercising the health care community.

On behalf of the Department of Health, training courses and exercises are delivered every year throughout the UK to develop resilience across the health care community. The HPA has been successful in bidding for contracts to design and deliver exercise and training programmes for the World Health Organisation (WHO), Food and Agricultural Organisation (UNFAO), European Commission, the European Centre for Prevention and Disease Control (ECDC) and the United States Agency for International Development (USAID).

The HPA is also involved in horizon scanning for new and emerging threats and developing and maintaining its plans and protocols for responses to health emergencies at local, regional and national level. The Microbial Risk Assessment group provides the HPA with the evidence based risk assessment capability to advise other organisations on policy, contingency planning and public health countermeasures in relation to new and emerging infectious disease threats and bioterrorism.

Five booklets outlining the key elements of the HPA's emergency preparedness and response function have been published and are available on request from Lynsey Thorp (lynsey.thorp@hpa.org.uk).