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England

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Laboratory confirmed cases of pertussis (England): January to March 2019

Health Protection Report
Volume 13 Number 22
1 July 2019

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In England, there were 605 laboratory confirmed cases of pertussis (culture, PCR, serology or oral fluid) reported to the Public Health England (PHE) pertussis enhanced surveillance programme in the first quarter of 2019, from January to March 2019 (table 1). Total cases were 6% lower than those reported in the same quarter of 2018 (647 cases) and 32% lower than the 896 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]. In June 2014, the Joint Committee on Vaccination and Immunisation (JCVI) advised 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 [4,5,6,7]. 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 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, 2018 and have fallen further in the first quarter of 2019.

Between January and March 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. Pertussis activity in all infants <1 year of age was 35% higher in the first quarter of 2019 (23 cases) than the equivalent period in 2018 (17 cases) and 38% lower than the first quarter of 2017 (37 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 12 confirmed cases in this quarter compared to 9 and 31 cases in the same quarter in 2018 and 2017 respectively. Low numbers were reported in older infants aged 3-5 months (7 cases) and 6-11 months (4 cases) consistent with protection from primary vaccination offered at 2, 3 and 4 months of age.

There were no reported deaths in infants with pertussis confirmed between January and March 2019. Of the 19 infants who have died following confirmed pertussis disease and who were born after the introduction of the maternal programme (on 1 October 2012), 17 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 71.7% across October to December 2018, 1.9 percentage points lower than coverage for the same period in 2017 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, January to March 2019

Age group	Culture	PCR	Serology	Oral fluid only	Total
<3 months	5	7	0	0	12
3-5 months	4	3	0	0	7
6-11 months	2	2	0	0	4
1-4 years	4	6	4	2	16
5-9 years	0	6	21	17	44
10-14 years	2	3	59	28	92
15+ years	5	14	405	6	430
Total	22	41	489	53	605

* 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 (Q1)

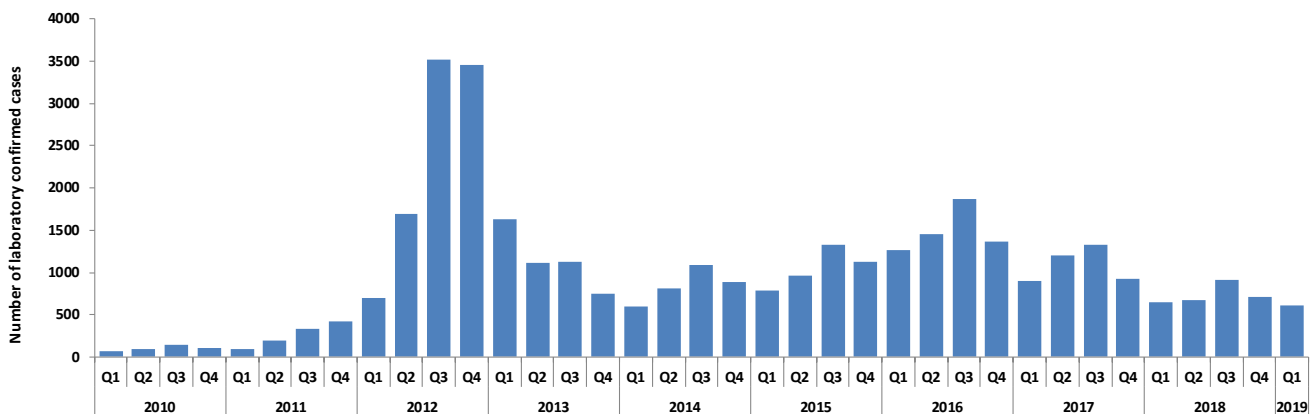


Table 2: Laboratory-confirmed cases of pertussis by age and year England, January to March only: 2012 - 2019

Age group	2012	2013	2014	2015	2016	2017	2018	2019
<3 months	70	26	12	16	35	31	9	12
3-5 months	11	7	5	6	9	6	4	7
6-11 months	2	0	3	2	5	0	4	4
1-4 years	4	20	6	14	15	11	13	16
5-9 years	13	29	24	39	77	37	30	44
10-14 years	98	175	79	82	121	89	65	92
15+ years	504	1368	473	622	1002	722	522	430
Total	702	1625	602	781	1264	896	647	605

References

1. [“Confirmed pertussis in England and Wales continues to increase”](#). *Health Protection Report* 6(15): news, 13 April 2012.
2. Department of Health: [Pregnant women to be offered whooping cough vaccine](#) (news story), 28 September 2012.
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8. [Pertussis vaccination programme for pregnant women update: vaccine coverage \(England\), October to December 2018](#). *Health Protection Report* 13(14), 26 April 2019.
9. [Pertussis vaccination programme for pregnant women update: vaccine coverage \(England\), April to June 2018](#). *Health Protection Report* 11(34), 29 September 2017.
10. PHE website (May 2018). [Guidelines for the public health management of pertussis](#).

About Public Health England

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.

Public Health England, Wellington House, 133-155 Waterloo Road, London SE1 8UG
Tel: 020 7654 8000 www.gov.uk/phe

Twitter: [@PHE_uk](https://twitter.com/PHE_uk) Facebook: www.facebook.com/PublicHealthEngland

Queries relating to this document should be directed to:

Immunisation, Hepatitis and Blood Safety Department,
National Infection Service, PHE Colindale,
61 Colindale Avenue, London NW9 5EQ.

immunisation@phe.gov.uk

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Published **July 2019**

PHE publications gateway number: **2019030**.

