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# Annual report from the sentinel surveillance of blood borne virus testing in England 2019

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# Sentinel surveillance of BBV testing in England: background to the annual report for 2019

This report provides summary data for individuals who had tests reported to the sentinel surveillance programme during 2019. Sections 1 to 7 describe testing and demographic information for individuals tested by venepuncture and dried blood spot 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 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 in interpreting trends in the number of positive individuals identified over time. In 2019, sentinel surveillance captured front-line testing for hepatitis A, B, C and HIV, covering approximately 40% of the population, and over 80% of the population from all 9 PHECs tested for hepatitis D, E and HTLV.

Number of tests for a year includes all tests for an individual until an individual is diagnosed positive, no tests are counted after a positive test, therefore an individual can be counted more than once. The proportion positive is calculated among individuals tested.

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: 2019](#)'.

# 1. Hepatitis A IgM testing

In 2019, 17 participating centres supplied hepatitis A-specific IgM antibody (anti-HAV IgM) testing data (a marker of acute infection). Overall 46,814 individuals were tested at least once for anti-HAV IgM, of whom 270 (0.6%) tested positive. The age and gender of individuals tested was well reported (>99.7% complete). The highest number of individuals tested were tested in London, and the highest test positivity was in the North East (1.7%) (Supplementary table 1).

Males accounted for 53.0% of individuals testing, with a positivity of 0.6% for both males and females. Among all individuals testing, the highest proportion of tests were among those aged 65 years and older (20.3%). However, positivity was highest among children aged 1 to 14 years (2.9%) (Supplementary Table 2). The median age of individuals undergoing testing was 46 years (IQR 32 to 61) whereas the median age of individuals testing positive was 49 years (IQR 28 to 68).

The type of service which requested the hepatitis test was identified using the record location of the requestor (table 1). Where known (n= 47,896), general practice tested the greatest proportion of individuals for anti-HAV IgM (42.8%), with a further 23.6% tested in other known hospital wards, and 8.4% tested in general medical/surgical departments. Positivity was highest in individuals testing in occupational health (5.0%), unspecified wards (2.2%), accident and emergency and in specialist HIV services (both 1.3%).

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=44,002) (Supplementary table 3). Where known, the majority of individuals were classified as being of white or white British ethnic origin (82.6%), a further 11.4% were classified as Asian or Asian British origin, 2.7% were classified as black or black British origin and 3.2% were classified as other and/or mixed ethnic origin. The greatest proportion positive was among individuals of Asian or Asian British origin and of Other and/or mixed origin (0.9%).

**Table 1. Number of individuals tested, and testing positive for anti-HAV IgM in participating centres by service type, January to December 2019\***

Service type	Number of individuals tested	Number positive (%)
<b>Primary care</b>		
Accident and emergency	3,355	42 (1.3)
Drug dependency services	100	0 (0.0)
General practitioner	20,489	74 (0.4)
GUM clinic	1,980	9 (0.5)
Occupational health	20	1 (5.0)
Prison services	55	0 (0.0)
Pharmacy	0	0 (0.0)
Total primary care <sup>≠</sup>	25,937	126 (0.5)
<b>Secondary care</b>		
Antenatal	650	1 (0.2)
Fertility services	182	0 (0.0)
General medical/surgical departments	4,005	18 (0.4)
Obstetrics and gynaecology	1,091	2 (0.2)
Other ward type (known service) <sup>†</sup>	11,322	63 (0.6)
Paediatric services	1,019	8 (0.8)
Renal	512	6 (1.2)
HIV	76	1 (1.3)
Specialist infectious disease services	2,094	19 (0.9)
Unspecified ward <sup>§</sup>	946	21 (2.2)
Total secondary care <sup>≠</sup>	21,459	139 (0.6)
Unknown <sup>#</sup>	66	5 (7.6)

\* 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. An individual can test in more than one service type.

† 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.

≠ Totals for individuals testing in primary and secondary care, does not equal the sum of the individuals testing in each setting within primary and secondary care, as an individual can test in more than one setting.

## 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 virus (HBV) 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 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 2019, 125,112 women aged between 12 and 49 years old were identified as undergoing at least one antenatal screening for HBsAg, representing 21.3% of all individuals tested for HBsAg in participating sentinel centres. Overall 296 (0.2%) of these women tested positive. The median age of women tested was 31 years (IQR 26 to 34) and the median age of women testing positive was 30 years (IQR 27 to 34). The highest number of women were tested in the North West, and the highest test positivity was in London and the West Midlands (both 0.4%) (Supplementary table 4).

A HBeAg result was available for 89.9% (266) of HBsAg positive women, and of these, 7.1% (21) were HBeAg positive. Most women who underwent antenatal screening were classified as belonging to one of four broad ethnic groups ( $n=121,821$ ) (table 2). Where known, the majority of individuals were classified as being of white or white British ethnic origin (79.5%), a further 11.4% were classified as Asian or Asian British origin, 3.4% were classified as other and/or mixed ethnic origin, and 3.2% were classified as black or black British origin. The proportion testing positive was higher among women of black or black British origin or other and/or mixed origin (1.1% and 1.0% respectively) than women of Asian or Asian British origin and white or white British origin (0.4% and 0.1% respectively).

The proportion of HBeAg positive women among those who were positive for HBsAg and tested for HBeAg also differed by ethnic group, with 20.5% of other and/or mixed ethnic origin women testing positive, 11.8% of Asian or Asian British women and 5.1% of white or white British women.

**Table 2. Number of antenatal women (12-49 years) tested and testing positive for HBsAg, and number of HBsAg positive women tested and testing positive for HBeAg by ethnic group, January to December 2019\***

Ethnic group	Number of women (12 to 49 years) tested	Number HBsAg positive (%)	Number HBsAg positive tested for HBeAg	% HBsAg positive tested	Number HBeAg positive (%)
Asian or Asian British origin	14,164	52 (0.4)	51	98.1	6 (11.8)
Black or black British origin	3,947	44 (1.1)	40	90.9	1 (2.5)
Other and/or mixed origin	4,240	43 (1.0)	39	90.7	8 (20.5)
White or white British origin	99,470	137 (0.1)	118	86.1	6 (5.1)
Unknown ethnic origin	3,291	20 (0.6)	18	90.0	0 (0.0)

\* Excludes dried blood spot testing, oral fluid testing, reference testing and testing from hospitals referring all samples. Only women aged 12 to 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 2019, 557,872 samples were tested for HBsAg, excluding antenatal screening, in 19 participating sentinel centres, equating to 461,257 individuals. Overall, 4,362 (0.9%) individuals tested positive, with the highest positivity in the West Midlands (1.3%) (Supplementary Table 5). This may reflect more targeted testing of risk groups and/or genuinely higher prevalence of HBV in people being tested in this PHEC.

The age and gender of individuals tested for HBsAg was well reported (>99.3% complete). Where known, more males (55.0%) were tested than females (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. Positivity was higher among males compared to females (1.1% vs 0.7%  $p<0.001$ ). Among all individuals testing the highest proportion of tests (24.5%) were among those aged between 25 and 34 years, followed by those aged between 35 and 44 years (20.3%). The highest positivity was among those aged under 1 (1.6%), followed by those aged between 35 and 44 years and between 45 and 54 years (both 1.2%). The median age of individuals tested was 41 years (IQR 30 to 58) and testing positive was 38 years (IQR 30 to 48).

Where known (n=555,394), the greatest proportion of individuals tested for HBsAg were tested in other known hospital wards (20.1%), with a further 19.5% tested in general practice and 10.2% tested in renal services (table 3). Positivity was highest among individuals testing in unspecified wards, specialist liver services, pharmacies and HIV services (1.9%, 1.8%, 1.7% and 1.7% respectively).

**Table 3. Number of individuals tested, and testing positive for HBsAg in participating centres by service type (excluding antenatal testing), January to December 2019\***

Service type	Number of tests	Number of individuals tested	Number positive (%)
<b>Primary Care</b>			
Accident and emergency	36,526	33,803	161 (0.5)
Drug dependency services	30,223	29,535	390 (1.3)
General practitioner	8,245	104,607	1,121 (1.1)
GUM clinic	48,832	45,105	456 (1.0)
Occupational health	17,393	16,708	64 (0.4)
Prison services	52,802	44,726	563 (1.3)
Pharmacy	1,376	1,295	22 (1.7)
Total primary care <sup>≠</sup>	295,397	273,565	2,777 (1.0))
<b>Secondary Care</b>			
Fertility services	19,007	17,287	87 (0.5)
General medical / surgical departments	18,077	16,481	90 (0.5)
Obstetrics and gynaecology	19,646	18,421	47 (0.3)
Other ward type (known service) <sup>†</sup>	111,690	99,323	685 (0.7)
Paediatric services	5,696	5,200	40 (0.8)
Renal	56,739	19,165	100 (0.5)
Specialist HIV services	1,428	1,390	23 (1.7)
Specialist liver services	14,619	13,455	246 (1.8)
Unspecified ward <sup>§</sup>	13,095	10,441	202 (1.9)
Total secondary care <sup>≠</sup>	259,997	192,773	1,520 (0.8)
Unknown <sup>#</sup>	2478	2273	202 (8.9)

\* Excludes 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. An individual can test in more than one service type. The proportion positive is calculated using number of individuals. Number of tests includes all tests until a person is diagnosed positive, no tests are counted after a positive test, a person can be counted more than once.

<sup>†</sup> Other ward types includes cardiology, coroner, dermatology haematology, ultrasound, x-ray.

<sup>§</sup> 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.

<sup>#</sup> These services are currently being investigated to identify specific service type, where possible.

<sup>≠</sup> Totals for individuals testing in primary and secondary care, does not equal the sum of the individuals testing in each setting within primary and secondary care, as an individual can test in more than one setting.



83.5% of individuals tested for HBsAg were classified as belonging to one of four broad ethnic groups (n=385,120) (table 4). Most individuals of unknown ethnic origin were tested by GUM clinics, from which only minimal demographic data are available, resulting in poor ethnic classification. Where known, the majority of individuals were classified as being of white or white British ethnic origin (80.8%), a further 12.2% were classified as Asian or Asian British origin, 3.7% were classified as black or black British origin and 3.4% were classified as other and/or mixed ethnic origin. The proportion positive varied by ethnic group; 4.2% of individuals of other and/or mixed ethnicity tested positive compared to 3.6% of black or black British origin individuals, 1.3% of Asian or Asian British origin individuals and 0.6% of white or white British origin individuals.

**Table 4. Number of tests, individuals tested, and individuals testing positive for HBsAg in participating centres by ethnic group (excluding antenatal testing), January to December 2019\***

<b>Ethnic group</b>	<b>Number of tests</b>	<b>Number of individuals tested</b>	<b>Number positive (%)</b>
Asian or Asian British origin	59,179	46,999	599 (1.3)
Black or black British origin	17,627	13,942	468 (3.4)
Other and/or mixed origin	15,601	13,139	548 (4.2)
White or white British origin	383,526	311,040	1865 (0.6)
Unknown ethnic origin	81,939	76,137	882 (1.2)

\* 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. The proportion positive is calculated using number of individuals. Number of tests includes all tests until a person is diagnosed positive, no tests are counted after a positive test, a person can be counted more than once.

### 3. Hepatitis C antibody testing

Sentinel surveillance collects data on testing for hepatitis C-specific antibodies (anti-HCV), a marker of ever having a hepatitis C (HCV) infection. It is important to note that no laboratory methods are currently available to distinguish definitively between acute or chronic HCV infections. Therefore, positive anti-HCV results do not therefore necessarily represent incident or current infections, with a HCV PCR test required to identify a current infection.

In 2019, 527,525 samples were tested for anti-HCV in 19 participating sentinel centres, equating to 441,631 individuals. Overall, 12,461 (2.8%) individuals tested positive. This varied by PHEC, with the highest positivity in the West Midlands (5.8%) (Supplementary Table 7), and Operational Delivery Network (ODN), with the highest positivity in South Yorkshire ODN (30.0%) (Supplementary table 8). This may reflect testing coverage, more targeted testing of risk groups and/or genuinely higher prevalence of HCV in people being tested in this geography.

Of those individuals testing positive for anti-HCV (n=12,461), 7,345 were tested for HCV RNA on the same day or after their anti-HCV positive test. Among persons HCV RNA tested after a positive anti-HCV test, 49.3% (n=3,624) were positive, of whom 22.9% (n=829) had a HCV genotype recorded; 49.0% were genotype 1, with a further 45.1% genotype 3.

Age and gender were well reported (>98.8% complete). Males represented 60.2% of all persons tested, with a higher positivity in males compared to females (3.4% vs 1.9% respectively, p<0.001). Where known, the highest proportion of tests (24.0%) were among those aged between 25 and 34 years, followed by those aged between 35 and 44 years (20.9%). The highest positivity was among those aged between 35 and 44 years with 4.9%. (Supplementary Table 9). The median age of those tested was 40 years (IQR 30 to 55 years), whereas the median age of those tested positive was 41 years (IQR 35 to 49 years).

Where known (n=455,179), the greatest proportion of individuals tested for anti-HCV were from other known hospital wards (18.4%), with a further 17.4% from general practice and 10.1% from GUM (table 5). The highest positivity was among individuals testing in specialist drug services (21.0%), pharmacies (6.9%) and prisons (5.0%).

**Table 5. Number of individuals tested, and testing positive for anti-HCV in participating centres by service type, January to December 2019\***

Service type	Number of tests	Number of Individuals tested	Number positive (%)
<b>Primary care</b>			
Accident and emergency	37,294	34,586	315 (0.9)
Drug dependency services	29,476	29,045	6,112 (21.0)
General practitioner	94,911	91,493	1,368 (1.5)
GUM clinic	65,970	52,925	513 (1.0)
Occupational health	17,363	16,112	28 (0.2)
Prison services	49,783	42,757	2,159 (5.0)
Pharmacy	1,277	1,210	83 (6.9)
Total primary care <sup>≠</sup>	296,074	265,910	10,578 (4.0)
<b>Secondary care</b>			
Antenatal	1,558	1,512	20 (1.3)
Fertility services	18,293	16,625	55 (0.3)
General medical / surgical departments	17,011	15,545	181 (1.2)
Obstetrics and gynaecology	8,883	7,998	32 (0.4)
Other ward type (known service) <sup>†</sup>	107,716	96,830	905 (0.9)
Paediatric services	4,491	4,072	18 (0.4)
Renal	42,784	18,556	76 (0.4)
Specialist HIV services	5,018	4,373	40 (0.9)
Specialist liver services	14,387	13,207	68 (0.5)
Unspecified ward <sup>§</sup>	9,191	8,333	190 (2.3)
Total secondary care <sup>≠</sup>	229,332	179,509	1,585 (0.9)
Unknown <sup>#</sup>	2,119	2,006	68 (3.4)

\* Excludes 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. An individual can test in more than one service type. The proportion positive is calculated using number of individuals. Number of tests includes all tests until a person is diagnosed positive, no tests are counted after a positive test, a person can be counted more than once.

<sup>†</sup> Other ward types includes cardiology, coroner, dermatology haematology, ultrasound, X-ray.

<sup>§</sup> 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.

<sup>#</sup> These services are currently being investigated to identify specific service type, where possible

<sup>≠</sup> Totals for individuals testing in primary and secondary care, does not equal the sum of the individuals testing in each setting within primary and secondary care, as an individual can test in more than one setting.

Most individuals tested for anti-HCV were classified as belonging to one of four broad ethnic groups (n=358,588) (table 6). The majority of individuals were classified as being of white or white British ethnic origin (80.9%), a further 12.2% were classified as Asian or Asian British origin, 3.6% were classified as black or black British origin and 3.3% were classified as other and/or mixed ethnic origin. The proportion positive varied slightly by ethnic group: 2.3% in white or white British origin individuals, 1.1% in individuals of Asian or Asian British ethnic origin tested positive, 0.9% in other or mixed ethnic origin individuals and 0.6% in black or black British origin individuals.

**Table 6. Number of tests, individuals tested, and individuals testing positive for anti-HCV in participating centres by ethnic group, January to December 2019\***

<b>Ethnic group</b>	<b>Number of tests</b>	<b>Number of Individuals tested</b>	<b>Number positive (%)</b>
Asian or Asian British origin	52,190	43,719	478 (1.1)
Black or black British origin	15,313	12,861	76 (0.6)
Other and/or mixed origin	13,660	11,906	107 (0.9)
White or white British origin	348,768	290,102	6534 (2.3)
Unknown ethnic origin	97,064	82,536	4936 (6.0)

\* 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. The proportion positive is calculated using number of individuals. Number of tests includes all tests until a person is diagnosed positive, no tests are counted after a positive test, a person can be counted more than once.

## 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-HDV IgM), a marker of acute hepatitis D (HDV) infection. Seven sentinel laboratories provide HDV 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 be interpreted accordingly. Data are shown by region of the requesting service.

In 2019, 1,119 individuals were tested at least once for HDV TA and/or HDV IgM, and 33 (2.9%) individuals tested positive, this varied by PHEC with the highest positivity in Yorkshire and the Humber (4.6%), followed by the North West (4.3%), (Supplementary table 10).

The age and gender of individuals tested for HDV was well reported (>97.9% complete). Where known, slightly more males were tested than females (51.5%). The positivity among males and females testing for HDV TA and/or HDV IgM was similar (3.4% and 2.4% respectively,  $p=0.36$ ). The highest proportion of tests were among those aged between 35 and 44 years (31.0%), with a similar proportion among those aged between 25 and 34 years (30.5%). Positivity was highest among those aged between 35 and 44 years (4.3%), followed by those aged between 35 and 4 years (3.2%). The median age of individuals tested was 38 years (IQR 31 to 47) and the median age of individuals testing positive was 36 years (IQR 30 to 45).

The greatest proportion of individuals (79.2%) were tested by a hospital which referred all HDV samples to a sentinel centre. In these cases the service that originally requested the test could not be determined. A further 10.0% tested in other known hospital wards, and 3.4% tested in general practice. Most individuals tested for hepatitis D were classified as belonging to one of four broad ethnic groups ( $n=1,038$ ) (Supplementary table 11). Almost half of individuals were classified as being of white or white British ethnic origin (48.7%), a further 16.6% were classified as Asian or Asian British ethnic origin, 19.8% were classified as other and/or mixed origin, and 14.8% were classified as black or black British origin. The proportion positive varied by ethnic group; 1.5% of other or mixed ethnic origin individuals tested positive compared to 4.5% of individuals of black or black British ethnic origin, 4.1% of persons Asian or Asian British, and 3.0% of white or white British origin individuals.

## 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 E (HEV) infection. Ten sentinel laboratories provide HEV testing facilities. Recent HEV testing guidelines and increased disease awareness have resulted in more sentinel laboratories testing for HEV.

In 2019, 23,374 individuals were tested at least once for anti-HEV IgM. Overall, 701 (3.0%) individuals tested positive, although this varied by PHEC with the greatest positivity in the North West (20.1%) (Supplementary Table 12).

The age and gender of individuals tested for anti-HEV IgM was well reported (>99.3% complete). Where known, slightly more males were tested than females (51.6%), with a higher positivity among males compared to females (3.8 % vs. 2.1% respectively,  $p < 0.001$ ). The highest proportion of tests were among those aged 65 years and older (26.4%), followed by those aged between 55 and 64 years, with 16.9% of tests.

Positivity was also highest in these age groups at 3.8% for those aged 65 year and older and 4.0% for those aged 55-64 years old. The median age of individuals tested was 51 years (IQR 34 to 66) and the median age of individuals testing positive was 57.5 years (IQR 43 to 69).

Overall 5.1% (321/6,336) of males aged 50 or over tested for anti-HEV IgM were positive, compared to 2.3% (133/5,735) among those under the age of 50. A similar pattern was seen among females, where 2.4% (143/5,896) of females aged 50 or over tested positive compared to 1.7% (92/5,423) among those under the age of 50. Where known ( $n=23,637$ ), the greatest proportion of individuals (45.7%) were tested by a hospital which referred all HEV samples to a sentinel centre. In these cases the service that originally requested the test could not be determined. A further 14.7% tested in other known hospital wards, and 12.0% tested in unknown hospital wards.

Most individuals tested for anti-HEV IgM were classified as belonging to one of four broad ethnic groups ( $n=22,732$ ) (Supplementary table 13). The majority of individuals were classified as being of white or white British ethnic origin (82.7%), a further 13.3% were classified as Asian or Asian British origin, 2.3% were classified as other and/or mixed ethnic origin, and 1.7% were classified as black or black British origin. The proportion positive varied by ethnic group; 3.8% of Asian or Asian British origin individuals tested positive compared to 2.9% of individuals of white or white British origin, 1.7% of other or mixed ethnic origin and 1.0% of black or black British origin.

## 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 2019, 104,300 women aged between 16 and 49 years old were identified as undergoing antenatal screening at least once for HIV, representing 11.4% of all individuals tested for HIV in participating sentinel centres. Overall, 115 (0.1%) of these women tested positive, with the highest positivity in the West Midlands (0.3%) (Supplementary table 14). The median age of women tested was 30 years (IQR 26 to 34) and the median age of women testing positive was 33 years (IQR 27 to 37).

### b. Non-antenatal HIV screening

In 2019, 807,496 samples were tested for HIV, excluding antenatal screening, in 17 participating sentinel centres, equating to 677,238 individuals (adults aged 16 years and over). Overall, 3,744 (0.6%) individuals tested positive, although this varied by PHEC with the highest positivity in the West Midlands (0.9%) (Supplementary Table 15). The age and gender of adults tested for HIV was well reported (>99.6% complete). Where known, similar numbers of females (49.3%) were tested compared to males (50.7%) (Supplementary Table 16). The number of females tested may include some undergoing routine antenatal screening who could not be identified as such from the information provided. Positivity was higher in males compared to females (0.9% vs 0.2%  $p < 0.001$ ). A third of all individuals tested (31.5%) were aged between 25 and 34 years followed by 21.3% aged between 15 and 24 years. Positivity was highest in those aged between 45 and 54 years (1.0%), followed by those aged between 55 and 64 years, and 35 and 44 years (0.8% and 0.7%, respectively). The median age of individuals tested was 33 years (IQR 25 to 46) and the median age of individuals testing positive was 40 years (IQR 30.5 to 49).

Where known ( $n=697,606$ ), the greatest proportion of individuals tested for HIV were from GUM clinics (28.7%), with a further 16.3% tested in accident and emergency departments and 13.9% tested in general practice (table 7). The highest positivity was among individuals tested in specialist HIV services (5.1%), specialist liver services (1.4%) and GUM clinics (0.7%).

**Table 7. Number of adults (16+ years old) tested and testing positive for HIV in participating centres by service type (excluding antenatal testing), January to December 2019\*†**

Service type	Number of tests	Number of individuals tested	Number positive (%)
<b>Primary care</b>			
Accident and emergency	129,231	114,000	657 (0.6)
Drug dependency services	17,549	17,311	5 (0.0)
General practitioner	102,062	96,861	219 (0.2)
GUM clinic	245,244	200,245	1407 (0.7)
Occupational health	15,130	14,367	17 (0.1)
Prison services	27,094	23,480	100 (0.4)
Pharmacy	61	59	0 (0.0)
Total primary care≠	536,371	466,323	2,405 (0.5)
<b>Secondary care</b>			
Fertility services	42,682	35,736	113 (0.3)
General medical / surgical departments	28,530	24,811	93 (0.4)
Obstetrics and gynaecology	19,873	18,850	28 (0.1)
Other ward type (known service)†	103,801	95,354	446 (0.5)
Paediatric services	5,552	5,438	12 (0.2)
Renal	28,060	15,089	50 (0.3)
Specialist HIV services	5,945	5,939	305 (5.1)
Specialist liver services	9,853	9,036	123 (1.4)
Unspecified ward§	24,526	20,874	122 (0.6)
Total secondary care≠	268,822	231,127	1,292 (0.6)
Unknown#	2,143	2,040	47 (2.3)

\* Excludes individuals aged under 16, antenatal screening, 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. An individual can test in more than one service type. The proportion positive is calculated using number of individuals. Number of tests includes all tests until a person is diagnosed positive, no tests are counted after a positive test, a person can be counted more than once.

† 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

≠ Totals for individuals testing in primary and secondary care, does not equal the sum of the individuals testing in each setting within primary and secondary care, as an individual can test in more than one setting.



Two thirds of adults tested for HIV were classified as belonging to one of four broad ethnic groups (n=436,945) (table 8). Where known, the majority of individuals were classified as being of white or white British ethnic origin (77.8%), a further 11.8% were classified as Asian or Asian British origin, 6.2% were classified as black or black British origin and 4.2% were classified as other and/or mixed ethnic 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; 1.0% of individuals of black or black British origin tested positive compared to 0.6% of individuals of white or white British origin, 0.6% of other and/or mixed origin individuals and 0.4% of Asian or Asian British origin individuals.

**Table 8. Number of tests, adults (16+ years old) tested, and, adults (16+ years old) testing positive for HIV in participating centres by ethnic group (excluding antenatal testing), January to December 2017\***

<b>Ethnic group</b>	<b>Number of tests</b>	<b>Number of individuals tested</b>	<b>Number positive (%)</b>
Asian or Asian British origin	60,491	51,547	200 (0.4)
Black or black British origin	32,751	27,212	279 (1.0)
Other and/or mixed origin	21,053	18,198	110 (0.6)
White or white British origin	404,279	339,988	2,058 (0.6)
Unknown ethnic origin	288,922	240,293	1,097 (0.5)

\* 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. The proportion positive is calculated using number of individuals. Number of tests includes all tests until a person is diagnosed positive, no tests are counted after a positive test, a person can be counted more than once.

## 7. HTLV testing

In 2019, 12,543 individuals were tested at least once for HTLV-1 specific antibodies in 10 participating sentinel centres. Overall, 79 (0.6%) individuals tested positive, although this varied by PHEC with the highest positivity in the South West (2.6%). It is likely that individuals in the South West were tested due to the presentation of HTLV-like symptoms, and very few individuals were tested from this region, (Supplementary Table 17).

The age and gender of individuals tested for HTLV-1 was well reported (>97.6% complete) (Supplementary Table 18). Where known, slightly more males were tested than females (56.2%), with positivity higher in females compared to males (0.9% vs. 0.5% respectively,  $p=0.007$ ). The highest proportion of tests were among those aged 55-64 years old and those aged 65 years and over (21.5% and 22.7%, respectively). Positivity was highest among those aged between 1 and 14 years (1.5%), followed by those aged between 55 and 64 years (0.7%) and those aged 45-54 years old and those aged 65 years and over (both 0.6%). The median age of individuals tested was 52 years (IQR 36 to 63) and the median age of individuals testing positive was 55.5 years (IQR 37 to 65).

The greatest proportion of individuals (42.5%) were tested in other ward type, with a further 17.4% by a hospital which referred all HTLV samples to a sentinel centre and 15.9% in renal services.

Most individuals tested for HTLV-1 were classified as belonging to one of four broad ethnic groups ( $n=11,911$ ) (Supplementary table 19). The majority of individuals were classified as being of white or white British ethnic origin (86.7%), a further 8.4% were classified as Asian or Asian British origin, 3.0% were classified as black or black British origin, and 1.8% were classified as other and/or mixed ethnic origin. The proportion positive varied by ethnic group; 1.7% of individuals of black or black British origin tested positive compared to 0.9% of other and/or mixed origin individuals, and 0.5% of both Asian or Asian British origin individuals and white or white British origin individuals.

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Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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