



## Infection reports

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### Immunisation

## Laboratory reports of hepatitis A infection, and hepatitis C: 2014

### 1. Laboratory reports of hepatitis A infection: 2014

During 2014, there were 300 confirmed laboratory reports of hepatitis A virus (HAV) infection in England and Wales (Table 1). The greatest number of reports were among the 25 to 34 years age group (n=52), no cases of hepatitis A were reported in the under 1 age group. More reports were received for females than males during the second and fourth quarter of 2014, with more reports among males during the first and third quarter (Table 1).

Table 1: Laboratory reports of hepatitis A by age, sex, and quarter, England and Wales, 2014\*

Age group (years)	Q1			Q2			Q3			Q4			Total
	Jan-Mar			Apr-Jun			Jul-Sep			Oct-Dec			
	Female	Male	NK	Female	Male	NK	Female	Male	NK	Female	Male	NK	
<1	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to 4	0	2	1	1	0	0	3	3	0	6	5	0	21
5 to 9	3	3	0	3	0	0	4	6	0	5	3	0	27
10 to 14	3	2	0	2	1	0	3	2	0	6	2	0	21
15 to 24	7	4	0	4	2	0	7	3	0	8	6	0	41
25 to 34	0	10	0	3	3	0	4	8	0	13	11	0	52
35 to 44	3	3	0	6	2	0	2	7	0	3	4	0	30
45 to 54	3	8	0	4	4	0	3	5	0	3	4	0	34
55 to 64	3	2	0	5	4	0	2	3	0	3	2	0	24
≥65	8	4	0	12	3	0	5	6	0	7	5	0	50
NK	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>30</b>	<b>38</b>	<b>1</b>	<b>40</b>	<b>19</b>	<b>0</b>	<b>33</b>	<b>43</b>	<b>0</b>	<b>54</b>	<b>42</b>	<b>0</b>	<b>300</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 2014, the greatest number of hepatitis A reports were from the London (n=118) and South East (n=55) regions (Table 2). The comparatively high number of reports from London and the South East was consistent with previous years. Overall, there was a similar number of reports received during 2014 (n=300) compared to 2013 (n=283).

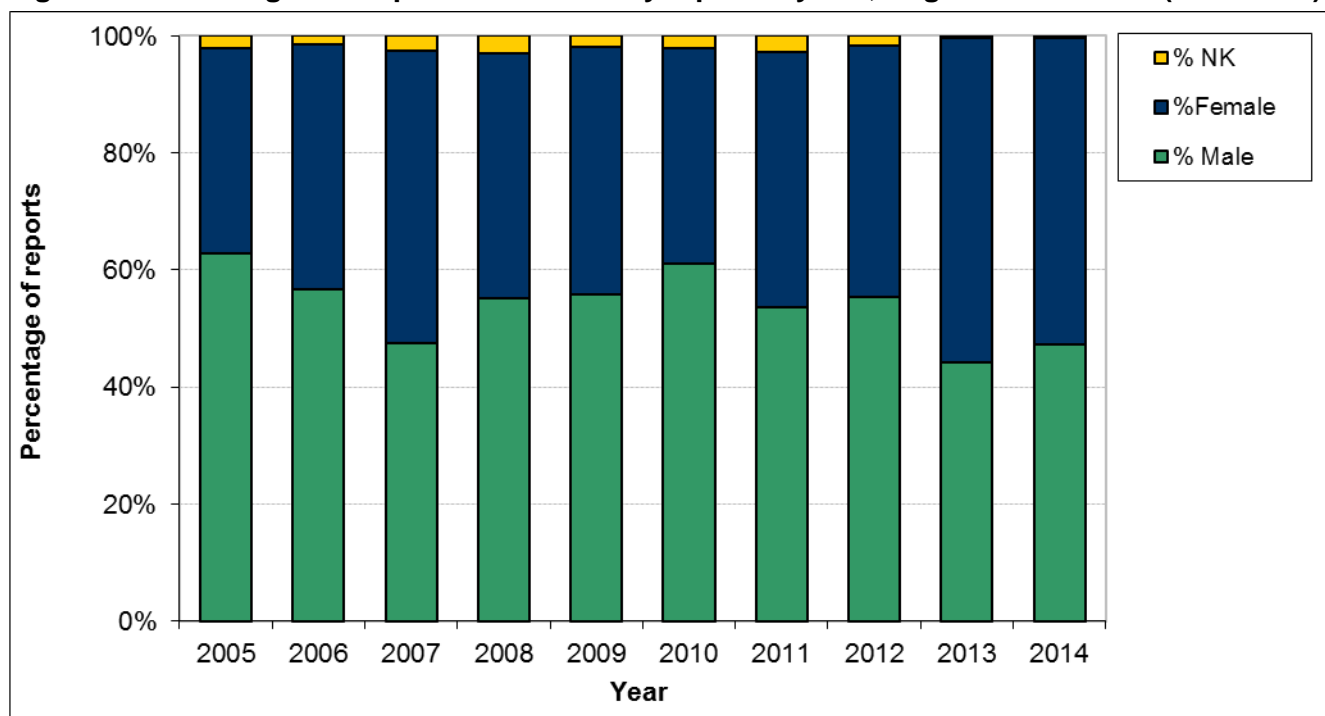
The overall trend has been a decline in the number of reports since 2005. The increased number of reports during 2010 was due to unrelated outbreaks of hepatitis A in the London and the South West regions. A number of clusters were also identified in 2014. Due to the small number of laboratory reports 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 (2005-2014)**

PHE Centre	Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
East Midlands	31	15	13	19	14	9	6	7	8	10
East of England	41	40	31	34	38	36	24	25	23	15
London	28	47	50	54	53	72	69	71	91	118
North East	31	12	14	5	8	12	10	13	10	9
North West	136	71	63	48	64	56	24	28	34	22
South East	26	28	32	66	50	28	44	38	29	55
South West	52	40	33	30	24	48	11	18	29	14
West Midlands	58	66	71	67	59	61	41	44	29	32
Yorkshire and Humber	67	54	36	27	34	40	23	36	19	17
Wales	16	25	20	10	12	9	5	8	11	8
<b>Total</b>	<b>486</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>

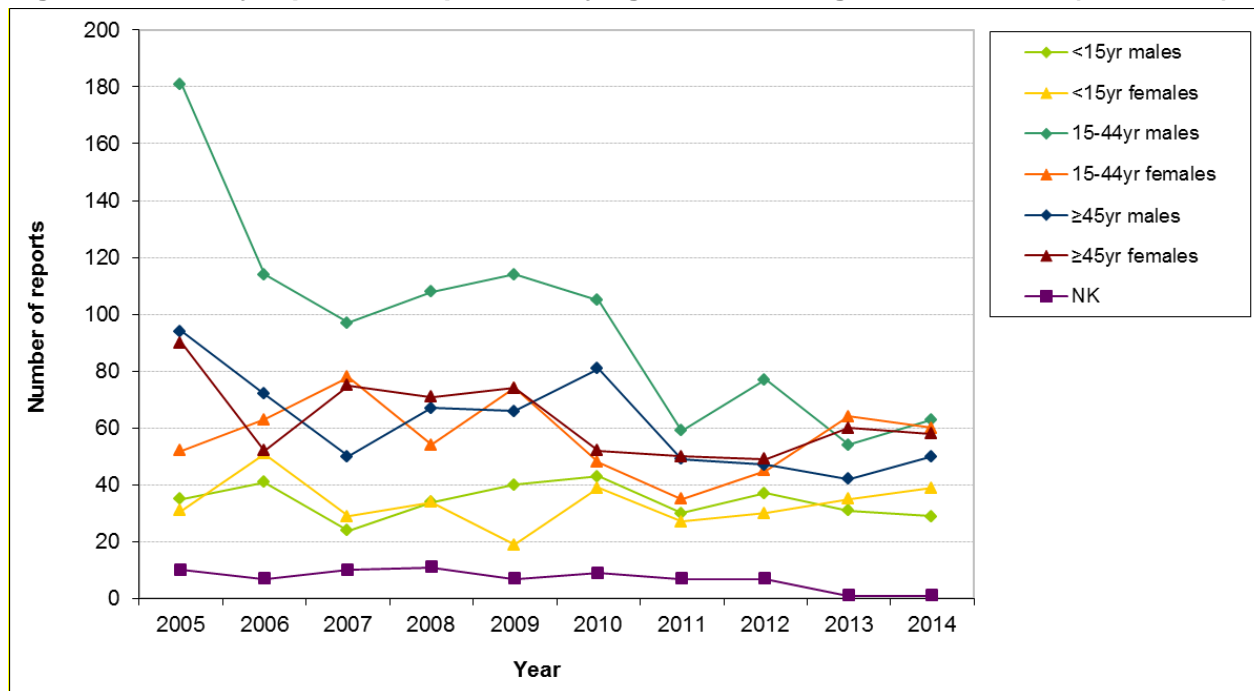
Age and gender were well completed each year (>98% complete) (Figure 1). Where known, males accounted for 47% (142/300) of reports during 2014 (Figure 1). As reported last year, since 2005 the majority of reports were among males for all years excluding 2007, and most recently also 2013 and 2014 (Figure 1). The proportion of reports among males has varied slightly each year; overall males have accounted for 57% of hepatitis A laboratory reports during this period (range 4-63%).

**Figure 1: Percentages of hepatitis A laboratory reports by sex, England and Wales (2005-2014)**



In 2014, the number of reports received from both the 15 to 44 year old males and those aged 45 years and over increased compared to 2013, (Figure 2). In comparison contrary to the previously reported increase in the number of reported received from 15 to 44 year old females there was a slight drop between 2013 and 2014. During 2014, males accounted for 46% of reports among the 45 years and over age group, 51% of reports in the 15 to 44 age group, and 43% of reports in the under 15 years age group. In comparison during 2013 males accounted for 46% of reports in the 15 to 44 years age group.

**Fig. 2: Laboratory reports of hepatitis A by age and sex, England and Wales (2005-2014)**



As reported previously, there was no risk factor information reported for anything other than recent travel in 2014. Travel history was available for 16.7% of reported cases, compared to 2013 when 15.2% 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.

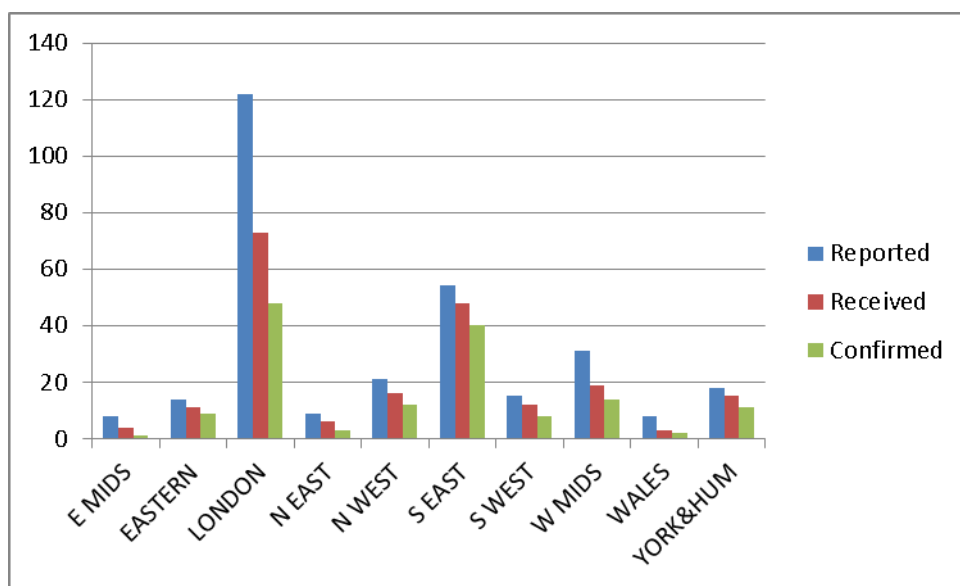
**Table 3. Trends in hepatitis A laboratory reports, England and Wales (2005-2014)**

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
No. of reports	486	398	363	360	356	371	257	288	283	300
No. (%) aged 15-44 years	240 (49%)	182 (46%)	178 (49%)	167 (46%)	190 (53%)	157 (42%)	96 (37%)	122 (%)	118 (42%)	123 (41%)
No. (%) male	310 (63%)	227 (57%)	172 (47%)	209 (55%)	220 (56%)	230 (61%)	138 (54%)	162 (55%)	127 (44%)	142 (47%)
No. (%) with travel history	18 (3.7)	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)
No. (%) travelled abroad	9 (1.9)	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)

## Reference laboratory confirmation and phylogeny of hepatitis A infection: 2014

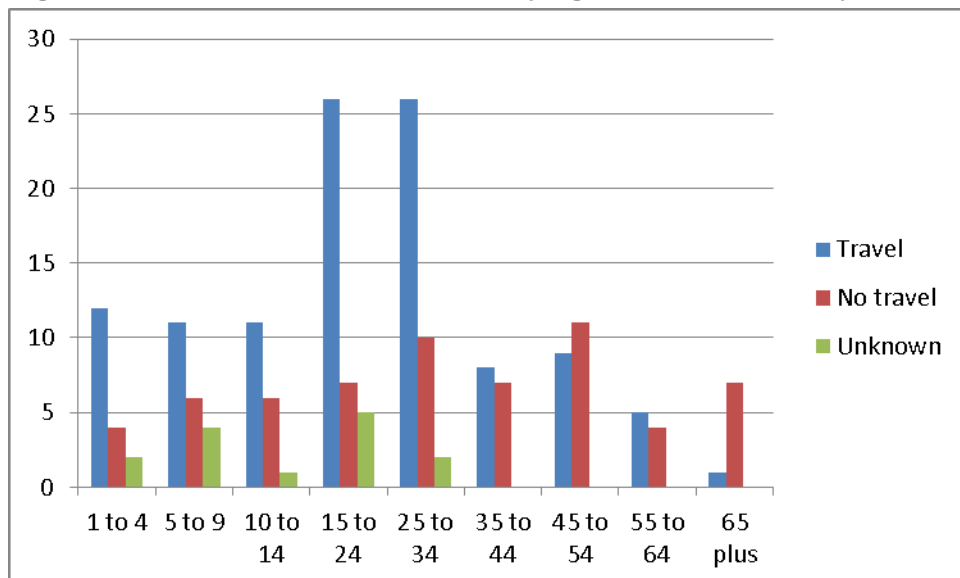
Of the 300 laboratory reports of acute HAV infection during 2014, 207 (69%) had samples forwarded to the Virus Reference Department (VRD) for confirmation. Of the 93 (31%) cases who did not have a sample forwarded to VRD for confirmation, 2 were SGSS errors, 4 were known false positives, 1 was a laboratory control not a patient, 11 had no sample remaining and 10 had samples forwarded for HEV testing. For the remaining 65 cases no sample or information was received. Acute HAV infection was not confirmed in 28.5% (59/207) of the forwarded samples. The remaining 148 (71.5%) cases were confirmed to have acute HAV infection. In addition 36 cases were confirmed to have acute HAV infection that had not been reported through the laboratory reporting system although they were recorded in HPzone. The breakdown of samples received per region can be seen in Figure 1.

**Figure 1. Number of cases received for confirmation by region and the number confirmed.**

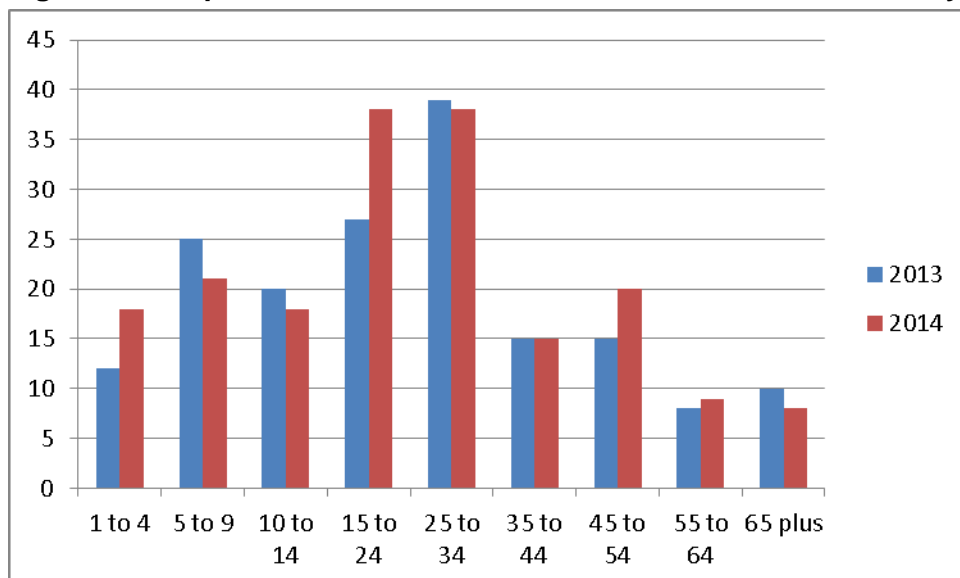


Of the 185 confirmed cases, 109 (58.9%) reported a travel history, 62 (33.5%) had no travel history and 14 (7.6%) had no information. The age of the cases ranged from 1 to 78 years of age with travel associated infections peaking in young adults and then declining with older age (Figure 2). There has been an increase in cases confirmed in the 1 to 4, 15 to 24 and 45 to 54 age brackets compared to 2013 (Figure 3)

**Figure 2. Confirmed HAV infections by age and travel history n=185: Jan – Dec 2014**



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



It was possible to genotype samples from 181 of the confirmed cases; 62 (34.3%) were genotype IA, 58 (32%) were genotype IB, 1 (0.6%) was genotype IIA, and 60 (33.1%) were genotype IIIA. This sequence information for each genotype, with the exception of genotype IIA as the numbers are too low, is presented as phylogenetic trees. Each sequence is represented by a dot with the patient region and the week of sampling in brackets.

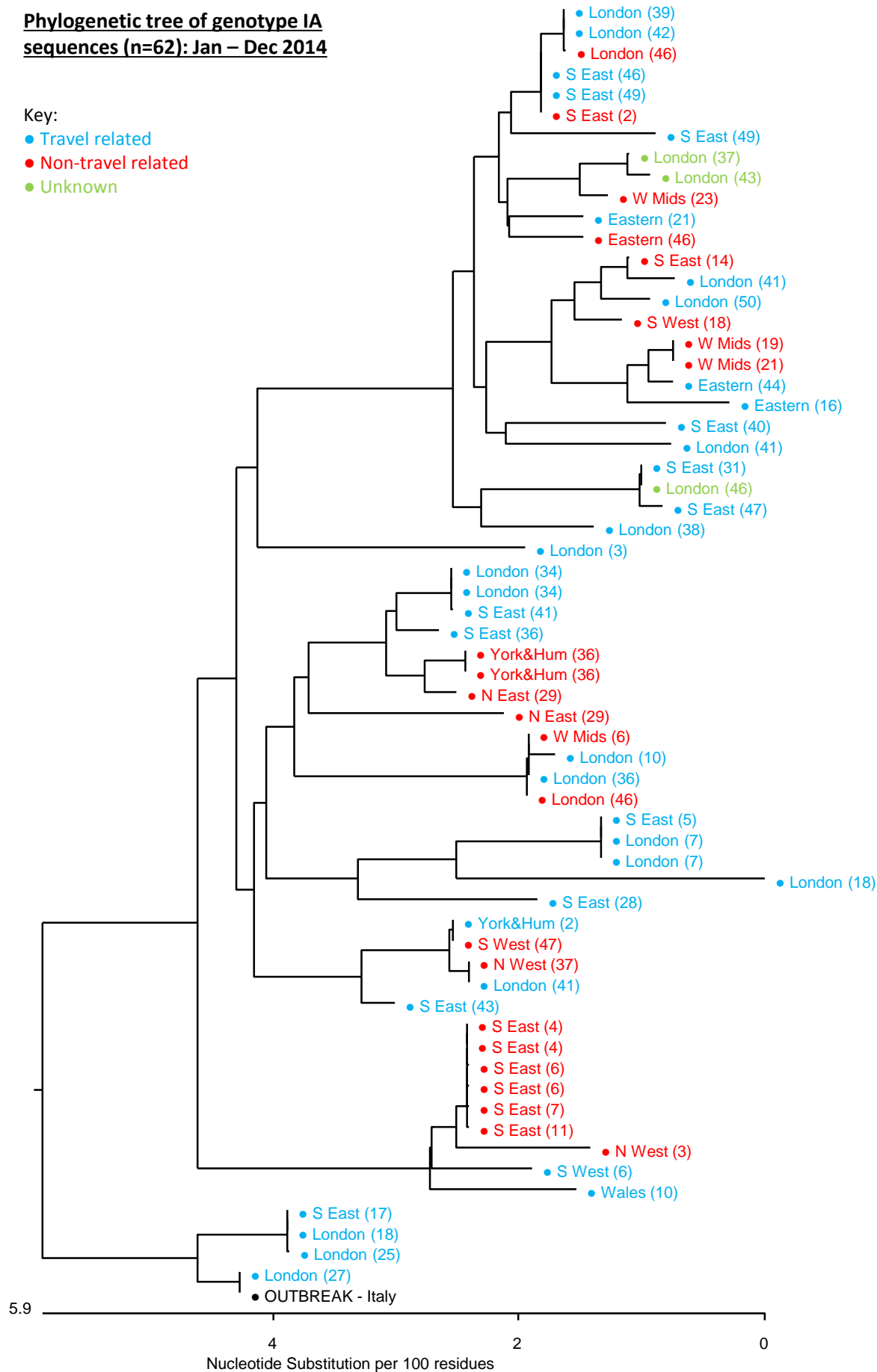
The majority of cases with genotype IA had a travel history reported 36/62 (58.6%) this is contrary to 2013 where more than half the cases had no travel history. This difference can be attributed to the fact that there were no large European outbreaks associated with genotype IA and contaminated food stuffs. Nationally there was one outbreak affecting multiple individuals who had no travel history; however no source was identified.

For genotype IB half the cases had no travel history which is slightly less than in 2013. As with genotype IA there were no large European outbreaks associated with genotype IB and contaminated food stuffs. Nationally there were two outbreaks affecting multiple individuals who had no travel history. The first outbreak was in the South East with nine cases and the second cluster comprised of four cases mainly from London. No source was identified for either outbreak.

**Phylogenetic tree of genotype IA sequences (n=62): Jan – Dec 2014**

Key:

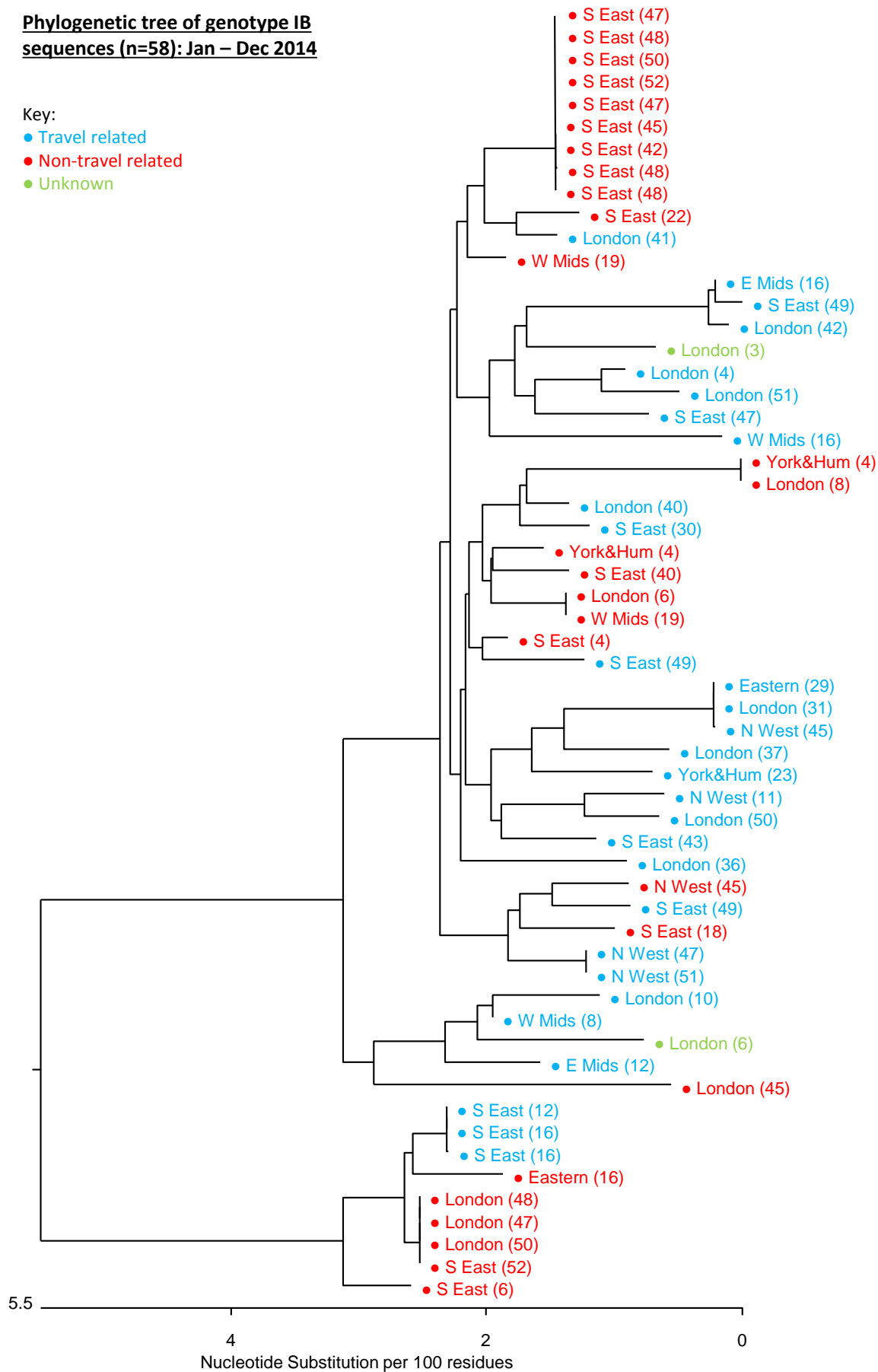
- Travel related
- Non-travel related
- Unknown



**Phylogenetic tree of genotype IB sequences (n=58): Jan – Dec 2014**

Key:

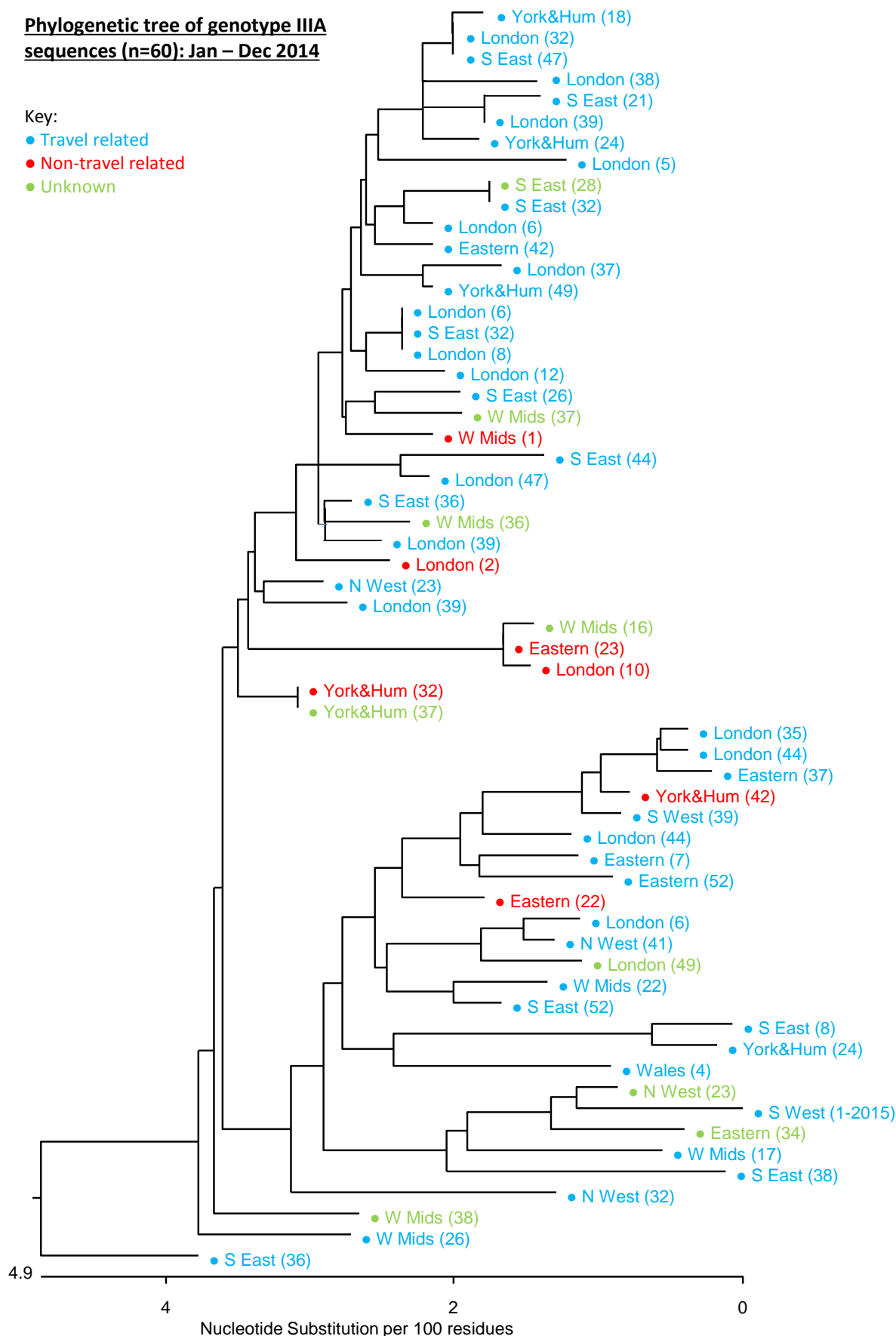
- Travel related
- Non-travel related
- Unknown



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

Key:

- Travel related
- Non-travel related
- Unknown



As in 2013 the majority of cases with genotype IIIA had a travel history (44/60, 73.3%). Nationally there were no large outbreaks caused by genotype IIIA. 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 (5).



## Summary

Comparison of SGSS reports with data from VRD have shown that nearly a quarter of the reports (22%) were not true cases of acute HAV. In addition significant numbers of cases genotyped within VRD have not been reported (36 cases) although were notified to their local Health Protection Teams.

Typing of hepatitis A virus is an invaluable tool and has increased our understanding of the molecular epidemiology of the virus; this is only possible by the continued submission of samples by laboratories from both travel associated and non-travel associated cases. It is clear that there are significant numbers of non-travel related cases which may indicate that contaminated food stuffs may be a more common occurrence than is thought and our ability to determine the origins of these non-travel associated strains is based on typing of strains from cases with known travel history. Typing has also enabled seemingly unrelated cases to be linked and has identified numerous clusters over the year.

As part of the ongoing enhanced surveillance of hepatitis A and to ensure sample confirmation, it is important that laboratories forward serum samples to VRD at PHE National Infection Service at Colindale as soon as the preliminary diagnostic testing is complete.

## References

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5. Health Protection Agency (HPA). Foreign travel-associated illness – a focus on those visiting friends and relatives: 2008 report. [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1231419800356](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1231419800356)

## 2. Laboratory reports of hepatitis C: 2014

During 2014, there were 11,997 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, 2014\***

Age group (years)	Q1			Q2			Q3			Q4			Total
	Jan-Mar			Apr-Jun			Jul-Sep			Oct-Dec			
	Female	Male	NK	Female	Male	NK	Female	Male	NK	Female	Male	NK	
<1	1	1	0	3	2	0	4	1	0	3	2	0	17
1 to 4	0	2	0	2	2	1	2	2	0	1	1	0	13
5 to 9	1	4	0	0	0	0	2	1	0	2	0	0	10
10 to 14	2	1	0	3	3	0	3	2	0	1	5	0	20
15 to 24	75	65	2	55	80	3	53	86	1	53	74	3	550
25 to 34	260	488	6	230	425	11	243	443	12	260	462	9	2,849
35 to 44	216	584	5	218	539	7	248	614	14	256	602	7	3,310
45 to 54	159	496	0	192	475	1	235	613	4	209	531	3	2,918
55 to 64	90	241	1	129	231	1	138	333	2	115	278	0	1,559
≥65	52	51	0	78	72	0	87	113	1	94	109	0	657
NK	3	11	2	3	13	3	12	23	3	3	13	5	94
<b>Total</b>	<b>859</b>	<b>1,944</b>	<b>16</b>	<b>913</b>	<b>1,842</b>	<b>27</b>	<b>1,027</b>	<b>2,231</b>	<b>37</b>	<b>997</b>	<b>2,077</b>	<b>27</b>	<b>11,997</b>

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

Overall, there was a 3% increase in the number of reports received during 2014 compared to 2013 (11,997/11,692).

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 2014, the greatest number of hepatitis C reports were received from the London (n=3,836) and Yorkshire and Humber (n=1,513) PHE Centres (Table 2). The comparatively high number of reports from these regions was consistent with previous years.

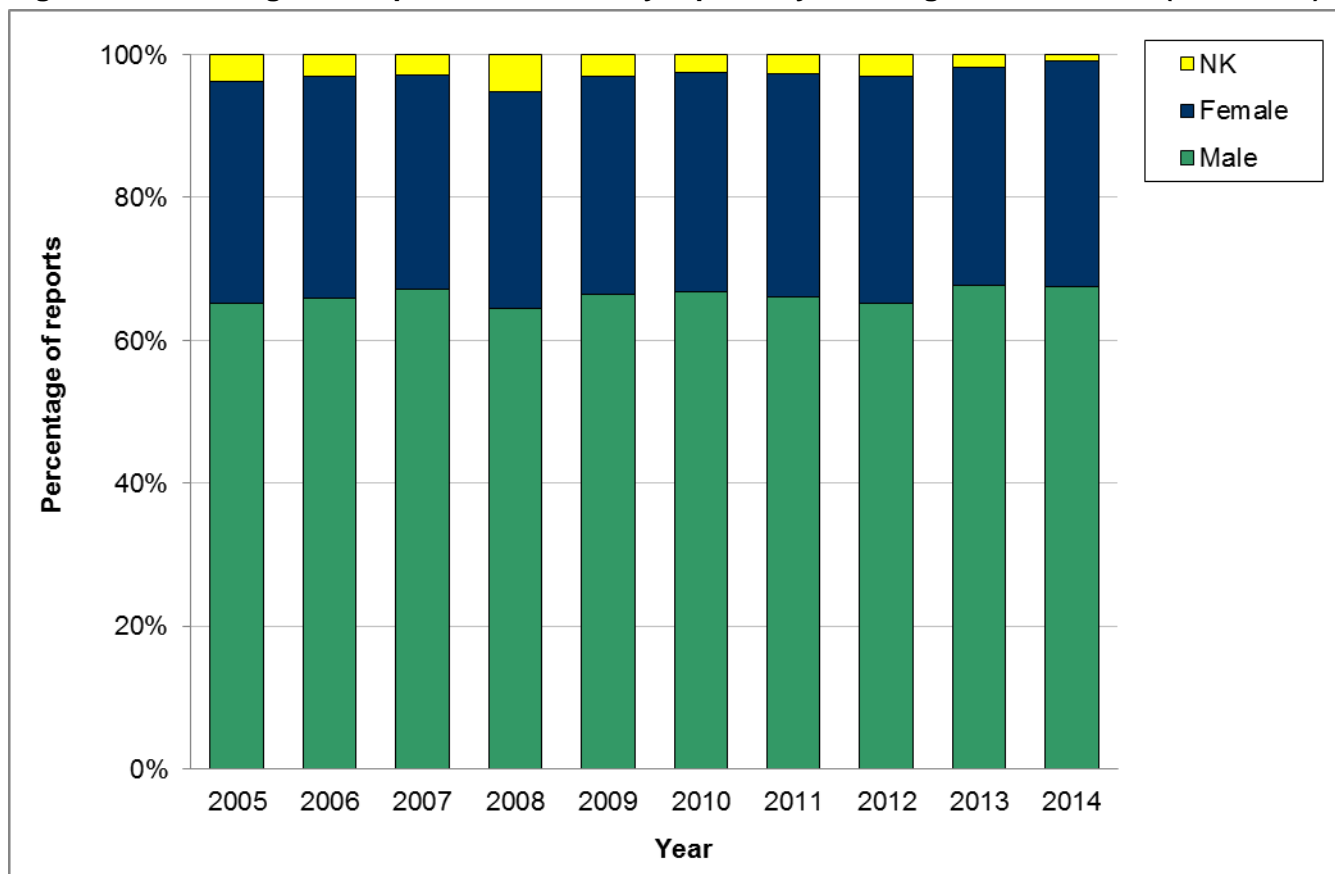
Apart from 2010, the overall trend is of a year on year increase in the number of hepatitis C reports. This may be due to in part to more complete reporting and/or more targeted testing of individuals.

**Table 2: Laboratory reports of hepatitis C by region, England and Wales (2005-2013)**

PHE Centre	Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
East Midlands	443	259	402	588	576	515	673	672	549	591
East of England	653	684	695	794	706	607	844	776	707	792
London	805	1190	1017	966	856	968	2012	2789	3089	3836
North East	277	245	141	167	275	317	310	301	360	305
North West	1505	1380	1737	1666	2117	1807	1514	1797	1981	1496
South East	325	379	786	1083	1147	1170	1300	1298	1137	1323
South West	695	872	1046	1114	999	732	973	1111	997	983
West Midlands	572	487	614	673	860	778	774	740	781	648
Yorkshire and Humber	1016	1449	1363	1344	1091	981	1507	1376	1470	1513
Wales	281	327	333	487	356	318	486	502	690	510
<b>Total</b>	<b>6,572</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>

Age and gender were well completed each year (>97% complete) (Figure 1). Where known, males accounted for 68% (8,094/11,890) of reports during 2014 which was consistent with previous years (Figure 1). In total, males have accounted for 67% of reports during this period.

**Figure 1: Percentages of hepatitis C laboratory reports by sex, England and Wales (2005-2014)**



During 2014, where known 56% of hepatitis C reports were among the 15 to 44 year old age group, a further 43% were among the 45 over age group with under 1% of reports among the under 15 years old age group. Since 2005 the highest number of reports has consistently been in the 15 to 44 year age group (Figure 2). However there has been a year on year decline 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 (2005-2014)**

