Public Health England

Protecting and improving the nation's health

Rotavirus infant immunisation programme 2014/15:

Vaccine uptake report on the temporary sentinel data collection for England

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Contents

Executive Summary

Rotavirus is a very common and potentially serious infection of the large bowel, mainly affecting young babies. Nearly every child will have at least one episode of rotavirus gastroenteritis by five years of age. People of any age can be affected but the illness is more severe in young infants. Symptoms of rotavirus infection include vomiting, diarrhoea, stomach cramps and mild fever, which usually last for three to eight days. Some children, however, may develop severe gastroenteritis, become dehydrated and require hospitalisation for rehydration. The rotavirus immunisation programme was introduced on 1 July 2013 in the UK with the objective of preventing a significant number of young infants from developing rotavirus infection. It may also provide some additional protection to the wider population through herd immunity. The aim of the rotavirus immunisation programme is to provide two doses of vaccine to infants from six weeks of age and before 24 weeks of age. The first dose of vaccine is offered at two months (approximately eight weeks) of age and the second dose at least four weeks after the first dose.

In order to rapidly assess the implementation of the programme in England, PHE established a sentinel vaccine coverage collection via automatic uploads of GP practice data using the ImmForm website. This temporary surveillance programme for rotavirus coverage will eventually be replaced by data from the routine quarterly COVER (Cover of vaccination evaluated rapidly) reporting scheme, which will assess vaccine coverage for rotavirus vaccine alongside other vaccines offered in the first year of life for all children in England aged 12 months, using data extracted from Child Health Information Systems (CHIS). This report presents data covering the period February 2014 to March 2015; the first fourteen months where rotavirus vaccine coverage data, evaluated at 25 weeks of age for children offered vaccine through the routine vaccination programme, were available.

High coverage was rapidly achieved for the first cohort of children offered rotavirus vaccine routinely in England and this has been maintained throughout the first fourteen months of the routine programme. Over this period, rotavirus vaccine coverage for children in the routine cohort averaged 93.3% for one dose and 88.3% for two doses. This ranged by NHS England Area team (AT) from 89.5% (Devon, Cornwall and Isles of Scilly AT) to 95.7% (Cumbria, Northumberland, Tyne and Wear AT) for one dose, and from 82.5% (London AT) to 92.5% (Durham, Darlington and Tees AT) for two doses.

In this report, rotavirus vaccine coverage data is published by ethnicity and gender for the first time. Although the ethnicity data is still experimental these data do suggest that rotavirus vaccine coverage varies by ethnicity with the White-British, Chinese and Indian ethnic groups having the highest coverage for both one dose (93.5%, 92.4% and 92.4% respectively), and two doses of vaccine (88.3%, 86.1% and 85.9% respectively). Infants

of ‘Other’ ethnic groups and white-Irish ethnicity had the lowest coverage for both one and two doses of vaccine (80.7% and 83.1% for one dose; 72.7% and 74.8% for two doses respectively). Coverage was comparable for both males and females.

Rotavirus infection in the UK is seasonal, occurring mostly in winter and early spring (January to March). The number of rotavirus laboratory reports in England was 67% lower for the 2013/14 season than the ten-season average covering the period 2003/2004 to 2012/13. This decline in cases has continued and been sustained during the 2014/15 rotavirus season (laboratory reports are currently 69% lower than the ten-season average) suggesting that the introduction of the rotavirus vaccine has been successful in significantly reducing the burden of rotavirus disease.

Background

The national rotavirus immunisation programme started in July 2013[1] following the advice and recommendation by the Joint Committee on Vaccination and Immunisation (JCVI).[2] Rotavirus is a very common and potentially serious infection of the large bowel, mainly affecting young babies. Nearly every child will have at least one episode of rotavirus gastroenteritis by five years of age. People of any age can be affected but the illness is more severe in young infants. Symptoms of gastroenteritis include vomiting, diarrhoea, stomach cramps and mild fever, which usually last for three to eight days. Some children, however, may develop severe gastroenteritis and become dehydrated, and require hospitalisation for rehydration. The rotavirus immunisation programme in the UK is expected to prevent a significant number of young infants from developing this infection. A published study [3] estimated that vaccinating a birth cohort of infants in England and Wales may prevent around 90,000 infections, about 10,000 hospitalisations and around two deaths due to rotavirus in that cohort over the first five years of life. It may also provide some additional protection to the wider population through herd immunity.

There are two rotavirus vaccines authorised for use by the European Medicines Agency, Rotarix (manufactured by GSK) and RotaTeq® (manufactured by Sanofi Pasteur MSD). Rotarix is the vaccine being used in the UK and is a live attenuated vaccine administered orally to young infants. The aim of the rotavirus immunisation programme is to provide two doses of Rotarix vaccine to infants from six weeks of age and before 24 weeks of age. The first dose of Rotarix vaccine is offered at two months (approximately eight weeks) of age and the second dose at least four weeks after the first dose. The Rotavirus Green Book chapter summarises the history and epidemiology of the disease and provides detailed recommendations on supply, storage and use of the vaccine as well as guidance on contraindications, precautions and adverse reactions.[4]

All PHE documents relating to the rotavirus vaccination programme for infants – including training slide-sets, patient leaflets and factsheets – are accessible via the PHE Rotavirus Vaccination Programme for Infants series webpages.[5]

Public Health England's immunisation information for health professionals home page can be found here: http://www.gov.uk/government/organisations/public-health-england/series/immunisation

Methods

Vaccine coverage data collection

In order to rapidly assess the implementation of the programme in England, PHE established a sentinel vaccine coverage collection via ImmForm.[1] This temporary surveillance programme for rotavirus coverage will eventually be replaced by data from the routine quarterly COVER (Cover of vaccination evaluated rapidly) reporting scheme, which will assess vaccine coverage for rotavirus vaccine alongside other vaccines offered in the first year of life for all children in England aged 12 months, using data extracted from Child Health Information Systems (CHIS).[1] In England a new Information Standards Notice (ISN) for the COVER programme was approved by the Standardisation Committee for Care Information (SCCI) in September and published in November 2014 [6]. Some CHIS IT suppliers are still making the necessary changes to their systems in order to become compliant with the ISN and are not yet able to provide rotavirus vaccine coverage data. Once all areas are compliant and data is flowing across England the ImmForm collection will no longer be required.

The sentinel surveillance programme was set up to extract monthly coverage data directly from GP practice systems for children who had reached the upper age for receiving the vaccine (25 weeks).[1] The ImmForm web-based system has been developed over a number of years, collecting and presenting data in relation to immunisation programmes in England. The system automatically extracts data from participating general practice (GP) clinical systems allowing collection with minimal or no burden to the NHS while providing quick and timely coverage figures. The data is stored securely and a variety of hierarchical reports to support programme performance management at local and national levels are provided. Vaccine coverage data can be reported at the desired frequency, usually monthly, allowing rapid assessment of new vaccination programmes.

[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://www.immform.dh.gov.uk/SignIn.aspx?ReturnUrl=%2f

Vaccine coverage data for the rotavirus immunisation programme submitted through the ImmForm website is monitored, validated and analysed by PHE. Monthly data is collected on the following:

- denominator: the number of infants in a GP practice who, in the survey month, reach 25 weeks of age

- numerators: number of infants in the denominator who received a) a first dose and b) a second dose of Rotarix from six weeks of age up to 24 weeks of age, including vaccinations given by other healthcare providers

One of the provisions of the Equality Act 2010 was to introduce the public sector Equality Duty which came into force across Great Britain on 5 April 2011. Public bodies need to be satisfied that they have sufficient information to understand the effects of a particular policy on people with protected characteristics (ie age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex, and sexual orientation), or the way a function is carried out, on the aims set out in the general equality duty.[7] In order to monitor inequalities in vaccine coverage, additional information on gender and ethnicity was collected in the monthly rotavirus vaccine coverage surveys.

Although the rotavirus vaccine programme was introduced in July 2013, children evaluated in the monthly surveys prior to February 2014 would have been offered rotavirus vaccine opportunistically alongside their two- and three-month immunisations, or via a separate specific appointment. The data presented in this report cover the period February 2014 to March 2015, the first fourteen months where rotavirus vaccine coverage data, evaluated at 25 weeks of age for children offered vaccine through the routine vaccination programme, were available. While ethnicity and gender are reported in the monthly collections, numbers for each of the different ethnic groups reported on a monthly basis are too small to allow meaningful interpretation of the data. For the first time, rotavirus vaccine coverage data is published in this report by ethnicity and gender, using this larger aggregated dataset spanning fourteen months. This data is considered experimental and should be interpreted with the caveats detailed in the report. In order to assess the representativeness of this data, comparisons were made with the 2011 National Census data.[8]

National laboratory reports of rotavirus

Microbiology laboratories across England report laboratory-confirmed rotavirus infections to Public Health England (PHE) for surveillance purposes. Data on the number of laboratory reports of rotavirus in England are collated by the PHE Gastrointestinal, Emerging and Zoonotic Infections department (GEZI). Weekly counts

(by date of specimen) of laboratory-confirmed rotavirus infections between July 2009 and May 2015 were extracted and annual seasonal data compared.

Results

Vaccine coverage data

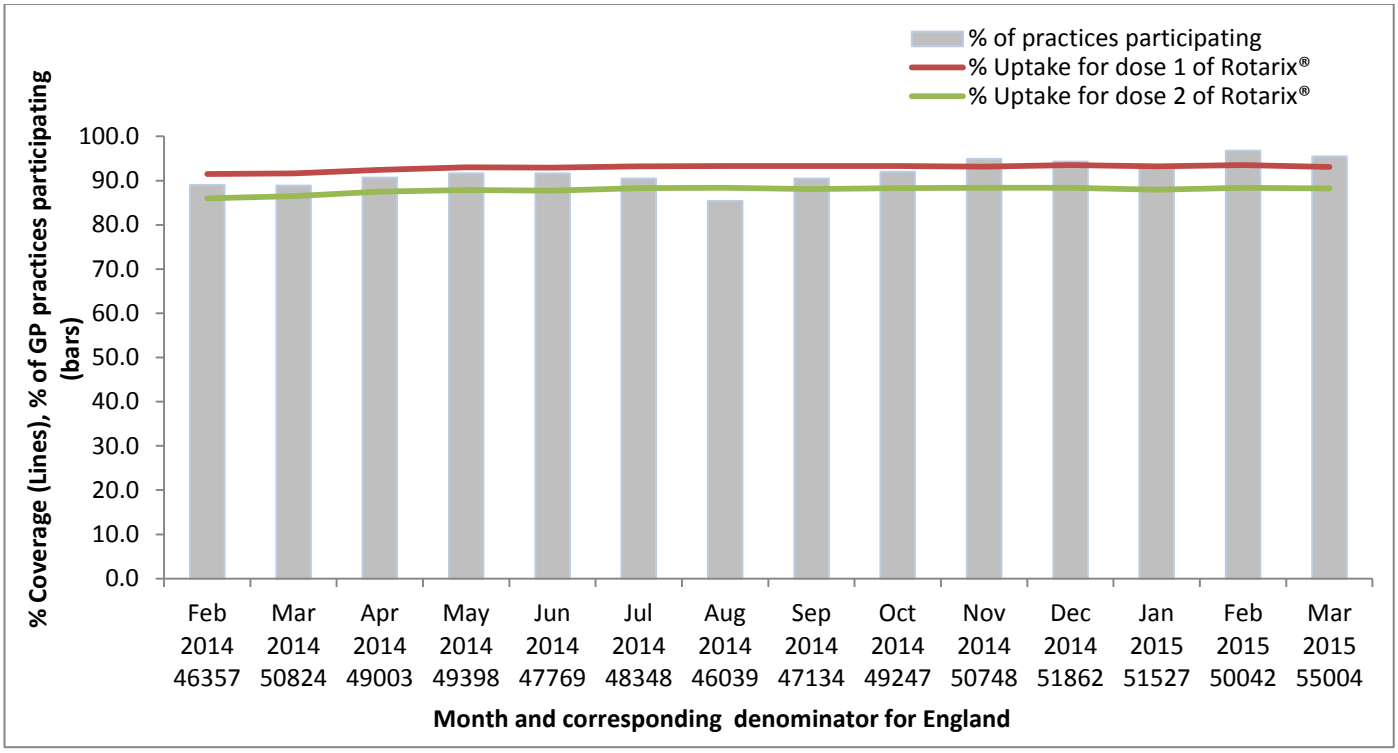
GP practice participation was high and ranged from 85.4% to 96.8% of all GP practices in England every month (each monthly survey represents between 46,357 and 55,004 children) (Figure 1).

Rotavirus vaccine coverage data for children in the routine vaccination cohort averaged 93.3% for one dose, and was consistently above 93% from July 2014 through to March 2015 (Appendix 1). Coverage for the two dose course averaged 88.3% (Appendix 2). Coverage varied by NHS England area team (AT) and ranged from 89.5% to 95.7% for one dose, and 82.5% to 92.5% for two doses.

Coverage was consistently above 85% for all ATs for the first dose, and from September 2014 onwards, all ATs consistently reported coverage of ≥90%. From May 2014 onwards, three ATs (Durham, Darlington and Tees; Cumbria, Northumberland, Tyne and Wear and South Yorkshire and Bassetlaw) consistently reported coverage ≥95% for the first dose.

All ATs consistently reported coverage of the second dose of at least 79.6%. Coverage improved from May 2014 onwards, with the majority (at least 23/25) of ATs reporting coverage of the second dose of at least 85%. Four ATs – Durham, Darlington and Tees; East Anglia; Hertfordshire and the south Midlands; and North Yorkshire and the Humber – consistently reported more than 90% coverage for the second dose. Seven ATs (London; Merseyside; Devon, Cornwall and Isles of Scilly; Greater Manchester, Birmingham and the Black Country; Bristol, North Somerset, Somerset and South Gloucestershire; Kent and Medway; Surrey and Sussex) had below average coverage for both one and two doses of vaccine.

Figure 1: Monthly rotavirus vaccination coverage estimates (primary and secondary dose) by age 25 weeks and the percentage of GP practices participating February 2014 to March 2015



Reporting of gender indicated that 51.3% of eligible infants were male, the same as that reported in the Office for National Statistics (ONS) live birth statistics for 2013.[9] Rotavirus vaccination coverage was comparable for males and females for both one dose (93.1% versus 93.3%), and two doses (88.0% versus 88.3%).

Only two (EMIS and Microtest) out of four GP IT suppliers were able to extract complete ethnicity data for the routine cohort, where every child in a practice had been assigned an ethnicity code including those coded as 'not stated' (Table 1), representing 55.4% of all the children surveyed. However, an ethnic group was only assigned for 57.4% of these children, representing just 31.8% of eligible children overall. Due to these limitations the ethnicity data should be interpreted with caution. Despite this, the proportions of children recorded as being of white (75.5%) or black ethnicity (5.3%) were comparable with estimates from the 2011 national census for children aged 0-4 years (75.8% and 5.3% respectively).[9] Children reported as Asian or other ethnicities were slightly over represented compared with the 2011 census data (11.7% versus 10.8% and 1.9% versus 1.5% respectively), while children reported as mixed ethnicity were under represented (4.7% versus 6.5%).

Average coverage between February 2014 and March 2015 for children registered with these two IT suppliers was marginally lower than the average for all children included in

the surveys (92.9% versus 93.3% for 1st dose; 87.9% versus 88.3% for 2nd dose). The data suggest that rotavirus vaccine coverage varied by ethnicity with a 12.8% and 15.6% difference in coverage recorded for one and two doses respectively between the groups with the highest coverage and those with the lowest coverage.

Infants from white-British, Chinese and Indian ethnic groups had the highest coverage at 93.5%, 92.4% and 92.4% respectively for one dose, and 88.3%, 86.1% and 85.9% respectively for two doses. Infants from other ethnic groups and of white-Irish ethnicity had the lowest coverage for both one and two doses of vaccine (80.7% and 83.1% for one dose respectively; 72.7% and 74.8% for two doses respectively).

Table 1. Rotavirus vaccine coverage by ethnic group for the routine cohort at 25 weeks of age, February 2014 to January 2015 (ranked by dose 1 coverage)

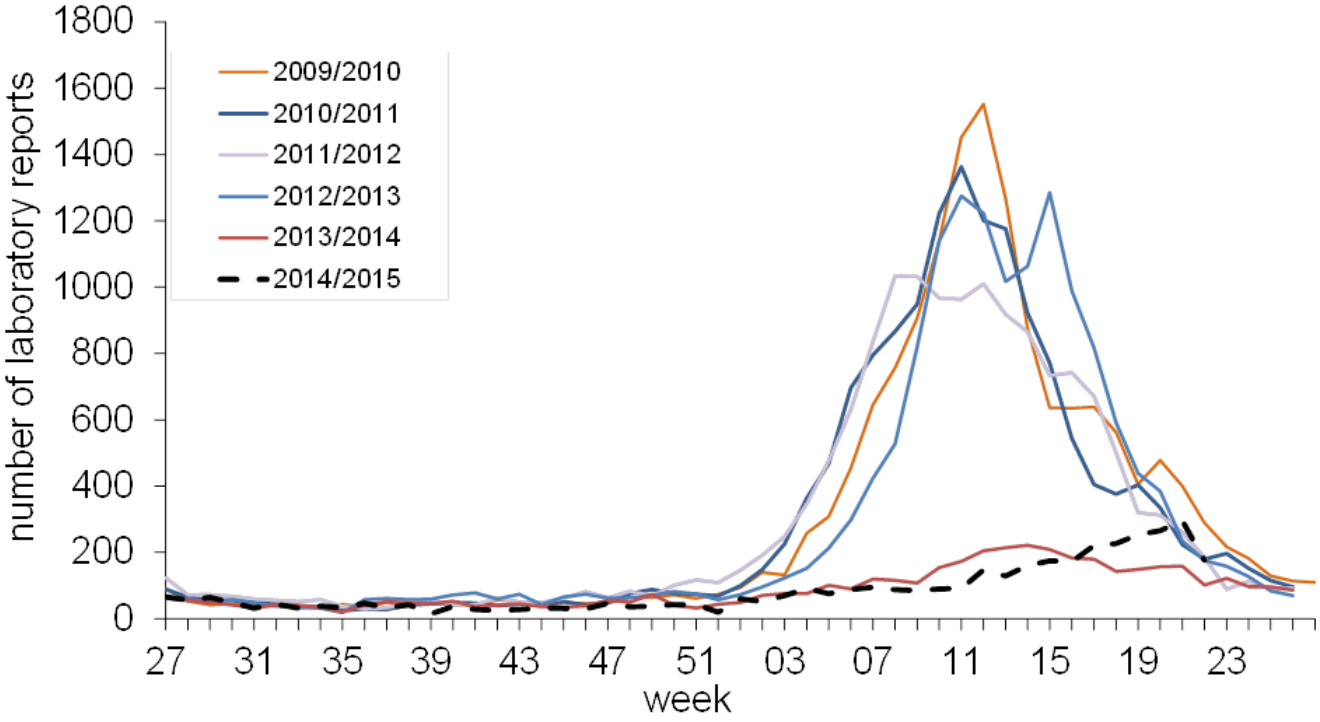
Ethnic group	No. of patients	No. vaccinated with one dose	% uptake of one dose of Rotarix	No. vaccinated with two doses	% uptake of two doses of Rotarix
White - British	125491	117344	93.51	110786	88.28
Asian or Asian British - Indian	6189	5699	92.08	5304	85.70
Other ethnic groups - Chinese	1131	1048	91.69	974	86.12
Asian or Asian British - Any other Asian background	4301	3940	91.61	3633	84.47
Black or Black British - African	5855	5349	91.36	4894	83.59
Asian or Asian British - Bangladeshi	3898	3540	90.82	3267	83.81
Mixed - White and Black African	1494	1354	90.63	1278	85.54
Mixed - White and Asian	2078	1876	90.28	1749	84.17
Asian or Asian British - Pakistani	7657	6907	90.21	6345	82.87
Mixed - White and Black Caribbean	1979	1760	88.93	1611	81.40
Mixed - Any other mixed background	3206	2841	88.62	2618	81.66
White - Any other White background	16678	14594	87.50	13454	80.67
Black or Black British - Any other Black background	2619	2280	87.06	2043	78.01
Black or Black British - Caribbean	1460	1256	86.03	1120	76.71
White - Irish	452	374	82.74	336	74.34
Other ethnic groups - Any other ethnic group	3653	2951	80.78	2655	72.68
Ethnicity not stated/recorded	137680	125640	91.26	117421	85.29
Ethnicity not given - patient refused	148	123	83.11	113	76.35
Total	**325,969**	**298,876**	**91.69**	**279,601**	**85.78**

Laboratory reports of rotavirus infection

Rotavirus infection in the UK is seasonal, occurring mostly in winter and early spring (January to March). The number of rotavirus laboratory reports in England was 67% lower for the 2013/14 season than the ten-season average covering the period 2003/2004 to 2012/13.[10] This decline in cases has continued and been sustained during

the 2014/15 rotavirus season (laboratory reports currently at 69% lower than the ten-season average) suggesting that the introduction of the rotavirus vaccine has been successful in significantly reducing the burden of rotavirus disease.[11]

Figure 2: Seasonal comparison of laboratory reports of rotavirus 2009/2010 to 2014/15 in England



Discussion:

High coverage was rapidly achieved for the first cohort of children offered rotavirus vaccine routinely in England and this was maintained throughout the first fourteen months of the routine programme. Coverage varied among ATs, on average by 6.2% for the first dose and 9.9% for the second dose. On average, national coverage was 5% higher for the first rotavirus vaccine dose than the second. ATs with the lowest coverage of the first dose also had the lowest coverage of the second dose.

Rotavirus vaccination is unique in the routine childhood immunisation schedule in that administration of the vaccine is bound by strict age limits.[4] For the first dose, infants must be aged six weeks and it is preferable that the full course of two doses of Rotarix be completed before 16 weeks of age, allowing at least four weeks between the first and second dose. This is to provide early protection and avoid temporal association

between vaccination and intussusception. Children who inadvertently receive the first dose of rotavirus vaccine at age 15 weeks or older should still receive their second dose at least four weeks later - providing that they will still complete the course by less than 24 weeks of age. After 23 weeks and 6 days rotavirus vaccine is contraindicated. Because of these strict timeframes, if a child is not vaccinated with the first dose early enough it is not possible for them to complete their schedule and this probably accounts for why coverage for a completed course of this vaccine is slightly lower than completed courses of the other vaccines offered in the first year of life (eg DTaP/IPV/Hib, PCV and MenC).[12]

Vaccine coverage varied by ethnic group by as much as 12.8% for one dose and 15.6% for two doses. For both one and two doses of vaccine, only infants of white-British ethnicity exceeded the average uptake, while all other ethnic groups had lower than average coverage. The lowest coverage was for infants from “other ethnic groups”, a heterogeneous group that is difficult to define and target. Second to this was the white-Irish category, with 10% and 13% lower coverage for one and two doses than white-British children. It should be noted, however, that this group represented the smallest denominator, comprising just 0.14% of the cohort used for ethnicity analyses. While census data includes a “white: Gypsy or Irish traveller” category for defining traveller populations, the GP data only have a white-Irish category, and it is likely that this group includes individuals from traveller populations, a considerably marginalised group with restricted access to healthcare and poor health outcomes.[13-15]

These preliminary findings highlight the importance of collecting this data to describe health inequalities and help target communication and interventions to improve uptake among ethnic minorities. Ethnicity data was only available from two IT suppliers, representing over half of eligible infants in the cohort. Ethnicity was coded as not reported for 42% of those infants, meaning ethnicity was available for less than a third of eligible children. This level of capture of ethnicity was similar to that reported for shingles coverage.[16] This is surprising as it has been reported that following the incentivisation of ethnicity recording within primary care under the Quality and Outcomes Framework (QOF) in 2004, recording dramatically increased to levels of over 90% for all newly registered patients.[17-21] We would therefore expect ethnicity data for young babies to be closer to 90% completion rather than the 42% reported in the ImmForm collection. The good correlation between the available ethnicity data and the 2011 census data suggests however that the data was largely representative. We are working with GP IT suppliers, and ImmForm and PRIMIS[1] colleagues, to explore possible explanations for the low levels of ethnicity coding in the ImmForm data extracts such as the use of different ethnicity READ codes in primary care.

A considerable decline in the number of laboratory reported cases of rotavirus was observed for the 2013/14 rotavirus season following the introduction of rotavirus vaccine in July 2013. This decline in cases has continued and been sustained for the 2014/15

rotavirus season and it is apparent that the introduction of the rotavirus vaccine has been successful in significantly reducing the burden of rotavirus disease.

[1] PRIMIS are a business unit of the University of Nottingham and were commissioned by Public Health England to provide READ codes for this collection

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Appendices

Appendix 1: Monthly rotavirus vaccine coverage for one dose (%)[1] at 25 weeks of age by area team: England, February 2014 to March 2015

Area Team	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015		
														Number patients registered	Number vaccinated with dose 1 of Rotarix®	% vaccinated with dose 1 of Rotarix®
Cheshire, Warrington & Wirral (Q44)	93.2	91.7	91.6	90.8	91.4	92.0	92.9	94.4	91.7	93.9	94.0	94.7	94.3	1063	991	93.2
Durham, Darlington & Tees (Q45)	93.6	94.5	96.1	95.1	95.5	95.4	95.9	96.4	96.9	96.5	96.1	96.5	95.0	1044	1004	96.2
Greater Manchester (Q46)	90.6	90.5	90.7	91.6	91.0	91.8	92.1	92.5	91.9	92.3	92.2	91.8	92.3	3027	2765	91.3
Lancashire (Q47)	90.9	93.1	93.9	94.6	95.3	94.6	95.2	96.1	94.7	95.3	95.2	93.8	94.6	1549	1462	94.4
Merseyside (Q48)	87.1	88.5	90.0	90.3	91.0	90.0	90.2	90.5	92.5	92.5	91.0	92.0	91.1	1222	1107	90.6
Cumbria, Northumberland, Tyne & Wear (Q49)	95.0	94.3	94.7	95.6	95.4	96.2	96.2	96.5	96.2	95.8	96.4	95.6	95.2	1686	1629	96.6
North Yorkshire & Humber (Q50)	95.5	95.4	95.3	95.8	95.0	95.7	96.2	96.1	94.3	95.8	96.4	95.0	95.3	1466	1389	94.7
South Yorkshire & Bassetlaw (Q51)	94.9	95.0	94.7	95.9	95.1	96.8	95.0	96.6	95.1	95.6	95.3	95.6	96.1	1424	1353	95.0
West Yorkshire (Q52)	94.5	94.2	94.7	95.2	93.9	94.4	94.9	95.3	95.1	95.2	95.1	95.3	95.6	2518	2378	94.4
Arden, Herefordshire & Worcestershire (Q53)	89.4	91.9	93.2	94.9	93.9	93.4	94.5	94.6	93.9	95.3	96.6	95.6	93.3	1493	1411	94.5
Birmingham & the Black Country (Q54)	90.0	89.7	90.9	91.4	92.8	92.9	93.3	93.6	92.2	92.0	93.0	93.0	91.7	2846	2596	91.2
Derbyshire & Nottinghamshire (Q55)	94.6	93.7	94.5	95.1	95.1	95.0	95.1	94.7	94.8	94.5	95.6	95.1	95.4	1897	1809	95.4
East Anglia (Q56)	94.5	93.2	95.7	94.3	94.6	95.1	95.6	95.5	95.5	94.1	95.2	95.1	94.3	2268	2150	94.8
Essex (Q57)	95.7	93.3	94.7	95.6	95.0	95.1	95.7	95.3	95.3	96.1	94.5	93.8	95.1	1672	1579	94.4
Hertfordshire & the South Midlands (Q58)	94.5	94.2	93.9	94.8	94.4	94.7	94.4	94.6	95.2	94.5	95.8	94.5	95.2	2862	2701	94.4
Leicestershire & Lincolnshire (Q59)	92.0	91.7	93.2	93.4	94.4	93.7	94.6	94.6	94.7	93.9	93.8	94.0	94.8	1742	1617	92.8
Shropshire & Staffordshire (Q60)	92.7	95.7	93.9	95.1	96.1	94.3	93.8	94.3	94.5	93.4	94.9	94.5	94.7	1343	1285	95.7
Bath, Gloucestershire, Swindon & Wiltshire (Q64)	93.0	93.9	94.1	93.4	93.3	94.8	94.4	94.7	93.7	94.0	94.4	94.2	94.0	1347	1282	95.2
Bristol, North Somerset, Somerset & South Gloucestershire (Q65)	89.9	88.4	88.7	92.2	92.3	91.5	92.4	92.3	93.3	92.4	92.6	91.3	93.1	1556	1446	92.9

Devon, Cornwall &Isles of Scilly (Q66)	85.5	88.1	89.4	90.9	88.0	90.8	89.5	86.9	89.7	90.1	90.6	91.5	90.3	1436	1313	91.4
Kent & Medway (Q67)	90.7	91.5	92.5	93.9	92.6	93.2	94.2	92.5	93.9	93.8	94.0	94.6	94.6	1553	1439	92.7
Surrey & Sussex (Q68)	91.3	90.5	92.7	93.2	93.0	93.1	92.4	92.8	92.9	93.2	93.0	92.8	92.4	2604	2423	93.0
Thames Valley (Q69)	92.7	92.2	92.5	94.2	93.5	93.4	92.9	93.6	94.0	93.7	93.4	94.2	94.7	2264	2143	94.7
Wessex (Q70)	93.3	93.2	93.8	94.9	94.6	95.2	95.6	93.5	94.4	94.8	94.5	94.3	95.3	2480	2342	94.4
London (Q71)	87.3	88.1	89.3	89.7	90.1	90.2	89.9	90.4	90.4	89.7	90.3	89.9	91.1	10642	9577	90.0
England	**91.5**	**91.6**	**92.4**	**93.0**	**92.9**	**93.2**	**93.3**	**93.3**	**93.3**	**93.2**	**93.5**	**93.3**	**93.5**	**55004**	**51191**	**93.1**
Monthly reported denominator	**46357**	**50824**	**49003**	**49398**	**47769**	**48348**	**46039**	**47134**	**49247**	**50748**	**51862**	**51527**	**50042**	**55004**		

1. Denominator and numerator presented for each area team for March 2015; these data are representative of all months presented

Appendix 2: Monthly rotavirus vaccine coverage for two doses (%)[1] at 25 weeks of age by area team: England, February 2014 to March 2015

Area Team	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015		
														Number patients registered	Number vaccinated with dose 1 of Rotarix®	% vaccinated with dose 1 of Rotarix®
Cheshire, Warrington & Wirral (Q44)	88.3	86.9	86.7	86.2	88.1	88.0	88.9	91.4	88.0	89.2	90.9	90.7	89.7	1063	954	89.7
Durham, Darlington & Tees (Q45)	90.7	91.6	92.7	92.0	92.2	91.2	92.7	94.6	93.8	92.8	92.6	92.2	91.9	1044	975	93.4
Greater Manchester (Q46)	84.2	84.3	84.9	85.6	84.2	86.2	86.0	86.8	86.5	86.4	86.6	85.1	85.3	3027	2564	84.7
Lancashire (Q47)	86.1	88.1	90.9	89.2	90.5	90.7	89.3	91.7	90.3	90.4	90.4	88.7	89.8	1549	1404	90.6
Merseyside (Q48)	78.3	81.9	82.4	83.0	85.1	82.5	83.1	82.8	82.8	84.3	83.6	85.6	82.6	1222	1045	85.5
Cumbria, Northumberland, Tyne & Wear (Q49)	90.1	89.4	90.3	90.1	92.6	92.4	92.6	92.1	92.2	92.4	93.5	91.3	91.2	1686	1571	93.2
North Yorkshire & Humber (Q50)	90.1	92.0	91.9	92.1	91.7	91.5	93.0	90.8	91.0	92.2	92.4	91.2	91.1	1466	1330	90.7
South Yorkshire & Bassetlaw (Q51)	90.9	90.8	89.5	91.0	90.0	91.7	90.6	91.4	91.1	90.8	90.0	89.1	91.4	1424	1277	89.7
West Yorkshire (Q52)	90.4	90.2	91.1	91.6	89.5	91.6	91.8	91.1	91.7	91.7	91.4	91.1	91.9	2518	2295	91.1
Arden, Herefordshire & Worcestershire (Q53)	83.9	87.7	88.9	90.5	89.4	88.5	88.7	89.8	89.9	89.9	91.6	90.4	88.0	1493	1358	91.0
Birmingham & the Black Country (Q54)	82.1	84.3	84.7	85.1	85.9	87.3	87.0	86.4	85.6	86.3	85.7	86.9	86.0	2846	2427	85.3
Derbyshire & Nottinghamshire (Q55)	89.9	89.3	90.3	91.0	91.1	91.2	91.3	89.5	89.9	90.4	91.1	89.7	90.9	1897	1714	90.4
East Anglia (Q56)	91.1	90.1	92.5	90.1	90.7	91.8	91.9	92.5	91.7	90.9	90.6	91.0	91.3	2268	2075	91.5
Essex (Q57)	91.5	89.2	90.9	91.4	91.4	92.0	92.8	91.5	91.8	93.7	91.3	89.8	91.2	1672	1519	90.8
Hertfordshire & the South Midlands (Q58)	90.9	91.1	91.1	91.9	91.7	91.6	91.0	91.9	92.7	91.3	92.2	90.6	92.1	2862	2604	91.0
Leicestershire & Lincolnshire (Q59)	89.2	88.1	90.3	90.0	91.1	90.8	90.8	91.7	92.0	90.6	90.3	90.6	89.8	1742	1557	89.4
Shropshire & Staffordshire (Q60)	87.9	91.8	90.3	91.4	92.5	90.1	90.9	89.9	90.4	89.6	91.8	90.5	90.8	1343	1224	91.1
Bath, Gloucestershire, Swindon & Wiltshire (Q64)	89.8	89.3	89.5	89.5	88.8	90.0	90.5	90.4	89.6	91.0	90.3	90.4	90.1	1347	1237	91.8
Bristol, North Somerset, Somerset & South Gloucestershire (Q65)	83.0	83.2	84.1	87.5	87.4	85.9	87.1	87.8	88.6	87.9	87.8	86.3	88.0	1556	1371	88.1
Devon, Cornwall &Isles of Scilly (Q66)	80.2	82.2	84.1	86.0	83.4	85.2	84.5	81.8	83.3	85.1	85.0	87.1	84.4	1436	1244	86.6
Kent & Medway (Q67)	83.8	86.5	86.5	89.2	87.0	87.6	88.9	87.1	88.8	89.5	88.9	88.2	88.5	1553	1349	86.9

Surrey & Sussex (Q68)	86.4	85.8	89.2	88.5	88.3	88.0	88.4	87.9	88.6	88.6	88.5	87.9	87.9	2604	2300	88.3
Thames Valley (Q69)	86.6	87.4	87.0	88.6	88.0	88.9	88.8	88.8	88.5	88.1	89.1	89.5	89.7	2264	2005	88.6
Wessex (Q70)	88.5	89.2	89.8	91.1	90.3	91.7	91.6	89.4	89.9	91.6	90.4	90.4	91.2	2480	2239	90.3
London (Q71)	79.8	80.6	82.3	82.5	82.2	83.3	82.6	82.8	83.1	83.0	82.8	82.4	84.2	10642	8849	83.2
England	**86.0**	**86.5**	**87.5**	**87.9**	**87.7**	**88.3**	**88.4**	**88.2**	**88.3**	**88.4**	**88.4**	**87.9**	**88.4**	**55004**	**48487**	**88.2**
Monthly reported denominator	**46357**	**50824**	**49003**	**49398**	**47769**	**48348**	**46039**	**47134**	**49247**	**50748**	**51862**	**51527**	**50042**	**55004**		

1. Denominator and numerator presented for each area team for March 2015; these data are representative of all months presented