



## Infection reports

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### 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			Q2			Q3			Q4			Total
	Jan-Mar			Apr-Jun			Jul-Sep			Oct-Dec			
	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
<b>Total</b>	<b>37</b>	<b>43</b>	<b>1</b>	<b>41</b>	<b>32</b>	<b>1</b>	<b>48</b>	<b>50</b>	<b>1</b>	<b>31</b>	<b>45</b>	<b>0</b>	<b>330</b>

\* 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).

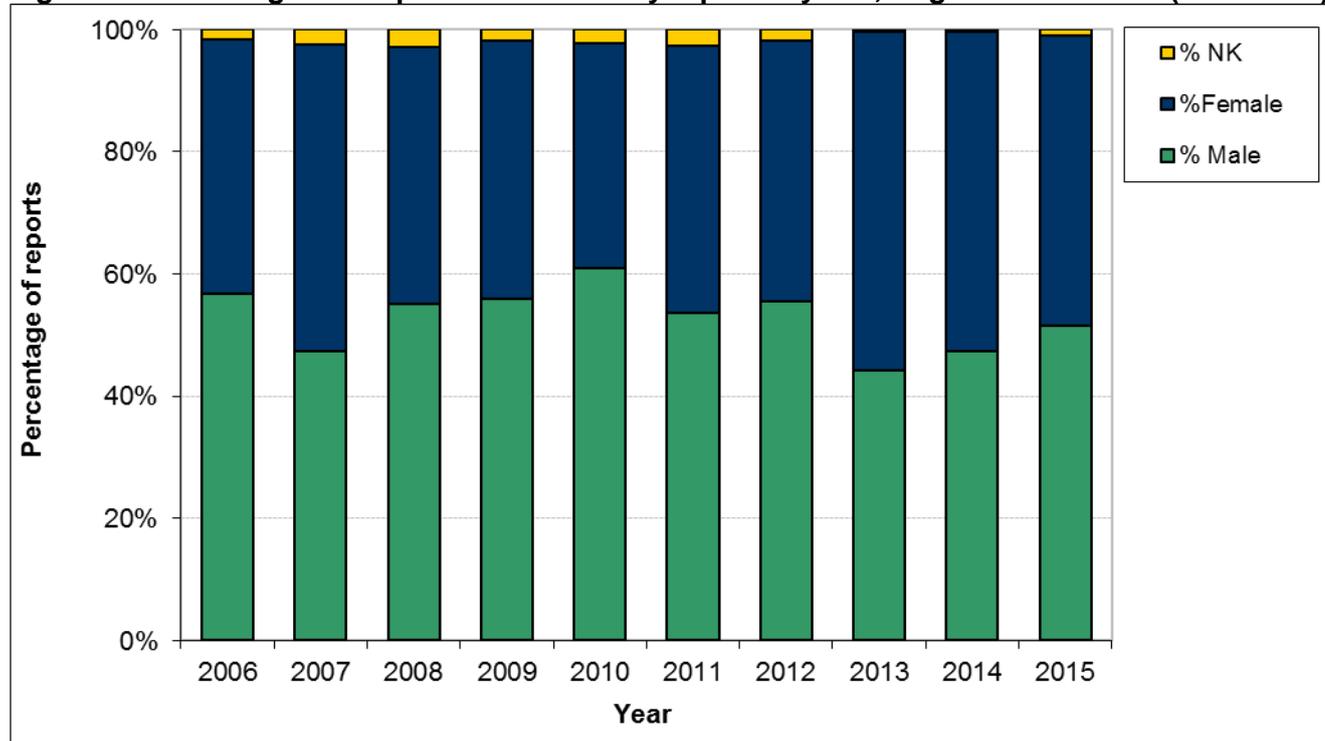
The overall trend has been a decline in the number of reports since 2006. The increased number of reports during 2010 was due to unrelated outbreaks of hepatitis A in the London and the South West regions. A number of clusters were also identified in 2014 and 2015. Due to the small number of laboratory 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
<b>Total</b>	<b>398</b>	<b>363</b>	<b>360</b>	<b>356</b>	<b>371</b>	<b>257</b>	<b>288</b>	<b>283</b>	<b>300</b>	<b>330</b>

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%).

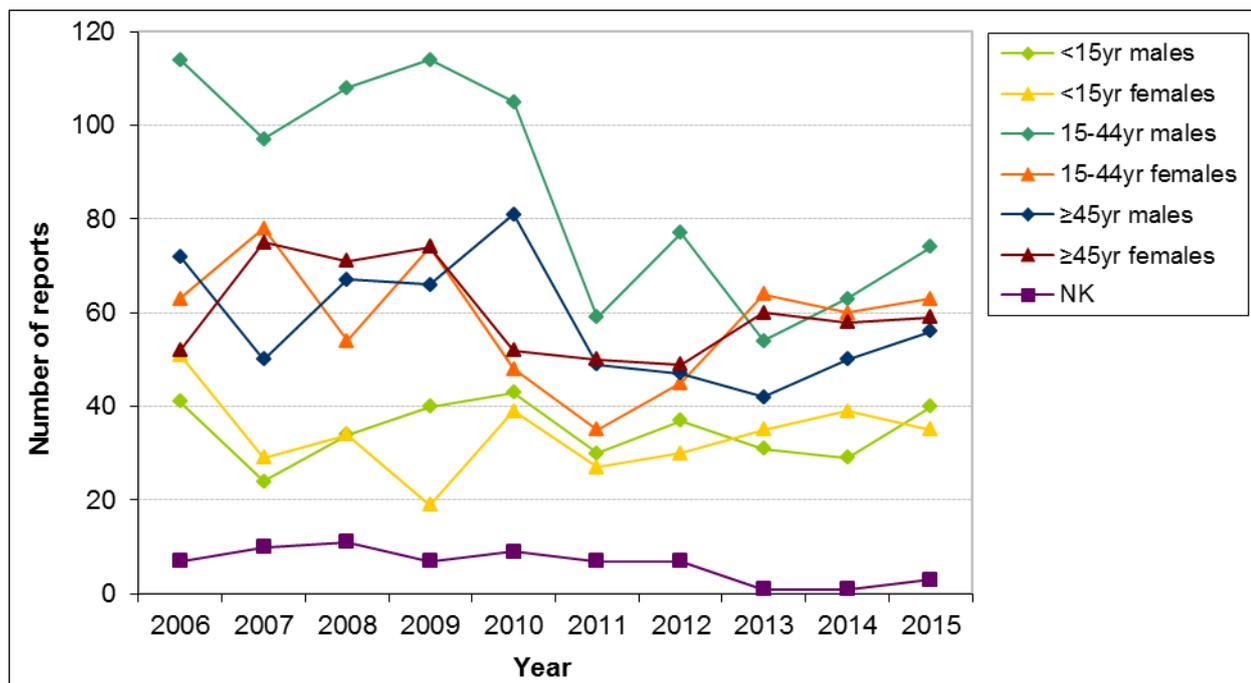
**Figure 1: Percentages of hepatitis A laboratory reports by sex, England and Wales (2006-2015)**



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)**

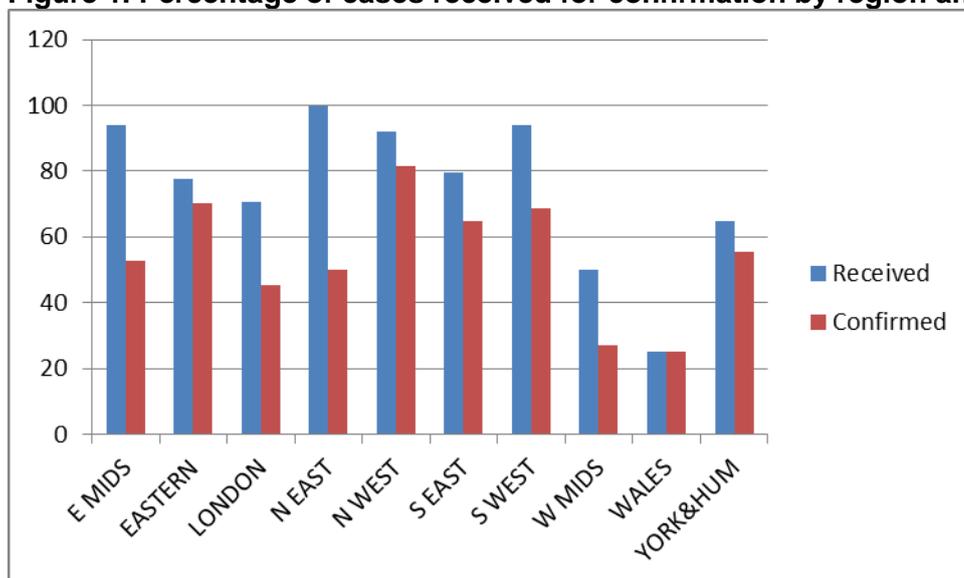
Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Number of reports</b>	<b>398</b>	<b>363</b>	<b>360</b>	<b>356</b>	<b>371</b>	<b>257</b>	<b>288</b>	<b>283</b>	<b>300</b>	<b>330</b>
<b>Number (%) aged 15-44 years</b>	182 (46%)	178 (49%)	167 (46%)	190 (53%)	157 (42%)	96 (37%)	122 (42.4%)	118 (42%)	123 (41%)	138 (41%)
<b>Number (%) male</b>	227 (57%)	172 (47%)	209 (55%)	220 (56%)	230 (61%)	138 (54%)	162 (55%)	127 (44%)	142 (47%)	170(51.5%)
<b>Number (%) with travel history</b>	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%)
<b>Number (%) travelled abroad</b>	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.

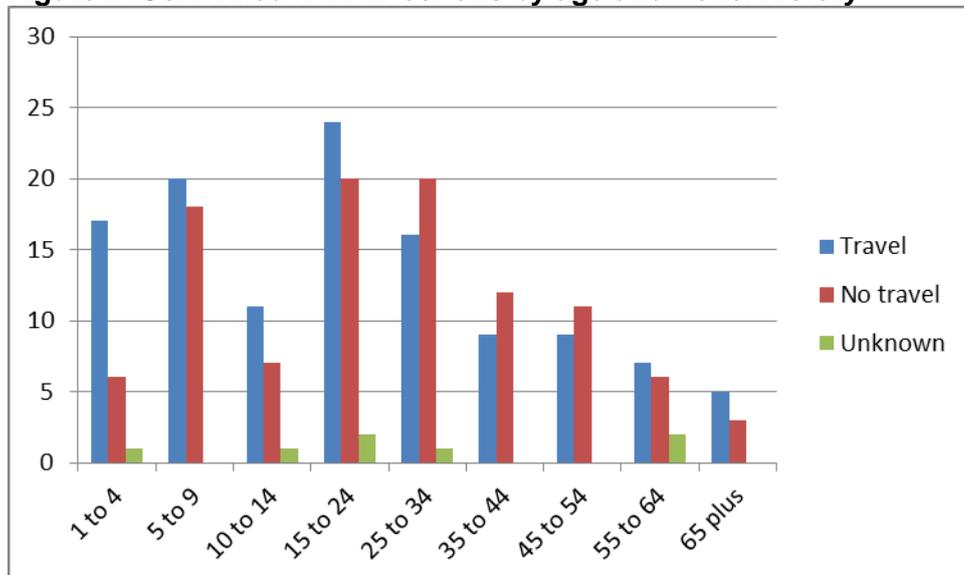
**Figure 1. Percentage of cases received for confirmation by region and the percentage confirmed.**



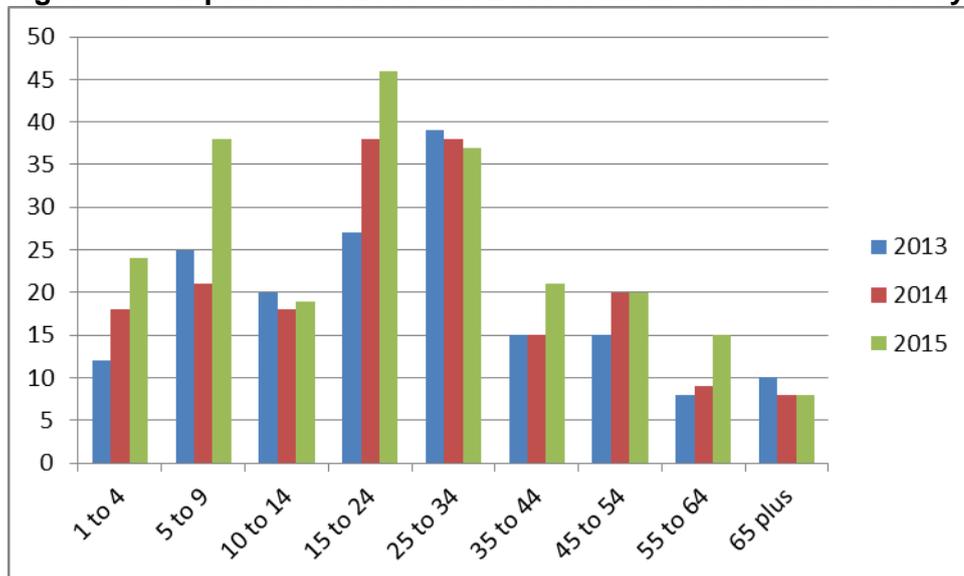
Of the 228 confirmed cases, 118 (51.8%) reported a travel history, 103 (45.2%) had no travel history and 7 (3%) had no information. The age of the cases ranged from 1 to 80 years of age with travel associated infections peaking in young adults and then declining with older age (Figure 2). There has been 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.

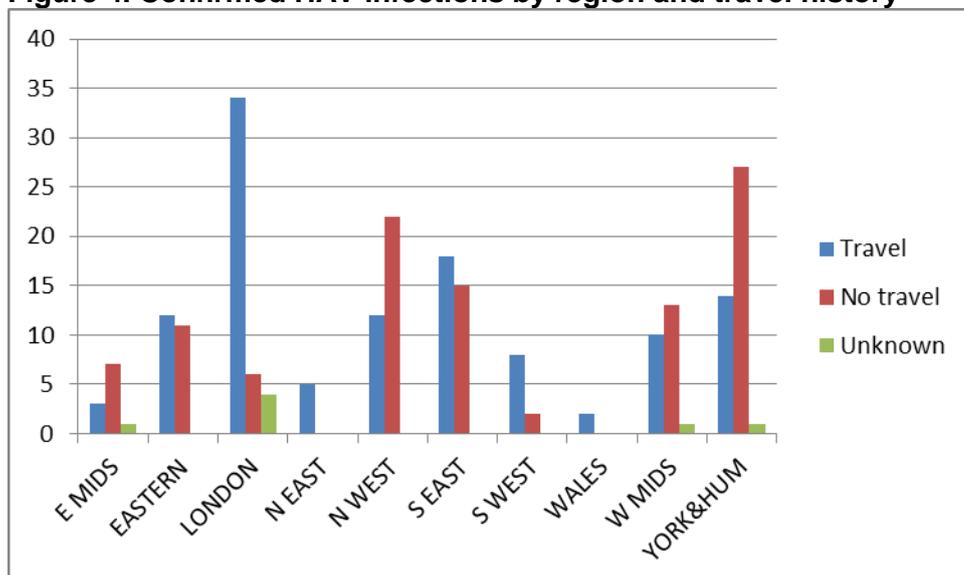
**Figure 2. Confirmed HAV infections by age and travel history**



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



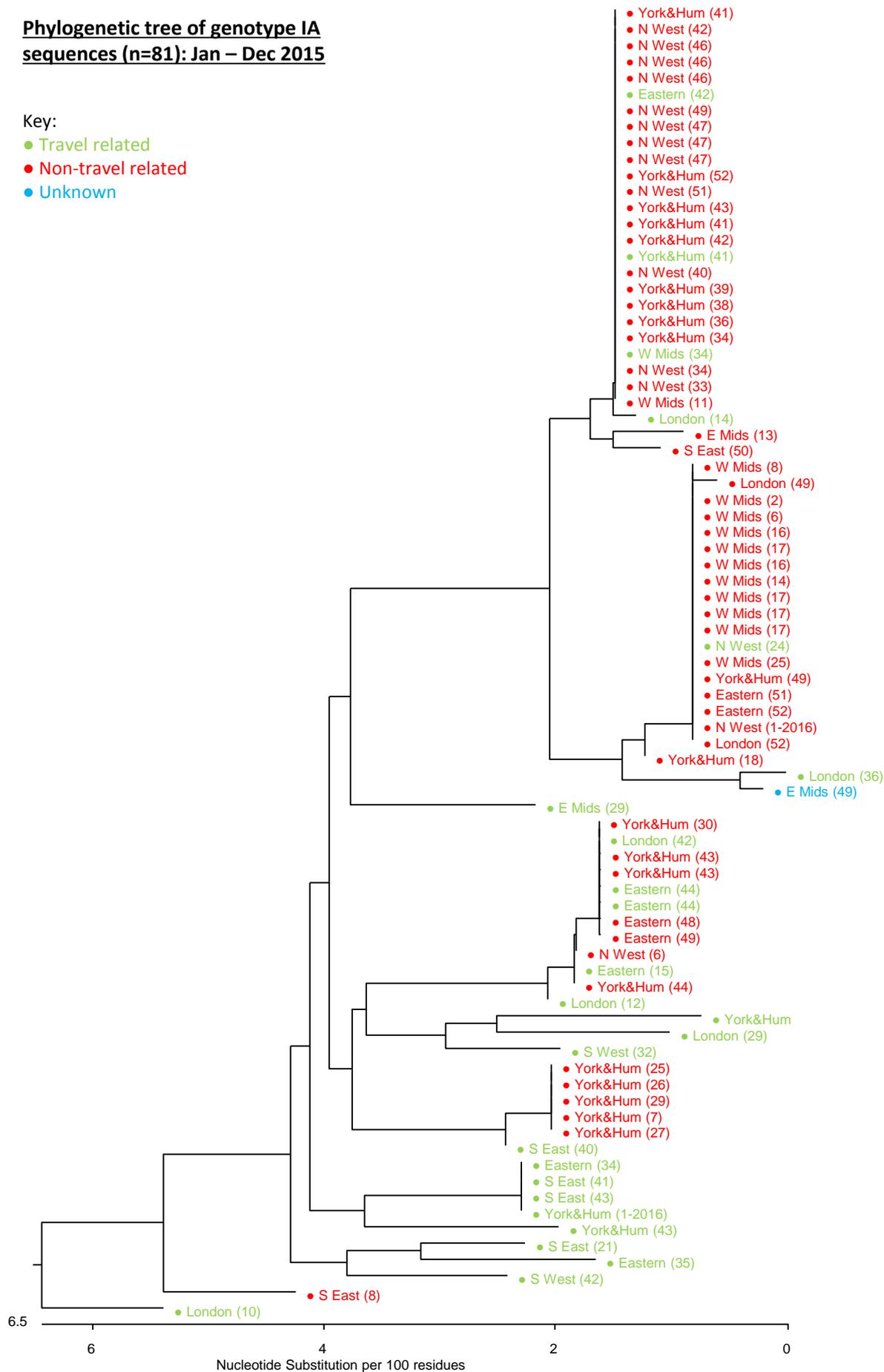
**Figure 4. Confirmed HAV infections by region and travel history**



**Phylogenetic tree of genotype IA sequences (n=81): Jan – Dec 2015**

Key:

- Travel related
- Non-travel related
- Unknown



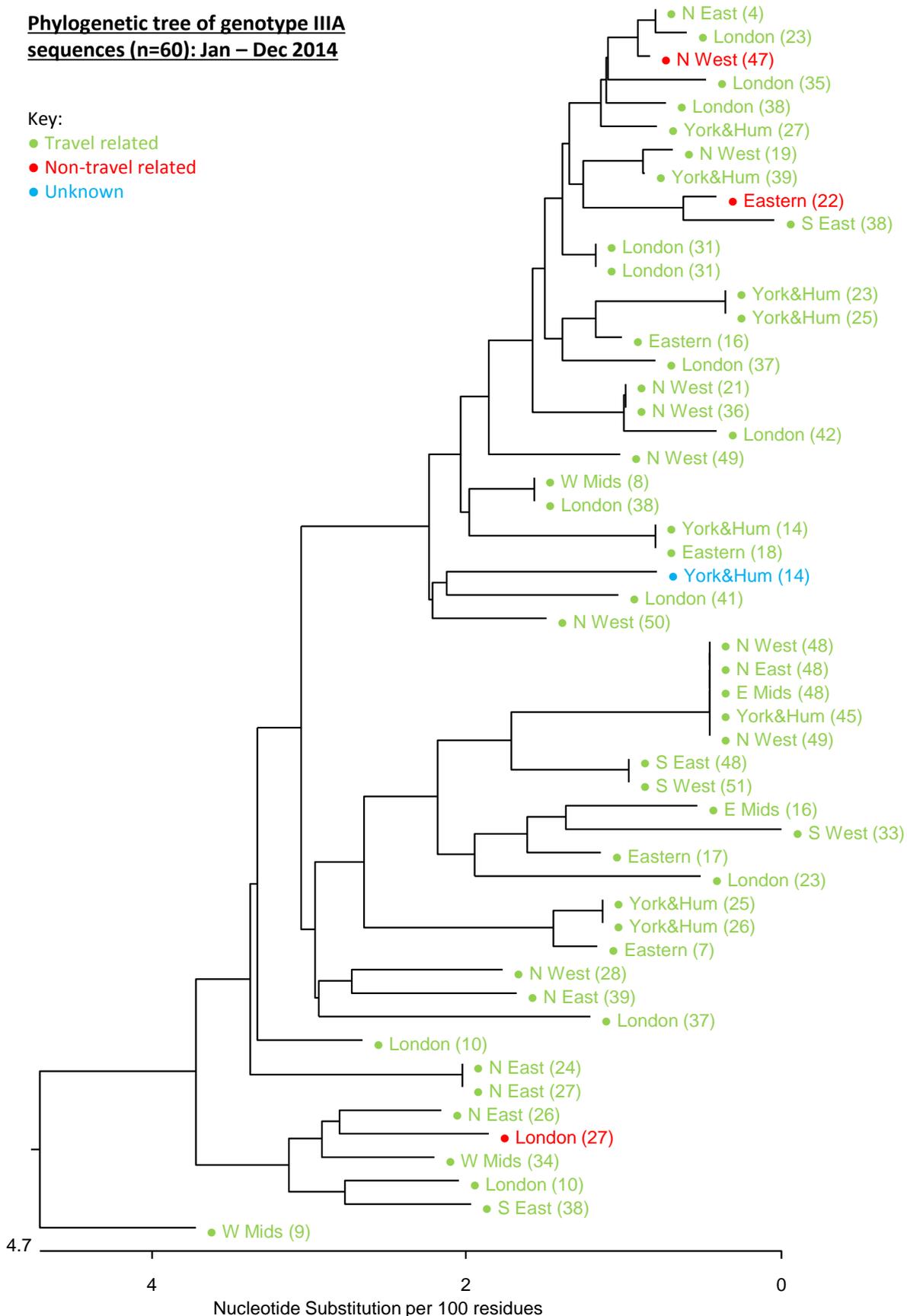
The majority of cases with genotype IA had no travel history 55/81 (67.9%) this is contrary to 2013 where more than half the cases had travel history. This difference can be attributed to the fact that a number of regions were affected by large non-travel associated community outbreaks (see Figure 4).

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

**Phylogenetic tree of genotype IIIA sequences (n=60): Jan – Dec 2014**

Key:

- Travel related
- Non-travel related
- Unknown



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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## 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			Q2			Q3			Q4			Total
	Jan-Mar			Apr-Jun			Jul-Sep			Oct-Dec			
	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
<b>Total</b>	<b>818</b>	<b>1,919</b>	<b>34</b>	<b>926</b>	<b>2,038</b>	<b>31</b>	<b>916</b>	<b>1,974</b>	<b>19</b>	<b>870</b>	<b>2,043</b>	<b>38</b>	<b>11,626*</b>

\* 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.

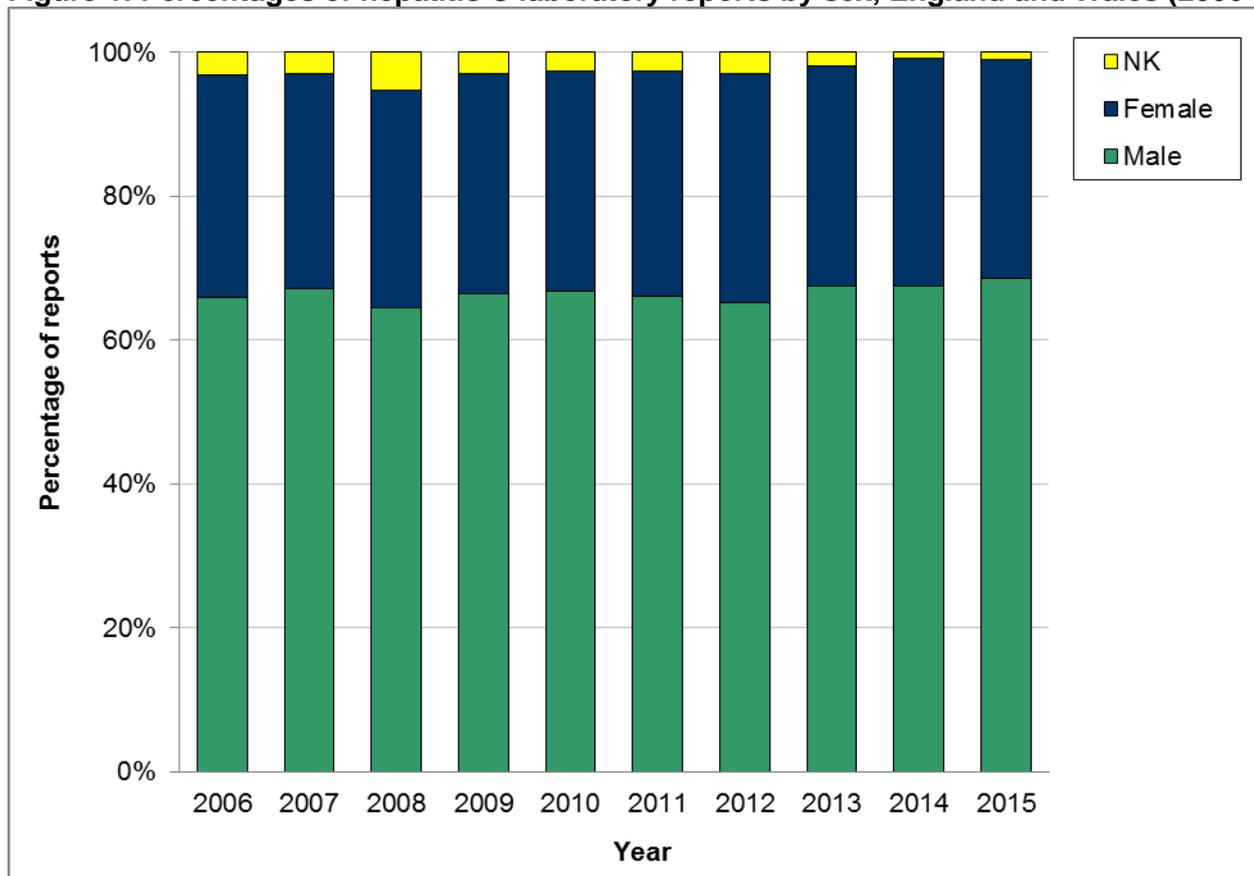
**Table 2: Laboratory reports of hepatitis C by region, England and Wales (2006-2015)**

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
<b>Total</b>	<b>7,272</b>	<b>8,134</b>	<b>8,882</b>	<b>8,983</b>	<b>8,193</b>	<b>10,393</b>	<b>11,362</b>	<b>11,761</b>	<b>11,997</b>	<b>11,626</b> **

\*\* 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)**

