



NORTHERN IRELAND AGAINST HEPATITIS

Find The Missing Millions.

NI Regional Hepatitis B&C
Managed Clinical Network
Annual Report 2018

We are delighted to present the 2018 report of the Northern Ireland Hepatitis B & C Managed Clinical Network.

This report highlights the ongoing work across Northern Ireland to target those particularly at risk of acquiring hepatitis B and C with access to harm reduction, testing and treatment. We would like to thank everyone who is part of this for their hard work and commitment.

This year we have undertaken work focusing on people who inject drugs, who are particularly at risk of contracting blood borne viruses (BBV). We have provided training for those who work in the sector and those working in the prisons as well as prisoners. Work has also been carried out to increase the number of places offering needle exchange services throughout Northern Ireland.

We are pleased to report a decrease or stabilizing of the numbers of people diagnosed with hepatitis B and C over recent years along with an increase in those treated and cured of their hepatitis C infections.

The introduction of hepatitis B vaccine as part of the routine childhood immunisation schedule also offers an opportunity for longer term control of hepatitis B infections.

There is still a long way to go to meet the WHO goals of eliminating viral hepatitis as a public health threat by 2030 but working together we are making real progress which we will build on in the coming years.



Dr. Lucy Jessop
Chair of Managed Clinical Network



Dr. Neil McDougall
Clinical Lead

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HEPATITIS B

Hepatitis B virus (HBV) is a blood borne virus that can cause serious liver disease, however a safe and effective vaccine is available to protect individuals from infection. Hepatitis B virus is transmitted between people by contact with the blood or other body fluids (i.e. semen and vaginal fluid) of an infected person. Hepatitis B is transmitted parenterally and sexually. Transmission most commonly occurs following sexual intercourse, as a result of blood to blood contact, including injury with contaminated sharp instruments or other equipment by people who inject drugs or by perinatal transmission from mother to child.

Hepatitis B is most common in sub-Saharan Africa, Asia, South America and southern parts of eastern and central Europe, the Middle East and the Indian subcontinent.

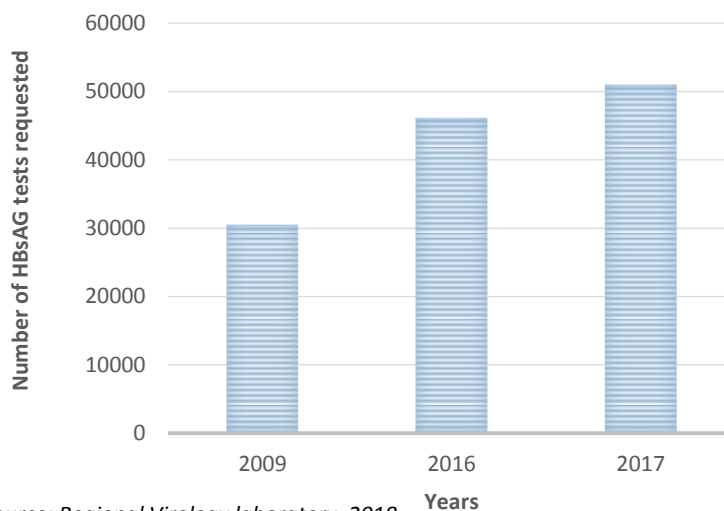
THE EPIDEMIOLOGY OF HEPATITIS B IN NORTHERN IRELAND 2007-2017

Northern Ireland is a very-low prevalence country for HBV with an average of 90 -120 new cases being diagnosed every year. In Northern Ireland, a total of 98 Hepatitis B infections were reported in 2017. 6 of which were acute infection and 92 chronic infections, of this 13 were new antenatal cases (figure 2).

Some of these infections will have been related to sexual transmission or injecting drug use; however, risk factor information is not available for the majority of cases.

Certain ethnic groups living in Northern Ireland have strong links with parts of the world with high rates of HBV infection (sub-Saharan Africa, most of Asia, the Pacific, the Amazon, the southern parts of Eastern and Central Europe and the Middle East) and are particularly vulnerable to on-going risk of HBV transmission.

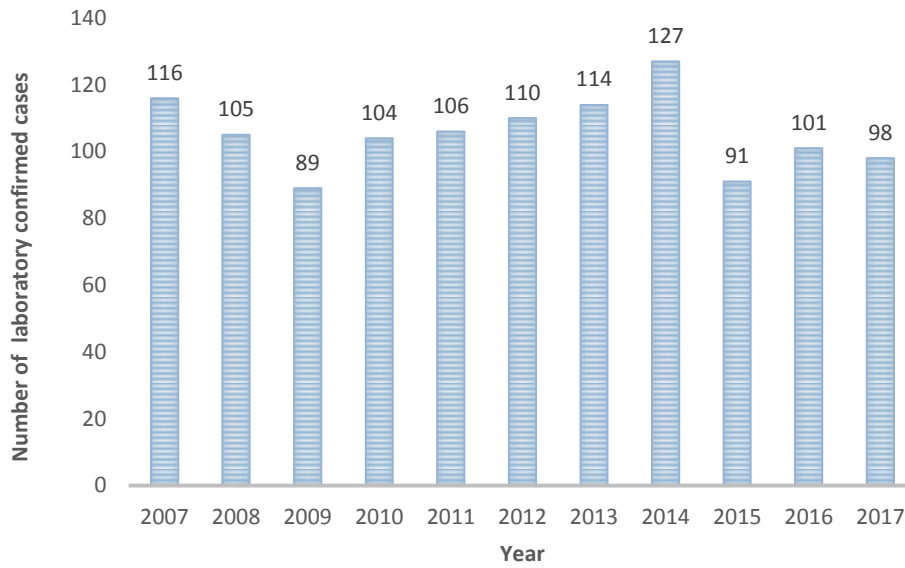
FIGURE 1: NUMBER THE HEPATITIS B TEST REQUESTS IN NORTHERN IRELAND, 2009 - 2017



Source: Regional Virology laboratory, 2018

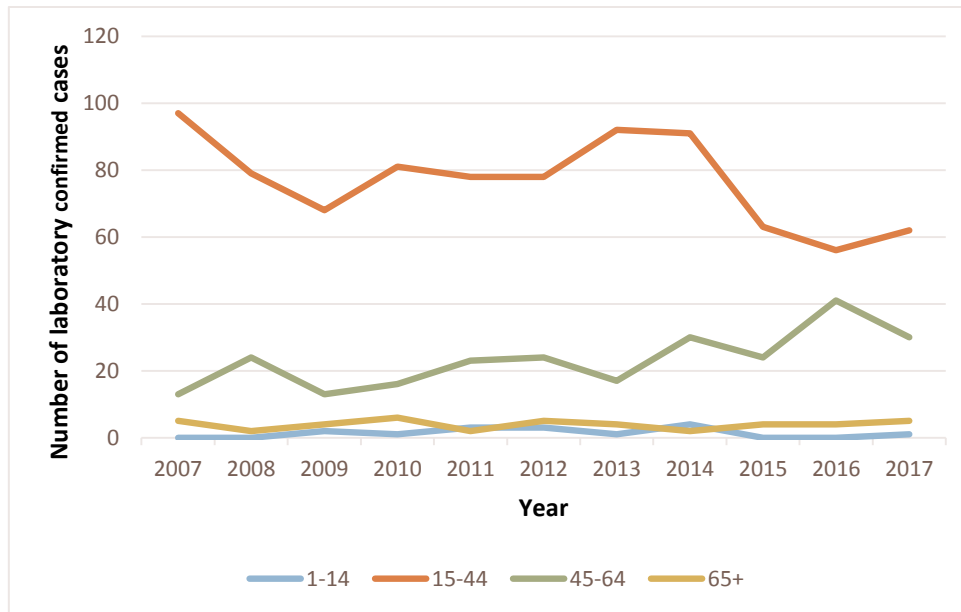
Hepatitis B test requests have risen from 30500 in 2009 to 50957 in 2017. This accounts for a 67% increase.

FIGURE 2: TOTAL NUMBER OF LABORATORY CONFIRMED CASES OF HEPATITIS B DIAGNOSED EACH YEAR, NORTHERN IRELAND, 2007-2017



Source: Regional Virology Laboratory/PHA

FIGURE 3: LABORATORY CONFIRMED CASES OF HEPATITIS B BY AGE GROUP, NORTHERN IRELAND, 2007-2017



Source: Regional Virology Laboratory/PHA 2018

The age group most affected by Hepatitis B are the 15-44 year old age bracket with 74% (73/98) of those infected falling in this age group (figure 3). Of the children (1-14) years tested, numbers remain very low in 2017.

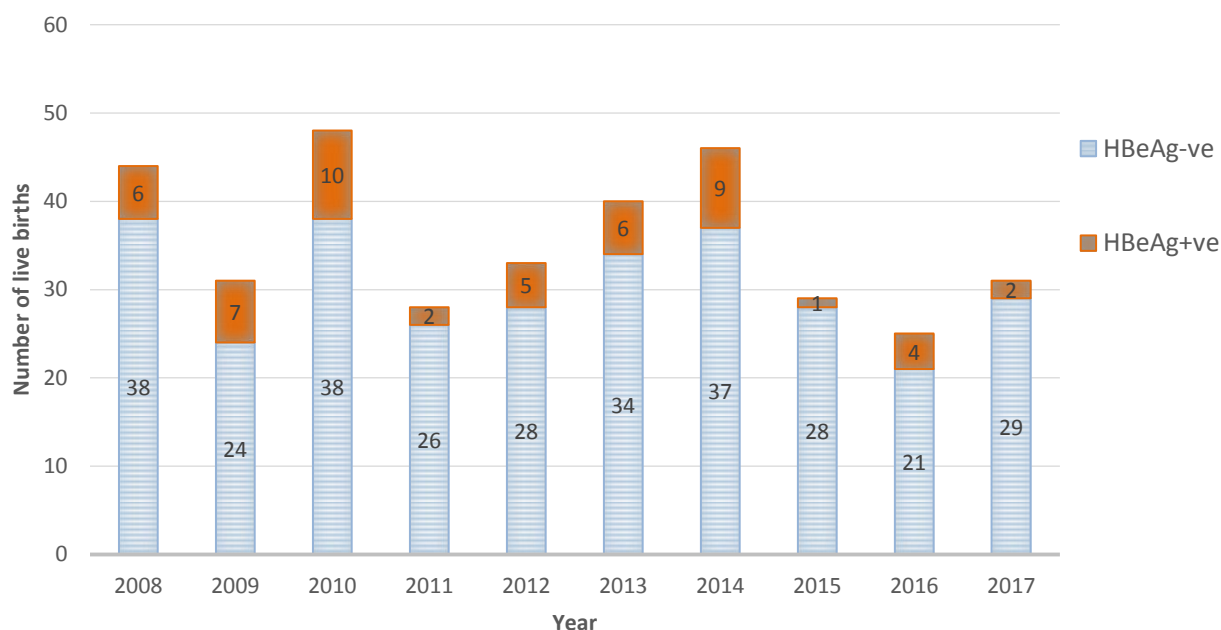
TREATMENTS FOR HEPATITIS B

All treatment of Chronic Hepatitis B in NI is based at the Royal Victoria Hospital Liver Unit. Patients are treated in line with NICE guidelines (NICE CG165) using either Pegylated Interferon for up to 48 weeks or long term oral antiviral therapy. In addition, the antenatal hepatitis B pathway results in treatment of 2-3 women per year with oral antiviral therapy in the last trimester of pregnancy to reduce the risk of transmission of hepatitis B to the neonate.

HEPATITIS B NOTIFICATION

Notifications of acute and chronic hepatitis B are reported to the duty room of the Public Health Agency (PHA) in Northern Ireland. PHA recommends a suite of actions that include all patients with chronic hepatitis B being advised to be referred for specialist follow up to hepatology. All pregnant women (figure 4) who are hepatitis B positive should be referred and seen by a Hepatology consultant as per local protocol, to assess the need for any antenatal treatments to reduce the risk of mother to baby transmission of hepatitis B.

FIGURE 4: NUMBER OF LIVE BIRTHS (DOB 2008-2017) TO HEPATITIS B POSITIVE MOTHERS, NORTHERN IRELAND



Source: Regional Virology Laboratory/PHA 2018

Figure 4 shows the total number of live births to Hepatitis B positive mothers since 2008, with 31 babies being born in 2017.

HEPATITIS B VACCINATION PROGRAMME

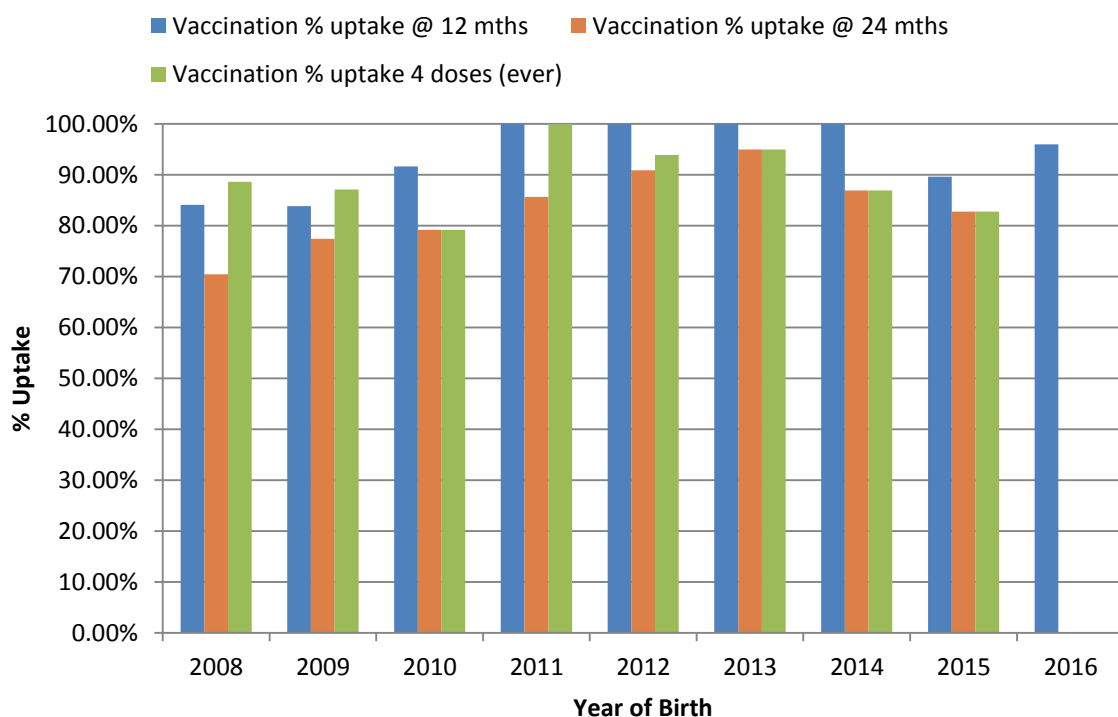
Hepatitis B vaccine is offered to those thought to be at increased risk of hepatitis B or its complications.

The vaccine gives protection against the hepatitis B virus, which is a major cause of serious liver disease, including scarring of the liver (cirrhosis) and liver cancer.

Hepatitis B vaccine was introduced for babies from August 2017 in the UK, making it one of the last countries in Europe to introduce a universal hepatitis B vaccination programme for infants. Hepatitis B vaccination is offered to all babies at 8, 12 and 16 weeks of age.

Data for the uptake of hepatitis B vaccine in the universal immunization programme is not yet available but it is likely to be above 95%, as was the case with the other vaccines offered at 8, 12 and 16 weeks of age.

FIGURE 5. HEPATITIS B VACCINATION UPTAKE (DOB 2008-2016), NORTHERN IRELAND



Source: Northern Ireland Child Health System 2018

Babies born to mothers who are hepatitis B positive are offered hepatitis B vaccine at birth, 1 and 12 months along with a blood test to check for infection at 12 months, as well as the routine immunisations.

The immunisation uptake is monitored at the age of 12 and 24 months. The immunisation rate of these babies is around 90%. Some babies can become lost to follow-up if they leave Northern Ireland.

HEPATITIS C

Hepatitis C is an infectious disease caused by the hepatitis C virus (HCV) that primarily affects the liver. The virus persists in the liver in about 75% to 85% of those initially infected. Early on chronic infection typically has no symptoms. Over many years however, it can lead to chronic liver disease and cirrhosis. In some cases, those with cirrhosis will develop complications such as liver failure and liver cancer.

HCV is spread primarily by blood-to-blood contact associated with intravenous drug use, poorly sterilized medical equipment, needle-stick injuries in healthcare, and transfusions.

Hepatitis C is found worldwide. The most affected regions are Eastern Mediterranean and European Regions, with the prevalence of 2.3% and 1.5% respectively. Prevalence of HCV infection in other regions varies from 0.5% to 1.0%. Depending on the country, hepatitis C virus infection can be concentrated in certain populations (for example, among people who inject drugs) and/or in general populations.

More detailed information on the epidemiology of hepatitis C in the UK is published annually by Public Health England. Available at:

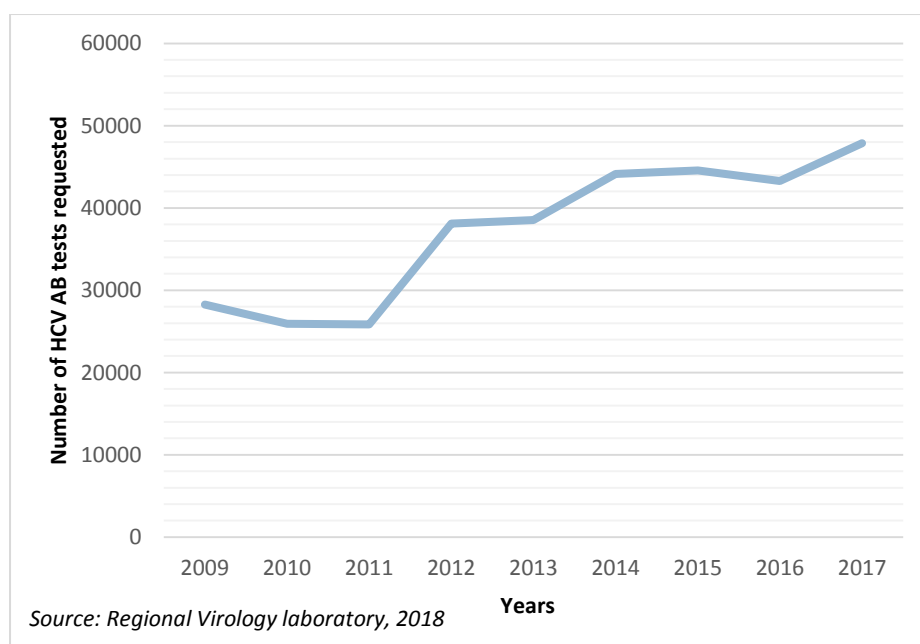
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/632465/HCV_in_the_uk_report_2017.pdf

THE EPIDEMIOLOGY OF HEPATITIS C IN THE UK

In the UK, it is estimated that around 214,000 people are living with chronic HCV. Injecting drug use continues to be the most important risk factor for infection with around half of people who inject drugs (PWID) thought to have been infected in England and Wales, with levels being lower in Northern Ireland (23%) but higher in Scotland (55%) – (Hepatitis C in UK Report - 2017).

Hepatitis C remains the most common blood-borne infection among people who inject drugs (PWID), and there are significant levels of transmission among this group in the UK. Two in every 5 PWID are living with hepatitis C and approximately half of these infections remain undiagnosed (Shooting up, 2017)

FIGURE 6: NUMBER THE HEPATITIS C TEST REQUESTS IN NORTHERN IRELAND, 2009 - 2017



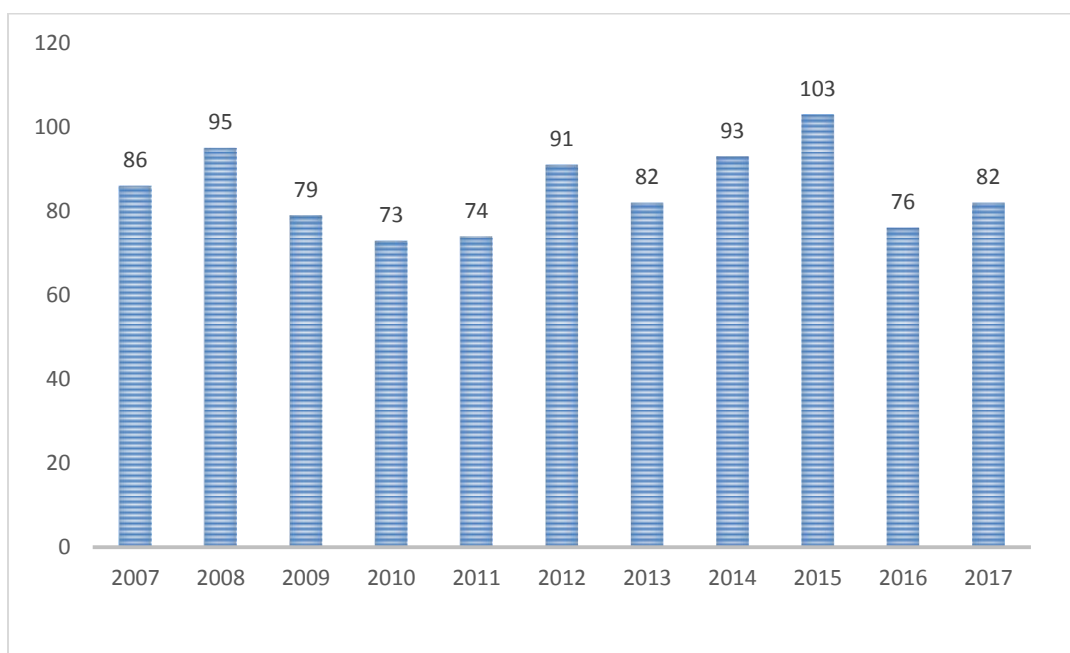
Requests for hepatitis C testing has increased over the years from 28256 HCV antibody tests in 2009 to 47864 HCV antibody tests in 2017. That is a 69% increase in the number of tests requested over this period.

THE EPIDEMIOLOGY OF HEPATITIS C IN NORTHERN IRELAND 2007-2017

Northern Ireland is a very-low prevalence country for HCV with an average of 80 -100 new HCV PCR positive cases being diagnosed every year (figure 7).

The cumulative total of laboratory confirmed cases of hepatitis C PCR positive in Northern Ireland from 1990 to 2017 is 3039.

FIGURE 7: LABORATORY CONFIRMED HCV PCR POSITIVE CASES, NORTHERN IRELAND, 2007-2017

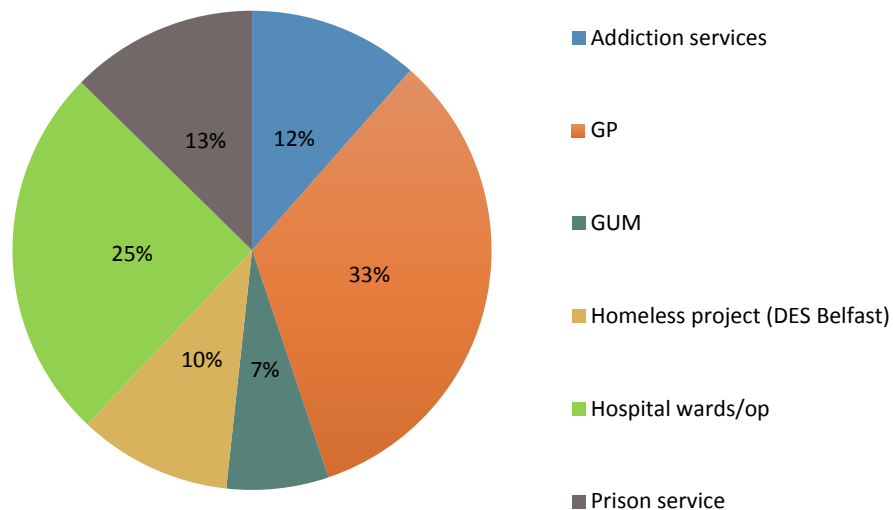


Source: Regional Virology Laboratory/RVH Database 2018

Information supplied by the Regional Virus Laboratory shows that there are approximately twice as many males being diagnosed with Hepatitis C than females. Of the 82 hepatitis C positive cases diagnosed in 2017, 58 (70%) were male and 24(30%) were female.

The majority of confirmed cases of hepatitis C were detected in persons aged from 15 to 44 years old with 42% of those diagnosed in 2017 being aged 30 -40 years of age.

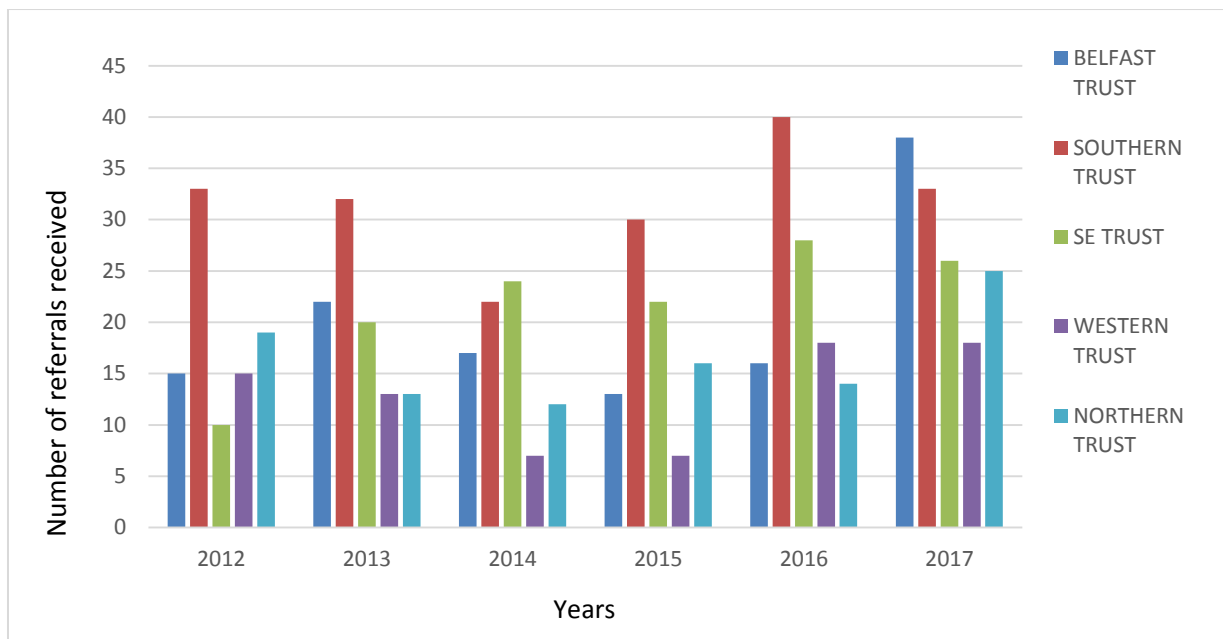
FIGURE 8: SOURCE OF HEPATITIS C PCR POSITIVE CASES IN 2017



Source: Regional Virology Laboratory 2018

In 2017, the majority of hepatitis C blood test requests came from Primary care.

FIGURE 9: REFERRALS RECEIVED FOR SPECIALIST ASSESSMENT OF HEPATITIS C PER TRUST AREA. NORTHERN IRELAND, 2012 - 2017

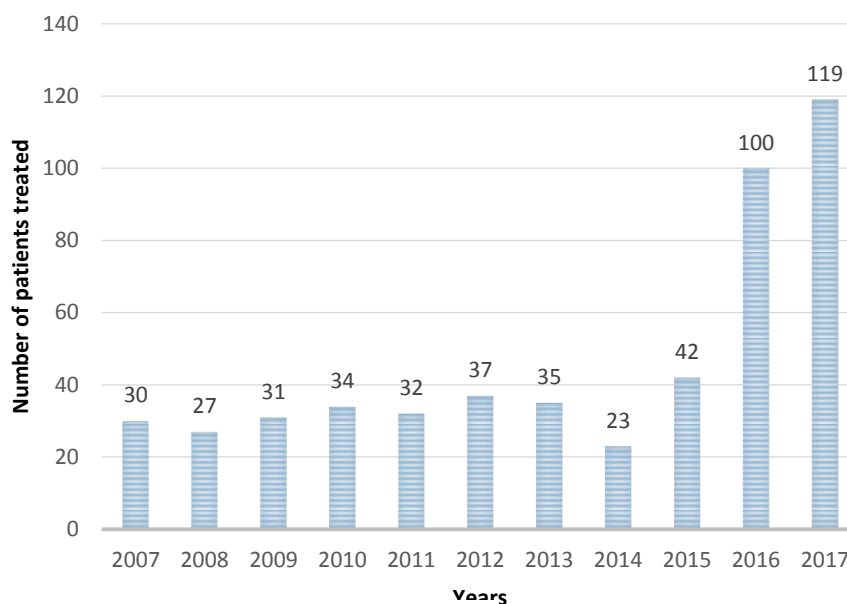


Referrals for specialist assessment of Hepatitis C (HCV) come from all over Northern Ireland with 27% of all referrals received in 2017 being received from the Belfast Trust Area and 24 % from the Southern trust area

TREATMENTS FOR HEPATITIS C

Treatment of HCV infection has changed dramatically in recent years. Interferon-based treatments have been replaced by all-oral therapies lasting 8 -12 weeks with fewer side effects and cure rates in excess of 95%. The number of patients treated for HCV in NI during 2016-2017 increased significantly due to an initiative to make the new all-oral therapies available to those who had been waiting for interferon-free treatment after previous treatment failure (figure 9).

FIGURE 9: HEPATITIS C TREATMENT INITIATIONS IN NORTHERN IRELAND, 2007-2017



Source: Local RVH database/ Regional Hepatology clinic 2018

A review of all treatments with interferon free all-oral HCV treatment in 2016 demonstrated a success rate (clearance of HCV) of 97%. All end of treatment results are not yet available for all those treated in 2017.

TABLE 1: ROUTE OF HCV TRANSMISSION RECORDED BY PATIENTS PRESENTING FOR TREATMENT, NORTHERN IRELAND, 2007-2017

Route (where recorded 2007-2017)	Number (%)
PWID	486(69.6 %)
Blood/blood products	28(4.0%)
Sex	37(5.3%)
Needle stick injury	5(0.7%)
Tattoo	47(6.7%)
Overseas healthcare	28(4.0%)
Mother to baby and household	1(0.1%)
Other	11(1.6%)
Unknown	56(8.0%)
TOTAL	699(100%)
Data Source: Regional Hepatology Unit, Belfast Hospital and Social Care Trust 2018	

Source: RVH local HCV database 2018

Of those patients presenting for specialist assessment between 2007 and 2017, who could recall the possible route of infection, the largest proportion of HCV infections (69.6%) could be attributed to injecting drug use (Table 1).

HCV disproportionately affects populations who are marginalized and underserved and have poorer access to healthcare and health outcomes (Hep C in UK 2016).

NEEDLE EXCHANGE SERVICES IN NORTHERN IRELAND

Harm reduction interventions for PWID, including access to sterile injecting equipment and effective drug dependence treatment, can prevent and control HCV among PWID. Optimal access to clean injecting equipment and opioid substitution treatment (OST) is crucial in curbing the spread of HCV, particularly given that it also has the potential to prevent reinfection after treatment.

The Northern Ireland Needle Syringe Exchange Scheme is a low threshold service for injecting drug users. It aims to help limit the spread of blood borne viruses such as HIV and Hepatitis B and C through providing sterile injecting equipment and safely disposing of used injecting equipment. Needle exchanges also provide advice, information and support to reduce the harms resulting from injecting, and support clients to access other relevant services, including treatment services.

There are 21 static needle exchanges in Northern Ireland: 20 are Community Pharmacy based, and there is one Trust based service in Ballymena. The Public Health Agency also funds 5 Low Threshold Services (one in each Trust area) and these provide an outreach needle exchange service.

Between April 2016 and March 2017, there were 29,283 visits to a needle exchange. This was an increase of 1% on the previous year's visits. Of those visits, 61% were by clients reporting injecting opioids, and 36% were by clients reporting injecting steroids and / or for tanning.

A total of 35,573 packs were given out, a decrease of 2% on the previous year.

The provision of effective interventions to reduce risk and prevent and treat infections needs to be maintained. These interventions include needle and syringe programmes, opioid substitution treatment and other treatments for drug misuse and dependence (Shooting up, 2017).

INCREASE IN CASES OF HEPATITIS C INFECTIONS IN NORTHERN IRELAND AMONGST PWID

In Northern Ireland, an increase in cases of hepatitis C among PWID was detected in 2016-17. This highlights the ongoing risk hepatitis C in PWID, particularly in tight networks, and the need for ongoing surveillance to detect cases quickly to allow for an appropriate response. Northern Ireland has lower levels of infection with hepatitis C in its PWID population compared with the rest of the UK in the UAM study- anti-HCV prevalence in 2017 Northern Ireland 23%; Wales 50%, and England 66% (UAM, 2018).

In 2016, through screening of PWID by the homeless nursing service, 3 cases of recently acquired hepatitis C infections were diagnosed, which were a cause for concern. The injecting networks of these cases were identified and targeted for screening and harm reduction education. The screening identified that those at risk are mainly injecting heroin and, despite the availability of clean injecting packs and education on blood-borne virus transmission, they are still sharing injecting equipment such as spoons and filters. This enhanced testing is still ongoing as more people at risk of acquiring infection are identified, mainly via the public health homeless nursing team.

The situation is being managed by raising awareness of the risks of blood-borne virus transmission among users and also those working with them, e.g. homeless hostel staff. There has been increased testing of PWID for blood-borne viruses including the introduction of dried blood spot testing and increased availability of clean injecting equipment. New users have been identified through the enhanced screening which has allowed them to be referred to drug addiction services and for hepatitis C treatment.

BBV AWARENESS TRAINING IN PRISONS IN NORTHERN IRELAND



(Image by AndyAitchison.uk)

Blood Borne Viruses (BBV) are a serious public health concern. If undiagnosed and untreated they can cause severe illness and even death, yet they are preventable and treatable diseases. Prisons are not isolated institutions and failing to respond effectively to these BBVs puts everyone at risk; prisoners, their families and the wider community. (NAT, 2017)

There is a much higher prevalence of these BBVs in the prison population than the general population. Providing education and information on prevention in prisons is important as practices which increase the risk of BBV transmission; sharing injecting equipment, unprotected sex and tattooing - continue to take place in prison (NAT, 2017).

All staff working within Prisons should receive basic BBV training so they can identify transmission risks and know how to prevent them. Advanced training can include additional information about living with BBVs, from treatment to the stigma and discrimination faced by some people.

The risk of BBV transmission from prisoners to staff is extremely low. However all staff should still be made aware of health and safety procedures which includes the use of universal precautions. Proper use of universal precautions, such as wearing disposable gloves when handling anything contaminated with blood, will prevent transmission of BBVs (NAT, 2017) (HSE 2018)

Since Oct 2017 the Hepatitis B&C Network and South Eastern HSC Trust (SET) Health Development have been delivering BBV awareness sessions as part of new prison officer's induction programme, with 137 new recruits attending BBV awareness sessions from Dec 2017 – June 2018. The Network has also delivered several BBV awareness sessions for other staff working within Prisons, including prison officers and SET prison healthcare staff and also for prisoners across the 3 prisons in NI. To date a further 170 staff working in the prisons and 146 prisoners have attend blood borne virus awareness sessions.

Currently SET prison healthcare services offer BBV screening and Hepatitis B vaccination to all people committed to prison. BBV screening is offered within an opt-in model of service provision. Prisons in other parts of the UK have introduced an opt-out model for BBV screening and this approach planned to be introduced into the Prisons in NI in 2018/19. It is anticipated that this will result in an increased uptake of BBV screening and detection among the prisoner population.

LOOKING AHEAD TO 2020 AND BEYOND

The WHO have developed a Global Health Sector Strategy for Viral Hepatitis with the aim to eliminate viral hepatitis as a public health threat by 2030²³.

In Northern Ireland the upscaling of the new and highly effective hepatitis C treatments and the introduction of hepatitis B vaccine for babies into the routine schedule means that this goal is moving a step closer in Northern Ireland.

In 2018, the Hepatitis B and C Managed Clinical Network plans to work with the Department of Health in Northern Ireland to produce an Action Plan towards the WHO elimination goals (WHO, 2016).

APPENDIX 1: GLOBAL HEALTH SECTOR STRATEGY FOR VIRAL HEPATITIS²³

TARGET AREA	BASELINE 2015	2020 TARGETS	2030 TARGETS
Impact targets			
Incidence: New cases of chronic viral hepatitis B and C infections	Between 6 and 10 million infections are reduced to 0.9 million infections by 2030 (95% decline in hepatitis B virus infections, 80% decline in hepatitis C virus infections)	30% reduction (equivalent to 1% prevalence of HBsAg* among children)	90% reduction (equivalent to 0.1% prevalence of HBsAg among children) ⁹
Mortality: Viral hepatitis B and C deaths	1.4 million deaths reduced to less than 500 000 by 2030 (65% for both viral hepatitis B and C)	10% reduction	65% reduction
Service coverage targets			
Hepatitis B virus vaccination: childhood vaccine coverage (third dose coverage)	82% ¹¹ in infants	90%	90%
Prevention of hepatitis B virus mother-to-child transmission: hepatitis B virus birth-dose vaccination coverage or other approach to prevent mother-to-child transmission	38%	50%	90%
Blood safety	39 countries do not routinely test all blood donations for transfusion-transmissible infections 89% of donations screened in a quality-assured manner ¹²	95% of donations screened in a quality-assured manner	100% of donations are screened in a quality-assured manner
Safe injections: percentage of injections administered with safety-engineered devices in and out of health facilities	5%	50%	90%
Harm reduction: number of sterile needles and syringes provided per person who injects drugs per year	20	200	300
Viral hepatitis B and C diagnosis	<5% of chronic hepatitis infections diagnosed	30%	90%
Viral hepatitis B and C treatment	<1% receiving treatment	5 million people will be receiving hepatitis B virus treatment 3 million people have received hepatitis C virus treatment (Both targets are cumulative by 2020)	80% of eligible persons with chronic hepatitis B virus infection treated 80% of eligible persons with chronic hepatitis C virus infection treated

9 The abbreviation "HBsAg" refers to hepatitis B virus surface antigen. It should be noted that some of WHO's regional committees have already endorsed region-specific targets. 1% is to be taken as the global average.

10 Documentation of the 0.1% HBsAg will require development of new methods for validation that should be developed in the light of all available efforts to eliminate mother-to-child transmission of the hepatitis B virus, such as the use of the hepatitis B vaccine and anti-viral medicines.

11 WHO/UNICEF coverage estimates 2013 revision, July 2014, see: http://apps.who.int/immunization_monitoring/globalsummary/

APPENDIX 1: MEMBERSHIP OF THE STEERING GROUP 2017

Dr	Lucy Jessop	Consultant in Health Protection, PHA	Chairperson of NI Hepatitis B&C MCN
Dr	Neil McDougall	Consultant Hepatologist, Belfast Trust(Clinical Lead)	Clinical lead for the NI Hepatitis B&C MCN
Dr	Ian Cadden	Consultant Hepatologist	Belfast Trust
Dr	Stephen Bailie	GP Unit	Health Board
Ms	Helen Creighton	Pharmacist	Health and Social Care Board
Mrs	Alison Griffiths	Health Protection Nurse	Public Health Agency
Dr	Conall McCaughey	Consultant Virologist	Belfast Trust
Ms	Seana Murray	Admin Support NI Hepatitis C Clinical Network	Belfast Trust
Mrs	Annelies McCurley	Regional NI Hepatitis C MCN Manager	Belfast Trust
Mrs	Orla McCormick	Hepatitis Specialist Nurse	Belfast Trust
Mrs	Karen Patterson	Hepatitis Specialist Nurse	Belfast Trust
Dr	Say Quah	Consultant in Genitourinary Medicine	Belfast Trust
Mrs	Lorna Hawe	Regional Antenatal Screening Programme Co-ordinator	Public Health Agency
Mrs	Victoria Creasy	Health and Social Wellbeing Improvement Senior Officer	Public Health Agency
Mrs	Tracey Heasley	Clinical Lead for SET Prison Nursing staff	South Eastern Trust
Ms	Gemma Wasson	Hepatology Pharmacist	Belfast Trust
	Position vacant	Team Leader Substitute Prescribing Team and Prescribed Medication Team	
	Position vacant	Addiction Services	

REFERENCES

1. Bromley Briefings: Prison the facts, Prison Reform Trust, Summer 2017. Available at: <http://www.prisonreformtrust.org.uk/publications/factfile> (Last accessed June 2018)
2. Centre for Disease Control And Prevention (CDC) (2015). Available at: <http://www.cdc.gov/hepatitis/HBV/index.htm> (Last accessed May 2017)
3. DOH - Department of Health (2011) Hepatitis B antenatal screening and new-born immunisation programme. Best practice guidance. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215622/dh_132637.pdf (Last accessed May 2017)
4. DOJ Department of Justice (2014) The safety of prisoners held by the Northern Ireland Prison Service, Criminal Justice Inspection Northern Ireland. Available at: <https://www.justice->

- [ni.gov.uk/sites/default/files/publications/doj/the-safety-of-prisoners-report-10-14.pdf](https://www.gov.uk/sites/default/files/publications/doj/the-safety-of-prisoners-report-10-14.pdf) (Last accessed June 2018)
5. Hepatitis C in England - The Health Protection Agency Annual Report 2017. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/599738/hepatitis_c_in_england_2017_report.pdf (Last accessed May 2017)
 6. Harris RJ, Ramsay M, Hope VD, Brant L, Hickman M, Foster GR, et al (2012). Hepatitis C prevalence in England remains low and varies by ethnicity: an updated evidence synthesis. *European Journal of Public Health* 2012; 22(2):187-92. Available at: [http://research-information.bristol.ac.uk/en/publications/hepatitis-c-prevalence-in-england-remains-low-and-varies-by-ethnicity-an-updated-evidence-synthesis\(6bc37a49-a078-40aa-8185-d66327389946\)/export.html](http://research-information.bristol.ac.uk/en/publications/hepatitis-c-prevalence-in-england-remains-low-and-varies-by-ethnicity-an-updated-evidence-synthesis(6bc37a49-a078-40aa-8185-d66327389946)/export.html) (Last accessed May 2017)
 7. HSE (The Health and Safety Executive) guidance on Blood-Borne Viruses in the work place. Available at: <http://www.hse.gov.uk/pubns/indg342.pdf>
 8. National Aids Trust (NAT) 2017. Tackling Blood-Borne Viruses A framework for prisons in the UK. Available at: https://www.nat.org.uk/sites/default/files/tackling_BBVS_in_prison2017.pdf (Last accessed June 2018)
 9. NICE Clinical guideline 165 (June 2013). Hepatitis B (chronic). Diagnosis and management of chronic hepatitis B in children, young people and adults. June 2013. Available at: <https://www.nice.org.uk/guidance/cg165> (Last accessed May 2017)
 10. NICE. Hepatitis B and C testing: people at risk of infection. NICE guidelines [PH43] 2013. Available at: <https://www.nice.org.uk/guidance/ph43> (Last accessed May 2018)
 11. Public Health England DoH. Hepatitis C in the UK 2015 report. London: Public Health England, 2015. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/448710/NEW_FINAL_HCV_2015_IN_THE_UK_REPORT_28072015_v2.pdf (Last accessed May 2018)
 12. Public Health England. The hexavalent DTaP/IPV/Hib/HepB combination vaccine: information for healthcare practitioners about the inclusion of hepatitis B vaccine in the routine infant immunisation programme. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/623743/Hexavalent_combination_vaccine_guidance_routine.pdf (Last accessed June 2018)
 13. Prevention and Control of Viral Hepatitis Infection: Framework for Global Action, <http://www.who.int/hiv/pub/hepatitis/Framework/en/> (Last accessed Aug 2018)
 14. UAM(2018) Data tables of the Unlinked Anonymous Monitoring Survey of HIV and Hepatitis in People Who Inject Drugs. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729614/hpr2718_uam-pwid.pdf (Last accessed July 2018)

15. UK National Screening Committee. Infectious diseases in pregnancy screening programme standards. 2016-2017. Available at: <https://phescreening.blog.gov.uk/2016/07/26/new-infectious-diseases-in-pregnancy-screening-handbooks-published> (Last accessed May 2017)
16. Shooting up: infections among people who inject drugs in the UK(2017). Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/663003/Shooting Up 2017 report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/663003/Shooting_Up_2017_report.pdf) (Last accessed June 2018)
17. SPS. Scottish Prison Service (2012) Hep C Prevalence and Incidence among Scottish Prisoners and Staff Views of its Management - Executive Summary. Available at: <http://www.sps.gov.uk/Corporate/Publications/Healthcare6.aspx> (Last accessed June 2018)
18. Tait JM, Stephens BP, McIntyre PG, Evans M, and Dillon JF (2015) Dry blood spot testing for hepatitis C in people who injected drugs: reaching the populations other tests cannot reach. *Frontline Gastroenterology*. Available at: www.ncbi.nlm.nih.gov (Last accessed June 2018)
19. The Royal Pharmaceutical Society (2017) Professional standards for optimising medicines for people in secure environments. Available at: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Professional%20standards/Optimising%20medicines%20in%20secure%20environments/Professional%20Standards%20Secure%20Environments-edition-2.pdf?ver=2017-05-18-112406-223> (Last accessed June 2018)
20. World Health Organization Regional Office for Europe (WHO). Available at: <http://www.euro.who.int/en/health-topics/communicable-diseases/hepatitis/data-and-statistics> (Last accessed May 2017)
21. World Hepatitis Day 2016: Speaking out on hepatitis, the “silent killer. Available at: <http://www.euro.who.int/en/health-topics/communicable-diseases/hepatitis/world-hepatitis-day/world-hepatitis-day-2016-speaking-out-on-hepatitis,-the-silent-killer> (Last accessed May 2017)
22. World Health Organisation (WHO) Hepatitis C Global Alert and response. Available at: <http://www.who.int/csr/disease/hepatitis/whocdcsrlyo2003/en/index4.html#endemicity> (Last accessed July 2016)
23. World Health Organisation (WHO) Global health sector strategy on viral hepatitis 2016-2021. Available at: <http://www.who.int/hepatitis/strategy2016-2021/ghss-hep/en/> (Last accessed Aug 2018)