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Pertussis vaccination programme for pregnant women update: vaccine coverage in England, October to December 2017

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Pertussis vaccination programme for pregnant women update: vaccine coverage in England, October to December 2017

This report presents pertussis vaccine coverage in pregnant women in England for the period October to December 2017, updating previous data reported for July to September 2017 [1].

Following increased pertussis activity in all age groups, including infants under three months of age, and the declaration of a national pertussis outbreak in April 2012 [2] pertussis vaccine has been offered to pregnant women since 1 October 2012 [3]. The prenatal pertussis vaccination programme aims to minimise disease, hospitalisation and deaths in young infants, through intra-uterine transfer of maternal antibodies, until they can be actively protected by the routine infant programme with the first dose of pertussis vaccine scheduled at eight weeks of age [4]. In June 2014 the Joint Committee on Vaccination and Immunisation (JCVI) considered available data and, based on the high effectiveness and safety of the programme, advised it should continue for a further five years [5]. In February 2016 the JCVI considered new evidence demonstrating that vaccination earlier in pregnancy would increase opportunities during pregnancy for vaccination, without detrimentally affecting the protection afforded to the infant [6, 7]. Based on this, JCVI advised that vaccination could be offered from gestational week 16, although for operational reasons, vaccination should ideally be offered from around 20 weeks, on or after the foetal anomaly scan [8]. This advice was implemented from April 2016.

Reported pertussis activity was higher in 2016 than in any year between 2013 and 2015 but did not reach the overall peak levels recorded in 2012 [9]. The increase in 2016 was consistent with pre-existing cyclical trends with peaks in disease every 3 or 4 years. Cases fell in all age groups in 2017 and were 27% lower than in 2016 [10]. After the introduction of the maternal programme in 2012, reported incidence remained higher in all age groups from one year and older relative to years preceding the pre-2012 peak. In young infants under three months of age targeted by the programme, however, disease levels fell back

to those observed before the 2012 peak and are still in line with those seen in earlier (pre-2012) peak years.

Key points

- Pertussis vaccine coverage in pregnant women averaged 73.6% across the quarter, 1.4% lower than coverage for the same period in 2016 but continuing at the higher levels seen since April 2016.

Methods

General practice (GP) level pertussis vaccine coverage data are automatically uploaded via participating GP IT suppliers to the ImmForm* website on a monthly basis.

ImmForm data are validated and analysed by PHE to check data completeness, identify and query any anomalous data and describe epidemiological trends.

Since April/May 2016 (implementation date varied by GP IT supplier) the following monthly data have been collected:

- *Denominator*: number of women who delivered in the survey month, excluding miscarriages and stillbirths, regardless of gestational age
- *Numerator*: number of women receiving pertussis vaccination between week 16 of pregnancy and delivery

For accurate denominators to be extracted from GP IT systems by the automated survey and precise coverage estimates to be calculated, it is important that the medical records of all women who have given birth have the following fields completed:

- the date of delivery
- the date of receipt of a pertussis-containing vaccine at or after week 16 of pregnancy, regardless of the setting where the vaccine was administered
- where relevant, fields indicating stillbirth or miscarriage

Participation and data quality

Data from the smallest IT supplier were unreliable since July 2017 and continue to be excluded for September to December 2017.

* ImmForm is the system used by Public Health England to record vaccine coverage data for some immunisation programmes and to provide vaccine ordering facilities for the NHS

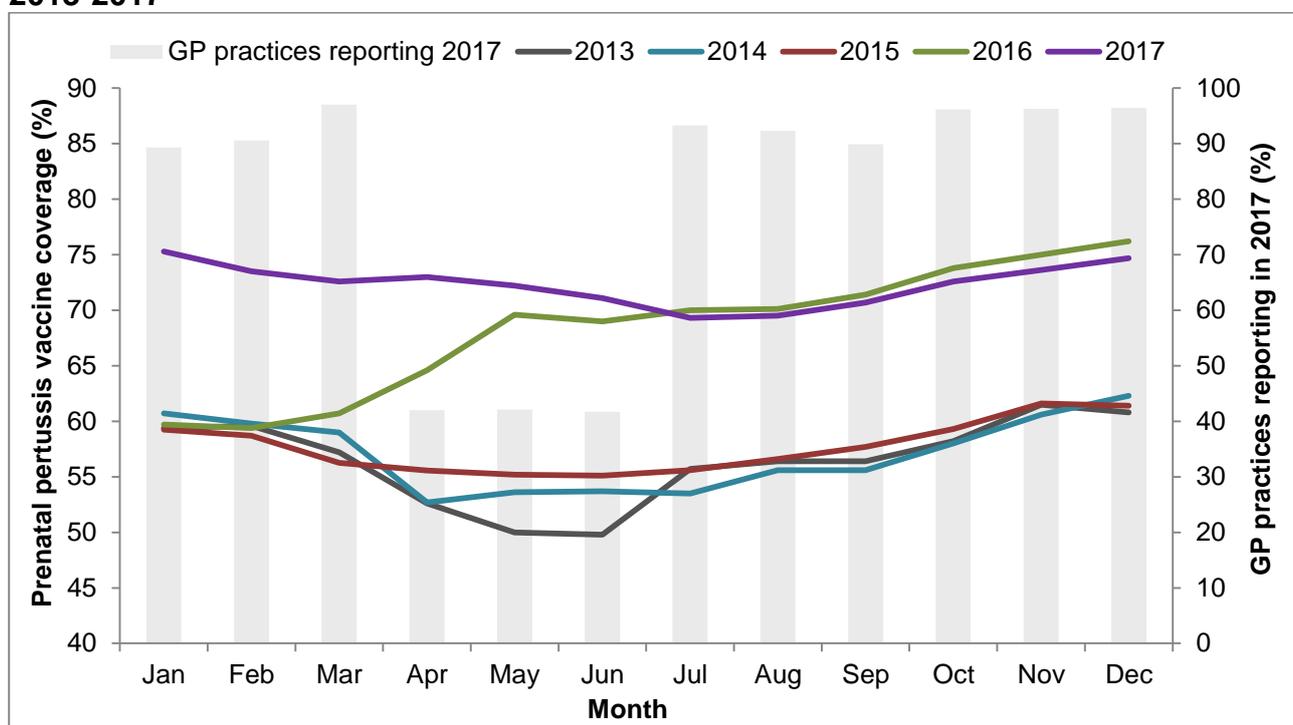
National GP practice participation remains high, between 96.1% (October) and 96.5% (December), but local prenatal pertussis coverage estimates for a small number of LTs, ATs and CCGs have reduced participation from GP practices, particularly in South West England.

Results

Pertussis vaccine coverage continued to increase from 70.7% in September to 74.7% in December 2017 (Figure 1). Coverage between October to December 2017 remained below (1.4%) coverage reported for the same period in 2016, but followed a similar upward trend.

During October to December, prenatal pertussis vaccine coverage by NHS England LT ranged from 60.6% (London, October) to 83.6% (Yorkshire and Humber, December) (Table1).

Figure 1. Monthly pertussis vaccination coverage (%) in pregnant women: England, 2013-2017



Footnotes:

1. New IT specification implemented in March/April 2016 [11]; coverage reported prior to this date is likely to have been underestimated.
2. Women first offered pertussis vaccine from 20 weeks gestational age in April 2016 would have been expected to deliver in August 2016.

Discussion

Prenatal pertussis vaccine coverage remains high at above 70% and, although slightly below coverage reported in 2016, increased between October and December 2017 in line with previous years.

Factors that could have contributed to the overall increase in coverage observed since April 2016 were described in the April to September 2016 report [11]. Women who received vaccine from as early as 20 weeks were likely to be included in the data from August 2016 onwards for women delivering around the time of their due date. The longer period available for vaccination, including a greater opportunity for signposting and reminders, could be contributing to an increase in coverage.

National coverage estimates in the 2017 were close (within 3%) to coverage estimates extracted from the Clinical Research Practice Datalink (CPRD) for the same period for the purpose of on-going estimation of vaccine effectiveness [12]. The CPRD is a sentinel primary care network that includes 510 English general practices, representing approximately 6% of the UK population [13].

A recently published study which used ImmForm GP level data to assess variation in maternal pertussis coverage found that patients' ethnicity and deprivation were predictors of coverage which contributed to, but did not wholly account for, geographical variation in coverage in England [14]. Based on April 2014 to March 2015 pre-natal pertussis coverage data, and after adjusting for geography and deprivation, coverage was lowest in black-other and black-Caribbean women compared with White British women (-16.3% and -15.4%, respectively). Coverage decreased with increasing deprivation, and was 14% lower in the most deprived quintile compared with the least deprived [14].

Pertussis activity fell in 2017 after a cyclical peak in cases in 2016. Disease levels remain elevated in older age groups and so unprotected young infants continue to be at risk of infection. GPs, practice nurses, obstetricians and midwives should continue to encourage pregnant women to receive the pertussis vaccine, ideally between weeks 20 and 32 of their pregnancy (but up to term) to optimise protection for their babies from birth [8]. Between October and December, pertussis vaccine coverage varied by more than 20% each month between Local Teams. Identifying examples of good practice in areas achieving consistently high coverage for pertussis vaccination during pregnancy and applying them to low coverage areas may help address this gap.

There are limitations to the data presented in this report. First, completeness of data is reliant on the recording of delivery dates in the mothers' medical records and comparison of these data with national data on maternities [15], indicates that in 2016 these data represented about 65% of the population of pregnant women.

Second, the survey does not cover all GP practices in England. Amongst those GPs included there may be differential completeness of the recording of delivery dates. Coverage may be overestimated if women who have received the vaccine are more likely to have their delivery date recorded. Furthermore, women not registered with a GP (and therefore less likely to be having regular contact with the health service prior to delivery) will not be captured by this reporting system.

Following the change in recommendation for eligibility of the vaccine around the time of the 20 week scan, some maternities have started offering the pertussis vaccine, and PHE is in the process of mapping the pertussis vaccine offer in maternities across England. This may increase vaccine coverage, but the extent to which doses administered in maternity settings are recorded in GP systems (used in this report) is unknown, and is currently being investigated.

Continued support in the delivery of this important programme has been sought from service providers (GP practices and maternity units), Screening and Immunisation Teams and Health Protection Teams. The continued high coverage reported here suggests the delivery of this programme is becoming better embedded. Screening and Immunisation Teams should continue to update service providers on the current epidemiology of the disease, the recent changes to and effectiveness of the vaccination programme, and the need to maintain and improve coverage achieved thus far.

If coverage, and ultimately the impact of the programme itself, is to be accurately monitored, it is essential that GPs and practice nurses continue to ensure that vaccination and date of delivery are recorded in the patient's GP record. In areas that have commissioned maternity units to offer pertussis vaccines in pregnancy, it is important that providers ensure doses of vaccines given to individual women are also communicated to the woman's GP. Maternity units not offering pertussis vaccines to pregnant women should continue to discuss its importance, making use of available resources [16] and sign-post the woman to her GP to receive the vaccine.

Table 1. Monthly pertussis vaccination coverage (%) in pregnant women by NHS England Local Team: England, October to December 2017

Local Team	Oct-17	Nov-17	Dec-17
London	60.6	61.1	61.7
Midlands and East (Central Midlands)	74.0	75.6	76.3
Midlands and East (East)	75.4	73.7	77.0
Midlands and East (North Midlands)	76.9	76.8	77.7
Midlands and East (West Midlands)	69.1	71.1	72.0
North (Cheshire and Merseyside)	77.4	78.7	80.9
North (Cumbria and North East)	79.6	79.6	81.4
North (Greater Manchester)	70.2	74.5	74.2
North (Lancashire)	69.0	70.8	70.4
North (Yorkshire and Humber)	81.9	82.9	83.6
South (South Central)	76.5	78.4	77.8
South (South East)	76.6	78.0	78.5
South (South West)	70.0	70.7	75.1
South (Wessex)	75.0	76.5	76.4
England	72.6	73.6	74.7
Monthly reported denominator	35,705	34,072	32,226

Date of data extraction: 22 March 2018

References

1. Public Health England. *Pertussis Vaccination Programme for Pregnant Women update: vaccine coverage in England, July to September 2017*. HPR 12(1) 2018; Available from: <https://www.gov.uk/government/publications/pertussis-immunisation-in-pregnancy-vaccine-coverage-estimates-in-england-october-2013-to-march-2014>
2. *A level 3 incident is the third of five levels of alert under the HPA's Incident Reporting and Information System (IERP) according to which public health threats are classified and information flow to the relevant outbreak control team is coordinated. A level 3 incident is defined as one where the public health impact is significant across regional boundaries or nationally. An IERP level 3 incident was declared in April 2012 in response to the ongoing increased pertussis activity*. HPR, 2012. **6**(15).
3. Department of Health press release, 28 September 2012. "Pregnant women to be offered whooping cough vaccination"
<https://www.gov.uk/government/news/pregnant-women-to-be-offered-whooping-cough-vaccination>
4. Public Health England. *The complete routine immunisation schedule from autumn 2017*. 2017; Available from: <https://www.gov.uk/government/publications/the-complete-routine-immunisation-schedule>
5. *Joint Committee on Vaccination and Immunisation minutes*. 2014; Available from: <https://www.gov.uk/government/groups/joint-committee-on-vaccination-and-immunisation#minutes>
6. Eberhardt, C.S., et al., *Maternal Immunization Earlier in Pregnancy Maximizes Antibody Transfer and Expected Infant Seropositivity Against Pertussis*. *Clin Infect Dis*, 2016. **62**(7): p. 829-36.
7. JCVI. *JCVI February 2016 Minutes*. 2016; Available from: <https://www.gov.uk/government/groups/joint-committee-on-vaccination-and-immunisation>
8. Public Health England. *Pertussis: the green book, chapter 24*. 2016; Available from: <https://www.gov.uk/government/publications/pertussis-the-green-book-chapter-24>
9. Public Health England. *Laboratory confirmed cases of pertussis reported to the enhanced pertussis surveillance programme in England: annual report for 2016*. HPR **11**(12),
<https://www.gov.uk/government/publications/pertussis-laboratory-confirmed-cases-reported-in-england-2016>
10. Public Health England. *Laboratory confirmed cases of pertussis reported to the enhanced pertussis surveillance programme in (England: annual report for 2017*. HPR **12**(15),
<https://www.gov.uk/government/publications/pertussis-laboratory-confirmed-cases-reported-in-england-2017>

11. PHE (2016). *Pertussis Vaccination Programme for Pregnant Women: vaccine coverage estimates in England, April to September 2016*. HPR **10**(41), <https://www.gov.uk/government/publications/pertussis-immunisation-in-pregnancy-vaccine-coverage-estimates-in-england-october-2013-to-march-2014>
12. Andrews, N., *Effectiveness of maternal pertussis vaccination in prevention of confirmed pertussis in children in England using the screening method*. 2018. [Unpublished report]
13. Clinical Research Practice Datalink. Accessed 19 October 2016. Available at: <https://www.cprd.com/home/>
14. Byrne L, Ward C, White JM, Amirthalingam G, Edelstein M. Predictors of coverage of the national maternal pertussis and infant rotavirus vaccination programmes in England. *Epidemiol Infect.* 2017 Dec 14:1-10. doi: 10.1017/S0950268817002497
15. Office for National Statistics. Birth characteristics. Release date: 16 October 2017. Accessed 6 December 2017. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthcharacteristicsinenglandandwales>
16. Public Health England. *Pregnancy: how to help protect you and your baby*. 2017. Available at: <https://www.gov.uk/government/publications/pregnancy-how-to-help-protect-you-and-your-baby>

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