Public Health England

Protecting and improving the nation's health

Hepatitis B in the North West

2017 data

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Executive summary

This is the fourth hepatitis B report produced for the North West. It draws on a range of routinely available data up to the end of 2017 to summarise the latest trends in hepatitis B virus (HBV) infection and prevention activities in the North West. The report aims to provide information to commissioners and providers of hepatitis treatment and prevention services, and to public health professionals working to reduce inequalities and the burden of disease from BBV (blood borne virus) infections.

Epidemiology and burden

The rate of acute hepatitis B infection has shown a generally declining trend in England and the North West since 2010. In 2017, 38 cases of confirmed or probable acute hepatitis B were reported across the North West (0.52 per 100,000 population), a reduction on the 74 cases reported in 2016.

There were 706 new laboratory reports of hepatitis B (acute and chronic) in North West residents in 2017. Trends in laboratory reports are hard to interpret as they may reflect changes in testing or reporting. There was a notable increase in the number of laboratory reports of hepatitis B in 2012. The most likely explanation is that it became a statutory requirement for laboratories to report hepatitis B in October 2010. Since 2012 there has been a continued decline in the number of reports each year.

The directly standardised rate of newly reported cases suggests that Manchester, Oldham, Salford and Bolton are the higher prevalence areas in the North West.

Data from the Unlinked Anonymous Monitoring Survey of people who inject drugs in contact with specialist services show that the prevalence of hepatitis B core antibody (anti-HBc), a marker of current or previous infection, increased from 23% in 2016 to 28% in 2017.

Morbidity and mortality

The hospital admission rate for hepatitis B related end-stage liver disease/ hepatocellular carcinoma was 0.91 per 100,000 for the North West in 2012 and 2013 to 2014 and 2015.

The under 75 mortality rate from hepatitis B related end-stage liver disease/ hepatocellular carcinoma in the North West was 0.12 per 100,000 in 2015 to 2017.

Increasing awareness and reducing undiagnosed infections

Sentinel laboratories in the North West received 142,603 antenatal screening samples from pregnant women between 2013 and 2017. The overall detection rate was 0.3%. Detection rates were notably higher in women of non-white ethnicity.

Excluding antenatal testing, sentinel laboratories tested 325,746 samples for hepatitis B between 2013 and 2017. The overall detection rate was 0.72%.

Due to technical issues a number of laboratories nationally and in the North West are currently not reporting full diagnostic results to PHE Second Generation Surveillance System. This means that in some Local Authority areas the number of cases is under-reported.

Preventing new infections

The Department of Health introduced routine infant hepatitis B vaccination for children in August 2017. All children born on or after 1 August 2017 are offered the hexavalent vaccine (Infanrix hexa®) which protects against 6 childhood diseases including hepatitis B, at 8, 12 and 16 weeks of age. Children born to hepatitis B positive mothers will also receive additional doses of monovalent hepatitis B vaccine at birth, 4 weeks and 12 months. PHE North West and NHS England are working with service providers to integrate the selective neonatal hepatitis B programme delivery into primary care at 1-month post exposure.

For babies born to hepatitis B positive mothers, monovalent hepatitis B vaccination coverage has decreased consecutively for the last 5 years. From 2015 to 2016 and 2017 to 2018, the proportion of babies born to hepatitis B positive mothers in the North West, who have had 3 doses of the hepatitis B vaccine at 12 months fell from 69% to 57%. In the same period, the coverage for the booster dose for exposed babies by 24 months fell from 40% to 25%. This decrease in vaccine coverage may be due to inconsistencies in recording of vaccinations, and further work may be required to determine the reasons. Transient population groups can become lost to local follow up, impacting on coverage. The inclusion of hepatitis B within the routine immunisation schedule could help to increase hepatitis B vaccination and ensure more babies in this risk group are protected, however this vaccination schedule does not provide the same early protection for those born to hepatitis B infected mothers. Data on coverage of the hexavalent programme is not yet available.

Hepatitis B prisoner vaccination data have not been included in this report due to changes in the reporting system for prisons. We expect that the data will be available for the next hepatitis B annual report.

Progress on recommendations: 2017 annual report

Recommendation	Progress
PHE North West should work with providers to ensure that data on vaccine coverage at 12 months of the selective neonatal hepatitis B vaccine is reported through the COVER programme in a complete and timely fashion	In 2017, the coverage of selective neonatal hepatitis B vaccine at 12 and 24 months have fallen to 57% and 25% respectively. This is likely to be due to lack of recording than lack of vaccination. This remains a priority for PHE North West.
PHE North West should build on the existing work with NHS England and local prisons to continue the improvement in the coverage and quality of data reported using the Health and Justice Indicators of Performance (HJIPs)	PHE North West has worked with ODNs and providers to review care pathways hepatitis cases and implementation of intensive 'test and treat' campaigns in prisons. Work is ongoing in PHE at national level to more accurately capture testing done in secure and detained settings and to communicate this to ODNs
PHE Field Services will work with the North West Public Health Microbiologist and affected NHS laboratories to explore and identify solutions to the under-reporting of hepatitis B and to identify the most feasible way forward regarding laboratory reporting of hepatitis B results using PHE's automated Second Generation Surveillance System (SGSS)	PHE Field Service has worked with diagnostic laboratories to improve reporting of hepatitis B results through SGSS. Work still continues to improve the reporting of serological markers needed to determine correct diagnosis.

Recommendations

The following recommendations are directed towards PHE and commissioners and providers of hepatitis B treatment and prevention services.

Recommendation 1

PHE North West should work with providers to ensure that data on vaccine coverage at 12 months of the selective neonatal hepatitis B vaccine is reported through the COVER programme in a complete and timely fashion. Further work with commissioners and providers may be needed to determine reasons for apparent drop in vaccination coverage if downward trends continue after improvements in recording of vaccination status.

Recommendation 2

PHE North West should build on the existing work with NHS England and local prisons to continue the improvement in the coverage and quality of data reported using the Health and Justice Indicators of Performance (HJIPs)

Recommendation 3

Further work is needed by PHE Field Services to improve the reporting by NHS diagnostic laboratories of serological markets of hepatitis B infection through SGSS.

Sources of data used in this report

Routine sources of information are used to build up a picture of the epidemiology of hepatitis B. These are summarised below as:

- 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 Public Health England (PHE); data source: Centre for infectious diseases compiled dataset
- laboratory notifications of hepatitis B: since October 2010, laboratories also have a statutory requirement to report all diagnoses of hepatitis B, both chronic and acute, to PHE – they are also asked to differentiate between acute and chronic cases; data source: SGSS
- Sentinel Surveillance of Blood-Borne Virus testing: 4 laboratories in the North West collect information on all hepatitis B testing, which allows for examination of trends in testing
- hospital admission data North West, provided by PHE Centre for Infectious Disease Surveillance and Control; data source: Hospital Episode Statistics
- proportion of liver transplants associated with hepatitis B cirrhosis provided by PHE Centre for Infectious Disease Surveillance and Control; data source: NHS Blood and Transplant
- deaths from End Stage Liver Disease (ESLD) or Hepatocellular Cancer (HCC) in those with HBV mentioned on their death certificate provided by PHE Centre for Infectious Disease Surveillance and Control; data source: Hospital Episode Statistics
- PHE Liver Disease profiles used data on hospital admissions for hepatitis B related end stage liver disease by UTLA; data source: Hospital Episode Statistics
- unlinked anonymous data on people who inject drugs (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
- infants born to hepatitis B positive mothers; data source: Cover of Vaccination Evaluated Rapidly (COVER)

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 infection

An acute hepatitis B case is defined as a patient who is hepatitis surface antigen (HBsAg) positive and IgM antibody (anti-HBc IgM) positive, with abnormal liver function tests in a pattern consistent with acute viral hepatitis.

Rates of acute infection include cases classified as acute or probable acute and reported from the PHE Centre and/or from laboratories around the country to LabBase, the PHE national laboratory reporting database. LabBase holds data for laboratories throughout England and hepatitis B data are enhanced by reference laboratory results. These data are collected using the PHE Second Generation Surveillance System (SGSS).

The rate of acute hepatitis B has been declining in England and the North West since 2010 (Figure 1). In 2017, 38 cases of confirmed or probable acute hepatitis B were reported across the North West (0.52 per 100,000). The incidence of acute hepatitis B for England was 0.80 per 100,000.

Figure 1: Incidence of acute or probable acute hepatitis B per 100,000 population, North West and England 2010 to 2017[1]

Cases of acute hepatitis B infection will have been exposed to the hepatitis B virus in the preceding 6 months. In addition to taking public health action to prevent transmission, risk exposure information is collected for cases of acute hepatitis B infection reported to Health Protection Teams (HPTs). This is helpful in identifying recent sources of infection and transmission routes.

Chronic hepatitis B

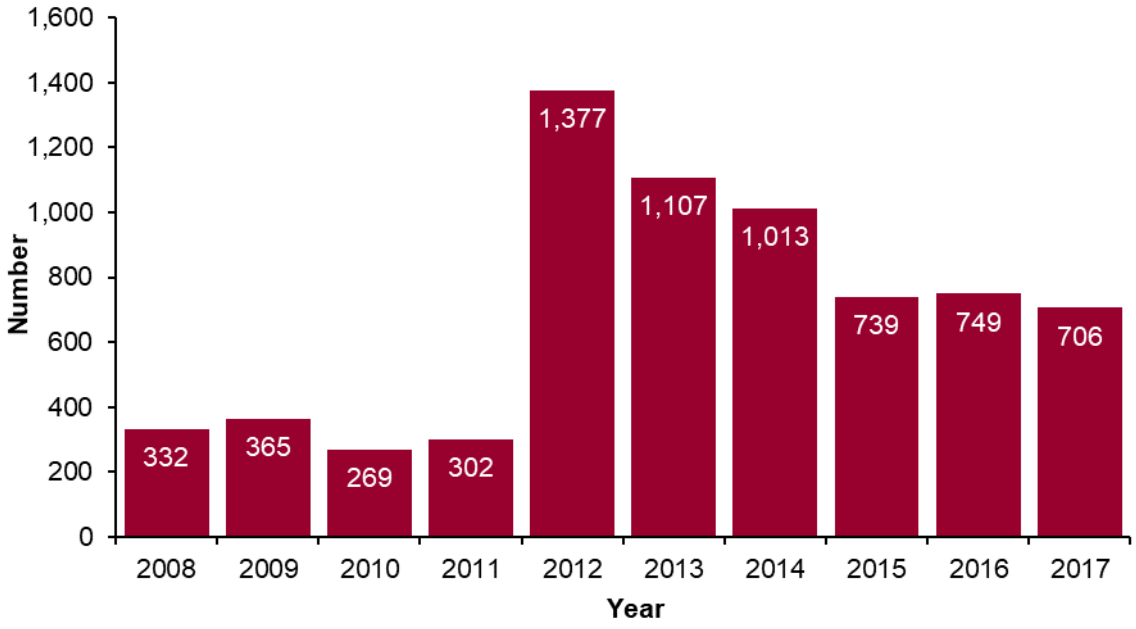
While information on acute hepatitis B is helpful to better understand current transmission risks, most of the burden of hepatitis B is related to chronic infection.

There is considerable uncertainty about the number of people with chronic hepatitis B in the UK [2]. In 2002 the Department of Health estimated that chronic hepatitis B affected 180,000 people in the UK [1]. It has been estimated that 95% of people with chronic hepatitis B in the UK are migrants from countries of higher prevalence, most of whom acquired the infection in early childhood in the country of their birth [3]. This section provides information derived from laboratory reports on the number of diagnoses by age, gender and location of the patient.

Laboratory reports

There were 706 new laboratory reports (not previously known diagnosis) of hepatitis B assigned by national surveillance to residents of the North West in 2017 (Figure 2). Trends in laboratory reports are hard to interpret as they may reflect changes in testing, reporting or disease epidemiology. There was a notable increase in the number of laboratory reports of hepatitis B in 2012. The most likely explanation is that it became a statutory requirement for laboratories to report hepatitis B in October 2010. Since 2012 there has been a continued decline in the number of reports each year.

Figure 2: Number of laboratory reports of hepatitis B (acute and chronic), residents of North West PHE Centre, 2008 to 2017



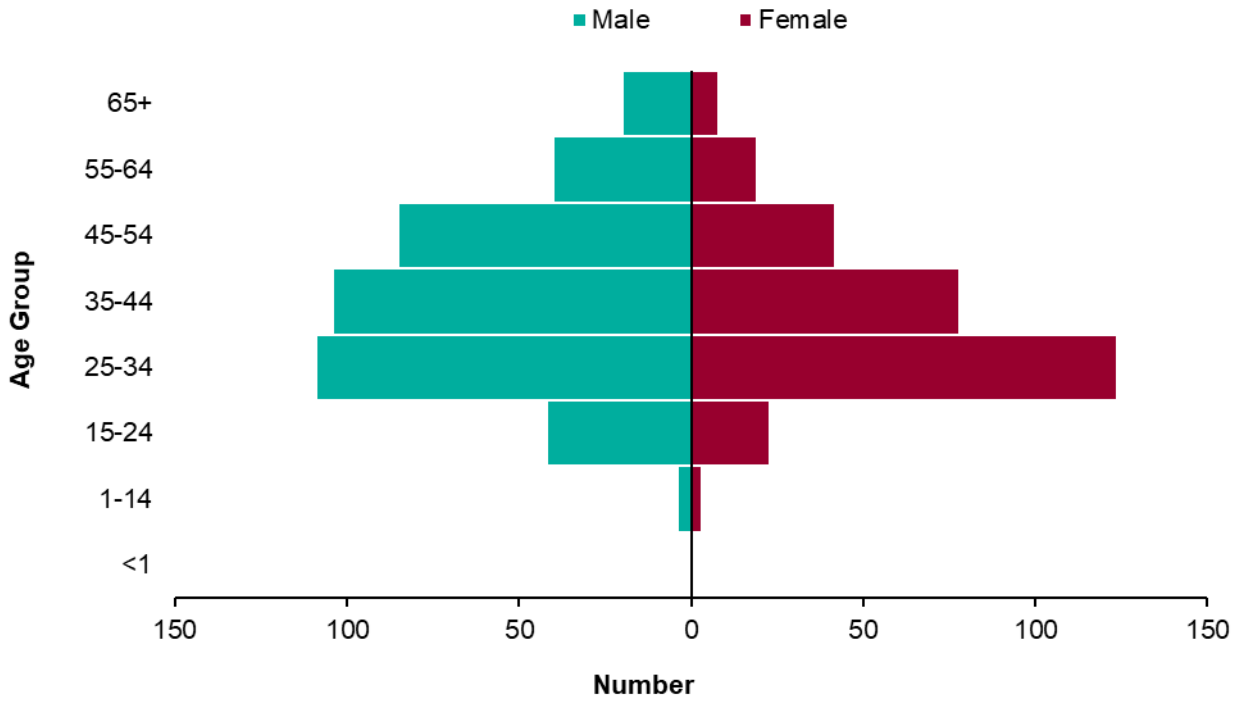
The rate of new laboratory reports per 100,000 in the North West is lower than that reported for England as whole (Figure 3).

Figure 3: Laboratory reports of hepatitis B (acute and chronic) per 100,000 population*, residents of North West PHE Centre and England, 2008 to 2017

*95% Confidence Intervals represented by the dotted line around the rate (solid) line

All hepatitis B laboratory reports included the age (706/706) and nearly all included the sex (701/706) of cases. A majority of cases are male (57%) and most cases (77%) are reported in people aged 25 to 54 years (Figure 4).

Figure 4: Age group and gender of laboratory reported cases of hepatitis B (acute and chronic), residents of North West PHE centre, 2017



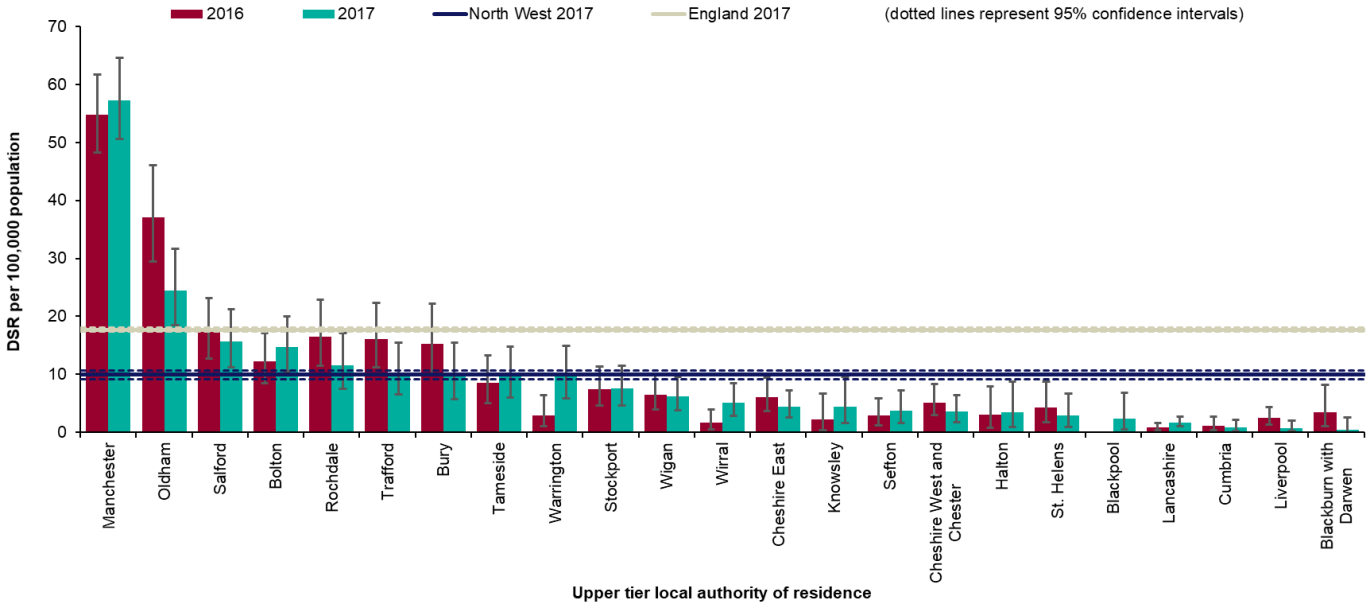
Laboratory reports include a patient or GP postcode for 80% of cases. This allows for reporting of numbers and rates of new cases by upper tier local authority. Geographical variation by upper tier local authority is evident, with the greatest number of positive test results being returned for residents of Manchester and Oldham (Table 1). The low number of reports from Liverpool is due to a technical issue. As a result, the laboratory is not able to report the full diagnostic results leading to underreporting of the number of cases in Liverpool. Similar issues are likely to have affected laboratories in Preston, Blackpool and Carlisle.

Table 1: Number of laboratory reports of hepatitis B (acute and chronic), residents of North West by upper tier local authority, 2012 to 2017

Upper tier local authority	2012	2013	2014	2015	2016	2017
Blackburn with Darwen	0	4	6	4	5	1
Blackpool	8	18	4	12	0	3
Bolton	1	29	40	34	35	40
Bury	0	11	23	23	28	18
Cheshire East	11	16	34	37	20	16
Cheshire West and Chester	19	34	16	16	17	11
Cumbria	15	17	10	8	5	4
Halton	0	0	5	4	4	4
Knowsley	17	11	6	3	4	6
Lancashire	100	113	72	28	9	19
Liverpool	43	36	109	2	16	4
Manchester	1,049	588	396	295	331	320
Oldham	5	58	112	141	83	57
Rochdale	2	24	55	41	35	25
Salford	20	32	50	27	49	44
Sefton	5	7	13	3	9	8
St. Helens	0	5	8	8	7	5
Stockport	8	26	20	23	21	21
Tameside	1	13	12	24	19	21
Trafford	13	25	25	25	37	24
Warrington	1	3	11	9	6	20
Wigan	23	15	13	26	21	20
Wirral	6	3	10	10	5	15

The directly standardised rate of newly reported cases suggests that Manchester, Oldham, Salford and Bolton are higher prevalence areas (Figure 5).

Figure 5: Laboratory reports of hepatitis B (acute and chronic), directly standardised rate (DSR) per 100,000 population by upper tier local authority of residence, PHE North West centre, 2016 and 2017



The largest proportion of tests are reported from the Manchester laboratory (69%) and Royal Oldham (26%) (Table 2). No reports were received from Royal Liverpool University Hospital or Carlisle Microbiology Laboratory in 2017. Centralisation of hepatitis testing to specialist virology services ensures that results with relevant virological markers are interpreted and reported in a timely way to both diagnosing clinicians and PHE. Many of the larger virology laboratories also participate in sentinel surveillance programmes which contribute to national and local surveillance of hepatitis B.

Table 2: Number of reports of hepatitis B (acute and chronic) by reporting laboratory in North West 2017

Laboratory	Number	% of PHE centre total
PHE North West, Manchester Laboratory	492	69%
Royal Oldham Hospital	184	76%
Chester Microbiology Laboratory	28	4%
Preston Microbiology Laboratory	4	<1%
Victoria Hospital, Blackpool	4	<1%

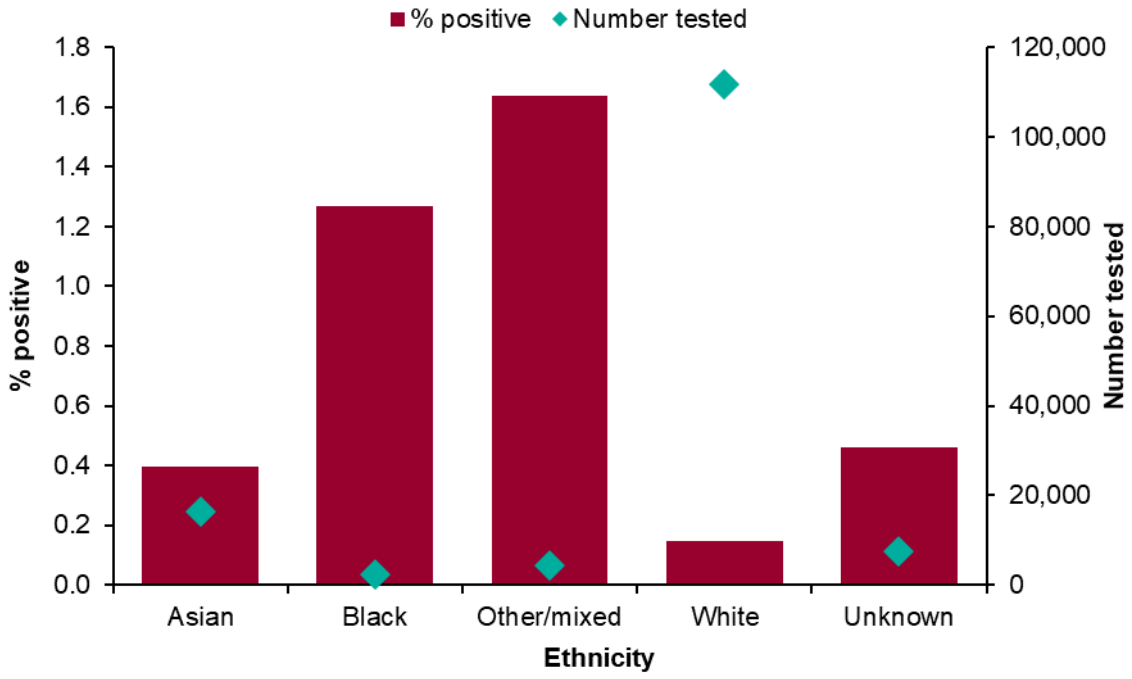
Sentinel surveillance of hepatitis B testing

We lack comprehensive information about the prevalence of hepatitis B in specific groups. However, some information is available on the ethnicity of cases, the reported reason for testing and the type of services requesting hepatitis B tests for patients, and on those receiving antenatal care. Sentinel surveillance of hepatitis testing aims to supplement routine laboratory surveillance of hepatitis viruses in England by monitoring trends in testing [4]. This is useful for monitoring the impact of awareness raising and prevention activities and provides additional information on detection rates by ethnicity, the type of services offering testing and reasons for testing.

The sentinel laboratories for the North West are located in Liverpool, Manchester, Chester and Preston and provide useful additional information for just over 60% of positive tests reported.

Sentinel laboratories in the North West received 142,603 antenatal screening samples between 2013 and 2017. Hepatitis B surface antigen (a marker of infection) was detected in 368 samples (0.3%). The majority of women tested were of White ethnicity. However, detections rates were notably higher in women of non-White ethnicity (Figure 6)

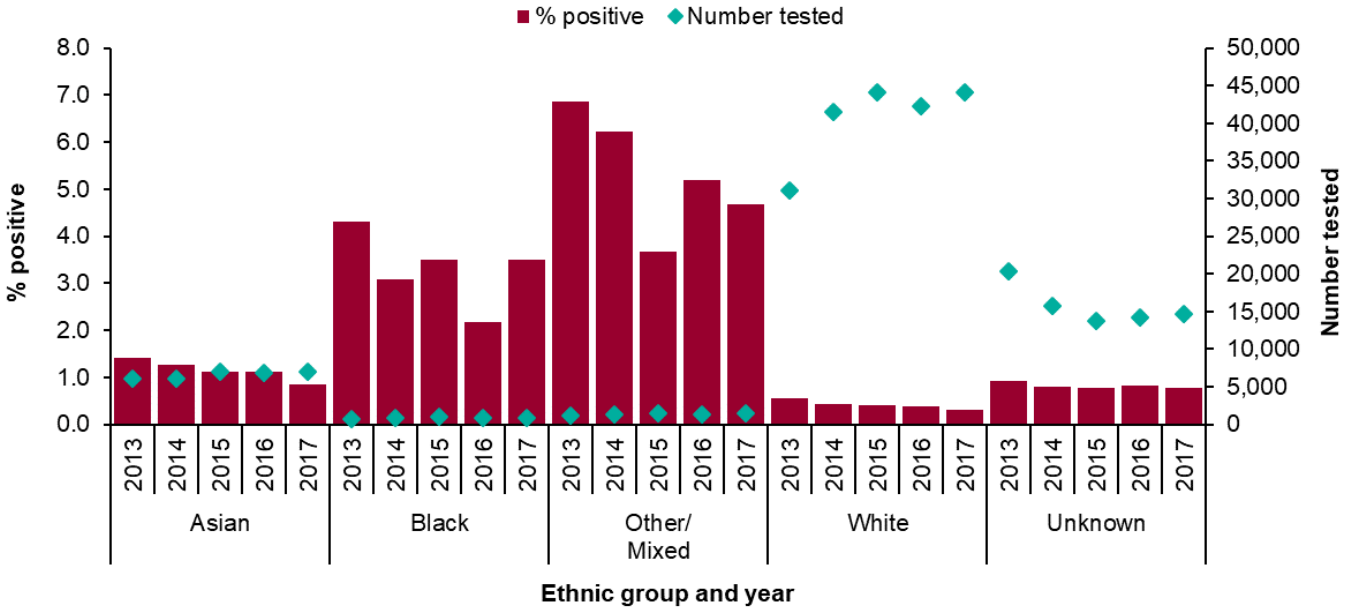
Figure 6: Number of pregnant women tested during the antenatal period and percent testing positive for HBsAg by ethnicity, sentinel laboratories in North West, 2013 to 2017*



* Includes routine antenatal screening for HBsAg of women aged between 12 and 49 years. Data are de-duplicated subject to availability of date of birth, soundex and first initial.

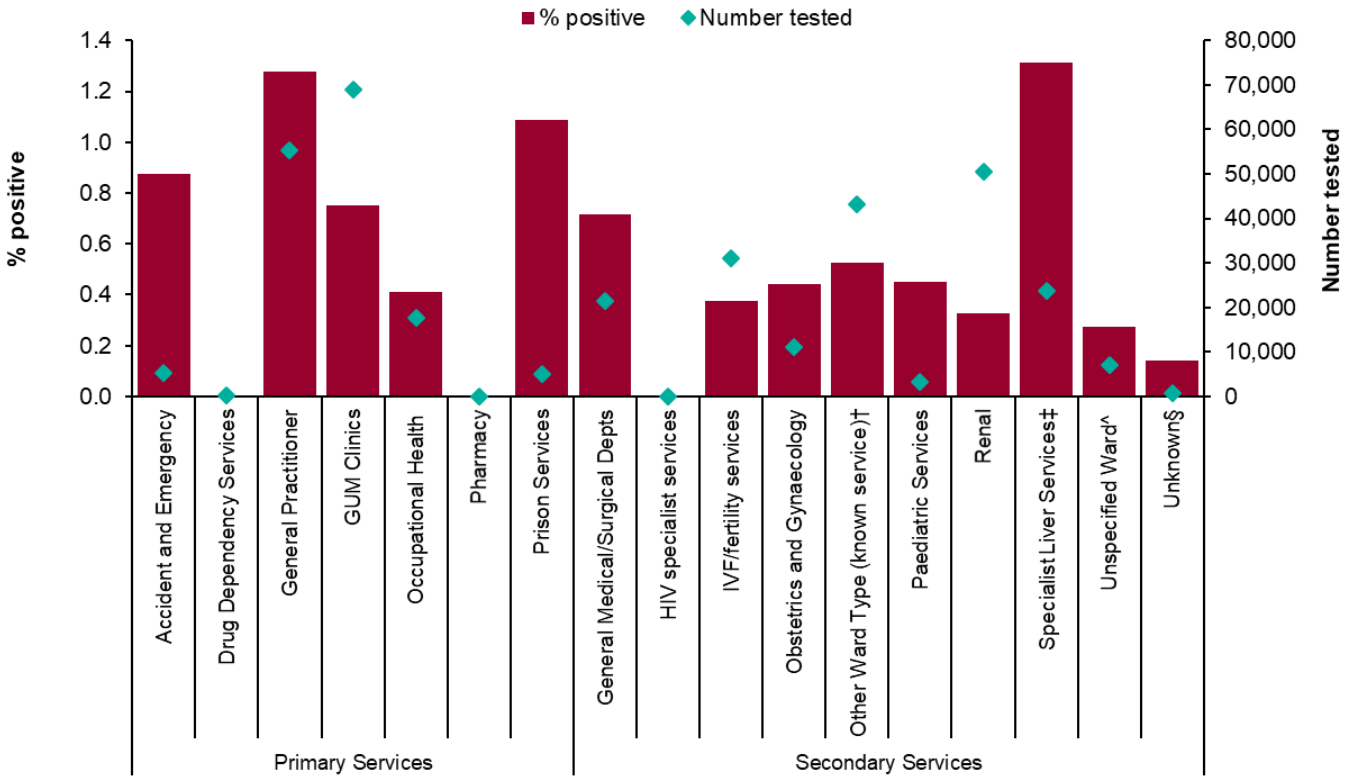
Excluding antenatal testing, sentinel laboratories tested 325,746 samples for hepatitis B between 2013 and 2017. The overall detection rate was 0.72%. Again, detection rates are not evenly distributed across ethnic groups (Figure 7). In 2017, the highest detection rate was seen in people reported as Other/Mixed (4.7%) and Black ethnicity (3.5%) and the detection rate for people of Asian ethnicity was 0.9% whilst people of White ethnicity had the lowest detection rate (0.3%).

Figure 7: Number of individuals tested and % positive for HBsAg by ethnic group (excluding antenatal cases), sentinel laboratories in North West, 2013 to 2017



The highest detection rates are reported from specialist liver services. However, from 2013 to 2017 49.8% of all hepatitis B tests were sent from GPs and GUM clinics. Detection rates for people tested in these services are 1.3% and 0.8% respectively. The relatively low rate of testing reported for drug dependency services can probably be explained by the preference for dry blood spot testing in these services. Dry blood spot testing is not included in sentinel surveillance reports in 2017.

Figure 8: Number of individuals tested for HBsAg and % positive by service type in sentinel laboratories in North West (excluding antenatal testing), 2013 to 2017



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

‡ This refers to infectious disease services, hepatology departments and gastroenterology departments.

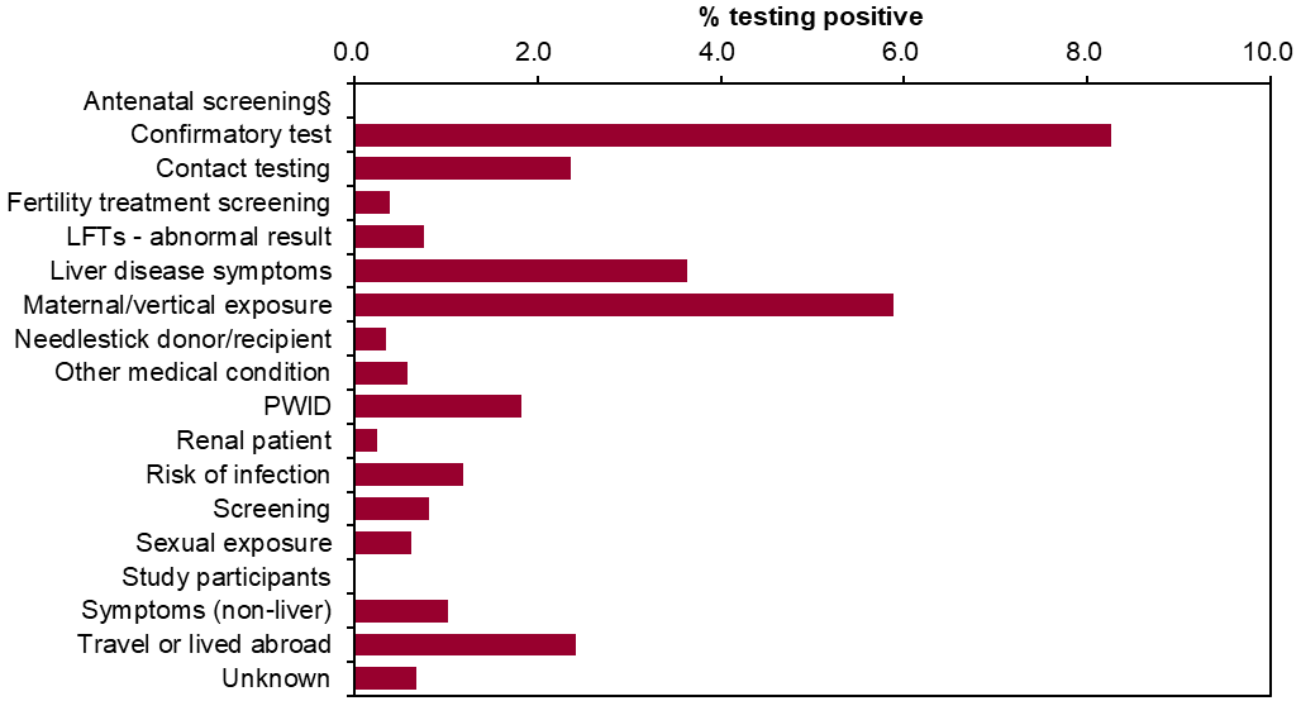
^ These are hospital services which are currently being investigated to identify specific service type, and may include any of the secondary care services mentioned above

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

The reason for testing was reported in 30% of cases tested in sentinel laboratories. Of these, it is notable that of those tested as a contact of a known case 2.4% were positive (Figure 9). It is important that diagnosing clinicians are aware of the importance of contact identification, screening and vaccination. The free online module which The Royal College of GPs offers on the Detection, Diagnosis and Management of Hepatitis B and C in Primary Care is currently being reviewed and will be updated in the near future [5]. Health care professionals working with populations from higher prevalence regions should be encouraged to undertake this training.

Of those tested with a history of travel or living abroad, 2.4% of those tested were positive. This supports the recommendation that these groups are proactively targeted for testing in addition to vaccination.

Figure 9: Percentage of individuals testing positive for HBsAg by risk factor/reason for testing in sentinel laboratories in the North West, 2013 to 2017



Hepatitis B in people who injected drugs

Sentinel laboratory data do not include tests using dry blood spot, so are of limited value in assessing prevalence in people who inject drugs (PWID). Data from the Unlinked Anonymous Monitoring Survey of people who inject drugs in contact with specialist services [6] can be used to estimate levels of exposure (Table 3).
Please note that total hepatitis B core antibody (anti-HBc) provides evidence of exposure to infection at some time, not the burden of infection.

The anti-HBc prevalence in people tested using dry blood spot in specialist drug services increased from 23% in 2016 to 28% in 2017.

Table 3: Anti-HBc prevalence, in people tested using dry blood spot in specialist drug services 2013 to 2017

Year	2013	2014	2015	2016	2017	
Sample type	DBS	DBS	DBS	DBS	DBS	
Anti-HBc Prevalence †	**32%**	**27%**	**23%**	**23%**	**28%**	
Proportion of samples anti-HBc positive	32%	27%	23%	23%	28%	
Number of samples anti-HBc positive	122	102	94	114	87	
Total number of samples collected	379	383	414		495	316

† Anti-HBc Prevalence = [(number of oral fluids anti-HBc positive/0.75) + number of DBS anti-HBc positive] / (number of oral fluids + number of DBS)x100

Impact of hepatitis B infections

Liver disease is largely preventable. Whilst approximately 5% is attributable to autoimmune disorders (diseases characterised by abnormal functioning of the immune system), most liver disease is due to 3 main risk factors: alcohol, obesity and viral hepatitis [7].

Public Health England publishes online Liver Disease Profiles (https://fingertips.phe.org.uk/profile/liver-disease) and Public Health Profiles (https://fingertips.phe.org.uk/) which are regularly updated and include the most recent data. Please visit the websites to get District and County level indicator data for your area. The headlines for the North West are:

- the directly standardised hospital admission rate due to liver disease was 155.3 per 100,000 for the North West in 2016 and 2017
- the hospital admission rate for hepatitis B related end-stage liver disease/hepatocellular carcinoma was 0.91 per 100,000 for the North West in 2012 to 2013 and 2014 to 2015
- the directly standardised under-75 mortality rate for liver disease in the North West was 26.3 per 100,000 in 2015 to 2017
- the under-75 mortality rate from hepatitis B related end-stage liver disease/ hepatocellular carcinoma in the North West was 0.12 per 100,000 in 2015 to 2017

Vaccination and other public health interventions

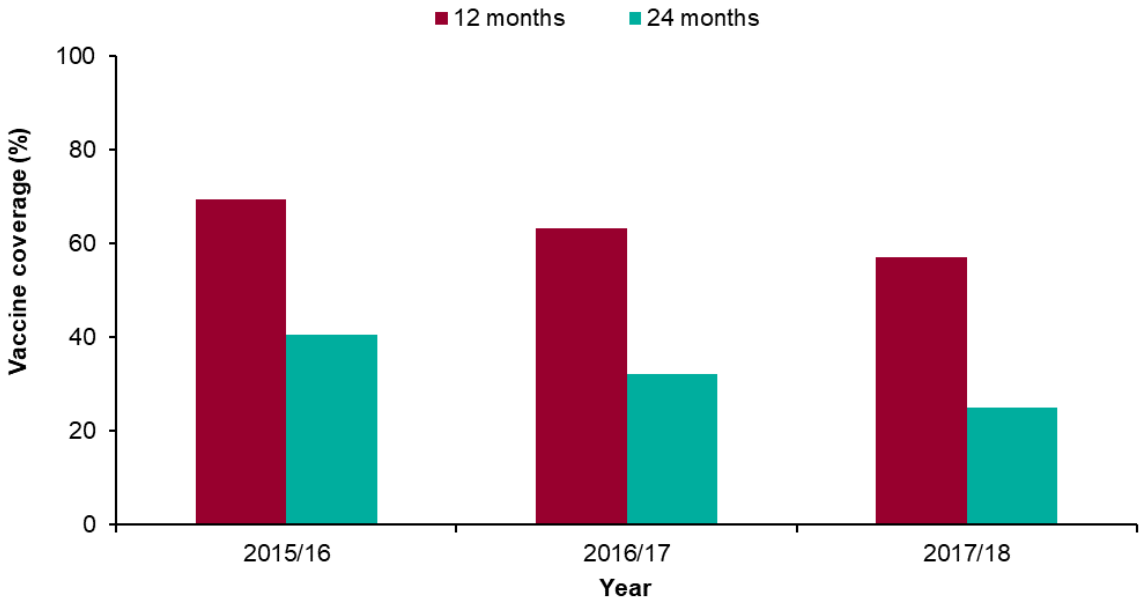
All babies in the UK born on or after 1 August 2017 are offered 3 doses of hepatitis B-containing vaccine as part of the NHS routine vaccination schedule. These doses are given at 8, 12 and 16 weeks of age.

Babies at high risk of developing hepatitis B infection from infected mothers are given additional doses of hepatitis B vaccine at birth, 4 weeks and also at 1 year of age.

For hepatitis B given as part of the routine vaccination schedule, vaccination coverage data are not yet available.

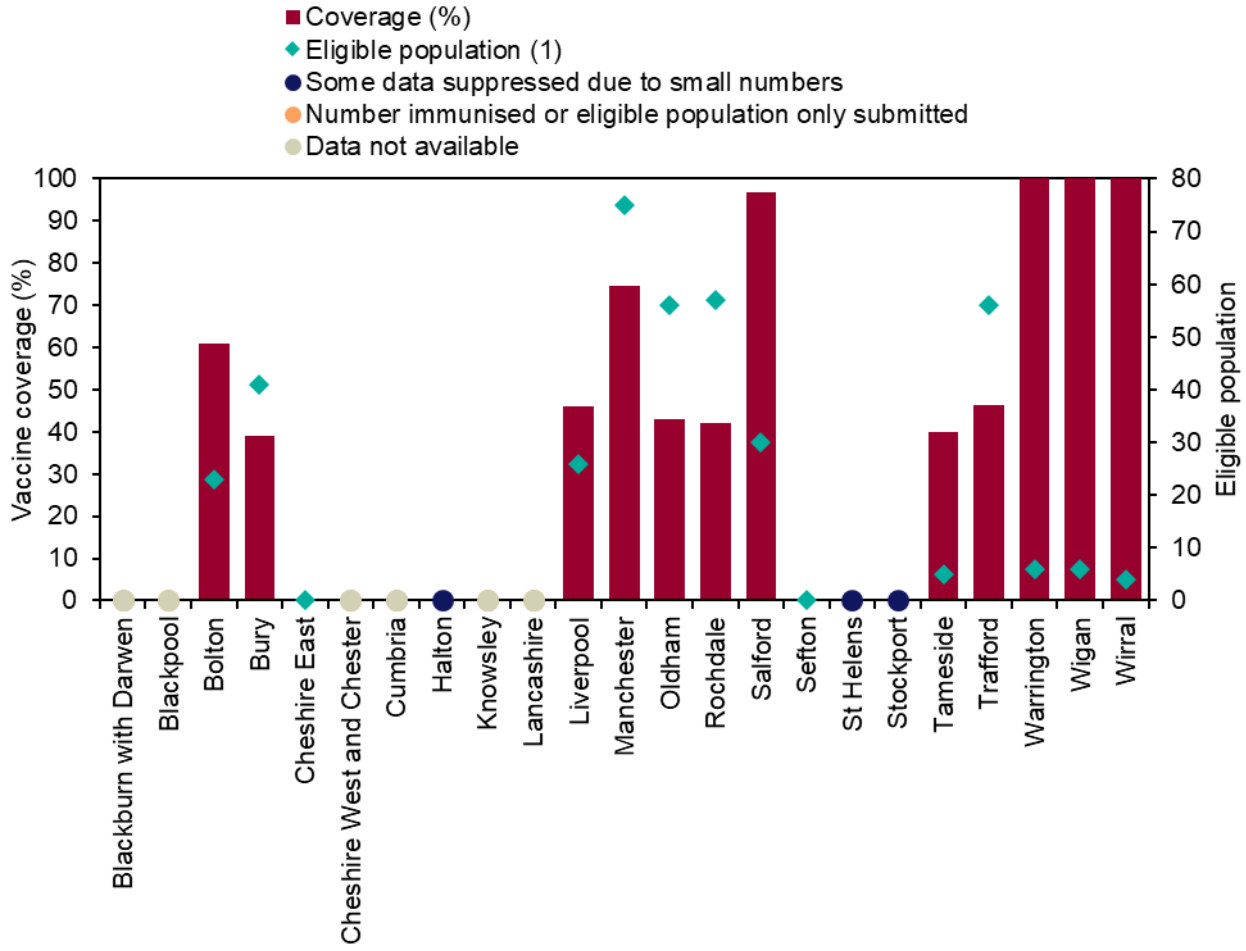
From 2015 to 2016 and 2017 to 2018, the coverage rate in the North West for exposed babies reaching 12 months of age fell from 69% to 57%. This data captures completion of the first 3 doses of the hepatitis B vaccine. In the same period, the coverage rate for exposed babies reaching 24 months of age fell from 40% to 25%. The coverage has decreased consecutively for the last 5 years. This decrease in vaccine coverage is likely to be due to lack of recording of vaccinations. The data for coverage at 24 months provides information on uptake of the hepatitis B booster vaccination at 12 months. It also provides an indication of the proportion of exposed babies being tested for hepatitis B infection.

Figure 10: Neonatal hepatitis B vaccine coverage at 12 and 24 months, North West, 2015 to 2016 and 2017 to 2018



The vaccination coverage differed substantially between local authorities. For detail on the coverage by local authority, please see Figure 11.

Figure 11: Children vaccinated against hepatitis B by their 1st birthday by Local Authority: vaccine coverage and eligible population, North West, 2017 to 2018



Preventing hepatitis B infection in people who inject drugs

A range of interventions are commissioned by local authorities aimed at reducing the burden of viral hepatitis in people who inject drugs (PWID). These include provision of services to needle exchange and injecting paraphernalia to PWID, advice on injecting behaviour and hepatitis B vaccination of service users. Data from the Unlinked Anonymous Monitoring Survey of people who inject drugs in contact with specialist services can be used to review injecting behaviour against the prevalence of hepatitis B core antibody (anti-HBc). For full details, please see the most recent report and data tables here: www.gov.uk/government/statistics/people-who-inject-drugs-hiv-and-viral-hepatitis-monitoring

The prevalence of hepatitis B core antibody (anti-HBc) increased in 2017 to 28%. There is an association between reported injecting behaviour and exposure to hepatitis B infection (Figure 12).

Figure 12: Anti-HBc prevalence among PWID, North West, 2008 to 2017

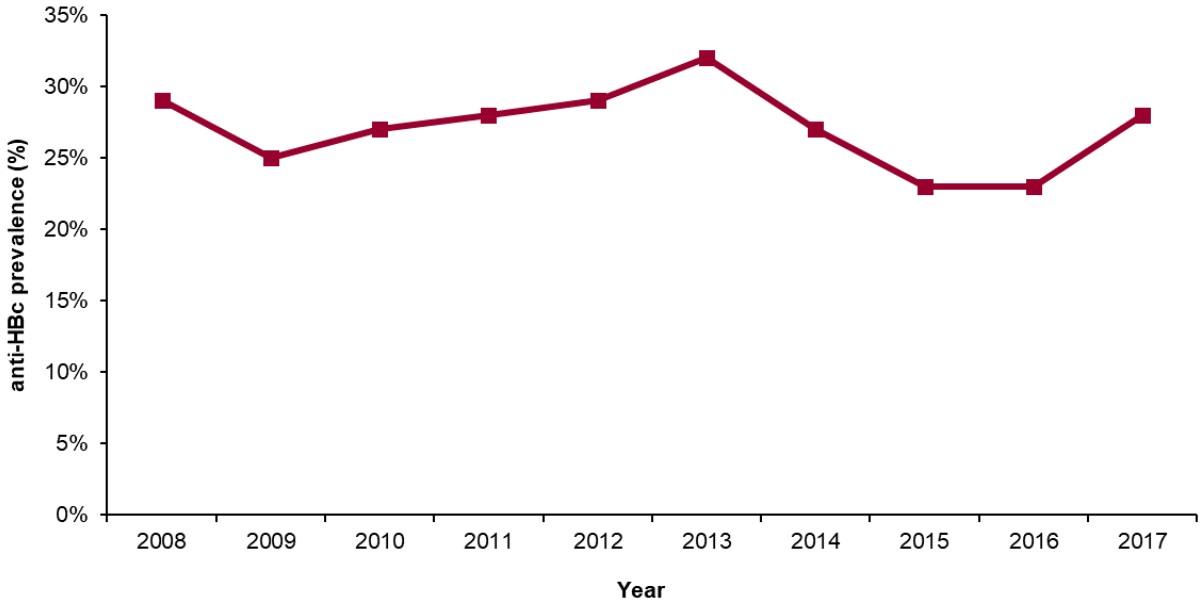
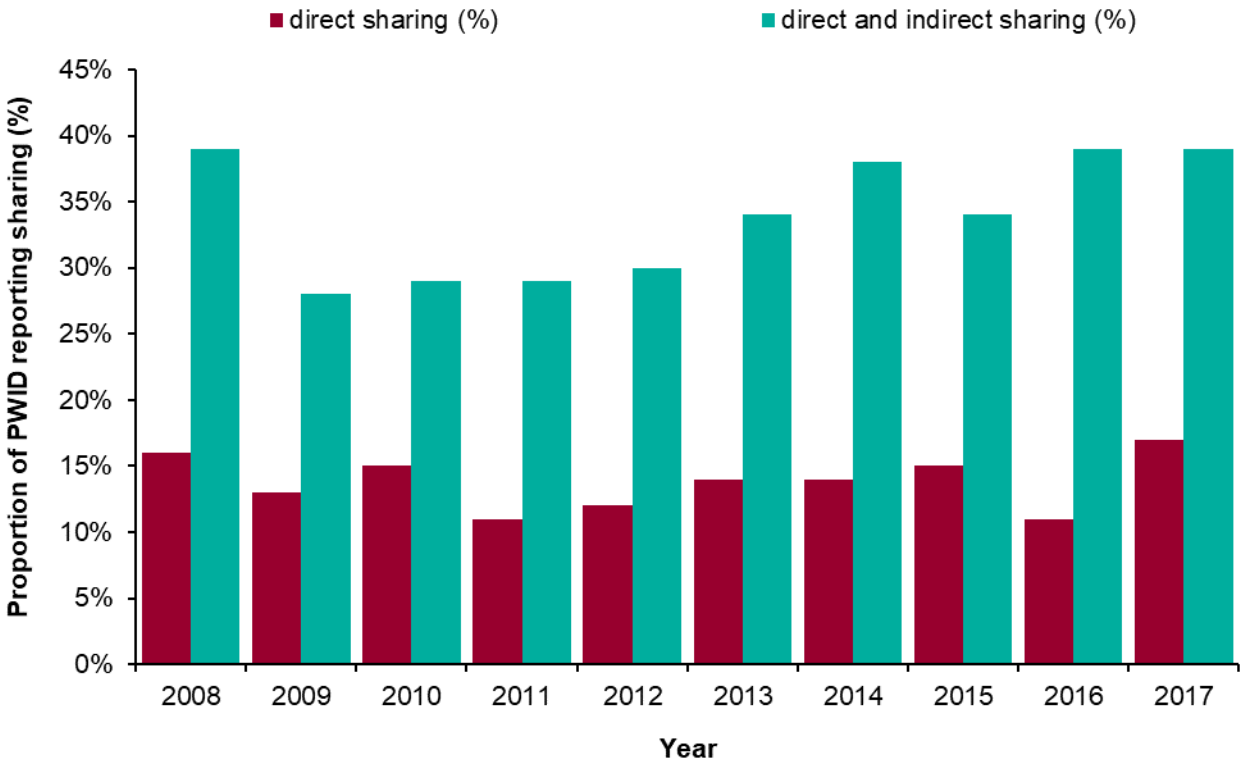


Figure 13: Self-reported sharing of injecting equipment among PWID, North West, 2008 to 2017



The National Drug Treatment Monitoring System reports HBV vaccination completion for all clients in community drug and alcohol treatment services. The average vaccination completion rate for the North West is 9.1%, slightly higher than the England average (8.7%). However, there is significant disparity with local authorities' rates of completion varying between 1% and 30% in 2016/17 (Figure 14).

Figure 14: Persons entering substance misuse treatment – Percentage of eligible persons completing a course of hepatitis B vaccination 2016 to 2017

Area	Value	Lower CI	Upper CI
England	8.1	7.9	8.3
North West region	9.5*	8.9	10.1
Blackburn with Darwen	10.4	7.6	14.0
Blackpool	26.6	22.1	31.6
Bolton	16.4	12.9	20.6
Bury	2.7	1.2	5.7
Cheshire East	12.7	8.9	17.7
Cheshire West and Chest...	3.1	1.6	6.0
Cumbria	13.1	9.3	18.1
Halton	30.4	22.3	39.9
Knowsley	36.5	30.1	43.4
Lancashire	10.6	8.9	12.5
Liverpool	2.3	1.6	3.3
Manchester	4.9	3.5	6.9
Oldham	3.0	1.5	5.9
Rochdale	3.9	2.5	5.9
Salford	16.5	10.8	24.4
Sefton	3.7	2.3	6.1
St. Helens	2.1	1.0	4.3
Stockport	*	-	-
Tameside	2.3	1.0	5.3
Trafford	*	-	-
Warrington	34.8	27.3	43.2
Wigan	5.3	3.6	7.6
Wirral	16.4	13.7	19.5

Source: Public Health England, National Drug Treatment /monitoring System (NDTMS)

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