Pertussis vaccination programme for pregnant women: vaccine coverage in England, January to March 2020 and 2019-20 annual coverage

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Pertussis vaccination programme for pregnant women: vaccine coverage in England, January to March 2020 and 2019-20 annual coverage

This report presents pertussis vaccine coverage in pregnant women in England for the period January to March 2020, updating previous data reported for October to December 2019 [1]. This report also presents annual data from April 2019 until March 2020, where all the monthly data for the financial year were collated to determine annual vaccine coverage.

Following increased pertussis activity in all age groups, including infants under 3 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 8 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 72.2% across the quarter, 1.1 percentage points higher than coverage for the same quarter in 2018/19
- annual vaccine coverage for the financial year 2019/20 was 70.5%, 1.7 percentage points higher compared to 2018/19
Methods

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

Annual vaccine coverage was calculated by summing the 12 monthly numerators and denominators for the financial year (April 2019 to March 2020). This is different to previous reports where a separate annual extraction (based on the same coding specification) was used to report annual coverage.

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

National GP practice participation remained high, 99.2% (January), 98.9% (February), and 98.8% (March). All GP IT suppliers provided data for the January to March quarterly figures.

* 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
Results

Monthly pertussis vaccine coverage ranged across the quarter from 72.5% in January 2020 to 72.0% in March 2020 with average coverage for the quarter at 72.2% (Table 1, Figure 1, see data tables). During this period, monthly prenatal pertussis vaccine coverage by NHS England Local Team ranged from 58.0% (London, February) to 81.0% (Cumbria and North East, February) (Table 1). Annual vaccine coverage for April 2019 to March 2020 was 70.5%, ranging from 57.4% (London) to 78.9% (Yorkshire and Humber, and Cumbria and North East).

Monthly coverage between January to March 2020 was between 0.5 to 1.8 percentage points greater than coverage reported for the same period in 2019 and followed a similar seasonal trend (Figure 1). Average annual coverage for the 2019/20 financial year was 1.7 percentage points higher than annual coverage for 2018/19. Coverage between January and March 2020 remains higher than coverage observed prior to April 2016 (Figure 1) which is reflected in the attached data tables.

Figure 1. Monthly pertussis vaccination coverage (%) in pregnant women: England, 2013 -2020

Footnotes:
1. New IT specification implemented in March/April 2016 [9]; 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, and August to September 2019.
Table 1. Monthly and annual pertussis vaccination coverage (%) in pregnant women by NHS England Local Team (England): Quarter 4, 2019/20 (January to March 2020)

<table>
<thead>
<tr>
<th>NHS England Local Team</th>
<th>Annual*</th>
<th>Jan-20</th>
<th>Feb-20</th>
<th>Mar-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>London</td>
<td>57.4</td>
<td>58.3</td>
<td>58.0</td>
<td>58.2</td>
</tr>
<tr>
<td>North East and Yorkshire (Yorkshire and Humber)</td>
<td>78.9</td>
<td>80.4</td>
<td>80.7</td>
<td>80.3</td>
</tr>
<tr>
<td>North East and Yorkshire (Cumbria and North East)</td>
<td>78.9</td>
<td>80.5</td>
<td>81.0</td>
<td>80.9</td>
</tr>
<tr>
<td>North West (Cheshire and Merseyside)</td>
<td>70.6</td>
<td>72.4</td>
<td>73.1</td>
<td>73.5</td>
</tr>
<tr>
<td>Midlands (North Midlands)</td>
<td>74.9</td>
<td>78.1</td>
<td>76.3</td>
<td>77.5</td>
</tr>
<tr>
<td>Midlands (West Midlands)</td>
<td>67.4</td>
<td>71.1</td>
<td>69.3</td>
<td>70.6</td>
</tr>
<tr>
<td>Midlands (Central Midlands)</td>
<td>71.2</td>
<td>74.2</td>
<td>71.9</td>
<td>67.3</td>
</tr>
<tr>
<td>East of England</td>
<td>70.7</td>
<td>72.9</td>
<td>73.2</td>
<td>72.9</td>
</tr>
<tr>
<td>North West (Greater Manchester)</td>
<td>69.9</td>
<td>72.7</td>
<td>71.1</td>
<td>70.1</td>
</tr>
<tr>
<td>North West (Lancashire and South Cumbria)</td>
<td>72.1</td>
<td>74.8</td>
<td>74.5</td>
<td>76.0</td>
</tr>
<tr>
<td>South West (South West North)</td>
<td>72.6</td>
<td>74.6</td>
<td>72.5</td>
<td>73.2</td>
</tr>
<tr>
<td>South West (South West South)</td>
<td>74.3</td>
<td>76.5</td>
<td>77.7</td>
<td>77.5</td>
</tr>
<tr>
<td>South East (Hampshire, IoW and Thames Valley)</td>
<td>72.6</td>
<td>74.9</td>
<td>73.2</td>
<td>72.4</td>
</tr>
<tr>
<td>South East (Kent, Surrey and Sussex)</td>
<td>74.5</td>
<td>76.0</td>
<td>75.7</td>
<td>76.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>70.5</strong></td>
<td><strong>72.5</strong></td>
<td><strong>72.0</strong></td>
<td><strong>72.0</strong></td>
</tr>
<tr>
<td>Annual/monthly denominator</td>
<td>445107</td>
<td>37267</td>
<td>33597</td>
<td>35005</td>
</tr>
</tbody>
</table>

* Annual coverage was calculated using the monthly data from April 2019 to March 2020.
Discussion

In 2019 there were 3681 laboratory confirmed cases reported to the Pertussis Enhanced Surveillance Programme in England. In line with the cyclical nature of pertussis disease, the total confirmed in 2019 was 25% higher than the 2948 reported in 2018. The incidence in England was 7 per 100,000 in 2019 compared to 5/100,000 in the previous year and 8 per 100,000 in 2017; it reached 18 per 100,000 in 2012 (epidemic peak year). Prior to the major peak in 2012, annual incidence ranged between 0.4/100,000 to 2/100,000. The maternal pertussis immunisation programme, introduced in response to the 2012 outbreak, became permanent from June 2019. The number of confirmed cases in infants <3 months in 2019 was 69% higher (83 cases) than in 2018 when 49 cases were reported. However, incidence in this age group continues to decline overall from 234/100,000 in 2012 to 52/100,000 in 2019 with small expected cyclical increases. Raised levels of pertussis persist in all age groups other than infants, and it therefore continues to be important to encourage women to be immunised against pertussis at the optimal time during pregnancy in order to protect their babies from birth [11].

Since May 2016 vaccine coverage on a monthly basis remains approximately 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 [9]. As previously observed, pertussis vaccine coverage varied by over 20 percentage points each month between Local Teams this quarter. 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 2020 remained above 70%, decreasing from 72.5% in January to 72.0% 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 (where increased opportunities and signposting for pre-natal pertussis vaccine are observed during the influenza season). Additionally, average annual prenatal pertussis vaccine coverage over the 2019/20 financial year was 1.7 percentage points higher than average coverage reported in 2018/19 and 0.6 percentage points higher than the annual coverage based on the 11 monthly extracts in 2018/19 (data from one of the largest IT suppliers was not returned in April 2018).
Limitations to the data presented in this report may explain variability in coverage by Local Team and over time. 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 [12], indicates that in 2016, prior to the implementation of the revised IT specification, 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 in the national immunisation programme. 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 [13] 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 2014.


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


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