Pertussis vaccination programme for pregnant women update: vaccine coverage in England, January to March 2019 and 2018/19 annual coverage

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Pertussis vaccination programme for pregnant women update: vaccine coverage in England, January to March 2019 and 2018/19 annual coverage

This report presents pertussis vaccine coverage in pregnant women in England for the period January to March 2019, updating previous data reported for October to December 2018 [1]. The report also presents annual data from April 2018 until March 2019.

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 and the vaccine is now offered through general practice as well as some maternity services.
Key points

• Pertussis vaccine coverage in pregnant women averaged 71.1% across the quarter, 1.0 percentage points lower than coverage for the same quarter in 2018
• Annual vaccine coverage for the financial year 2018/19 was 68.8%, 3.1 percentage points lower compared to 2017/18
• The decrease in quarterly and annual vaccine coverage compared to 2017/18 could represent a genuine decrease, or a shift from vaccination in general practice to vaccination in maternities; the latter are not always recorded in primary care records and are therefore not fully represented in the data included in this report

Methods

General practice (GP) level pertussis vaccine coverage data are automatically uploaded via participating GP IT suppliers to the ImmForm\textsuperscript{1} website monthly and a separate annual extraction was uploaded at the end of the financial year. 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 (annual) data have been collected:

• \textit{denominator}: number of women who delivered in the survey month (year), excluding miscarriages and stillbirths, regardless of gestational age
• \textit{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

Since 1 April 2018 NHS England organisational changes came into effect which resulted in six new CCGs and two new NHS local teams. These changes are detailed in the April to June 2018 quarterly report [9].

\textsuperscript{1} 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
Participation and data quality

National GP practice participation remains very high representing 98.5% (January), 98.6% (February), 98.7% (March), respectively. National GP practice participation from the 2018/19 annual extraction was 96.0% of practices. All GP IT suppliers provided data for the January to March quarterly figures. Data from the smallest IT supplier was not returned for the annual coverage estimate.

Results

Pertussis vaccine coverage decreased from 71.6% in January 2019 to 70.2% in March 2019 (Table 1, Figure 1, see data tables). During January to March 2019, prenatal pertussis vaccine coverage by NHS England LT ranged from 58.4% (London, March) to 81.0% (Yorkshire and Humber, February) (Table 1). Over the 2018-19 financial year, average coverage was 68.8%.

Table 1. Quarter 4 monthly and annual pertussis vaccination coverage (%) in pregnant women by NHS England Local Team: England, January to March 2019

<table>
<thead>
<tr>
<th>Local Team</th>
<th>Annual 2018-19</th>
<th>Jan-19</th>
<th>Feb-19</th>
<th>Mar-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS ENGLAND MIDLANDS AND EAST (EAST)</td>
<td>70.6</td>
<td>71.7</td>
<td>72.7</td>
<td>70.2</td>
</tr>
<tr>
<td>NHS ENGLAND LONDON</td>
<td>57.3</td>
<td>59.4</td>
<td>59.8</td>
<td>58.4</td>
</tr>
<tr>
<td>NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)</td>
<td>68.9</td>
<td>72.6</td>
<td>71.1</td>
<td>72.3</td>
</tr>
<tr>
<td>NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)</td>
<td>71.8</td>
<td>73.8</td>
<td>72.8</td>
<td>73.7</td>
</tr>
<tr>
<td>NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)</td>
<td>67.6</td>
<td>68.9</td>
<td>67.9</td>
<td>66.5</td>
</tr>
<tr>
<td>NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)</td>
<td>77.2</td>
<td>80.9</td>
<td>79.6</td>
<td>77.0</td>
</tr>
<tr>
<td>NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)</td>
<td>78.5</td>
<td>80.7</td>
<td>81.0</td>
<td>78.1</td>
</tr>
<tr>
<td>NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)</td>
<td>70.0</td>
<td>73.3</td>
<td>71.4</td>
<td>67.9</td>
</tr>
<tr>
<td>NHS ENGLAND NORTH (GREATER MANCHESTER)</td>
<td>68.9</td>
<td>69.9</td>
<td>69.9</td>
<td>67.6</td>
</tr>
<tr>
<td>NHS ENGLAND NORTH (LANCASHIRE)</td>
<td>67.5</td>
<td>70.0</td>
<td>70.9</td>
<td>68.9</td>
</tr>
<tr>
<td>NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)</td>
<td>72.0</td>
<td>74.4</td>
<td>74.8</td>
<td>72.4</td>
</tr>
<tr>
<td>NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)</td>
<td>72.1</td>
<td>74.1</td>
<td>74.0</td>
<td>73.8</td>
</tr>
<tr>
<td>NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)</td>
<td>73.3</td>
<td>73.3</td>
<td>74.5</td>
<td>75.8</td>
</tr>
<tr>
<td>NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)</td>
<td>66.9</td>
<td>74.5</td>
<td>71.9</td>
<td>71.1</td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td><strong>68.8</strong></td>
<td><strong>71.6</strong></td>
<td><strong>71.5</strong></td>
<td><strong>70.2</strong></td>
</tr>
<tr>
<td>Annual/monthly denominator</td>
<td>392,449</td>
<td>36,792</td>
<td>32,580</td>
<td>35,943</td>
</tr>
</tbody>
</table>
Monthly coverage between January and March 2019 was between 0.6% and 1.3% below coverage reported for the same period in 2018 but followed a similar seasonal trend (Figure 1). Average annual coverage for the 2018-19 financial year was 3.1% lower than annual coverage for 2017-18. Coverage between January and March 2019 remains higher than coverage observed prior to April 2016 (Figure 1) which is reflected in the data tables associated with this report.

**Figure 1. Monthly pertussis vaccination coverage (%) in pregnant women: England, 2013-2019**

Footnotes:

1. New IT specification implemented in March/April 2016 [10]; 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.
3. Data from one of the largest IT suppliers were missing in April 2017.
4. Data from the smallest IT supplier was excluded July 2017 to September 2018.
Discussion

Pertussis activity was lower in 2018 than in any year since the outbreak peak in 2012. Confirmed pertussis cases in 2018 were 32% lower than those reported during 2017; cases in infants under three months of age were more than 50% lower in 2018 compared to 2017 [11]. The number of confirmed cases in infants under 3 months remains low with 12 confirmed cases from January to March 2019 compared to 9 and 31 cases in the same quarter in 2018 and 2017 respectively [12]. 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. Disease levels remain elevated in older age groups and so unprotected young infants continue to be at risk of infection with the increased possibility of serious complications in this age group.

Since 2016 vaccine coverage has been around 70%. Factors that could have contributed to the overall increase in coverage observed since April 2016 were described in the April to September 2016 report [10]. Between January and March 2019, pertussis vaccine coverage varied by over 20% each month between Local Teams. Identifying methods and procedures in areas achieving consistently high coverage for pertussis vaccination during pregnancy and applying them to low coverage areas may help address this gap.

Overall, prenatal pertussis vaccine coverage between January and March 2019 remained above 70%, decreasing from 71.6% in January to 70.2% in March. This follows a similar downward trend at the beginning of the year which has been seen in previous years and could be due to the end of the influenza season with its increased opportunities and signposting for pre-natal pertussis vaccine. Additionally, average annual prenatal pertussis vaccine coverage over the 2018/19 financial year was 3.1% lower than average coverage reported in 2017/18. Limitations to the data presented in this report may explain the gradual decrease in coverage.

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 [13], indicates that in 2016 these data represented about 65% of the population of pregnant women. A PHE report (unpublished) suggests that maternity
notes regarding pregnancy and delivery are often scanned or archived, rather than coded in an extractable format.

Second, 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 early findings (pending publication) suggest that while maternity delivery of pertussis vaccine may increase vaccine coverage, only a small proportion of doses delivered in maternities are recorded in GP systems. As a result, maternity delivery of pertussis vaccination may even lead to an artefactual decrease in vaccine coverage when only GP data is analysed (as is the case with this report) as shift from vaccination in general practice to vaccination in maternities takes place.

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 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 [14] and sign-post the woman to her GP to receive the vaccine.

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].
References


2. Public Health England (2012). 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.


5. JCVI (2014). Joint Committee on Vaccination and Immunisation minutes.


7. JCVI (2016). Joint Committee on Vaccination and Immunisation Minutes (February 2016).


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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.

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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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