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Laboratory confirmed cases of pertussis (England): April to June 2019

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In England, there were 974 laboratory confirmed cases of pertussis (culture, PCR, serology or oral fluid) reported to the Public Health England (PHE) pertussis enhanced surveillance programme in the second quarter of 2019, from April to June (table 1). Total cases were 43% higher than those reported in the same quarter of 2018 (680 cases) and 19% lower than the 1198 cases reported in this quarter in 2017.

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].

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].

In June 2019, the Joint Committee on Vaccination and Immunisation (JCVI) recommended that the maternal vaccination programme continue as a routine programme [3]. Assessments of the impact, effectiveness and safety of the temporary maternal vaccination programme have been published [4,5,6,7].

Following the outbreak 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); cases fell in 2017 and 2018. Total number of confirmed cases in the first two quarters of 2019 were 19% higher (1578 cases) than the 1327 cases reported in the same period in 2018 and 25% lower than the first half of 2017 (2094 cases).

Between April and June 2019, 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. The number of infants aged less than 1 year

doubled in the second quarter of 2019 (39 cases) compared to the same period in 2018 (20) but was lower than in the equivalent periods in 2017 (45 cases) and 2016 (72 cases) (table 2).

The number of confirmed cases in infants under 3 months, who are targeted by the maternal immunisation programme, continues to remain low with 23 confirmed cases in this quarter compared to 10 and 26 cases in the same quarter in 2018 and 2017 respectively. Low numbers were reported in older infants aged 3-5 months (8 cases) and 6-11 months (8 cases) consistent with protection from primary vaccination offered at 2, 3 and 4 months of age.

One infant was reported to have died with pertussis confirmed between April and June 2019. Of the 20 infants who have died following confirmed pertussis disease and who were born after the introduction of the maternal programme (on 1 October 2012), 18 were born to mothers who had not been immunised against pertussis during pregnancy. Calculated maternal vaccine effectiveness against death in their infant from pertussis is very high at around 95% [6].

Pertussis vaccine coverage for pregnant women averaged 71.1% across January to March 2019, 1.0 percentage points lower than coverage for the same period in 2018 but continuing at the higher levels seen since April 2016 [8]. This drop could represent a genuine decrease, or reflects an increase in vaccines being delivered in maternity settings, 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 [9].

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 [10] for details of appropriate laboratory investigation of suspected cases of pertussis which is informed by the age of the suspected case and time since onset of their symptoms.

Surveillance data in young infants following the introduction of the pertussis immunisation in pregnancy programme continues to demonstrate that a 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, April to June 2019

Age group	Culture	PCR	Serology	Oral fluid only	Total
<3 months	8	15	0	0	23
3-5 months	2	6	0	0	8
6-11 months	1	7	0	0	8
1-4 years	1	15	4	10	30
5-9 years	0	6	22	40	68
10-14 years	2	6	90	57	155
15+ years	6	19	643	14	682
Total	20	74	759	121	974

* 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, 2010 to 2019 (Q2)

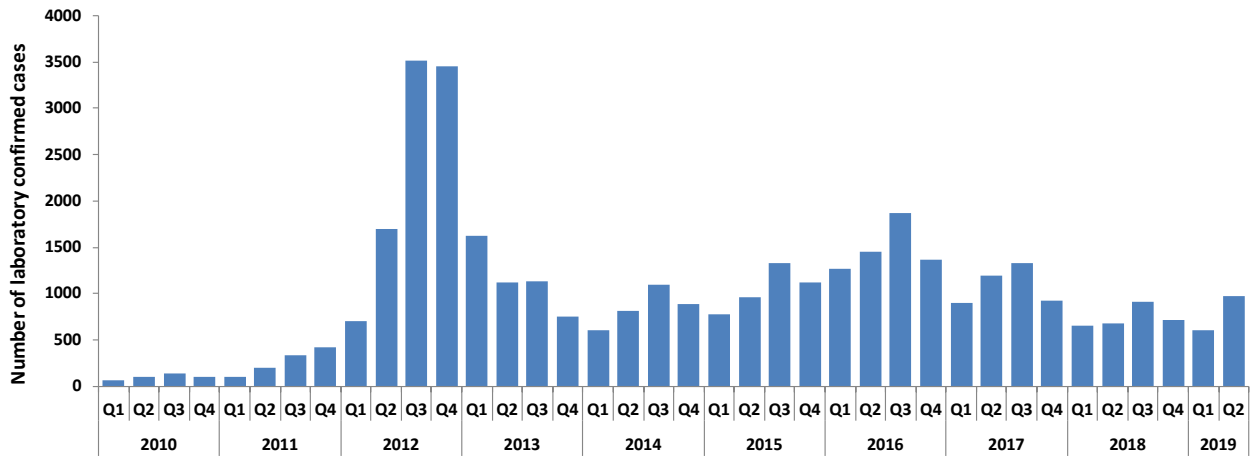


Table 2: Laboratory-confirmed cases of pertussis by age and year England, April to June only: 2012 - 2019

Age group	2012	2013	2014	2015	2016	2017	2018	2019
<3 months	118	25	26	31	50	26	10	23
3-5 months	16	12	1	4	16	12	7	8
6-11 months	5	4	2	4	6	7	3	8
1-4 years	12	8	8	14	33	21	15	30
5-9 years	36	19	37	48	82	77	42	68
10-14 years	216	119	89	138	157	124	82	155
15+ years	1294	933	647	719	1104	931	521	682
Total	1697	1120	810	958	1448	1198	680	974

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1. *Health Protection Report* 6(15), 13 April 2012.
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8. *Health Protection Report* 13(26), 26 July 2019.
9. *Health Protection Report* 11(34), 29 September 2017.
10. PHE website: Guidelines for the public health management of pertussis.

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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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