Public Health England

Health Protection Report
weekly report

Volume 10 Number 24 Published on: **22 July 2016**

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Transfusion transmitted infections (UK): 2015

A description of the possible transfusion-transmitted infection (TTI) incidents investigated by the United Kingdom (UK) Blood Service in 2015 has been published in the Serious Hazards of Transfusion (SHOT) Annual Report [1].

The risk of a screened component transmitting hepatitis B virus (HBV), hepatitis C virus (HCV) or human immunodeficiency virus (HIV) in the UK is very low [2]. Nevertheless, to maintain haemovigilance, investigations are performed if a recipient is suspected to have been infected via transfusion. UK Blood Service investigations in 2015 have confirmed that there were:

- one proven bacterial transfusion-transmission reported in 2015
- one possible group B streptococcus transmission; although the investigation is complete, the source of the infection in the patient could not be confirmed
- two transfusion-transmitted hepatitis E virus (HEV) incidents and three cases where transfusion was not the source of HEV infection.

The key messages for 2015 are:

- bacterial screening of platelets will reduce but not remove the risk of transfusion transmission of bacteria
- good practice and quick thinking of the hospital staff prevented further harm to the patient in the bacterial TTI in 2015 [3]
- haemovigilance is essential to identify incidents and inform hospital staff and other clinicians of safe practice

In 2015, the Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) recommended that HEV negative components were required for specific patient groups:

- allogeneic stem cell/bone marrow transplantation
- solid organ transplantation

More details can be found at NHSBT Hepatitis E Screening. In order to supply HEV screen negative components for selected patient groups, UK blood centres are currently testing a proportion of whole blood and apheresis donations for HEV RNA; positive donors are being notified to the local Health Protection Teams.

Suspected transfusion transmitted infections should be reported to the blood services who can advise on the information required and how to proceed.

See the SHOT annual report [1] for a fuller description of incidents investigated in 2015, cumulative data by transfusion year and advice on action to be taken when it is suspected that a transfusion-transmitted infection incident has occurred.

References

1. NHSBT/PHE Epidemiology Unit (2016). Serious Hazards of Transfusion (SHOT) annual report.
2. NHSBT/PHE Epidemiology Unit (2015). Safe Supplies (annual review)
3. Morrison RRP, McDonald CP, Roy A, Allen J, Brailsford SR (2016). Bedside vigilance pays off: a case of confirmed Staphylococcus aureus transmission from a pooled platelet pack in the UK.

Malaria imported into the UK: 2015

Public Health England (PHE) has published its annual malaria report for the UK for 2015 [1].

In 2015, 1,400 cases of imported malaria were reported in the UK, 11.7% lower than reported in 2014 and 11.6% below the mean number of cases reported between 2005 and 2014. The majority of cases (76%) continue to be caused by the potentially-fatal *Plasmodium falciparum* parasite.

Of those with travel history/country of residence information available (976/1,400, 70%), the majority of malaria cases had travelled abroad from the UK (744/976, 76%), with most having travelled to visit friends and relatives in West Africa.

Six deaths were reported in 2015, compared to three in 2014, all from falciparum malaria acquired in Western Africa.

The latest report shows that malaria remains an important issue for UK travellers, particularly for those of African or Asian ethnicity who are non-UK born and going to visit friends and family in their country of origin. Failure to take chemoprophylaxis is associated with the majority of cases. Those providing advice should engage with these population groups wherever possible, including using potential opportunities to talk about future travel plans outside a specific health consultation, such as during new patient checks or childhood immunisation appointments [2].

The PHE Advisory Committee on Malaria Prevention Guidelines [3], and resources available from the National Travel Health Network and Centre, should assist clinicians in helping travellers to make rational decisions about protection against malaria. Useful resources for travellers, including translated advice leaflets are available from the PHE website [4].

References

1. PHE (20 July 2016). Malaria imported into the United Kingdom (2015).
2. PHE website. Communicable Diseases: Migrant Health Guide.
3. PHE Advisory Committee on Malaria Prevention. Guidelines for malaria prevention in travellers from the United Kingdom.
4. PHE website. Malaria: guidance, data and analysis

Electronic Reporting System (ERS) for enhanced surveillance of carbapenemase-producing Gram-negative bacteria upgraded

PHE has launched an upgraded version of the electronic reporting system (ERS) that supports enhanced surveillance of carbapenemase-producing Gram-negative bacteria in England.

The ERS was first implemented in May 2015, the aims being:

- to improve understanding of the epidemiology of carbapenemase-producing Gram-negative bacteria in England and to monitor changes through better ascertainment of case details, and thereby
- to inform control measures to prevent the spread of carbapenemase-producing Gram-negative bacteria in healthcare settings.

The web-based ERS was designed to enable laboratories to request confirmation of carbapenemase-production from PHE reference or specialist laboratories and also to submit enhanced surveillance data for these organisms.

An ERS upgrade was rolled-out on 11 July 2016 to add additional functionality and improve the user experience following constructive feedback from laboratories and Trusts over the past 12 months. With the new features, users can now:

- record local molecular test results
- register multiple organisations and user roles
- produce reports for their laboratories and/or Trusts

With the increasing availability and use of commercial carbapenemase detection tests in NHS and private laboratories, the confirmation of carbapenemase production in Gram-negative bacteria is rapidly becoming a method for diagnostic microbiology laboratories rather than for reference laboratories. The ERS is the only method currently available that allows this locally-generated data to be captured and used to inform regional and national trends. Active participation in this surveillance by every Trust in the country is vital for building a comprehensive “picture” of the growing carbapenemase problem in England.

The ERS can be accessed at https://cro.phe.nhs.uk/. Supporting documentation for the system, including guidance on isolates to be referred for confirmatory testing and a step-by-step user guide can be found on PHE’s Carbapenem Resistance health protection collection webpages.

National outbreak of verocytotoxin-producing *E. coli* O157 phage type 34

On 21 June 2016, the South West PHE Centre observed higher than expected notifications of *E. coli* O157 cases from front line laboratories. An outbreak control team (OCT) was convened on 22 June to investigate this increase and, on the 24 June, the first samples associated with this increase were confirmed as VTEC serogroup O157 phage type 34, positive for the eae (intimin) and verocytotoxin 2 genes but negative for the verocytotoxin 1 gene. On 27 June a significant increase in the outbreak strain was observed nationally, and the incident was declared and managed as a national outbreak.

Analysis of whole genome sequencing data indicated that isolates fell within a 5-SNP (single nucleotide polymorphism) cluster, a strain not related to those currently circulating amongst the UK bovine reservoir. The outbreak strain was most closely related (> 70 SNPs) to sequences identified in people reporting recent travel to the Mediterranean region suggesting that the strain was likely to have been imported.

As at 14 July, a total of 158 cases had been identified of which 105 met the confirmed case definition and 53 the probable case definition [1]. Onset dates for primary cases ranged from 31 May 2016 to 5 July 2016 with cases identified in England (144), Wales (six) and Scotland (one). Reports of secondary transmission in households were infrequent. Cases were predominately female (119/158). Fifteen cases were under 18 years old and ages ranged from one to 98 years. As at 14 July, 62 cases were known to have sought tertiary care at some point during their illness (57 in England, four in Wales and one in Scotland). As at 14 July, four patients remained in hospital. Features of haemolytic uraemic syndrome (HUS) had been reported in seven cases. Two cases had died, both of whom had E. coli infection listed as a causative factor. The outbreak was characterised by multiple small clusters linked to catering and residential care premises with particular foci in the South West, South East and North West of England (see map in the full version of this report published on 19 July [1]).

As at 19 July, 5 July remained the latest symptom-onset date, suggesting that the worst of the outbreak has passed [2].

References

1. PHE (19 July). "National outbreak of verocytotoxin-producing *E. coli* O157 phage type 34", *HPR* Advanced Access report, 19 July.
2. PHE (21 July). PHE website news story.

Public Health England

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Infection Reports

Immunisation

- **Laboratory reports of hepatitis A and C (E&W): annual report 2015**

HIV/STIs

- **Annual report from the sentinel surveillance study of blood borne virus testing in England: 2015**

Vaccine coverage reports

- **Shingles vaccine coverage report (England), September 2015 to May 2016**
- **Pneumococcal Polysaccharide Vaccine (PPV) coverage report (England), April 2015 to March 2016**

Infection report

Volume 10 Number 24 Published on: 22 July 2016

Immunisation

Laboratory reports of hepatitis A infection, and hepatitis C: 2015

Laboratory reports of hepatitis A infection: 2015

During 2015, there were 330 confirmed laboratory reports of hepatitis A virus (HAV) infection in England and Wales (Table 1). The greatest number of reports were among the 15 to 24 years age group (n=54), only one case of hepatitis A was reported in the under 1 year age group. More reports were received for females than males during the second quarter of 2015, with more reports among males during the remaining quarters (Table 1).

Table 1: Laboratory reports of hepatitis A by age, sex, and quarter, England and Wales, 2015*

Age group (years)	Q1 Jan-Mar			Q2 Apr-Jun			Q3 Jul-Sep			Q4 Oct-Dec			Total
	Female	Male	NK	Female	Male	NK	Female	Male	NK	Female	Male	NK	
<1	0	0	0	0	0	0	1	0	0	0	0	0	1
1 to 4	2	5	0	2	3	0	1	5	0	3	0	0	21
5 to 9	5	4	0	4	1	0	8	6	0	4	6	0	38
10 to 14	2	2	0	1	0	0	0	6	0	2	2	0	15
15 to 24	2	6	0	6	5	0	11	10	1	3	10	0	54
25 to 34	9	6	0	4	9	0	8	5	0	5	5	0	51
35 to 44	3	5	0	7	4	0	4	8	0	1	1	0	33
45 to 54	4	5	0	5	0	0	3	3	0	4	10	0	34
55 to 64	6	3	0	5	5	0	4	1	0	6	5	0	35
≥65	4	7	0	7	5	0	8	6	0	3	6	0	46
NK	0	0	1	0	0	1	0	0	0	0	0	0	2
Total	**37**	**43**	**1**	**41**	**32**	**1**	**48**	**50**	**1**	**31**	**45**	**0**	330

* Due to late reporting, numbers for each quarter may have changed slightly since their HPR quarterly reports.

The number of laboratory reports by PHE Centre is presented below. Reports were assigned to a PHE Centre according to i) the patient's place of residence ii) the postcode of the patient's registered GP practice, iii) the postcode of the source laboratory. In 2015, the greatest number of hepatitis A reports were from the London (n=79) and Yorkshire and Humber (n=69) regions (Table 2). The comparatively high number of reports from London was consistent with previous years, but there was over a 3-fold increase in Yorkshire and Humber cases compared to 2014 (n=69). Overall, there was a similar number of reports received during 2015 (n=330) compared to 2014 (n=300).

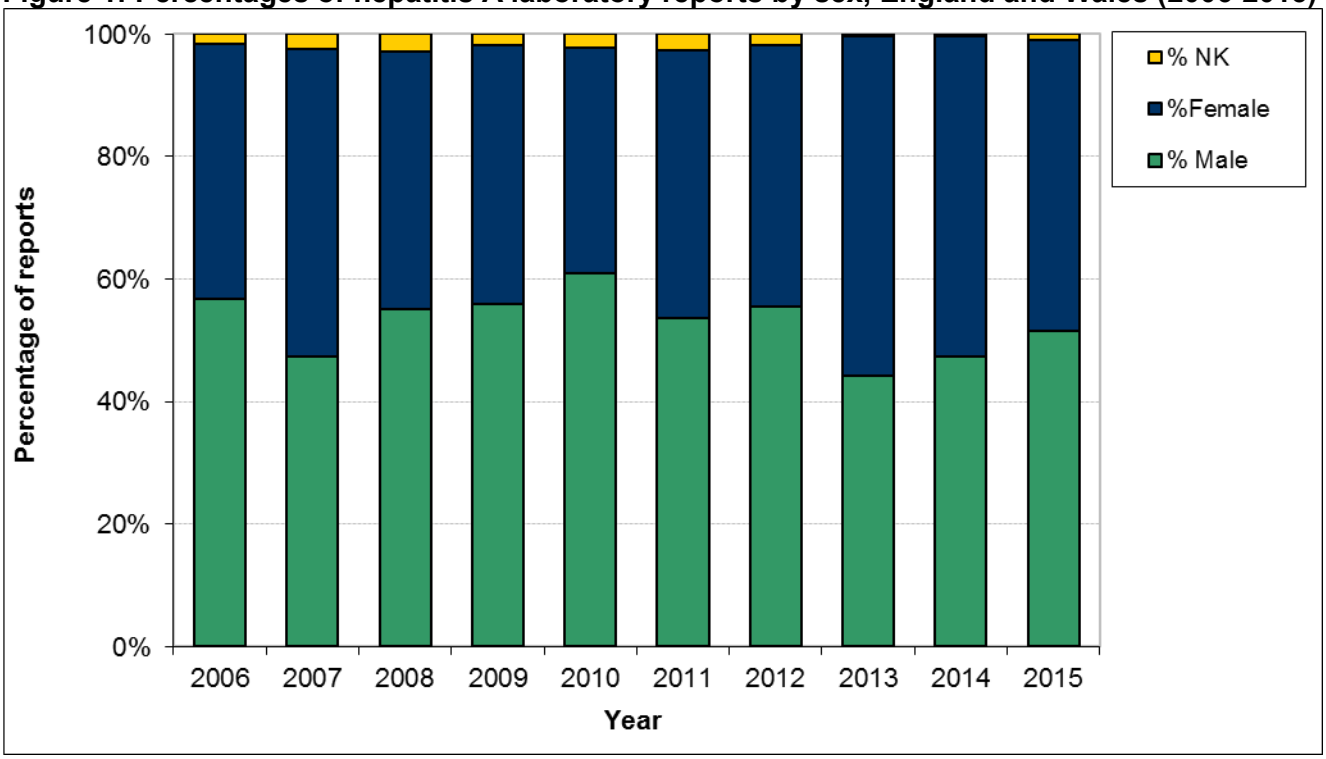
The overall trend has been a decline in the number of reports since 2006. The increased number of reports during 2010 was due to unrelated outbreaks of hepatitis A in the London and the South West regions. A number of clusters were also identified in 2014 and 2015. Due to the small number of laboratory reports per PHE Centre for all centres apart from London, trends in sub-national data over time should be interpreted with caution.

Table 2: Laboratory reports of hepatitis A by PHE Centre (England) and Wales (2006-2015)

PHE Centre	Year									
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
East Midlands	15	13	19	14	9	6	7	8	10	11
East of England	40	31	34	38	36	24	25	23	15	24
London	47	50	54	53	72	69	71	91	118	79
North East	12	14	5	8	12	10	13	10	9	11
North West	71	63	48	64	56	24	28	34	22	43
South East	28	32	66	50	28	44	38	29	55	27
South West	40	33	30	24	48	11	18	29	14	15
West Midlands	66	71	67	59	61	41	44	29	32	47
Yorkshire and Humber	54	36	27	34	40	23	36	19	17	69
Wales	25	20	10	12	9	5	8	11	8	4
Total	**398**	**363**	**360**	**356**	**371**	**257**	**288**	**283**	**300**	**330**

Age and sex were well completed each year (>98% complete) (Figure 1). Where known, males accounted for 52% (170/327) of reports during 2015 (Figure 1). As reported last year, since 2006 the majority of reports were among males for all years excluding 2007, and most recently also 2013 and 2014 (Figure 1). The proportion of reports among males has varied slightly each year; overall males have accounted for 54% of hepatitis A laboratory reports during this period (range 44-61%).

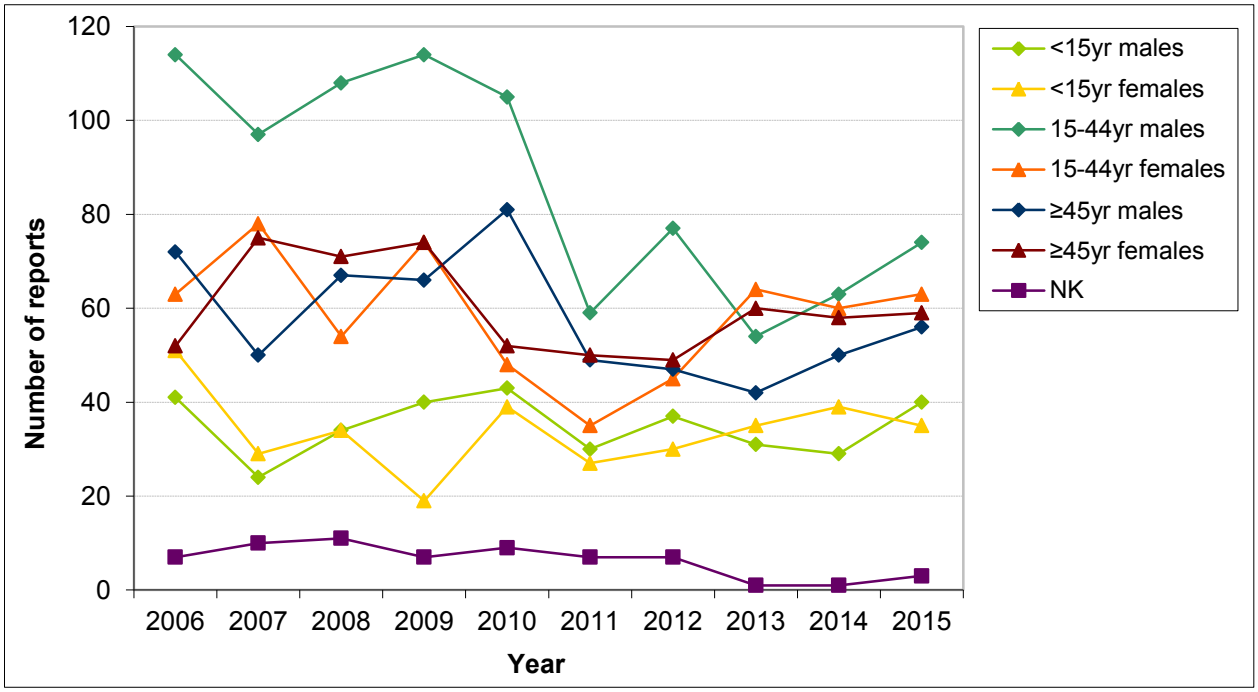
Figure 1: Percentages of hepatitis A laboratory reports by sex, England and Wales (2006-2015)



In 2015, the number of reports received from both males and females of the 15 to 44 year old age group and those aged 45 years and over increased compared to 2014, (Figure 2).

During 2015, males accounted for 53% of reports in the under 15 years age group, 54% of reports in the 15 to 44 age group, and 49% of reports among the 45 years and over age group. In comparison, during 2014 males accounted for 53%, 54% and 43% of reports in the under 15 years age group, the 15 to 44 and the 45 years and over groups, respectively.

Fig. 2: Laboratory reports of hepatitis A by age and sex, England and Wales (2006-2015)



As reported previously, there was no risk factor information reported for anything other than recent travel in 2015. Travel history was available for 18.5% of reported cases, compared to 2014 when 16.7% had a known travel history (Table 3). Overall, risk factor information including travel history remains rare, which limits the conclusions that can be drawn from these data. More complete risk factor information would enable a better understanding of the current epidemiology of hepatitis A virus infection in England and Wales.

Table 3: Trends in hepatitis A laboratory reports, England and Wales (2006-2015)

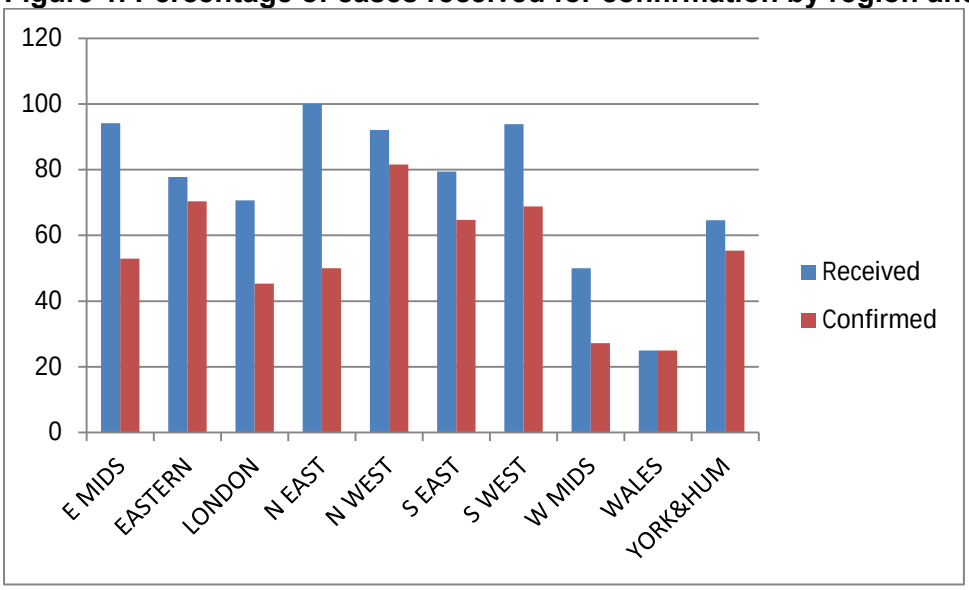
Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of reports	**398**	**363**	**360**	**356**	**371**	**257**	**288**	**283**	**300**	**330**
Number (%) aged 15-44 years	182 (46%)	178 (49%)	167 (46%)	190 (53%)	157 (42%)	96 (37%)	122 (42.4%)	118 (42%)	123 (41%)	138 (41%)
Number (%) male	227 (57%)	172 (47%)	209 (55%)	220 (56%)	230 (61%)	138 (54%)	162 (55%)	127 (44%)	142 (47%)	170(51.5%)
Number (%) with travel history	35 (8.8)	53 (14.6)	60 (16.7)	64 (18.0)	66 (17.8)	43 (16.7)	62 (21.5)	43 (15.2)	50 (16.7)	61 (18.5%)
Number (%) travelled abroad	17 (4.3)	23 (6.3)	18 (5.0)	13 (3.7)	29 (7.8)	7 (2.7)	20 (6.9)	10 (3.5)	4 (1.3)	11 (3.3%)

Reference laboratory confirmation and phylogeny of hepatitis A infection: 2015

Of the 330 laboratory reports of acute HAV infection during 2015, 243 (73.6%) had samples forwarded to the Virus Reference Department (VRD) for confirmation. Of the 87 (26.4%) cases who did not have a sample forwarded to VRD for confirmation, one was a laboratory control not a patient, seven had no sample remaining, seven had samples forwarded for HEV testing and one sample was forwarded for HDV testing.

Acute HAV infection was not confirmed in 26.3% (64/243) of the forwarded samples. The remaining 179 (73.7%) cases were confirmed to have acute HAV infection. In addition 49 cases were confirmed to have acute HAV infection that had not been reported through the laboratory reporting system and with the exception of three samples they were all recorded in HPzone. The breakdown of samples received per region can be seen in Figure 1.

Figure 1. Percentage of cases received for confirmation by region and the percentage confirmed.



Of the 228 confirmed cases, 118 (51.8%) reported a travel history, 103 (45.2%) had no travel history and 7 (3%) had no information. The age of the cases ranged from 1 to 80 years of age with travel associated infections peaking in young adults and then declining with older age (Figure 2). There has been an increase in cases confirmed in all age groups except the 25-34 and 65 plus age group compared to 2014 (Figure 3).

It was possible to genotype 223 of the confirmed cases; 81 (36.3%) were genotype IA, 89 (39.9%) were genotype IB, and 53 (23.8%) were genotype IIIA. This sequence information for each genotype is presented as phylogenetic trees. Each sequence is represented by a dot with the patient region and the week of sampling in brackets.

Figure 2. Confirmed HAV infections by age and travel history

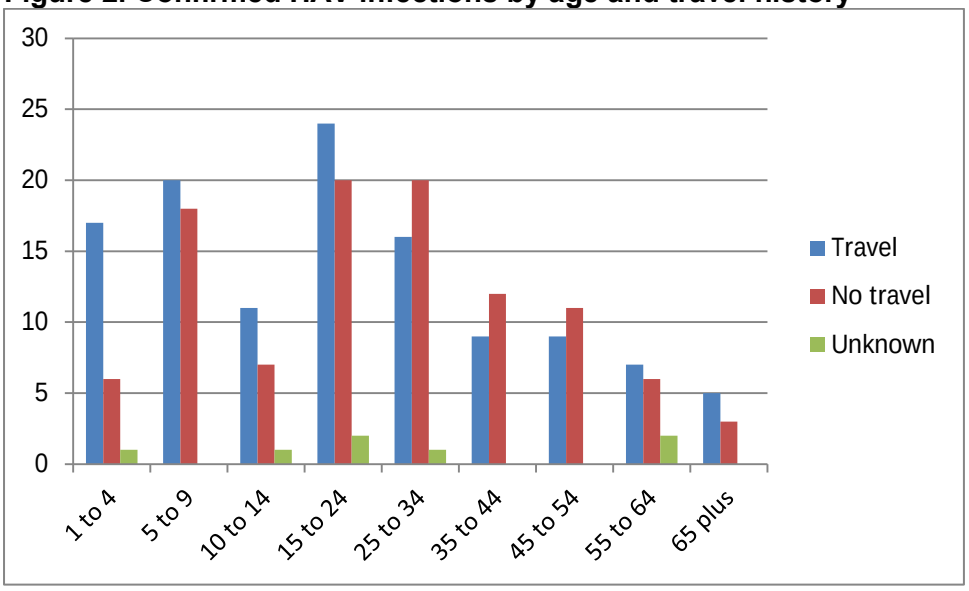


Figure 3. Comparison of 2013 and 2014 confirmed HAV infections by age

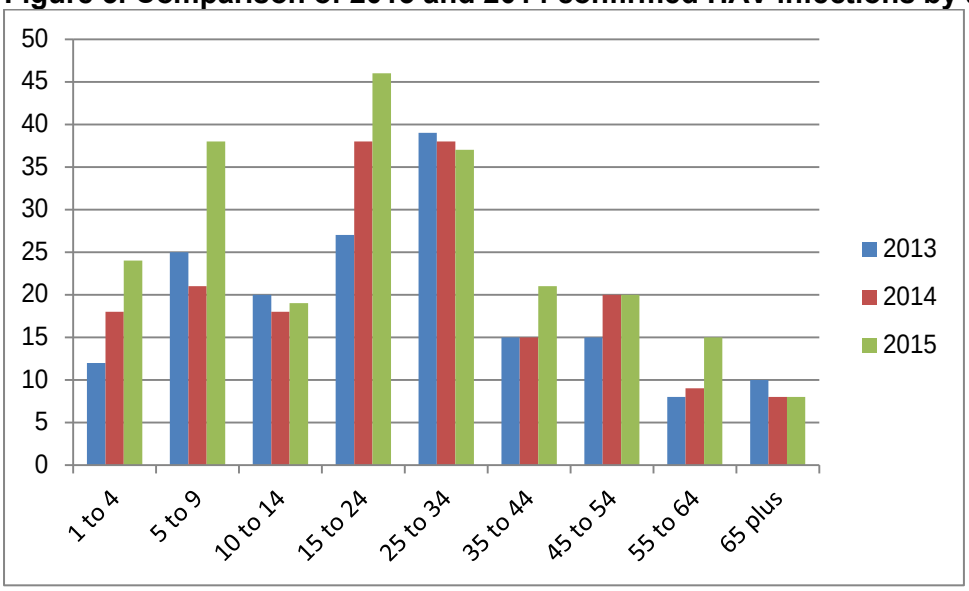
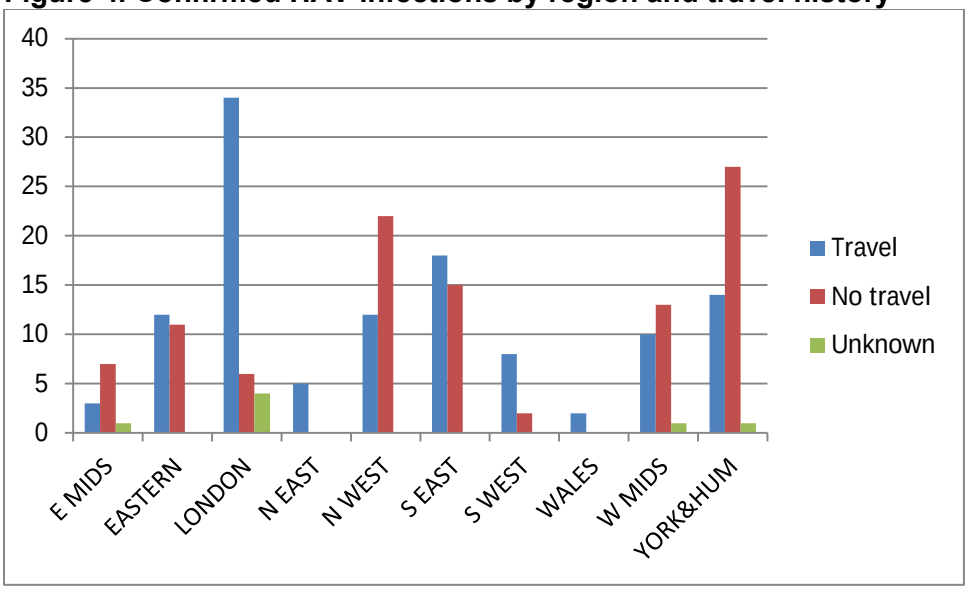
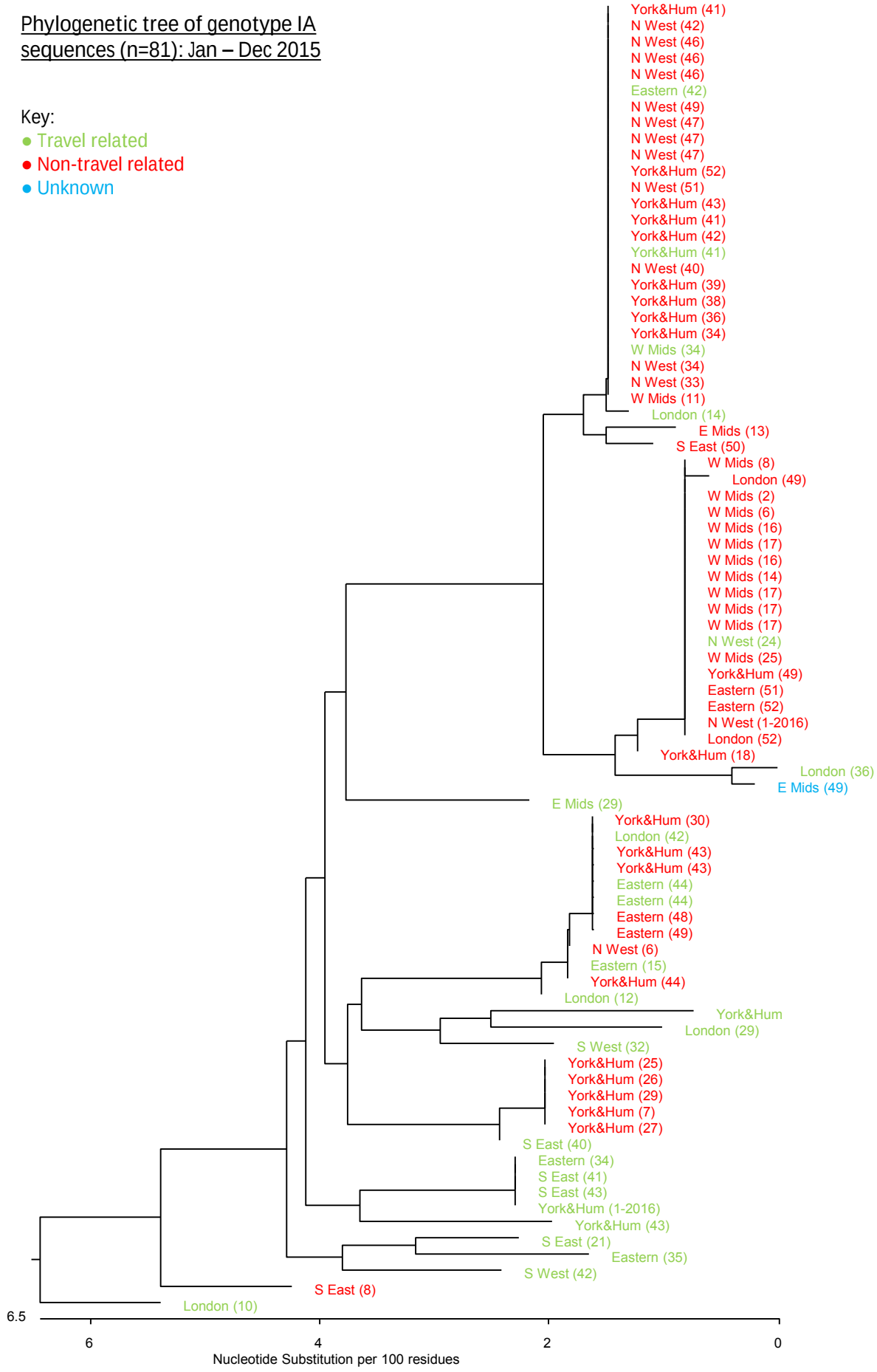


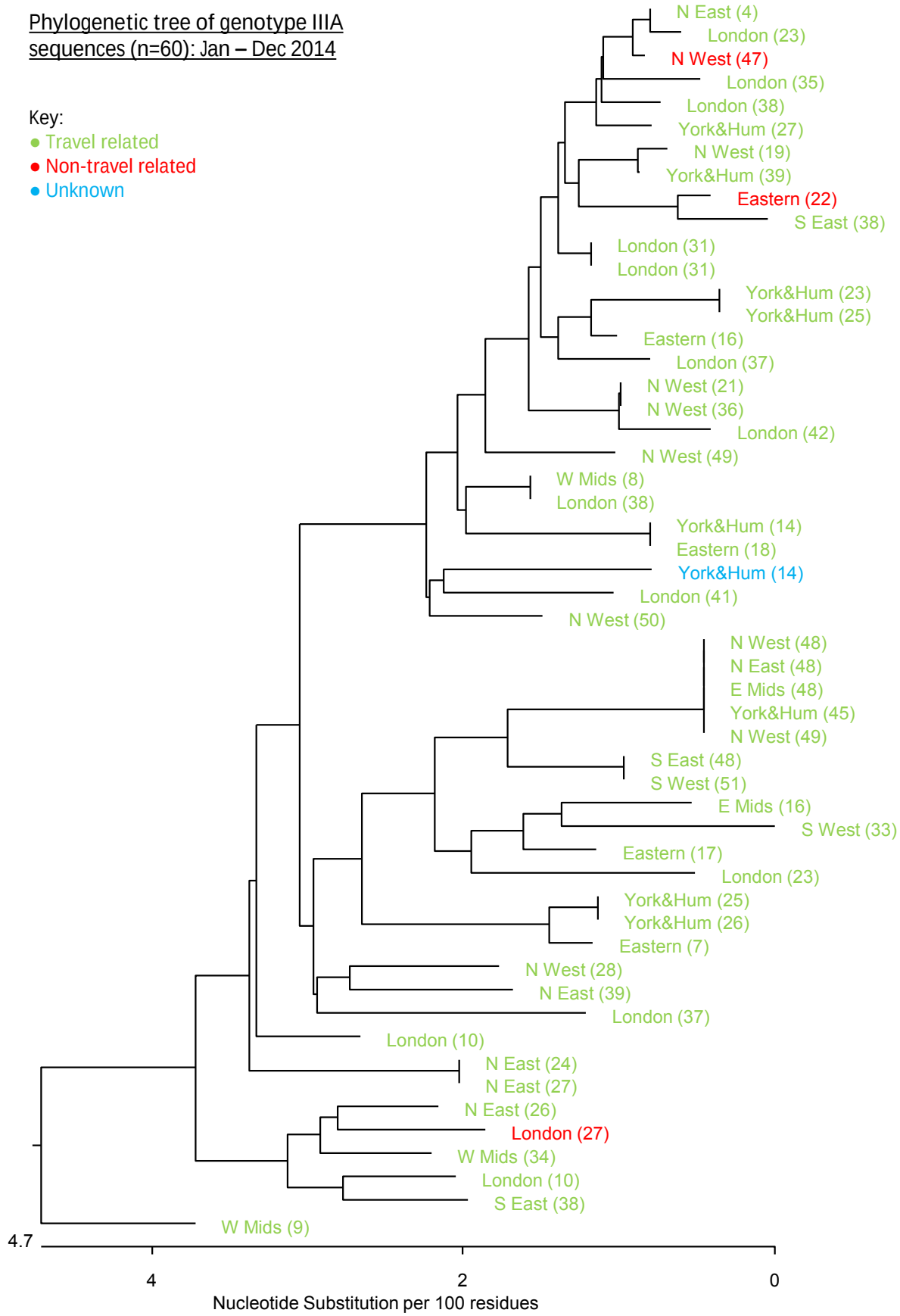
Figure 4. Confirmed HAV infections by region and travel history





The majority of cases with genotype IA had no travel history 55/81 (67.9%) this is contrary to 2013 where more than half the cases had travel history. This difference can be attributed to the fact that a number of regions were affected by large non-travel associated community outbreaks (see Figure 4).

For genotype IB there was little difference in the number of travel versus non-travel related cases (43 and 41 respectively).



As in 2014 the majority of cases with genotype IIIA had a travel history (48/53, 90.6%). Genotype IIIA is geographically associated with South Asia and travellers may not perceive themselves or their family to be at risk if they grew up in an endemic area and are travelling “home” to visit friends and relatives (1).

Summary

In 2015 nearly three quarters of samples associated with laboratory reports of acute HAV infection were forwarded to VRD for confirmation. Comparison of SGSS reports with data from VRD have shown that nearly a quarter of the reports (26.3%) were not true cases of acute HAV. In addition significant numbers of cases genotyped within VRD have not been reported (49 cases) although they were notified to their local Health Protection Teams.

Typing of hepatitis A virus remains an invaluable tool in tracking community outbreaks and our increased understanding of the molecular epidemiology of the virus has enabled us to determine the likely country of origin of some outbreaks even when a source cannot be identified. This is only possible by the continued submission of samples by laboratories from both travel associated and non-travel associated cases.

References.

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4. Gillesberg Lassen S, Soborg B, Midgley SE, Steens A, Vold L, Stene-Johansen K, Rimhanen-Finne R, Kontio M, Löfdahl M, Sundqvist L, Edelstein M, Jensen T, Vestergaard HT, Fischer TK, Mølbak K, Ethelberg S. Ongoing multi-strain food-borne hepatitis A outbreak with frozen berries as suspected vehicle: four Nordic countries affected, October 2012 to April 2013. Euro Surveill. 2013 Apr 25;18(17):20467.
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Laboratory reports of hepatitis C: 2015

During 2015, there were 11,626 confirmed laboratory reports of hepatitis C in England and Wales (Table 1). The demographic breakdown of individuals with reported hepatitis C per quarter was relatively consistent with more reports among males and in the 25 to 54 years old age group.

Table 1: Laboratory reports of hepatitis C by age, sex, and quarter, England and Wales, 2015*

Age group (years)	Q1 Jan-Mar			Q2 Apr-Jun			Q3 Jul-Sep			Q4 Oct-Dec			Total
	Female	Male	NK	Female	Male	NK	Female	Male	NK	Female	Male	NK	
<1	5	5	0	5	5	0	5	3	0	4	3	0	35
1 to 4	0	1	1	0	0	0	2	2	0	3	2	0	11
5 to 9	2	6	0	3	4	0	2	5	0	0	3	0	25
10 to 14	1	1	1	2	1	0	2	4	0	0	1	0	13
15 to 24	39	74	5	49	65	1	46	67	3	39	54	4	446
25 to 34	220	384	6	197	441	8	223	405	5	199	427	5	2,520
35 to 44	206	585	7	244	605	5	245	547	5	234	600	12	3,295
45 to 54	178	526	3	222	545	7	186	557	3	206	527	7	2,967
55 to 64	95	253	2	130	272	3	131	265	0	102	312	2	1,567
≥65	71	79	0	74	94	1	69	113	1	82	102	1	687
NK	1	5	9	0	6	6	5	6	2	1	12	7	60
Total	**818**	**1,919**	**34**	**926**	**2,038**	**31**	**916**	**1,974**	**19**	**870**	**2,043**	**38**	**11,626****

* Laboratory reports are not reliable for differentiating acute and chronic infections. Due to late reporting, numbers or each quarter may have changed slightly since their HPR quarterly reports.
** Provisional data

Overall, there was a 3.1% decrease in the number of reports received during 2015 compared to 2014 (11,626/11,997).

The number of laboratory reports by PHE Centre is presented below. Reports were assigned to a PHE Centre according to i) the patient's place of residence ii) the postcode of the patient's registered GP practice, iii) the postcode of the source laboratory. During 2015, the greatest number of hepatitis C reports were received from London (n=4,091) followed by the North West (1,385), South East (1,331) and Yorkshire and Humber (n=1,326) PHE Centres (Table 2). The comparatively high number of reports from these regions was consistent with previous years.

During 2015 laboratory reports of cases of hepatitis C intermittently failed to be uploaded to SGSS. The reasons for this are currently being investigated.

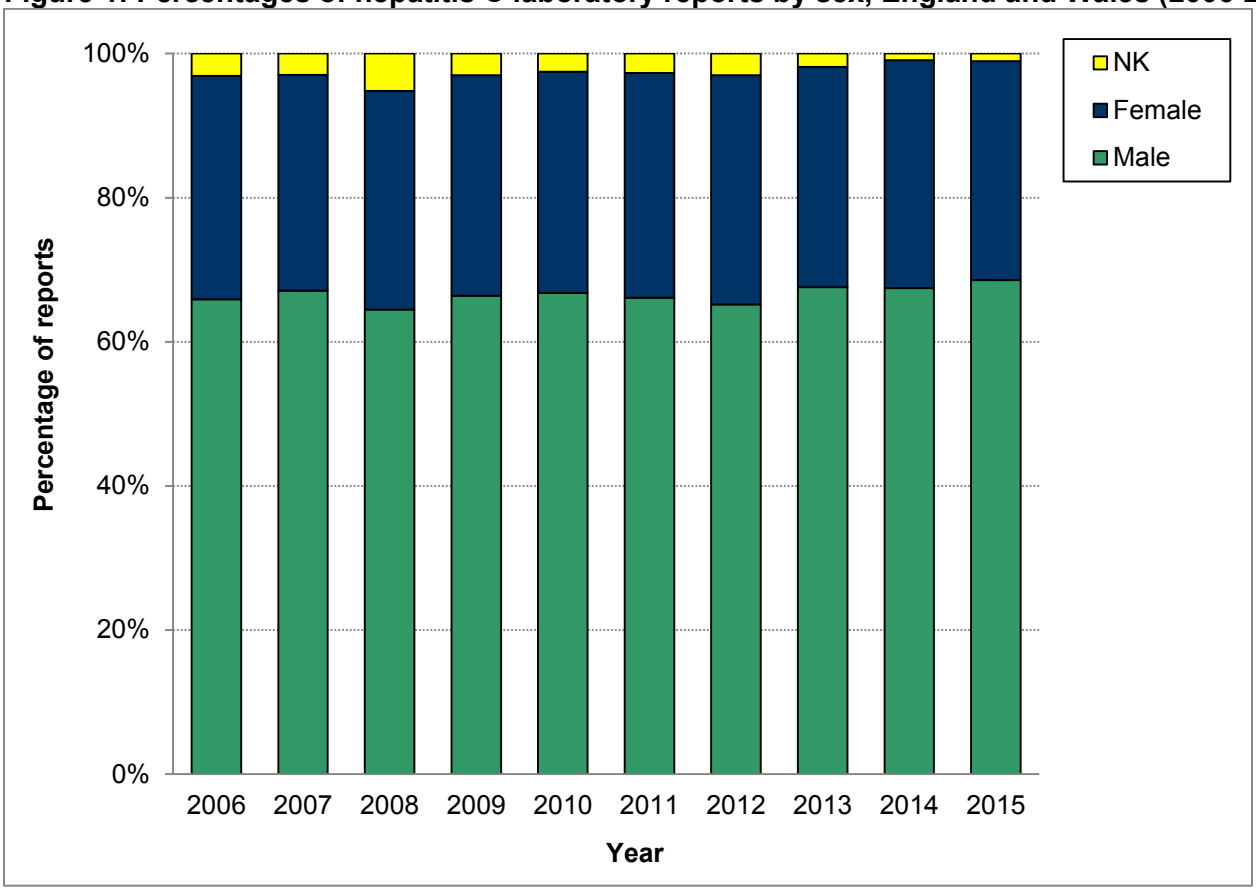
Table 2: Laboratory reports of hepatitis C by region, England and Wales (2006-2015)

PHE Centre	Year									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
East Midlands	259	402	588	576	515	673	672	549	591	401
East of England	684	695	794	706	607	844	776	707	792	840
London	1190	1017	966	856	968	2012	2789	3089	3836	4091
North East	245	141	167	275	317	310	301	360	305	233
North West	1380	1737	1666	2117	1807	1514	1797	1981	1496	1385
South East	379	786	1083	1147	1170	1300	1298	1137	1323	1331
South West	872	1046	1114	999	732	973	1111	997	983	1077
West Midlands	487	614	673	860	778	774	740	781	648	864
Yorkshire and Humber	1449	1363	1344	1091	981	1507	1376	1470	1513	1326
Wales	327	333	487	356	318	486	502	690	510	78
Total	7,272	8,134	8,882	8,983	8,193	10,393	11,362	11,761	11,997	11,626 **

** Provisional data

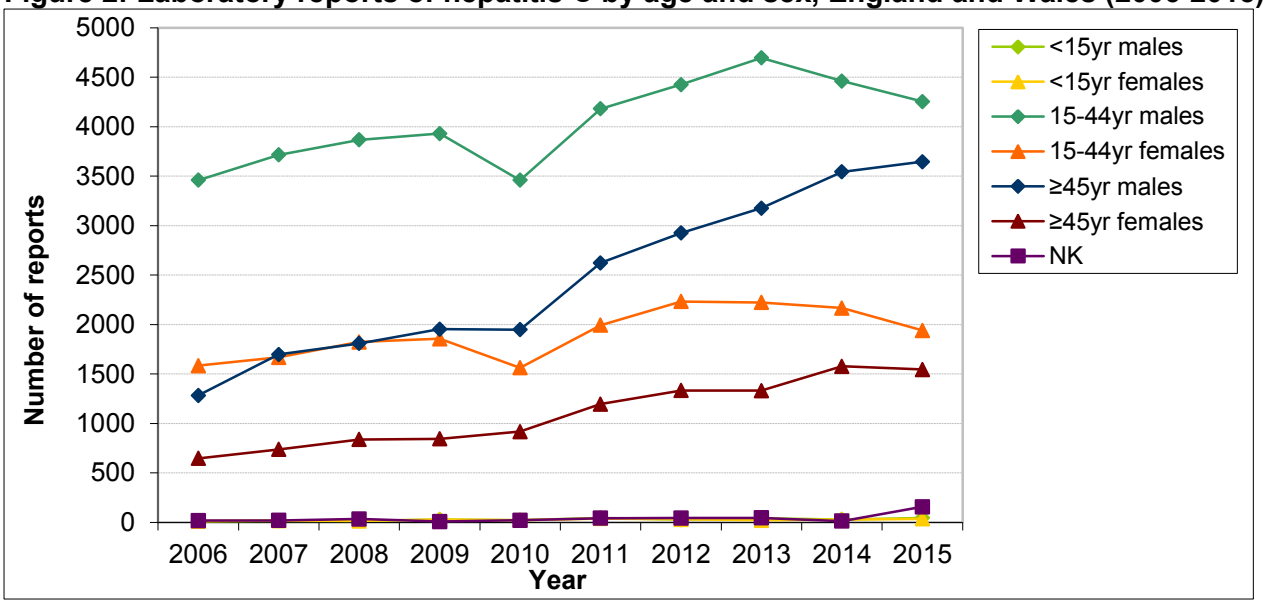
Age and sex were well completed each year (>99% complete) (Figure 1). Where known, males accounted for 69% (7,974/11,504) of reports during 2015 which was consistent with previous years (Figure 1). In total, males have accounted for 68% of reports during this period.

Figure 1: Percentages of hepatitis C laboratory reports by sex, England and Wales (2006-2015)



During 2015, where known 53% of hepatitis C reports were among the 15 to 44 year old age group, a further 45% were among the 45 years and over age group with under 1% of reports among the under 15 years old age group. Since 2006 the highest number of reports has consistently been in the 15 to 44 year age group (Figure 2). However there has been only a slight a year on year raise in the proportion of hepatitis C reports among the 15 to 44 year old age group and a corresponding increase in reports among the 45 years and over age group. The proportion of reports among the under 15 years old age group has remained low at less than 1% per year.

Figure 2: Laboratory reports of hepatitis C by age and sex, England and Wales (2006-2015)



Infection report

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HIV-STIs

Annual report from the sentinel surveillance study of blood borne virus testing in England: data for January to December 2015

This report provides summary data for individuals who were first reported to the sentinel surveillance programme during 2015. Sections 1 to 7 describes testing and demographic information for individuals tested by venepuncture for hepatitis A to E, HIV, and HTLV.

The sentinel surveillance of blood borne virus testing began in 2002, with the aim of supplementing the routine surveillance of hepatitis. Information on the testing carried out in participating centres is collected irrespective of test result and can therefore also be used as a basis for estimating prevalence among those tested. These data have enhanced our knowledge and understanding of hepatitis testing, in terms of who is being tested and from which service types individuals are accessing testing, and also in interpreting trends in the number of positive individuals identified over time. In 2015, sentinel surveillance captured front-line testing for hepatitis A, B, C and HIV among all PHECs in England, covering approximately 40% of the population, and over 80% of the population from all 15 PHECs tested for hepatitis D, E and HTLV.

The supplementary tables referred to in this report are available on the GOV.UK website page "Sentinel surveillance of blood borne virus testing in England: 2015".

1. Hepatitis A IgM testing

In 2015, 21 participating centres supplied hepatitis A-specific IgM antibody (anti-HAV IgM) testing data (a marker of acute infection). Overall 28,235 individuals were tested for anti-HAV IgM, of whom 134 (0.5%) tested positive (Supplementary Table 1). The age and gender of individuals tested was well reported (>99.7% complete). Where known, a similar number of males (53.9%) and females were tested. Half of all individuals tested and one-third of those who tested positive were aged between 25 and 54 years old (Supplementary Table 2). The median age of individuals undergoing testing was 47 years (IQR 31 – 63) whereas the median age of individuals testing positive was 31 years (IQR 17 – 63). As seen in previous years, the greatest proportion positive was among children aged 1-14 years (4.2%).

The type of service which requested the hepatitis test was identified using the record location of the requestor (Table 1). Where known (n=28,144), general practice tested the greatest proportion of individuals for anti-HAV IgM (54.5%), with a further 17.7% tested in other known hospital wards, and 11.1% tested in general medical surgical wards. The highest proportion of positive tests were from unspecified wards (6.1%), paediatric services (2.8%), and accident and emergency (1.6%).

A combination of self-reported ethnicity and name analysis software was used to classify most individuals tested for anti-HAV IgM as belonging to one of four broad ethnic groups (n=27,609) (Supplementary table 3). Where known, the majority of individuals were classified as being of white or white British ethnic origin (83.8%), a further 11.9% were classified as Asian or Asian British origin, 2.7% were classified as other and/or mixed ethnic origin, and 1.6% were classified as black or black British origin. The greatest proportion positive was among individuals of Asian or Asian British origin (1.0%).

Table 1. Number of individuals tested, and testing positive for anti-HAV IgM in participating centres by service type, January – December 2015*

Service type	Number tested	Number positive (%)
Primary Care		
Accident and emergency	1,089	17 (1.6)
Drug dependency services	66	0 (0.0)
General practitioner	15,336	38 (0.2)
GUM clinic	228	0 (0.0)
Occupational health	31	0 (0.0)
Prison services	115	0 (0.0)
Total primary care	16,865	55 (0.3)
Secondary Care		
Antenatal	473	2 (0.4)
Fertility services	14	0 (0.0)
General medical / surgical departments	3,117	18 (0.6)
Obstetrics and gynaecology	229	1 (0.4)
Other ward type (known service)†	4,980	12 (0.2)
Paediatric services	747	21 (2.8)
Renal	237	2 (0.8)
HIV	30	0 (0.0)
Specialist infectious disease services	1,159	4 (0.3)
Unspecified ward§	293	18 (6.1)
Total secondary care	11,279	78 (0.7)
Unknown#	91	1 (1.1)
Total	**28,235**	**134 (0.5)**

* Excludes reference testing and testing from hospitals referring all samples. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

† Other ward types includes cardiology, coroner, dermatology, haematology, ultrasound, x-ray.

§ These are hospital services which are currently being investigated to identify specific service type, and may include any of the secondary care services mentioned above.

These services are currently being investigated to identify specific service type, where possible.

2. Hepatitis B surface antigen testing

Sentinel surveillance collects data on testing for hepatitis B surface antigen (HBsAg). All pregnant women in the UK are offered hepatitis B screening as part of their antenatal care. Data from the test request location and freetext clinical details field accompanying the test request were reviewed to distinguish individuals tested for HBsAg as part of routine antenatal screening (section 2a) from those tested in other settings and for other reasons (section 2b). It is possible that some women undergoing antenatal screening may not be identified as such and may therefore be included in section 2b as non-antenatal testing.

a. Antenatal HBsAg screening

In 2015, 90,967 women aged between 12 and 49 years old were identified as undergoing antenatal screening for HBsAg, representing 30.4% of all individuals tested for HBsAg in participating sentinel centres (Supplementary Table 4). Overall 315 (0.3%) of these women tested positive. The median age of women tested was 29 years (IQR 25– 33) and the median age of women testing positive was 28 years (IQR 26 – 33). A HBeAg result was available for all HBsAg positive women (305), and of these, 8.5% were HBeAg positive (Table 2).

Most women who underwent antenatal screening were classified as belonging to one of four broad ethnic groups (n= 88,882) (Table 2). The majority of individuals were classified as being of white or white British ethnic origin (77.7%), a further 16.2% were classified as Asian or Asian British origin, 3.9% were classified as other and/or mixed ethnic origin, and 2.1% were classified as black or black British origin. The proportion testing positive was higher among women of black or black British origin and other and/or

mixed origin (1.5% and 1.3% respectively) than women of Asian or Asian British origin and white or white British origin (0.4% and 0.2% respectively).

The proportion of HBeAg positive women also differed by ethnic group with 25.0% of other and/or mixed ethnic origin women testing positive, 12.5% of Asian or Asian British women, 6.9% of black or black British women and 2.9% of white or white British women.

Table 2. Number of antenatal women tested and testing positive for HBsAg, and number of HBsAg positive women tested and testing positive for HBeAg by ethnic group, January – December 2015*

Ethnic group	Number tested HBsAg	Number positive (%)	Number HBsAg positive tested for HBeAg	% HBsAg positive tested	Number HBeAg positive (%)
Asian or Asian British origin	14,438	64 (0.4)	64	100.0	8 (12.5)
Black or black British origin	1,884	29 (1.5)	29	100.0	2 (6.9)
Other and/or mixed origin	3.495	45 (1.3)	44	97.8	11 (25.0)
White or white British origin	69,065	143 (0.2)	136	95.8	4 (2.9)
Unknown ethnic origin	2,085	34 (1.6)	32	94.1	1 (3.1)
Total	**90,967**	**315 (0.3)**	**305**	97.1	**26 (8.5)**

* Excludes dried blood spot testing, oral fluid testing, reference testing and testing from hospitals referring all samples. Only women aged 12-49 years old are included. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

b. Non-antenatal HBsAg testing

In 2015, 208,375 individuals were tested at least once for HBsAg, excluding antenatal screening, in 21 participating sentinel centres. Overall, 2,363 (1.1%) of individuals tested positive, with the highest proportion of positive tests in the West Midlands (3.0%) (Supplementary Table 5). This may reflect more targeted testing of risk groups and/or genuinely higher prevalence of hepatitis B in people being tested in this PHEC.

The age and gender of individuals tested for HBsAg was well reported (>99.4% complete). Where known, an equal numbers of males (50.1%) and females were tested (Supplementary Table 6). The number of females tested may include some undergoing routine antenatal screening who could not be identified as such from the information provided. Males had a greater proportion testing positive compared to females (1.5% vs 0.8% p<0.001). More than two fifths of all individuals tested and three fifths of individuals testing positive were aged between 25 and 44 years old. The median age of individuals tested and positive were similar with 36 years (IQR 26 – 52) and 35 years (IQR 28 – 46) respectively.

Where known (n=208,027), general practice tested the greatest proportion of individuals for HBsAg (33.1%), with a further 17.5% tested in GUM clinics, and 17.0% tested in other known hospital wards (Table 3). The highest proportion of positive tests were among unspecified wards, HIV specialist services and in specialist liver services (5.9%, 2.3% and 1.8% respectively).

Over three-quarters of individuals tested for HBsAg were classified as belonging to one of four broad ethnic groups (n=166,481) (Table 4). The majority of individuals were classified as being of white or white British ethnic origin (78.5%), a further 15.2% were classified as Asian or Asian British origin, 3.8% were classified as other and/or mixed ethnic origin, and 2.5% were classified as black or black British origin. Most individuals of unknown ethnic origin were tested by GUM clinics, from which only minimal demographic data are available, resulting in poor ethnic classification. The proportion positive varied by ethnic group; 5.3% of individuals of other and/or mixed ethnicity tested positive compared to 5.1% of black or black British origin individuals, 1.7% of Asian or Asian British origin individuals and 0.6% of white or white British origin individuals.

Table 3. Number of individuals tested, and testing positive for HBsAg in participating centres by service type (excluding antenatal testing), January – December 2015*

Service type	Number tested	Number positive (%)
Primary Care		
Accident and emergency	3,891	45 (1.2)
Drug dependency services	723	1 (0.1)
General practitioner	68,754	1,020 (1.5)
GUM clinic	36,477	438 (1.2)
Occupational health	12,107	50 (0.4)
Prison services	2,318	30 (1.3)
Total primary care	124,270	1,584 (1.3)
Secondary Care		
Fertility services	9,161	46 (0.5)
General medical / surgical departments	9,938	93 (0.9)
Obstetrics and gynaecology	11,467	27 (0.2)
Other ward type (known service)†	35,385	266 (0.8)
Paediatric services	3,020	12 (0.4)
Renal	4,966	28 (0.6)
Specialist HIV services	438	10 (2.3)
Specialist liver services	6,348	116 (1.8)
Unspecified ward§	3,034	179 (5.9)
Total secondary care	83,757	777 (0.9)
Unknown#	348	2 (0.6)
Total	**208,375**	**2,363 (1.1)**

* Excludes dried blood spot, oral fluid, reference testing and testing from hospitals referring all samples. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

† Other ward types includes cardiology, coroner, dermatology haematology, ultrasound, x-ray.

§ These are hospital services which are currently being investigated to identify specific service type, and may include any of the secondary care services mentioned above.

These services are currently being investigated to identify specific service type, where possible

Table 4. Number of individuals tested, and testing positive for HBsAg in participating centres by ethnic group (excluding antenatal testing), January – December 2015*

Ethnic group	Number tested	Number positive (%)
Asian or Asian British origin	25,283	433 (1.7)
Black or black British origin	4,176	214 (5.1)
Other and/or mixed origin	6,368	339 (5.3)
White or white British origin	130,654	775 (0.6)
Unknown ethnic origin	41,894	602 (1.4)
Total	**208,375**	**2,363 (1.3)**

* Excludes dried blood spot, oral fluid, reference testing and testing from hospitals referring all samples. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

3. Hepatitis C antibody testing

Sentinel surveillance collects data on testing for hepatitis C-specific antibodies (anti-HCV). It is important to note that no laboratory methods are currently available to distinguish between acute or chronic hepatitis C virus infections. Therefore, positive anti-HCV results do not therefore necessarily represent incident infections.

In 2015, 176,471 individuals were tested at least once for anti-HCV in 21 participating sentinel centres. Overall, 3,035 (1.7%) of individuals tested positive. This varied by PHEC with the highest proportion of positive tests were from the West Midlands (3.7%) (Supplementary Table 7). This may reflect more targeted testing of risk groups and/or genuinely higher prevalence of hepatitis C in people being tested in this PHEC. Of those individuals testing positive for anti-HCV 75.3% were tested for HCV RNA by PCR, of whom 64.5% tested positive (n=1,473). Of the PCR positive individuals 52.7% had a HCV genotype recorded; 45.5% were genotype 1, with a further 45.2% genotype 3.

Age and gender were well reported (>99.4% complete). Where known, more males (55.3%) were tested than females (Supplementary Table 8). More than two fifths of all individuals tested and around half testing positive were aged between 25 and 44 years old. A greater proportion of males tested positive compared to females (2.1% vs 1.2% respectively, p<0.001). The median age of those tested was 38 years (IQR 28 – 54 years), whereas the median age of those tested positive was 42 years (IQR 33 – 52 years).

Where known (n=176,245), general practice tested the greatest proportion of individuals for anti-HCV (32.3%), with a further 18.7% tested in other known hospital wards and 16.5% tested in GUM clinics (Table 5). The highest proportion of positive tests were among unspecified wards (14.3%), specialist drug (10.0%) and prison services (6.7%).

Table 5. Number of individuals tested, and testing positive for anti-HCV in participating centres by service type, January – December 2015*

Service type	Number tested	Number positive (%)
Primary Care		
Accident and emergency	3,934	78 (2.2)
Drug dependency services	743	74 (10.0)
General practitioner	56,982	936 (1.6)
GUM clinic	29,077	484 (1.7)
Occupational health	10,053	19 (0.2)
Prison services	3,265	220 (6.7)
Total primary care	104,054	1,811 (1.7)
Secondary Care		
Antenatal	1,563	32 (2.0)
Fertility services	9,240	33 (0.4)
General medical / surgical departments	9,380	166 (1.8)
Obstetrics and gynaecology	2,357	13 (0.6)
Other ward type (known service)†	33,034	378 (1.1)
Paediatric services	2,241	21 (0.9)
Renal	4,913	41 (0.8)
Specialist HIV services	397	15 (3.8)
Specialist liver services	6,278	113 (1.8)
Unspecified ward§	2,788	399 (14.3)
Total secondary care	72,191	1,211 (1.7)
Unknown#	226	13 (5.8)
Total	**176,471**	**3,035 (1.7)**

* Excludes dried blood spot, oral fluid, reference testing and testing from hospitals referring all samples. Individuals aged less than one year are excluded since positive tests in this age group may reflect the presence of passively-acquired maternal antibody rather than true infection. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

† Other ward types includes cardiology, coroner, dermatology haematology, ultrasound, x-ray

§ These are hospital services which are currently being investigated to identify specific service type, and may include any of the secondary care services mentioned above.

These services are currently being investigated to identify specific service type, where possible

Most individuals tested for anti-HCV were classified as belonging to one of four broad ethnic groups (n=142,268) (Table 6). The majority of individuals were classified as being of white or white British ethnic origin (80.1 %), a further 14.2% were classified as Asian or Asian British origin, 3.4% were classified as other and/or mixed ethnic origin, and 2.3% were classified as black or black British origin. The proportion positive varied slightly by ethnic group: 1.6% of individuals of Asian or Asian British origin and white or white British origin tested positive, compared to 1.2% of other or mixed ethnic origin individuals and 0.7% of black or black British origin individuals.

Table 6. Number of individuals tested, and testing positive for anti-HCV in participating centres by ethnic group, January – December 2015*

Ethnic group	Number tested	Number positive (%)
Asian or Asian British origin	20,154	326 (1.6)
Black or black British origin	3,343	25 (0.7)
Other and/or mixed origin	4,863	58 (1.2)
White or white British origin	113,908	1,857 (1.6)
Unknown ethnic origin	34,203	769 (2.2)
Total	**176,471**	**3,035 (1.7)**

* Excludes dried blood spot testing, oral fluid testing, reference testing and testing from hospitals referring all samples. Excludes individuals aged less than one year, in whom positive tests may reflect the presence of passively-acquired maternal antibody rather than true infection. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

4. Hepatitis D total antibody testing

Sentinel surveillance collects data on testing for hepatitis D-specific total antibody (HDV TA) and A-specific IgM antibody (anti-HAV IgM), a marker of acute hepatitis D infection. Six sentinel laboratories provide hepatitis D testing facilities. Given the small number of tests individuals tested for HDV TA and/or HDV IgM are aggregated, and therefore do not necessarily represent incident infections, and should be interpreted accordingly. Data are shown by region of the requesting service.

In 2015, 2,515 individuals were tested at least once for HDV TA and/or HDV IgM in six participating sentinel centres (Supplementary Table 9). Overall 100 (4.0%) of individuals tested positive, although this varied by PHEC.

The age and gender of individuals tested for hepatitis D was well reported (>98.3% complete). Where known, more males were tested than females (56.4% male). The proportion of males testing positive was significantly greater when compared to females (4.7% vs 2.8%, p=0.01). Three-fifths of all individuals tested and testing positive were aged between 25 and 44 years old. The median age of individuals tested was 35 years (IQR 28 – 45) and the median age of individuals testing positive was 37 years (IQR 29 – 46).

Where known (n=2,513), almost two-thirds (63.1%) of individuals were tested by a hospital which referred all hepatitis D samples to a sentinel centre. In these cases the original service that initially requested the test could not be determined.

Most individuals tested for hepatitis D were classified as belonging to one of four broad ethnic groups (n=2,071). Almost a half of individuals were classified as being of white or white British ethnic origin (47.0%), a further 23.5% were classified as Asian or Asian British ethnic origin, 19.3% were classified as other and/or mixed origin, and 10.2% were classified as black or black British origin (Table 7). The proportion positive varied by ethnic group; 4.9% of Asian or Asian British origin tested positive compared to 3.8% of individuals of black or black British ethnic origin individuals and white or white British origin individuals and 2.5% of other or mixed ethnic origin individuals.

Table 7. Number of individuals tested, and testing positive, for HDV-TA and/or HDV IgM in participating centres by ethnic group, January – December 2015*

Ethnic group	Number tested	Number positive (%)
Asian or Asian British origin	487	24 (4.9)
Black or black British origin	211	8 (3.8)
Other and/or mixed origin	400	10 (2.5)
White or white British origin	973	37 (3.8)
Unknown ethnic origin	444	21 (4.7)
Total	**2,515**	**100 (4.0)**

* Excludes reference testing. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

5. Hepatitis E IgM testing

Sentinel surveillance collects data on testing for hepatitis E-specific IgM antibody (anti-HEV IgM), a marker of acute hepatitis A infection. Six sentinel laboratories provide anti-HEV IgM testing facilities.

In 2015, 12,396 individuals were tested at least once for anti-HEV IgM in six participating sentinel centres (Supplementary Table 10). This represents a 8.9% increase in the number of individuals tested in 2015 compared to that reported in 2014. This increase in testing is likely to reflect a substantial increase in confirmed HEV cases since 2010. Overall, 831 (6.7%) of individuals tested positive, although this varied by PHEC with the highest proportion of positive tests in the North West (14.6%).

The age and gender of individuals tested for anti-HEV IgM was well reported (>99.5% complete). Where known, a similar number of males and females were tested (53.0% male). A greater proportion of males tested positive compared to females (7.7 % vs. 5.6% respectively, $p<0.001$). Over two-fifths of all individuals tested and a third of individuals testing positive were aged between 25 and 54 years old. The median age of individuals tested was 51 years (IQR 34 – 65) and the median age of individuals testing positive was 59 years (IQR 46 – 69).

Overall 10.4% (353/3,397) of males aged 50 or over tested positive for HEV, compared to 4.9% (153/3,144) among those under the age of 50. A similar pattern was seen among females, where 7.2% (220/3,043) of females aged 50 or over tested positive compared to 3.8% (104/2,755) among those under the age of 50.

Where known (n=12,373), most individuals were tested by a hospital which referred all anti-HEV IgM samples to a sentinel centre (60.1%). In these cases the original service that initially requested the test could not be determined. Where the test was not a referral, the highest proportion of positives tested through general medical surgical (9.9%) and specialist renal services (9.7%).

Most individuals tested for anti-HEV IgM were classified as belonging to one of four broad ethnic groups (n=11,822). The majority of individuals were classified as being of white or white British ethnic origin (83.0%), a further 13.5% were classified as Asian or Asian British origin, 2.1% were classified as other and/or mixed ethnic origin, and 1.3% were classified as black or black British origin (Table 8). The proportion positive varied by ethnic group; 7.3% of individuals of white or white British origin tested positive compared to 4.5% of Asian or Asian British origin individuals and 2.0% of other or mixed ethnic origin individuals and 0.7% of black or black British origin individuals.

Table 8. Number of individuals tested, and testing positive, HEV IgM in participating centres by ethnic group, January – December 2015

Ethnic group	Number tested	Number positive (%)
Asian or Asian British origin	1,600	72 (4.5)
Black or black British origin	153	1 (0.7)
Other and/or mixed origin	254	5 (2.0)
White or white British origin	9,815	721 (7.3)
Unknown ethnic origin	574	32 (5.6)
Total	**12,396**	**831 (6.7)**

6. HIV testing

Sentinel surveillance collects data on testing for HIV. All pregnant women in the UK are offered HIV screening as part of their antenatal care. Data from the test request location and free-text clinical details field accompanying the test request were reviewed to distinguish individuals tested for HIV as part of routine antenatal screening (section 6a) from those tested in other settings and for other reasons (section 6b). It is possible that some women undergoing antenatal screening may not be identified as such and may therefore be included in section 6b as non-antenatal testing.

a. Antenatal HIV screening

In 2015, 65,327 women aged between 16 and 49 years old were identified as undergoing antenatal screening for HIV, representing 21.3% of all individuals tested for HIV in participating sentinel centres (Supplementary Table 11). Overall, 101 (0.2%) of these women tested positive. The median age of women tested was 29 years (IQR 25 – 33) and the median age of women testing positive was 33 years (IQR 26 – 40).

b. Non-antenatal HIV testing

In 2015, 241,218 adults aged 16 years old and over were tested at least once for HIV, excluding antenatal screening, in 15 participating sentinel centres. Overall, 2,107 (0.9%) of individuals tested positive, although this varied by PHEC with the highest proportion of positive tests in the South West (8.3%) (Supplementary Table 12), although few individuals were tested from this PHEC.

The age and gender of adults tested for HIV was well reported (>99.1% complete). Where known, similar numbers of females (51.9%) were tested compared to males (Supplementary Table 13). The number of females tested may include some undergoing routine antenatal screening who could not be identified as such from the information provided. A greater proportion of males tested positive compared to females (1.4% vs 0.4% p<0.001). Half of all individuals tested and three-fifths of those testing positive were aged between 25 and 34 years old. The median age of individuals tested was 30 years (IQR 23 – 41) and the median age of individuals testing positive was 36 years (IQR 28 – 46).

Where known (n=240,757), GUM clinics tested the greatest proportion of individuals for HIV (49.3%), with a further 18.9% tested in general practice, and 10.8% tested in other known hospital wards (Table 9). The highest proportion of positive tests were among specialist HIV services, unspecified wards and specialist liver services (31.9%, 7.1% and 1.6% respectively).

Table 9. Number of adults (16+ years old) tested and testing positive for HIV in participating centres by service type (excluding antenatal testing), January – December 2015*†.

Service type	Number tested	Number positive (%)
Primary Care		
Accident and emergency	3,271	46 (1.4)
Drug dependency services	341	1 (0.3)
General practitioner	45,489	167 (0.4)
GUM clinic	118,620	1,287 (1.1)
Occupational health	8,411	11 (0.1)
Prison services	2,481	15 (0.6)
Pharmacy	2	0 (0.0)
Total primary care	178,613	1,527 (0.9)
Secondary Care		
Fertility services	8,932	21 (0.2)
General medical / surgical departments	8,729	81 (0.9)
Obstetrics and gynaecology	6,318	8 (0.1)
Other ward type (known service)†	26,115	148 (0.6)
Paediatric services	1,049	3 (0.3)
Renal	3,335	16 (0.5)
Specialist HIV services	138	44 (31.9)
Specialist liver services	5,026	78 (1.6)
Unspecified ward§	2,500	177 (7.1)
Total secondary care	62,142	576 (0.9)
Unknown#	461	4 (0.9)
Total	**241,218**	**2,107 (0.9)**

* Excludes individuals aged under 16, antenatal screening, dried blood spot testing, oral fluid testing, reference testing and testing from hospitals referring all samples. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

† Other ward types includes cardiology, coroner, dermatology haematology, ultrasound, x-ray.

§ These are hospital services which are currently being investigated to identify specific service type, and may include any of the secondary care services mentioned above.

These services are currently being investigated to identify specific service type, where possible

Almost half of adults tested for HIV were classified as belonging to one of four broad ethnic groups (n=114,432) (Table 10). Where known, the majority of individuals were classified as being of white or white British ethnic origin (82.6%), a further 11.2% were classified as Asian or Asian British origin, 3.3% were classified as other and/or mixed ethnic origin, and 2.9% were classified as black or black British origin. Most individuals of unknown ethnic origin were tested in GUM clinics, hence the lack of demographic information. The proportion positive varied by ethnic group; 3.2% of individuals of black or black British origin tested positive compared to 0.7% of other and/or mixed origin individuals and 0.6% of white or white British origin and Asian or Asian British origin individuals.

Table 10. Number of adults (16+ years old) tested, and testing positive for HIV in participating centres by ethnic group (excluding antenatal testing), January – December 2015*

Ethnic group	Number tested	Number positive (%)
Asian or Asian British origin	12,865	73 (0.6)
Black or black British origin	3,264	106 (3.2)
Other and/or mixed origin	3,759	25 (0.7)
White or white British origin	94,544	594 (0.6)
Unknown ethnic origin	126,786	1,309 (1.0)
Total	**241,218**	**2,107 (0.9)**

* Excludes individuals aged under 16, antenatal screening, dried blood spot testing, oral fluid testing, reference testing and testing from hospitals referring all samples. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

7. HTLV testing

In 2015, 6,298 individuals were tested at least once for HTLV-1 specific antibodies in 11 participating sentinel centres (Supplementary Table 14). Overall, 82 (1.3%) of individuals tested positive, although this varied by PHEC with the highest proportion of positive tests in the East Midlands (10.3%), although few individuals were tested from this region.

The age and gender of individuals tested for HTLV-1 was well reported (>94.5% complete) (Supplementary Table 15). Where known, similar numbers of males and females were tested (51.7% male), with a higher proportion of females testing positive compared to males (1.9% vs. 0.8% respectively, $p<0.001$). Over half of all individuals tested and two-thirds of those testing positive, were aged 45 years and older. The median age of individuals tested was 48 years (IQR 33 – 60) and the median age of individuals testing positive was 55 years (IQR 37 – 69).

Where known (n=6,295), a quarter of individuals were tested by a hospital which referred all HTLV-1 samples to a sentinel centre (26.4%). In these cases the original service that initially requested the test could not be determined.

Most individuals tested for HTLV-1 were classified as belonging to one of four broad ethnic groups (n=5,537) (Table 11). The majority of individuals were classified as being of white or white British ethnic origin (86.3%), a further 9.2% were classified as Asian or Asian British origin, 2.6% were classified as black or black British origin, and 1.9% were classified as other and/or mixed ethnic origin (Table 11). The proportion positive varied by ethnic group; 2.8% of other and/or mixed origin individuals tested positive compared to 1.4% of individuals of black or black British origin, 1.1% of individuals of white or white British origin and 0.8% of Asian or Asian British origin individuals.

Table 11. Number of individuals tested, and testing positive for HTLV in participating centres by ethnic group, January – December 2015*

Ethnic group	Number tested	Number positive (%)
Asian or Asian British origin	512	4 (0.8)
Black or black British origin	142	2 (1.4)
Other and/or mixed origin	107	3 (2.8)
White or white British origin	4,776	54 (1.1)
Unknown ethnic origin	761	19 (2.5)
Total	**6,298**	**82 (1.3)**

* Excludes reference testing. Data are de-duplicated subject to availability of date of birth, soundex and first initial. All data are provisional.

8. Dried blood spot testing

Dried blood spot testing data are not yet complete for 2015.

Reference

1. Judd A, *et al* (2003). Evaluation of a modified commercial assay in detecting antibody to hepatitis C virus in oral fluids and dried blood spots. *J Med Virol.* **71**: 49-55.

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Immunisation

Shingles vaccine coverage report (England) September 2015 to May 2016

Provisional cumulative vaccine coverage estimates to the end of May 2016 show 51.0% coverage for the routine 70 year old and 51.1% for the 78 year old catch-up cohort. Compared with May 2015, coverage was lower by 1.8% for the routine cohort and by 1.4% for the catch-up cohort.

Introduction

This report describes the first nine months (September 2015 to May 2016) of the third year of the herpes zoster (shingles) vaccination programme in England, comparing cumulative vaccine coverage estimates with the 2014/15 and 2013/14 programmes [1, 2].

In this year of the programme (1 September 2015 to 31 August 2016) shingles vaccine is routinely offered to patients aged 70 years old on 1 September 2015 (born between 2 September 1944 and 1 September 1945) and to a catch-up cohort comprised of adults aged 78 years old on 1 September 2015 (born between 2 September 1936 and 1 September 1937). GPs may continue to offer immunisation to anyone who was eligible for shingles vaccine in the first two years of the programme but has not yet been vaccinated, up until their 80th birthday. This includes people aged 71, 72 or 79 on 1 September 2015 [3, 4].

As a live viral vaccine, the shingles vaccine is contraindicated for individuals with severe immunosuppression and pregnant women. It is essential to assess the eligibility of individuals prior to offering the shingles vaccine and ensure that those who can benefit are not excluded. Further information on shingles vaccine eligibility is available in the “Immunisation against infectious disease” book (the Green Book) [5].

Methods

GP practice level shingles vaccine coverage data are automatically uploaded via participating GP IT suppliers to the ImmForm* website on a monthly basis.

* 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.

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

- vaccine coverage − the total number of patients aged 70 or 78 years on 1 September 2015 who have ever received the vaccination (numerator) as a proportion of the number of patients registered aged 70 or 78 years on 1 September 2015 (denominator)
- vaccine uptake − The total number of patients aged 70 or 78 years on 1 September 2015 who received the vaccination between 1 September 2015 and 31 November 2015 (numerator) as a proportion of the number of patients registered aged 70 or 78 years on 1 September 2015 (denominator)

This report describes vaccine **coverage** of each eligible cohort for England and by NHS England area team (AT). Vaccine coverage estimates by NHS England Clinical Commissioning Group (CCG) are presented in an appendix associated with this report.

Results

In total, shingles vaccine coverage data were available for 7291/7620 (95.7%) English GP practices in May 2016. This ranged by AT from 90.3% of practices in Shropshire and Staffordshire, to 99.1% of practices in North Yorkshire and Humber (see table).

By the end of May 2016, 51.0% of the 70 year old routine cohort were vaccinated (compared to 52.8% in May 2015 and 56.5% in May 2014), and 51.1% of the 78 year old catch-up cohort were vaccinated (compared to 52.5% in May 2015) (figures 1 and 2).

Coverage by AT ranged from 43.7% (Essex) to 57.0% (Cheshire, Warrington and Wirral) for the routine 70 year old cohort, and from 43.3% (Essex) to 55.7% (Cheshire, Warrington and Wirral) for the 78 year old catch-up cohort (table).

Discussion

Provisional cumulative shingles vaccine coverage estimates to the end of May 2016 indicate a decline in coverage of 1.8% for the routine cohort compared to May 2015. Coverage for the 78 year old catch-up cohort also dropped, by 1.4% compared to May 2015. It is important that GPs continue to offer the shingles vaccine to eligible patients in order to prevent the significant burden of disease associated with shingles among older adults in England, and ensure those who are approaching their 80th birthday do not miss out on the opportunity to get vaccinated [6].

Finalised annual coverage data for the 2015/16 shingles programme is due to be published in autumn 2016.

Figure 1. Monthly cumulative shingles vaccine coverage for the routine cohort (70 year olds) for September 2015 to May 2016, compared to 2014/15 and 2013/14 data, England

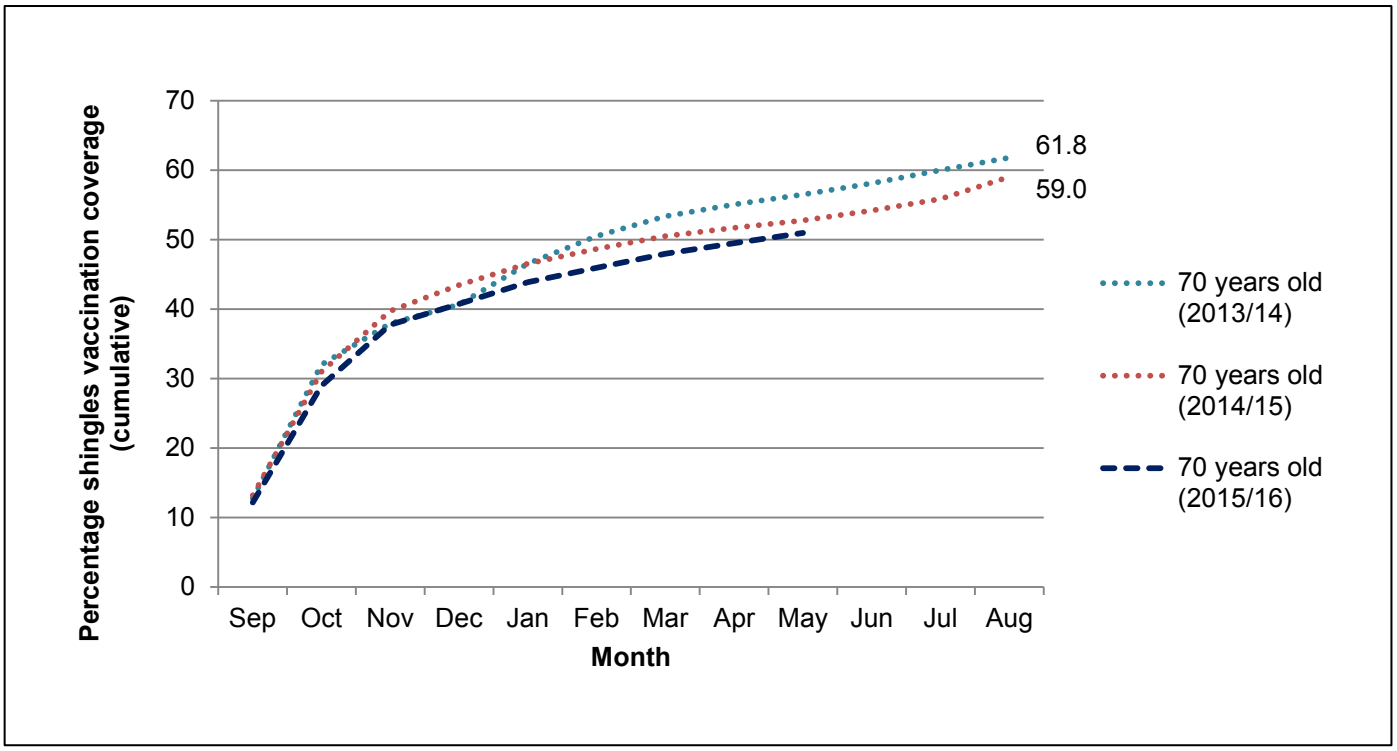
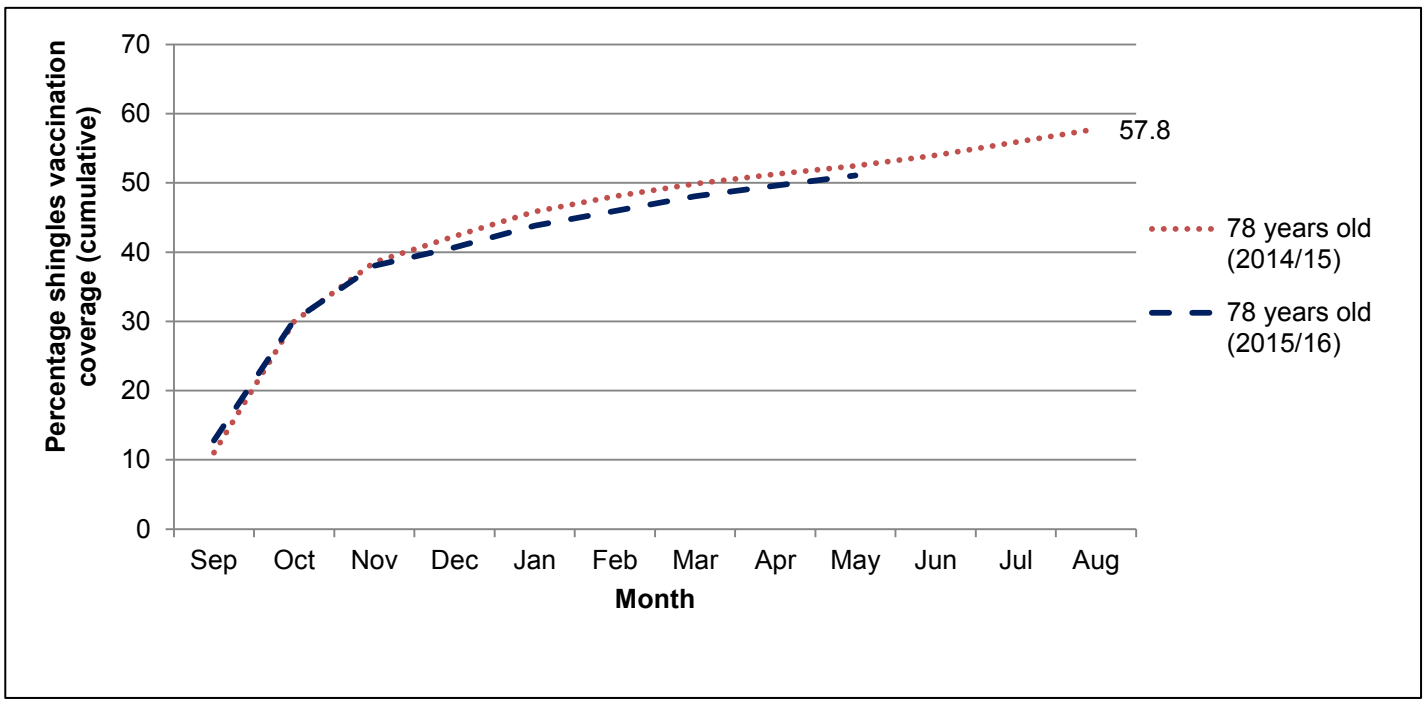


Figure 2. Monthly cumulative shingles vaccine coverage for the catch-up cohort (78 year olds) for September 2015 to May 2016, compared to 2014/15 data, England



NB: Coverage for the 2013/14 catch-up cohort are not shown as they were a different age cohort (79 years of age)

Cumulative shingles vaccine coverage to end May 2016 by age cohort and Area Team, England

Area Team (code)	% of practices reporting data in May 2016	% coverage in routine cohort (70 year olds)	% coverage, catch-up cohort (78 year olds)
Cheshire, Warrington and Wirral (Q44)	97.6	57.0	55.7
Durham, Darlington and Tees (Q45)	94.7	52.7	51.3
Greater Manchester (Q46)	95.6	50.6	49.2
Lancashire (Q47)	96.4	51.8	52.1
Merseyside (Q48)	90.3	48.9	49.8
Cumbria, Northumberland, Tyne and Wear (Q49)	97.6	54.3	54.7
N Yorkshire and Humber (Q50)	99.1	51.3	51.5
S Yorkshire and Bassetlaw (Q51)	96.1	52.1	51.1
W Yorkshire (Q52)	98.8	51.2	51.6
Arden, Herefordshire and Worcestershire (Q53)	96.5	54.0	54.4
Birmingham and Black Country (Q54)	93.3	48.0	47.7
Derbyshire and Notts. (Q55)	98.1	53.7	51.7
East Anglia (Q56)	97.2	53.4	53.7
Essex (Q57)	98.8	43.7	43.3
Hertfordshire and the S Midlands (Q58)	97.1	51.1	52.1
Leicestershire and Lincolnshire (Q59)	97.5	52.9	50.8
Shropshire and Staffordshire (Q60)	90.3	52.7	54.4
Bath, Gloucs. Swindon and Wiltshire (Q64)	97.9	52.7	53.3
Bristol, N Somerset, Somerset and S Gloucs. (Q65)	93.5	54.2	55.6
Devon, Cornwall and Scilly Isles (Q66)	94.6	52.0	52.0
Kent and Medway (Q67)	92.8	50.3	50.9
Surrey and Sussex (Q68)	95.7	50.0	51.6
Thames Valley (Q69)	92.1	54.7	55.0
Wessex (Q70)	94.8	51.4	52.5
London (Q71)	95.6	43.8	44.6
ENGLAND	**95.7**	**51.0**	**51.1**

References

1. PHE (2015). *Herpes zoster (shingles) immunisation programme 2013/2014: Report for England. 2015*.
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3. NHS England (2015). *Who can have the shingles vaccine?*
4. NHS England (2015). *Who's eligible for the shingles vaccine in 2015/16 and beyond?*.
5. PHE (2016). *Shingles (herpes zoster): the green book, chapter 28a*.
6. PHE (2016). *Approaching 80? Make sure you have had your shingles vaccine*.

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Immunisation

Pneumococcal Polysaccharide Vaccine (PPV) coverage report, England, April 2015 to March 2016

Coverage of PPV in adults aged 65 years and over, vaccinated any time up to and including 31 March 2016, was 70.1%, compared with 69.8% in 2015. The proportion of adults aged 65 years who were vaccinated in the last 12 months was 16.6%, compared to 16.1% in 2015.

Introduction

This report describes vaccine coverage for the eleventh year of the pneumococcal polysaccharide vaccine (PPV) programme in England, in adults aged 65 and over, comparing vaccine coverage estimates with the previous years of the programme [1-3].

Pneumococcal disease can present as non-invasive or invasive infections caused by the bacterium Streptococcus pneumoniae (also called pneumococcus). Non-invasive disease includes middle ear infections (otitis media), sinusitis and bronchitis, whilst invasive pneumococcal disease (IPD) includes septicaemia, pneumonia and meningitis.

IPD is a significant cause of morbidity and mortality globally and in the UK with more than 5,000 confirmed cases reported annually in England. Young children, the elderly and people in clinical risk groups are most at risk of severe pneumococcal disease, and so all of these groups are currently offered pneumococcal immunisation.

A pneumococcal immunisation programme for older people was introduced in the UK in August 2003 [4]. In the first year of the programme, all people aged 80 years or above were offered a single dose of PPV and in April 2004, this was extended to include all people aged 75 years and over. Since April 2005 all people aged 65 years and over have been offered the vaccine.

PPV contains purified polysaccharide from 23 capsular pneumococcal types (PPV23). Most healthy adults develop a good antibody response to a single dose of PPV however children younger than two years do not and so a pneumococcal conjugate vaccine (PCV13) is used in the childhood immunisation programme. Further information on PPV vaccine eligibility is available in the “Immunisation against infectious disease” book (the Green Book) [5].

[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.

Methods

GP practice level PPV vaccine coverage data are automatically uploaded via participating GP IT suppliers to the ImmForm1 website on an annual basis. These data are then validated and analysed by PHE to check data completeness, identify and query any anomalous results and describe epidemiological trends. The following definitions are used in this report:

- vaccine **coverage** – the total number of patients aged 65 and above on 31 March 2016 **who have ever received the vaccination** (numerator) as a proportion of the number of patients registered aged 65 and above on 31 March 2016 (denominator)
- vaccine **uptake** – the total number of patients aged 65 and above on 31 March 2016 **who have received the vaccination between 1 April 2015 and 31 March 2016** (numerator) as a proportion of the number of patients registered aged 65 and above on 31 March 2016 (denominator)

In previous years, PPV coverage data has been collected for the 65 years and over age group, and reported for those aged 65 years only, 66 to 69 years, 70 to 74 years and 75 years and over. To better understand how PPV coverage increases after the first year individuals become eligible, data for the 2015-16 collection are reported by the following age bands:

- 65 years and over (overall)
- 65 years only
- 66 years only
- 67 years only
- 68 years only
- 69 years only
- 70 to 74 years
- 75 years and over

This report describes vaccine coverage and uptake of each eligible cohort for England and by NHS England Area Team (AT). Data by NHS England Local Authority and NHS England Clinical Commissioning Group (CCG) are presented in an appendix associated with this report.

Results

Out of 7,648 GP practices in 2016, 7,268 (95%) provided data, a slight decrease on the 96.7% (7,561/7,822) of practices reporting in 2015. This ranged by AT from 89.0% of practices in Merseyside, to 99.4% of practices in West Yorkshire (table 1).

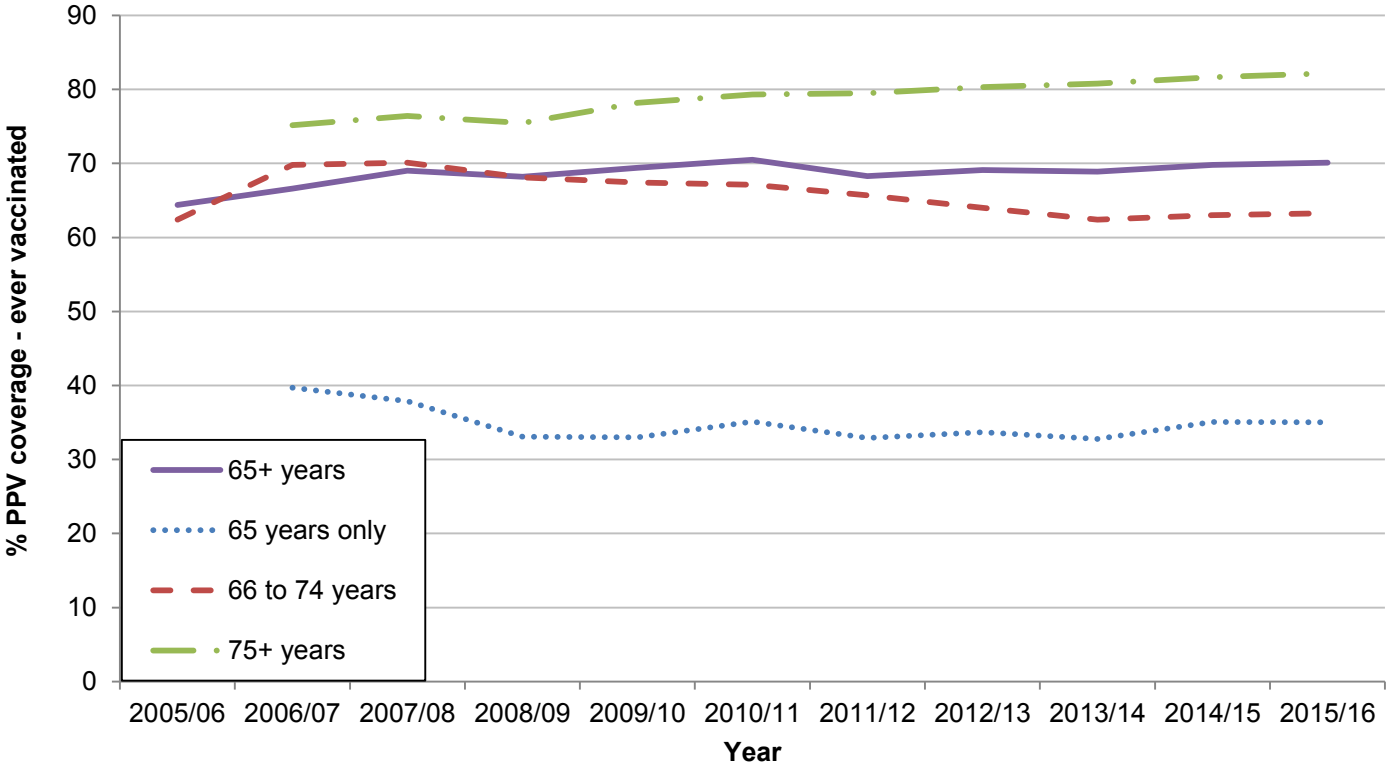
PPV **coverage** was 70.1% in all patients aged 65 and over, immunised at any time up to 31 March 2016 in England, rising to 82.1% for those aged 75 and over. Table 1 describes coverage by AT and age group.

Table 1. Percentage of GP practices reporting and vaccination coverage for patients who received PPV anytime up to 31 March 2016 by age group (years) for each Area Team in England

Area Team (code)	% of GP practices respond-ing	Age group							
		Overall (Aged 65 and over)	Aged 65 only	Aged 66 only	Aged 67 only	Aged 68 only	Aged 69 only	Aged 70-74	Aged 75 and over
Cheshire, Warrington and Wirral (Q44)	97.6	**73.4**	40.8	51.9	57.4	62.1	67.3	75.9	83.9
Durham, Darlington and Tees (Q45)	95.3	**70.8**	38.9	48.4	54.3	58.6	62.6	72.3	82.9
Greater Manchester (Q46)	92.7	**70.3**	37.7	49.2	54.6	59.0	63.4	72.9	81.9
Lancashire (Q47)	96.0	**70.7**	37.0	46.7	54.1	58.6	64.2	73.0	82.3
Merseyside (Q48)	89.0	**73.7**	41.2	55.0	61.7	65.0	69.8	76.5	82.7
Cumbria, Northumberland, Tyne and Wear (Q49)	95.6	**72.7**	38.6	49.5	56.4	61.5	65.9	74.9	84.3
N Yorkshire and Humber (Q50)	98.2	**70.7**	36.0	45.7	53.1	58.0	62.9	71.7	83.5
S Yorkshire and Bassetlaw (Q51)	98.1	**72.2**	37.1	49.9	59.4	61.7	64.0	73.8	83.4
W Yorkshire (Q52)	99.4	**72.3**	38.5	50.8	56.4	61.7	65.6	74.0	83.8
Arden, Herefordshire and Worcestershire (Q53)	94.3	**71.5**	36.2	48.9	56.5	59.4	64.3	73.4	82.9
Birmingham and Black Country (Q54)	93.1	**68.1**	34.7	43.8	49.6	54.3	58.5	69.0	79.9
Derbyshire and Notts. (Q55)	99.2	**73.2**	39.2	50.5	58.0	62.6	66.3	75.2	84.4
East Anglia (Q56)	97.2	**72.5**	36.8	49.7	56.7	61.5	64.8	74.1	83.9
Essex (Q57)	98.8	**65.6**	27.7	38.6	45.4	50.4	55.7	66.9	79.7
Hertfordshire and the S Midlands (Q58)	95.5	**70.0**	32.1	43.8	50.6	57.5	62.2	72.9	83.0
Leicestershire and Lincolnshire (Q59)	97.5	**71.2**	37.5	49.6	56.3	60.7	63.6	72.6	82.7
Shropshire and Staffordshire (Q60)	89.8	**67.9**	33.5	43.1	49.3	54.0	58.9	69.9	80.7
Bath, Gloucestershire, Swindon and Wiltshire (Q64)	96.3	**70.7**	32.7	46.5	53.2	57.6	61.9	72.5	83.2
Bristol, N Somerset, Somerset and S Gloucestershire (Q65)	94.8	**70.1**	33.9	44.3	51.4	56.1	61.6	71.6	82.8
Devon, Cornwall and Scilly Isles (Q66)	93.7	**68.8**	32.5	44.8	52.1	56.1	61.0	69.9	81.2
Kent and Medway (Q67)	90.0	**69.3**	30.4	44.7	50.5	55.1	62.6	73.5	81.6
Surrey and Sussex (Q68)	94.1	**67.7**	30.6	41.7	47.4	53.0	58.2	68.7	80.3
Thames Valley (Q69)	92.6	**73.1**	36.9	47.4	55.6	61.4	66.2	75.7	84.8
Wessex (Q70)	95.5	**71.5**	34.5	47.0	52.2	58.0	62.3	72.7	83.8
London (Q71)	94.8	**65.3**	31.7	41.6	46.9	52.3	56.8	67.0	78.1
England	**95.0**	**70.1**	**35.0**	**46.4**	**52.9**	**57.7**	**62.3**	**71.9**	**82.1**
England denominator	**7,268**	**9,436,825**	**550,062**	**563,954**	**575,099**	**622,417**	**626,237**	**2,251,015**	**4,248,041**

Since 2011/12, coverage in the 65 years and over age group has increased from 68.3% (2011/12) to 70.1% (2015/16) and from 79.5% (2011/12) to 82.1% (2015/16) in the 75 years and over age group (figure 1). PPV coverage in all patients aged 65 and over was 70.2% in males and 70.1% in females (figure 4).

Figure 1. Percentage PPV coverage – ever vaccinated, by age group, England, 2005/06 to 2014/15



PPV **uptake** in the previous 12 months across all age groups has remained stable over the past seven years (figure 2). In the 65 years only group, there has been a slight increase in PPV uptake from 13.7% (2013/14) to 16.6% (2015/16). In addition, 18.4% of patients in the 65 years only group had already received the vaccine any time up to and including 31 March 2016 as they were eligible prior to reaching 65 years of age due to their inclusion in specific clinical risk groups. Data collected in 2015-16 shows that older age groups are still being vaccinated (figure 3). The proportion of individuals vaccinated in the previous 12 months decreases with age as the proportion of individuals already vaccinated increases (figure 3). PPV uptake in all patients aged 65 and over was 4.7% in males and 4.4% in females (figure 4). A small proportion (1.8%) of patients aged 65 or above refused/declined PPV vaccination and there was no difference in the proportion of patients refusing/declining the vaccine by gender.

Figure 2. Percentage PPV uptake – past 12 months, by age group, England, 2005/06 to 2015/16

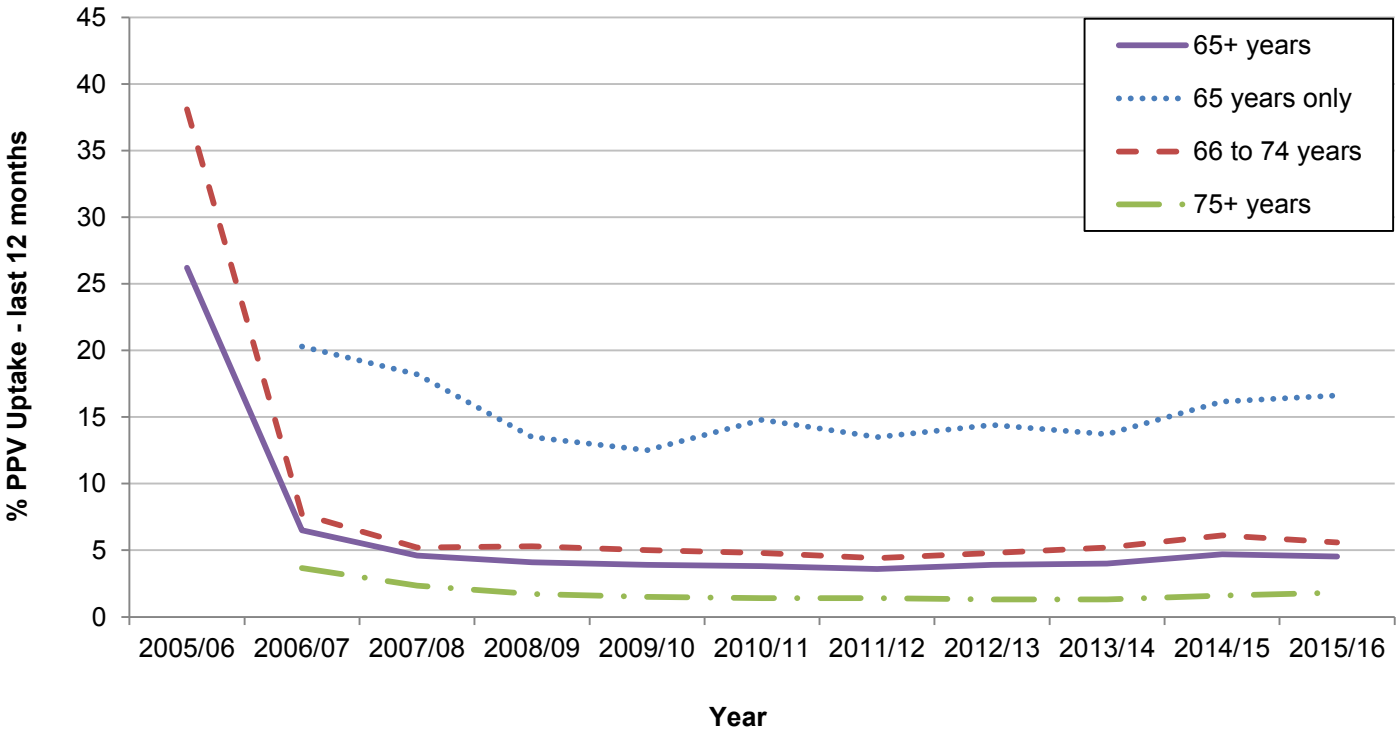


Figure 3. Percentage patients receiving PPV (ever or between 1 April 2015 and 31 March 2016), by age group, England

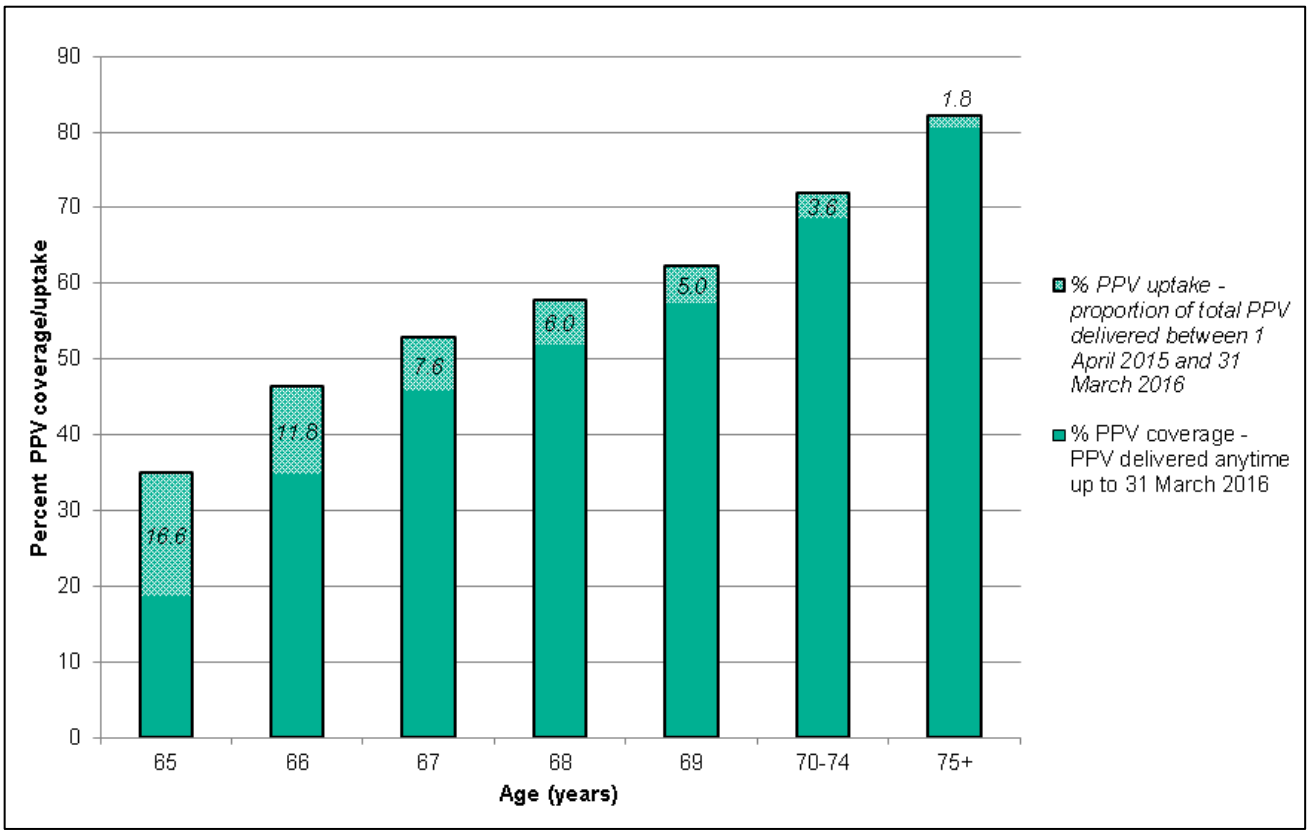
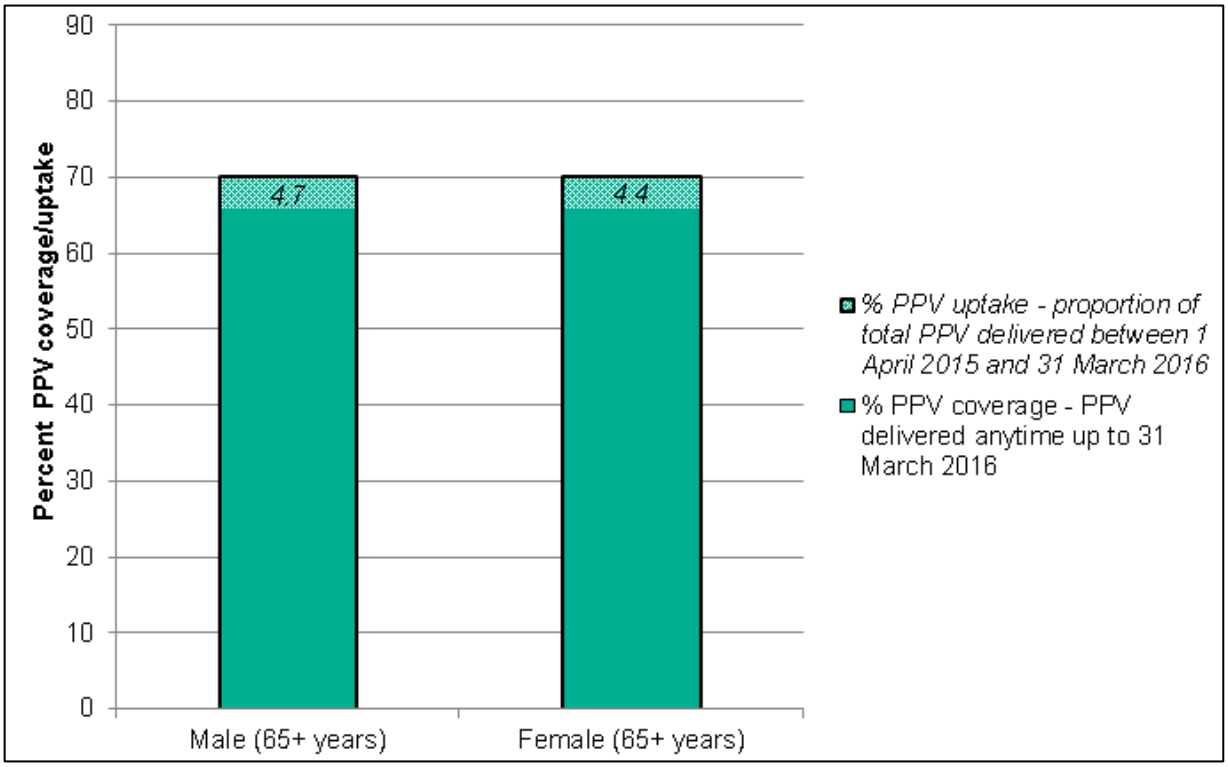


Figure 4. Percentage patients receiving PPV (ever or between 1 April 2015 and 31 March 2016), by gender, England



More detailed tables by AT, CCG and Local Authority are presented in an appendix associated with this report.

Discussion

The proportion of GP practices participating in the PPV survey was at least 95% for the second consecutive year. PPV coverage among people aged 65 years and over has seen small yearly increases over the past three years from 68.9% in 2013/14 to 70.1% in 2015/16.

The impact of the PPV programme on reducing the incidence of vaccine-type IPD in patients aged 65 years and over has not been evident in surveillance data, due to the vaccine's modest effectiveness, its existing use in risk groups prior to their entry into the over 65 year old programme, and the indirect impact of the conjugate vaccines used in children [6]. However, there is evidence of individual protection against the serotypes covered by PPV23 [7]. PHE is currently doing a study to further assess effectiveness in the 65 and over age group and any decline by time since vaccination.

For the first year, data by individual year group have been collected for those aged 66 to 69 years. These data indicate that many of those eligible for PPV vaccination do not receive the vaccine in the first year that they become eligible but in the subsequent years, with additional uptake gradually decreasing with age. Increasing vaccine coverage in the older age groups demonstrates that vaccination continues to be offered opportunistically in primary care to those aged over 65 years.

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