



Health Protection Report

weekly report

Volume 3 Number 12 Published on: 27 March 2009

Current News

- ▶ **World TB day update – 24 March 2009**
- ▶ **Accuracy of *Clostridium difficile* toxin detection kits**

Infection Reports

HIV/STIs

- ▶ **New HIV diagnoses in the UK: an update to the end of December 2008**

Immunisation

- ▶ **COVER programme, October to December 2008: Quarterly vaccination coverage statistics for children aged up to five years in the United Kingdom**
- ▶ **Surveillance of markers of infection detected in antenatal samples tested by NHS Blood and Transplant (NHSBT): England, 2008**

News

Volume 3 Number 12 Published on: 27 March 2009

- ▶ World TB day update – 24 March 2009
 - ▶ Accuracy of *Clostridium difficile* toxin detection kits
-

World TB day update – 24 March 2009

To mark World TB Day 2009, the Health Protection Agency (HPA) has published a newsletter providing an update on the activities of numerous organisations to control tuberculosis (TB) in the UK and globally [1]. Activities highlighted include initiatives such as the Department of Health funded TB Find and Treat project, the MDRTB Service and the London TB Workforce group, as well as action at the local and regional level and in the devolved administrations aimed at delivering a first class tuberculosis service.

Improvements in surveillance are being made with the implementation of a national web-based enhanced surveillance system and the UK *Mycobacterium tuberculosis* Strain-Typing Database. Such developments will improve the timeliness and availability of surveillance data including laboratory information, which will assist the public health management of cases and clusters.

The newsletter also releases provisional national figures for TB in the UK in 2008. A total of 8679 new cases were provisionally reported in 2008 (14.2 cases per 100,000 population), an increase of 2.2 % compared to the number of cases provisionally reported in 2007. Finalised 2008 data will be published later this year.

The HPA acknowledges the assistance of colleagues within its Local and Regional Services network, and of Health Protection Scotland, the National Public Health Service for Wales and the Communicable Disease Surveillance Centre Northern Ireland, in providing provisional TB figures referred to above.

The World Health Organization (WHO) has also published its most recent data on TB incidence in 2007 [2]. It estimates that there were 9.27 million new TB cases worldwide in 2007 (139 per 100,000) and 1.3 million people dying of TB. Although the number of new cases increased compared to previous years due to population growth (9.24 million in 2006), the rate is slowly declining at about 1% per year. Further information can be obtained from the WHO report "Global tuberculosis control – epidemiology, strategy, financing" [2].

References

1. Tuberculosis Update, Health Protection Agency, London, March 2009, http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1237797271436.
 2. Global tuberculosis control - epidemiology, strategy, financing, World Health Organization, Geneva, 2009, http://www.who.int/tb/publications/global_report/2009/en/.
-

Accuracy of *Clostridium difficile* toxin detection kits

The NHS Purchasing and Supplies Agency's Centre for Evidence-based Purchasing (CEP) has published an evaluation report on the accuracy of *Clostridium difficile* toxin detection kits [1]. The CEP evaluation is the largest single study of such kits to date, examining six immunoassays and three membrane-bound assays, and using 600 faecal samples. The report details the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of the kits using two gold standard methods (a cytotoxin assay and cytotoxigenic culture).

Significant differences between the accuracy of kits were seen. None of the nine assays tested had a particularly high sensitivity (67-92%), meaning that a significant proportion of true positives will be missed by these kits. The PPVs also varied markedly; at a 10% prevalence of toxin positive faecal samples, which approximates to the positivity rate in a diagnostic laboratory, the best PPV was less than 88%. This raises concerns about potential false positive results, which will be more likely in settings where *C. difficile* infection (CDI) is uncommon. In the community setting only circa. 2% of diarrhoeal samples tested may be positive for *C. difficile* toxin [2]. In such settings the best PPV in the CEP study was less than 60%. A key problem with low sensitivity tests, which also have suboptimal specificity, is that repeat testing, while increasing the likelihood of obtaining a true positive result, also increases the chance of a false positive.

Accurate diagnosis of CDI is important to determine whether prompt treatment, or further diagnostic testing (eg for other causes of diarrhoea), is required, to optimise the use of isolation facilities and other healthcare resources, and for surveillance. Toxin detection kits allow more rapid diagnosis of CDI, and were introduced as alternatives to the slower cytotoxin assay, which also needs a cell culture line to be maintained. However, it is not difficult to maintain a continuous cell line, and thus this approach is still an option for some laboratories. There is also the possibility of sending faecal samples to another laboratory, as these may be stored at 4°C for several days before re-testing [3]. As cytotoxicity assays are slower, this may require the use of another rapid assay as an initial screen, particularly in outbreak or endemic settings.

In summary, the currently available kits for detection of *C. difficile* toxins have variable performance. Recent studies show that these kits may miss about one in 5 to one in 10 cases of CDI and falsely identify some cases as positive when they are not [1,4]. The poor positive predictive values of toxin detection kits, especially in the context of widespread testing, and the possibility of missing true positives mean there are limitations to using these as single tests for the laboratory diagnosis of CDI. If a kit is used then it should be one of the better performing assays [1]. Caution is required in the interpretation of toxin-positive results from diagnostic kits to ensure that these are consistent with the clinical presentation. The issuing of interpretive comments with reports may aid clinicians in interpreting results. The use of a confirmatory test, as part of a diagnostic algorithm, will increase the accuracy of toxin-positive results. However, the optimum combination of diagnostic tests for CDI needs to be defined. Well-performed cell-culture cytotoxicity assays remain a gold standard for diagnostic testing. The HPA has issued a series of questions and answers in response to the CEP evaluation [5].

References

1. NHS Purchasing and Supplies Agency, Centre for Evidence based Purchasing. *Clostridium difficile* toxin detection assays. Evaluation report CEP08054, 2009. Wilcox MH, Eastwood KA. Available at: www.pasa.nhs.uk/pasa/Doc.aspx?Path=%5bMN%5d%5bSP%5d/NHSprocurement/CEP/CEP08054.pdf. Accessed 17 March 2009.
2. Wilcox MH, Mooney L, Bendall R, Settle CD, Fawley WN. A case-control study of community-associated *Clostridium difficile* infection. *J Antimicrob Chemother* 2008;62:388-96.
3. Freeman J, Wilcox MH. The effects of storage conditions on viability of *Clostridium difficile* vegetative cells and spores and toxin activity in human faeces. *J Clin Pathol* 2003;56:126-8.
4. Planche T, Aghaizu A, Holliman R, Riley P, Poloniecki J, Breathnach A, Krishna S. Diagnosis of *Clostridium difficile* infection by toxin detection kits: a systematic review. *Lancet Infect Dis* 2008;8:777-84.
5. Health Protection Agency *C. difficile* Diagnosis Working Group: Questions and answers about the laboratory diagnosis of *Clostridium difficile* infection, www.hpa.org.uk/infections/cdifficileq&a.

Infection reports

Volume 3 Number 12 Published on: 27 March 2009

HIV/STIs

▶ New HIV diagnoses in the United Kingdom: data to the end of December 2008

New HIV diagnoses in the United Kingdom: data to the end of December 2008

United Kingdom (UK) data from the Health Protection Agency Centre for Infections, Health Protection Scotland and the Institute of Child Health (London)

In 2008, an estimated 7370 persons were newly diagnosed with HIV in the United Kingdom, of whom 4670 were men and 2700 were women, a rate of 16 new diagnoses per 100,000 men and nine per 100,000 women. Although the number of new HIV diagnoses remains high, the 2008 total is a decrease of 9% from the 8090 diagnoses reported for 2005 (table 1). Underlying differences in HIV transmission across exposure categories were seen with the moderate fall in total diagnoses largely due to the continued fall in diagnoses of heterosexually acquired HIV infections in people from sub-Saharan Africa.

The second highest annual total of new HIV diagnoses among MSM was in 2008 showing that transmission of HIV within the UK is still mainly occurring in MSM. In addition, however, there has also been an increasing trend of new diagnoses in heterosexually acquired infections within the UK. New HIV diagnoses amongst injecting drug users increased between 1999 and 2003 (130 to 180 new diagnoses a year) and have remained fairly constant since (table 1). Mother to child transmission remained at a low level and has decreased since the peak of around 150 new diagnoses in 2003 and 2004.

Continuing high number of new HIV diagnoses among men who have sex with men

Of the estimated 7370 persons newly diagnosed in 2008, 38% (2830) probably acquired their infection through sex between men. The 2008 figure was the second highest annual number of new diagnoses among men who have sex with men (MSM) and was slightly lower than the corresponding figure for 2007 (3050). The small decline follows the 110% increase in annual HIV diagnoses between 1999 (1450) and 2007. Over the past decade there has been little change in the estimated proportion of newly diagnosed MSM who acquired their infection within the UK (ranging from 79% [1140/1450] in 1999 to 83% [2340/2830] in 2008), or who were of white ethnicity (ranging from 89% [1290/1450] in 1999 to 85% [1870/2190] in 2003, and 86% [2420/2830] in 2008).

Table 1. HIV diagnoses (adjusted) by year of diagnosis and exposure category

			1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Sex*	Men		2243	2536	3145	3637	4117	4520	4776	4640	4829	4670	
	Women		998	1412	1982	2665	3272	3300	3317	3080	2831	2700	
	Total		3240	3950	5130	6300	7390	7820	8090	7720	7660	7370	
Probable exposure category	Sex between men		<i>Adjstd**</i>	1450	1600	1830	1990	2190	2470	2750	2720	3050	2830
			<i>Obsrvd</i>	1431	1581	1798	1949	2140	2419	2678	2589	2719	2012
	Hetero-sexual contact	All	<i>Adjstd**</i>	1540	2090	3010	4020	4820	5000	4990	4620	4270	4200
			<i>Obsrvd</i>	1515	2062	2966	3948	4713	4889	4859	4402	3812	2998
		In the UK ****	<i>Adjstd***</i>	200	240	330	500	600	720	830	870	980	1090
			<i>Obsrvd</i>	194	235	322	397	474	569	642	649	633	547
		Abroad	<i>Adjstd**</i>	1340	1850	2680	3520	4220	4280	4160	3750	3290	3110
			<i>Obsrvd</i>	1285	1803	2617	3271	3858	3758	3491	2964	2246	1557
	Injecting drug use		<i>Adjstd**</i>	130	120	140	130	180	150	190	200	180	190
			<i>Obsrvd</i>	123	118	142	126	173	143	183	189	164	121
	Other exposure categories****		<i>Adjstd**</i>	120	140	140	170	210	200	170	190	160	150
			<i>Obsrvd</i>	122	136	140	165	205	195	164	179	139	94

* 2008 figures adjusted for reporting delay (observed figures for 2008: 4248 men; 2458 women; 6706 total).

** Adjusted for undetermined risk; 2008 figure also adjusted for reporting delay.

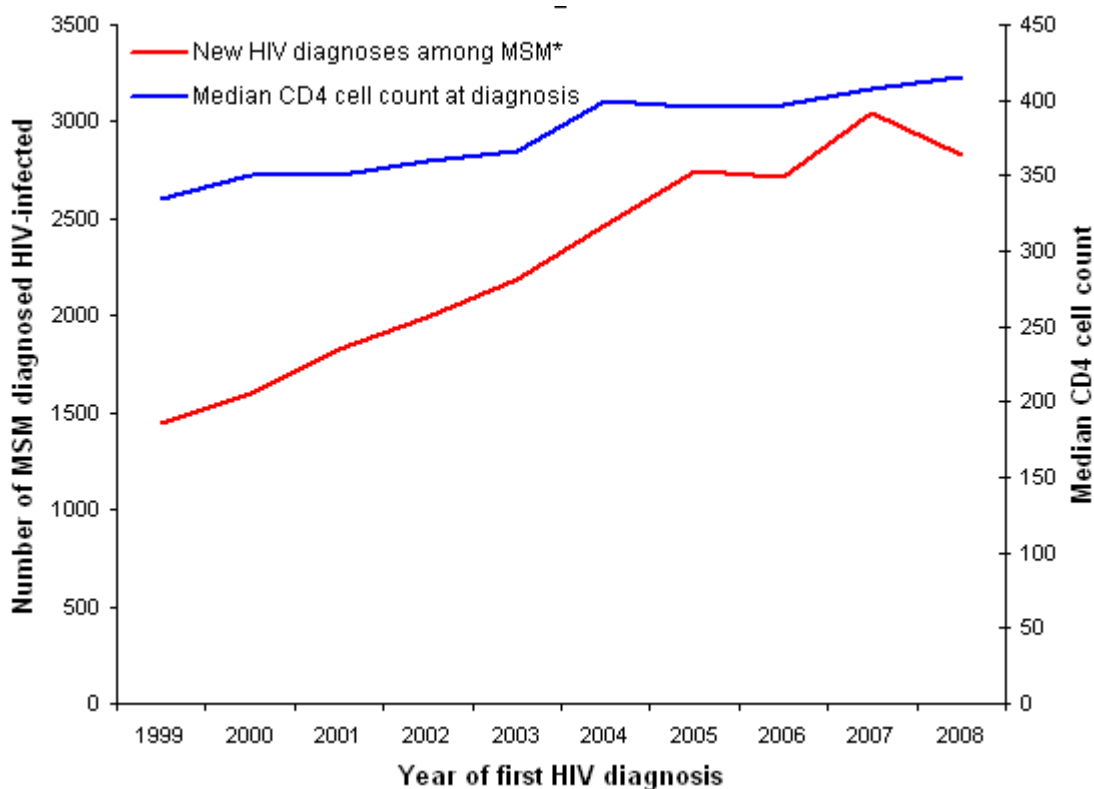
*** Adjusted for undetermined risk; since 2002 HIV infected persons who had heterosexual contact both in the UK and abroad have been categorised separately - it has been assumed that an HIV-infected person was more likely to have acquired their infection through heterosexual contact within the UK if officially reported HIV prevalence in the particular country of exposure abroad (usually in sub-Saharan Africa) was less than the estimated current 3.7% HIV prevalence in black-Africans in the UK; 2008 figure also adjusted for reporting delay.

**** In 2008, approximately three quarters of persons in the "Other exposure" category were infected through mother to child transmission.

It is too early to know whether the annual number of new HIV diagnoses among MSM has peaked or whether the 2008 decline is an artefact due to a failure to fully adjust for reporting delay. Also, in recent years considerable emphasis has been put on increased testing especially in groups at higher risk of acquiring HIV. Part of the high numbers of new diagnoses among MSM is therefore probably the result of diagnosis of those infected some time previously who would not have been tested were it not for this increased emphasis on testing. Evidence of earlier diagnosis and testing is shown by the median CD4 cell count at HIV diagnosis among MSM which has changed over the past decade, increasing each year from 334 in 1999 to 416 in 2008 (figure 1).

The 2008 data on 'incidence' testing in selected GU clinics is not yet available but data up to 2007 showed little change in HIV incidence among MSM over the past decade. Moreover, median age at diagnosis has remained constant between 1999 and 2008 (34 or 35 years of age in all years). It had been hoped that HIV incidence in this population would fall due to the effect of treatment lowering of viral load in large numbers of the HIV infected MSM. It now seems that any such effect may have been offset by an increase in behavioural risk amongst MSM over the past decade.

Figure 1. Trend in new HIV diagnoses and median CD4 cell count at diagnosis among men who have sex with men



* Adjusted for undetermined risk; 2008 figure also adjusted for reporting delay.

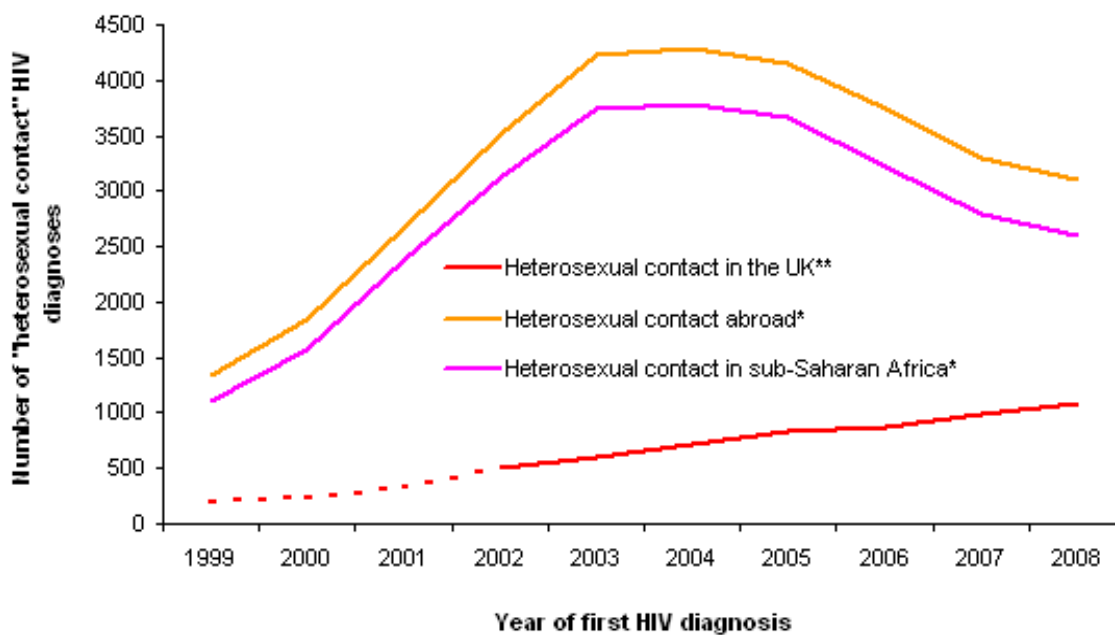
Trends in new HIV diagnoses among persons infected through heterosexual contact

There was a 16% fall in the number of new HIV diagnoses in those persons infected heterosexually, from a peak of 5000 in 2004 to an estimated 4200 in 2008 (table 1). In 2008, an estimated 57% (4200/7370) of newly diagnosed HIV-infected persons acquired their infection heterosexually, compared to 65% (4820/7390) of the HIV diagnoses reported for 2003.

Most HIV-infected persons who were infected heterosexually were of black-African ethnicity and acquired their infection abroad. Two-thirds (2790/4200) of newly diagnosed persons infected heterosexually and reported in 2008 were of black-African ethnicity and 20% [830] were of white ethnicity; three-quarters (3110/4200) acquired their infection abroad of whom 84% [2600] acquired their infection in sub-Saharan Africa.

The proportion of HIV-infected persons infected heterosexually of black-African ethnicity has declined each year from a peak of 81% (3900/4820) in 2003. The proportion of persons infected heterosexually who acquired their infection in sub-Saharan Africa peaked in 2001 (79%; 2380/3010) whereas in terms of numbers the peak occurred in 2004 (3775). Since 2004 there has been a marked decline in the number of people from African Commonwealth countries migrating to the UK which probably accounts for much of this observed decline.

Figure 2. New diagnoses of HIV infection acquired through heterosexual contact



* Adjusted for undetermined risk; 2008 figure also adjusted for reporting delay.

** Adjusted for undetermined risk; since 2002 HIV infected persons who had heterosexual contact both in the UK and abroad have been categorised separately - it has been assumed that an HIV-infected person was more likely to have acquired their infection through heterosexual contact within the UK if officially reported HIV prevalence in the particular country of exposure abroad (usually in sub-Saharan Africa) was less than the estimated current 3.7% HIV prevalence in black-Africans in the UK; 2008 figure also adjusted for reporting delay.

Increase in new diagnoses of HIV infection acquired through heterosexual contact in the UK

Since 2002 HIV infected persons who had heterosexual contact both in the UK and abroad have been categorised separately. It has been assumed that an HIV-infected person was more likely to have acquired their infection through heterosexual contact within the UK if officially reported HIV prevalence in the particular country of exposure abroad (usually in sub-Saharan Africa) was less than the estimated current 3.7% HIV prevalence in black-Africans in the UK.

Between 2002 and 2008 the estimated number of new HIV diagnoses acquired through heterosexual contact in the UK increased by 118% (from 500 to 1090) (figure 2). In 2008, such persons accounted for 15% of all new diagnoses and 26% of those acquired heterosexually. Of the estimated 1090 people infected heterosexually in the UK and diagnosed in 2008, 45% (490) were of white ethnicity and 36% (400) of black-African ethnicity.

Immunisation

- ▶ **COVER programme, October to December 2008: Quarterly vaccination coverage statistics for children aged up to five years in the United Kingdom**
- ▶ **Surveillance of markers of infection detected in antenatal samples tested by NHS Blood and Transplant (NHSBT): England, 2008**

COVER programme, October to December 2008: Quarterly vaccination coverage statistics for children aged up to five years in the United Kingdom

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, October to December 2008.

Children who reached their first birthday in the quarter (born October to December 2007) were the sixth 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 February and April 2008.

Children who reached their second birthday in the quarter (born October to December 2006) would have been scheduled to receive their third dose primary vaccinations between February and April 2007 and first measles, mumps, and rubella (MMR) vaccination between November 2007 and April 2008. These children are the fifth 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 October to December 2003) would have been scheduled to receive their third dose primary vaccinations between February and April 2004, their first MMR between November 2004 and April 2005, their pre-school diphtheria, tetanus, acellular pertussis, inactivated polio (DTaP/IPV) booster and second dose MMR from February 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 Primary Care Trusts (PCTs) in England. This is the first quarter all London PCTs have reported since January to March 2005. Ongoing data quality concerns and caveats have been issued by six London PCTs, one PCT in the South East Coast region, and one in Yorkshire and Humber region, hence the continued need for caution when evaluating the vaccination programme in London. A small number of PCTs that have recently moved onto the TPP child health system are still experiencing difficulties with producing either PCV or Hib/MenC booster coverage from migrated data. These problems are being addressed by TPP and should be resolved before the next quarterly and annual COVER data are due to be produced in April.

Individual PCT data for this quarter are published on the HPA website at http://www.hpa.org.uk/infections/topics_az/cover/default.htm.

Coverage at 12 months

UK coverage at 12 months for DTaP/IPV/Hib3 increased by 0.6% to 92.4% compared with the previous quarter, MenC2 increased by 0.3% to 91.8% and PCV2 increased by 0.5% to 91.9% (table 1) [3]. Country-specific comparisons for coverage at 12 months show Scotland and Northern Ireland achieved at least 96% coverage and Wales at least 95% for all three immunisations. In England, coverage increased by 0.6% for both DTaP/IPV/Hib3 (three doses of diphtheria, tetanus, pertussis, polio and Hib) vaccine and PCV2 (two doses of pneumococcal vaccine) to 91.6% and 91.1% respectively, with all regions except the West Midlands and South Central reporting increases (table 1) [3]. Coverage of MenC in England increased by 0.4% to 91%.

66 of the 173 participating PCTs/HBs/ARs (38%) achieved at least 95% coverage at 12 months for DTaP/IPV/Hib3 and 58 (34%) achieved 95% for two doses of MenC vaccine and PCV vaccine. All countries and all English Strategic Health Authorities (SHAs) apart from London achieved at least 90% coverage at 12 months for DTaP/IPV/Hib3, MenC2 and PCV2.

Table 1. Completed primary immunisations (all antigens) by 12 months: October to December 2008

Strategic Health Authorities (SHAs)/Country	PCT/HB/AR*† (total)	DTaP/IPV/Hib3 %	MenC2 %	PCV2 %
English SHAs				
North East	12 (12)	95.0	94.8	94.5
North West	24 (24)	93.7	93.4	93.3
Yorkshire and the Humber	14 (14)	93.4	93.0	92.7
East Midlands	9 (9)	94.0	93.5	93.8
West Midlands	17 (17)	93.8	93.6	93.7
East of England	14 (14)	94.5	93.9	94.0
London	31 (31)	83.1	81.2	81.0
South Central	9 (9)	93.9	93.1	93.4
South East Coast	8 (8)	90.5	90.4	90.7
South West	14 (14)	94.5	94.3	94.6
England (Total)	152 (152)	91.6	91.0	91.1
Wales	3 (3)	95.8	95.6	95.5
Northern Ireland	4 (4)	97.4	97.3	97.3
Scotland §	14 (14)	97.1	96.9	96.9
United Kingdom	173 (173)	92.4	91.8	91.9

* Primary Care Trusts/health boards/administrative regions

† Number of trusts reporting DTaP/IPV/Hib3 coverage

§ Scottish data will be available from 30th September at <http://www.show.scot.nhs.uk/scieh/>

Coverage at 24 months

95% coverage at 24 months was achieved by 104 of the 173 PCTs/HBs/ARs (60%) for DTaP/IPV/Hib3, by 88/173 (51%) for MenC, by 10 for the PCV booster, and 6 for the Hib/MenC booster, and by one Scottish Health Board and two English PCTs for MMR.

Compared to the previous quarter UK MMR coverage increased by 1.0%, with all countries (except Wales) and all English regions showing improvement, particularly London and South East Coast regions where coverage increased by 3.3% and 2.7% respectively. [3] (table 2). UK PCV booster coverage, reported for the fifth time this quarter, increased by 1.8% to 84.1% and Hib/MenC booster increased by 1.6% to 86.7% when compared to the previous quarter (table 2) [3]. Again, London and South East Coast reported the greatest increases; London PCV coverage increased by 5.1% and Hib/MenC by 5.8%, in South East Coast PCV coverage increased 4.2% and Hib/MenC by 3.4%.

Compared to the previous quarter, UK coverage for DTaP/IPV/Hib at 24 months increased by 0.2% to 94.2% and infant MenC increased by 0.6% to 92.5%. Country-specific comparisons for these two immunisations show Scotland, Northern Ireland and Wales still achieved at least 95%, whilst in England coverage was 93.6% for DTaP/IPV/Hib (eight regions achieved at least 95%) and 91.9% for infant MenC coverage (four regions achieved at least 95%). (table 2) [3].

Table 2. Completed primary immunisations (all antigens) by 24 months: October to December 2008

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)	95.3	96.4	86.1	91.7	88.2
North West	24(24)	95.7	94.0	86.3	88.5	87.8
Yorkshire and the Humber	14 (14)	95.0	94.7	85.1	85.9	86.1
East Midlands	9 (9)	95.6	95.9	85.9	88.2	87.1
West Midlands	17 (17)	96.3	94.7	90.2	91.1	88.8
East of England	14 (14)	95.0	95.3	83.6	89.7	84.1
London	31 (31)	86.2	80.4	68.5	72.4	74.8
South Central	9 (9)	95.7	94.2	87.1	89.7	87.7
South East Coast	8 (8)	93.0	91.3	82.5	85.2	84.0
South West	14 (14)	96.2	95.7	87.5	90.4	87.9
England (Total)	152 (152)	93.6	91.9	82.8	85.8	84.5
Wales	3 (3)	96.8	95.1	87.2	92.2	88.4
North. Ireland	4 (4)	98.3	96.4	92.6	90.5	91.8
Scotland §	14 (14)	98.1	96.0	93.3	92.0	92.6
United Kingdom	173 (173)	94.2	92.5	84.1	86.7	85.5

* Primary Care Trusts/health boards/administrative regions.

† Number of trusts reporting DTaP/IPV/Hib3 coverage

§ Scottish data will be available from 30th September at <http://www.show.scot.nhs.uk/scieh/>

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 reporting at least 95% coverage for all three immunisations (table 3).

UK MMR1 coverage increased by 0.6% to 89.8% compared to the previous quarter, with Scotland and Northern Ireland achieving at least 95%. UK MMR2 coverage increased by 0.9% to 78.8%. In England, coverage increased by 1.1% for MMR2 and remained similar for DTaP/IPV (0.2% increase) at 79.2% compared to last quarter; coverage for both of these booster vaccines increasing in 7 of the 10 regions. Coverage for all antigens at five years increased in London, particularly MMR1 and MMR2 which increased 1.9% to 81.3% and 2.8% to 61.2% respectively compared to the previous quarter. Despite this, London coverage is still lower than corresponding values for other English regions and in particular, coverage for MMR2 and DTaP/IPV is at least 13% 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)	96.3	95.9	96.9	93.0	85.0	87.6
North West	24(24)	95.6	94.4	94.3	93.2	82.0	83.6
Yorkshire & Humber	14 (14)	94.9	94.2	94.8	91.6	81.0	82.0
East Midlands	9 (9)	94.9	94.6	94.9	91.0	83.0	85.1
West Midlands	17 (17)	95.6	94.4	94.6	91.5	82.5	86.9
East of England	14 (14)	93.6	93.0	94.1	87.4	78.5	82.8
London	31 (31)	84.7	83.8	83.2	81.3	61.2	56.5
South Central	9 (9)	92.3	91.6	91.8	89.6	78.8	83.2
Sth. East Coast	8 (8)	91.7	91.9	91.4	86.8	74.3	79.6
South West	14 (14)	96.4	95.8	95.7	92.1	83.2	87.8
England (Total)	152 (152)	92.9	92.2	92.3	89.0	77.4	79.2
Wales	3 (3)	95.8	95.1	93.4	91.1	82.3	87.8
Northern Ireland	4 (4)	97.1	93.3	94.8	96.0	88.6	90.6
Scotland §	14 (14)	98.1	97.2	97.1	95.6	88.6	91.5
United Kingdom	173 (173)	93.5	92.8	92.8	89.8	78.8	80.9

* Primary Care Trusts/health boards/administrative regions

† Number of trusts reporting DTP/Pol3 coverage

§ Scottish data will be available from 30 September at <http://www.show.scot.nhs.uk/scieh/>

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>

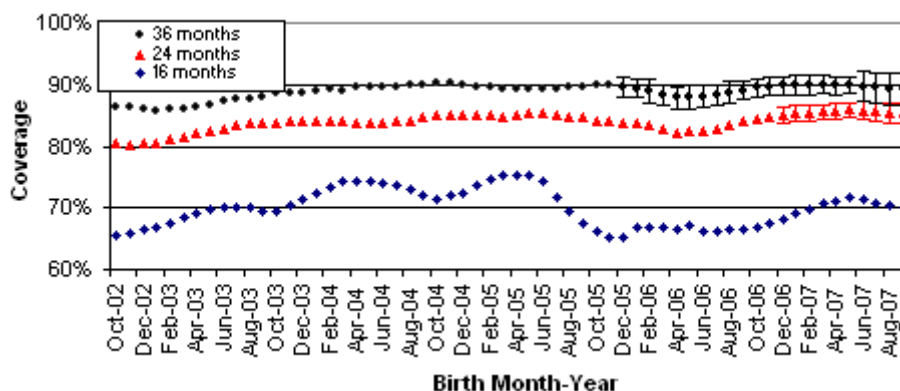
Data collected from December 2008 to February 2009 for children in the four age cohorts is summarised in table 4, and ranged from 69.0 to 72.2% at 16 months, 81.5 to 82.6% at 20 months, 85.0% to 85.4% at 24 months, and 89.9% to 90.4% at 36 months.

Table 4. Monthly sentinel estimates of measles, mumps rubella (MMR) coverage at 16, 20, 24 and 36 months: December 2008 to February 2009

Evaluation month	Proportion of children vaccinated at each age				
	Number of PCT/trusts	16 months	20 months	24 months	36 months
December 2008	35	72.2	81.5	85.0	89.9
January 2008	35	69.0	81.7	85.4	90.4
February 2008	35	69.3	82.6	85.2	90.1

The figure shows observed and projected MMR coverage at 16, 24 and 36 months in England for birth cohorts from October 2002 to August 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: 50.9% for 16 to 24 months, 63.7% for 16 to 36 months, 21.2% for 20 to 24 months, 44.9% for 20 to 36 months and 32.1% 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.

Figure. 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 (i.e. those born between October and December 2007), and coverage of four doses of vaccine in infants who reached two years of age (i.e. those born between October and December 2006).

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	8 (12)	5	80%	8(12)	1	100%
North West	21 (24)	53	70%	21 (24)	39	62%
Yorkshire & the Humber	13 (14)	32	97%	13 (14)	25	60%
East Midlands	7 (9)	18	94%	7 (9)	12	83%
West Midlands	15 (17)	53	75%	14 (17)	54	41%
East of England	11 (14)	34	68%	11 (14)	48	67%
London	25 (31)	335	58%	25 (31)	416	33%
South Central	8 (9)	32	94%	8 (9)	16	81%
South East Coast	6 (8)	6	67%	6 (8)	13	38%
South West	11 (14)	9	33%	11 (14)	15	13%
Total	125(152)	577	67%	124 (152)	639	41%

Data were received from 125/152 (82%) PCTs in England, 2% more than reported in the last quarter [3]. Some of the returns may relate to only part of the PCT due to mergers. Coverage in England for three doses in those aged one year increased 6% to 67% [3] (table 5). Coverage in England for four doses in those aged 24 months decreased by 10% to 41% compared to the last quarter [3].

Hep B coverage at 12 months is lower than that obtained for routine antigens at this age (table 1) and is thought to be associated with the population at risk being highly mobile, making high uptake difficult to achieve. In England, by far the largest number of infants at risk is in London. A recent report of factors in London associated with incomplete vaccination of babies at risk of perinatal hepatitis B transmission found that the majority of mothers with hepatitis B delivered in the trust where they received antenatal care and few families were lost to follow-up after 15 months, and that the main determinant of complete vaccination was the organisation of the health services [4]. The study identified 249 babies at risk in London in the January to March 2007 quarter compared to 182 babies aged 24 months reported to the COVER programme by 22 of the 31 PCTs [5]. Although final coverage estimates for the study were similar to those calculated by the COVER returns it indicates that improvements are still needed to ensure that COVER data accurately reflects the true local burden in infants at risk [4].

Commentary

Further improvements in UK MMR coverage at 24 months were observed this quarter with uptake increasing by 1% to 85.5% compared to the previous quarter [3]. This upward trend was observed in all countries except Wales (where coverage remained the same as in the previous quarter) and all English regions, particularly in London and South Central regions where increases of 3.3% and 2.7% respectively were reported.

UK coverage of two doses of MMR at five years of age also increased by 0.9% to 78.8%, achieving the highest level recorded since the COVER programme started evaluating MMR2 in April to June 1998 [6]. A more modest increase of 0.6%, to 89.8%, was observed for UK coverage of at least one dose of MMR at aged five, however, in Northern Ireland coverage of MMR1 at five years has exceeded 95% for the third successive quarter and in Scotland this level has been achieved for the second time [3].

Increased MMR coverage in all English regions observed during the last two quarters suggests that 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 [7], is 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 1370 cases were reported, with continued activity in 2009 [8].

Changes introduced into the childhood immunisation programme in September 2006 included a new pneumococcal conjugate vaccine (PCV) offered at two and four months of age with DTaP/IPV/Hib vaccine, and a change from three to two MenC vaccines given before 12 months of age (offered at three and four months with DTaP/IPV/Hib). Children who reached their first birthday in the quarter (born October to December 2007) were the sixth quarterly birth cohort recorded by COVER to have been scheduled to receive their primary vaccinations according to this new schedule. UK coverage for MenC2 and PCV2 at 12 months is now 91.8% and 91.9% respectively, just below coverage of DTaP/IPV/Hib3 (92.4%) offered at the same time.

Children reaching their second birthday in the quarter (born October to December 2006) were the fifth quarterly birth cohort recorded by COVER to be offered at 12 months and 13 months respectively the new booster Hib/MenC and PCV vaccines, also introduced in September 2006. UK coverage for both booster vaccines evaluated at 24 months continues to increase and are now at similar levels to MMR coverage in this age group; PCV coverage was up 1.8% (to 84.1%), and Hib/MenC booster was up 1.6% (to 86.7%) on the previous quarter's estimates [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/>

References

1. Department of Health. *Important changes to the childhood immunisation programme. PL CMO (2006) 1*. London: DH, 2006. Available online at: http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Professionalletters/Chiefmedicalofficerletters/DH_4137171
2. Department of Health. *Haemophilus influenzae type b (Hib) vaccine for young children – catch-up programme. PL/CMO/2007/5, PL/CNO/2007/3, PL/CPHO/2007/2*. 23 July 2007. London: DH, 2007. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Professionalletters/Chiefmedicalofficerletters/DH_076964
3. HPA. COVER programme: July to September 2008. *Health Protection Report* [serial online] 2008 [cited 23 March 2008]; **2**(51): Immunisation. Available online at <http://www.hpa.org.uk/hpr/archives/2008/hpr5108.pdf>.
4. Giraudon I, Permalloo N, Nixon G et al. Factors associated with incomplete vaccination of babies as risk of perinatal hepatitis B transmission: a London study in 2006. *Vaccine* 2009; **27**: 2016-2022.
5. HPA. COVER programme: January to March 2007. *Health Protection Report* [serial online] 2007 [cited 24 March 2009]; **1**(26): Immunisation. Available online at <http://www.hpa.org.uk/hpr/archives/2007/hpr2607.pdf>.
6. CDSC. COVER/Korner: April to June 1998. *Comm Dis Rep CDR Wkly* 1998; **8**: 345-6. Available online at: <http://www.hpa.org.uk/cdr/archives/1998/cdr3998.pdf>
7. Department of Health *CEM/CMO/2008/12: MMR catch-up programme* [online]. London: Department of Health, 6 August 2008. Available online at: www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Professionalletters/Chiefmedicalofficerletters/DH_086837
8. HPA. Confirmed measles cases in England and Wales – an update to end of January 2009. *Health Protection Report* [serial online] 2009 [cited 24 March 2009]; **3**(8): news. Available at <http://www.hpa.org.uk/hpr/archives/2009/news0809.htm>.

Surveillance of markers of infection detected in antenatal samples tested by NHS Blood and Transplant (NHSBT): England, 2008

Introduction

NHS Blood and Transplant (NHSBT) provide a testing service for antenatal samples from Primary and Acute Care Trusts in England. In addition to blood grouping, NHSBT laboratories perform testing for hepatitis B surface antigen (HBsAg) and antibodies for HIV (anti-HIV), syphilis (antibodies to treponemes) and rubella. The number of antenatal samples tested and found to be reactive was reported by the testing laboratories to the NHSBT/HPA Centre for Infections Antenatal Surveillance Scheme each month. Additional testing by the NHSBT National Transfusion Microbiology Reference Laboratory (NTMRL) was undertaken on reactive samples (or if screen negative for rubella) and also reported to the scheme. Additional data were obtained via NHSBT Red Cell Immunohaematology on age, ethnicity and parity for all samples tested. When an antenatal sample tested positive for HBsAg, anti-HIV or syphilis, or negative for antibodies to rubella (as tested by NTMRL), the local health provider was advised to obtain a repeat sample from the woman for confirmatory testing by a local accredited microbiology testing laboratory and to refer them for appropriate follow-up.

Annual data, England: January to December 2008

In 2008, NHSBT tested more than 178,000 antenatal samples for some or all four markers of infection for specific English trusts where NHSBT was contracted to provide testing. This was approximately one third of the antenatal screening tests in England. However, the number of women booking antenatal care within each trust was not available to NHSBT therefore uptake of testing was difficult to estimate from these data. All NHSBT collection centres were outside London .

A total of 940 antenatal samples were identified as positive for markers of infection (table 1). Of antenatal samples tested, 546 (0.35%) were positive for HBsAg, 177 (0.12%) were positive for anti-HIV, and 217 (0.12%) were positive for anti- *Treponema pallidum* (syphilis). Of antenatal samples tested, 2366 (3.19%) lacked antibodies to rubella. The percentage of positive samples detected varied between markers as well as collection centres due to differences in the population covered by each centre and the maternity units using the same collection centre. Additional hepatitis B virus (HBV) testing was performed on 489 HBsAg positive samples by NTMRL; 80.8% (n=395) were anti-HBe positive and 13.3 % (n=65) were HBeAg positive including three which were positive for both anti-HBe and HBeAg. A further 5.9% (n=29) were negative for both anti-HBe and HBeAg. 57 did not have anti-HBe/HBeAg testing where status was known from previous results. The percentage who were both HBsAg and HBeAg positive was similar to that seen in 2007 (12.5%). The average age of women with positive samples was 29, 30 and 28 years for HBV, HIV and syphilis respectively and 23 years for women with rubella negative samples.

Table 1. Markers of infection detected in antenatal samples tested by NHS Blood and Transplant in England, 2008

Collection centre*	Number	HBsAg	Anti-HIV	Anti- <i>T. pallidum</i>	Anti-rubella****
Birmingham and Oxford	Positive samples**	288	87	111	2,195
	Samples tested	68,335	68,108	68,366	68,795
	Percent positive	0.42	0.13	0.16	3.19
	HBeAg positive (% of HBsAg)***	31 (12.1)	–	–	–
Cambridge	Positive samples**	25	8	12	–
	Samples tested	15,698	15,897	15,937	–
	Percent positive	0.16	0.05	0.08	–
	HBeAg positive (% of HBsAg)***	3 (12.5)	–	–	–
Leeds	Positive samples**	7	1	11	–
	Samples tested	3194	3186	13040	–
	Percent positive	0.22	0.03	0.08	–
	HBeAg positive (% of HBsAg)***	0 (0)	–	–	–
Manchester and Liverpool	Positive samples**	43	1	22	171
	Samples tested	10929	4289	23834	5380
	Percent positive	0.39	0.02	0.09	3.18
	HBeAg positive (% of HBsAg)***	7 (17.9)	–	–	–
Sheffield	Positive samples**	183	80	61	–
	Samples tested	57648	57074	57697	–
	Percent positive	0.32	0.14	0.11	–
	HBeAg positive (% of HBsAg)***	24 (14.7)	–	–	–
Total	Positive samples**	546	177	217	2,366
	Samples tested	155,804	148,554	178,874	74,175
	Percent positive	0.35	0.12	0.12	3.19
	HBeAg positive (% of HBsAg)***	65 (13.3)	–	–	–

* NHSBT centre where samples were received but not necessarily where samples have been tested.

** Reactive (non-reactive for rubella) on initial testing and positive (negative for rubella) when sample retested at NHSBT NTMRL.

*** 57/546 samples were not tested for anti-HBe/HBeAg where known from previous results.

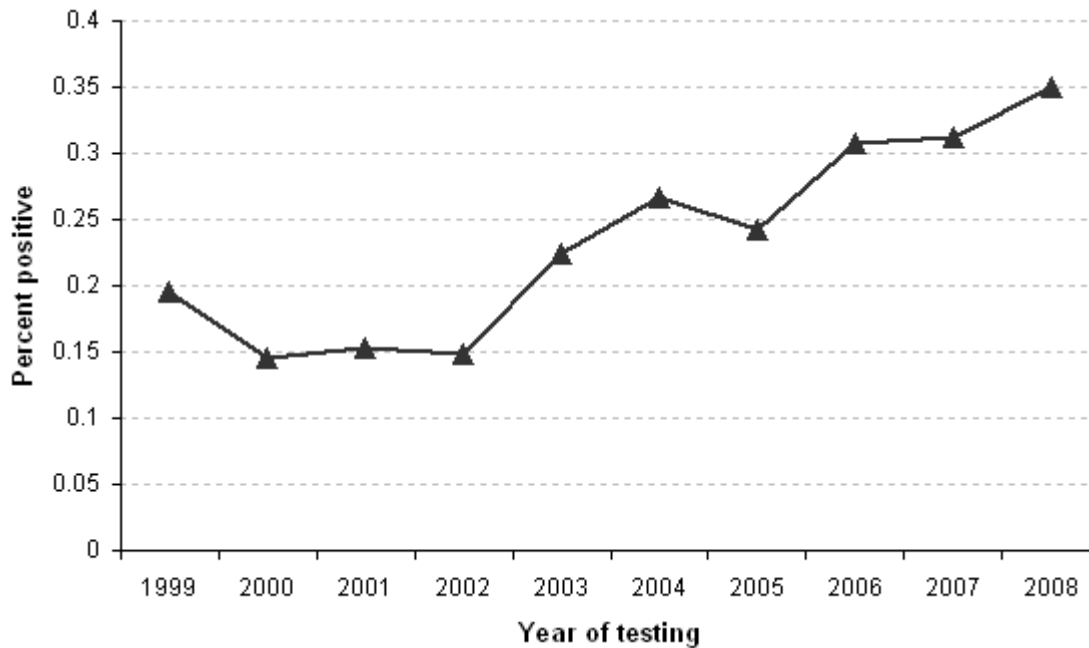
**** Samples negative for rubella antibodies.

Cumulative data, England: 1999 to 2008

HBV

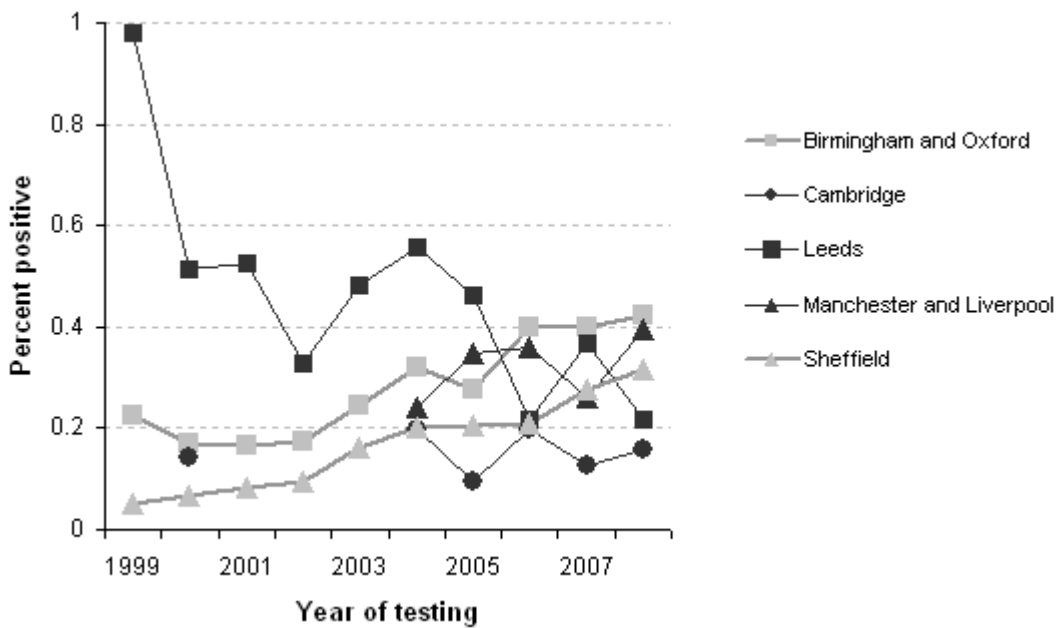
In the period 1999-2008, the overall annual percentage of HBsAg positive antenatal samples increased from 0.19% in 1999 to 0.35% in 2008 (figure 1). However not all centres were collecting samples before 2004. The majority of samples tested were collected by Birmingham & Oxford and Sheffield. During the period of surveillance, there has been increasing awareness of HBV transmission. Responsibility for offering testing to all women moved to the local provider in April 2002 supported by Department of Health standards [1]. The variation by centre (figure 2) is likely to reflect differences in the antenatal populations being tested including differences in the population of women of childbearing age born in or to parents from HBV endemic countries.

Figure 1. The overall percentage of HBsAg positive* antenatal samples tested by NHSBT, England 1999-2008



* Reactive on initial testing and positive when sample retested at NHSBT NTMRL.

Figure 2. The percentage of HBsAg positive* antenatal samples by NHSBT collection centre, England 1999 to 2008**



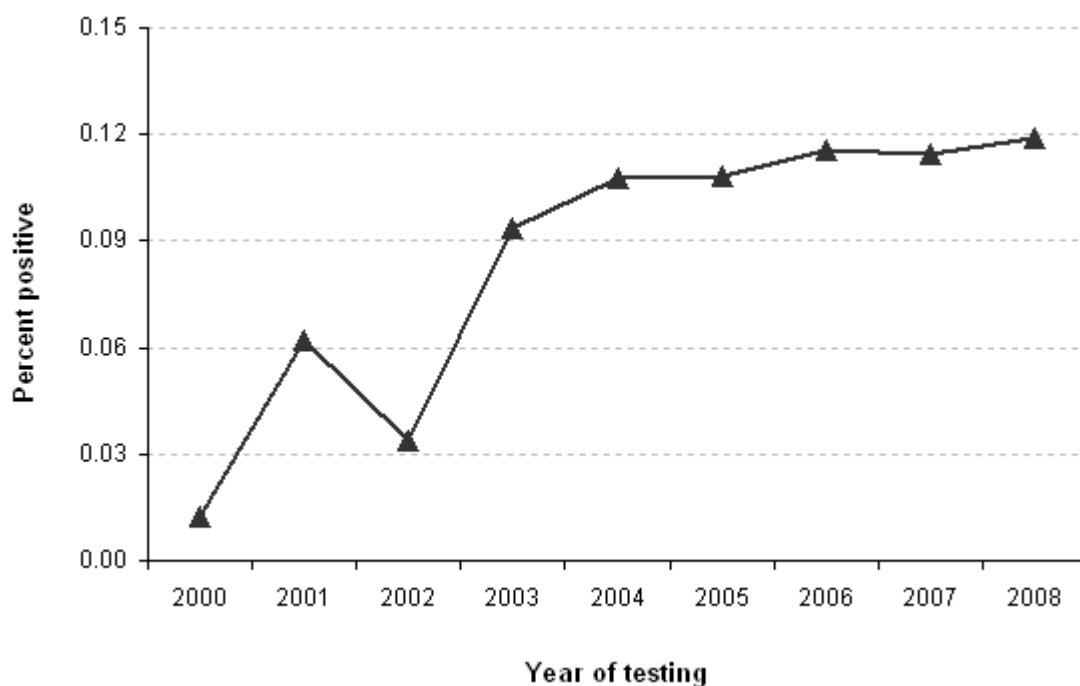
* Reactive on initial testing and positive when sample retested at NHSBT NTMRL.

** The number of antenatal samples tested varies between collection centre (see table 1).

HIV

Anti-HIV testing for antenatal women was introduced in 2000. Between 2000 and 2008 the overall annual percentage of antenatal samples positive for anti-HIV increased from 0.01% to 0.12%. However, between 2004 and 2008 the proportion of positive samples stabilised with no significant change ($p=0.26$) (figure 3). The overall increase, particularly between 2000 and 2004, may be due to an increase in uptake of HIV testing and greater awareness of the risk of transmission and the benefits of detection during pregnancy.

Figure 3. The percentage of anti-HIV positive* antenatal samples tested by NHSBT, England 2000 to 2008

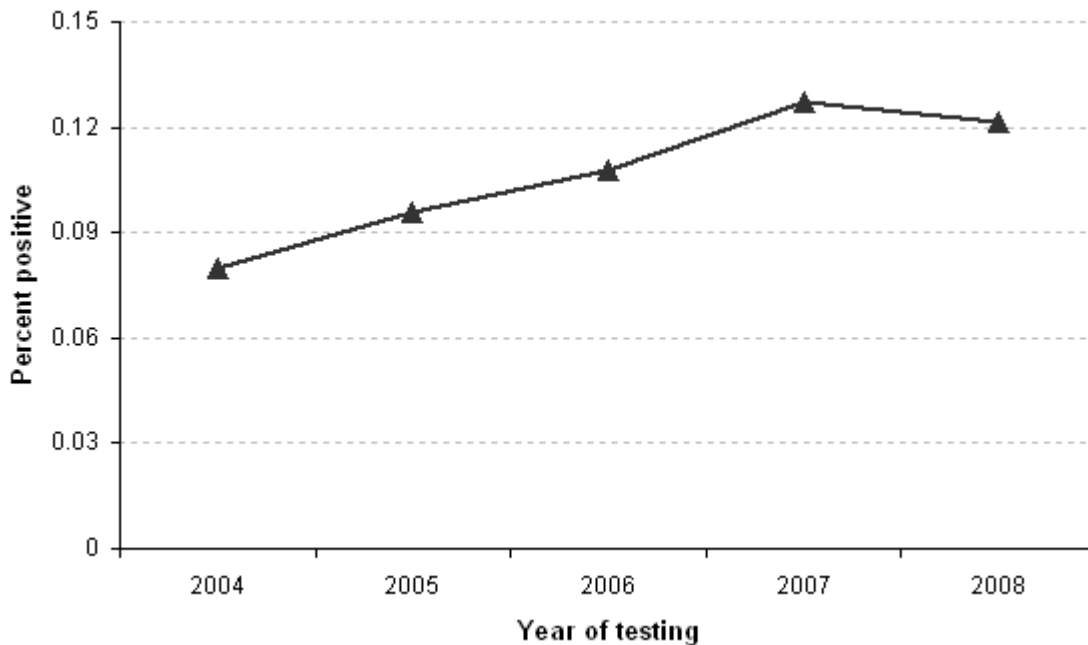


* Reactive on initial testing and positive when sample retested at NHSBT NTMRL.

Syphilis

Surveillance data on treponemal positivity has been reported to the Infection Surveillance antenatal testing scheme since 2004. The overall percentage of antenatal samples positive for treponemal antibodies has increased slightly from 0.08% in 2004 to 0.12% in 2008 (figure 4). The treponemal positivity rate in antenatal women screened by NHSBT was consistently lower than that of other infections between 2004 to 2006. In 2007 it was higher and in 2008 equal to HIV.

Figure 4. The percentage of anti-*T. pallidum* (syphilis) positive* antenatal samples tested by NHSBT, England 2004 to 2008

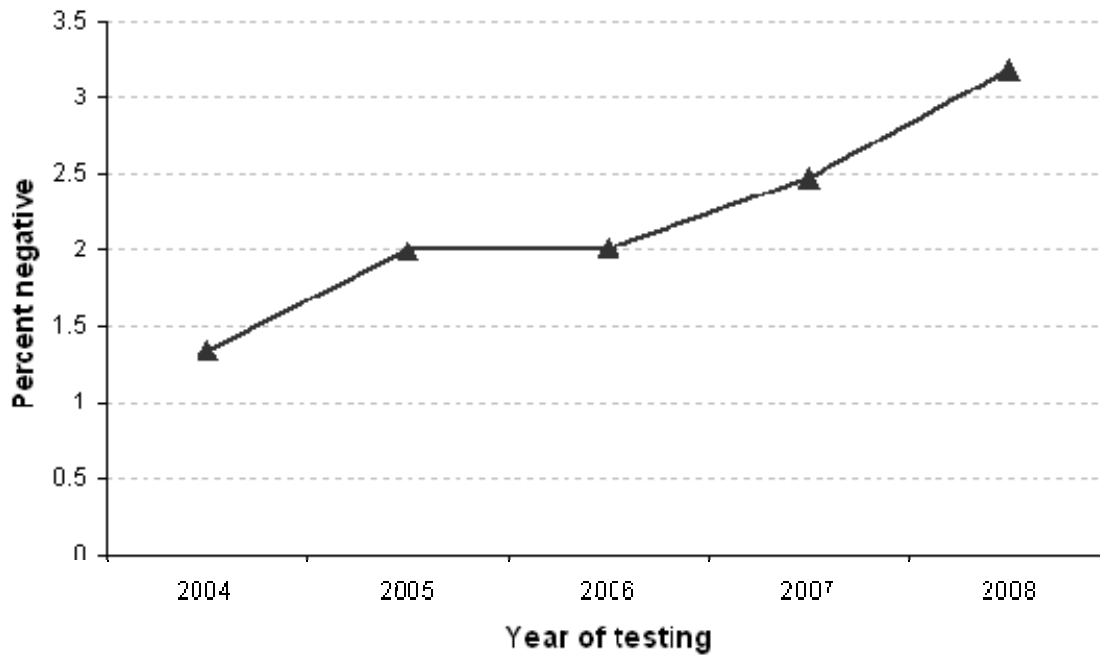


* Reactive on initial testing and positive when sample retested at NHSBT NTMRL.

Rubella

Testing for rubella susceptibility has been carried out in two centres since 2004 covering samples from Birmingham & Oxford and Manchester & Liverpool, with approximately 70 000 samples tested each year. All antenatal samples that were either non-reactive or close to the test cut-off value were sent to NTMRL. The overall rubella susceptibility rate increased between 2004 and 2008 from 1.35% to 3.19% (figure 5) although there was a slight decrease in the last 2 quarters of 2008 (not shown). A more detailed analysis of rubella susceptibility is underway.

Figure 5. The percentage of anti-rubella negative* antenatal samples tested by NHSBT, England 2004 to 2008



* Reactive on initial testing and positive when sample retested at NHSBT NTMRL. 2004 was an incomplete year of testing.

For further information please see "Antenatal testing for infection by NHSBT" on the HPA web site at: www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1218525470190?p=1218525470190 or contact the Infection Surveillance team at infection.surveillance@nhsbt.nhs.uk.

Reference

1. Department of Health (2003). Screening for infectious diseases in pregnancy: standards to support the UK antenatal screening programme, www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4050934.