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Herpes zoster (shingles) immunisation programme 2017 to 2018: evaluation report

Evaluation of the fifth year of the shingles vaccination programme in England from 2017 to 2018

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Executive summary

This report presents the evaluation of vaccine coverage of the herpes zoster (shingles) vaccination programme in England, from 1 September 2017 to 31 August 2018, the fifth year of the programme. Eligibility criteria for the shingles vaccination were revised in April 2017 so that adults become eligible for the routine programme on their 70th birthday, and for the catch up programme on their 78th birthday, and remain eligible until their 80th birthday. Data underlying this report were collected according to the previous eligibility criteria. Therefore eligible individuals are split across the 69 and 70 year old cohorts (for the routine programme) and the 77 and 78 year old cohorts (for the catch up). As a result, coverage in the routine and catch up cohorts presented in this report will be presented according to the previous eligibility criteria with additional 69 and 77 year olds vaccinated in the past year.

Shingles vaccine coverage in the routine cohort (aged 70 years on 1 September 2017) was 44.4% in 2017/18 representing a 17.4% decline since the start of programme and a 3.9% decrease since 2016/17. A decrease in coverage was also observed in the catch-up cohort (aged 78 years) to 46.2% in 2017/18, a 3.2% decrease from 2016/17. However, to capture all vaccination activity reflecting the new eligibility criteria it is important to also consider coverage in the 69 and 77 year old cohorts in 2017/18. By August 2018, uptake was 18.7% and 20.3% among the 69 and 77 year olds respectively, compared with 4.9% and 5.5% in 2016/17 respectively. It is therefore likely that part of the decrease in coverage in the routine and catch up cohorts evaluated in 2017-18 is a data artefact related to the change in eligibility criteria as a proportion of those eligible under the new criteria for routine and catch-up vaccinations are in the 69 and 77 year old cohorts respectively. After taking this into account, this suggests that coverage has increased compared to that achieved in 2016-17, possibly reversing the downward trend seen in previous years.

Going forward, provisional shingles coverage reports will be based on quarterly extracts running from 1 April to 31 March. Each quarter, cumulative coverage data for

the four birth cohorts (born April to June, July to September etc.) who become eligible on their 70th (routine cohort) or 78th (catch-up cohort) birthdays will be extracted, reflecting the new eligibility criteria. There will also be an annual collection to monitor coverage for all eligible cohorts. The 2018-19 annual report will cover the period April to March.

Longer term follow-up data suggests that some of those eligible for shingles vaccination who did not receive it in the year they became eligible catch-up in subsequent years, so these coverage estimates are likely to increase (for example, coverage for 71 year olds in 2017/18 was 59.1% by the end of August 2018, 10.8% higher than coverage for this cohort at the end of August 2017).

Shingles is caused by the reactivation of a latent varicella zoster virus (VZV) infection and is typically characterised by a unilateral vascular rash. The incidence and severity of shingles increases with age. The virus may cause persistent pain extending beyond the period of the rash and is known as post herpetic neuralgia (PHN). The aim of the vaccination programme is to reduce the incidence and severity of shingles in those targeted by the programme by boosting individuals' pre-existing VZV immunity. Given the gradual decrease in coverage since the programme's inception, GPs are urged to continue to offer vaccinations to these cohorts as per current guidance, to improve protection in these age groups. Increasing coverage among patients receiving the vaccine from their 70th and 78th birthdays indicates that the recent changes to the programme are being put in effect and GPs are encouraged to continue vaccinating eligible patients up to the 80th birthday. A revised quarterly shingles vaccine coverage collection will estimate cumulative coverage based on the new eligibility criteria from April 2018.

Introduction

Shingles is caused by the reactivation of latent varicella zoster virus (VZV) infection, following a decline in cell mediated immunity and the incidence of disease is known to increase with age. Shingles typically presents with a unilateral vesicular rash, usually limited to a single dermatome. The diagnosis is almost exclusively made on clinical suspicion with very few cases being laboratory confirmed. An important and debilitating complication of shingles is persistent pain extending beyond the period of rash known as post-herpetic neuralgia (PHN). The risk of PHN increases with age and is known to contribute significantly to the overall burden of shingles within the population [1, 2].

Zostavax is a live attenuated vaccine, is the only marketed shingles vaccine in the UK [3]. It is derived from the Oka strain of VZV and has a significantly higher antigen content than the Varivax varicella vaccine [4]. Since it is a live vaccine, Zostavax

should not be given to patients who have a known primary or acquired immunodeficiency state or patients who recently received or are currently receiving immunosuppressive therapy including high-dose corticosteroids, biological therapies or specific combination therapies [4].

In 2010, the UK's Joint Committee on Vaccination and Immunisation (JCVI) recommended that a herpes zoster (shingles) vaccination programme should be introduced for adults aged 70 years with a catch up programme for those aged 71 to 79 years [5,6]. The aim of the programme is to reduce the incidence and severity of shingles in those targeted by the programme by boosting individuals' pre-existing VZV immunity. On 1 September 2013, a shingles vaccination programme was introduced and vaccine was routinely offered to adults aged 70 years on 1 September 2013, and to those aged 79 years as part of the catch-up campaign.

As of 1 April 2017, patients could be immunised throughout the year as they reached 70 or 78 years old. At that time, in order to ensure vaccine supply, the majority of patients were offered the immunisation in the autumn months [7].

From 1 April 2018, as sufficient vaccine became available, practices have been encouraged to immunise patients who became 70 or 78 years of age at any point in the year following their 70th or 78th birthday. This change in criteria also reduced additional pressure in primary care to offer the vaccine coinciding with the influenza vaccine. Finally, patients who became eligible in the first four years of the programme but have not been vaccinated against shingles remain eligible until their 80th birthday (patients aged 71, 72, 73, 74 and 79 on 1 September 2017).

Consequently, interpreting coverage in the fifth year of the programme (1 September 2017 to 31 August 2018) is more complex than in previous years as the new eligibility criteria were not uniformly implemented at the same time. Additionally, the extraction specification for 2017/18 remained aligned with the old eligibility criteria (being 70 or 78 on the 1st of September) and therefore, part of the eligible cohorts were in the 69 and 77 year old cohorts at the time of extraction. In order to interpret trends in coverage both the 69 and 70 year old cohorts have to be considered for the routine cohort and the 77 and 78 year old for the catch up cohort.

This report describes vaccine coverage data in the routine and catch-up cohorts in the fifth year of the programme, updating provisional cumulative data published in July 2018 reporting coverage to end-May 2018, and updates coverage for all cohorts eligible for shingles vaccines since the introduction in 2013. All PHE documents relating to the shingles vaccination programme, including previous annual reports are accessible via the PHE shingles vaccination programme pages

Methods

Shingles vaccination programme

As of 1 September 2017, the shingles vaccine was routinely offered to patients aged 70 to 74 years old as part of the routine schedule. Patients aged 78 and 79 years old were also offered the vaccine as catch-up cohorts. Finally patients aged 69 and 77 years old were given the opportunity to be vaccinated in the routine or catch-up programmes. Patients aged 75 (born before 02/09/1942) and 76 years old will become eligible for the vaccine on their 78th birthday (Tables 1 and 2).

Table 1. Age and birth cohorts of patients eligible for routine or catch-up vaccination from 1 September 2018 to 31 August 2018, England.

Eligibility 01/09/2017 – 31/08/2018	Age	Birth cohort
Partly routine - from 70th birthday	69	02 September 1947 - 01 September 1948
Routine - as of 1 September 2017	70	02 September 1946 - 01 September 1947
	71	02 September 1945 - 01 September 1946
	72	02 September 1944 - 01 September 1945
	73	02 September 1943 - 01 September 1944
	74	02 September 1942 - 01 September 1943
Partly catch-up - from 78th birthday	77	02 September 1939 - 01 September 1940
Catch-up - as of 1 September 2017	78	02 September 1938 - 01 September 1939
	79	02 September 1937 - 01 September 1938

Table 2. Age and birth cohorts of patients not eligible for the shingles vaccine during the period 1 September 2017 to 31 August 2018, England.

Eligibility 01/09/2017 – 31/08/2018	Age	Birth cohort
Currently not eligible for the vaccine	75	02 September 1941 - 01 September 1942*
	76	02 September 1940 - 01 September 1941

*All patients born after 2/9/1942 remain eligible until their 80th birthday

Data extraction and analyses

The data extractions were finalised for the period 1 September 2017 to 31 August 2018 before the change in the criteria effective from April 2017 were announced. As a result, coverage in the routine and catch up cohorts is not an accurate reflection of the shingles programme for 2017/18 and individuals eligible in 2017/18 are split between the 69 and 70 year old cohort (for the routine programme) and the 77 and 78 year old (for the catch up programme). Monthly cumulative vaccine coverage data for shingles vaccination in England were automatically extracted from records of participating general practices (GPs) in England visa the ImmForm website. Vaccine coverage data by gender, contraindications and refusals for the routine and catch-up cohort were also collected.

Data were then validated and analysed by PHE to check data completeness, identify and query any anomalous results and describe epidemiological trends. The automated surveys measured the proportion vaccinated in two ways:

- vaccine coverage – the total number of patients aged 70 or 78 years on 1 September 2017 who have ever received the vaccination (numerator) as proportion of number of patients registered aged 70 or 78 years on 1 September 2017 (denominator)

- vaccine uptake – the total number of patients aged 67 to 83 years on 1 September 2017 who have received the vaccination between September 2017 and 31 August 2018 (numerator) as a proportion of the number of patients registered aged 67 to 83 years on 1 September 2017 (denominator)

Participation and data quality

Out of 7,065 GP practices in England, reliable shingles coverage data for 6,741 (95.4%) practices were provided by GP IT suppliers for the period 1 September 2017 to 31 August 2018, compared with 91.5% in the previous year. GP practice representation in August 2018 by local team (LT) ranged from 98.4% in North (Yorkshire and Humber) to 92.2% in Greater Manchester (Table 3).

The monthly cumulative vaccine uptake estimates for September and October 2017 data from only two of the four IT suppliers, representing 56.6% and 57.6% of all GP practices respectively. Meanwhile, monthly cumulative vaccine uptake estimates for November 2017 include data from only three of the four IT suppliers representing 59.8% of all GP practices (Figure 1).

Coverage data by gender, contraindications and refusals for the routine and catch-up cohort were also collected. This information varied by GP IT supplier. Data from one of the larger IT suppliers was excluded from vaccine coverage estimates for those with a contraindication in the catch-up cohort. Data from the smallest IT supplier were excluded from estimates calculating the proportion of patients who refused the shingles vaccination.

Results

Vaccine coverage

In the routine cohort (patients aged 70 years old as of 1 September 2017), annual shingles vaccine coverage was 44.4% in 2017/18 compared with 48.3% in 2016/17, 54.9% in 2015/16, 59.0% in 2014/15 and 61.8% in 2013/14. Uptake among those aged 69 years old as of 1 September 2017 was 18.7%, compared with 4.9% in 2016-17.

Vaccine coverage among the routine cohort ranged from 41.0% in London to 47.4% in South (South Central) and from 16.0% in London to 22.8% in South (Wessex) among 69 year olds (Table 3) compared to 1.0% (Lancashire) to 7.9% (Hampshire, Isle of Wight and Thames Valley) in 2016-17.

Vaccine coverage for the catch-up cohort (patients aged 78 years old as of 1 September 2017) was 46.2%, compared with 49.4% in 2016 to 2017, 55.5% in 2015 to 2016 and 57.8% in 2014 to 2015 (no comparative data for 2013 to 2014). Uptake among those aged 77 year old as of 1 September 2017 was 20.3%, compared with 5.5% in 2016-17. Vaccine coverage in the catch up cohort ranged from 41.6% in

London to 50.2% in South (South Central)and from 17.3% in North (Greater Manchester) to 24.8% in South (Essex) among 77 year olds (Table 3) compared to 1.8 (Lancashire) to 7.9% (Midlands and East (East)) in 2016-17. .

Table 3. Shingles vaccine coverage in England by age cohort and Local Team to end August 2018

Local Team	Practices reporting data in August 2018 (%)	Percentage of age cohort vaccinated to end August 2018			
		70 year olds as of 01/09/17[1]	69 year olds as of 01/09/17[2]	Catch-up 78 years as of 01/09/17[1]	77 year olds as of 01/09/17[2]
London	94.0	41.0	16.0	41.6	19.4
Midlands and East (Central Midlands)	96.8	42.3	18.2	43.9	19.7
Midlands and East (East)	96.7	43.0	19.9	45.3	20.8
Midlands and East (North Midlands)	96.4	46.5	18.9	47.3	18.3
Midlands and East (West Midlands)	94.5	44.0	17.7	46.4	19.7
North (Cheshire and Merseyside)	94.4	43.4	15.8	45.3	16.6
North (Cumbria and North East)	96.9	44.9	17.7	46.4	18.6
North (Greater Manchester)	92.2	41.6	15.1	43.3	17.3
North (Lancashire)	96.4	42.1	15.4	43.0	16.6
North (Yorkshire and Humber)	98.4	46.8	22.0	46.5	22.4
South (South Central)	96.4	47.4	19.7	50.2	23.1
South (South East)	94.7	45.3	18.5	48.1	20.9
South (South West)	93.8	45.5	19.6	49.3	21.7
South (Wessex)	96.0	47.1	22.8	50.0	24.8
England	**95.4**	**44.4**	**18.7**	**46.2**	**20.3**

1. Routine and catch-up cohorts are based on the patients' age on 1 September 2017

2. Immunisation occurs on or after the 70th and 78th birthday from 2 September 2017 to 31 August 2018.

Vaccine coverage by Local Authority (LA) for the routine cohort ranged from 24.4% to 57.4% and for the catch-up cohort from 27.2% to 62.4% see web tables. Please note these do not include vaccine uptake figures for 69 and 77 year old cohorts.

Similarly to the previous years, most of those vaccinated in the 2017 to 2018 programme received the shingles vaccine in the last few months of the calendar year during the seasonal influenza vaccination campaign. By the end of January 2018 (the end of the seasonal influenza vaccination uptake monitoring period for 2017 to 2018) approximately 78% of those vaccinated by the end of August had received their vaccine (Figures 1 and 2).

Figure 1. Monthly cumulative shingles vaccine coverage for routine cohorts 2013/14 to 2017/18, the percentage of GP practices reporting in 2017/18 and vaccine uptake among those aged 69 who received the vaccine on their 70th birthday, England

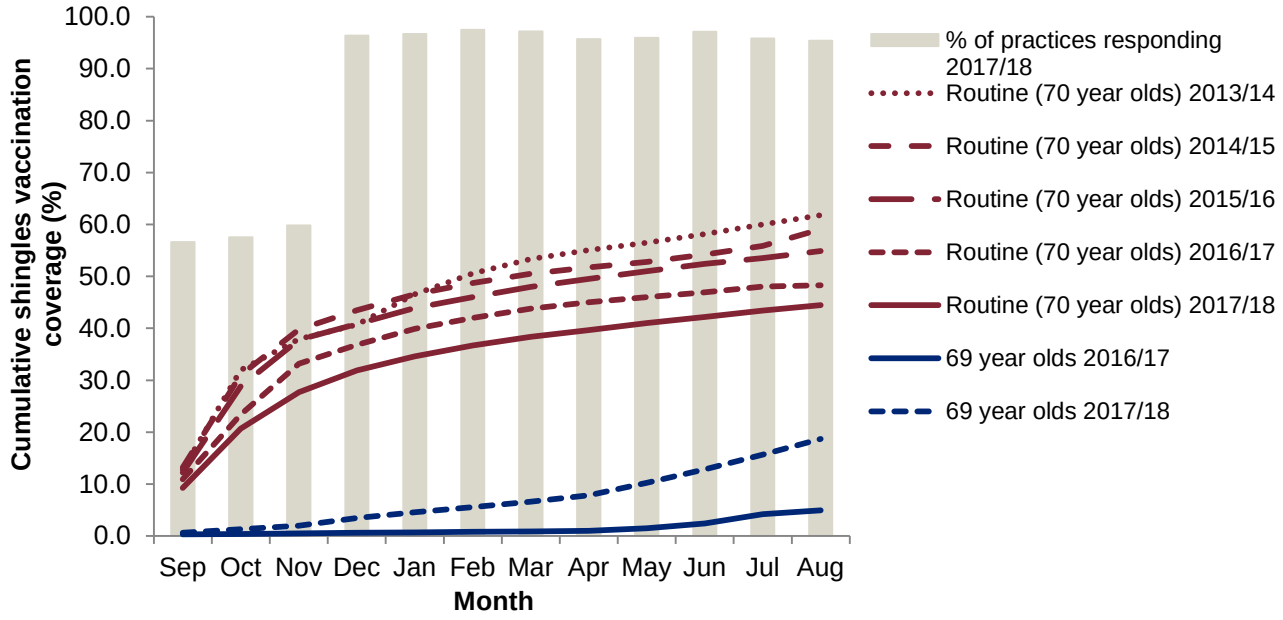
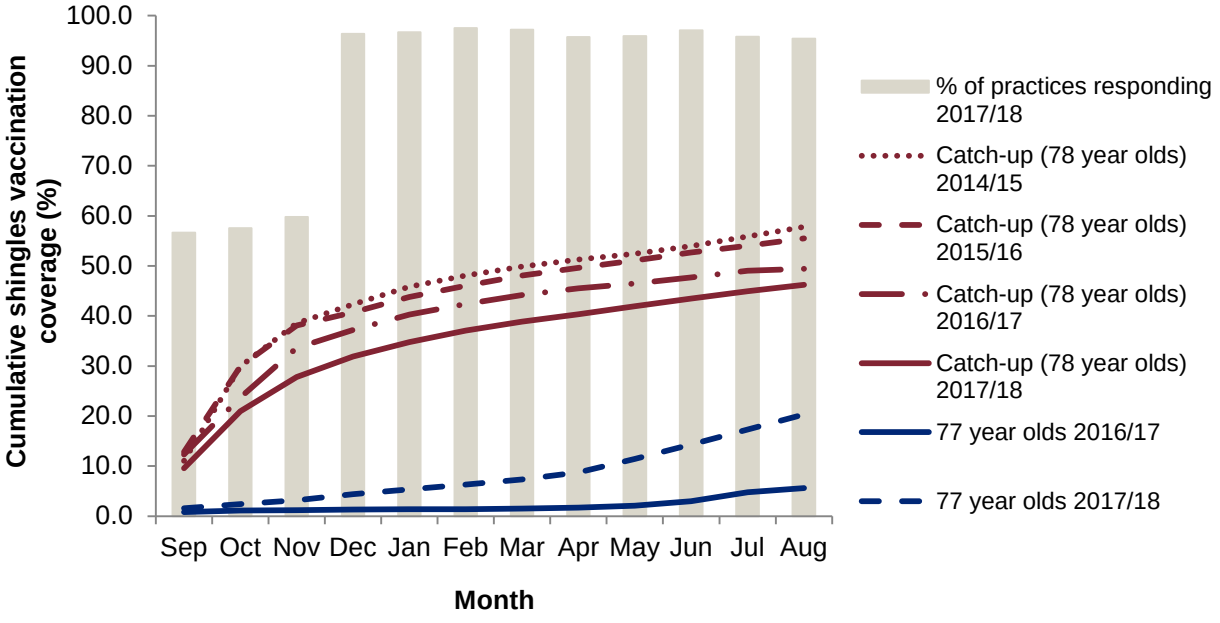


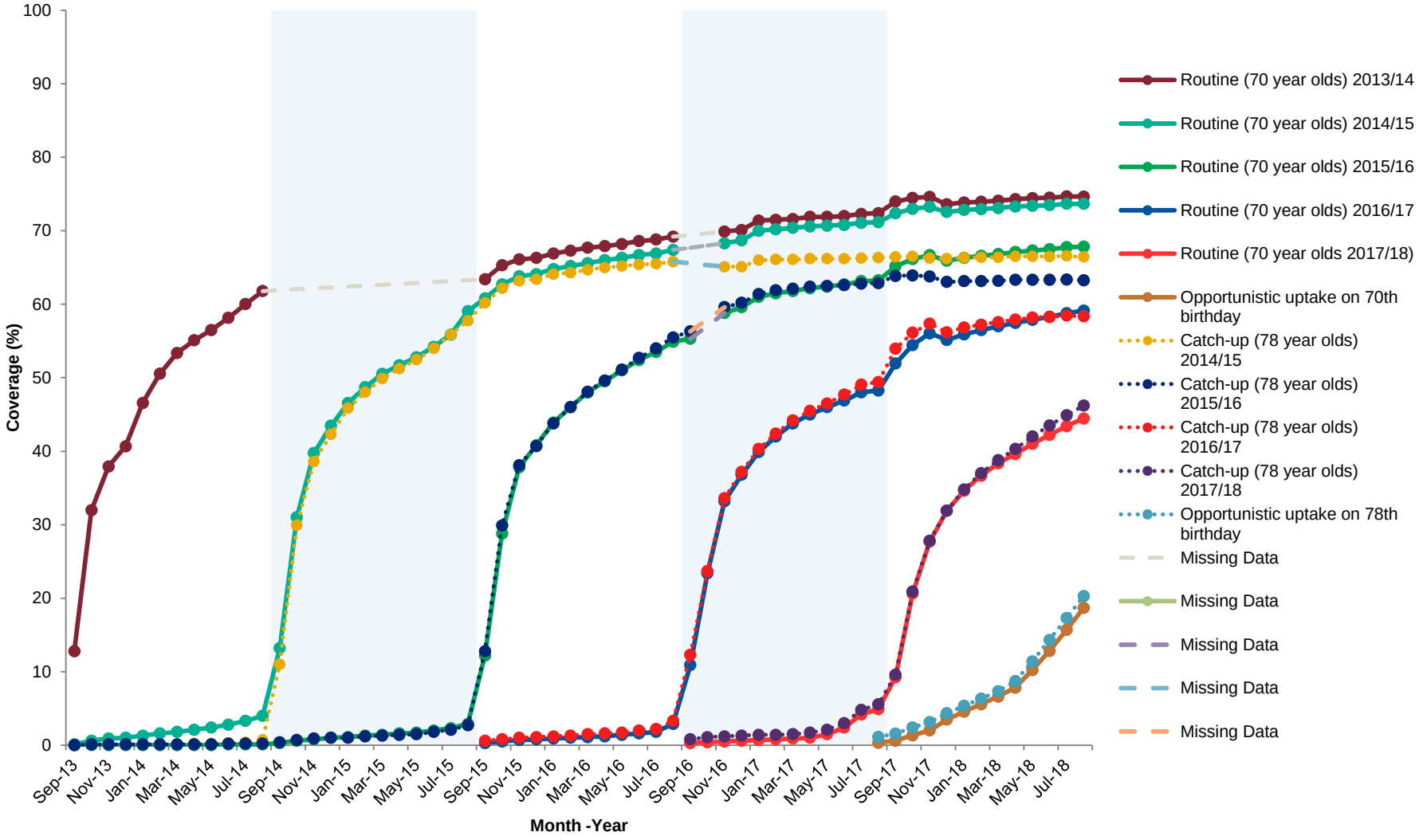
Figure 2. Monthly cumulative shingles vaccination coverage for catch-up cohorts 2014/15 to 2017/18 and the percentage of GP practices reporting in 2017/18 and vaccine uptake among those aged 77 who received the vaccine on their 80th birthday, England



Vaccine coverage in previous years' routine cohorts continued to increase in 2017 to 2018. Those aged 71 years in 2017 to 2018 (i.e. those in the routine 70 year old cohort in 2016 to 2017) had increased coverage from 48.3% in August 2017 to 59.1% by the end of August 2018. Similarly, those currently aged 74, 73 and 72 years (i.e. 70 years in 2013 to 2014, 2014 to 2015 and 2015 to 2016) had steadily increased coverage to 74.7%, 73.7%, and 67.8% respectively by August 2018 (Figure 3).

The cohorts aged 69 and 77 on 1st September 2017 which includes individuals who were offered the vaccine on or after their 70th and 78th birthday from 2 September 2017 to 31 August 2018 had an overall uptake of 18.7% and 20.3% (Table 3 and Figure 3). These results indicated that in the new eligibility criteria are being applied. This is particularly noticeable from April 2018 onwards when the influenza vaccination campaigns were brought to an end and sufficient vaccine supplies were available [`7].

Figure 3. Monthly cumulative shingles vaccine coverage for routine and catch-up cohorts monitored between September 2013 to August 2018, England



Contraindications, refusals and uptake by gender

An estimated 2.8% of the routine cohort and 4.1% of the catch-up cohort fell into clinical risk groups in whom shingles vaccine may be contraindicated. Vaccine uptake in these groups was 24.4% for the routine cohort, and 28.1% for the catch-up cohort compared to 26.5% for the routine cohort and 17.5% for the catch-up cohort in 2015/16.

The proportion of individuals recorded as declining shingles vaccine has remained similar over the last four years. A total of 6.1% of 70 year olds and 7.1% of 78 year olds were recorded as having declined the vaccine, compared to 7.3% and 8.3% respectively in 2016/17, 6.1% and 7.0% respectively in 2015/16, and 8.5% and 9.6% respectively in 2014/15.

In 2017/18, as in the previous two years, vaccine uptake was higher in males for the catch-up cohort (40.9% males vs 39.1% females) but lower in males for the routine cohort (38.4% males vs 39.3% females).

Discussion

This is the fifth year vaccine coverage estimates have been calculated for the shingles vaccination programme in England based on the age of cohorts of patients offered the routine shingles vaccine (70 years old) and the catch-up cohort (78 years old) on 1 September. Although coverage in the routine and catch-up cohorts have declined compared with the previous year, the large increase in uptake among 69 and 77 year olds, which include part of the eligible cohorts under the new eligibility criteria suggests that overall coverage has increased compared to that achieved in 2016-17, possibly reversing the downward trend seen in previous years.

Nevertheless, uptake has declined since the programme inception, and a number of factors are thought to have contributed to this trend. These include difficulties in practices identifying the eligible patients during busy influenza immunisation clinics, a lack of call/re-call in the service specification to allow mop up of those who missed immunisation during the flu season, and possible lowering of patients' awareness of the vaccine since its introduction in 2013. In April 2017, PHE revised and simplified the eligibility criteria for shingles vaccination basing eligibility on turning 70 or 78 rather than calculating age on a specific date, allowing patients to be immunised earlier than the previous schedule. PHE has released communication materials for health professionals and the public to explain those changes, including posters, leaflets and an eligibility calculator [8] In addition, a Shingles Five Year Anniversary issue of Vaccine update was published in September 2018 describing VZV, highlighting the history of the shingles vaccination programme and sharing local approaches to improve coverage. This

change affects the ability of this year's coverage data extraction, which was finalised for the period 1 September 2017 to 31 August 2018 before the change in the criteria effective from April 2017 was announced, to capture coverage for all those becoming eligible in this period. From April 2017, coverage among the 69 and 77 year old cohorts began to slowly increase, especially since April 2018 when sufficient vaccine became available and practices were encouraged to immunise patient turning 70 and 78 years old. It is important to note that, among those eligible for vaccination, those born closer to August 2018 (the evaluation month) had less time to be vaccinated than those born closer to September 2017. A revised quarterly shingles vaccine coverage collection will estimate cumulative coverage based on the new eligibly criteria from April 2018. This change will mean that data collected using the revised collection extraction specification will not be directly comparable to previous years.

Patients aged 75 and 76 years old (born before 2 September, 1942) were not eligible for the vaccine in 2017/18 but will become eligible on their 78th birthday and routinely offered vaccine during 2019/20 and 2018/19, respectively.

The programme continues to show that coverage in each previous routine and catch-up cohort increases in the following years. Coverage for the original routine cohort offered vaccine from September 2013 and now aged 74 was 74.7% at the end of August 2018. It is therefore expected that, like in previous years, coverage in those who were 70 on 1 September 2017 will increase in subsequent years as they are immunised.

Approximately 2.8% of the age cohorts eligible for the shingles vaccine are identified as contraindicated (immunocompromised), and approximately a quarter of those are recorded as having received the vaccine. Read codes record in the electronic patient record whether an individual is on a particular medication, but not the specific dose. However the eligibility criteria for shingles are time-dependent and dose-dependent for certain treatments, in particular steroids and methotrexate. Because the majority of patients on these medications are on doses below the threshold for contra-indication, most patients recorded as receiving these medications are not classified as contra-indicated in the shingles coverage collection, regardless of the dose they are prescribed. Omitting individuals receiving higher (immunosuppressive) doses of these medications, for whom shingles vaccine is contraindicated, from the contraindicated category within the shingles coverage collection may have two consequences: a) an underestimation of the proportion of individuals in the routine and catch-up cohorts who are contra-indicated, which would be consistent with other estimates of the number of immunosuppressed individuals in this age group and b) an underestimation of vaccine coverage among those who are not classified as contra-indicated.

The UK is one of the few countries to have introduced a shingles vaccination programme for older adults and to collate comprehensive coverage data [9]. Due to the recent changes in the programme in England, vaccine coverage may not be directly

comparable to coverage in Northern Ireland, Scotland and Wales. Annual coverage figures for Northern Ireland, Scotland and Wales are provided by the Public Health Agency in Northern Ireland, Health Protection Scotland and Health Protection, Public Health Wales, respectively.

In the United States (US) adults aged 60 years and older are recommended to receive shingles vaccine, and in 2015 coverage for this age group was 30.6% [10]. Australia included shingles vaccine as part of its national immunisation programme and has been free of charge as of November 2016 for those aged 70 years, with a five year catch-up programme for those aged 71-79 years [11]. Canada also recommend the shingles vaccine for older adults, but the vaccine has not previously been publicly funded, hence coverage has been low (estimated coverage in Alberta, Canada, was 8.4% for those aged 60 and above from 2009 to 2013) [12]. Shingles vaccine has been available free of charge for those aged 65-70 years in Ontario since September 2016, but coverage data are not currently collected [13].

In October 2017, a two-dose recombinant adjuvanted zoster vaccine (Shingrix) was licensed by the FDA in the United States. People aged 50 years and older are eligible for the vaccine [14, 15]. In October 2017, an update from the varicella sub-committee was presented to the JCVI regarding the Shingrix vaccine. Initial data collected showed high efficacy and a long duration of protection [16]. In February 2018 JCVI stated that the vaccine would be suitable for patients that are eligible for the Zostavax vaccine but contraindicated for receipt of the vaccine[17,18]. Further research by PHE indicates that the Shingrix vaccine is highly likely to be cost-effective among adults aged 70-79 years old [18]. Finally, analysis on the cost effectiveness of two doses and the optimal age to receive the Shingrix vaccine must be further analysed [18].

The Equality Act 2010 requires PHE to ensure that interventions and services are designed and implemented in ways that meet the needs of different groups in society, advancing equality of opportunity between protected groups and others. In order to monitor inequalities in vaccine coverage, these data are delineated by gender and ethnicity. Higher vaccine coverage in males continued to be recorded for the catch-up cohort in 2017/18, but lower for males for the routine cohort, as for 2016/17 and 2015/16.

National data collected in 2014/15 has been analysed to explore inequalities in vaccine coverage and identified that compared with White British, some ethnicities had significantly lower coverage even after adjusting for geography and deprivation [19]. Differences in shingles vaccine coverage by ethnic group have also been reported in the United States where, in those aged 60 years and older in 2015, highest coverage was observed in Whites (34.6%) compared with Blacks (13.6%), Hispanics (16.0%) and Asians (26.0%) [10]. Data for England will continue to be monitored and PHE, together

with its partners, has agreed to form a working group to better describe and address inequalities in uptake across all vaccine programmes.

In effort to encourage GPs to offer the vaccination throughout the year, a “Shingles – all year round!” campaign was introduced and a range or resources to support the programme were created. GPs are urged to continue to offer vaccinations to all eligible cohorts throughout the year as per current guidance, to improve protection in these age groups, who remain eligible until they reach the age of 80.

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