Immunisation

Pertussis Vaccination Programme for Pregnant Women: vaccine coverage estimates in England, June to September 2015

Background to the pertussis vaccination in pregnancy programme

In the UK the introduction of routine national immunisation against pertussis (whooping cough) in 1957 resulted in a marked reduction in pertussis notifications and deaths [1]. Despite a sustained period of high vaccine coverage since the early 1990s, pertussis has continued to display 3-4 yearly peaks in activity. Each year in the five years prior to 2012, there were on average in England nearly 800 confirmed cases of whooping cough, 270 babies admitted to hospital and four deaths in babies [Health Protection Agency (HPA) unpublished data]. The highest disease incidence occurs in infants under three months of age who are too young to have completed the primary vaccine course and have the greatest risk of complications and death. This age group is considered a key indicator of pertussis activity [2] and the primary aim of the pertussis vaccination programme is to minimise disease, hospitalisation and deaths in young infants.

In 2012, pertussis activity increased markedly beyond levels reported in the previous 20 years and extended into all age groups, including infants under three months of age. By April 2012, the HPA had declared a national pertussis outbreak (level 3 incident) [3]. In response to this ongoing outbreak, with the associated disease morbidity and mortality in infants, the Department of Health announced that pertussis immunisation would be offered to pregnant women from 1 October 2012 to protect infants from birth whilst disease levels remain high [4]. This programme aims to passively protect infants from birth, 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 [5].

Overall pertussis activity persists at raised levels compared to the years preceding the outbreak in 2012 [6]. The incidence of laboratory confirmed cases continues to be highest in infants under three months of age targeted by the vaccination programme. Unlike cases in those aged one year and older, however, reported cases in young infants are now back in line with those
seen before the 2012 peak. Between 1 October 2012 and 30 June 2015, 12 deaths have been reported in young babies with confirmed pertussis. Eleven of these 12 babies were born to mothers who had not been vaccinated against pertussis [6].

In June 2014 the Joint Committee on Vaccination and Immunisation (JCVI) considered available data relating to the coverage, effectiveness and safety of the programme, its impact on disease and current epidemiology and advised that the programme should continue for a further five years [7]. This includes the continuation of all surveillance activities introduced to monitor the programme.

**Vaccine coverage collection methods**

Since April 2014, monthly data on the coverage of pertussis vaccination in pregnancy in England have been collected from GP records via the ImmForm website¹. The ImmForm web-based system automatically extracts vaccine coverage data from participating General Practice (GP) clinical systems with minimal or no burden to the NHS. Data are then validated and analysed by PHE to check data completeness, identify and query any anomalous results and identify epidemiological trends.

The monthly surveys capture data on number of women who delivered in the survey month at more than 28 weeks gestational age (denominator), and the number of pregnant women who delivered after 28 weeks gestational age in the survey month that received a dose of pertussis-containing vaccine in the preceding fourteen weeks (numerator).

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 28 of pregnancy, regardless of the setting where the vaccine was administered
- where relevant, any record of a premature delivery occurring at less than 28 weeks gestational age

In addition to the numerator and denominator, the automated survey records the number and percentage of GP practices responding each month.

This report updates the previous summary of the pertussis vaccination programme for pregnant women for the five months ending 31 May 2015 [8], presenting data collected for four months ending 30 September 2015.

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. https://portal.immform.dh.gov.uk/Logon.aspx?returnurl=%2fhome.aspx.
Results

Pertussis vaccine coverage in pregnant women increased over the four months from 55.1% in June to 57.7% in September 2015 (see figure). As observed in 2013 and 2014, coverage declined in late winter and early spring but was maintained at higher levels through the summer months than in the previous two years.

The proportion of GP practices participating nationally in the survey each month was 95.0%.

Vaccine coverage by NHS England Area Team (AT) and Clinical Commissioning Group (CCG) for the period April to September 2015 is presented in an Appendix associated with this report. In September 2015 there was a 21.6% difference in coverage between the ATs with the highest and lowest coverages (68.3% in South Yorkshire and Bassetlaw, 46.6% in London). Nine ATs achieved coverage greater than 60% for all four months and the number of ATs reporting greater than or equal to 60% coverage increased from 9/25 in June to 14/25 in September.

Prenatal pertussis vaccine coverage in England, January to December 2013 and 2014, with January to September 2015 data for comparison
Discussion

Compared with the same period of the previous year, prenatal pertussis vaccine coverage between June and September 2015 was higher every month, with the trough in late spring to early summer 2013 and 2014 not seen. The increase in coverage between September and December in both 2013 and 2014 coincides with the delivery of the seasonal influenza vaccination programme which also targets pregnant women [9], and it is anticipated that a similar increase will occur in late 2015. During the flu campaign GP practices actively call and recall eligible patients, which should include pregnant women, and this may be having a positive knock-on effect on pregnant women being offered pertussis vaccine at the same time.

Overall pertussis disease continues to persist at increased levels in those aged one year and older compared to the years preceding the outbreak in 2012 [6]. Unprotected young infants therefore continue to be at risk of infection and GPs and midwives should continue to encourage pregnant women to receive the pertussis vaccine, ideally between weeks 28 and 32 of their pregnancy (but up to week 38) [10], to further reduce the incidence of pertussis in young infants. Considerable variation in coverage between ATs has consistently been reported, with around a 20% difference between those with the highest coverage and those with the lowest coverage. 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 several 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 this data with national data on live births, indicates these data represent about 60% of the population of pregnant women [11]. However, monthly variations in the denominator closely mirror the seasonal variation observed in national live births.

Secondly, the survey does not cover all GP practices in England, although 95% of GP practices participated, and there may be differential completeness of the recording of delivery dates among GPs. 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.

Comparison with other data sources examined to estimate the vaccine coverage of this programme suggests that this methodology may be underestimating coverage [12]. If coverage, and ultimately the impact of the programme itself, is to be accurately monitored, it is essential
that GPs and practice nurses ensure that vaccination and date of delivery are recorded in the patient’s GP record.

Continued support in the delivery of this important programme is being sought from service providers (GP practices and maternity units), Screening and Immunisation Teams and Health Protection Teams. Screening and Immunisation Teams should continue to update service providers on the current epidemiology of the disease, the effectiveness of the vaccination programme and the need to maintain and improve coverage achieved. Further information on the pertussis vaccination programme for pregnant women is available here: https://www.gov.uk/government/collections/pertussis-guidance-data-and-analysis.

References

Appendix
“Prenatal pertussis coverage by area team: England, April to September 2015” is available on the GOV.UK website page “Pertussis immunisation in pregnancy: vaccine coverage estimates (England)”.