



## Infection report

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

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

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

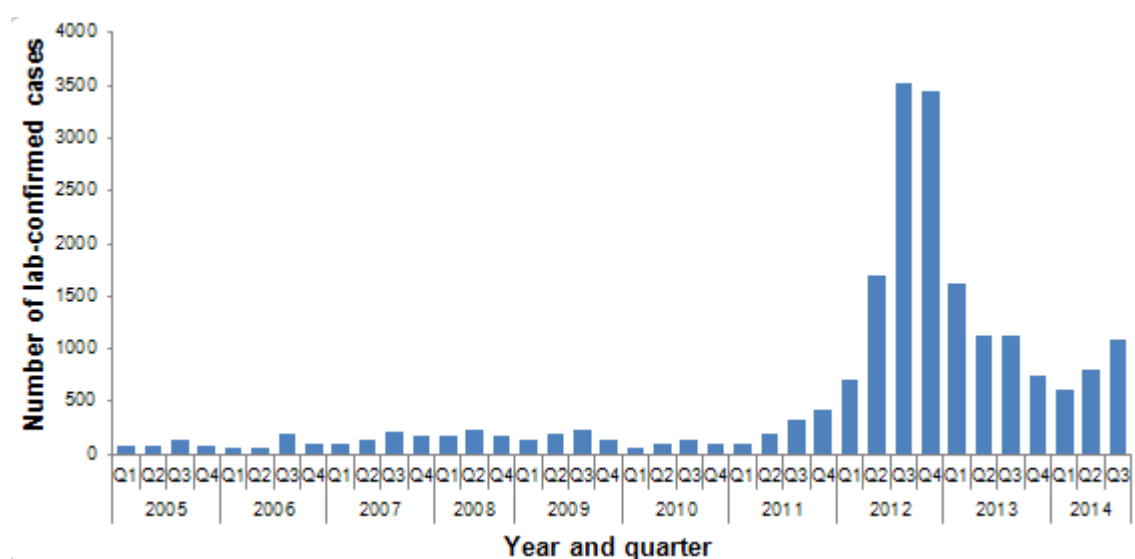
Following the high levels of activity in 2012, confirmed cases of pertussis first fell in the fourth quarter of 2012 and this decrease has continued overall with slight increases in the third quarters of 2013 and 2014, in line with the usual seasonal pattern. The highest number of laboratory confirmed cases in England has persisted in individuals aged 15 years and over whilst disease incidence continues to be highest in infants <3 months. The number of confirmed cases in infants less than 3 months in the third quarter of 2014 (47 cases) were more than double the 21 cases reported in the equivalent quarter in 2013 and 81% higher than the second quarter of 2014 (26). Two deaths were reported in infants with laboratory confirmed pertussis tested between July and September 2014 in England compared to four infant deaths reported in the second quarter of 2014. Data to the end of October 2014 has been published in a previous Health Protection news report [7].

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

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

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

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



## Laboratory investigation

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

Serological investigation by estimation of anti-pertussis toxin (PT) IgG antibody levels for older children and adults are also provided by the RVPBRU. RVPBRU also encourages submission of all *Bordetella pertussis* isolates for confirmation and national surveillance purposes. The RVPBRU is also offering an oral fluid (OF) testing service for clinically suspected cases reported to local Health Protection Teams, who are aged between 5-16 years (<17yrs) and have been coughing for more than 2 weeks and have not been immunised against pertussis in the previous year.

## References

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