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Laboratory confirmed cases of pertussis (England): July to September 2018

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In England there were 908 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 2018, from July to September 2018 (table 1). Total cases were 31% lower than those reported in the same quarter of 2017 (1324 cases) and 52% lower than the 1875 cases reported in this quarter in 2016.

A national outbreak of pertussis [1] was declared by the HPA in April 2012 and, as a response to the ongoing outbreak, the Department of Health (DH) introduced a temporary immunisation programme for pregnant women from October 2012 [2]. In June 2014 the Joint Committee on Vaccination and Immunisation (JCVI) recommended that the programme should continue for a further five years [3] based on UK evidence of impact, high effectiveness and safety and continuing high levels of disease [4-7]. From 1 April 2016 the recommended gestational age for vaccination was revised to ideally between 20-32 weeks but can be given as early as 16 weeks [3].

Following the peak in 2012 an overall decrease in pertussis was observed between 2013 and 2015. A relative increase in pertussis activity occurred in 2016 consistent with pre-existing epidemiological trends of 3-4 yearly cyclical peaks (Figure 1) and cases fell again in 2017 and have fallen further to date in 2018.

In the third quarter of 2018, the greatest number of laboratory confirmed cases in England continues in individuals aged 15 years and over although the highest disease incidence persists in infants <3 months. Pertussis activity in all infants <1 year of age was lower in the third quarter of 2018 (35 cases) than the equivalent periods in the previous four years (table 2). There were only 15 cases in infants under 3 months of age, who are targeted by the maternal immunisation programme, in this quarter compared to 49 and 40 cases in the same quarter in 2016 and 2017 respectively.

Confirmed cases aged 6-11 months were higher (34 cases) in 2016 than in any year since the introduction of enhanced surveillance in 1994. Between July and September, there were 18 laboratory confirmed cases in this age group in 2016, 7 cases in 2017 and 8 confirmed cases were reported in 2018. This infant age group is known to have

high levels of protection after completion of the primary immunisation programme.

Overall activity remains higher in all age groups from 1 year and older, relative to years preceding the pre-2012 peak. Ascertainment in those aged 5 to <17 years has improved with availability of oral fluid testing since 2013. From 1 May 2018 the availability of oral fluid testing was extended to all children aged 2 to <17 years. See the guidelines for the public health management of pertussis [8] for details of appropriate laboratory investigation of suspected cases of pertussis which is affected by the age of the suspect case and time since onset of their symptoms.

Pertussis vaccine coverage for pregnant women averaged 68.2% across April to June 2018, 3.9% lower than coverage for the same period in 2017 but continuing at the higher levels seen since April 2016 [9]. This drop could represent a genuine decrease, or an increase in vaccination in maternities, which is poorly recorded in primary care records. Extended eligibility criteria for the vaccine may have contributed to the increase in uptake observed over the last couple of years [10].

There have been no reported deaths in infants with pertussis confirmed between January and September 2018 and there were no deaths in infants with pertussis confirmed in 2017. Of the eighteen infants who have died following confirmed pertussis disease and who were born after the introduction of the maternal programme (on 1 October 2012), 16 were born to mothers who had not been immunised against pertussis during pregnancy.

Surveillance data in young infants following the introduction of the pertussis immunisation in pregnancy programme continues to demonstrate that a relatively low incidence has been maintained in this age group, with expected seasonal increases. It is important to be aware, however, that raised levels of pertussis persist in groups aged 1 year and older. Women should continue to be supported in accessing immunisation against pertussis during pregnancy (ideally between 20-32 weeks) to optimise protection for their babies from birth.

Table 1: Laboratory-confirmed cases of pertussis by age and testing method in England, July to September 2018.

Age group	Culture*	PCR	Serology	Oral fluid only	Total
<3 months	5	10	0	0	15
3-5 months	3	7	2	0	12
6-11 months	3	3	2	0	8
1-4 years	3	13	14	10	40
5-9 years	0	0	23	18	41
10-14 years	2	0	54	17	73
15+ years	2	17	694	6	719
Total	18	50	789	51	908

* Culture confirmed cases may additionally have tested positive by any other method, PCR confirmed cases may have additionally tested positive by serology or OF and serology confirmed cases may also have been confirmed by OF. Submission of all presumptive *B. pertussis* isolates is encouraged for confirmation of identity and to allow further characterisation for epidemiological purposes.

Figure 1: Total number of laboratory-confirmed pertussis cases per quarter in England, 2009 to 2018 (Q1-Q3).

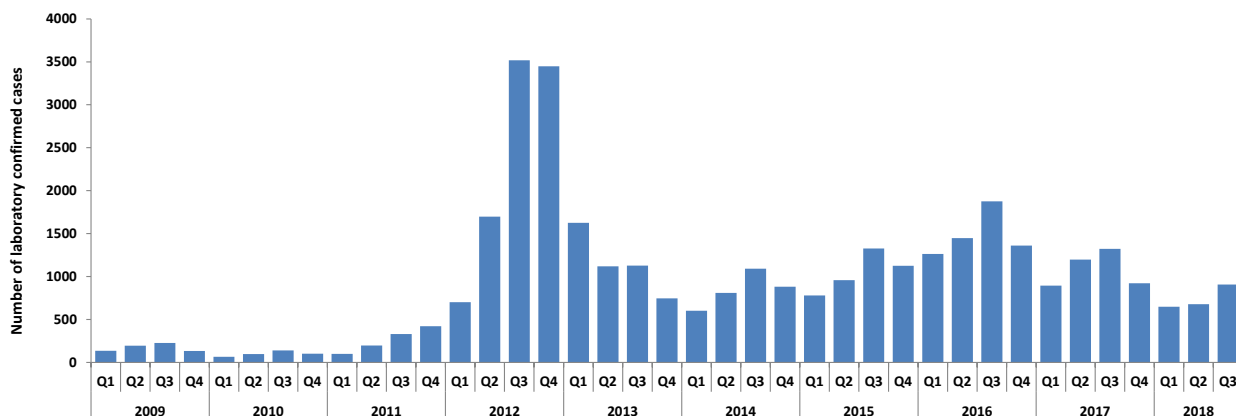


Table 2: Laboratory-confirmed cases of pertussis by age and year England, July to September only: 2012 - 2018

Age group	2012	2013	2014	2015	2016	2017	2018
<3 months	147	21	47	51	49	40	15
3-5 months	37	4	4	18	12	12	12
6-11 months	15	3	5	5	18	7	8
1-4 years	42	13	13	22	42	28	40
5-9 years	67	27	33	75	96	52	41
10-14 years	252	88	99	129	126	99	73
15+ years	2959	973	892	1027	1532	1086	719
Total	3519	1129	1093	1327	1875	1324	908

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9. *Health Protection Report* **12(27)**, 27 July 2018.
10. *Health Protection Report* **11(34)**, 29 September 2017.

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Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

About Health Protection Report

Health Protection Report is a national public health bulletin for England and Wales, published by Public Health England. It is PHE's principal channel for the dissemination of laboratory data relating to pathogens and infections/communicable diseases of public health significance and of reports on outbreaks, incidents and ongoing investigations.

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