Public Health England

# Hepatitis B epidemiology in London

## 2012 data

# About Public Health England

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# Executive summary

Hepatitis B is a vaccine preventable infection that can cause long-term liver disease and liver cancer (hepatocellular carcinoma). The virus is blood-borne and transmitted via contact with blood and other infected bodily fluids. Prevention is focused on vaccination of population groups most at risk and reduction in needle sharing in people who inject drugs (PWID). Health protection teams (HPTs) routinely follow-up acute hepatitis B cases and advise on vaccination of close contacts.

London has a particular high burden of hepatitis B. In 2012, the incidence rate of acute hepatitis B in London was 2.02 per 100,000 population, which is twice the national rate (England rate 1.04 per 100,000) and much higher than that seen in any other region. In 2012 there were 155 reports of acute hepatitis B in London, similar to the 160 seen in 2011. The highest rates of acute hepatitis B infection were in Newham, Islington, Lambeth and Brent.

Although there are concerns over data completeness, the most likely transmission route for acute hepatitis B in 2012 in London was through heterosexual exposure, followed by exposure through sex between men. Males and those aged 25 to 34 years were most likely to be infected. Where information on ethnicity and country of birth was collected, nearly three-fifths of cases were born overseas, one third of cases were white and a quarter black African.

It is of concern that a significant number of acute hepatitis B infections (n=26, 17%) were not notified to HPTs by clinicians. The majority of laboratories discriminated well between acute and long-term cases although under-reporting was likely in several laboratories.

The main burden of hepatitis B relates to long-term infection and the majority of those infected are likely to have been infected abroad. There were over 3,500 new laboratory reports of hepatitis B ascribed to London residents in 2012, the vast majority of which were long-term infections (98%). Hepatitis B positivity was higher in certain minority ethnic groups; those identified as black were over four times and Asians twice as likely to test positive as those identified as white or white British. Nineteen out of every 20 antenatal women testing positive for hepatitis B were born abroad, nearly half were born in Africa and an increasing number of women from Eastern Europe have tested positive for hepatitis B, although numbers appear to be plateauing.

Screening for hepatitis B in antenatal services is successful. Uptake of antenatal screening was very high in London (99%). The positivity rate among women attending antenatal services was 10.7 per 1,000 tested, which was more than double the national rate. In 2012, 1,479 women attending antenatal services tested positive for hepatitis B, of whom 45% were newly diagnosed. We estimate that primary care trusts (PCTs) only reported information on vaccination on less than two-thirds of all babies at risk. Where reported,

86% of babies born to hepatitis B positive mothers had received three doses of hepatitis B vaccination at 12 months in London in 2012/3 (83% had received four doses at 24 months). However, seven PCTs reported an uptake of 70% or less; Enfield, Tower Hamlets, Havering, Sutton & Merton, Barnet, Islington and Hounslow[15]. Furthermore, the following PCTs did not submit complete data in 2012/3; Brent, City and Hackney, Croydon, Hammersmith and Fulham, Harrow, Kensington and Chelsea and Westminster PCTs.

The overall reported coverage for hepatitis B vaccination in London prisons for 2012/3 was low at 40%, compared to 57% in England overall. This may reflect poor data quality. HMP Isis was the only establishment to meet the key performance and quality indicator (KPI) for hepatitis B vaccination in prisons, of 80% vaccine coverage of new receptions.

There has been success in prevention measures among PWID, with an increasing hepatitis B vaccination uptake (73% in 2012) and falling use of shared injecting equipment.

# Recommendations

- PHE Field Epidemiology Services, Victoria office should work with laboratories where reports lacked differentiation between acute and long-term hepatitis B infection, to improve reporting of this information.
- Laboratories are requested to refer residual blood samples from cases of possible acute hepatitis B infection to the Centre for Infectious Disease Surveillance and Control (CIDSC) Colindale for sequence based typing and avidity testing.
- HPTs and Field Epidemiology Services, Victoria office should work with laboratories where there may be under-reporting hepatitis B cases to support them to meet their statutory duty to report.
- HPTs should work with those NHS trusts who did not report all acute hepatitis B cases to improve reporting.
- HPTs should work towards improving their collection of risk factor information for cases of acute hepatitis B, especially the recording on HPZone of history of travel, ethnicity, country of birth and most likely transmission route.
- Healthcare practitioners should be alert to those at greater risk of hepatitis B, including those who have lived in highly endemic areas, and have a high index of suspicion for testing. GP practices are advised to test new registrants who are at increased risk.
- Commissioners and providers in local areas where information on neonatal hepatitis B vaccination uptake was either incomplete or absent should work to report complete information.

- Commissioners and providers of immunisation in local areas where the uptake of hepatitis B vaccination in babies born to hepatitis B positive mothers was less than 90% should work with HPTs to identify the reasons for this and to improve uptake.
- Commissioners, providers and HPTs should ensure that there are robust pathways in place for information about babies born to hepatitis B positive mothers to reach those responsible for vaccination. Teams in areas where fewer than ten at risk babies per year requiring vaccination were reported by child health information providers should ensure that this is not due to under-reporting. They should make use of Enhanced Surveillance of Antenatal Hepatitis B (ESAHB) data available from HPTs.
- Providers of antenatal care and vaccination of at risk babies should ensure that information materials on hepatitis B are available in those languages most frequently spoken by their local clients, to improve understanding of the need and process for vaccination. Across London the most common languages spoken by antenatal women testing positive for hepatitis B were Chinese or Vietnamese, Romanian, Somali, Polish and Turkish.
- Providers of antenatal care are advised to ensure that GPs are made aware of patients diagnosed with long-term hepatitis B, and to include information on the management of contacts.
- Healthcare providers should have measures in place to identify patients in whom hepatitis B vaccination is recommended and ensure that they are vaccinated. This includes those who may place themselves at risk through sexual activity and close household contacts of cases.
- Commissioners and providers of prison health services who did not report hepatitis B vaccination data should work to ensure that data is reported.
- Commissioners and providers of prison health services where the reported uptake of hepatitis B vaccination was less than 80% should work to improve reported uptake.
- Commissioners and providers of prison health services should consider offering routine hepatitis B testing to prisoners in addition to vaccination.
- HPTs should work with commissioners and providers to ensure that systems exist to support clinical practitioners in detecting long-term hepatitis B infection in patients at increased risk.
- HPTs should work with laboratories to ensure that essential public health information regarding the follow-up of cases and contacts is provided to clinicians in laboratory reports of hepatitis B.

# Introduction

Hepatitis B is an important public health problem, accounting for considerable morbidity and mortality. Using routine data sources, this report aims to describe the epidemiology of hepatitis B in London, provide information on some of the public health interventions designed to prevent transmission and make recommendations to improve the detection and public health management of new and existing infections.

## Background

Hepatitis B is a vaccine preventable infection which can cause long-term liver disease and liver cancer (hepatocellular carcinoma). The virus is blood-borne and transmitted via contact with blood and other infected bodily fluids. Hepatitis B is between 50 and 100 times more infectious than HIV and is of public health concern in the UK although the incidence in this country is low.

Most of the morbidity and mortality associated with hepatitis B is due to the long term consequences of long-term infection. Many people with acute infection have no symptoms, but they can experience nausea, abdominal pain, inflammation of the liver (hepatitis) and jaundice. Although there is a high clearance rate for the virus, a proportion will go on to develop long-term infection. Chronic infection is more likely in those infected at a younger age with 90% of those infected within the first year of life developing long-term infection. Many people with long-term infection are asymptomatic and unaware of their infection and unless they are tested will remain undiagnosed until they present with overt disease.

Certain population groups are at increased risk of hepatitis B in the UK. These include people who have increased potential for coming into contact with blood and other body fluids of infected individuals through their jobs eg healthcare workers, or through tattooing, piercing and/or acupuncture and sharing of injecting equipment including needles and associated paraphernalia. Prisoners are recognised as an at risk group, due to the relatively high incidence of risk behaviours including sharing injecting, tattooing and/or piercing equipment. Infants born to hepatitis B mothers are also at particular risk.

The prevalence of long-term infection is estimated to be 0.3% in the UK[1]. This contrasts with other parts of the world where hepatitis B is highly endemic. This includes all of Africa, some parts of South America, Alaska, northern Canada and parts of Greenland, eastern Europe, the eastern Mediterranean area, south-east Asia, China, and the Pacific Islands, except Australia, New Zealand and Japan[1]. In most of these areas, between 5% and 15% of the population are long-term infected carriers of HBV[1]. Worldwide, hepatitis B infection causes more than one million deaths every year[2].

People who were born or have lived in countries where hepatitis is highly endemic are therefore also at greater risk. Long-term infections in migrants are estimated to account for

around 96% of all new long-term hepatitis B infections in the UK[3]. The majority of migrants with long-term infection are likely to have acquired their infection in a high or intermediate prevalence country during childhood.

Public health interventions to prevent transmission of hepatitis B include healthcare infection control policies, identifying common sources of infection, providing infection control information to new cases, screening contacts, vaccination of groups most at risk and reducing sharing of needles among PWID.

Hepatitis B vaccine in the UK it is offered to those at higher risk of contracting the virus or in experiencing complications from infection (Table 1). It is widely recognised as being a safe and effective vaccine.

The public health response to new cases of hepatitis B is co-ordinated by HPTs. There are standards for the surveillance and follow-up of cases of hepatitis B[4]. For every acute infection reported, HPTs should identify the most likely transmission route, provide infection control advice to the case and recommend appropriate screening and vaccination of close contacts.

HPTs also support local partners in developing systems to improve detection and management of undiagnosed hepatitis B infection.

Table 1: Groups where pre-exposure hepatitis B vaccination is recommended in the UK[5]

| |
|---|
| Injecting drug users |
| Individuals who change sexual partners frequently |
| Close family contacts of a case or individual with long-term hepatitis B infection |
| Families adopting children from countries with a high or intermediate prevalence of hepatitis B |
| Foster carers |
| Individuals receiving regular blood or blood products and their carers |
| Patients with long-term renal failure |
| Patients with long-term liver disease |
| Inmates of custodial institutions |
| Individuals in residential accommodation for those with learning difficulties |
| People travelling to or going to reside in areas of high or intermediate prevalence |
| Individuals at high risk of requiring medical or dental procedures in such countries |
| Individuals at occupational risk, including: healthcare workers in the UK and overseas; staff of residential and other accommodation for those with learning difficulties; laboratory staff; other occupational risk groups including morticians, embalmers, prison service staff who are in regular contact with prisoners |

# Information sources

We use many routine sources of information to build up a picture of the epidemiology of hepatitis B. These are summarised below (more information is presented in Appendix 1):

- clinical hepatitis notifications: Acute viral hepatitis is a statutorily notifiable disease in the UK, meaning clinicians are required to report cases of acute hepatitis B based on clinical suspicion to PHE[6, 7]

- laboratory notifications of hepatitis B: Since 2010, laboratories also have a statutory requirement to report all diagnoses of hepatitis B, both long-term and acute, to PHE. They are also asked to differentiate between acute and long-term cases[7, 8]

- Sentinel Surveillance of Blood-borne Virus testing: Six laboratories in London region collect information on all hepatitis B testing, which allows for examination in trends in testing[9]

- antenatal infection surveillance: All antenatal clinics are requested to supply information on the uptake of hepatitis B testing and the number of positive tests[10]. In London a special surveillance system called Enhanced Surveillance of Antenatal Hepatitis B (ESAHB)[11] operates. Antenatal clinics provide information on every case of hepatitis B diagnosed during antenatal care to the PHE Field Epidemiology Services, Victoria office

- unlinked anonymous data on PWID: A small number of drug services collect information on hepatitis B from PWID, including those who have a current or past hepatitis B infection and vaccination uptake. Information about sharing of drug paraphernalia is also collected[12]

- prisoners: Hepatitis B vaccination of new receptions is reported by prison health providers[13]

- infants born to hepatitis B positive mothers: Vaccination uptake through Cover of Vaccination Evaluated Rapidly (COVER) is still provided by PCT level, as data by local authority are not available[14]

Unfortunately we do not have routine information on the number of people treated for hepatitis B, or prevalence surveys of the general population.

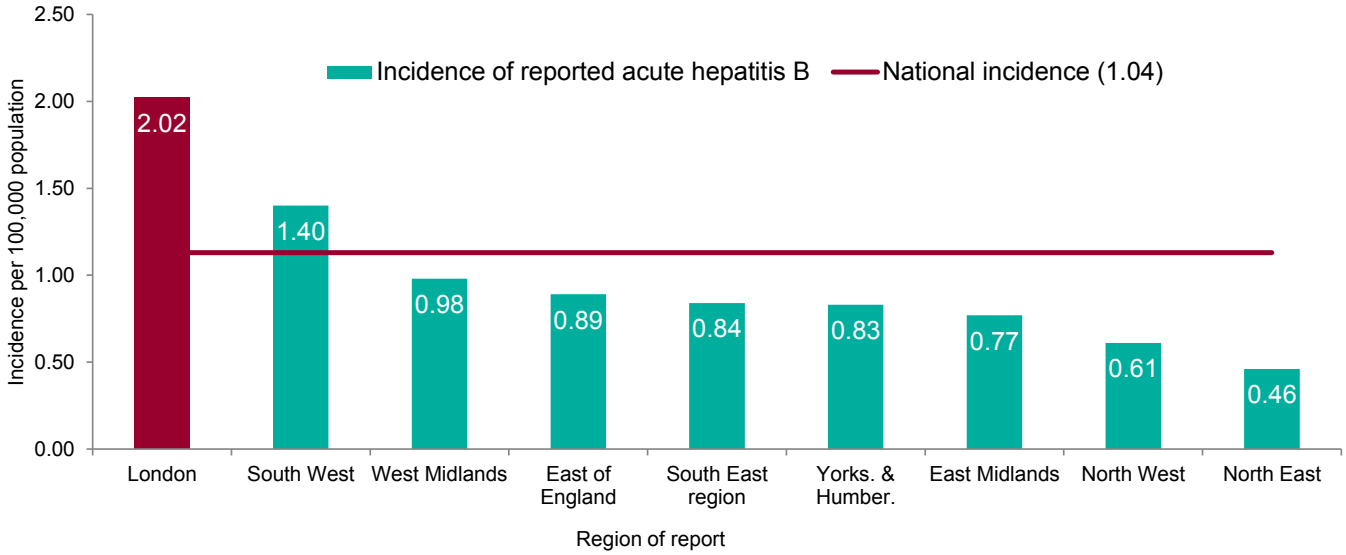
# Acute hepatitis B

This section describes acute hepatitis B. This is helpful in identifying recent sources of infection and transmission routes, which can aid understanding of who are currently most at risk, which can lead to a refocusing of prevention measures. The information is mainly from national PHE acute hepatitis B surveillance which combines data from both HPTs (from HPZone – the HPT public health management system) and laboratories. Further details are available in Appendix 1.

People diagnosed with an acute infection will have been exposed to hepatitis B in the preceding six months, in contrast to those newly diagnosed with long-term infection who may have been infected anytime in their lifetime, as they may not have had any symptoms at the time of their acute infection. This means that for acute hepatitis B particular exposures in the preceding six months can be explored further.

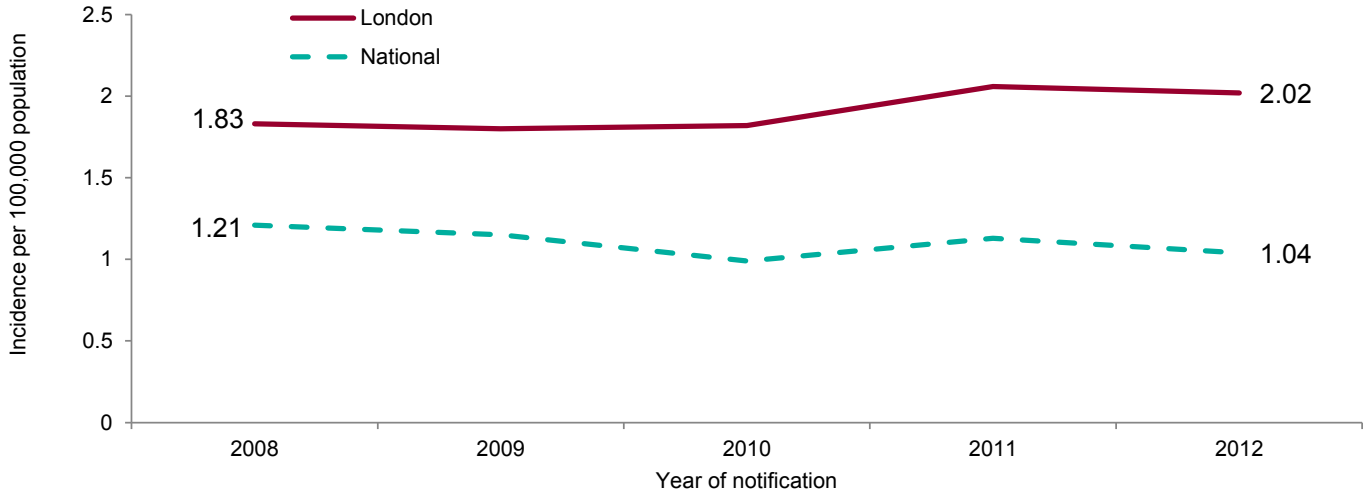
National acute hepatitis B surveillance has identified that London has an incidence rate of acute hepatitis B of 2.02 per 100,000 population, which is nearly twice the national rate (England rate 1.04 per 100,000) (Figure 1)[7].

Figure 1: Incidence of reported acute hepatitis B by region of residence per 100,000 population, 2012[7] (Source: PHE acute hepatitis B surveillance)




National incidence data has identified that the incidence of acute hepatitis B in London has increased since 2008 (1.83 per 100,000 in 2008 to 2.02 per 100,000 in 2012), while the rate for England has declined slightly (Figure 2). For London this may be in part due to increased reporting.

Figure 2: Incidence of reported acute hepatitis B per 100,000 population in London and England, 2008-2012[7] (Source: PHE acute hepatitis B surveillance)




While the above incidence figures are based on national surveillance data and is suitable for comparisons across regions, further cleaning of the data in London has identified a number of infections within this data as long-term infections, and therefore the remainder of this section relates to locally cleaned acute hepatitis B data.

Locally cleaned surveillance data identified 155 acute hepatitis B infections in London residents, similar to the 160 seen in 2011.

## Geography

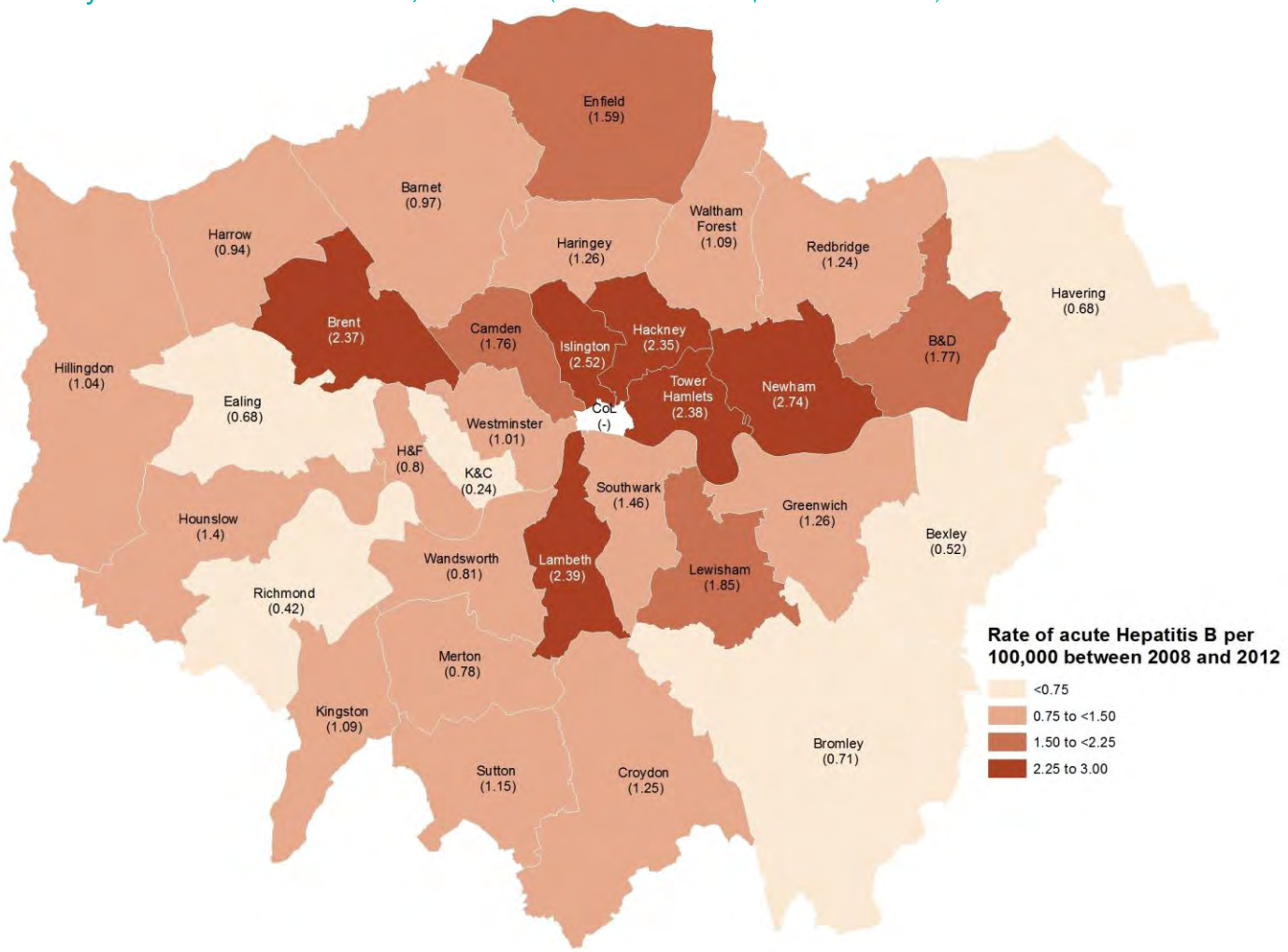
Based on local authority of residence, the highest number of reports of acute hepatitis B during 2012 was observed in Newham (n=11) and Lambeth (n=10)[7]. It was not possible to assign a local authority to a fifth of cases (32/155) (Figure 3) due to a lack of residence information on the laboratory report.

Figure 3: Number of acute hepatitis B cases by local authority of residence in London, 2012[7]

(Source: PHE acute hepatitis B surveillance)

The average annual rate of reported new acute hepatitis B infection over the five years from 2008 to 2012 was highest in Newham (2.7 per 100,000), Islington (2.5), Lambeth (2.4) and Brent (2.4) (Figure 4)[7].

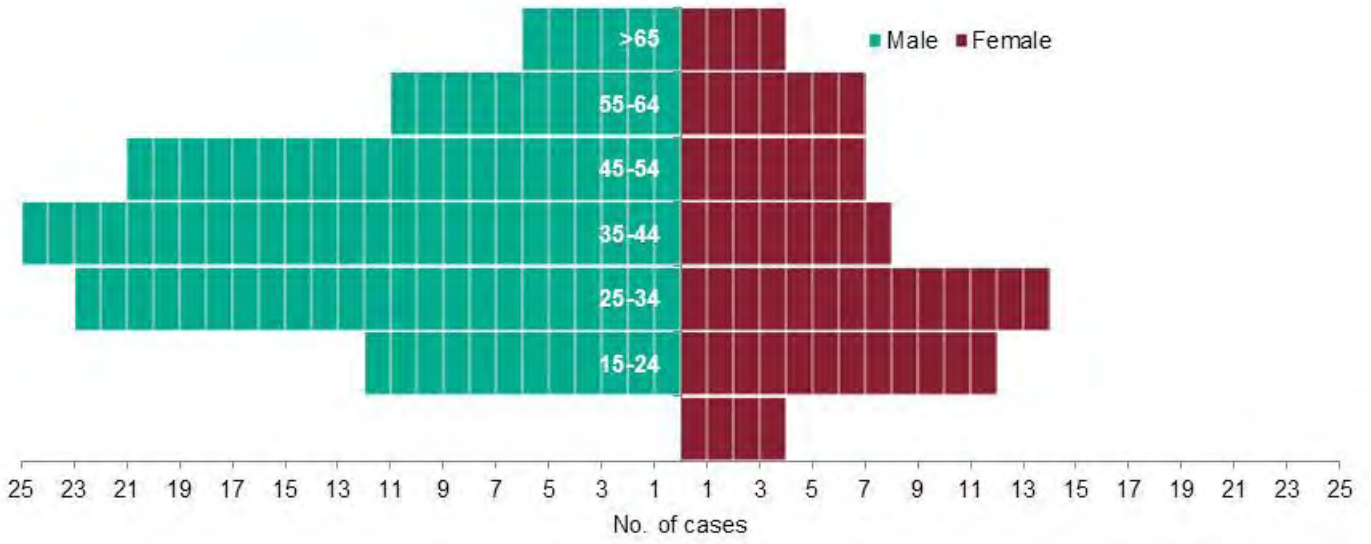
Figure 4: Map of the average annual rate of new reported acute hepatitis B cases by local authority of residence in London, 2008-12[7] (Source: PHE acute hepatitis B surveillance)




## Age and sex

Where known, nearly twice as many men (64%, 98/154) than women were diagnosed with acute hepatitis B in 2012 (Figure 5)[7]. The age group most affected were people aged 25 to 34 years (24% of cases, 37/155).

Figure 5: Number of cases of acute hepatitis B reported in London residents by age and sex, 2012[7] (Source: PHE acute hepatitis B surveillance)




## Ethnicity and country of birth

Where information was available (39/155), a third of acute hepatitis B cases in London in 2012 were white (14/39, including eight classified as white other, of whom four were born in Eastern Europe) and a quarter were black African (11/39) (Figure 6)[7]. However, as the majority of information is missing, it is difficult to interpret this data.

Figure 6: Ethnicity of London residents diagnosed with acute hepatitis B, 2012[7]

(Source: PHE acute hepatitis B surveillance)

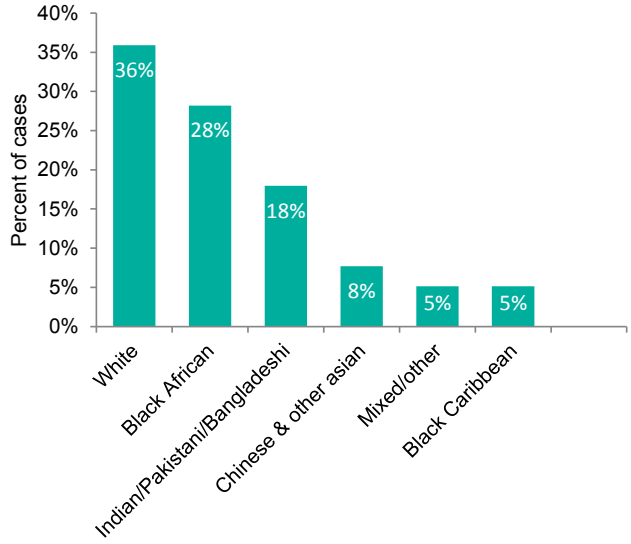
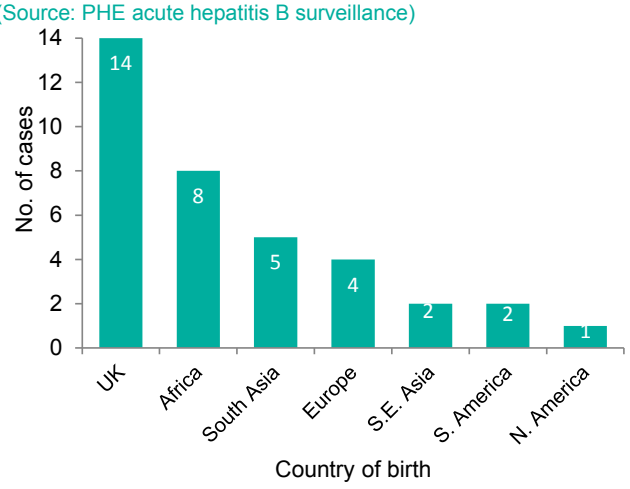



Figure 7: Country of birth of those diagnosed with acute hepatitis B in London, 2012[7]

(Source: PHE acute hepatitis B surveillance)



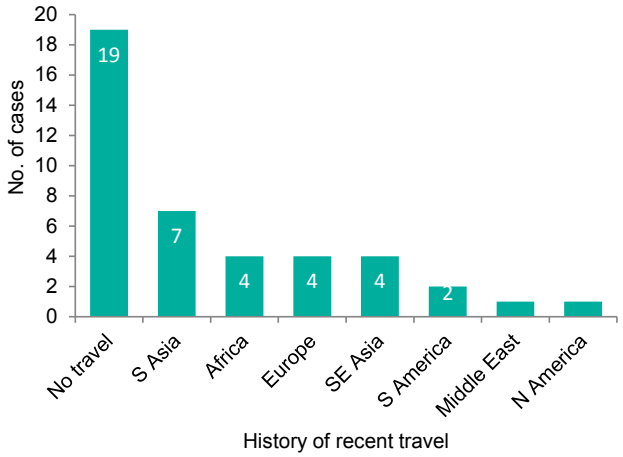

Where country of birth was available (40/155), around two-fifths of cases were UK born (14/40) (Figure 7)[7]. Eight cases were born in Africa.

## Travel history

Travel overseas to places where hepatitis B is endemic is a recognised risk factor for infection. Unfortunately we lack good information on this but where information was available (42/155), half had a travel history (23/42) (Figure 8)[7]. It is possible that this is an over-estimate, as a positive travel history may be more likely to be recorded than a negative travel history.

### Figure 8: Reported travel history of acute hepatitis B cases in London, 2012[7]

(Source: PHE acute hepatitis B surveillance)



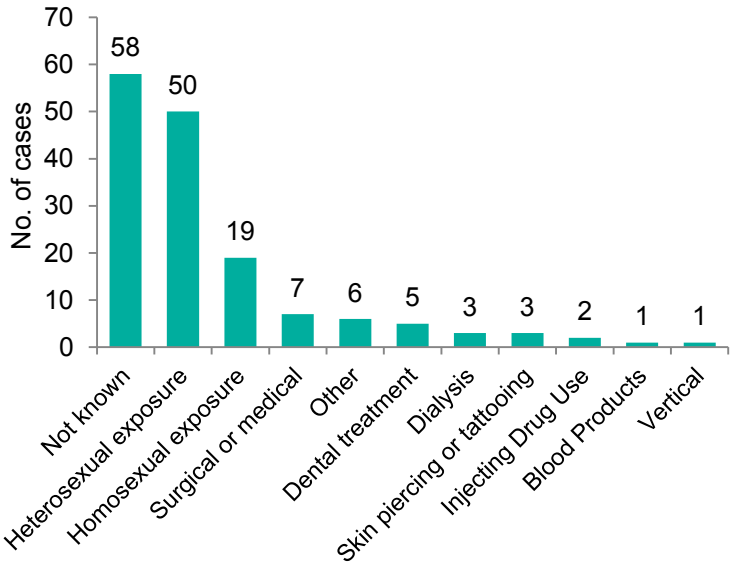

## Likely transmission route

Heterosexual exposure was the most likely transmission route identified for acute hepatitis B cases in London, which is consistent with the national picture (Figure 9).

Of the 97 cases where risk factor information was available, in half of cases (50/97) heterosexual exposure was identified as the most likely route of transmission[7]. In one-fifth of cases (19/97) sex between men was identified as the most likely route of transmission. Where information was available on these two groups of cases, more than half also had a recent travel history (15/26).

### Figure 9: Risk factors reported for London acute hepatitis B cases reported in 2012[7]

(Source: PHE Acute Hepatitis B surveillance)




## Data quality issues regarding acute hepatitis B

### Under-reporting

Under the Health Protection (Notification) regulations of 2010, acute infectious hepatitis is a statutory notifiable disease (all cases to be reported by clinicians upon clinical suspicion) and all hepatitis viruses are notifiable causative agents (all positive tests to be reported by

laboratories). Unfortunately not all cases are reported to HPTs which means that essential public health action to prevent transmission cannot be undertaken in those cases by HPTs.

It is evident from national matching analysis of both laboratory and HPT data that while the majority of cases classified as being acute hepatitis B were reported to HPTs by clinicians, 17% (26/155) were not[7]. However, it is possible that some of these reports may have been misclassified as acute rather than long-term infection (ie they were actually long-term infections). Of those cases of acute hepatitis B reported to HPTs, 55/155 (35%) were not reported by routine laboratory surveillance systems. The remaining 74 (48%) cases were reported by both HPT and routine laboratory surveillance systems.

## Lack of discrimination between acute and long-term infections on laboratory reports

The HPT public health response is different for acute hepatitis B and long-term hepatitis B, however, the information needed to make this differentiation is often not reported. The Standards for Local Surveillance and Follow-Up of Hepatitis B and C specifies that laboratory reports should include information to differentiate acute from long-term infection[4]. While the majority of laboratories discriminated between acute and long-term cases in 80% of cases, St Helier Hospital (0%), Queen's Hospital Romford (74%), Northwick Park and St Marks Hospital (74%) and Homerton Hospital (79%) did not[8].

## Lack of information on risk factors

Among the 129 cases known to HPTs, demographic and risk factor information was incomplete. Information about the most likely transmission route was poorly recorded on the fields in HPZone, with 31% of records lacking this information (an improvement from 43% in 2011)[15]. Ethnicity was missing for 70% of cases and 69% were missing country of birth (Table 2). Furthermore, three-quarters of case records (67%) did not include recent travel history. Heterosexual and homosexual exposures were known in nearly three-quarters of cases. Missing information may be due to difficulties contacting patients, patients being unwilling to supply certain information or patients not being asked.

Table 2: HPT completion of information on acute hepatitis B on HPZone, 2012[15] (Source PHE acute hepatitis B surveillance)

| | NECLHPT n=71 | NWLHPT n=16 | SELHPT n=24 | SWLHPT n=12 | London total n=129 |
|---|---|---|---|---|---|
| Ethnicity | 23% | 6% | 50% | 75% | 30% |
| Country of Birth | 25% | 6% | 42% | 75% | 31% |
| History of travel | 37% | 19% | 38% | 8% | 33% |
| Heterosexual exposure | 70% | 81% | 75% | 92% | 72% |
| Homosexual exposure | 69% | 81% | 83% | 92% | 73% |
| Most likely transmission route | 68% | 88% | 63% | 83% | 69% |

NECL=North East Central London: NWL=North West London: SEL=South East London: SWL=South West London

# Long-term hepatitis B

While information on acute hepatitis B is helpful in understanding current risks better, most of the burden of hepatitis B is related to long-term infection and this section provides information from various sources on this.

## Laboratory reports

There were 3,564 new laboratory reports of hepatitis B assigned by national surveillance to London residents in 2012. The corresponding rate of new laboratory reports per 100,000 residents is seemingly much higher than other region (Figure 10).

While it is likely that the burden of hepatitis B is higher in London there are several points to consider when interpreting this rate. If a patient postcode or GP information is unavailable, a report will be assigned to London if the laboratory of testing is in London (in just under half of cases). This would likely lead to an over-estimate of the rate for London, as patients from outside London may be seen in London hospitals. Conversely, the figures used nationally to calculate the rate do not include results from one large London laboratory. This would lead to the reported rate being an under-estimate.

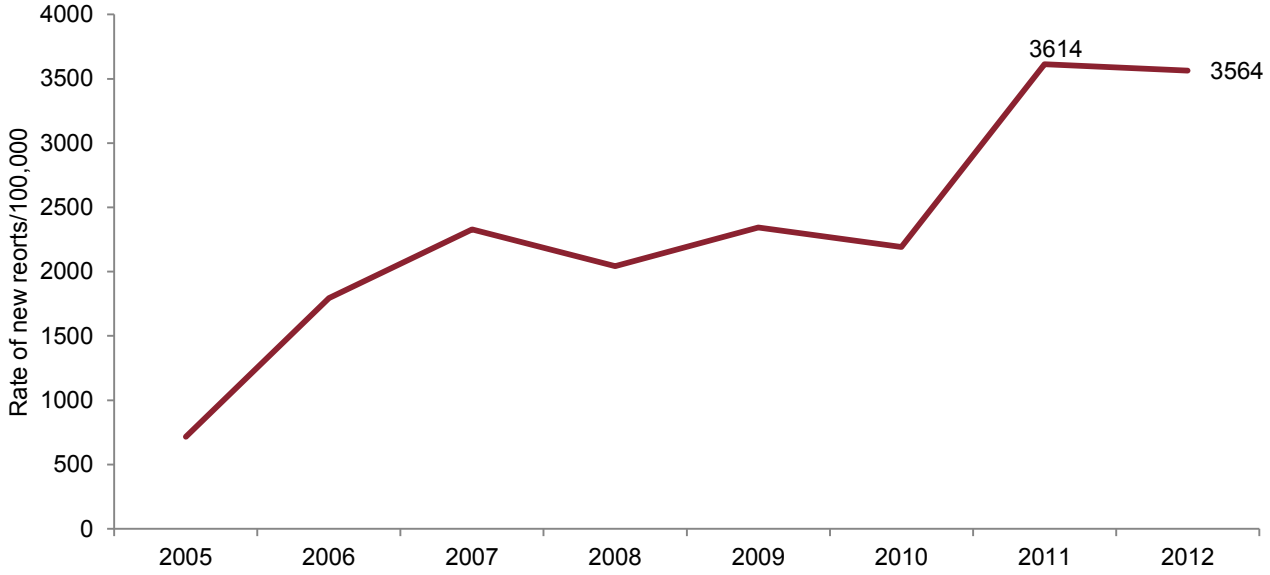
Figure 10: Rate of laboratory reports of hepatitis B per 100,000 residents by region, 2005-2012[8]

(Source: PHE Laboratory Surveillance)


The number reported in 2012 is similar to that reported in 2011, but much higher than that reported prior before 2011 (Figure 11)[8]. Trends in laboratory reports are hard to interpret as they may reflect better testing or reporting. The increase since 2010 is most likely due to improvements in reporting, as laboratory reporting became a statutory requirement in 2010. Only a small proportion of the reports were identified as acute infections (2%).

Figure 11: Number of laboratory reports of hepatitis B assigned to London residents, 2005-2012[8]

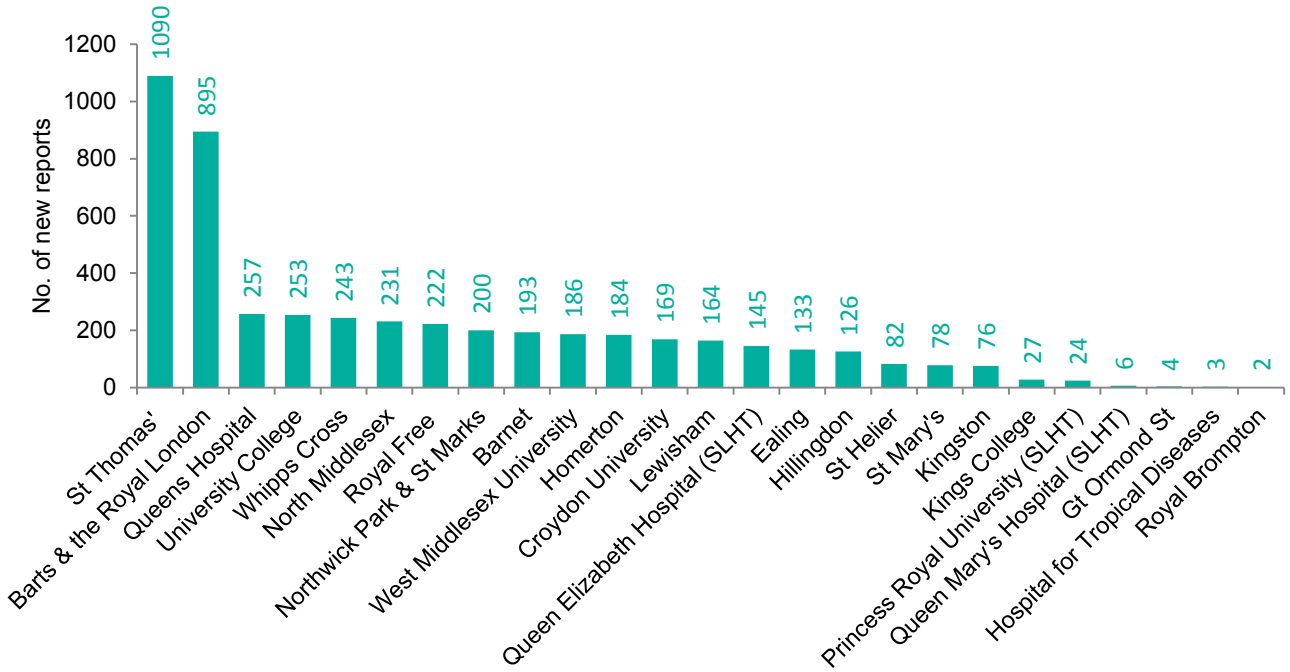
(Source: PHE Laboratory Surveillance)




Laboratory reporting is not complete and variations in the numbers reported by each London laboratory may reflect this. In 2012, by far the most laboratory reports were received from the Royal London and Guy's and St Thomas' Hospitals (Figure 12). The relatively low number of reports from some laboratories serving non-specialist centres could indicate that reporting is not complete.

Figure 12: New laboratory reports of hepatitis B from laboratories in London, 2012[8]

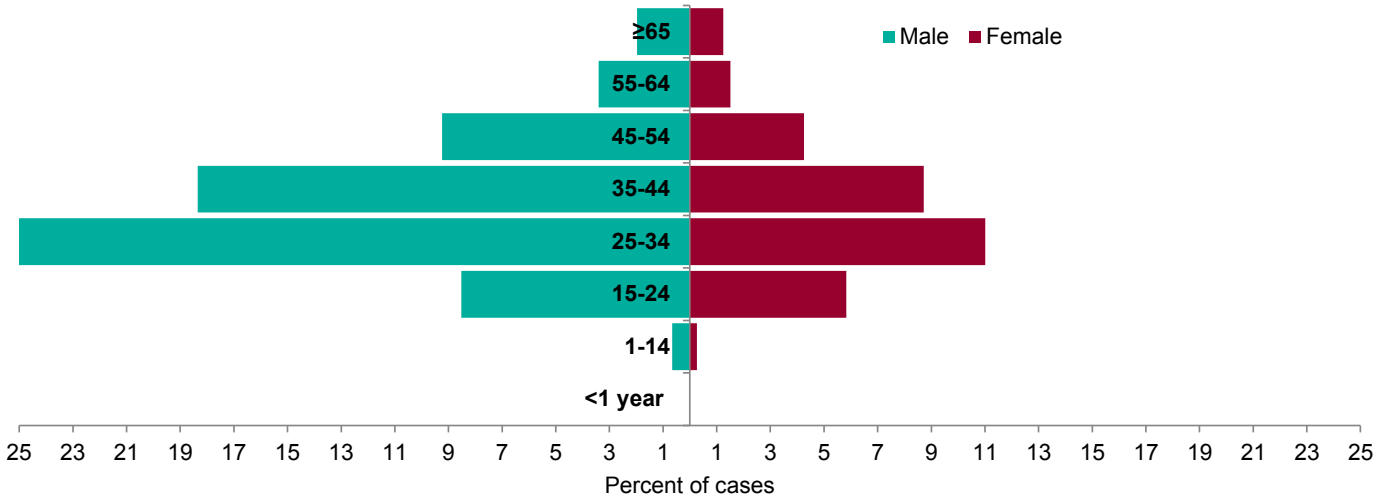
(Source: PHE Laboratory Surveillance)(SLHT – South London Healthcare Trust) Please note this includes reports from non-London residents




## Age and sex of people testing positive for hepatitis

Information from sentinel surveillance laboratories in London shows that two-thirds of people testing positive for HBsAg were male (64%) and those aged 25 to 44 years predominated[9] (Figure 13). Of those people who were tested for hepatitis B as a result of a clinical request, one in 34 males were positive (2.9%) and one in 55 females were positive (1.8%).

Figure 13: Age and sex of those testing positive for HBsAg in sentinel surveillance laboratories in London, 2008 to 2012[9] (Source: PHE Sentinel Surveillance of Blood–borne Virus testing)

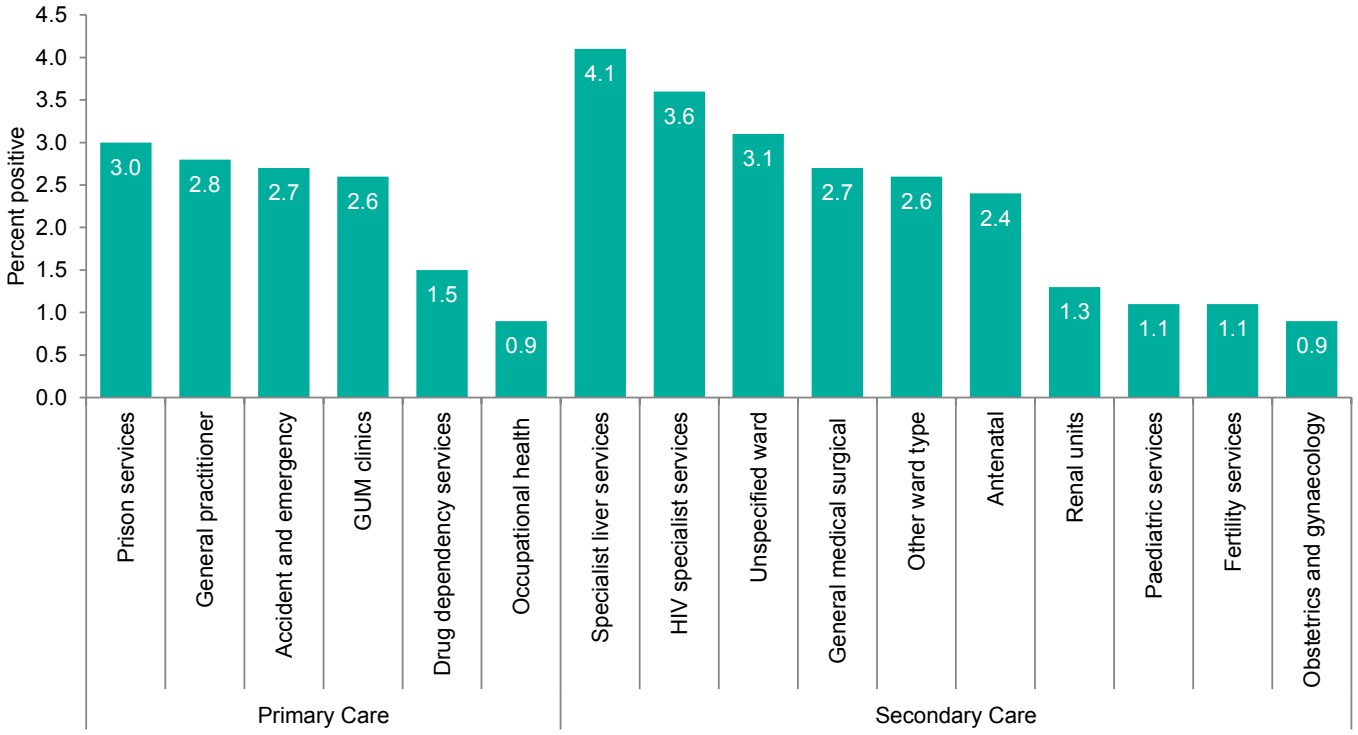



## Hepatitis B positivity by clinical setting

Results from testing in sentinel laboratories in London indicate that overall just one in 42 people who were tested for HBsAg, tested positive (2.4%)[9]. This included one in 33 patients tested by GPs and one in 37 people tested in A&E (Figure 14). The highest positivity was in patients tested in the secondary care clinical areas of specialist liver services (4.1%) and HIV specialist services (3.6%).

Figure 14: HBsAg positivity by clinical setting in sentinel surveillance laboratories in London, 2008-2012 (excludes antenatal screening)[9] (Source: PHE Sentinel Surveillance of Blood–borne Virus testing) Excludes dried blood

spot, oral fluid, reference testing, and testing from hospitals referring all samples.




## Information about particular population groups

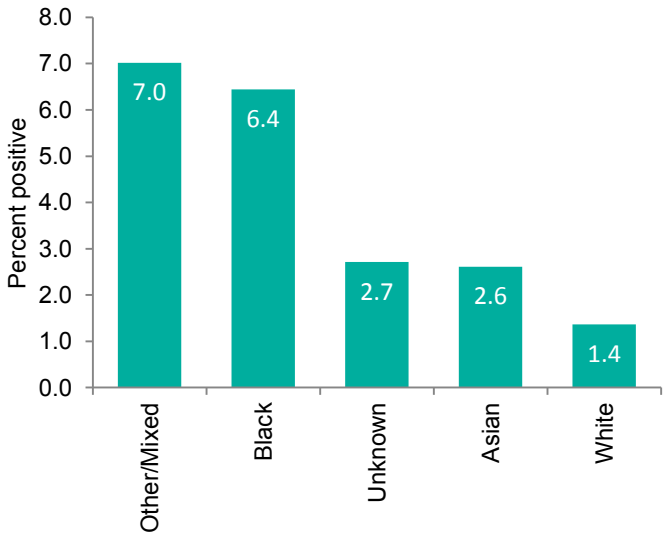
Unfortunately we lack comprehensive information about the prevalence of hepatitis B in most risk groups, but some information is available by ethnicity, on PWID and on those receiving antenatal care.

### Ethnic minority groups

Analysis of sentinel surveillance data shows that hepatitis B positivity is higher in certain minority ethnic groups (Figure 15). Those identified as black who were tested for hepatitis B were over four times more likely to test positive (6.4%), and Asians twice as likely to test positive (2.6%) than those identified as white or white British (1.4%)[9].

This information comes from analysis of information from sentinel laboratories in London. A combination of self-reported ethnicity and name analysis software was used to classify individuals as belonging to a broad ethnic group, as ethnicity is not routinely available from the participating laboratory information systems.

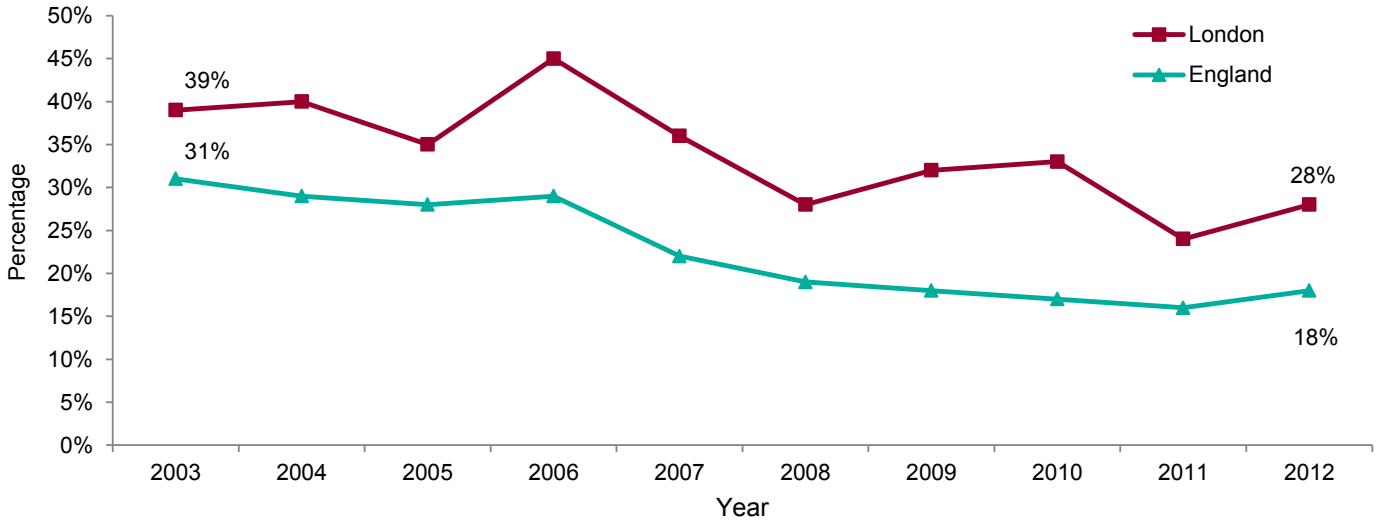
Figure 15: HBsAg positivity by ethnic group in sentinel surveillance laboratories in London, 2008-2012 (excludes antenatal screening)[9] (Source: PHE Sentinel Surveillance of Blood–borne Virus testing) Excludes dried blood spot, oral fluid, reference testing, and testing from hospitals referring all samples.



## People who inject drugs

In London 28% of PWID surveyed in 2012 had evidence of past or current hepatitis B (presence of Anti-HBc), which is higher than that seen in England (18%) (Figure 16). This is lower than that seen 10 years ago in London and a marked decline since 2006 (46%)[12].

Figure 16: Anti-HBc prevalence among PWID in the London and England, 2003-2012[12]
(Source: PHE Unlinked Anonymous Monitoring Survey of People Who Inject Drugs)




## Antenatal women

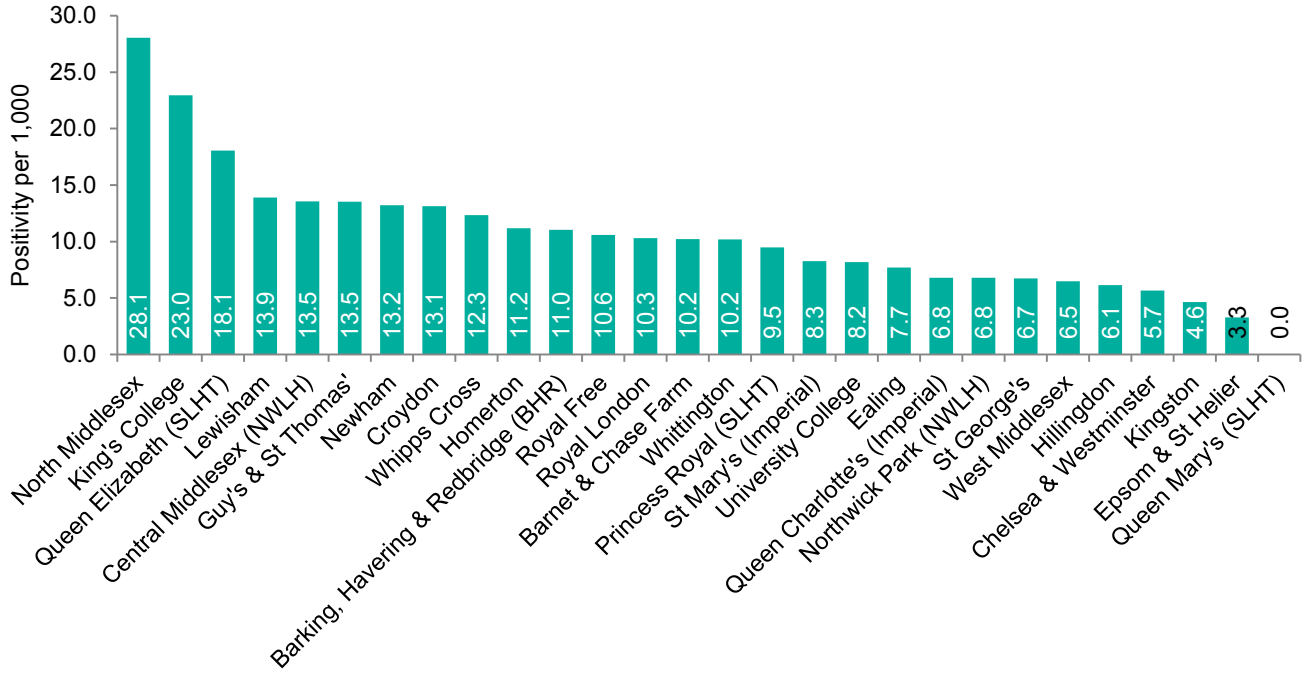
Hepatitis B positivity data is also collected in antenatal settings. The hepatitis B positivity rate among women attending antenatal services was 10.7 per 1,000 tested in London (1.07%) and has remained steady since 2005 (Figure 17)[10]. The positivity rate in London was more than double the 4.6 per 1,000 observed across England.

Figure 17: Proportion of antenatal women screening positive for HBsAg in London and England, 2005-2012[10] (Source: PHE National Antenatal Infections Screening Monitoring)

Only two NHS trust clinics had a lower positivity than the England average of 4.6 per 1,000 (Figure 18) (Appendix 2)[10]. Of the 1,479 women testing positive in this setting in 2012 in London, 45% were new diagnoses.

Figure 18: Rate of hepatitis B positivity per 1,000 antenatal attendees by clinic in London, 2012[10]

(Source: PHE National Antenatal Infections Screening Monitoring)(Quarters were missing for Queen Mary's, Princess Royal, Queen Elizabeth (all South London Hospitals Trust – SLHT) and Epsom and St Helier).



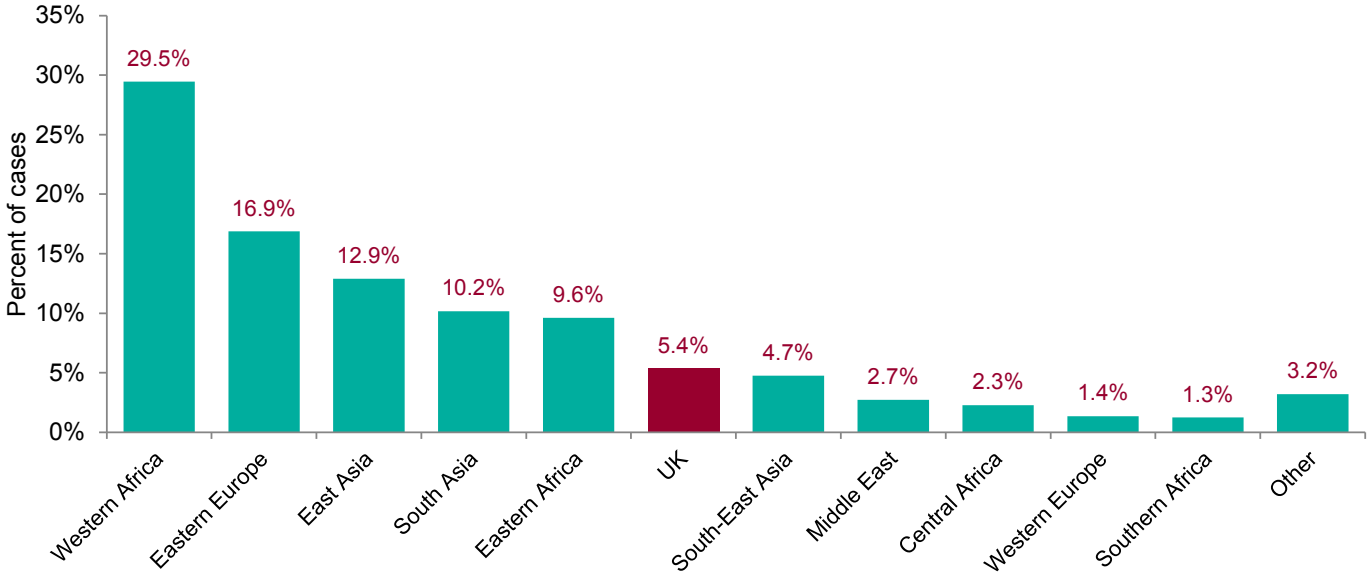

Nineteen out of every 20 antenatal women testing positive for hepatitis B in London were born abroad (95%, 3983/4196, missing information 928, 2008 to 2012 inclusive) (Figure 19)[11].

Nearly half were born in Africa (46%, 1906/4136, missing information 988, 2008 to 2012 inclusive). One in three women was born in Western Africa (29.5%) and one in six in Eastern Europe (16.9%).

The greatest increases observed from 2008 to 2012 were in women born in Eastern Europe (from 99 to 150), with the greatest numbers among those born in Romania, Poland, Lithuania and Bulgaria. Overall, the highest proportions were seen from the following countries; Nigeria (12%), China (10%), Ghana (10%), Somalia (7%) and Romania (6%).

## Figure 19: Country of birth of antenatal women testing positive for hepatitis B, London 2008-2012[11]

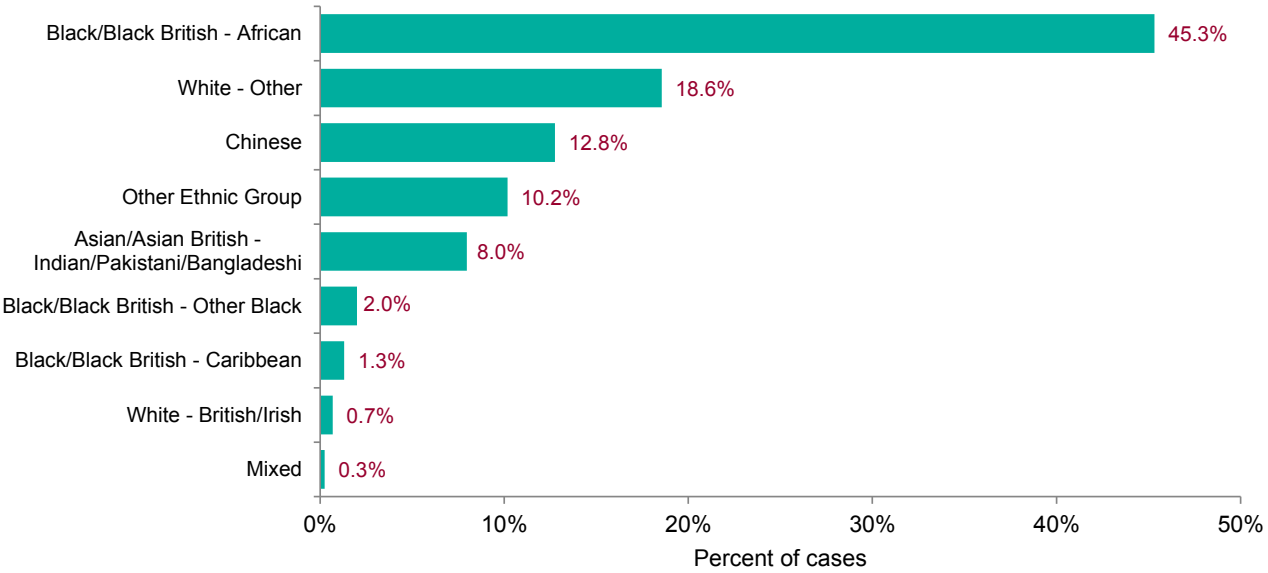
(Source: PHE London Enhanced surveillance of antenatal hepatitis B) Cases where country of birth was unknown have been excluded.




Correspondingly, nearly half of those testing positive were black African (45%) and 19% were white other (Figure 20) [12].

## Figure 20: Ethnicity of antenatal women testing positive for hepatitis B, London 2008-2012[11]

(Source: PHE Enhanced surveillance of antenatal hepatitis B in London) Cases where ethnicity was unknown have been excluded.




Where known, the majority of those testing positive for hepatitis B from 2008 to 2012 spoke English fluently (63%), while a fifth had basic English (22%) and a sixth had less than basic English (15%)[11]. For those who did not have English as a first language, 79 different languages were spoken; the largest proportions spoke Chinese or Vietnamese (25%), Romanian (10%), Somali (10%), Polish (6%) and Turkish (4%).

# Impact of hepatitis B infections

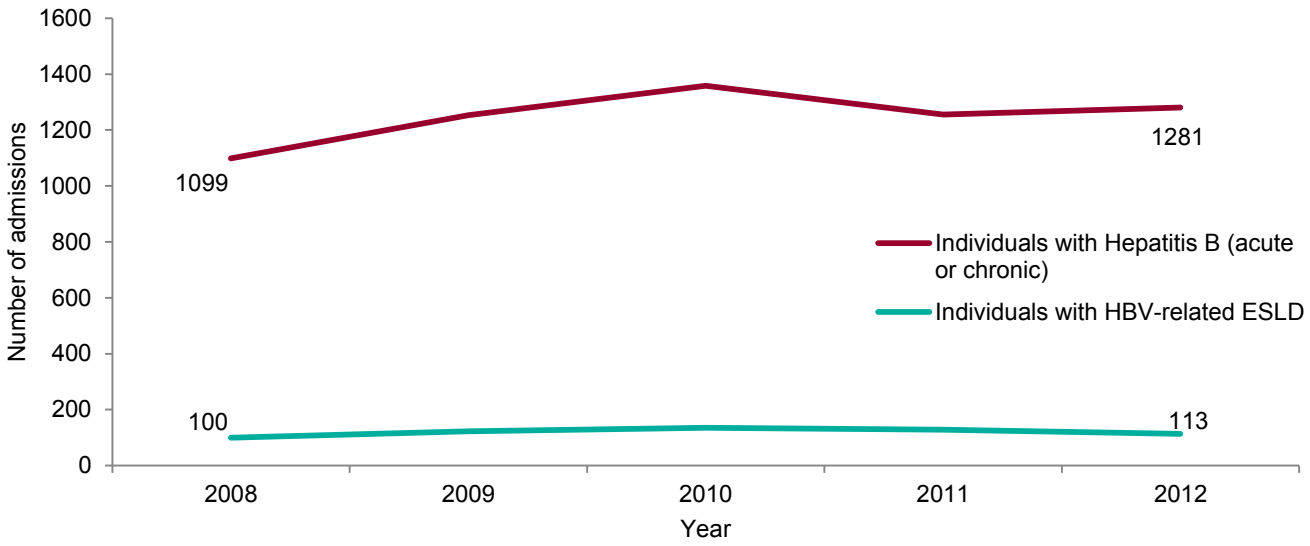
Failing to prevent or successfully treat hepatitis B has a great impact on the health of those long-term infected, as it can lead to hepatocellular carcinoma and cirrhosis. This in turn also impacts on health services, including provision of transplant care.

## Admissions

Admissions due to hepatitis B have increased slightly over the last five years. The number of admissions from acute or long-term hepatitis B appears increased to 1,281 per year in 2012, and the number of admissions due to end stage liver disease (ESLD) increased to 113 (Figure 21)[16].

Figure 21: Number of individuals admitted to hospital with a diagnosis of acute or long-term hepatitis B, and HBV related end stage liver disease (ESLD), London residents, 2008-12[16]

(Source: Hospital Episode Statistics)




## Transplants

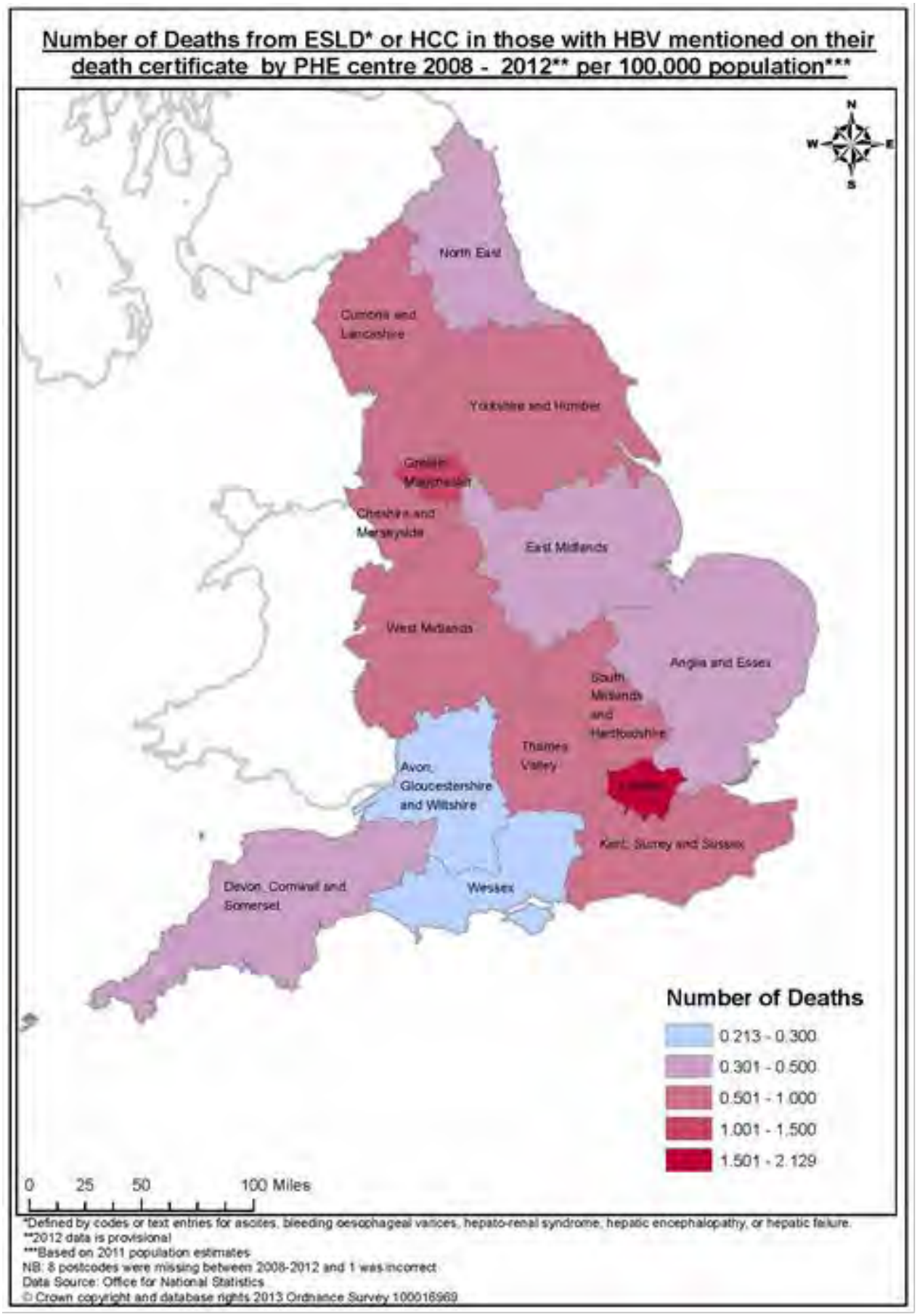
The number of liver transplants due to hepatitis B cirrhosis appears to be stable. For the 8 years from 2005 to 2012 there were 125 liver transplants in London residents where post hepatitis B cirrhosis was the primary indication for transplant, similar to the seen 120 between 1997 to 2004[16]. From 1997 to 2012, post hepatitis B cirrhosis was the indication for 16% of all liver transplants in London residents.

## Mortality

London has much higher number of deaths per population than other areas in England (Figure 22)[17].

Figure 22: Number of deaths from end stage liver disease or hepatocellular carcinoma in those with hepatitis B mentioned on their death certificate per 100,000 by PHE Centre, 2008 to 2012[17].

(Source: Office for National Statistics, Death Certification)



# Hepatitis B testing and screening

The National Institute for Health and Care Excellence (NICE) has recently published guidance on ways to promote and offer testing to people at increased risk of infection[18]. Recommendations are aimed at tackling:

- raising awareness about hepatitis B among both the general population and those people at increased risk of hepatitis B
- developing the knowledge and skills of healthcare professionals and others who provide services for people at increased risk of hepatitis B
- testing for hepatitis B in primary care, prisons, immigration removal centres, drug services and sexual health and genitourinary medicine clinics.

The only routinely collected information on hepatitis B screening is regarding antenatal screening. There is no routine information collected on hepatitis screening of healthcare workers.

## Antenatal screening

The aim of antenatal screening is to prevent transmission of hepatitis B from mother to child (perinatal transmission). Perinatal transmission from mother to baby is a very effective route of transmission of hepatitis B. Infants infected at birth by contact with the virus in their mothers' blood and body fluids are at high risk of developing a persistent (long-term) infection; 90% of those infected as neonates become persistently infected, compared to only 10% of adults. The risk of infection to the newborn is dependent on the mother's infectivity. Between 70-90% of mothers who are hepatitis B e-antigen (HBeAg) positive will transmit HBV to their infants. Transmission drops to approximately 10% in cases when there is maternal antibody to e-antigen.

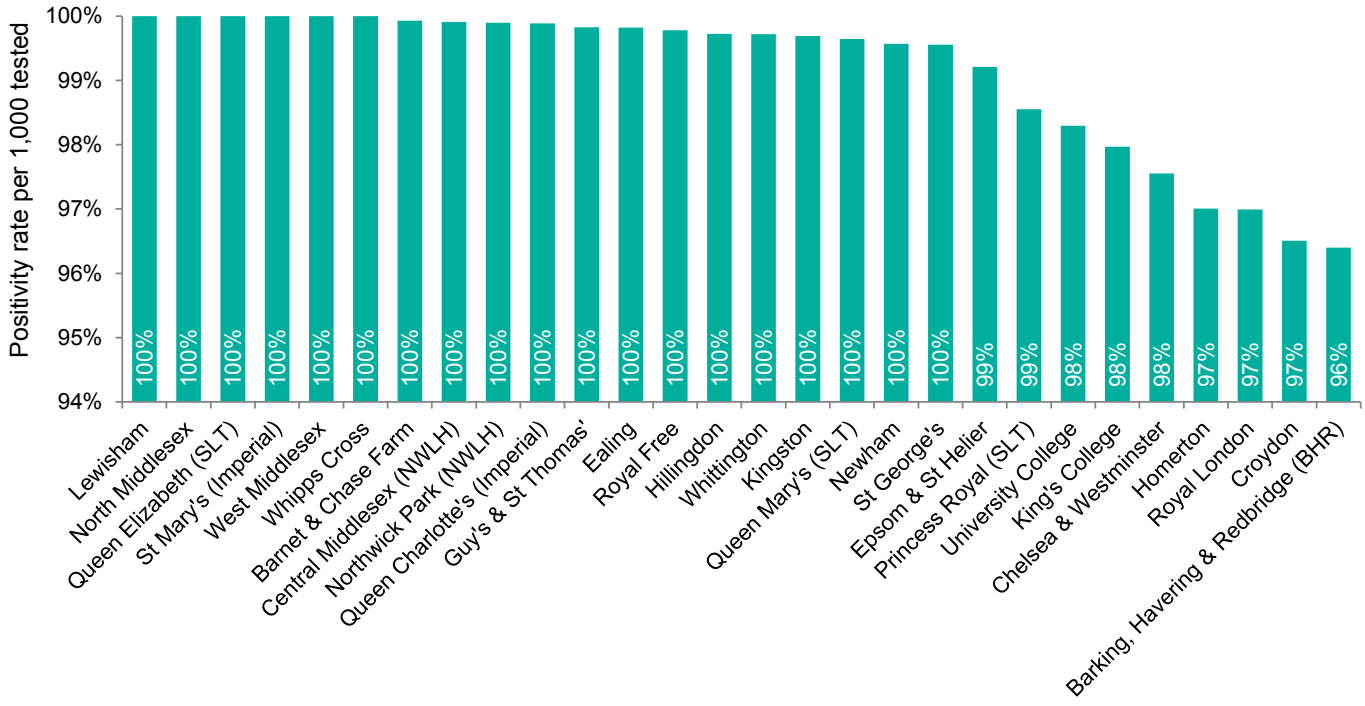
Vaccination of the newborn at birth (within 24 hours) and at 1, 2 and 12 months of age from mothers found positive for surface antigen (HBsAg) can prevent perinatal transmission of the infection at birth. Vaccination alone will reduce the risk of infection by 70% and the addition of hepatitis B immunoglobulin (HBIG) in high risk infants further reduces the risk of infection to 10%.

The reported uptake of hepatitis B screening in London was 99% in 2012, similar to the reported uptake in England in 2011 (98%)[10].

Uptake of screening varied by antenatal clinic (Figure 23) (Appendix 3). All clinics had uptake rates over 95%. For four clinics, antenatal screening data was incomplete.

Figure 23: Uptake of hepatitis B screening by antenatal clinic in London, 2012[10]

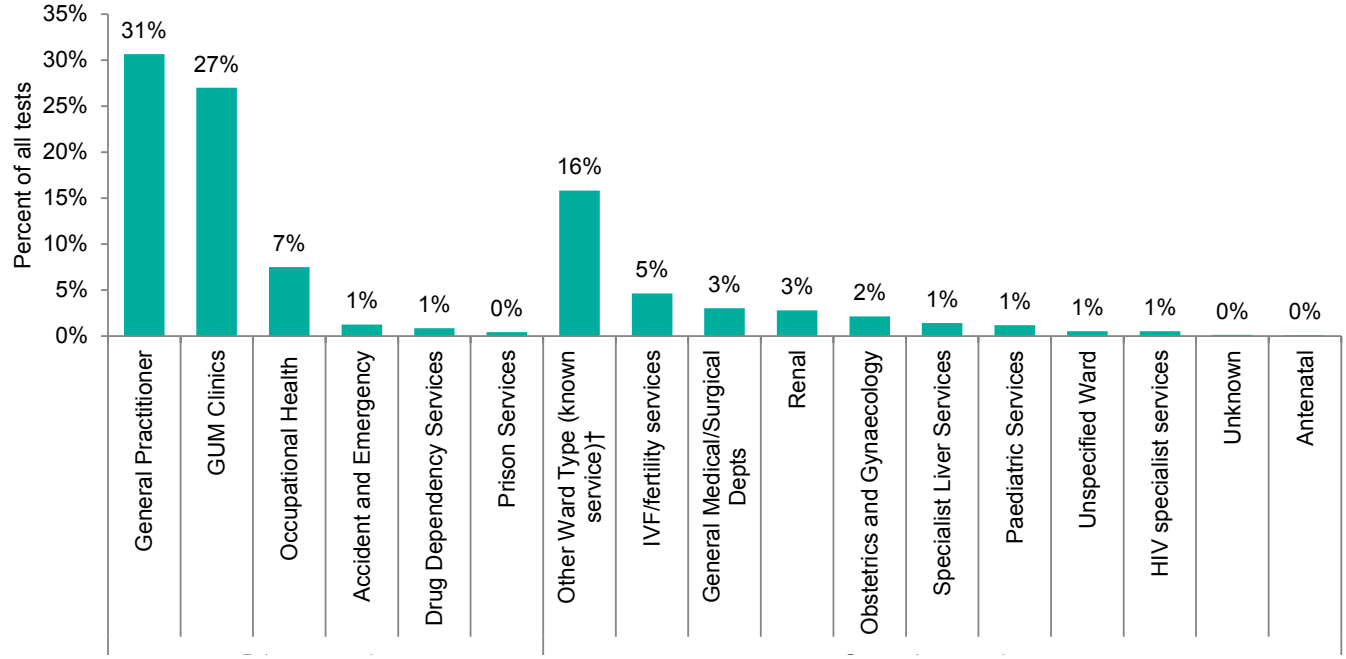
(Source: PHE National Antenatal Infections Screening Monitoring)




## Testing by clinical setting

Outside of routine antenatal screening, the majority of hepatitis B testing in London was conducted in General Practice (31%) and GUM (27%) (Figure 24)[9].

Figure 24: Proportion of all hepatitis B tests done by clinical setting in sentinel surveillance laboratories in London (excluding routine antenatal testing), 2008-12[9] (Source: PHE Sentinel Surveillance of Blood-borne Virus testing) (Specialist liver services – includes infectious disease services, hepatology departments and gastroenterology departments, Other ward types includes cardiology, dermatology, haematology, ultrasound, X-ray)

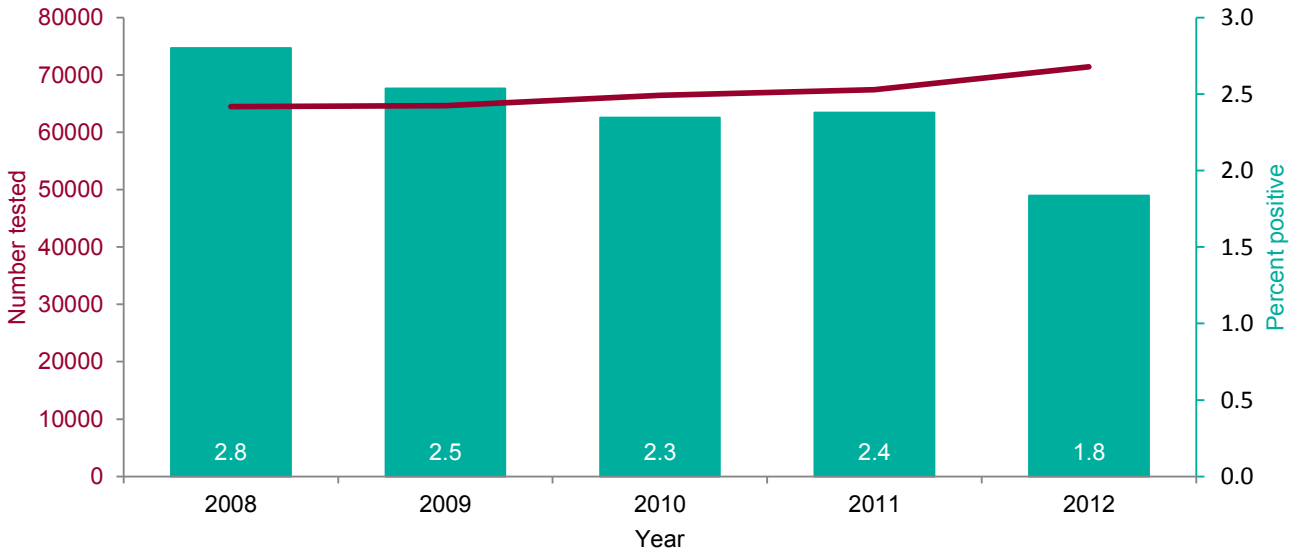


The majority of the positive tests came from General Practice (35%) and GUM clinics (30%) (2008 to 2012 data, excluding routine antenatal screening)[9]. Just under a third of positive tests were from secondary care (33%).

## Trend in testing

The number of hepatitis B tests conducted at the sentinel surveillance laboratories in London has increased by 11% since 2008 (excluding routine antenatal screening tests)(Figure 25)[9]. During this time the positivity rate has declined.

Figure 25: Number of tests in sentinel surveillance laboratories in London (excluding routine antenatal testing) and proportion positive for hepatitis B, by year, 2008-12[9] (Source: PHE Sentinel Surveillance of Blood–borne Virus testing) Excludes dried blood spot, oral fluid, reference testing, and testing from hospitals referring all samples.



# Vaccination and other public health interventions

Vaccination is key to the control of hepatitis B. As the UK has a low prevalence of hepatitis B, the current strategy in the UK is to vaccinate those most at risk as highlighted in Table 1, rather than universal vaccination. The only routine information collected on vaccination is regarding babies born to hepatitis B positive mothers, prisoners and PWID.

## Babies born to hepatitis B positive mothers

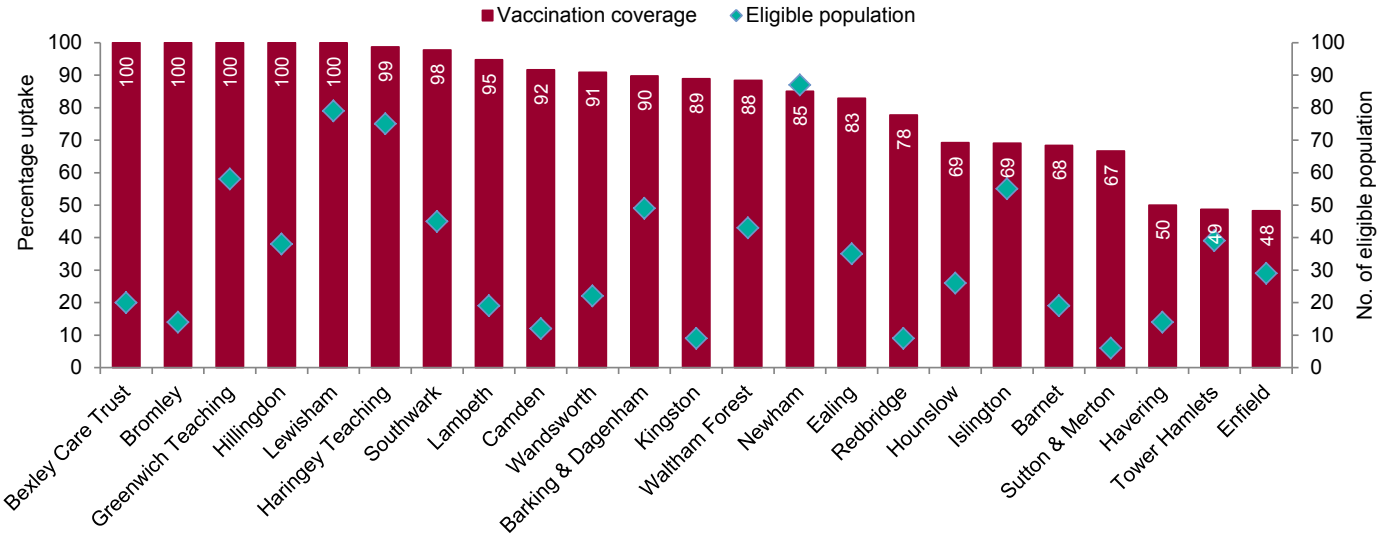
Hepatitis B vaccination is recommended for all babies born to hepatitis B positive mothers, and PCTs have a statutory duty to return information on this within the range of childhood immunisations monitored by the COVER programme.

In London, approximately 86% of babies born to hepatitis B positive mothers received three doses of hepatitis B vaccine by 12 months in 2012/3 (689/802) (Appendix 4)[14]. The fourth dose of vaccine was delivered to 83% of those eligible by 24 months (594/714).

Seven PCTs reported a 100% uptake of three doses of vaccine at 12 months (Figure 26)[14]; Bexley, Bromley, Greenwich Teaching, Hillingdon and Lewisham.

### Figure 26: Neonatal hepatitis B vaccine coverage of three vaccinations at 12 months by PCT, London 2012[14]

(Source: COVER) Please see Appendix 4 for more detailed information




Seven PCTs reported an uptake of 70% or less; Enfield, Tower Hamlets, Havering, Sutton & Merton, Barnet, Islington and Hounslow[14].

The following seven PCTs did not submit full data for 2012/3; Brent, City and Hackney, Croydon, Hammersmith and Fulham, Harrow, Kensington and Chelsea and Westminster. Richmond supplied data but this was suppressed due to small numbers.

A known problem with this vaccination programme has been in ensuring PCTs and providers of vaccination know of all their babies requiring vaccination. In 2012, the following PCTs reported identifying fewer than 10 babies requiring vaccination; Sutton and Merton (4), Havering (7), Havering (7), Kingston (9)[14]. Reasons for identifying few babies include having a low risk population, lacking robust information pathways from antenatal care to PCTs or poor reporting.

Of real concern is the difference between the number of antenatal women known to be positive for hepatitis B in London in 2011 (1,369)[10] and the number of babies identified by London PCTs that needed vaccination in 2012/3 (802)[14]. While many women may move out of the area, or may not complete their pregnancy, this is unlikely to account for nearly half of pregnancies and therefore this is an indicator that some PCTs lacked robust pathways from antenatal testing to vaccination of babies at risk.

## Prisoners

The overall coverage for hepatitis B vaccination in London prisons for 2012/3 was 40%, lower than that seen across England (57%)[13]. However, this is likely to be an under-estimate due to non-reporting by some establishments. Vaccine coverage is the proportion of new receptions who have been vaccinated, either previously or during their most recent attendance (Figure 27).

HMP Isis was the only establishment that met the Key Performance and Quality Indicator (KPI) for hepatitis B vaccination in prisons, of 80% vaccine coverage of new receptions (83%)[13] (Appendix 5).

### Figure 27: Hepatitis B vaccination coverage in London prisons, 2011/2 and 2012/3[13]

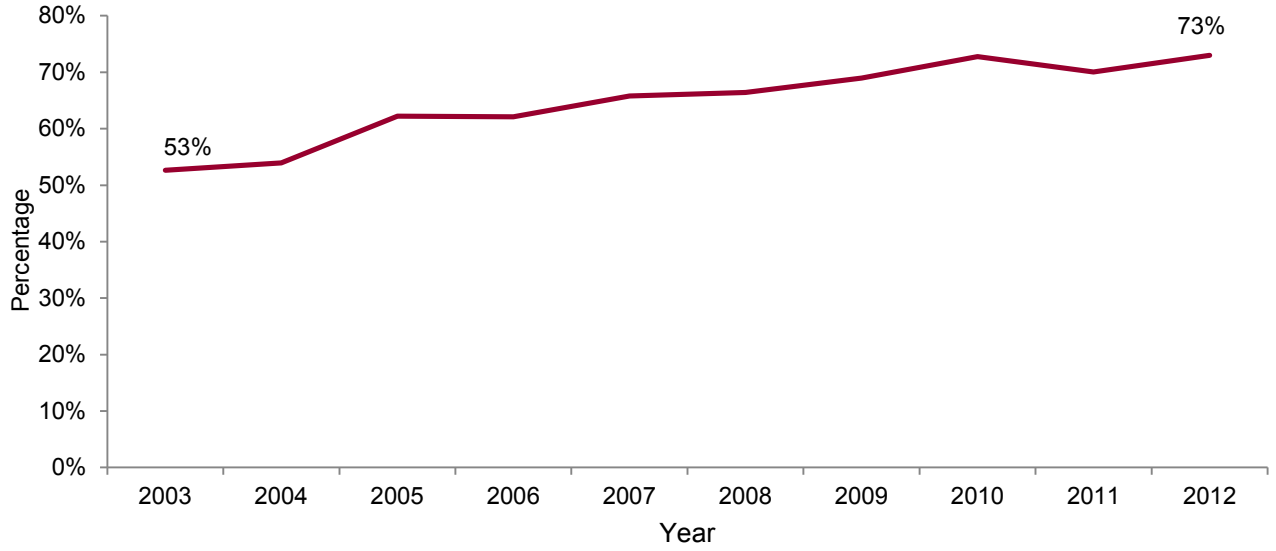
(Source: Prison Health Performance & Quality Indicators)

## People who inject drugs

Hepatitis B vaccination uptake in PWID has also increased steadily over the past decade, with 73% of participants reporting HBV vaccination in 2012, which is similar to that seen in England (75%) (Figure 28)[12].

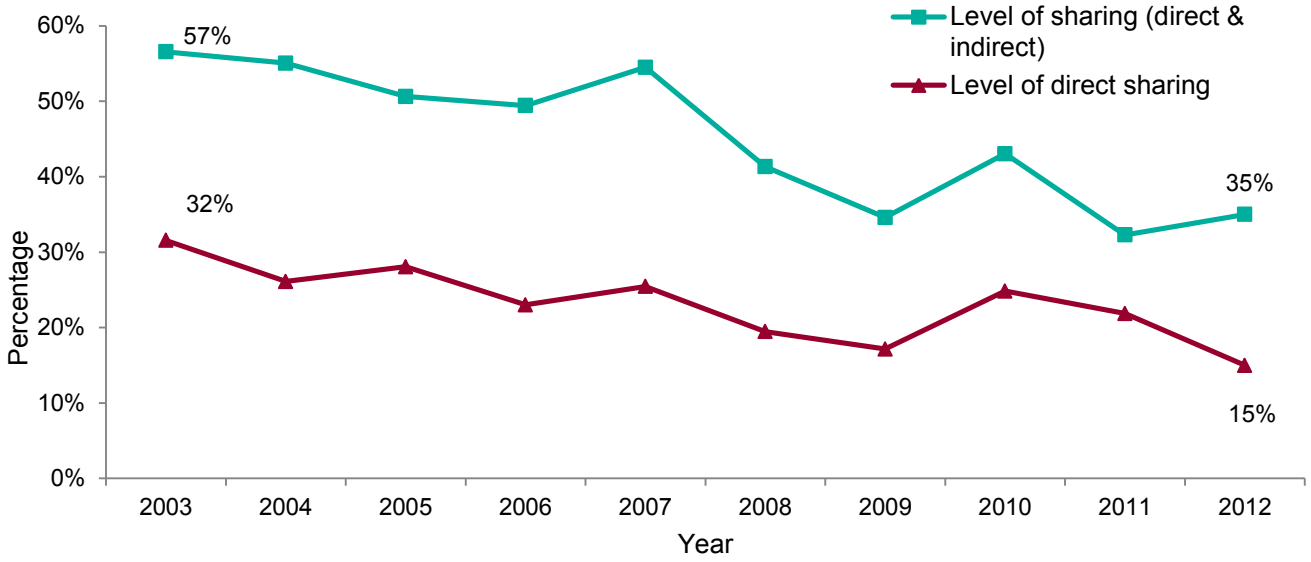
### Figure 28: Hepatitis B vaccine uptake in PWID in London, 2003 to 2012[12]

(Source: PHE Unlinked Anonymous Monitoring Survey of People Who Inject Drugs)




It is encouraging to see a fall in the proportion of PWID who directly or indirectly share injecting equipment in London from 57% in 2003 to 35% in 2012 (Figure 29)[12]. This is likely to be due to increased access to needle exchange services. Direct sharing is the sharing of needles and syringes among those who injected in the previous four weeks. Indirect sharing is the sharing of mixing containers, filters or the water used to prepare drugs.

### Figure 29: Levels of direct and indirect sharing of injecting equipment in PWID in London, 2003-2012[12] (Source: PHE Unlinked Anonymous Monitoring Survey of People Who Inject Drugs)



# References


1. Department of Health. Getting ahead of the curve: a strategy for combating infectious diseases (including other aspects of health protection). A report by the Chief Medical Officer. London: 2002.
2. World Health Organization. Hepatitis B. Surveillance and Control. Available from: http://www.who.int/csr/disease/hepatitis/whocdscsrlyo20022/en/index4.html.
3. Health Protection Agency. Migrant Health: Infectious diseases in non-UK born populations in England, Wales and Northern Ireland. A baseline report. 2006.
4. Health Protection Agency. Standards for Local Surveillance and Follow-up of Hepatitis B and C. 2011.
5. Department of Health. Immunisation against infectious disease. Green book. . 2006.
6. The Health Protection (Notifications) Regulations, (2010).
7. Public Health England. Acute hepatitis B surveillance.
8. Public Health England. Laboratory Surveillance Data.
9. Public Health England. Sentinel Surveillance of Blood-borne Virus Testing.
10. Public Health England. National Antenatal Infections Screening Monitoring (NAISM) Programme.
11. Public Health England Field Epidemiology Services Victoria office. Enhanced surveillance of antenatal hepatitis B (ESAHB).
12. Public Health England. Unlinked Anonymous Survey of People Who Inject Drugs.
13. NHS Quality Observatory. Prison Health Performance & Quality Indicators (PHPQIs).
14. Health and Social Care Information Centre. Cover of Vaccination Evaluated Rapidly (COVER).
15. Public Health England. HPZone (Health Protection Team Public Health Case Management System).
16. Health and Social Care Information Centre. Hospital Episode Statistics (HES).
17. Office of National Statistics. Death certification.
18. National Institute for Health and Clinical Excellence. Hepatitis B and C: ways to promote and offer testing to people at increased risk of infection. NICE public health guidance 43. 2012.

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Please contact fes.victoria@phe.gov.uk if you would like more information.

# Abbreviations

| | |
|---|---|
| Anti-HBc | Hepatitis B core antibody - appears at onset of symptoms in acute hepatitis B and persists for life; presence indicates resolving or resolved infection if the individual is HBsAg negative. |
| FES | PHE Field Epidemiology Service |
| HBeAg | Hepatitis B e antigen, The presence of HBeAg is associated with relatively high infectivity and severity of disease |
| HBsAg | Hepatitis B surface Antigen (a protein on the surface of the hepatitis B virus) - detected during acute or long-term hepatitis B virus infection. |
| HBV | Hepatitis B virus |
| HPT | Health protection team |
| IgM | IgM antibody to hepatitis B core antigen (IgM anti-HBc); positivity indicates recent infection with hepatitis B virus; however it may also remain positive in long-term infection |
| Nam PehChan | A computer program used to identify individuals of South Asian origin based on their name. It has a sensitivity of 91% and a positive predictive value of 63.2% (Cummins, 1999) |
| Onomap | Name analysis software |
| PCT | Primary care trust |
| PHE | Public Health England |
| PWID | People who inject drugs |
| SAO | (Individuals of) South Asian Origin |

# Appendix 1: Information sources

## Acute hepatitis B surveillance

The surveillance definition for acute hepatitis B is:

"HBsAg positive and anti-HBc IgM positive and abnormal liver function tests with a pattern consistent with acute viral hepatitis." As information on liver function is usually not available to PHE, for the purpose of this analysis:

- those cases classified as acute hepatitis by the HPT or the laboratory and with a documented positive anti-HBc IgM were classified as acute infections
- those classified as acute infections by the HPT but without anti-HBc IgM results, or not classified but with a positive anti-HBc IgM were assumed to be probable acute cases
- those classified as acute by the HPT but with contradictory evidence eg positive hepatitis serology results dated before July 2008; were reclassified as long-term infections
- cases classified as long-term infections or those not classified where anti-HBc IgM was negative or equivocal were assumed to be long-term infections
- those cases that remained unclassified and without anti-HBc IgM results were excluded from further analysis
- HPT cases with a date entered from 1 January 2012 to 31 December 2012 were extracted from HPZone and matched to a laboratory dataset using Microsoft Access and algorithms comparing combinations of the following variables: Surname, First name, soundex, date of birth, sex, clinic number and NHS number.

The laboratory database contained all confirmed hepatitis B infections reported to the PHE CIDSC for Infections by laboratories in England and Wales (LabBase). The Labbase data was used to augment laboratory results and determine final status of any matching cases reported from the HPT. A final reconciled dataset included cases classified as acute or probable acute and reported from the HPT and/or from the laboratory to CIDSC.

### Strengths and limitations

The majority of acute cases were reported independently by the HPT or laboratory, lending support to the value of using both systems to minimise under ascertainment and compile an accurate picture of acute hepatitis B epidemiology.

On the other hand, IgM may remain positive in long-term hepatitis B such as during an acute flare and so the use of IgM anti-HBC could result in overestimation of acute hepatitis cases. This can be minimised by matching to historical laboratory results to ensure no previous test results was available for the same patient. The level of IgM may also help to determine whether a case is acute or long-term.

Significant misclassification of long-term cases as acute infections is reported, although it is not clear to what extent.

## Antenatal surveillance

The NHS Infectious Diseases in Pregnancy Screening (IDPS) Programme in England is responsible for ensuring that all pregnant women are routinely offered screening for hepatitis B, HIV, syphilis and susceptibility to rubella infection.

This programme aims to ensure that women with hepatitis B, HIV and syphilis are identified and that these women are offered appropriate assessment and management of their health, as well as ensuring that strategies are put in place to reduce the risk of mother-to-child transmission of these conditions. The programme also aims to identify women who are susceptible to rubella, for whom postnatal MMR vaccination could protect future pregnancies.

At a woman's first antenatal visit she is offered and recommended tests for hepatitis B, Human Immunodeficiency Virus (HIV), rubella and syphilis. Blood is taken at the booking visit and tested for hepatitis B surface antigen. Positivity for HBsAg does not distinguish between acute or long-term infection.

Since 2004, the National Antenatal Infections Screening Monitoring (NAISM) programme has been monitoring the uptake and test results of antenatal screening for hepatitis B susceptibility in England. Information is requested at maternity unit or trust level on the number of pregnant women attending for antenatal care, the number screened and the results of testing. Since 2009, data has been collected on women previously diagnosed with hepatitis B.

The overall aim of Enhanced Surveillance of Antenatal Hepatitis B (ESAHB) is to obtain timely individual-level information on hepatitis B infection (HBsAg-positivity) in the pregnant women population. This is in order to facilitate individual follow-up, including contacts of mothers and audit of subsequent vaccine uptake as well as to improve the accuracy of the number of reported cases of hepatitis B and the public health response overall.

### Strengths and limitations

Key limitations include the data is not disaggregated ie we cannot match the women booking with the women tested and the accuracy of the figure for the number of women booking for antenatal care.

The term booking has not been used consistently. A standard definition is needed for calculating an accurate and meaningful screening uptake.

Uptake of antenatal screening is calculated as the proportion of women booked for antenatal care, as reported by maternity services, who have a screening test. If maternity unit booking data is not available, a proxy is often used for bookings, such as the number of laboratory tests for syphilis or rubella under the assumption that all booked women are screened for these infections. Using this proxy could overestimate screening uptake.

As part of the data processing, some data exclusions and adjustments are made, mainly when the denominator, numerator or both are not available, or when the screening uptake for a particular infection is over 100%.

## Unlinked anonymous survey of people who inject drugs

### Aims and objectives

The Unlinked Anonymous Monitoring Survey of HIV and Hepatitis in PWID aims to measure the changing prevalence of HIV, hepatitis B and hepatitis C in PWID who are in contact with specialist drug agencies (eg needle exchange services and treatment centres). The programme also monitors levels of risk and protective behaviours among PWID. The data is used to assess and develop appropriate preventative and health education campaigns, evaluate the impact of such interventions, and to assist in the provision of services for PWID in the UK.

### Methodology

Survey data has been collected on an annual basis since the survey was established in 1990. PHE works in partnership with over 60 specialist drug agencies in England, Wales and Northern Ireland to gather the survey data, and provides full training, survey materials, and feedback to each collaborating agency involved. Each year, the agencies are encouraged to ask all eligible clients to participate in the survey - an eligible client being a current or former injecting drug user who has not already participated in the survey in the current calendar year. Each eligible client is asked to complete a short questionnaire and to provide a dried blood spot sample. Identifying information is irreversibly unlinked from all samples before testing, ensuring that both the sample and the questionnaire are completely anonymous. Samples are tested for the presence of antibodies to HIV

(signalling current infection), and antibodies to hepatitis C and to the hepatitis B core antibody (which can indicate current or previous infection).

### Strengths and limitations

The biological sample collected in the survey was changed from an oral fluid to a dried blood spot (DBS) during 2009 and 2010. The sensitivities of the tests on a DBS sample for antibodies to hepatitis B core antigen are close to 100%. However, the sensitivity of the oral fluid sample test for antibodies to hepatitis B core antigen is about 75% ie a higher number of false negatives. This needs to be borne in mind when interpreting trend data.

## Sentinel surveillance of blood-borne virus testing (previously hepatitis)

This was set up in 2002 to enhance routine surveillance of hepatitis B. The study collects data on laboratory test results and demographic data for all individuals tested for hepatitis B in 24 sentinel laboratories in England, covering approximately one-third of the population.

Six sentinel surveillance laboratories are currently active in London covering 40 to 59% of London's population. Although the sentinel surveillance began in 2002, participating laboratories joined the programme at different dates. The second phase of prospective data collection has been ongoing since September 2004, with some but not all sites provided retrospective data on joining the programme. Consequently, data from five out of the six active laboratories were used for trend analysis.

### Strengths and limitations

The programme aims to supplement routine surveillance of hepatitis A, B, C, D, and E infections in England by providing information on trends in testing, individual risk exposures and clinical symptoms. Information on hepatitis testing carried out in participating centres is collected irrespective of test result and therefore can also be used to estimate prevalence among those individuals tested. Sentinel surveillance collects data on testing for hepatitis B surface antigen.

Limitations of the data include some duplication of individual patients and exclusion of dried blood spot, oral fluid, reference testing, and testing from hospitals referring all samples which do not have the original location identified. Individuals aged less than one year, in whom positive tests may reflect the presence of passively-acquired maternal antibody rather than true infection, are excluded.

# Appendix 2: Hepatitis B antenatal screening results for London, 2012

| Trust-Clinic | No. tested for HBsAg | Known to be HBV prior to testing | Of those known to be HBV positive, No. tested | Of those known to be HBV positive, No. NOT tested | No. newly testing pos-itive for HBsAg | Of those tested, No. HBV positive | Total no. HBV positive (includes those not tested) | Rate of positive tests per 1,000 attend-ees |
|---|---|---|---|---|---|---|---|---|
| Barking, Havering & Redbridge (BHR) | 10,341 | 93 | 93 | 0 | 21 | 114 | 114 | 11.0 |
| Barnet & Chase Farm | 7,140 | 33 | 33 | 0 | 40 | 73 | 73 | 10.2 |
| Central Middlesex (NWLH) | 2,286 | 21 | 18 | 3 | 10 | 28 | 31 | 13.5 |
| Chelsea & Westminster | 6,182 | 22 | 19 | 3 | 13 | 32 | 35 | 5.7 |
| Croydon | 4,946 | 30 | 30 | 0 | 35 | 65 | 65 | 13.1 |
| Ealing | 3,377 | 13 | 12 | 1 | 14 | 26 | 27 | 7.7 |
| Epsom & St Helier | 4,263 | 14 | 14 | 0 | 0 | 14 | 14 | 3.3 |
| Guy's & St Thomas' | 7,540 | 44 | 42 | 2 | 58 | 100 | 102 | 13.5 |
| Hillingdon | 4,721 | 18 | 13 | 5 | 11 | 24 | 29 | 6.1 |
| Homerton | 5,992 | 49 | 44 | 5 | 18 | 62 | 67 | 11.2 |
| King's College | 6,219 | 81 | 72 | 9 | 62 | 134 | 143 | 23.0 |
| Kingston | 6,469 | 16 | 13 | 3 | 17 | 30 | 33 | 4.6 |
| Lewisham | 5,108 | 25 | 25 | 0 | 46 | 71 | 71 | 13.9 |
| Newham | 7,421 | 60 | 60 | 0 | 38 | 98 | 98 | 13.2 |
| North Middlesex | 4,502 | 73 | 49 | 24 | 54 | 103 | 127 | 28.1 |
| Northwick Park (NWLH) | 3,980 | 16 | 15 | 1 | 11 | 26 | 27 | 6.8 |
| Princess Royal (SLHT) | 2,522 | 16 | 9 | 7 | 8 | 17 | 24 | 9.5 |
| Queen Charlotte's (Imperial) | 5,286 | 23 | 14 | 9 | 13 | 27 | 36 | 6.8 |
| Queen Elizabeth (SLHT) | 2,759 | 38 | 30 | 8 | 12 | 42 | 50 | 18.1 |
| Queen Mary's (SLHT) | 279 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Royal Free | 3,673 | 21 | 14 | 7 | 18 | 32 | 39 | 10.6 |
| Royal London | 6,401 | 32 | 32 | 0 | 34 | 66 | 66 | 10.3 |
| St George's | 6,088 | 27 | 25 | 2 | 14 | 39 | 41 | 6.7 |
| St Mary's (Imperial) | 4,831 | 23 | 18 | 5 | 17 | 35 | 40 | 8.3 |
| University College | 7,098 | 45 | 45 | 0 | 13 | 58 | 58 | 8.2 |
| West Middlesex | 5,896 | 26 | 20 | 6 | 10 | 30 | 36 | 6.5 |
| Whipps Cross | 6,729 | 53 | 52 | 1 | 30 | 82 | 83 | 12.3 |
| Whittington | 5,004 | 9 | 9 | 0 | 42 | 51 | 51 | 10.2 |

# Appendix 3: Hepatitis B antenatal screening uptake in London, 2012

| Trust-Clinic | Returns | Bookings * | HBsAg Tests * | Uptake |
|---|---|---|---|---|
| Barking, Havering & Redbridge (BHR) | 4 | 10727 | 10341 | 96% |
| Barnet & Chase Farm | 4 | 7145 | 7140 | 100% |
| Central Middlesex (NWLH) | 4 | 2288 | 2286 | 100% |
| Chelsea & Westminster | 4 | 6337 | 6182 | 98% |
| Croydon | 4 | 5125 | 4946 | 97% |
| Ealing | 4 | 3383 | 3377 | 100% |
| Epsom & St Helier | 3 | 4297 | 4263 | 99% |
| Guy's & St Thomas' | 4 | 7553 | 7540 | 100% |
| Hillingdon | 4 | 4734 | 4721 | 100% |
| Homerton | 4 | 6177 | 5992 | 97% |
| King's College | 4 | 6348 | 6219 | 98% |
| Kingston | 4 | 6489 | 6469 | 100% |
| Lewisham | 2 | 2399 | 2399 | 100% |
| Newham | 4 | 7453 | 7421 | 100% |
| North Middlesex[$] | 4 | 4368 | 4502 | 100% |
| Northwick Park (NWLH) | 4 | 3984 | 3980 | 100% |
| Princess Royal (SLHT) | 2 | 2559 | 2522 | 99% |
| Queen Charlotte's (Imperial) | 4 | 5292 | 5286 | 100% |
| Queen Elizabeth (SLHT) | 2 | 2759 | 2759 | 100% |
| Queen Mary's (SLHT) | 1 | 280 | 279 | 100% |
| Royal Free | 4 | 3681 | 3673 | 100% |
| Royal London | 2 | 3259 | 3161 | 97% |
| St George's | 4 | 6115 | 6088 | 100% |
| St Mary's (Imperial) | 4 | 4802 | 4831 | 100% |
| University College | 4 | 7221 | 7098 | 98% |
| West Middlesex | 4 | 5896 | 5896 | 100% |
| Whipps Cross[$] | 4 | 6505 | 6729 | 100% |
| Whittington | 4 | 5018 | 5004 | 100% |

[¥] *Numbers of bookings and tests are shown here as reported. For some clinics one or more quarters may have been excluded when uptake of testing was calculated. In addition, the uptake of testing cannot exceed 100%. See footnotes that follow for more information.*

[$] *Uptake has been capped at 100% (tests exceeded bookings but the excess was not more than 10% for any quarter).*

# Appendix 4: Hepatitis B vaccination uptake in neonates by London PCT, 2012/13

Uptake refers to babies born to hepatitis B positive mothers (not all babies)

| PCT | Coverage at 12 months | | | Coverage at 24 months | | |
|---|---|---|---|---|---|---|
| | 3 vaccines at 12 months | No. of at risk babies | 12 months uptake | 3 vaccines at 24 months | No. of at risk babies | 24 months uptake |
| Barking & Dagenham | 44 | 49 | 90 | 22 | 25 | 88 |
| Barnet | 13 | 19 | 68 | 2 | 4 | 50 |
| Bexley Care Trust | 20 | 20 | 100 | 14 | 17 | 82 |
| Brent Teaching PCT | - | - | - | - | - | - |
| Bromley | 14 | 14 | 100 | 7 | 7 | 100 |
| Camden | 11 | 12 | 92 | 13 | 14 | 93 |
| City & Hackney Teaching | - | - | - | - | - | - |
| Croydon | - | - | - | - | - | - |
| Ealing | 29 | 35 | 83 | 21 | 26 | 81 |
| Enfield | 14 | 29 | 48 | 5 | 17 | 29 |
| Greenwich Teaching | 58 | 58 | 100 | 65 | 69 | 94 |
| Hammersmith & Fulham | - | - | - | - | - | - |
| Haringey Teaching | 74 | 75 | 99 | 78 | 80 | 98 |
| Harrow | - | - | - | - | - | - |
| Havering | 7 | 14 | 50 | 3 | 8 | 38 |
| Hillingdon | 38 | 38 | 100 | 23 | 23 | 100 |
| Hounslow | 18 | 26 | 69 | 9 | 20 | 45 |
| Islington | 38 | 55 | 69 | 52 | 81 | 64 |
| Kensington & Chelsea | - | - | - | - | - | - |
| Kingston | 8 | 9 | 89 | 2 | 16 | 13 |
| Lambeth | 18 | 19 | 95 | 12 | 12 | 100 |
| Lewisham | 79 | 79 | 100 | 71 | 73 | 97 |
| Newham | 74 | 87 | 85 | 64 | 66 | 97 |
| Redbridge | 7 | 9 | 78 | 8 | 11 | 73 |
| Richmond & Twickenham | * | * | * | 2 | 5 | 40 |
| Southwark | 44 | 45 | 98 | 32 | 35 | 91 |
| Sutton & Merton | 4 | 6 | 67 | 9 | 10 | 90 |
| Tower Hamlets | 19 | 39 | 49 | 8 | 14 | 57 |
| Waltham Forest | 38 | 43 | 88 | 49 | 54 | 91 |
| Wandsworth | 20 | 22 | 91 | 23 | 27 | 85 |
| Westminster | - | - | - | - | - | - |

*− Zero returns or no data submitted for one or more quarters and so uptake not applicable*

** Some figures in the above table have been suppressed due to potential disclosure issues associated with small numbers.*

# Appendix 5: Hepatitis B vaccine coverage and uptake in prisons in London, 2012/3

| Prison | Total Recep-tions | No. of prisoners declining vac-ination | No. Already Vacc-inated | No. vac-inated within one month | Total Doses Given | % Vaccine Uptake# | % Dec-lined | % Already Vacc-inated | % Vaccine Coverage# |
|---|---|---|---|---|---|---|---|---|---|
| Isis (HMP) | 818 | 148 | 447 | 231 | 231 | 104% | 40% | 55% | 83% |
| Belmarsh (HMP) | 2,990 | 653 | 850 | 1,467 | 1,467 | 99% | 31% | 28% | 77% |
| Feltham (HMYOI/RC) | 2,765 | 1,060 | 728 | 1,039 | 2,014 | 106% | 52% | 26% | 64% |
| Holloway (HMP/YOI) | 2,130 | 397 | 954 | 398 | 374 | 51% | 34% | 45% | 63% |
| Pentonville (HMP) | 6,320 | 727 | 1,884 | 937 | 728 | 25% | 16% | 30% | 45% |
| Brixton (HMP) | 2,077 | 92 | 272 | 334 | 476 | 19% | 5% | 13% | 29% |
| Wormwood Scrubs (HMP) | 6,759 | 16 | 1,133 | 571 | 611 | 10% | 0% | 17% | 25% |
| Wandsworth (HMP) | 1,450 | 2 | 158 | 79 | 104 | 6% | 0% | 11% | 16% |
| Thameside (HMP) | 4,637 | 151 | 245 | 144 | 144 | 3% | 3% | 5% | 8% |
| **Total** | **29,946** | **3,246** | **6,671** | **5,200** | **6,149** | **26%** | **14%** | **22%** | **40%** |

*# Vaccine coverage is the proportion of new receptions who have been vaccinated, either previously or during their most recent attendance. Vaccine uptake is the proportion of prisoners who have not previously been vaccinated and do not decline vaccination, who are subsequently vaccinated at the prison.*