Public Health England

Protecting and improving the nation's health

Hepatitis C in the UK
2015 report

Health Protection Scotland

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About Public Health England

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Foreword

I am delighted to introduce the 2015 annual report on hepatitis C in the UK which brings together national level data from all four countries on hepatitis C infection, prevalence, burden of disease, prevention, awareness, testing and diagnosis, and treatment and care. This report describes the progress that has been made in some areas in tackling hepatitis C infection but also highlights the work that still needs to be done to curtail the increasing burden of end stage liver disease and liver cancer caused by hepatitis C infection. There are an estimated 214,000 individuals chronically infected with hepatitis C in the UK. Deaths from hepatitis C related end stage liver disease and liver cancer have doubled over the last decade– the majority occurring in people under the age of 60 years. In an era of curative treatments and prevention options, we must question whether this is acceptable.

The majority of infected persons are from marginalised and under-served groups in society, such as people who inject drugs (PWID). In England and Wales, 50% of PWID are thought to be infected, with lower levels in Northern Ireland (23%) and higher levels in Scotland (57%). Addressing hepatitis C infection in these groups will contribute to combating the premature mortality from hepatitis C related liver disease and our goal of reducing health inequalities.

Evidence-based prevention initiatives provided by drug services to encourage safer injecting, such as needle and syringe programmes, or non-injecting practices, are a cornerstone of hepatitis C infection control. The report shows that over the last decade the level of sharing of needles and syringes among PWID has declined in most UK countries. We need to maintain this downward trend by continued investment in drug services and needle and syringe programmes, and by ensuring they provide an appropriate range of services with sufficient coverage.

More people with hepatitis C are getting tested, particularly in primary care, indicating that more and more conversations about hepatitis C infection are happening in community consultations –such as at pharmacies, GP surgeries and drug services. While this is promising news, the data on treatment initiation shows that the majority of chronically infected people are not treated successfully in spite of new, highly effective drugs which have the potential to cure most infected people. There is an urgent need in England for clear pathways to help individuals navigate the clinical process so that those who test positive do not fall through the net. Continuing to build an environment where stigma and discrimination does not prevent people from accessing services will underpin success across all areas.

We are, of course, acutely aware of the financial challenges to providing the breadth and depth of prevention, diagnosis and treatment services to curb the rise in morbidity

and mortality from hepatitis C related liver disease. I therefore welcome NHS England's Early Access Programme to allow people with compensated and decompensated cirrhosis to benefit from expensive yet cost-effective drugs while they proceed through the NICE approval and NHS England implementation process. Difficult decisions will need to be made around hepatitis C treatment prioritisation, without losing sight of the impact of hepatitis C infection at the personal and societal level. Through concerted and collective action, we should overcome the barriers to scale up hepatitis C prevention, testing, treatment and care over the next five years.

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Executive summary

The scale of the problem

The most recent national estimates suggest that around 214,000 individuals are chronically infected with hepatitis C (HCV) in the UK;[1],[2],[3],[4] most of this infection (~90%) is genotype 1 and genotype 3.

Injecting drug use remains the most important risk factor for HCV infection in the UK. Data from the 2014 Unlinked Anonymous Monitoring (UAM) survey of people who inject drugs (PWID) suggest that levels of infection in this group remain high with half of injecting drug users surveyed in England and Wales and almost a quarter in Northern Ireland testing positive for HCV infection.[5] In 2013/14, 57% of PWID surveyed in Scotland tested positive for antibodies to HCV.. In England and Wales, in a sub-survey of people who inject image and performance enhancing drugs among the participants in the UAM Survey , 3.6% tested positive for antibodies to HCV during 2012-13.[5]

While it is acknowledged that both hospital episode statistics and death certification underestimate true numbers of admissions and deaths from HCV-related end stage liver disease (ESLD) and hepatocellular carcinoma (HCC),[6],[7] over the last decade (2004-2013), hospital admissions from HCV-related ESLD and HCC have nearly tripled in the UK, and deaths more than doubled. Hospital admissions from HCV-related ESLD and HCC rose from 950 in 2004 to 2,658 in 2013, while deaths have risen from 190 in 2004 to 424 in 2013. An overall increase in UK registrations for liver transplants where post-hepatitis C cirrhosis is given as either the primary, secondary or tertiary indication for transplant, from 45 in 1996 to 175 in 2014. Between 1996 and 2014, 15% of all liver transplants in England, were carried out in patients with hepatitis C-related disease.

To help tackle HCV infection, public health programmes need to make progress in the following four action areas:

- prevention of new infections
- increasing awareness of infection
- increasing testing and diagnosis
- getting diagnosed individuals into treatment and care

Prevention of new infections

There is good evidence that combining effective drug treatments, such as opiate substitution therapy; supporting safe injecting, for example through needle and syringe programmes (NSP); and treating HCV infection, can impact on the incidence and prevalence of HCV infection among PWID.[8],[9],[10],[11],[12] It is therefore noteworthy that the number of PWID in England receiving drug treatment has increased from 97,080 in 2006/07 to 107,670 in 2013/14.

Among those who continue to inject drugs, sharing of injecting equipment and associated paraphernalia is the main route of transmission of infection, and in most UK countries there is evidence to suggest that the level of sharing of needles and syringes is declining. In 2014 the UAM Survey found that among those who injected during the preceding four weeks, the levels of reported needle/syringe sharing were: 16% in England; 17% in Northern Ireland; and 22% in Wales.[5] In Scotland in 2013/14, provisional data indicate that 14% of PWID attending drug treatment services who had injected in the previous month reported needle/syringe sharing in that month.

To help reduce levels of sharing, NSP are provided and continue to be developed throughout the UK. In Scotland, there were 299 injection equipment provider outlets in 2013/14 with over four million needles/syringes distributed to PWID during that year.[13] In Northern Ireland, the number of packs dispensed by NSP has increased year-on-year since 2007/08, reaching 28,284 in 2013/14, and data from the Welsh Harm Reduction Database (HRD) show that 25,409 unique individuals accessed NSP services in 2014/2015. In England, indirect measures of NSP coverage suggest that the vast majority of PWID are accessing NSP; in 2014, the UAM Survey found that 85% of people who had injected drugs in the previous year reported that they had used an NSP during that time.

While data suggests that NSP are being accessed by many PWID across the UK, there remains a need to increase the amount of equipment distributed in many areas, with better targeting of this provision and education on appropriate needle and syringe cleaning techniques.

Across the UK, a number of methods have been used to gain insight into the number of new HCV infections and likely trends in incidence over time. Preliminary data suggest that incidence of HCV infection among PWID in England, Wales and Northern Ireland during 2014 was between 5 and 16 infections per 100 person years of exposure; in Scotland, incidence of infection among PWID in 2013/14 is estimated to be in the same range at 10 infections per 100 person years. In England and Scotland, data on infections in young adults and recent initiates to drug use suggest that incidence has remained relatively stable over recent years.

It is encouraging that enhanced surveillance of newly acquired HCV infection in men who have sex with men (MSM) provides evidence of ongoing, but declining sexual transmission of HCV among HIV-positive MSM in England. In this population, the estimated incidence of infection declined significantly over the four years up to 2013 to 2.3 per 1,000 person years in 2013.

Raising awareness of infection

In 2014 the UAM Survey suggests that 52% of participating PWID in England were aware of their HCV positive status, and this proportion has remained relatively stable over the last decade.[5] Levels of awareness of infection have also been relatively stable in Wales and Northern Ireland in recent years (2014 levels are 48% and 68% respectively).[5] In similar surveys in Scotland in 2013/14, 61% of PWID who tested hepatitis C antibody positive, including those who had cleared the virus, were aware of their HCV positive status.

Raising both professional and public awareness remains a priority and an important component of reducing the burden of undiagnosed infection.

Throughout the UK a variety of initiatives are ongoing to increase awareness of hepatitis C, many being designed to target those at greatest risk of infection, including PWID, offenders and individuals of South Asian origin. The success of these initiatives is dependent on the significant contribution of numerous key stakeholders working across a range of settings. The non-governmental organisation (NGO) sector has been particularly influential and their work continues to complement that of government and public sector initiatives in this area.

Educational films, roadshows and learning programmes have been developed to raise professional awareness in primary care, across the prison estate, in drug services, and among other individuals working with populations at risk of infection. By December 2014, a total of 2,356 individuals had completed the e-learning module from the Royal College of General Practitioners (RCGP) Certificate in the Detection, Diagnosis and Management of Hepatitis B and C in Primary Care, 41% of these doing so in 2014, and 615 individuals had completed Level 1 of the Certificate. To supplement this, a new RCGP course was launched in April this year: ‘Hepatitis C: Enhancing Prevention, Testing and Care.’

In prisons, audit suggests that 81% of prisons had received training on blood borne viruses (BBVs) for healthcare staff in England, although the content and frequency of this varied.[14] In Wales, an e-learning package has been developed to improve the knowledge of prison staff in relation to BBVs; over 500 staff have completed this training and an evaluation has been published.[15]

Increasing testing and diagnosis

By monitoring testing and diagnosis, we are able to assess the impact of awareness raising initiatives and prevention activity at a population level, as well as in sub-groups who are at increased risk of infection.

Across the UK, more individuals are being tested and diagnosed. Over the last five years particular improvements have been seen in primary care where surveillance indicates that testing has risen by 21%, 46% and 53% in England, Northern Ireland and Scotland respectively, suggesting that awareness of infection may be increasing in this setting

In 2014, more than 80% of PWID participating in the UAM Survey reported ever having had a voluntary confidential test (VCT) for hepatitis C (83% in England, 88% in Northern Ireland and 85% in Wales).[5] In similar surveys in Scotland in 2013/14, 88% of PWID reported having been tested for hepatitis C in the past. Among PWID in England, Scotland and Wales, dried blood spot testing (DBS) is continuing to contribute to the uptake of testing, with numbers tested by DBS in England increasing by 23% between 2013 and 2014 and 18% testing positive in 2014 by this method.

Testing for HCV in prisons is increasing but remains low with just 8.6% and 13.7% of receptions to English (2013/14) and Welsh prisons (2014) being tested respectively. In Scotland, 2% of all HCV antibody tests undertaken originated from prisons in 2014, representing a nearly six-fold increase since 2006, and in Welsh prisons DBS testing increased by more than 20% between 2013 and 2014. New national indicators, Health and Justice Indicators of Performance (HJIPs), have recently been developed in England for use by commissioners and partners to monitor the quality and performance of healthcare in all prescribed places of detention. HJIPs will support the introduction of HCV opt-out testing in England including the offer and uptake of HCV testing. Sentinel surveillance data in England suggest that testing via prison services varies by gender; between 2010 and 2014. In 2014, 17% of females tested positive compared to 6.4% of males. This may be due to a difference in the relative risk of female offenders having acquired hepatitis C compared to males, and/or differences in the offer and acceptance of blood borne virus (BBV) testing.

Among blood donors, rates of HCV have continued to fall across the UK to 19.3 and 0.3 infections per 100,000 donations in new and repeat donors, respectively (2014). In England and North Wales, a disproportionately large number of infections were seen in those of South Asian origin and in those of ‘other white’ backgrounds, the majority of whom were born outside the UK, particularly Eastern Europe. In England, sentinel surveillance data indicates that the number of people tested who were identified as being of Asian or Asian British origin increased from 14.8% in 2010 to 15.5% in 2014; over this period 2.2% tested positive. The overall increase in testing may be a reflection of targeted awareness-raising campaigns that have

taken place among Asian or Asian British communities in recent years. Sentinel surveillance also indicates that the number of people tested who were identified as being of Eastern European origin increased from 2.8% in 2010 to 3.3% in 2014. Over this period 5.0% of people of Eastern European origin tested positive, suggesting that these individuals may be at increased risk of HCV infection and/or that testing of these ethnic groups is more targeted at higher risk individuals than in the general population.

Public health guidance, published by the National Institute for Health and Care Excellence (NICE), is available to help focus activity to ensure that more people at increased risk of hepatitis C (and B) infection are offered testing.[16]

Treatment and care

Many HCV infections occur in marginalised communities, in particular PWID and black and minority ethnic populations. It is therefore important to ensure that care pathways exist that allow these individuals, as well as others, to access the treatment and care they need.

Overall across the UK, data suggest that referrals for HCV treatment and care are rising. Among UAM survey participants in England and Wales with antibodies to hepatitis C who were aware of their infection, increasing numbers of PWID report having seen a specialist nurse or doctor about their infection, with around 70% reporting having done so in the 2013 and 2014 surveys. In Wales referrals are rising and it is estimated that between 2011 and 2013 approximately 2,300 referrals were made for specialist assessment, with approximately 890 referrals in 2013. In Northern Ireland referral rates remain high in 2014; following a diagnosis of chronic hepatitis C, 82% were referred to hepatology services. In Scotland, an estimated 28% of people living in Scotland with diagnosed chronic infection attended a specialist centre in 2014. Among prison pathfinders implementing the opt-out BBV testing programme in England, the numbers being referred for hepatitis C treatment increased significantly following the introduction of the opt-out testing policy.[17]

Antiviral treatments are available in the UK that will successfully clear hepatitis C virus in the majority of patients, [18],[19],[20],[21],[22],[23],[24] [25],[26],[27],[28],[29] and new drugs coming online offer improved rates of viral clearance, fewer side effects, and are easier to administer, however, the cost of the new treatments, when coupled with the numbers potentially requiring them, raises real issues of affordability for UK health services. It is therefore important to monitor treatment uptake to assess whether sufficient numbers of infected individuals are accessing treatment, assess its impact, and identify and address any geographical variation or inequalities in service delivery.

In addition to the usual contractual reporting that providers are required to provide to commissioners in England, work is underway to agree arrangements for the collection of further

epidemiological, treatment and outcome data to add to the understanding of HCV and the effectiveness of the new treatments in England. In the meantime, a validated algorithm is used to monitor rates of HCV treatment across England using routine laboratory testing data to identify those commencing and responding to treatment after 2002.[30] These data suggest that the number of individuals experiencing treatment for the first time increased between 2002 and 2009, but have declined since. When most recent treatment events are examined, the numbers undergoing treatment have increased year on year between 2002 and 2014. Provisional rates of sustained viral response (SVR) for those undergoing their most recent course of treatment post 2002 between 2010 and 2013 were estimated to be 52% in those with genotype 1 and 71% in those with non-1 genotypes. Equivalent SVR rates for 2013 alone were 53% and 74% in those with genotypes 1 and non-1 respectively.

In Wales, data collection systems to provide information on the numbers of individuals commencing treatment and achieving SVR have been under development, and provisional data suggest that around 700 individual's commenced treatment in 2011-2013. In Northern Ireland, 420 people commenced treatment for hepatitis C since January 2004 and had an outcome recorded. For genotype 3 patients treated with pegylated interferon and ribavirin between January 2004 and June 2015, 78% achieved SVR. For patients with genotype 1 undergoing triple therapy (protease inhibitors, telaprevir or boceprevir, plus peginterferon and ribavirin) from September 2012 to April 2015, 70% of those with a known outcome achieved SVR.

In Scotland, the number of chronically infected people who began hepatitis C antiviral therapy increased from 468 in 2007/08 to 1,273 in 2014/15. Among 965 patients initiated on pegylated interferon and ribavirin across 14 specialist centres in Scotland during January 2012 to June 2013, 59% were known to have achieved an SVR; this rate ranged from 47% among 248 patients with genotype 1 to 64% among 717 patients with other genotypes. Among 389 genotype 1 patients initiated on a protease inhibitor (either telaprevir or boceprevir) during this period, 66% were known to have achieved an SVR.

Statistical modelling suggests that increased uptake and new therapies are both needed to avert rising hepatitis C-related end stage liver disease in England.[31] Preliminary results from further modelling suggest that extending new treatments, with their markedly improved rates of SVR, to just 2000 people in England per year with cirrhosis from 2015 would have a significant impact on HCV-related ESLD/HCC, with 5,220 people predicted to be living with HCV-related cirrhosis or HCC in 2020 compared to 11,710 by treating ESLD/HCC alone, however, without scale-up of new treatments in those with moderate disease, reductions in numbers of people with HCV-related ESLD/HCC would not continue beyond five years. Modelling studies [32] have also shown that while strategies prioritising persons with advanced liver fibrosis have the most advantageous impact on severe liver morbidity, they are suboptimal in terms of curtailing incident transmission.

Conclusion

Action plans and work programmes have driven improvements in the prevention, diagnosis and treatment of HCV across the UK, however, more needs to be done as the morbidity and mortality from HCV-related liver disease continues to rise.

UK headlines

PREVALENCE OF HEPATITIS C INFECTION
National estimates suggest that around 214,000 individuals are chronically infected with hepatitis C (HCV) in the UK; most infection (~90%) is genotype 1 and genotype 3.
Injecting drug use continues to be the most important risk factor for HCV infection in the UK with half of PWID thought to have been infected in England and Wales; levels are lower in Northern Ireland (23%) and higher in Scotland (57%).
PREVENTION AND INCIDENCE OF INFECTION IN PEOPLE WHO INJECT DRUGS
New infections among PWID and infection in both young adults and recent initiates to drug use suggest that incidence has remained relatively stable in the UK over recent years.
In most UK countries there is evidence to suggest that the level of sharing of needles and syringes among PWID has declined over the last decade.
AWARENESS OF INFECTION
Throughout the UK a variety of initiatives are ongoing to increase awareness of hepatitis C, many being designed to target those at greatest risk of infection, including PWID, offenders and individuals of South Asian origin. Educational films, roadshows and learning programmes have been developed to raise professional awareness in primary care, the prison estate, drug services, and among other individuals working with populations at risk of infection.
Recent UK surveys suggest that between 45-68% of PWID are aware of their HCV infections; levels of awareness of infection have remained relatively stable in the UK over the last decade.
TRENDS IN TESTING AND DIAGNOSIS
Across the UK, more individuals are being tested and diagnosed; over the last 5 years particular improvements have been seen in primary care where surveillance indicates that testing has risen by 21%, 46% and 53% in England, Northern Ireland and Scotland respectively, suggesting that awareness of infection may be increasing in this setting.
In 2014 (2013/14 for Scotland), more than 80% of PWID participating in UK surveys reported ever having had a hepatitis C test. Dried blood spot testing (DBS) is continuing to contribute to the uptake of testing among PWID.
Testing for HCV in prisons is increasing but remains low with just 8.6% and 13.7% of receptions to English (2013/14) and Welsh prisons (2014) being tested respectively.
In the UK, HCV in both new and repeat blood donors has continued to fall to a rate of 19.3 and

0.3 infections per 100,000 donations in new and repeat donors respectively; in England and North Wales, a disproportionately large number of infections are seen in those of South Asian origin and in those of 'other white' backgrounds, the majority of whom are born outside the UK, particularly in Eastern Europe.

In England, sentinel surveillance indicates that testing is increasing among individuals of Asian or Asian British origin, which may be a reflection of targeted awareness-raising campaigns that have taken place among Asian or Asian British communities over recent years.

TREATMENT AND CARE

Sentinel surveillance data in England suggest that the number of individuals experiencing treatment for the first time increased between 2002 and 2009, but have declined since; when most recent treatment events are examined, the numbers undergoing treatment have increased year on year between 2002 and 2014. In Scotland, between 2007/08 and 2014/15, the number of chronically infected people who began hepatitis C antiviral therapy increased 2.7-fold.

Modelling suggests that strategies prioritising persons with advanced liver fibrosis have the most advantageous impact on severe liver morbidity, but without scale-up of new treatments in those with moderate disease, reductions in numbers of people with HCV-related ESLD/HCC will not continue beyond five years; strategies excluding persons with mild disease are sub-optimal in terms of their potential to curtail incident transmission.

BURDEN OF HCV-RELATED END STAGE LIVER DISEASE

Over the last decade (2004-2013), hospital admissions from HCV-related end stage liver disease (ESLD) and hepatocellular carcinoma (HCC) have nearly trebled (2.8-fold increase) in the UK, and deaths from these indications have more than doubled (2.2-fold increase).

UK public health recommendations

Prevention

Commissioners of BBV prevention services for people who inject drugs need to sustain or expand, as appropriate, the current broad range of provision (including opioid substitution treatment and needle and syringe programmes) to minimise transmission of hepatitis C, including among people who inject new psychoactive substances or image and performance-enhancing drugs.

Diagnosis, testing and awareness of infection

Awareness of hepatitis C infection needs to be sustained and enhanced among professionals and people at risk of hepatitis C infection to ensure that more people are tested, and levels of undiagnosed infection are reduced.

Continued efforts are required to raise awareness and understanding of hepatitis C in primary care by encouraging GPs and other primary care staff to undertake e-learning or other training, for example, the RCGP certificates in the Detection, Diagnosis and Treatment of Hepatitis C (and B) in Primary care, and Hepatitis C: Enhancing Prevention, Testing and Care.

Testing needs to be sustained among those attending drug services, and enhanced across the prison estate; the use of newer technologies, like dried blood spot testing, that make testing easier in non-clinical settings should be further expanded throughout the UK.

Local provision should be in place to promote and offer testing to those groups who are not in regular contact with health services who may have acquired hepatitis C many years previously, some of whom will have advanced asymptomatic disease (for example, those who acquired their infection via past injecting drug use, medical/dental treatment abroad in countries where poor blood screening/infection control practices exist, or via transfusion in the UK prior to September 1991).

Treatment and care

Those responsible for commissioning hepatitis C treatment and care services should continue to work with public health agencies, clinicians and other stakeholders to improve the availability, access and uptake of approved hepatitis C treatments in primary and secondary care, drug treatment services, prisons and other settings, and to drive innovative approaches to provide outreach. It will be important to consider those individuals who have been diagnosed but subsequently lost to follow-up, as well as those who are newly diagnosed or already engaged with treatment services.

UK countries will need to review and establish systems for monitoring resistance to new direct acting antiviral drugs, and develop appropriate assays for future monitoring.

Surveillance and research

Data on the number of patients treated for hepatitis C, including the use of recently approved drugs, should be collected by NHS providers and be made available for performance monitoring by commissioners and UK public health agencies.

Proposals for more up-to-date prevalence studies, both overall and in risk groups, should be considered to improve national prevalence estimates and to identify whether additional targeted awareness-raising campaigns are required.

The scale of the problem

Hepatitis C infection in the UK

The most recent national estimates suggest that around 214,000 individuals are chronically infected with HCV in the UK.[1],[2],[3],[4]

In England, latest estimates from evidence synthesis models, which date to 2005,[1] indicate that 160,000 adults are chronically infected with hepatitis C, equating to 0.4% of the adult population.

In Scotland, approximately 36,700 people were estimated to be chronically infected with HCV during 2014 (equating to 0.7% of the Scottish population). This number is lower than that estimated for previous years (39,000 people in 2008-2009),[33] based on available data which now indicate that the annual number of people leaving the chronically infected population (through a combination of treatment, mortality and migration) exceeds the annual number of people joining the chronically infected population (as a result of infection acquisition through injecting drug use and migration).

When viral genotypes are considered, sentinel surveillance data from 2010-2014 show genotypes 1 (47%) and 3 (44%) predominating in England, with other genotypes comprising just 9% of infections. In Northern Ireland, of the 940 cases where the genotype was known, 413 (44%) were genotype 1 and 423 (45%) were genotype 3, with the remaining 11% comprising other genotypes (Table 1). In Scotland, approximately 39% of the 37,596 people who had ever been diagnosed with hepatitis C antibodies by the end of 2014 were known to have had a genotype test; of these, 48% were genotype 1, 46% were genotype 3 and the remaining 6% comprised other genotypes.[34]

National action plans to tackle hepatitis C are in place and are being further developed across the UK; in May this year a Liver Disease Delivery Plan[35] was launched in Wales, supported by £1m of new Welsh Government funding. This plan is due to run until 2020 and is one of a set of national service delivery plans that sets out how the Welsh Government and NHS Wales will develop and improve services for people with liver disease. The national response to HCV will continue as part of the liver disease plan, and annual funding of £1.377m linked to the Blood Borne Viral Hepatitis Action Plan will continue to support this work.

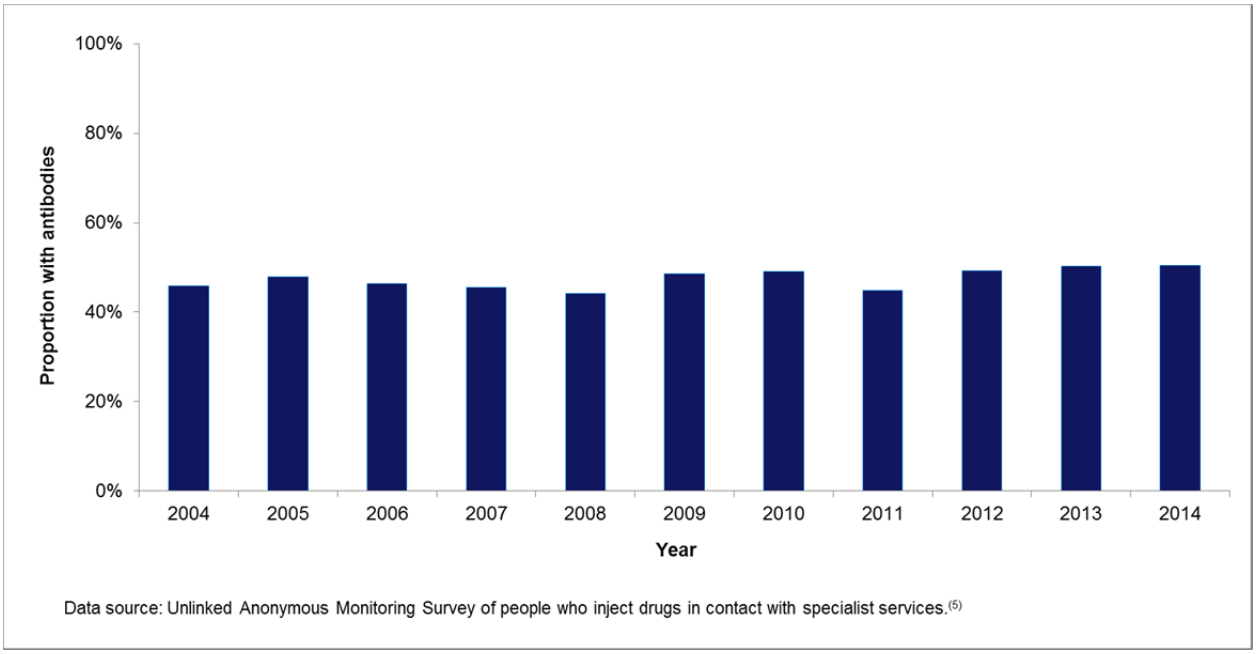
In all UK countries, injecting drug use continues to be the most important risk factor for HCV infection (Table 2, Table 3) [34] [36],[37] therefore, monitoring infection among this important risk group remains a UK priority.

Prevalence of infection in people who inject drugs

In England, 50% of PWID tested positive for antibodies to HCV (anti-HCV) in the 2014 UAM Survey of PWID in contact with drug services; this proportion has remained relatively stable over recent years.(Figure 1)[5]

Hepatitis C prevalence among PWID participating in the UAM Survey in 2014 varied across England, with prevalence ranging from 29% in the North East region to 66% in the North West.[5] This finding is supported by statistical modelling, which shows that the prevalence of infection among individuals in England who have ever injected drugs is markedly higher in London and the North West.[1]

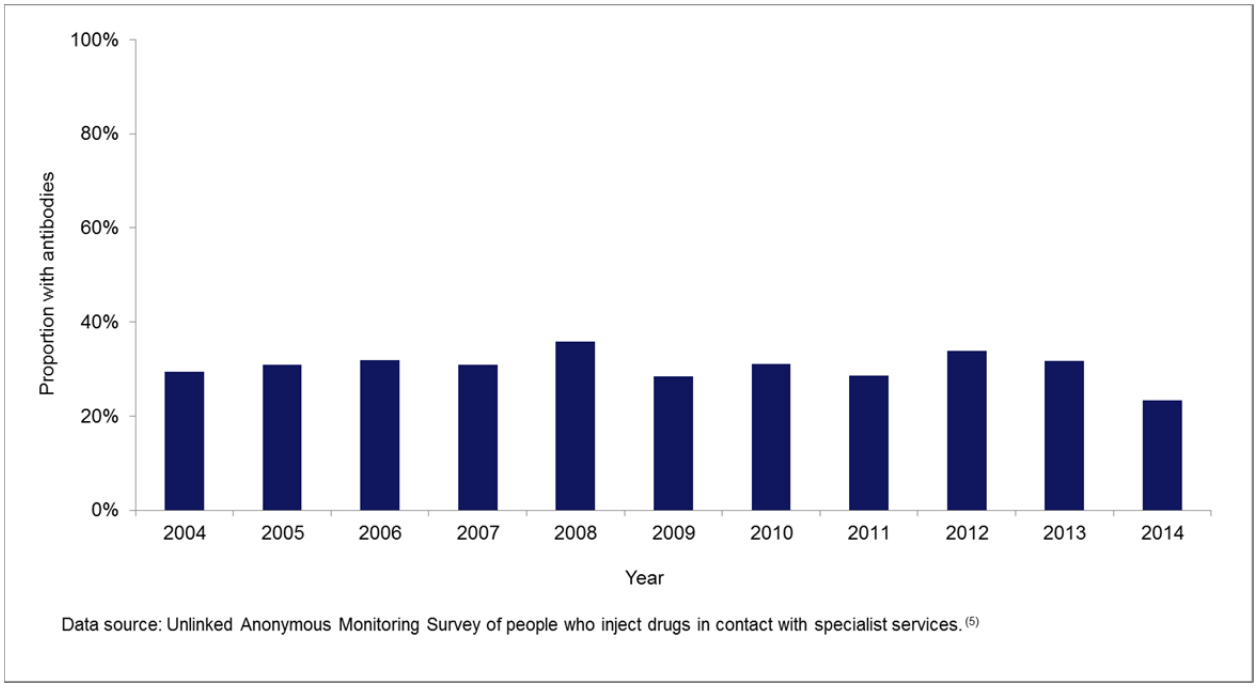
Figure 1. Trend in anti-HCV prevalence* among people who inject drugs in England: 2004 to 2014



* During 2009 to 2011 there was a phased change in the sample collected in the survey from an oral fluid to dried blood spot (DBS). The sensitivity of the anti-HCV tests on these two sample types is different. The sensitivity of the oral fluid test for anti-HCV is approximately 92%,[38] that on DBS samples is close to 100%. Data presented here have been adjusted for the sensitivity of the oral fluid test.

In Northern Ireland, levels of infection are lower overall with 23% of PWID participating in the UAM Survey testing positive for antibodies in 2014 (Figure 2).[5]

Figure 2. Trend in anti-HCV prevalence* among people who inject drugs in Northern Ireland: 2004 to 2014

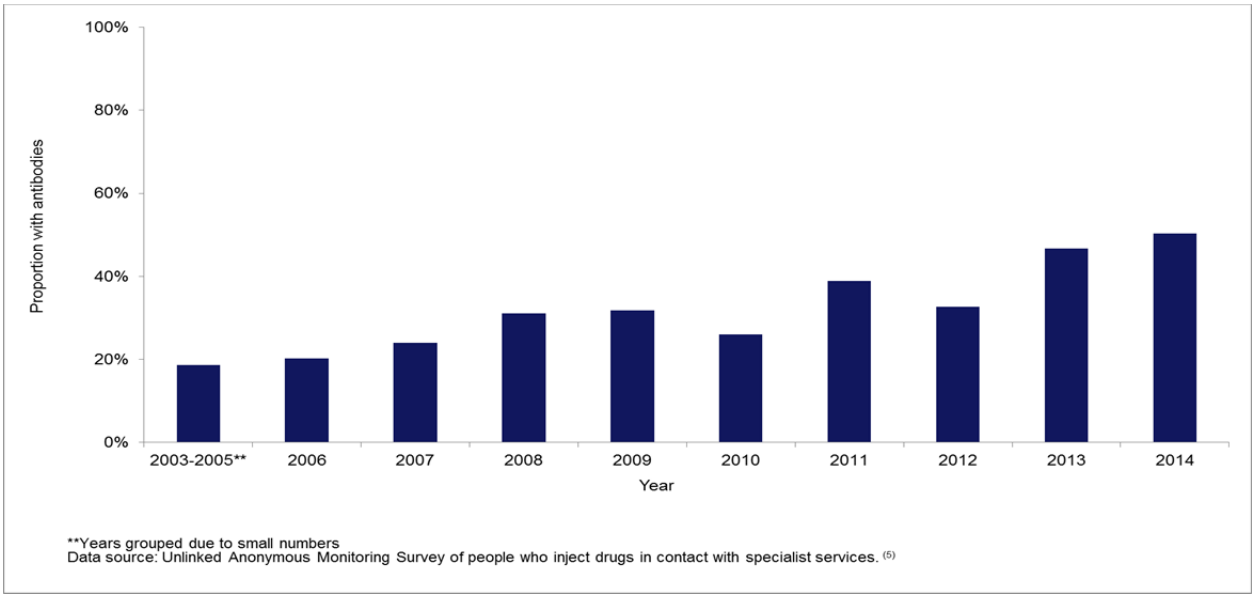


* During 2009 to 2011 there was a phased change in the sample collected in the survey from an oral fluid to dried blood spot (DBS). The sensitivity of the anti-HCV tests on these two sample types is different. The sensitivity of the oral fluid test for anti-HCV is approximately 92%,[38] that on DBS samples is close to 100%. Data presented here have been adjusted for the sensitivity of the oral fluid test.

In Wales, UAM Survey data suggest that the level of infection among PWID in 2014 (50%) is similar to England, but higher than a decade ago in Wales (19% in 2003-2005, Figure 3).[5] However, given the relatively small sample size and changes in survey sites, these results should be interpreted with caution.

Enhanced surveillance of PWID accessing BBV testing in drug services in Wales suggests that, in those tested in 2011, the proportion of those reported to the scheme with antibody to HCV ranged from 10% among those injecting for two years or less to 36% among those injecting for five years or more. For those tested and reported to the scheme in 2014, among those injecting for two or less years 18% had evidence of infection, and among those injecting for five years or more this was 32%[39](Table 4). The estimates of prevalence related to this enhanced surveillance scheme are relatively lower than those from UAM surveys because these data relate to diagnostic testing and may be less likely to include those who have already been diagnosed. The different geographical coverage of these two schemes and potential differences in respondent characteristics may also explain some of the differences observed. Further information related to the enhanced surveillance scheme is available at www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=62269

Figure 3. Trend in anti-HCV prevalence* among people who inject drugs in Wales: 2003 to 2014

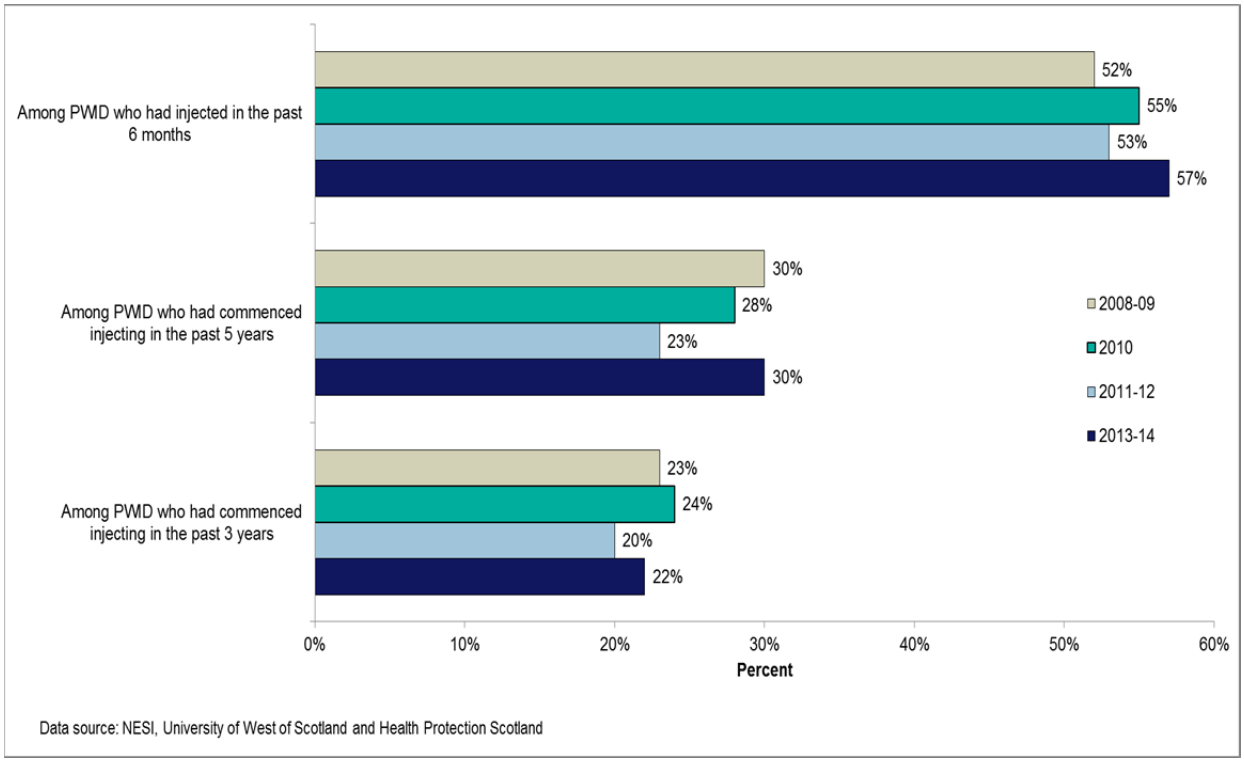


* During 2009 to 2011 there was a phased change in the sample collected in the survey from an oral fluid to dried blood spot (DBS). The sensitivity of the anti-HCV tests on these two sample types is different. The sensitivity of the oral fluid test for anti-HCV is approximately 92%[38] that on DBS samples is close to 100%. Data presented here have been adjusted for the sensitivity of the oral fluid test.

In England and Wales, among the participants in the UAM Survey of PWID sub-survey of people who inject image and performance enhancing drugs (IPED), 3.6% tested positive for antibodies to HCV during 2012-13.[5] Though the prevalence of antibodies to HCV was lower than that found among participants in the main survey targeted at people who inject psychoactive drugs, it is higher than observed in the general population.

In Scotland, among 1,924 PWID surveyed at services providing injection equipment during 2013-14, 1,102 (57%) tested positive for hepatitis C antibodies (in anonymous testing of their DBS samples; Figure 4); this compares to 52%, 55% and 53% who tested positive in 2008-09, 2010 and 2011-12, respectively.

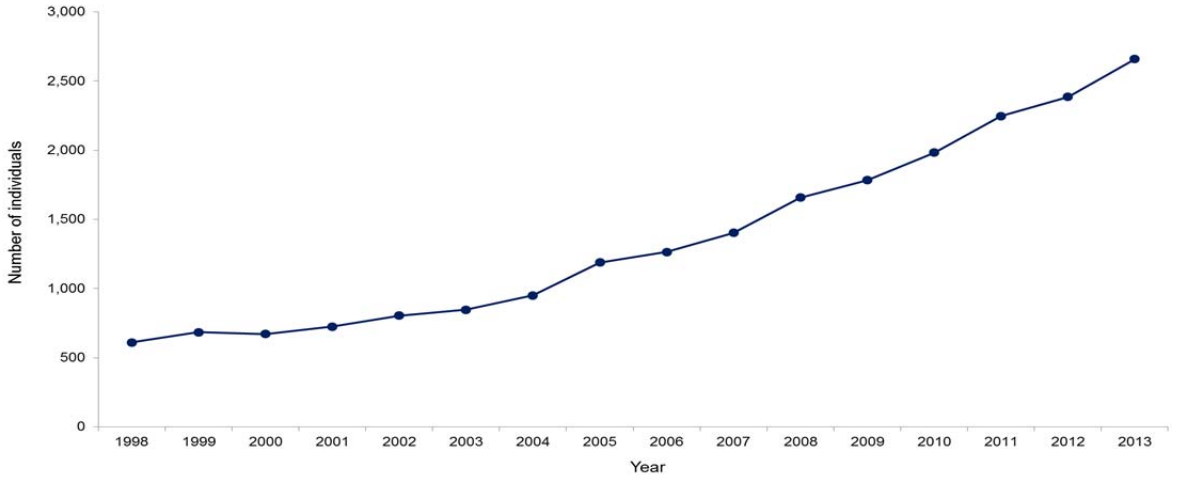
Figure 4. Proportion of PWID, surveyed at services providing injection equipment across mainland Scotland in 2008-09, 2010, 2011-12 and 2013-14 who were found to be hepatitis C antibody positive



Deaths from, and hospital admissions for, HCV-related end stage liver disease

Over the last decade (2004-2013), hospital admissions from HCV-related ESLD and hepatocellular carcinoma (HCC) have nearly tripled in the UK (increased 2.8-fold; Figure 5), and deaths from these indications have more than doubled (risen 2.2-fold; Figure 6). Hospital admissions from HCV-related ESLD and HCC rose from 611 in 1998 to 2,658 in 2013 (Figure 5), while deaths have risen from 98 in 1996 to 424 in 2013 (Figure 6).

Figure 5. Annual number of individuals in England[1], Scotland[2], Wales[1] and Northern Ireland[3] hospitalised with HCV-related ESLD* or HCV-related HCC: 1998 to 2013

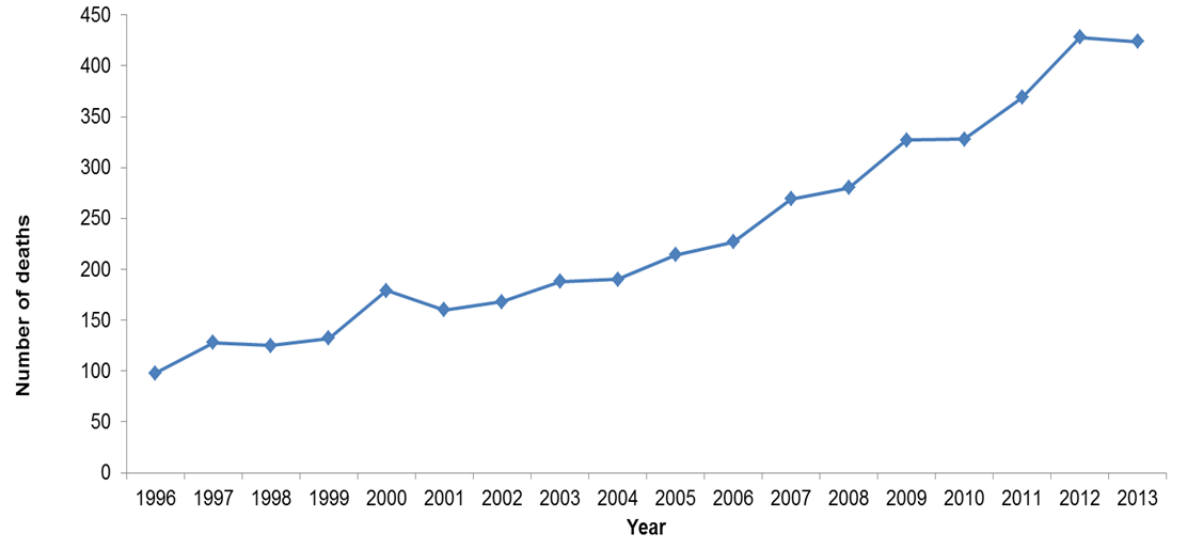


* Defined by codes or text entries for ascites, bleeding oesophageal varices, hepato-renal syndrome , hepatic encephalopathy or hepatic failure.

[1]Refers to individuals in England and Wales hospitalised with HCV-related ESLD or HCV-related HCC
[2]Refers to individuals in Scotland diagnosed with hepatitis C and admitted to hospital for the first-time with either ESLD or HCC.
3Refers to individuals in Northern Ireland who were admitted in HSC hospitals with HCV-related ESLD or HCV-related HCC. Data available from 2006 only.

Data source:Hospital Episode Statistics (HES), The NHS Information Centre for Health and Social Care, England;
Patient Episode Database for Wales (PEDW). NHS Wales Informatics Service,
Health Protection Scotland, in association with the Information Services Division.
Hospital Inpatient System, Northern Ireland

Figure 6. Deaths from ESLD* or HCC in those with hepatitis C mentioned on the death certificate in the UK: 1996 to 2013

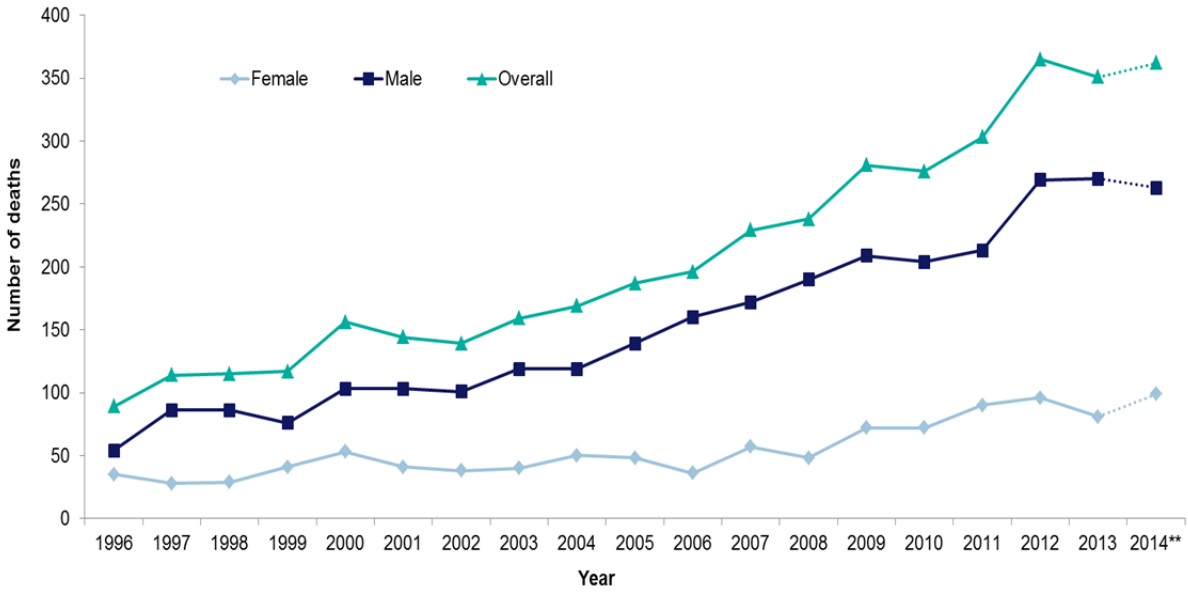


* Defined by codes or text entries for ascites, bleeding oesophageal varices, hepato-renal syndrome , hepatic encephalopathy or hepatic failure.

Data source: Office for National Statistics (England & Wales); Health Protection Scotland, in association with the Information Services Division; Northern Ireland Statistics and Research Agency

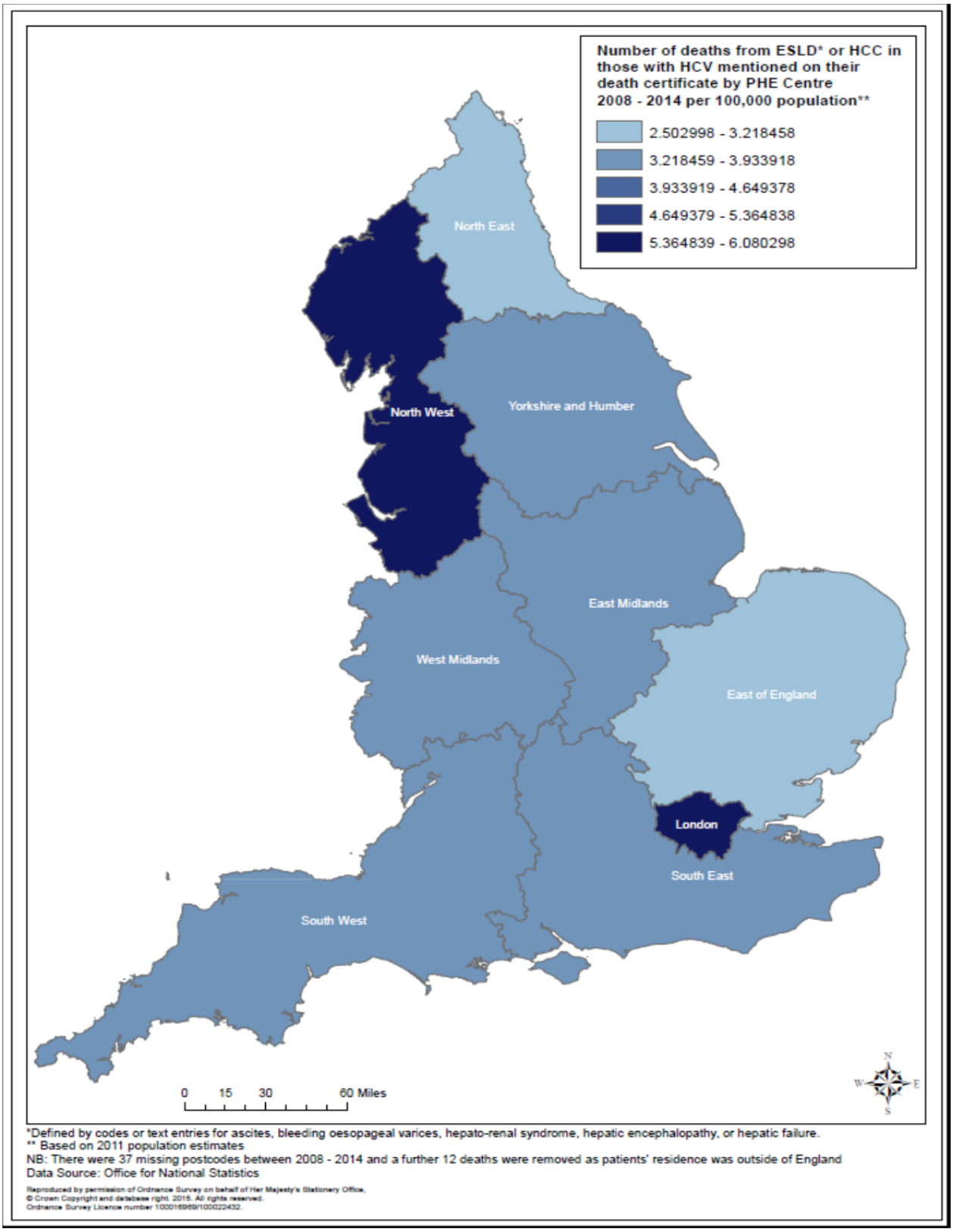
A similar pattern is observed in England, with hospital admissions from HCV-related ESLD and HCC continuing to rise (Table 5) and deaths seeming to stabilise after 2012 (Figure 7); hospital admissions (counting each individual once per calendar year) rose from 574 in 1998 to 2,652 in 2014 (Table 5), while deaths rose from 89 in 1996 to 362 in 2014 (Figure 7), remaining relatively stable over the last three years (Figure 7). Deaths per 100,000 population vary across England, with highest rates observed in London and the North West (Map 1).

Figure 7. Deaths from ESLD* or HCC in those with HCV mentioned on their death certificate in England: 1996 to 2014**



* Defined by codes or text entries for ascites, bleeding oesophageal varices, hepato-renal syndrome, hepatic encephalopathy or hepatic failure.
**2014 data is provisional
Data source: Office for National Statistics

Map 1. Number of deaths from ESLD* or HCC in those with HCV mentioned on their death certificate by PHE Centre 2008 to 2014* (per 100,000 population)****

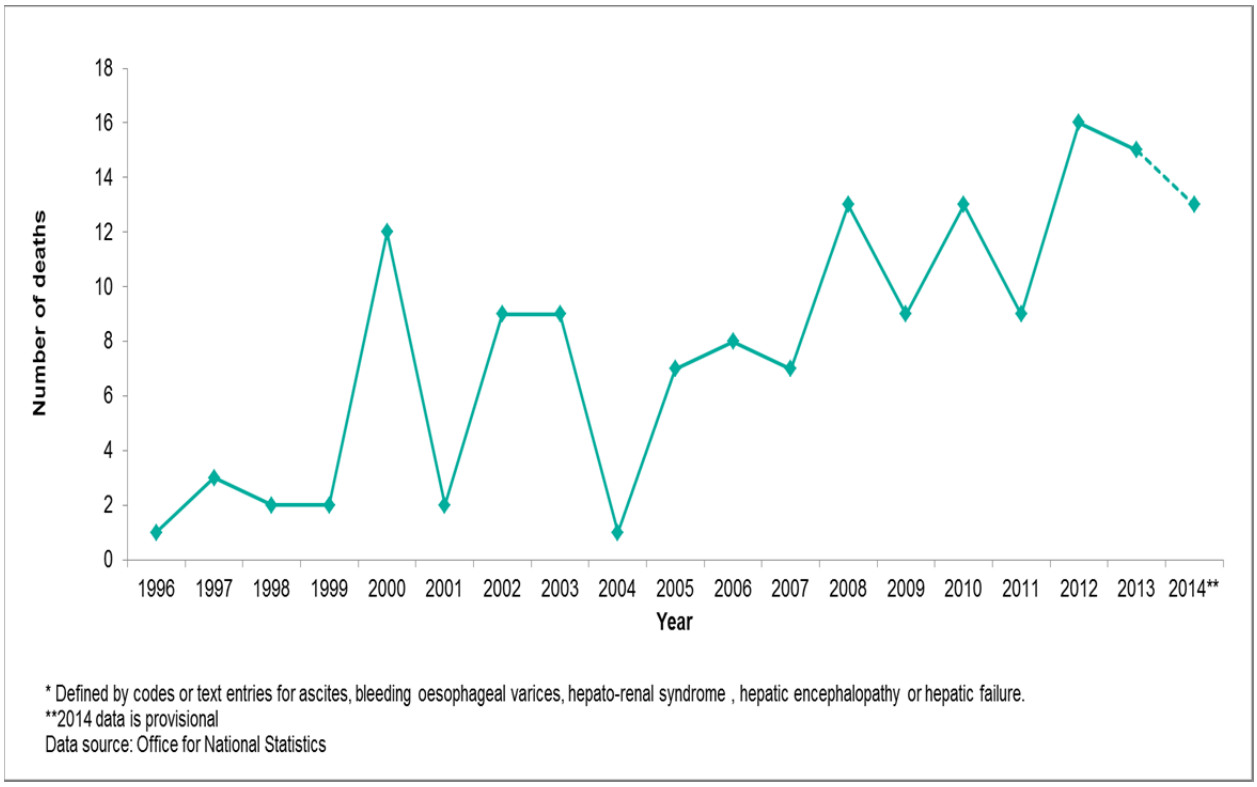


*** 2014 data provisional

In Northern Ireland, 14 deaths from HCV-related ESLD or HCC were registered in 2014; the highest annual figure recorded over the last decade; the majority of deaths have occurred in men. Hospital admissions of patients with HCV-related ESLD or HCC in Northern Ireland (counting each individual once per calendar year) have increased from 8 in 2006 to 23 in 2014 (Table 6)

In Wales, deaths recorded as HCV-related ESLD or HCC have fluctuated over recent years (Figure 8), but have averaged 13 deaths per year over the last five years. The majority of deaths were in men (85%; 128/151). Hospital admissions, counting each individual only once in any calendar year, for these indications in Wales have risen from 61 in 1999-2002 to 292 in 2011-2014 (Table 7).

Figure 8. Deaths from ESLD*, or HCC, in those with HCV mentioned on their death certificate in Wales: 1996 to 2014**

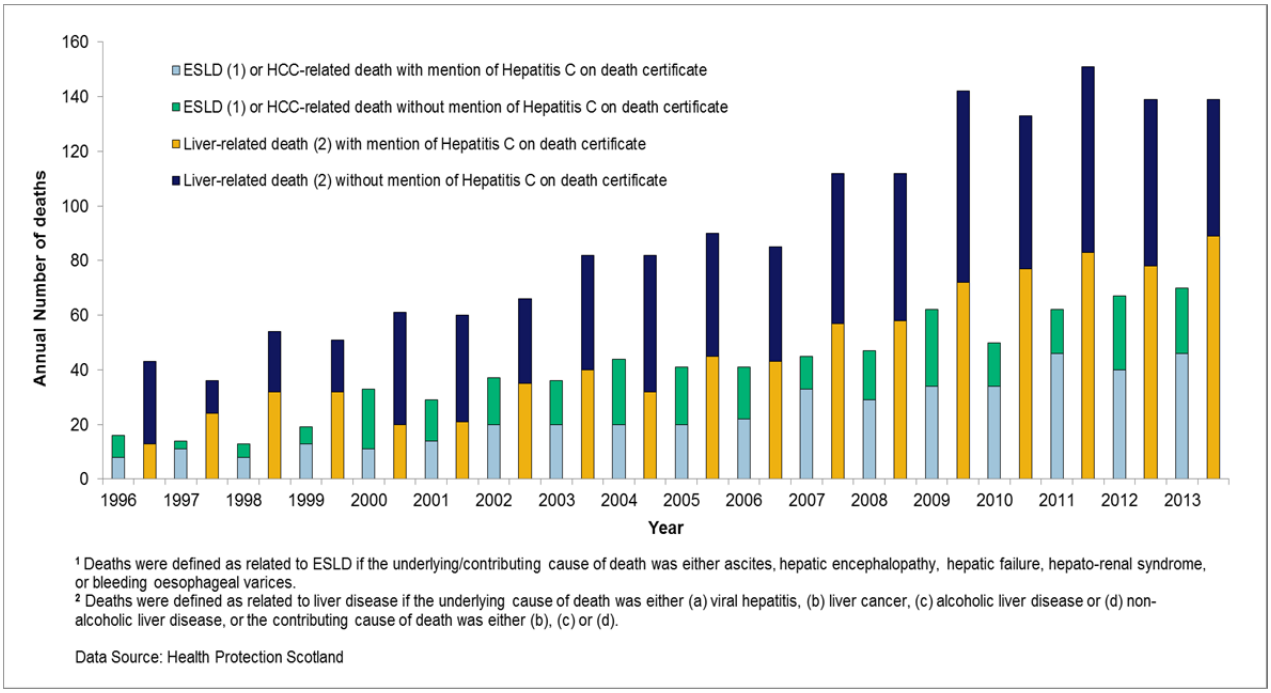


* Defined by codes or text entries for ascites, bleeding oesophageal varices, hepato-renal syndrome , hepatic encephalopathy or hepatic failure.
**2014 data is provisional
Data source: Office for National Statistics

In Scotland, liver-related deaths among people diagnosed with hepatitis C increased 3.2-fold from 43 in 1996 to 139 in 2013 (Figure 9), however, in the last five years (2009-2013), the annual number of liver-related deaths has remained relatively stable. By linking records in Scotland's National Hepatitis C Diagnoses Database to the national register of deaths, it is possible to determine that 851 (52%) of the total 1,638 liver-related deaths during 1996 to 2013 among people diagnosed with hepatitis C, had any mention of hepatitis C on their death certificate; a higher proportion (64%) had hepatitis C mentioned among liver-related deaths in 2013. Among the 139 liver-related deaths in 2013, 110 (79%) had liver disease recorded as the underlying cause of death (including

alcoholic liver disease as the underlying cause in 36), 111 (80%) were male, and 46 (33%) were aged less than 50 years. ESLD and HCC-related deaths among people diagnosed with hepatitis C in Scotland increased 4.4-fold from 16 in 1996 to 70 in 2013 (Figure 9). Of the total 726 ESLD and HCC-related deaths during 1996-2013 among people diagnosed with hepatitis C, 429 (59%) had hepatitis C mentioned on the death certificate.

Figure 9. Annual number of deaths related to liver disease and end-stage liver disease (ESLD)/hepatocellular carcinoma (HCC) among persons diagnosed with hepatitis C (antibody positive or RNA positive) in Scotland, during 1996 to 2013.



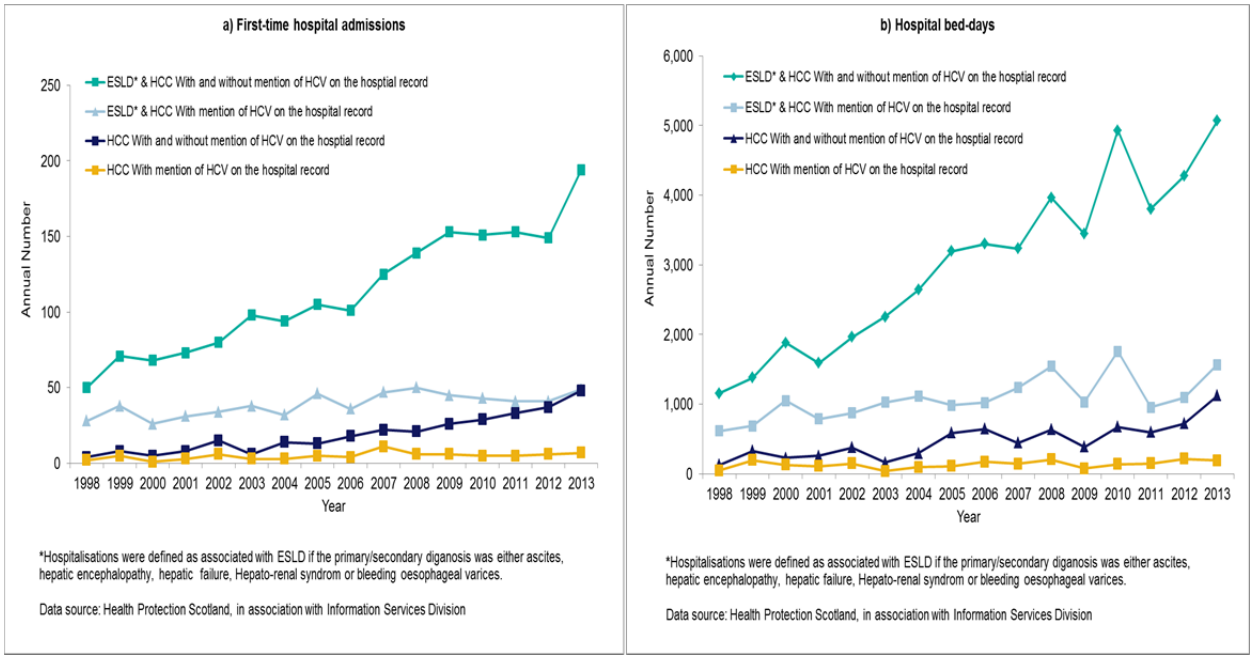
[1] Deaths were defined as related to ESLD if the underlying/contributing cause of death was either ascites, hepatic encephalopathy, hepatic failure, hepato-renal syndrome, or bleeding oesophageal varices.
[2] Deaths were defined as related to liver disease if the underlying cause of death was either (a) viral hepatitis, (b) liver cancer, (c) alcoholic liver disease or (d) non-alcoholic liver disease, or the contributing cause of death was either (b), (c) or (d).

Data Source: Health Protection Scotland

Data on hospitalisations were obtained via record-linkage of Scotland's National Hepatitis C Diagnoses Database to the national database on hospital admissions. These showed that first-time hospital admissions with either ESLD or HCC in Scotland among people diagnosed with hepatitis C increased 3.9-fold from 50 in 1998 to 194 in 2013 (Figure 10); the latter number of first-time admissions represents a notable 28% increase compared to the previous four-year period (averaging 152 first-time admissions per annum during 2009-2012). Of the total 1,804 first-time hospital admissions with either ESLD or HCC during 1998-2013 among people diagnosed with hepatitis C, only 625 (35%) had hepatitis C mentioned on the hospital record. Among the 194 first-time hospital admissions with either ESLD or HCC in 2013, 147 (76%) were male, and 92 (47%) were aged less than 50 years. Hospital bed-days with either ESLD or HCC among people diagnosed with hepatitis C increased 4.4-fold from 1,157 in 1998 to 5,068 in 2013 (Figure 10).

First-time hospital admissions with HCC in Scotland among people diagnosed with hepatitis C increased 12-fold from four in 1998 to 48 in 2013 (Figure 10). Of the total 307 first-time hospital admissions during 1998-2013 for HCC among people diagnosed with hepatitis C, only 78 (25%) had hepatitis C mentioned on the hospital record. Among the 48 first-time hospital admissions with HCC in 2013, 40 (83%) were male, and four (8%) were aged less than 50 years. Hospital bed-days with HCC among people diagnosed with hepatitis C increased more than eight-fold from 127 in 1998 to 1120 in 2013 (Figure 10).

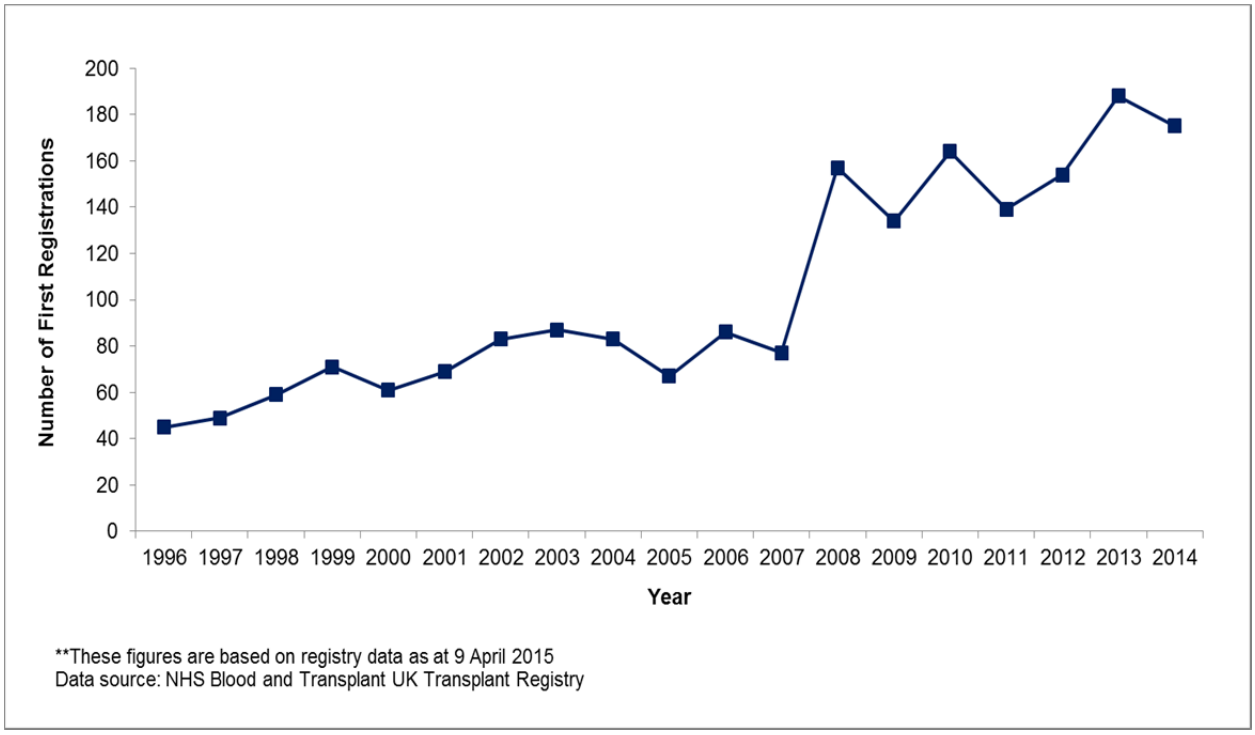
Figure 10. Annual number of: (a) first-time hospital admissions and (b) hospital bed-days associated with ESLD and HCC among persons diagnosed with hepatitis C (antibody positive or RNA positive) in Scotland, during 1998 to 2013.



Liver registrations and transplants for hepatitis C-related disease

In the UK, an overall increase in registrations for liver transplants where post-hepatitis C cirrhosis was given as either the primary, secondary or tertiary indication for transplant, is observed, from 45 in 1996 to 175 in 2014 (Figure 11).

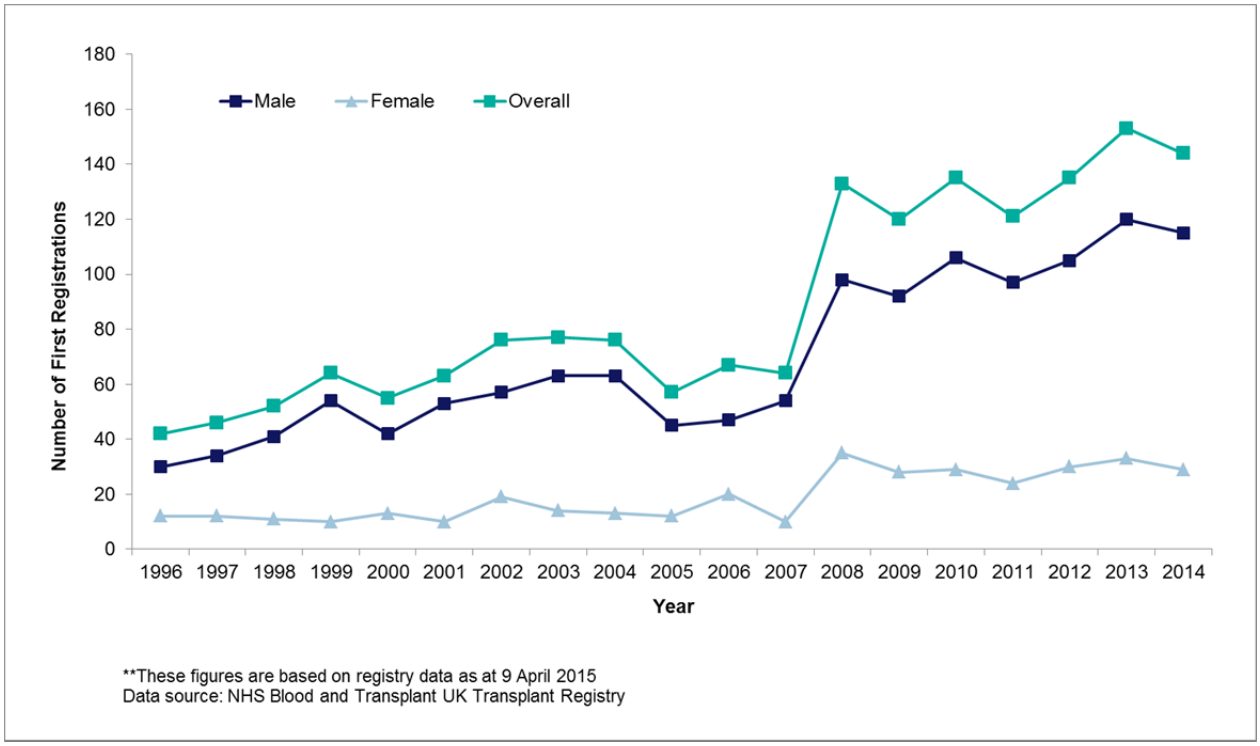
Figure 11. Number of first registrations* for a liver transplant in the UK where post-hepatitis C cirrhosis was given as the primary, secondary or tertiary indication for transplant: 1996 to 2014**



*New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

The number of English residents with post-hepatitis C cirrhosis recorded as either the primary, secondary or tertiary indication for transplant **registering** at NHS Blood and Transplant for a liver transplant increased from 42 registrations in 1996 to 144 in 2014 (Figure 12), with most registrations occurring in London (26% between 2000-2014; Table 8). A rise in liver transplants **undertaken** for this indication, from 43 in 1996 to 122 in 2014, was also observed (Table 9). Of all liver transplants performed in England, the percentage carried out in patients with hepatitis C-related disease increased from 10% in 1996 to 17% in 2014 (15% overall throughout the period), but has not increased over the last three years (Table 9).

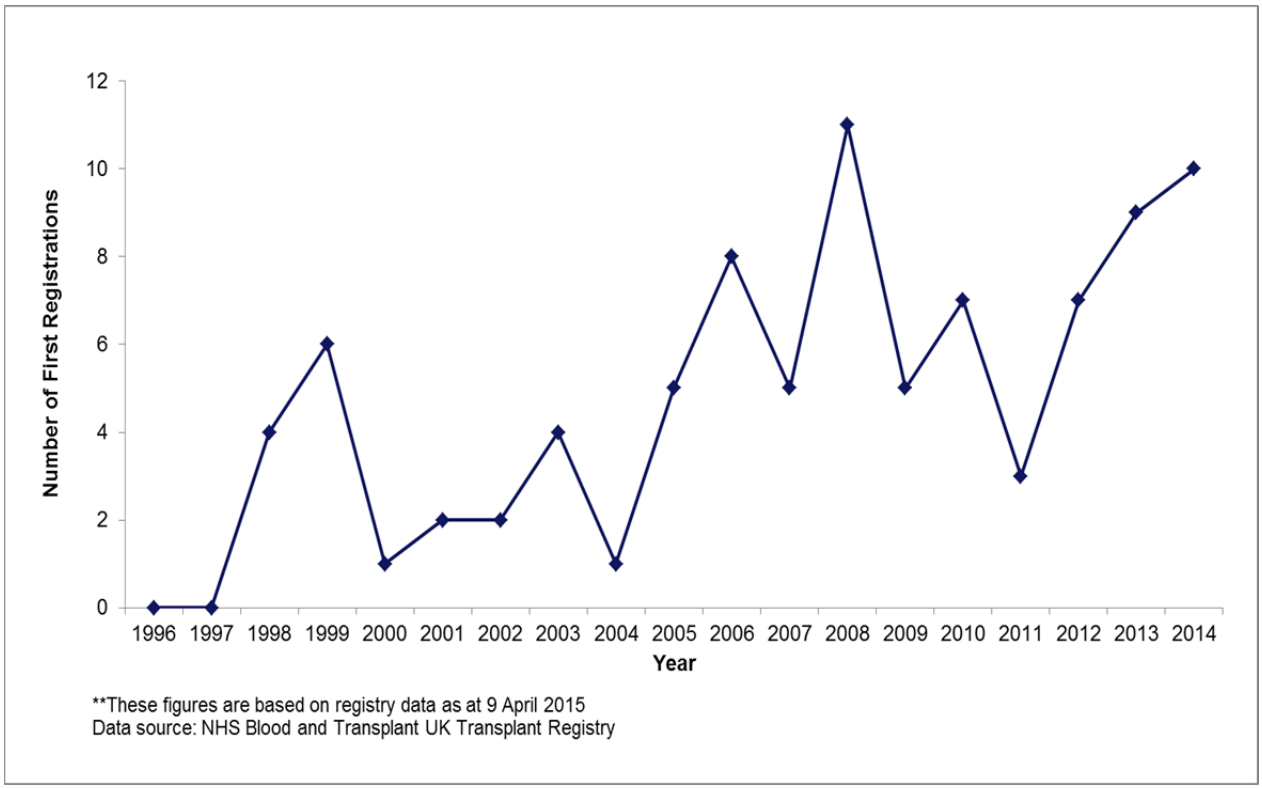
Figure 12. Number of first registrations* for a liver transplant in England where post-hepatitis C cirrhosis was given as either the primary, secondary or tertiary indication for transplant: 1996 to 2014**



*New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

When taken together, ten residents from Northern Ireland and Wales with post-hepatitis C cirrhosis recorded as either the primary, secondary or tertiary indication for transplant, registered at NHS Blood and Transplant for a liver transplant in 2014 (Figure 13), and seven patients underwent a transplant (Table 10). Neither the number of registrations, nor the number of transplants undertaken for this indication has exceeded eleven in any one year since 1996 in Northern Ireland and Wales together (Figure 13, Table 10).

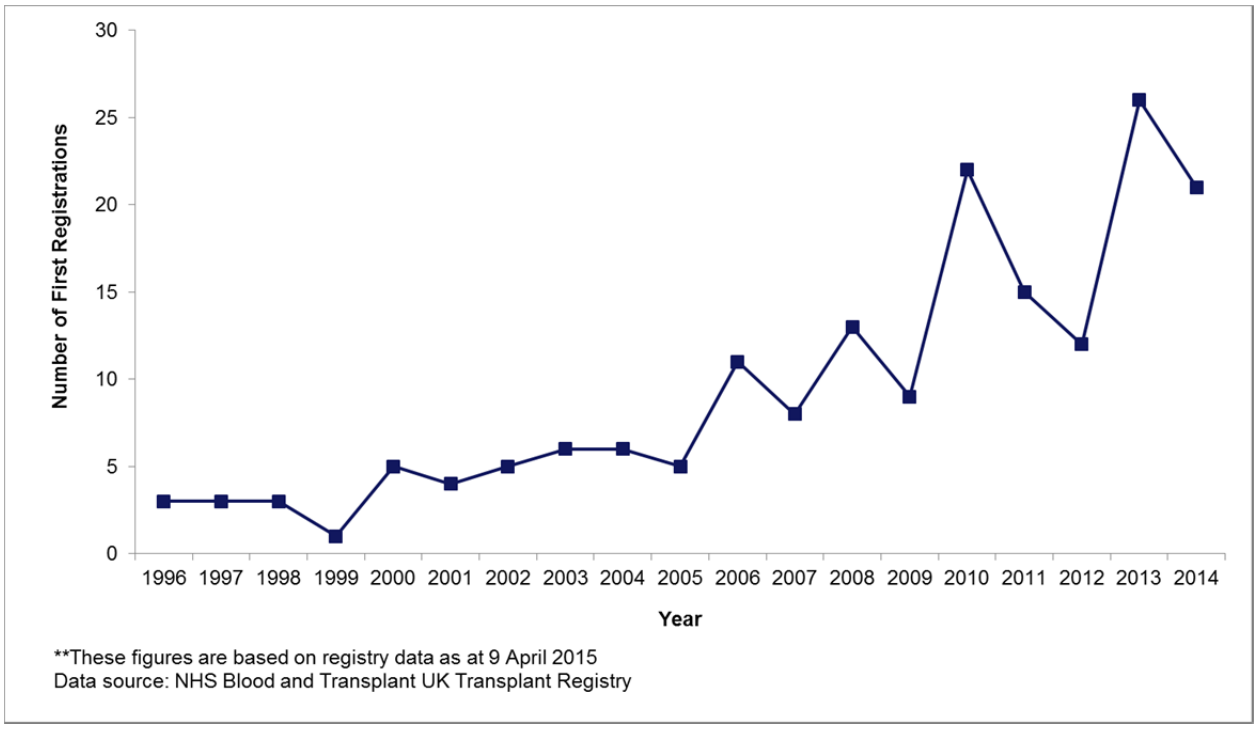
Figure 13. Number of first registrations* for a liver transplant in Northern Ireland and Wales where post-hepatitis C cirrhosis was given as the primary, secondary or tertiary indication for transplant: 1996 to 2014**



*New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

In Scotland, the overall number of liver transplant first registrations with post-hepatitis C cirrhosis recorded as either the primary, secondary or tertiary indication for transplant, has varied over the last 18 years, from one in 1999 to their highest level of 26 in 2013; 21 were registered in 2014 (Figure 14). The number of first liver transplants undertaken in patients with post-hepatitis C cirrhosis and HCV-related HCC fluctuated between 1996 and 2014, reaching their highest level of 24 in 2014, representing 21% of all liver transplants undertaken in that year (Table 11).

Figure 14. Number of first registrations* for a liver transplant in Scotland where post-hepatitis C cirrhosis was given as the primary, secondary or tertiary indication for transplant:1996 to 2014**

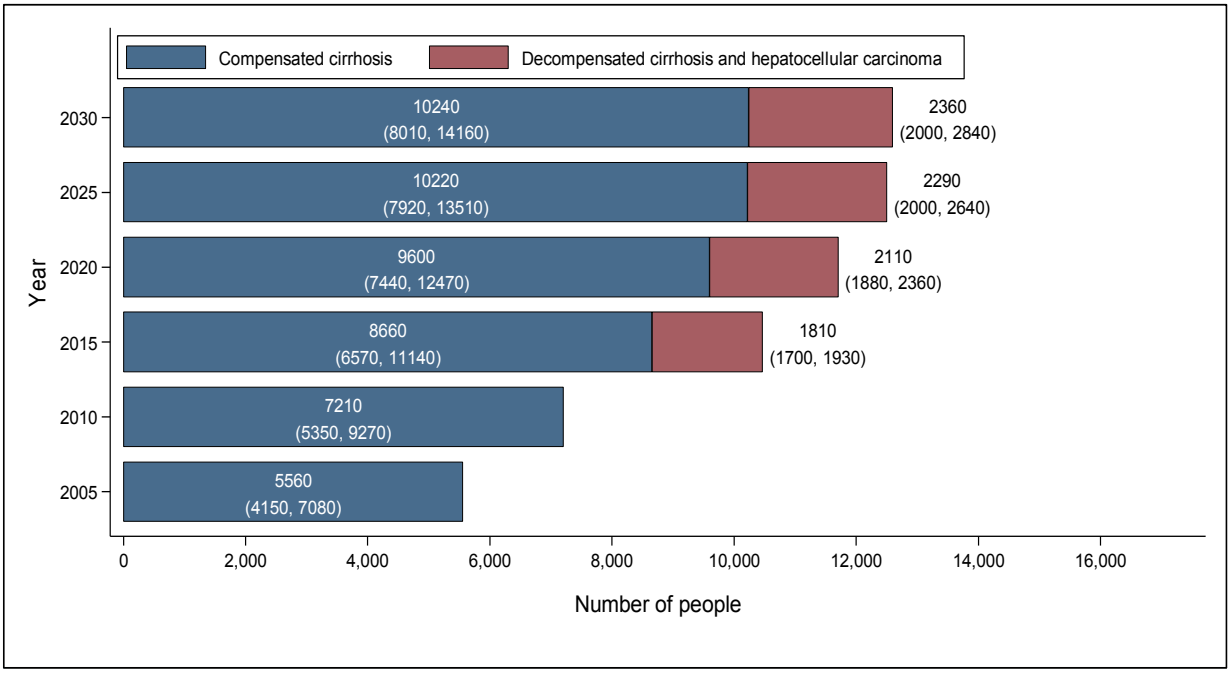


*New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

Future burden of HCV-related disease and action areas

In England, statistical modelling estimates that 10,470 individuals are currently living with HCV-related cirrhosis or HCC in England and predicts that this figure will rise to 12,510 in 2025 if low coverage of current treatments is maintained (Figure 15).

Figure 15. Estimated number of people living with HCV-related cirrhosis or decompensated cirrhosis/HCC in England: 2005 to 2030 (95% credible intervals are given in parentheses)*



*Note: this figure includes the impact of new direct acting antivirals (DAAs) that have been provided to patients with decompensated cirrhosis from 2014 under an early access program, and its continuation.

To help tackle HCV infection in the UK, public health programmes need to make progress in the following four action areas:

- prevention of new infections
- increasing awareness of infection
- increasing diagnosis
- getting diagnosed individuals into treatment and care

The outcome data presented in this report allow us to monitor the impact of prevention initiatives and awareness-raising activities that are taking place across the UK. National monitoring of numbers diagnosed and treated helps us to track our progress in controlling the infection, both in the general population as well as in those groups at particular risk of infection.

Prevention of infection in people who inject drugs

There is good evidence that the combination of effective drug treatments, such as opiate substitution therapy; support for safe injecting, for example through needle and syringe programmes (NSPs); and treatment of HCV infection in people who inject drugs (PWID), can impact on the incidence and prevalence of HCV infection.[8],[9],[10],[11],[12]

England

Evidence indicates that the prevalence of opiate and crack-cocaine injecting has fallen,[41] however, little is known about the extent of the injection of other psychoactive drugs or about the extent of the use of image and performance enhancing drugs.

The number of adults who had ever injected drugs and who were receiving treatment for their drug use increased from 97,080 in 2006/07 to 107,670 in 2013/14 (Table 12); almost half of all people in drug treatment in 2013/14[42] (45%, 48,268/107,670) were currently injecting when they entered treatment (Table 12). Of the 70,930 people newly presenting to treatment in 2013/14[42] 29,538 (42%) were either currently or had previously injected drugs.

NSPs are provided throughout England principally through pharmacies and specialist services. NSP coverage in England is estimated using data collected through the UAM Survey of PWID. In 2014 the vast majority (85%, 1,510/1,786) of participants who injected in the preceding year, reported using an NSP during that time, while only 5% (89/1,786) had never used an NSP.

Those who had injected in the preceding four weeks were asked how many times they had injected, and how many needles they had received during that time. Just less than half (48%, 486/1,020) reported receiving more needles than the number of times they had injected. These data should be interpreted cautiously as some people receive more needles than they need from NSPs because they pass them on to partners or friends, known as ‘secondary distribution’. Also, more than one needle is often required per injection, as needles may also be used during drug preparation and an injection may require several attempts (and therefore needles) to access a vein.

Just less than one third (29%, 403/1,384) of UAM Survey participants in 2014 who had injected during the preceding four weeks reported that they had injected with a needle that had previously been used and which they had attempted to clean.
Together these findings indicate that, in England the majority of PWID are accessing NSPs, however, the amount of equipment provided needs to be increased, and

provision needs to be better targeted. The findings also suggest a need for education on appropriate cleaning techniques for needles and syringes, such as using cold water and bleach to kill any virus on the equipment.

In the English prison estate, an audit of hepatitis C services in a representative sample of English prisons suggested that disinfection tablets for sterilising injecting equipment were available in 81% of English prisons.[14] These tablets were accessed in a variety of ways: 53% of prisons made them available via dispensers, 41% of prisons distributed them directly via prison officers, and 12% of prisons distributed them via healthcare staff.[14]

Wales

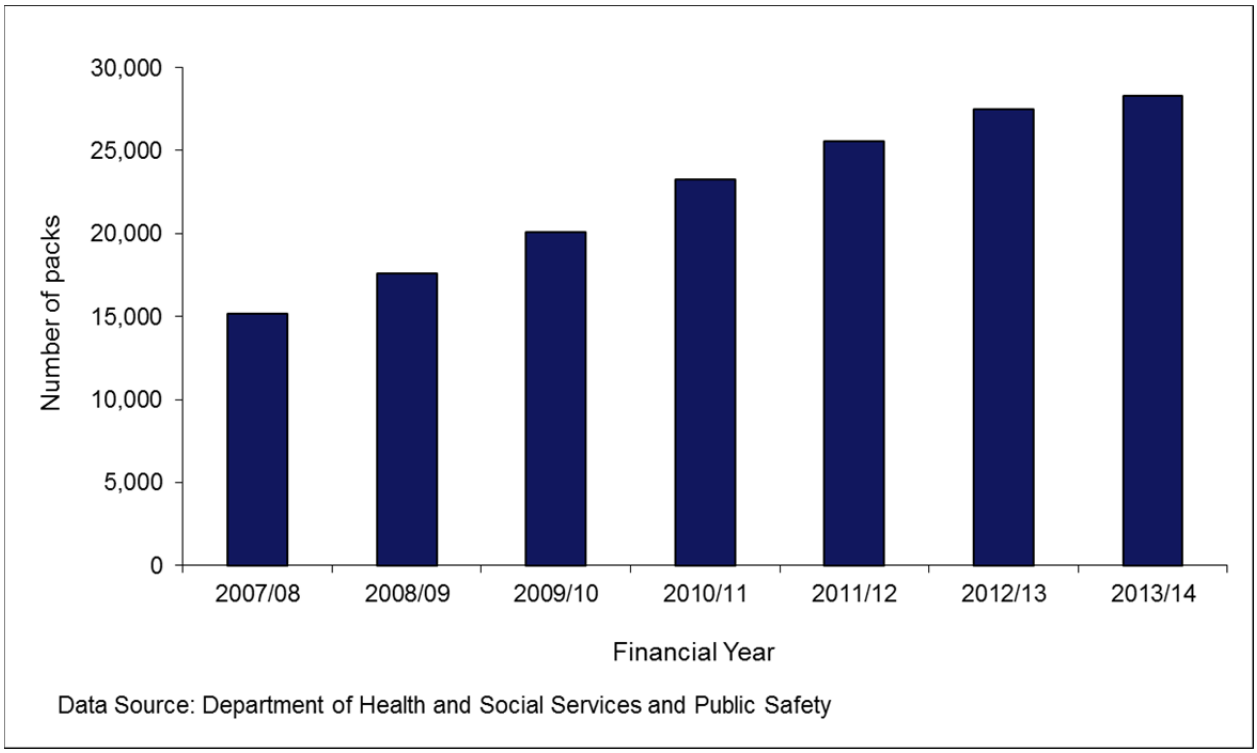
In 2014-15 the Harm Reduction Database (HRD) Wales was active in 47 statutory and voluntary sector NSP sites across Wales, including five mobile services and four hostels. The 207 community pharmacies providing NSP services were linked to the HRD in April 2014. Data from the HRD indicates a total of 25,409 unique individuals accessed NSP services (including community pharmacy) from April 2014 to March 2015. Of these, 50.9% reported primary use of image and performance enhancing drugs (IPED); 37.3% opioids; 9.4% stimulants (crack, amphetamine etc.) and 1.5% new psychoactive substances (NPSs). Due to the logistics of pharmacy based provision, self-reported data relating to HCV infection is not collected from within the community pharmacy environment and so the following data reported here includes only those individuals accessing statutory and voluntary sector NSP services for the period April 2014 to March 2015. In these settings, a total of 9,725 unique individuals accessed statutory and voluntary sector NSP services during that time. Among people who inject psychoactive drugs (all substances excluding IPED), 79.8% were male. The primary drug type profile was: 45% IPED; 43.3% opioid users; 8.3% stimulants (crack, amphetamine etc.) and 2.1% NPSs. Further information including self-reported blood borne viral hepatitis infection is available at:
www.publichealthwales.org/substancemisuse

Northern Ireland

In Northern Ireland, NSPs were available in 18 locations, including three outreach services. The number of packs dispensed by needle exchange schemes has increased year-on-year since 2007/08, reaching 28,284 in 2013/14 (Figure 16). Specific packs are available for people who inject image and performance enhancing drugs and the number of packs issued for this use is rising. In 2013/14, of the 15,483 visits to the needle exchange scheme where the person disclosed what they would use the needles for, 58% were for injecting image and performance enhancing drugs. In 2015, a pilot project is being undertaken with some pharmacy needle exchange sites to survey and

perform unlinked anonymous dry blood spot testing for blood borne viruses in individuals who use image and performance enhancing drugs to gain a greater insight into this group in Northern Ireland.

Figure 16. Number of packs dispensed by NSPs in Northern Ireland: 2007/08 to 2013/14

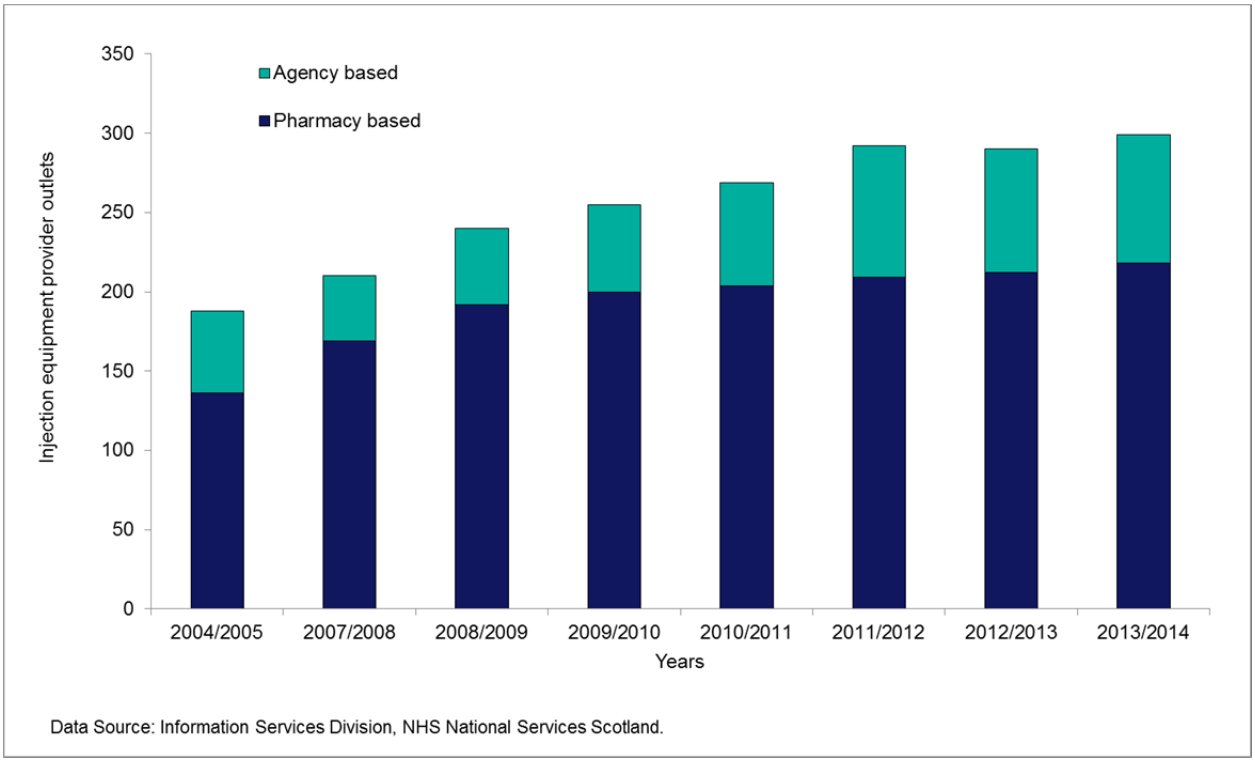


Scotland

The number of PWID (current) in mainland Scotland was last estimated for 2009 to be in the range 11,500-18,600, representing 0.3-0.6% of the Scottish population aged 15 to 64 years**;** this represents a decrease in the number of PWID (current) in mainland Scotland from 2006, which was estimated in the range of 16,300-27,000.[43]

In 2013/14, 299 injection equipment provider outlets, of which 218 (73%) were pharmacy based, were reported to be operating in Scotland.[13] These figures represent an increase from 188 in 2004/05 (Figure 17)[44],[45],[46],[47]

Figure 17. Injection equipment provider outlets operating in Scotland between 2004/2005 and 2013/2014.



Over four million needles/syringes were estimated to have been distributed to PWID in Scotland during 2013/14, based on data reported by 85% (255/299) of the injection equipment provider outlets. Accounting for the under-reporting in 2013/14, this is higher than the 3.6 million needles/syringes reported to have been distributed to PWID in Scotland during 2004/05, and similar to the number of needles/syringes – in the range 4.4 to 4.7 million per year - reported to have been distributed in recent years (2007/08 to 2012/13) (Table 13). The number of injecting paraphernalia items distributed to PWID has increased in recent years, with notable rises in the provision of filters and spoons/cookers between 2008/09 and 2009/10 and in the provision of sterile water between 2012/13 and 2013/14 (Table 13).

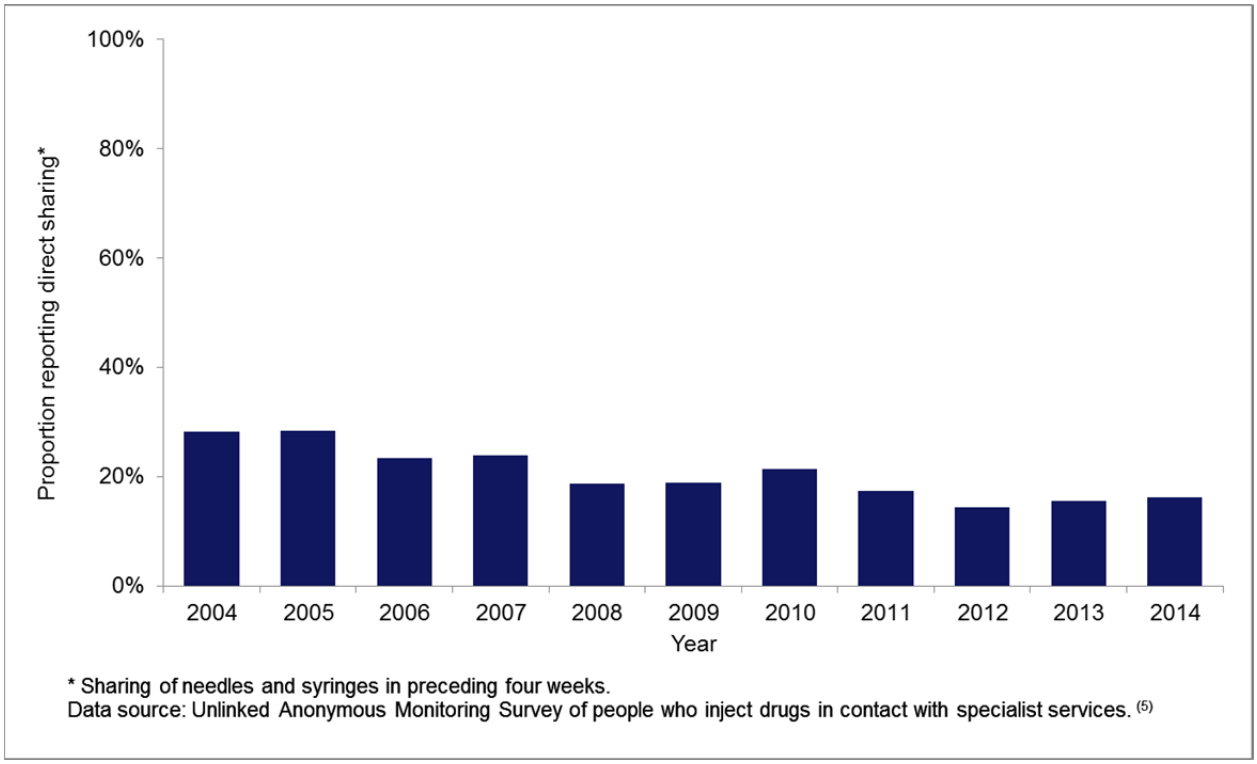
UK data on the sharing of needles and syringes by PWID

As the sharing of injecting equipment and associated paraphernalia is the main route of transmission of infection among PWID, it remains important to monitor levels of sharing within this population.

In England, 16% of currently injecting PWID participating in the UAM Survey, reported direct sharing of needles and syringes in 2014 (Figure 18); this level has declined from

28% in 2004. [5] The reported level of needle and syringe sharing among PWID participating in the UAM Survey in 2014 varied across England; with the level ranging from 12% in the East of England region to 23% in the South West.[5]

Figure 18. Trends in the sharing of needles and syringes in the preceding four weeks among people who inject drugs in England 2004 to 2014

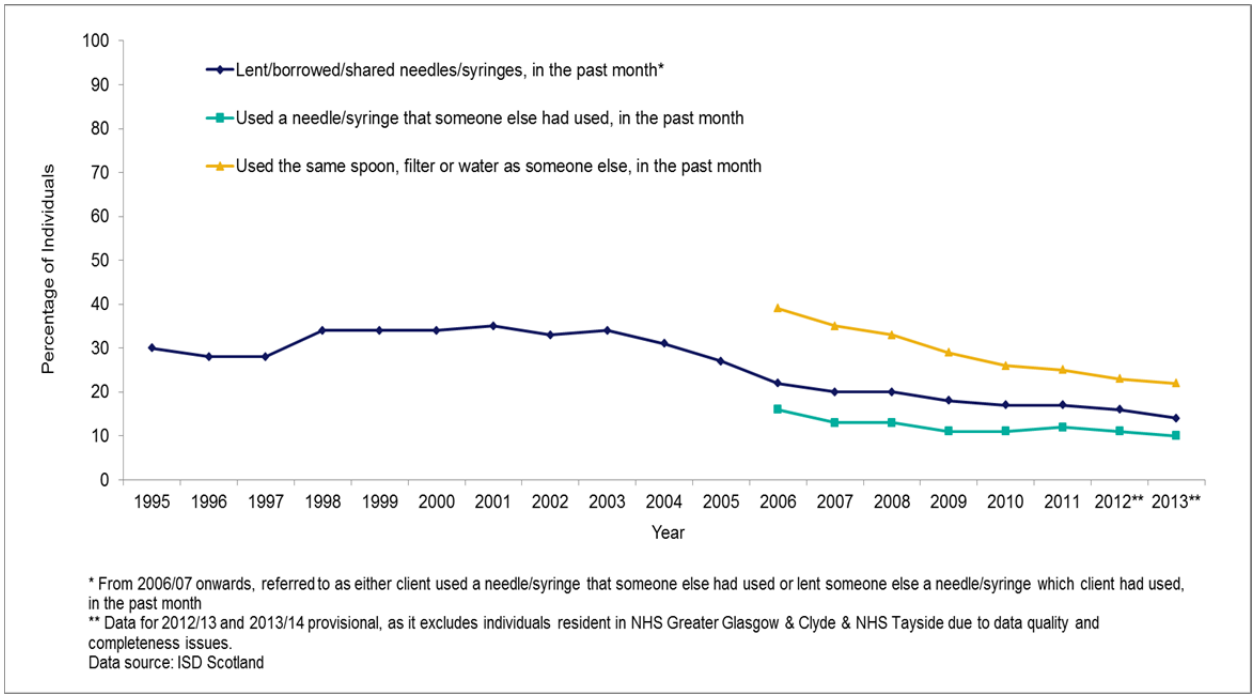


In Northern Ireland, 17% of currently injecting PWID reported direct sharing of needles and syringes in 2014; this level is lower than the 28% in 2004. In Wales, 22% reported direct sharing in 2014; this level is similar to that in 2003-2005 (21%)[5]

In Scotland, among individuals attending drug treatment services and who had injected in the previous month, a continual decline in needle/syringe sharing (either borrowing or lending a used needle/syringe) in the previous month was observed from 30% during 1995/96 to 14% during 2013/14 (Figure 19). Furthermore, a decline in only borrowing used needles/syringes in the past month was observed from 16% in 2006/07 to 10% during 2013/14.

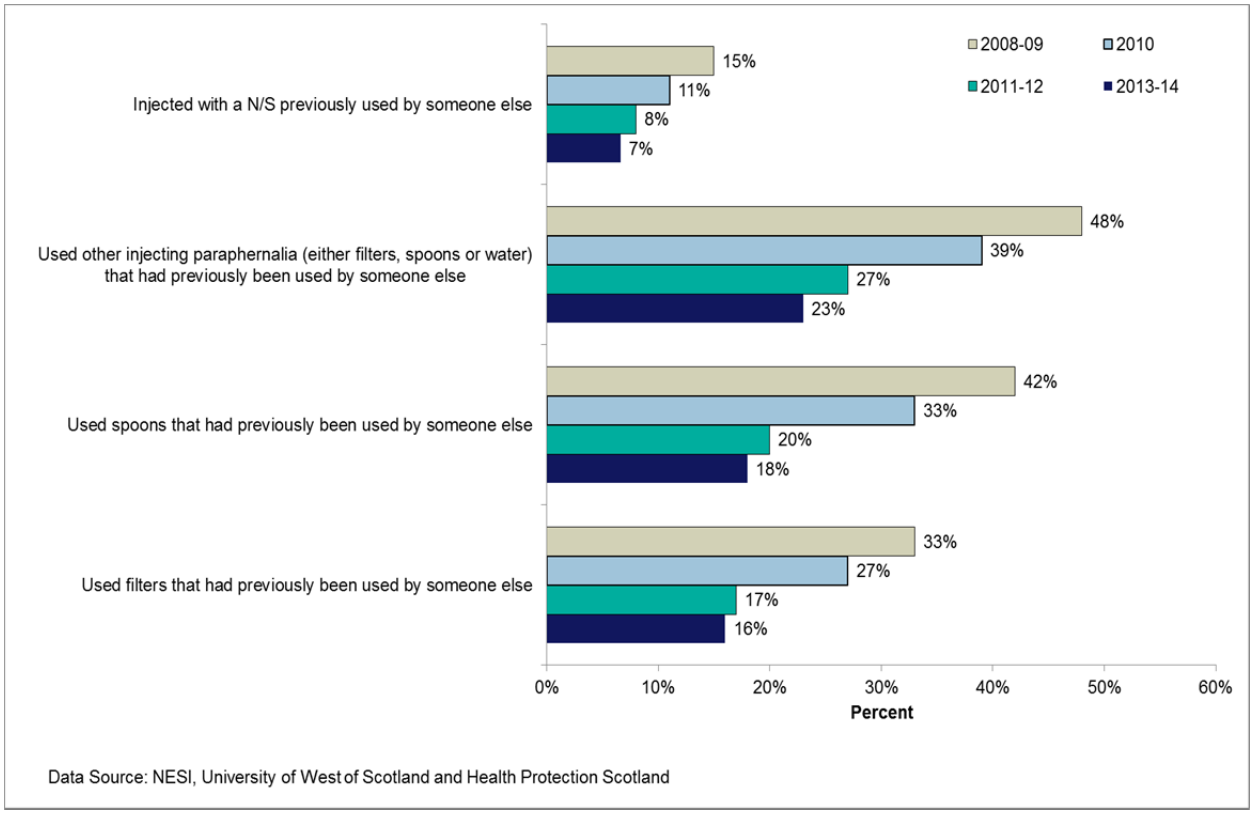
Among individuals attending drug treatment services in Scotland who had injected in the previous month, a decline in the proportion who had used the same injecting equipment (either a spoon, filter or water) as someone else in the past month was observed from 39% in 2006/07 to 22% during 2013/14 (Figure 19).

Figure 19. Percentage of individuals who reported that they had shared injecting equipment in the past month, among clients attending drug treatment services in Scotland who had injected drugs in the past month



In Scotland, among 1,912 PWID interviewed at services providing injection equipment during 2013-14 and who had injected in the past six months, 7% reported having recently (last six months) injected with a needle/syringe previously used by someone else; this compares to 15%, 11% and 8% among PWID similarly surveyed during 2008-09, 2010 and 2011-12, respectively (Figure 20). In this 2013-14 survey, 23% reported having recently (last six months) used other injecting paraphernalia (either filters, spoons or water) that had previously been used by someone else (with 18% having indicated spoons, 16% indicated filters, and 15% indicated water). These figures are lower than that reported among PWID surveyed in 2010 and 2011-12, where 39% and 27% respectively had recently (last six months) used other injecting paraphernalia that had previously been used by someone else (with 33% and 20% having indicated spoons, 27% and 17% indicated filters, and 29% and 21% indicated water, respectively) (Figure 20).

Figure 20. Proportion of PWID, surveyed at services providing injection equipment across mainland Scotland in 2008-09, 2010, 2011-12 and 2013-14, who reported sharing injection equipment.



Incidence of infection

Monitoring the impact of prevention measures on the incidence of infection remains a challenge as incident infection is difficult to measure directly. As a result, a number of methods are used to generate information to provide insight into the likely trends in incidence over time.

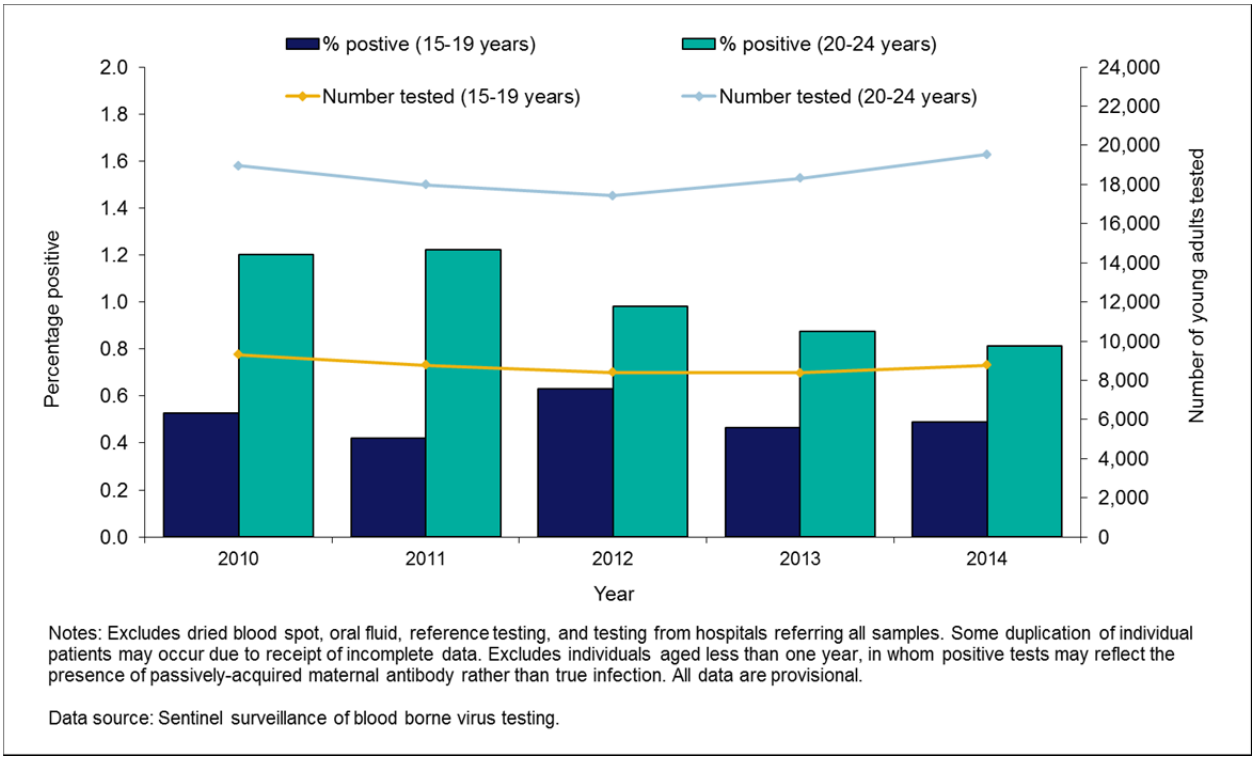
In England, Wales and Northern Ireland, recent transmission of hepatitis C has been explored among the participants in the UAM Survey of PWID by looking for those who have recently developed antibodies to hepatitis C. This has been undertaken by testing the HCV antibody positive DBS samples collected in the survey for antibody avidity. Samples from HCV-infected individuals (demonstrated by the detection of HCV RNA), with HCV antibodies whose overall avidity is weak are likely to be from individuals who have recently been infected with hepatitis C. The length of time that samples from recently infected individuals will have antibodies with weak avidity is uncertain, but this state may last from two to six months. Avidity testing was used to explore recent transmission in 2014 among those survey participants who had injected during the preceding year. Those testing anti-

HIV positive were excluded. Preliminary analysis of the data indicate that in this group there were 28 HCV antibody positive samples where the avidity of the antibody was weak and hepatitis C viral RNA was also present and 1,009 participants who were HCV antibody negative. Therefore, of the survey participants who were potentially at risk of acquiring hepatitis C, 2.8% (95% CI, 1.8%-3.9%) had been infected. These preliminary data are consistent with an incidence of hepatitis C infection among PWID in England, Wales and Northern Ireland of between five and 16 infections per 100 person years of exposure.

In the very early stages of HCV infection, individuals have high levels of viraemia prior to developing antibodies – often referred to as the viraemic pre-seroconversion window. During this relatively short period, individuals will test hepatitis C antibody negative but RNA positive. In Scotland, among 985 PWID who tested hepatitis C antibody negative at services providing injecting equipment during 2013-14, 1.5% were found to be RNA positive on DBS testing; this compares to 2.1%, 1.5% and 0.9% among PWID surveyed in 2008-09, 2010 and 2011-12. Assuming a viraemic pre-seroconversion window period of 51 days,[48] the incidence of HCV infection among PWID across Scotland is estimated at 10 per 100 person years during 2013-14; this compares with estimated incidence rates of 13.3, 9.9 and 6.1 per 100 person years during 2008-09, 2010 and 2011-12, respectively.

Because most new infections are acquired via injecting drug use at a relatively young age[49] the prevalence of infection in young adults or in recent initiates to injecting drug use, can be used as proxy measures. In England, these proxy measures suggest that incidence has remained relatively stable over recent years (Figures 21-23).

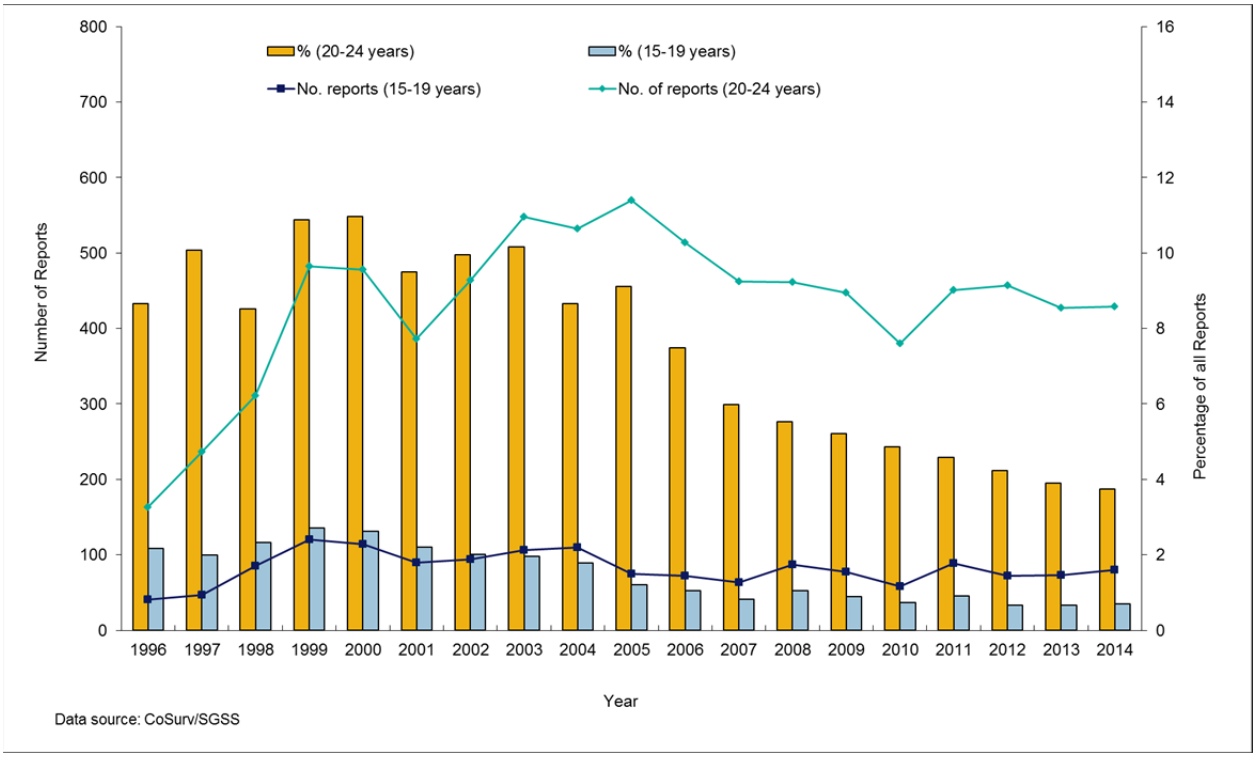
Figure 21. Number of anti-HCV tests performed in young adults and proportion positive by year in 23 sentinel laboratories 2010 to 2014



Notes: Excludes dried blood spot, oral fluid, reference testing, and testing from hospitals referring all samples. Some duplication of individual patients may occur due to receipt of incomplete data. Excludes individuals aged less than one year, in whom positive tests may reflect the presence of passively-acquired maternal antibody rather than true infection. All data are provisional.

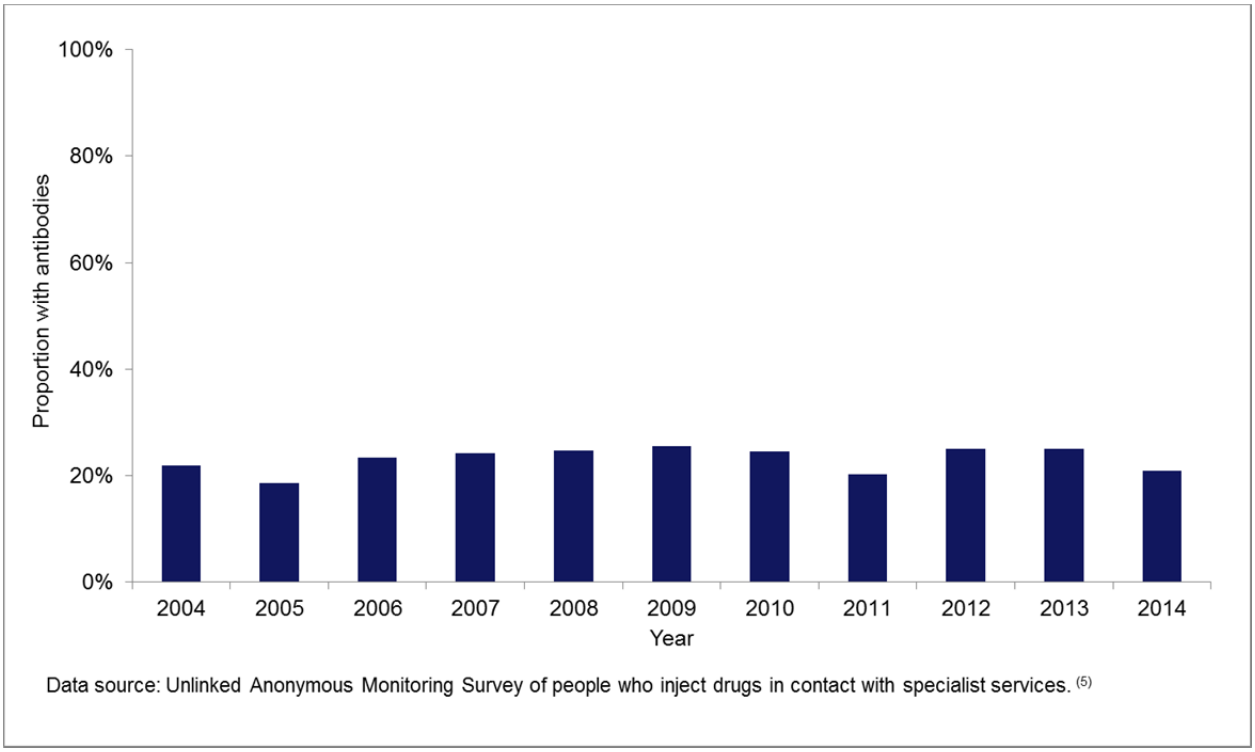
Data source: Sentinel surveillance of blood borne virus testing.

Figure 22. Laboratory reports* of hepatitis C in young adults in England: 1996 to 2014



*Statutory notification by diagnostic laboratories was introduced in October 2010[50],[51]

Figure 23. Hepatitis C prevalence* in those who began injecting in the last three years: England 2004 to 2014



* During 2009 to 2011 there was a phased change in the sample collected in the survey from an oral fluid to dried blood spot (DBS). The sensitivity of the anti-HCV tests on these two sample types is different. The sensitivity of the oral fluid test for anti-HCV is approximately 92%,[38] that on DBS samples is close to 100%. Data presented here have been adjusted for the sensitivity of the oral fluid test.

In England, enhanced surveillance of newly acquired HCV infection in MSM provides evidence of ongoing, but declining sexual transmission of HCV among HIV positive MSM. In this population, the estimated incidence of infection declined significantly over the four years up to 2013 to 2.3 per 1,000 person years in 2013.

In Scotland, among 415 PWID surveyed at services providing injection equipment during 2013-14 and who had commenced injecting in the past five years, 30% tested positive for hepatitis C antibodies (in anonymous testing of their DBS samples); this compares to 30%, 28% and 23% who had tested positive in 2008-09, 2010 and 2011-12 (Figure 4).

Diagnosis, testing and awareness of infection

Raising awareness of infection

Because hepatitis C is usually asymptomatic in the early years of infection, many individuals remain undiagnosed. Raising both professional and public awareness therefore remains a priority and an important component of reducing the burden of undiagnosed infection.

As in previous years, a variety of initiatives are ongoing throughout the UK to increase public awareness of hepatitis C. Many of these are specifically designed to target those at highest risk of infection, including past or current PWID, offenders, and individuals of South Asian origin. The success of these initiatives has been dependent on the significant contribution of numerous stakeholders working across a range of settings. For example, this year RCGP, HCV Action and The Hepatitis C Trust, launched an educational film to support primary care to increase their knowledge about HCV and help them to build confidence in diagnosing and supporting people through treatment (http://hcvaction.org.uk/resource/film-detecting-managing-hepatitis-c-primary-care). Other films have been developed targeting minority ethnic communities at increased risk of infection, like the health resource produced by Maslaha in both English and Urdu, to help tackle the high rates of hepatitis C (and B) among British Pakistani communities (www.understandhepbandc.org/). Such films can be particularly useful as they combine medical and cultural guidance to help learn about infection and how best to get tested.

This year, a second national event took place on 21 May 2015 in Birmingham to support stakeholders to implement the opt-out blood borne virus testing programme in English prisons.[17] Working with partners, HCV Action have arranged a series of road shows in England during 2015 which focus on hepatitis C generally but also serve to raise awareness about the opt-out BBV testing in prisons. The first of these was held in Liverpool on 6 March and the second was held in London on 26 June 2015. More information about these events is available on their website (www.hcvaction.org.uk/).

In England, the RCGP Certificate in the Detection, Diagnosis and Management of Hepatitis B and C in Primary Care was developed to help raise awareness in primary care and among other professionals working with groups at high risk of chronic viral hepatitis infection[52] By December 2014, 2,356 individuals had completed the e-learning module (61% in England; 0.5% in Northern Ireland; 5% in Wales; 9% in Scotland; 2% non-UK; 23% unknown region), 41% of these doing so in 2014, and 799 had attended face-to-face training days (Table 14). In total, 661 individuals had completed Level 1 of the certificate (comprising both the e-module *and* face-to-face training) (Table 14). To

supplement this, a new RCGP course was launched in April this year, '*Hepatitis C: Enhancing Prevention, Testing and Care*' which comprises four lessons: understanding hepatitis C; preventing transmission; testing and diagnosis; and treatment and care. By the end of June 2015, 113 attempts to complete the pre-course assessment resulted in an average score of 62% and 65 attempts to complete the post-course assessment resulted in an average score of 84%. This e-learning course takes approximately 2 hours to complete and is available at: http://elearning.rcgp.org.uk/course/info.php?id=175&popup=0.

RCGP Certificate in the Detection, Diagnosis and Management of Hepatitis B and C in Primary Care - Level 1

The certificate was created to support all healthcare professionals who want to become more confident in assessing and managing patients with hepatitis B and C. This certificate will provide the knowledge needed to integrate the prevention, care and treatment of Hepatitis B and C into your work. This certificate is comprised of a Hepatitis eLearning Module which is free to all, and a face-to-face training day organised by the RCGP; interested individuals can find out more information and book onto these courses at: www.rcgp.org.uk/smah.

The next RCGP Certificate in the Detection, Diagnosis and Management of Hepatitis B and C in Primary Care - Level 1 will be taking place at the RCGP headquarters on the 14th October 2015. Please refer to the web link to register for the course: www.rcgp.org.uk/professional-development/substance-misuse-and-associated-health-landing-page/rcgp-certificate-in-the-detection-hepatitis-b-and-c.aspx

RCGP also takes expressions of interest for Level 2 of the certificate, which will be rolled out again as soon as possible. Anyone wishing to be contacted when the course is accepting applications can send their expressions of interest to hepbandc@rcgp.org.uk.

Within the prison setting, an audit of hepatitis C services in a representative sample of English prisons suggested that 81% of prisons had training on BBVs for healthcare staff; 48% had training for prison officers and 57% had training for drug workers.[14] In Wales, within the prison setting, an e-learning package has been developed to improve the knowledge of prison staff in relation to BBVs. More than 500 staff have completed this training which is due for further roll out across the prison estate in Wales, and an evaluation has been published[15]

Overall, the NGO sector has been particularly influential and organisations such as The Hepatitis C Trust, the British Liver Trust, HCV Action, Addaction and the Scottish Drugs

Forum (Hepatitis Scotland) deserve a special mention. Such work is essential and complements government and public sector initiatives in this important area. Dedicated hepatitis C websites for healthcare professionals, the general public and South Asian communities are available on the NHS Choices website:

- www.nhs.uk/hepc includes a self-assessment tool on risk of having HCV infection.
- www.nhs.uk/hepatitisc/southasian
- www.nhs.uk/hepatitisc/hcp

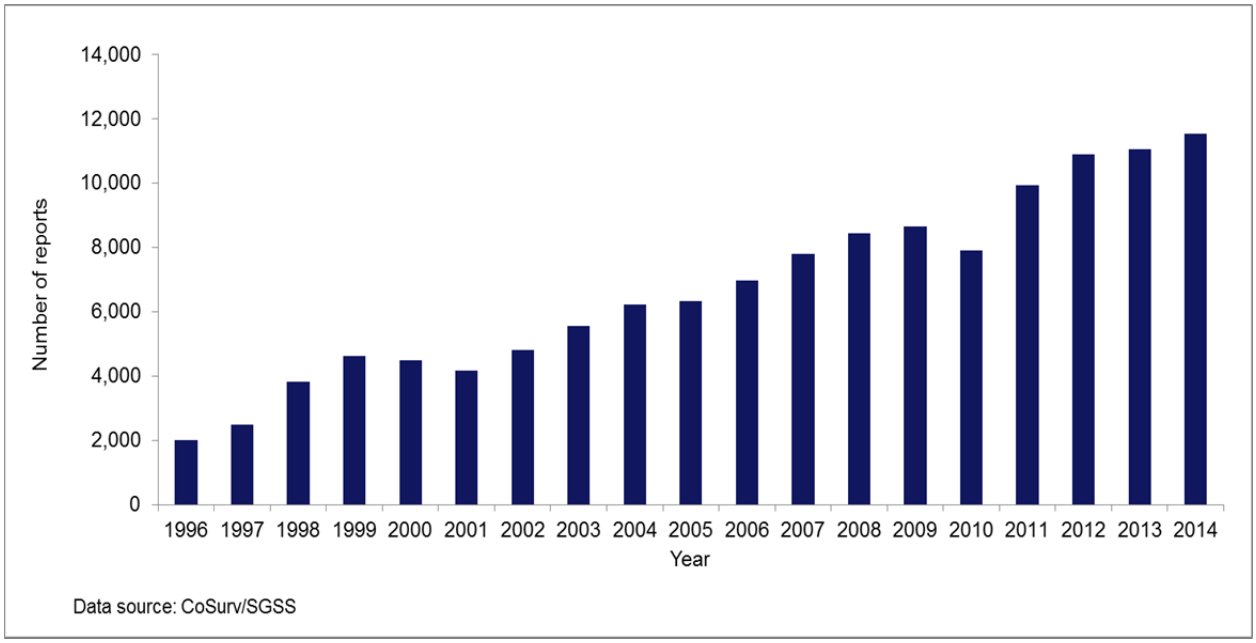
Testing and diagnosis in the general population

Trends in HCV diagnosis and testing are useful for monitoring the impact of awareness-raising initiatives and prevention activity; this in turn helps to track national progress in controlling the infection. Monitoring testing and diagnosis is useful at a population level, as well as in sub-groups that are at increased risk of infection. Monitoring infection in blood donors, who are at low risk of BBV infection, is also very useful for identifying new groups of individuals who may be at increased risk of infection. NICE public health guidance exists to help focus activity to ensure that more people at increased risk of hepatitis C (and B) infection are offered testing[16]

England

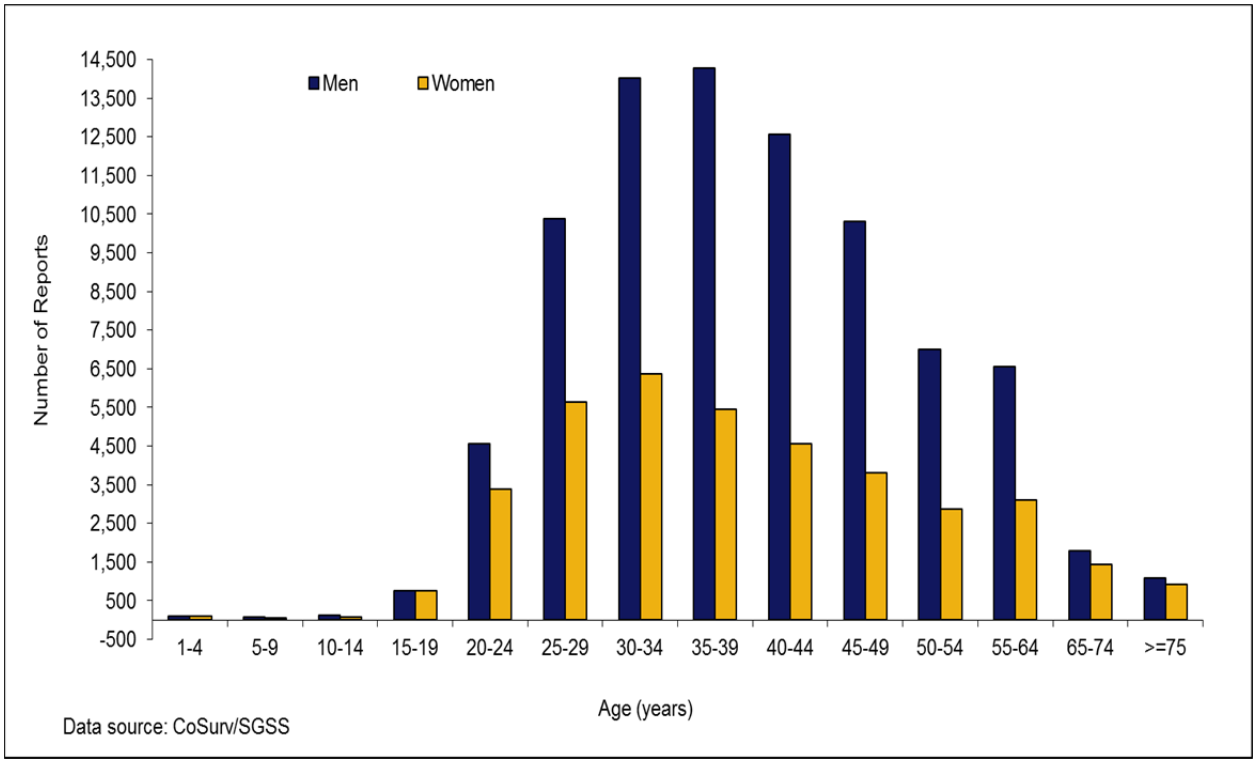
Over nearly two decades, there has been a steady increase in the number of laboratory confirmed reports of HCV in England with a more than five-fold increase between 1996 and 2014 (Figure 24). In 2014, 11,539 laboratory reports of individuals testing positive for antibodies to HCV were reported (Figure 24). Around two-thirds of laboratory reports (67%) were in men; almost half (46%) of all reports received were in individuals aged between 25 and 39 years (Figure 25).

Figure 24. Number of laboratory reports* of hepatitis C from England: 1996 to 2014



*Statutory notification by diagnostic laboratories was introduced in October 2010[50],[51]

Figure 25. Age and sex distribution of laboratory reports* of hepatitis C from England: 1996 to 2014



*Statutory notifications by diagnostic laboratories was introduced in October 2010[50],[51]

There continues to be regional variation in the number of laboratory reports of hepatitis C in England with the highest figures for 2014 being reported in London and lowest figures being reported in the North East (Table 15). A major increase of 24% was observed in London over the last year (Table 15), a proportion of which may be the result of improved reporting following the introduction of statutory reporting in 2010.[50], [51]

Trends in testing were analysed using data from the 23 sentinel laboratories where complete and consistent data have been available from January 2010 to December 2014 (Map 2; Figure 26). Numbers of tests undertaken rose by 5% between 2013 and 2014, but have remained relatively stable over the last five years. This may be partly due to testing saturation among the pool of 'easy-to-access' individuals. Overall, the proportion of people testing positive for anti-HCV has declined in recent years from 2.6% in 2010 to 1.8% in 2014, which is consistent with a higher proportion of individuals at relatively lower risk of infection being tested.

Map 2. Geographic distribution of centres who have participated in the Sentinel Surveillance of hepatitis Testing Study by Public Health England Centre.

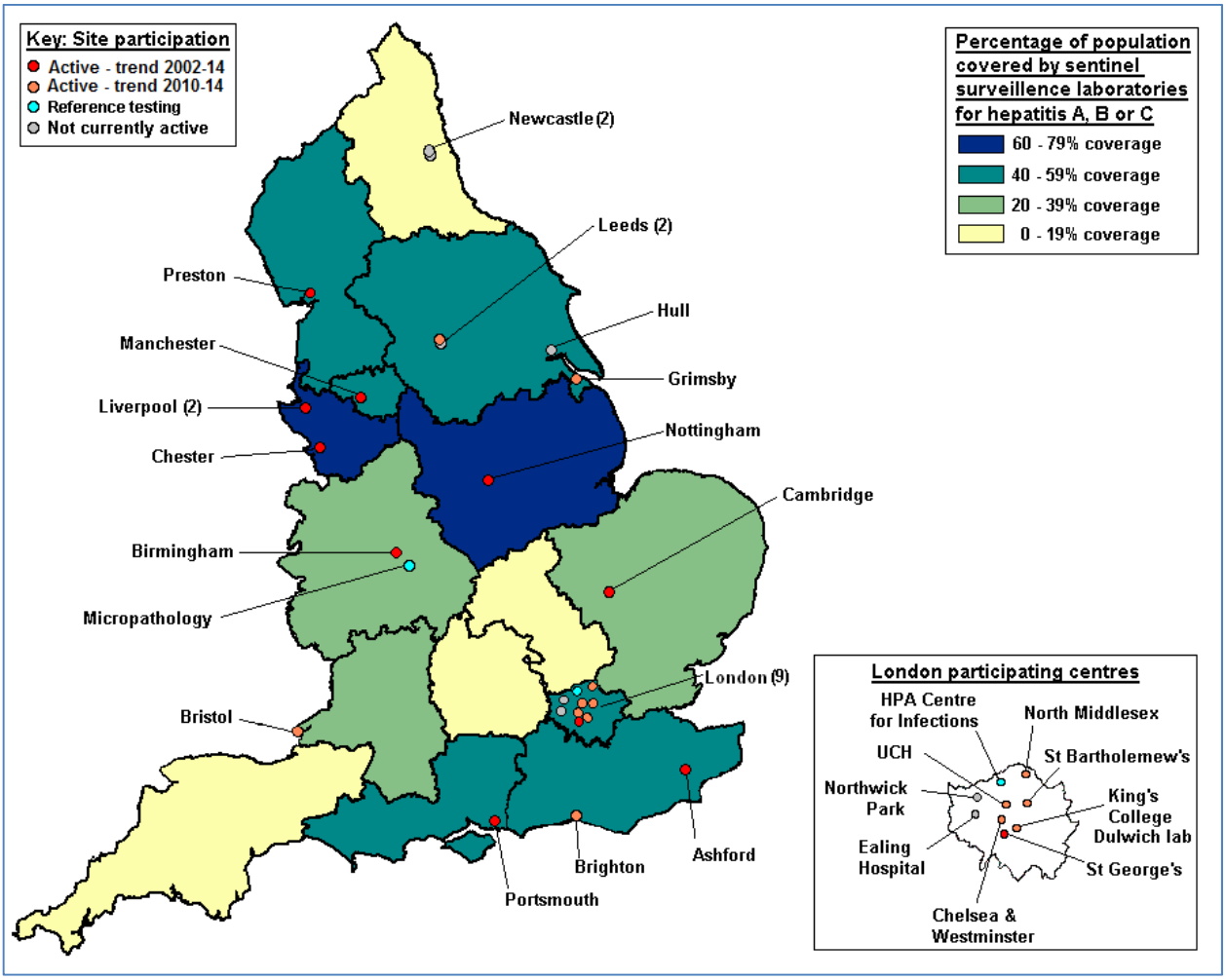
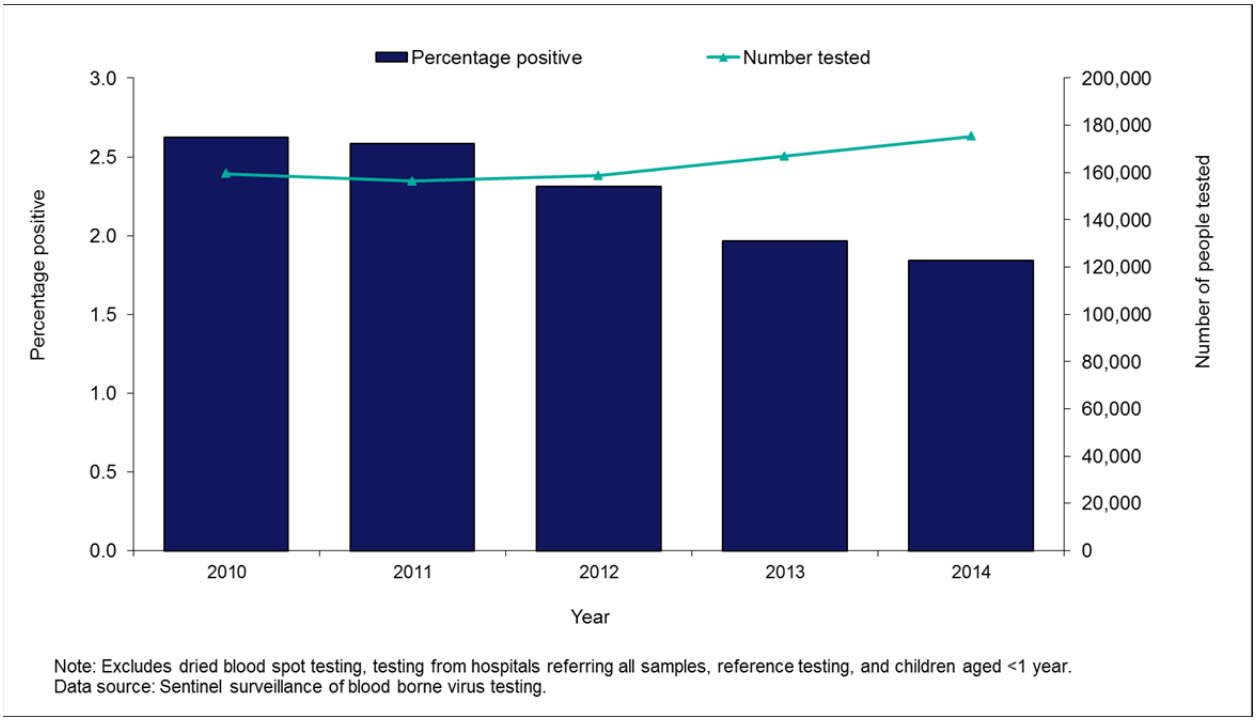
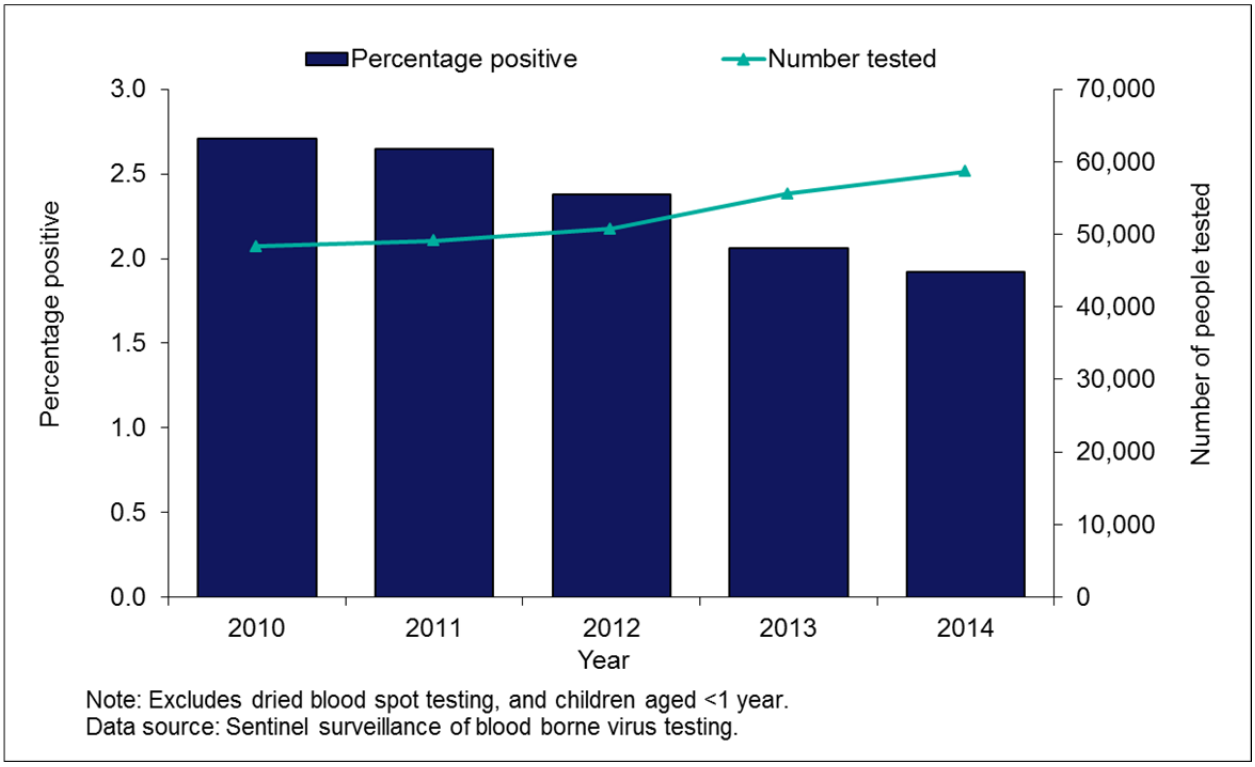


Figure 26. Number of people tested for anti-HCV by year, and proportion positive, in 23 sentinel laboratories: 2010 to 2014



In general practice, testing continued to increase year-on-year between 2010 and 2014 and rose by 5% between 2013 and 2014, suggesting that awareness of hepatitis C in this setting may be increasing. The proportion of individuals testing positive for hepatitis C decreased over this period from 2.7% in 2010 to 1.9% in 2014 (Figure 27).

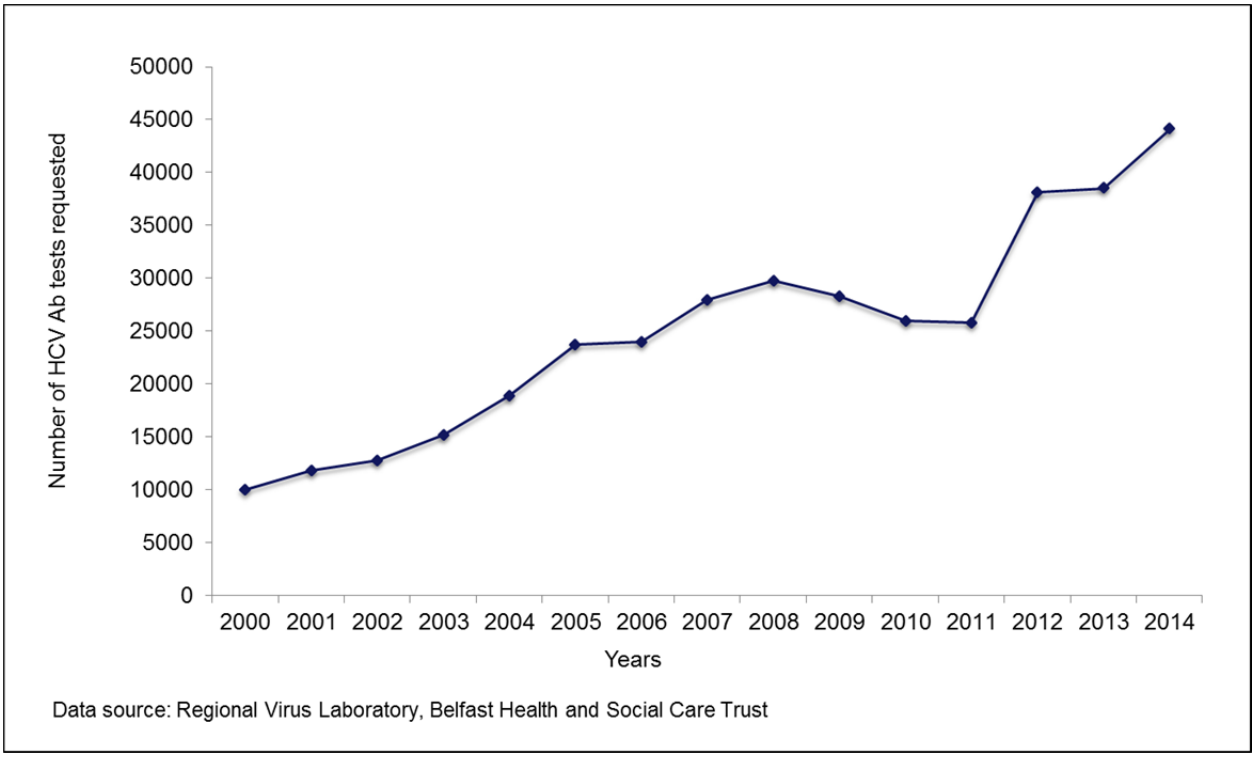
Figure 27. Number of people tested for anti-HCV by year, and proportion positive, through GP surgeries in 23 sentinel laboratories: 2010 to 2014



Northern Ireland

In Northern Ireland there has been an increasing trend in testing since 2000 (Figure 28). In 2012 there was a marked increase, which is partly attributable to an increase in testing in sexually transmitted infections (STI) clinics, and this increased again in 2014. (Figure 31)

Figure 28. Number of HCV antibody tests requested in Northern Ireland: 2000 to 2014



The number of new laboratory confirmed antibody positive reports of hepatitis C increased in 2014 to 138 (provisional data; Figure 29). In that year, 93 (67%) of the 138 new laboratory confirmed cases were HCV RNA positive on initial sample testing (Table 16).

The majority of confirmed cases of hepatitis C occurred in persons aged from 15 to 44 years old, with little change in proportions of different age groups over the past five years (Figure 30); 59% of newly-diagnosed cases in 2014 were in men.

Figure 29. Laboratory-confirmed HCV antibody positive cases in Northern Ireland: 1995 to 2014

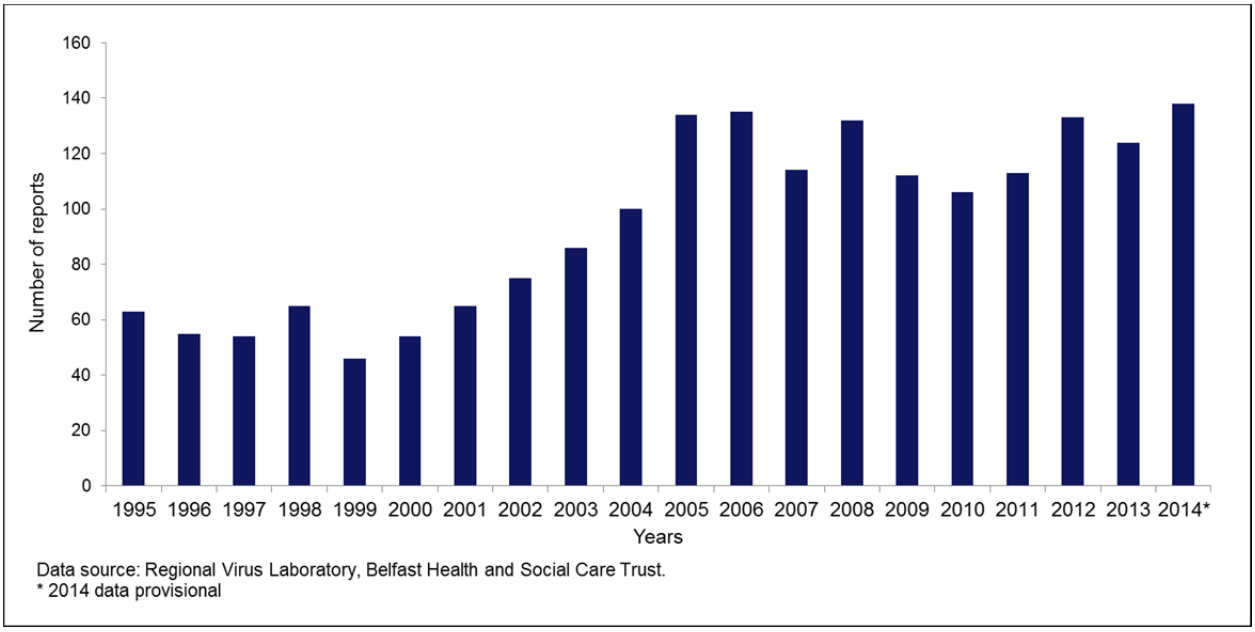
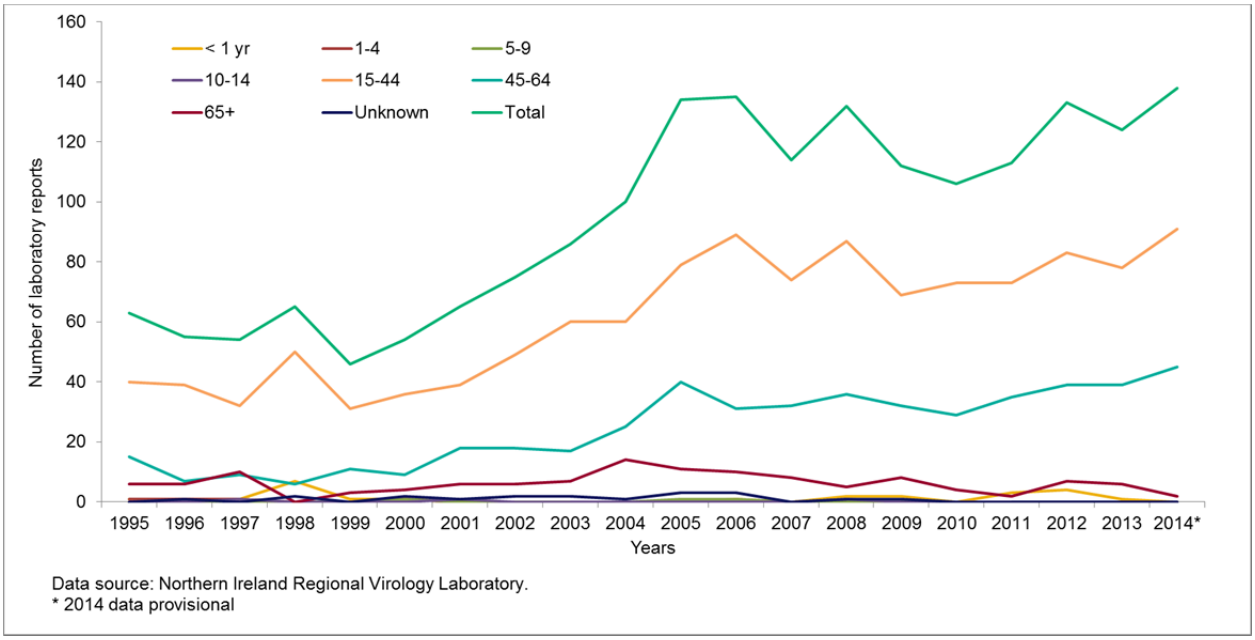
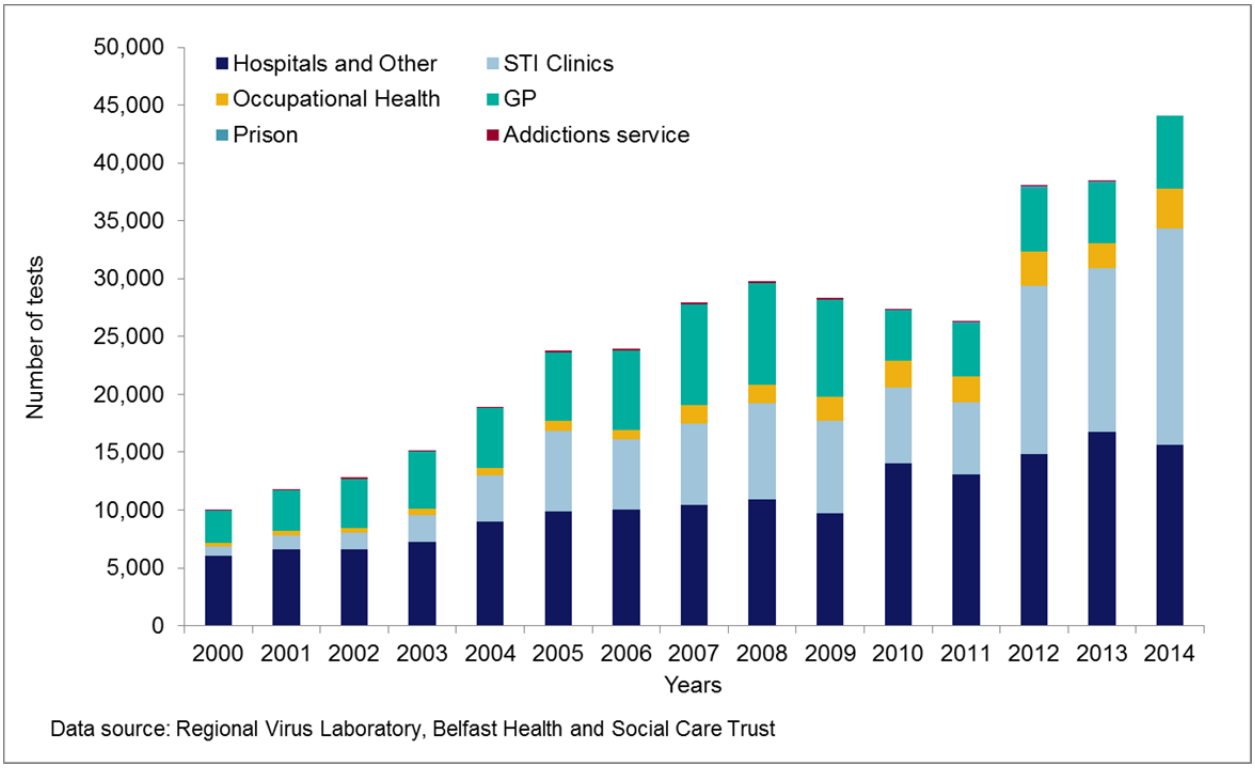


Figure 30. Laboratory confirmed HCV antibody positive cases in Northern Ireland, by age: 1995 to 2014



In Northern Ireland in 2014, the number of HCV testing requests received from GP's, occupational health and genitourinary medicine (GUM) settings increased; tests from hospital and other settings decreased compared to 2013 figures but where higher than test requests in 2012. (Figure 31)

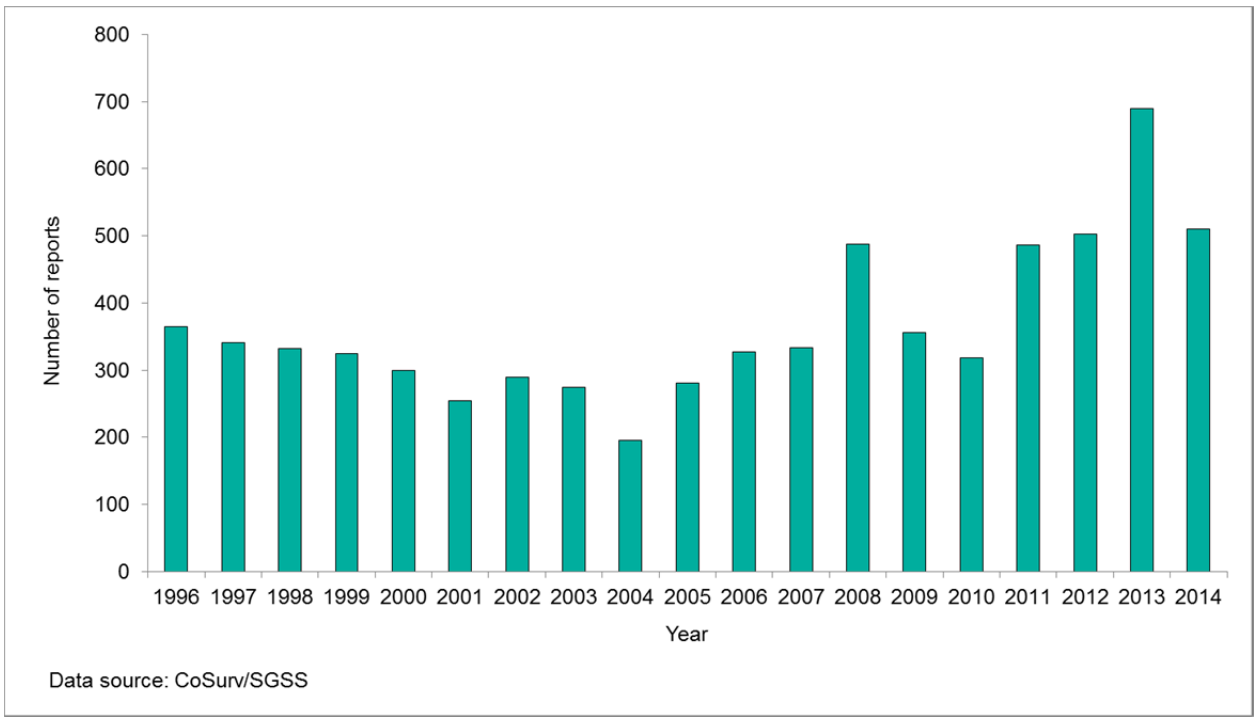
Figure 31. Source of hepatitis C antibody requests in Northern Ireland: 2000 to 2014



Wales

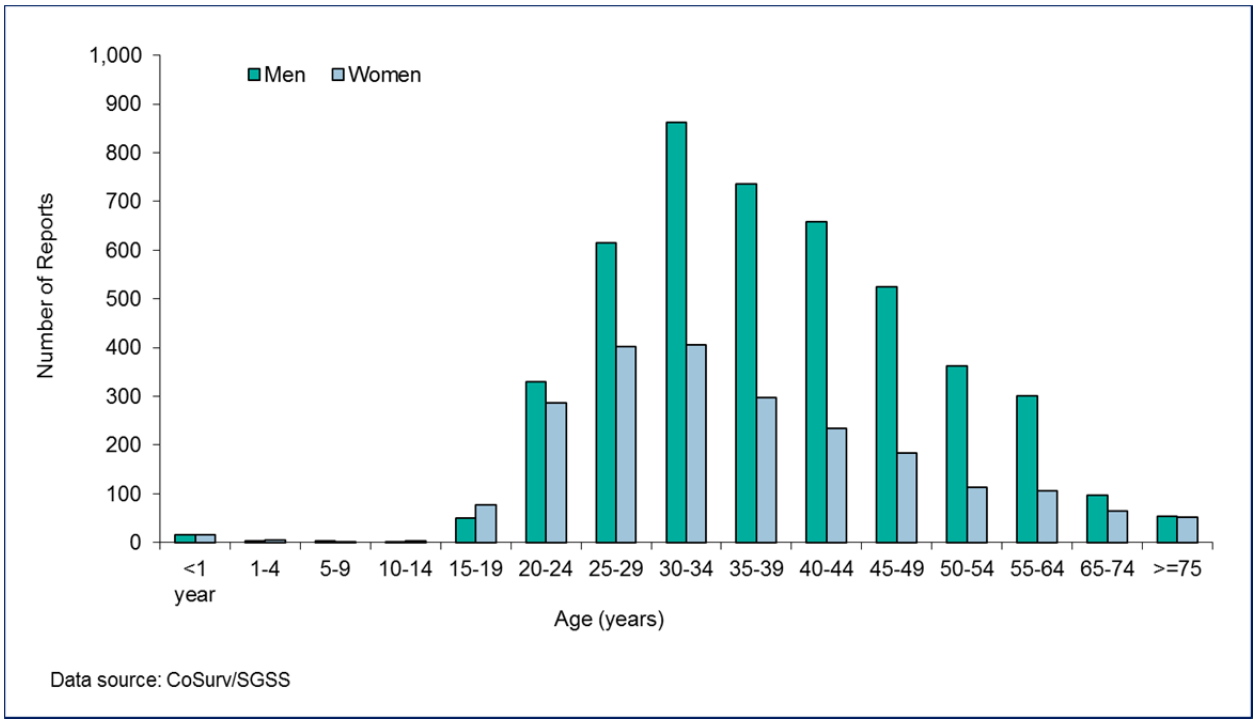
In Wales the number of laboratory reports of HCV infection has shown some variation since 1996, peaking at 690 reports in 2013, with 510 reports in 2014 (Figure 32). Systems used to derive these data have been undergoing changes which may have affected data in the most recent years. A proportion of the increase since 2010 is likely to be the result of improved reporting following the introduction of statutory reporting in that year.[50], [51] Most infections occur in males between the ages of 25 and 49 years, with a peak in those aged 30 to 39 years (Figure 33).

Figure 32. Number of laboratory reports* of hepatitis C from Wales: 1996 to 2014



*Statutory notification by diagnostic laboratories was introduced in October 2010[50], [51]

Figure 33. Age and sex distribution of laboratory reports* of hepatitis C in Wales: 1996 to 2014

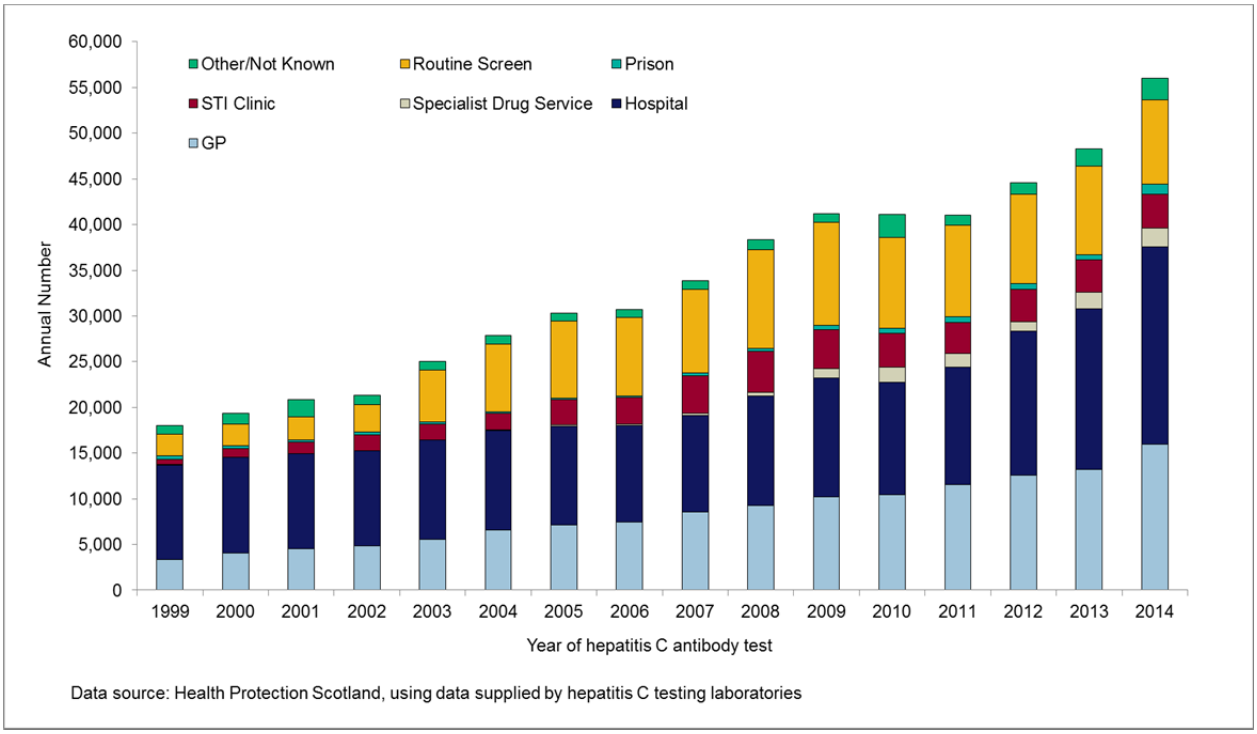


*Statutory notification by diagnostic laboratories was introduced in October 2010[50], [51]

Scotland

The number of people tested for hepatitis C antibody in Scotland's four largest NHS Board areas (ie Lothian, Grampian, Greater Glasgow and Clyde, and Tayside) each year has increased 3.1-fold from approximately 18,000 in 1999 to 55,900 in 2014 (Figure 34). Of the 55,900 people tested for hepatitis C antibody in 2014, 39% were undertaken in the hospital setting (including infectious disease and gastroenterology units), 28% by general practitioners, 16% as part of a routine screen (at either a renal, fertility or occupational health clinic), 7% in STI clinics, 4% in specialist drug services, 2% in prisons, and 4% in other/not known settings. In recent years (from 2006 to 2014), the number of people tested for hepatitis C antibody increased the most in specialist drug services (11.4-fold) and prisons (5.8-fold).

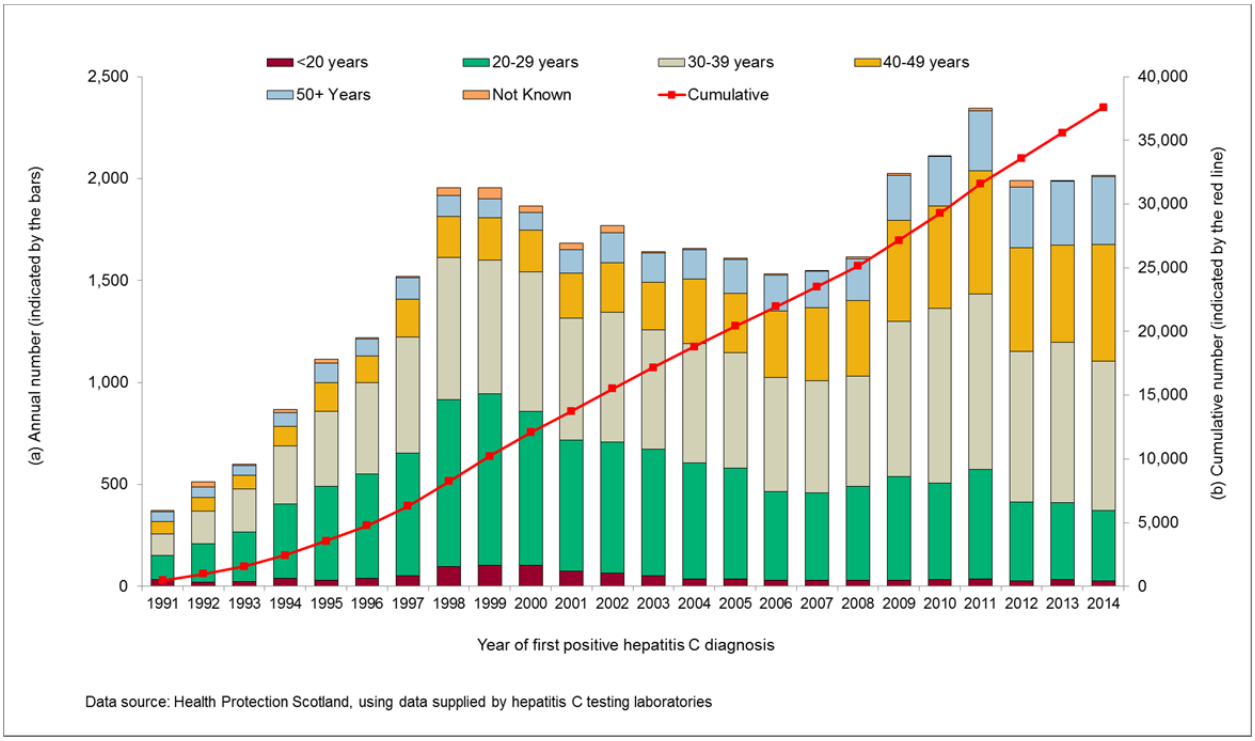
Figure 34. Annual number of people tested for hepatitis C antibody in Scotland's four largest NHS Board areas during 1999 to 2014, according to referral source



In Scotland, the number of new hepatitis C diagnoses has remained stable over the last 3 years, at around 2,000 per annum (Figure 35). [34]; this relates to an increase in the number of people being tested and diagnosed through DBS testing in specialist drug treatment settings since 2009.[53] Of 2,014 new hepatitis C diagnoses made during 2014, 17% were aged 20-29 years, 36% aged 30 to 39 years, 28% aged 40 to 49 years and 17% were aged 50 years and above, at the time of diagnosis; 66% were male; 24% were known to have been diagnosed by general practitioners, 31% in the hospital setting, 12% in specialist drug services, 5% in STI clinics, and 8% in prisons (source of referral was not known in 17% of cases).

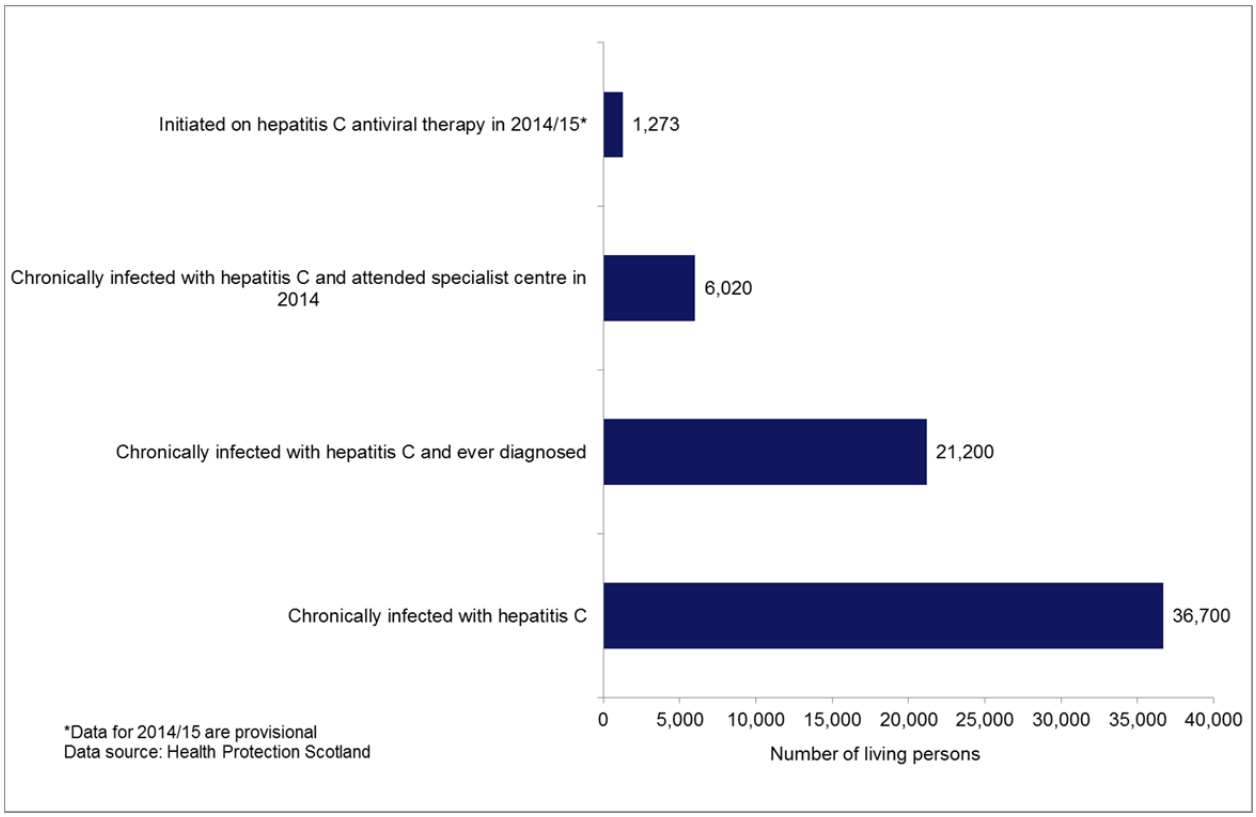
A total of 37,596 people had been diagnosed with hepatitis C in Scotland by the end of 2014 (Figure 35).

Figure 35. Annual and cumulative numbers of people reported to be diagnosed hepatitis C antibody positive in Scotland, 1991 to 2014



Of an estimated 36,700 people living in Scotland with chronic HCV infection during 2014, approximately 21,200 (58%) were estimated to have been diagnosed with hepatitis C by the end of 2014 (Figure 36), leaving an estimated 15,500 (42%) undiagnosed.

Figure 36. Estimated number of living people in Scotland in 2014, who were (i) chronically infected with hepatitis C, (ii) chronically infected with hepatitis C and ever diagnosed, (iii) chronically infected with hepatitis C and had attended a specialist centre in 2014, and (iv) initiated on hepatitis C antiviral therapy in 2014/15*

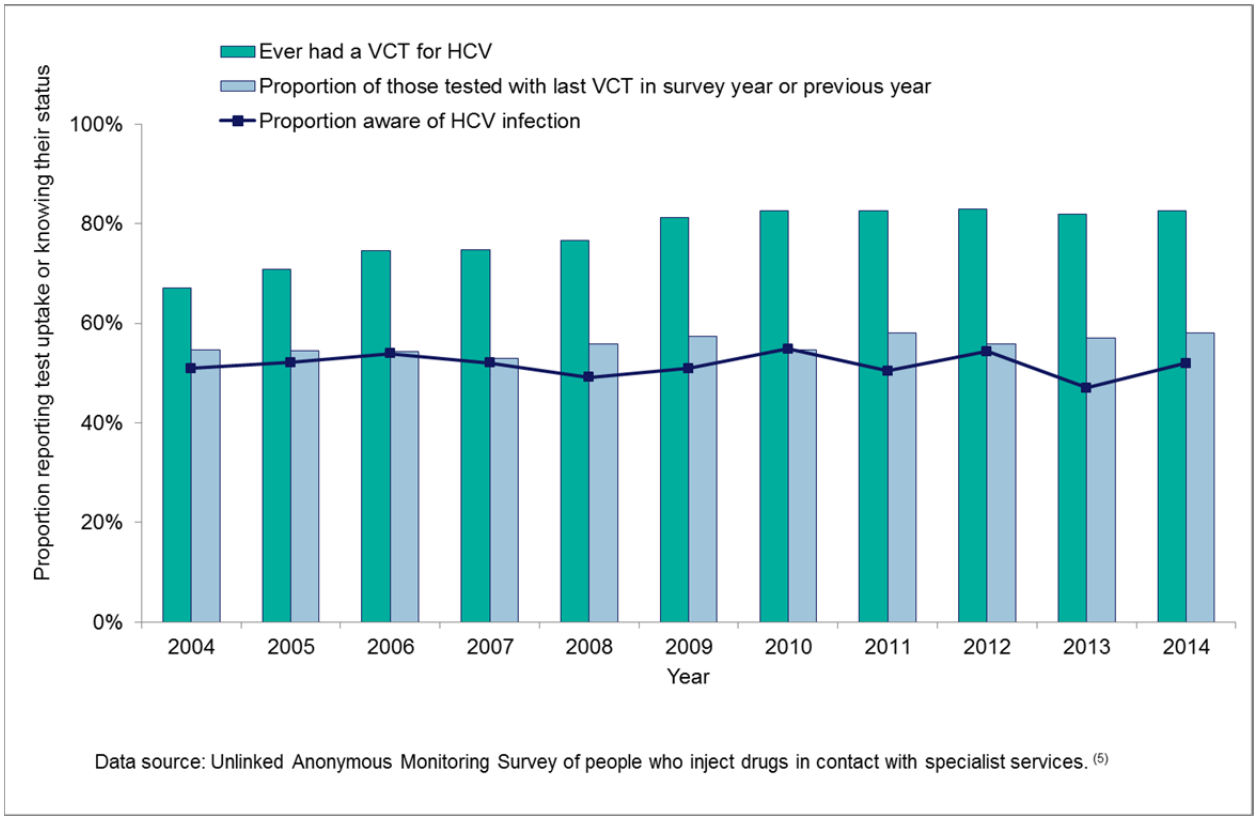


Testing and diagnosis in people who inject drugs

England

In 2014, 52% of HCV infected PWID in England participating in the UAM Survey reported being aware of their HCV positive status, and this proportion has remained relatively stable over the last decade (Figure 37).[5] In the same survey, 83% of PWID reported ever having had a voluntary confidential test (VCT) for HCV in 2014, an increase from 67% in 2004 (Figure 37).[5] The proportion of those ever tested who had their last test during the preceding two years was around 58% in 2014 (n=890), which was similar to the proportion found in previous years (Figure 37). These findings suggest that increasing the uptake of testing does not necessarily translate directly in to improved levels of awareness of infection in this population group. In part, at least, this will be because those who are at continuing risk of infection may not always be offered, or take-up the offer of, further hepatitis C tests at regular intervals.

Figure 37. Trends in reported uptake of voluntary confidential testing (VCT) for HCV infection and the proportion of those with HCV reporting being aware of their infection in England: 2004 to 2014



Data source: Unlinked Anonymous Monitoring Survey of people who inject drugs in contact with specialist services. [5]

National drug treamtment monitoring system (NDTMS) data shows that levels of hepatitis C testing among people who have ever injected drugs and who are in treatment for their drug use are continuing to rise in England (Table 17). The hepatitis C test status of adults in drug treatment is available from 2006 to 2014 (Table 17). The proportion of adults in drug treatment who have a hepatitis C test recorded has increased from 18.1% (2006/07) to 61.2% (2013/14). A similar rise has been recorded in those adults newly presenting for drug treatment (18.9% in 2006/07 compared with 49.1% in 2013/14).

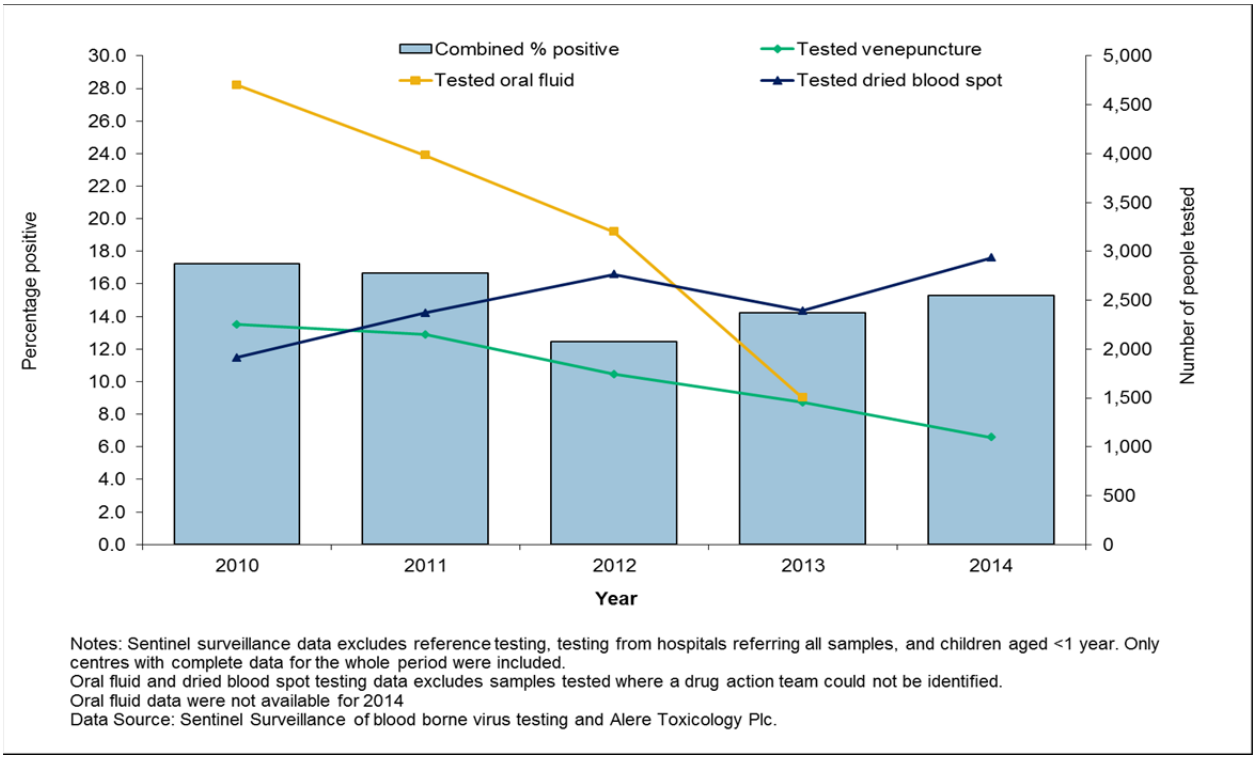
There continues to be a rise in testing among those in treatment who have ever injected drugs (including those newly presenting for treatment), and in 2013/14, more than three-quarters (75.8%) of all adults in treatment who have ever injected drugs were recorded as having received a test (Table 18). Levels of testing among those who have ever injected and newly presenting to treatment have remained stable over the last year (Table 18).

In 2013/14 more than four-fifths (83%; n= 161,287) of all adults receiving drug treatment were recorded as having been offered a hepatitis C test (information about whether people have been offered a hepatitis C test is recorded at the beginning of their latest

period of treatment) and about half (49.2%, n= 94,967) accepted the offer (Table 19). Considering just those who have ever injected drugs, over four-fifths were offered a test (86.8%, n= 93,483), and nearly three-fifths accepted the offer (58.1%, n= 62,561) in 2013/14. About the same proportion of those newly presenting to treatment were offered testing (81.3%, n= 24,013), with under half accepting the offer (Table 20).

Sentinel surveillance data suggests that alternative testing technologies are continuing to contribute to the uptake of testing in PWID, with DBS being the predominant method of testing in this population group (Figure 38). The number of people tested by venepuncture has fallen by 25% between 2013 and 2014 whereas the rate of DBS testing has increased by 23% over the last year (Figure 38). The percentage testing HCV positive remains high in this population group at 15% overall.

Figure 38. Number of people who inject drugs tested for anti-HCV in specialist services for drug users, by year, from multiple data sources: 2010 to 2014

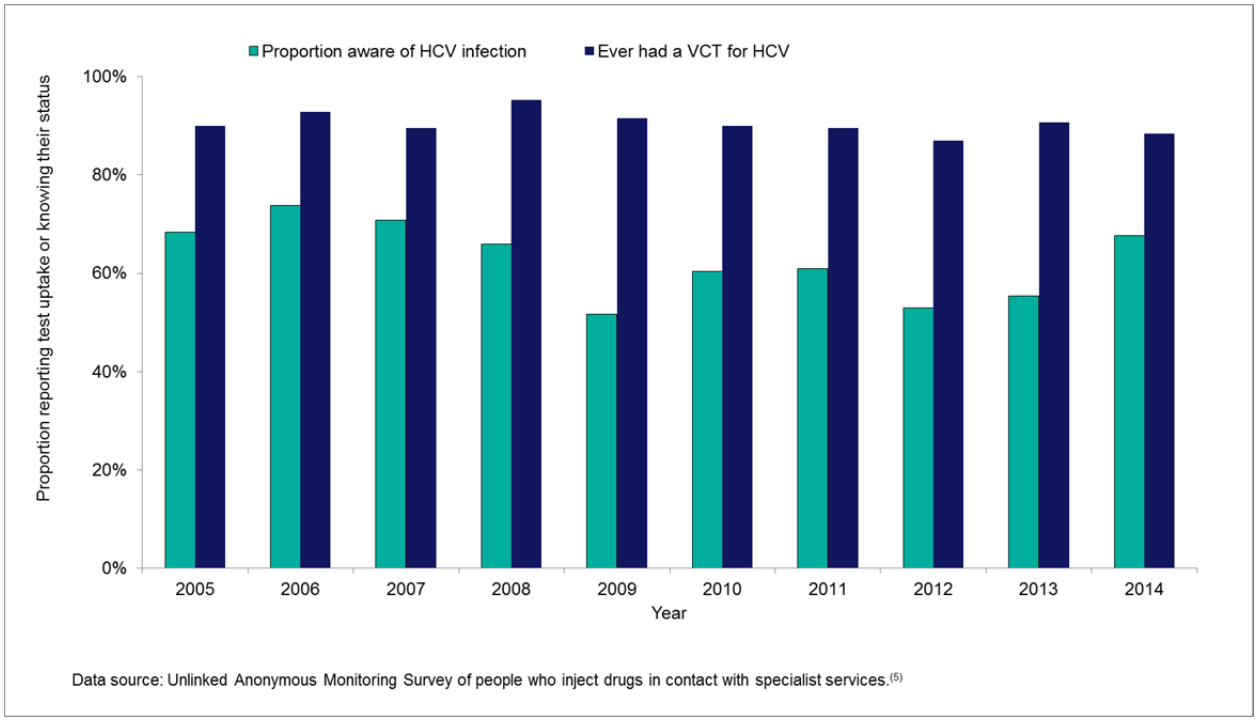


Notes: Sentinel surveillance data excludes reference testing, testing from hospitals referring all samples, and children aged <1 year. Only centres with complete data for the whole period were included.
Oral fluid and dried blood spot testing data excludes samples tested where a drug action team could not be identified.
Oral fluid data were not available for 2014
Data Source: Sentinel Surveillance of blood borne virus testing and Alere Toxicology Plc.

Northern Ireland

In the UAM Survey, 68% of HCV infected PWID in 2014 reported being aware of their HCV positive status, similar to levels reported in recent years; 88% reported ever having had a VCT for HCV in 2014 (Figure 39).[5]

Figure 39. Trends in reported uptake of voluntary confidential testing for HCV infection, and the proportion of those with HCV reporting being aware of their infection in Northern Ireland: 2005 to 2014*

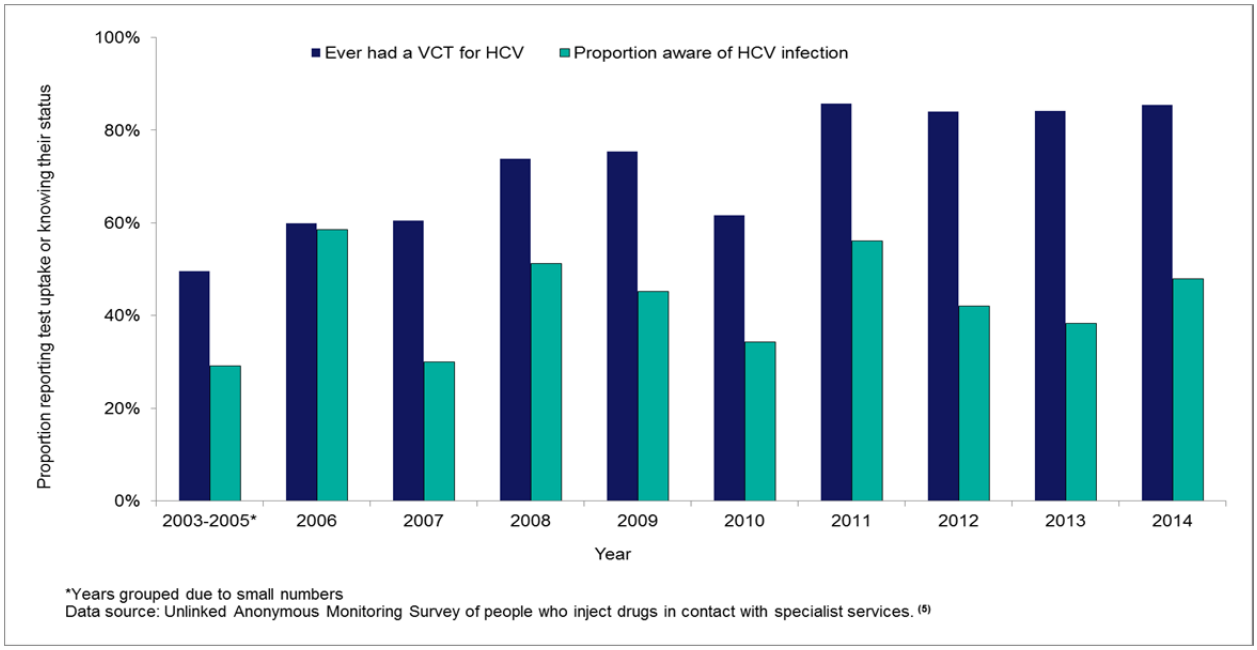


*HCV VCT uptake in 2002-2003 and 2004 was 79% and 80% respectively; the proportion aware of their HCV infection in 2002 to 2004 was 74%; data are grouped due to small numbers

Wales

In Wales, 48% of HCV infected PWID participating in the UAM Survey in 2014 reported being aware of their HCV positive status, similar to levels reported in previous years (Figure 40); 85% reported ever having had a VCT for HCV in 2014, an increase from 50% in 2003-2005 (Figure 40).[5]

Figure 40. Trends in reported uptake of voluntary confidential testing for HCV infection, and the proportion of those with HCV reporting being aware of their infection in Wales: 2003 to 2014



Data from the Virology Specialist Centre, Public Health Wales, which processes all DBS testing carried out in Wales, were examined. These data suggest that, for samples attributed to Substance Misuse Services or Prisons, the estimated number of individuals tested by DBS increased from 1,531 in 2011 to 1,874 in 2013, and in 2014 was 1,639 (Table 21). The proportion of individuals first identified as having a reactive result for HCV antibody within each year has fallen from 19% in 2011 to 10% in 2013 and was 11% in 2014. Estimation of the follow-up PCR testing rate of individuals with a first a reactive HCV antibody result was between 61% and 52% between 2011 and 2013, and provisional data for 2014 suggest a level of 39% (Table 21), however, the proportion of those with follow-up testing of reactive samples in 2014 is likely to rise as a number of those first identified as having a reactive DBS result late in 2014 may yet to have undergone follow-up testing. Among those tested by PCR, the proportion identified as having chronic infection in these groups varied from 72% to 86% (Table 21). These data differ from those presented in last year's report as some improvements have been made to the computer programme used to derive them, and the laboratory information management system has also been updated. There are some potential limitations with these data; it is possible that not all samples relating to an individual are identified as a match, and some of the samples included may not have been taken from individuals with a history of injecting.

Data from the HRD Wales from April 2011 to March 2015 were examined over four financial years (Table 22), and for those people who inject image and performance enhancing drugs (including steroids, growth hormone and melanotan), self-reported HCV status was recorded for 28-36% of these individuals in these time periods (Table

22). Where status was recorded, less than 1% were recorded as known positive (Table 22). Among those who inject psychoactive drugs (including heroin, cocaine, amphetamine and new psychoactive substances), data on self-reported HCV status was recorded for between 32-42% of those accessing these services (Table 22). Where status was known, between 11-13% self-reported having known HCV positive status (Table 22). Self-reported HCV status data quality remains an issue and work is ongoing to improve the completeness of these data as well as to improve uptake of HCV testing. Further information on the findings from the HRD is available at: www.publichealthwales.org/substancemisuse

Scotland

In Scotland, among 2,331 PWID interviewed at services providing injection equipment during 2013-14, 88% reported having been tested for hepatitis C in the past, while 45% reported a test in the last year. When those who reported they had been diagnosed with infection from a past test (that is, prior to 12 months ago) were excluded, the percentage of respondents who had been tested for hepatitis C in the last year increased to 52%; this figure compares to 40%, 45% and 49% reported by PWID surveyed in 2008-09, 2010 and 2011-12, respectively.

Among 1,335 PWID interviewed at services providing injection equipment in Scotland during 2013-14 and who were hepatitis C antibody positive (in anonymous testing of their DBS samples), 45% reported that they ‘have hepatitis C’ (ie were aware of their infection) and a further 16% reported having ‘cleared hepatitis C’. These figures are comparable to the 45% and 13% of hepatitis C antibody positive PWID who reported having the virus and having cleared the virus, respectively, in the 2011-12 survey.

In Scotland, the introduction of DBS in specialist drug service settings has had a significant impact on levels of diagnosis.[53] Of 2,014 new hepatitis C diagnoses made during 2014, 236 (12%) were known to have been diagnosed in specialist drug services where DBS testing for hepatitis C was first introduced in 2009 (this figure compares with 12, 189, 442, 441, 274 and 295 for years 2008, 2009, 2010, 2011, 2012 and 2013 respectively).

Testing and diagnosis among people in prisons

England

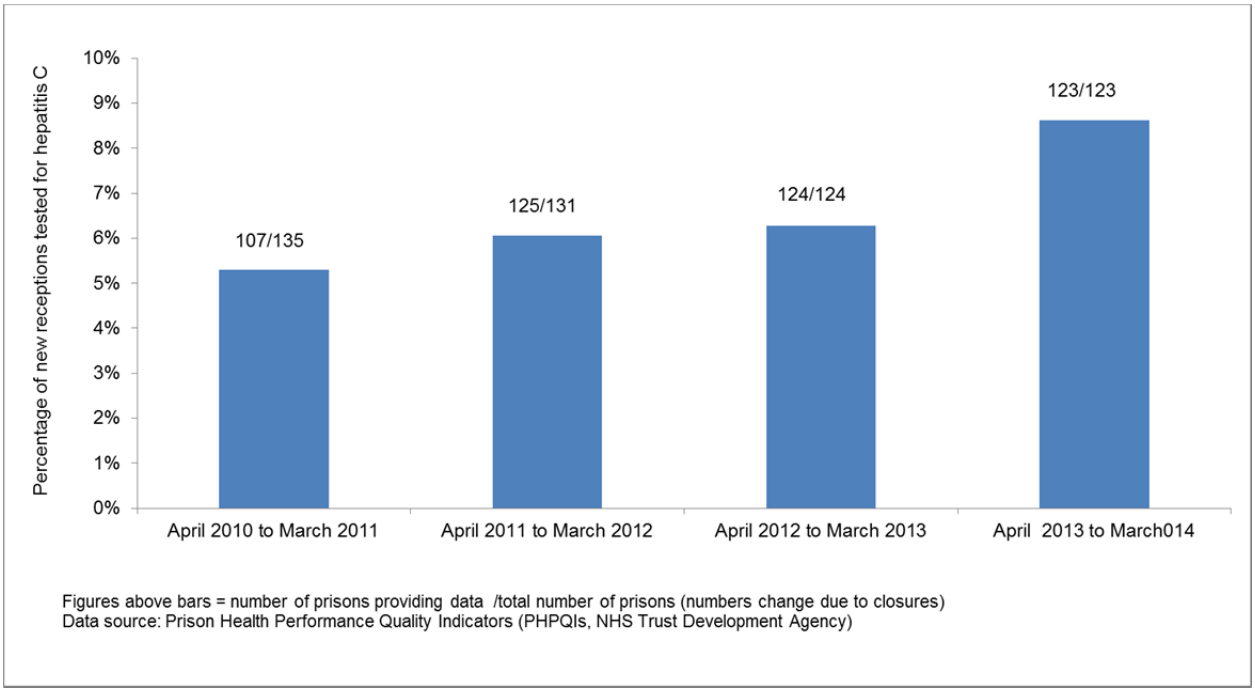
Hepatitis C affects a larger proportion of people in prison and other detention centres than the wider population, principally as a result of the relatively higher levels of injecting drug use that are observed among this population.[54],[55] Yet despite this, data

from several different sources suggests significant under-testing of this population group.[37] Recognising that people in prison were missing an opportunity for testing and treatment, PHE in consultation with its partners including NHS England and the National Offender Management Service (NOMS) as well as patient advocates such as The Hepatitis C Trust and the National AIDS Trust, advocated for the introduction of an 'opt-out' testing policy for BBVs for people in prisons which was agreed and published as a joint developmental priority in the National Partnership Agreement between PHE, NHS England and NOMS in October 2013.[56] This commitment has continued through to the revised National Partnership Agreement 2015/16.[56]

During 2014, 11 initial 'pathfinder' prisons introduced the policy as part of the first phase of implementation of the programme and lessons learned from their experience have been published.[17] While preliminary data suggest that levels of HCV testing improved following introduction of opt-out testing, levels remained low at 21% in nine of the 11 pathfinder prisons that provided data.[17] The authors also concluded that the collection and reporting of hepatitis C test results needed to be improved as it was not always possible to ascertain the proportion who were chronically infected due to variable reporting of hepatitis C RNA status and hepatitis C antibody positivity. However, using results from the subset of prisons with data on hepatitis C antibody status before and after the introduction of the opt-out policy from four of the 11 prisons, the number testing positive for hepatitis C antibodies remained stable at 9% despite the change from targeted to opt-out testing.[17] There are now an additional eleven prisons implementing the policy as part of the second phase of the programme, and these will be evaluated after six months of implementation, later in 2015.

Prison Health Performance Quality Indicator (PHPQI) data have shown a steady rise in hepatitis C tests performed, from 5.3% in 2010/11 to 8.6% in 2013/14 (Figure 41). This increase in testing goes beyond pathfinder prisons and suggests that there is increasing awareness across the prison estate about HCV, resulting in increased offers and uptake of testing among people in prisons. However, these data confirm those of others, that overall levels of testing remain low in this setting.

Figure 41. Proportion of new receptions to English prisons tested for hepatitis C: financial years 2010/11 to 2013/14



PHPQIs were replaced on 1 April 2014 with a new set of indicators called the Health and Justice Indicators of Performance (HJIPs), which include improved indicators for monitoring HCV testing (Figure 42).

Figure 42. Health and Justice Indicators of performance relating to hepatitis C testing

Hepatitis C testing	Percentage of patients offered hepatitis C testing, within 72hrs of reception
Hepatitis C antibody testing	Percentage of eligible patients who have undertaken an HCV antibody test
Hepatitis C PCR testing	Percentage of HCV antibody positive patients who underwent HCV PCR testing

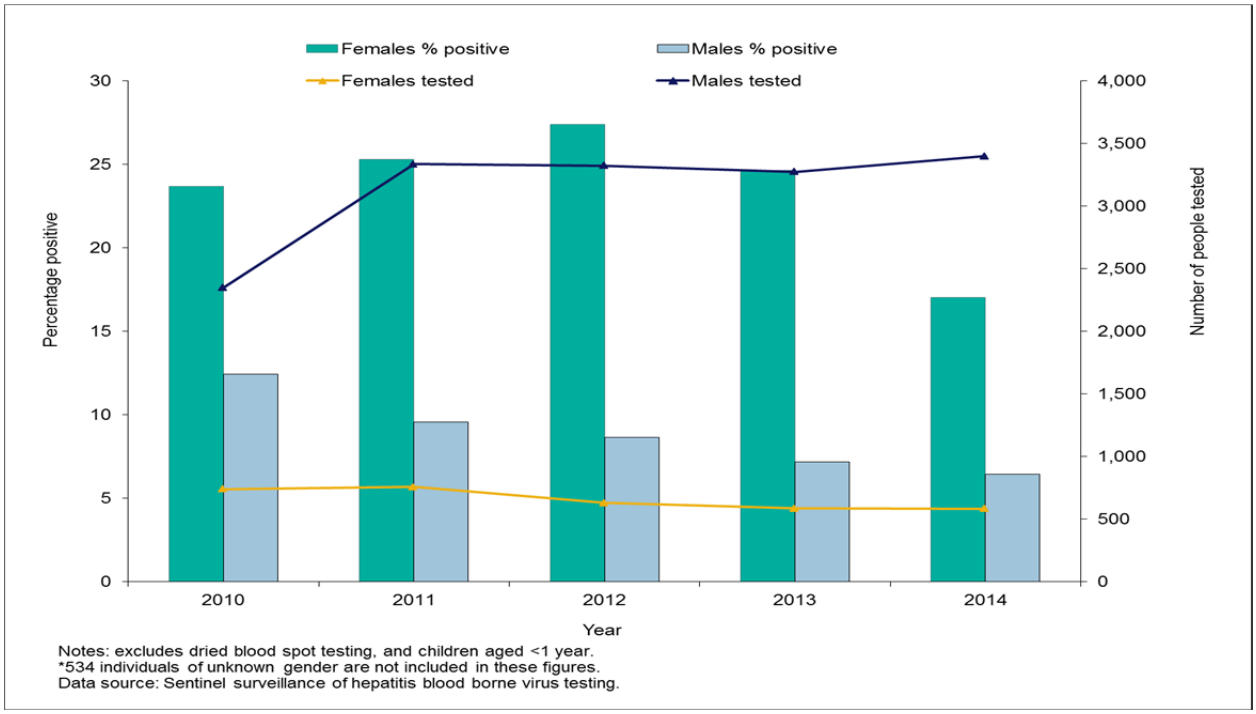
HJIPs will inform commissioners, healthcare providers and public health specialists about the uptake and impact of testing among people in prisons when the system is fully implemented and validated during 2015-16.

The Public Health Intelligence in Prisons and other Secure Settings Service (PHIPS), which is part of the Health and Justice Team at PHE, receive reports regarding communicable diseases in all prisons and other places of detention nationally. Reports of hepatitis C

infection to this service increased year on year from 2010 to 2013, in part as a result of improved reporting and efforts to gather reports retrospectively (Table 23). During 2014 reporting was introduced to distinguish between those with chronic and resolved infection. Once these data have been collected effectively for a full year, they will help inform economic evaluations of the potential demand for HCV treatment among people tested in prisons.

Data on testing within prison services are also available via sentinel surveillance. Sentinel surveillance data in England suggests that testing via prison services varies by gender (Figure 43). The proportion of males testing positive has undergone a steady decline each year, however, the proportion of females testing positive has remained relatively stable since 2010 but fell substantially in 2014 by 31% from 2013 levels, however, this should be interpreted cautiously as numbers are small (Figure 43). In 2014, 17.0% of females tested positive compared to 6.4% of males. This may be due to a difference in the relative risk of female offenders having acquired hepatitis C compared to males, and/or differences in the offer and acceptance of BBV testing.

Figure 43. Number of people* tested for anti-HCV, and proportion positive, through prison services by year in 23 sentinel laboratories: 2010 to 2014



Wales

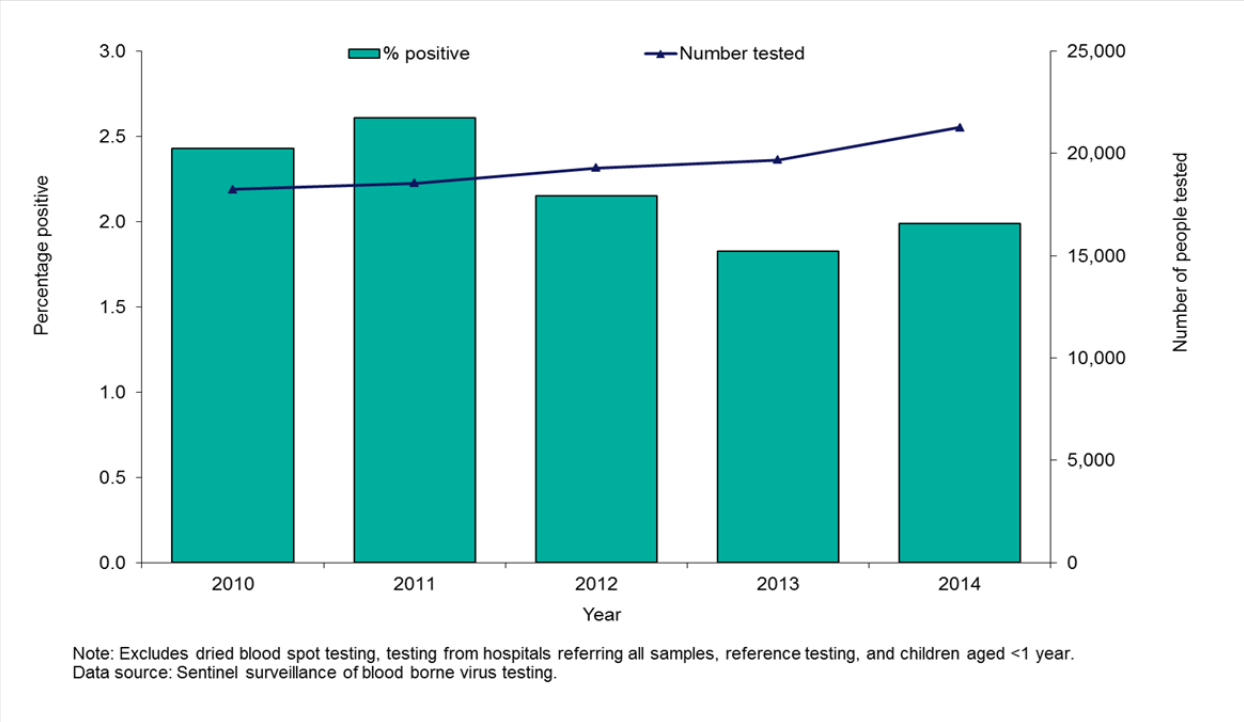
Since the rollout of the liver health promotion programme in Wales in 2012, literature has been made available to prisoners, during their reception health screen, to promote awareness of BBVs and to encourage people to come forward for testing. In 2014, 14% of receptions to Welsh prisons were tested for hepatitis C; similar to the number in 2013 (Table 24). Data

collected over 2013/2014 demonstrates that both dried blood spot and venepuncture methods are being used, and that DBS testing increased by more than 20% over the last year (Table 24). Improvements to data collection related to diagnosis are being made and an audit of testing and referrals across all Welsh prisons began in May 2015

Testing and diagnosis in black and minority ethnic populations

In England, sentinel surveillance data indicates that the number of people tested who were identified as being of Asian or Asian British origin has increased from 14.8% in 2010 to 15.5% in 2014. The overall increase in testing may be a reflection of targeted awareness-raising campaigns that have taken place among South Asian communities over recent years. Over this period (2010 to 2014), 2.2% of people of Asian or Asian British origin tested positive, declining from 2.4% in 2010 to 2.0% in 2014 (Figure 44).

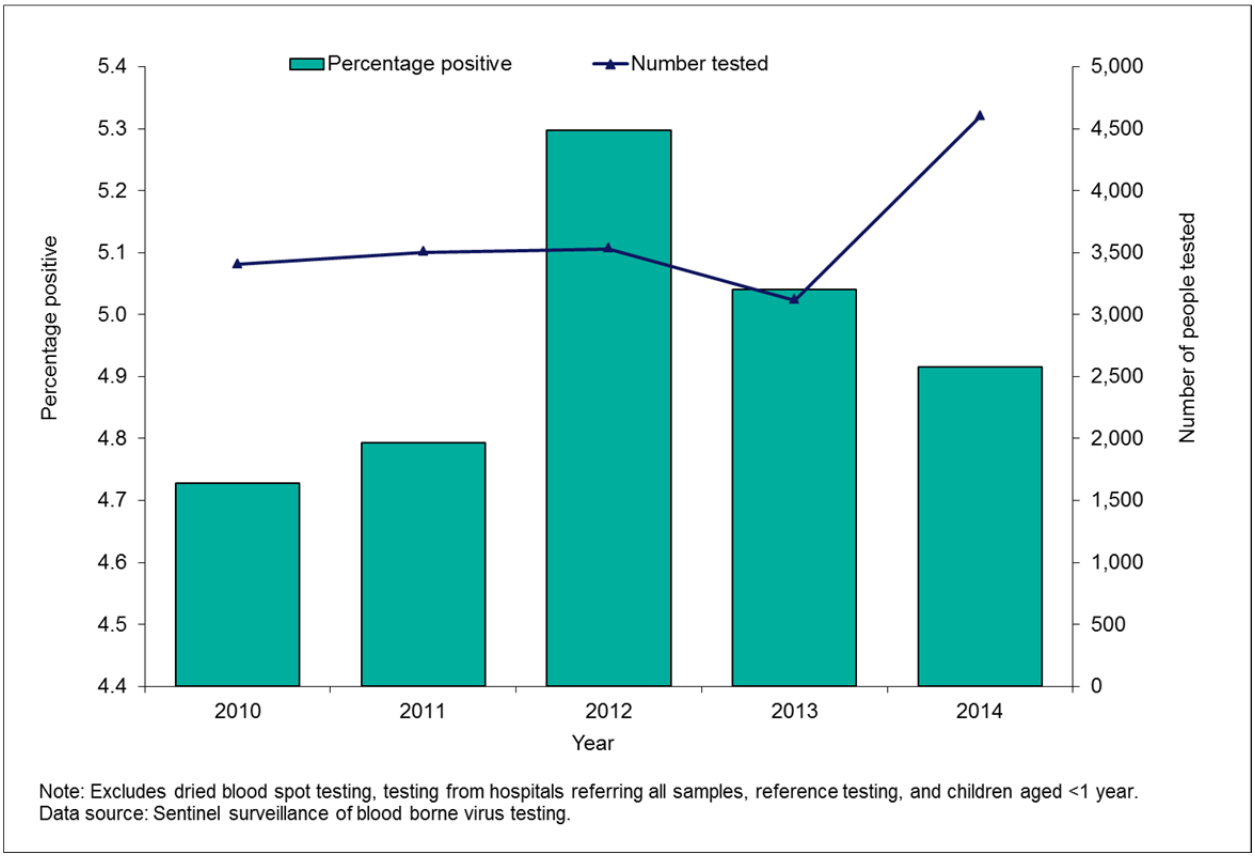
Figure 44. Number of Asian or Asian British people tested, and proportion positive, in 23 sentinel laboratories: 2010 to 2014



In Scotland, the prevalence of anti-HCV was 2.6% among South Asians participating in a community-based survey and case-finding exercise conducted in Glasgow during 2009-10 (ranging from 0.6% among those born in the UK to 3.1% among those born in Pakistan).[57] From analysis of these survey data, combined with laboratory surveillance data, an estimated 38% of HCV-infected South Asians living in Glasgow remained undiagnosed.[57]

In England, sentinel surveillance data indicates that the number of people tested who were identified as being of Eastern European origin (using self-reports or ONOMAP[58] name analysis software), increased from 2.8% in 2010 to 3.3% in 2014. Testing levels remained relatively stable between 2010 and 2013, but rose by nearly 50% between 2013 and 2014. Over the period 2010-2014, 5.0% of people of Eastern European origin tested positive (Figure 45). This data suggests that these individuals may be at relatively increased risk of having acquired hepatitis C and/or that testing of these ethnic groups is more targeted at higher risk individuals than in the general population.

Figure 45. Number of Eastern European people tested, and proportion positive, in 23 sentinel laboratories: 2010 to 2014



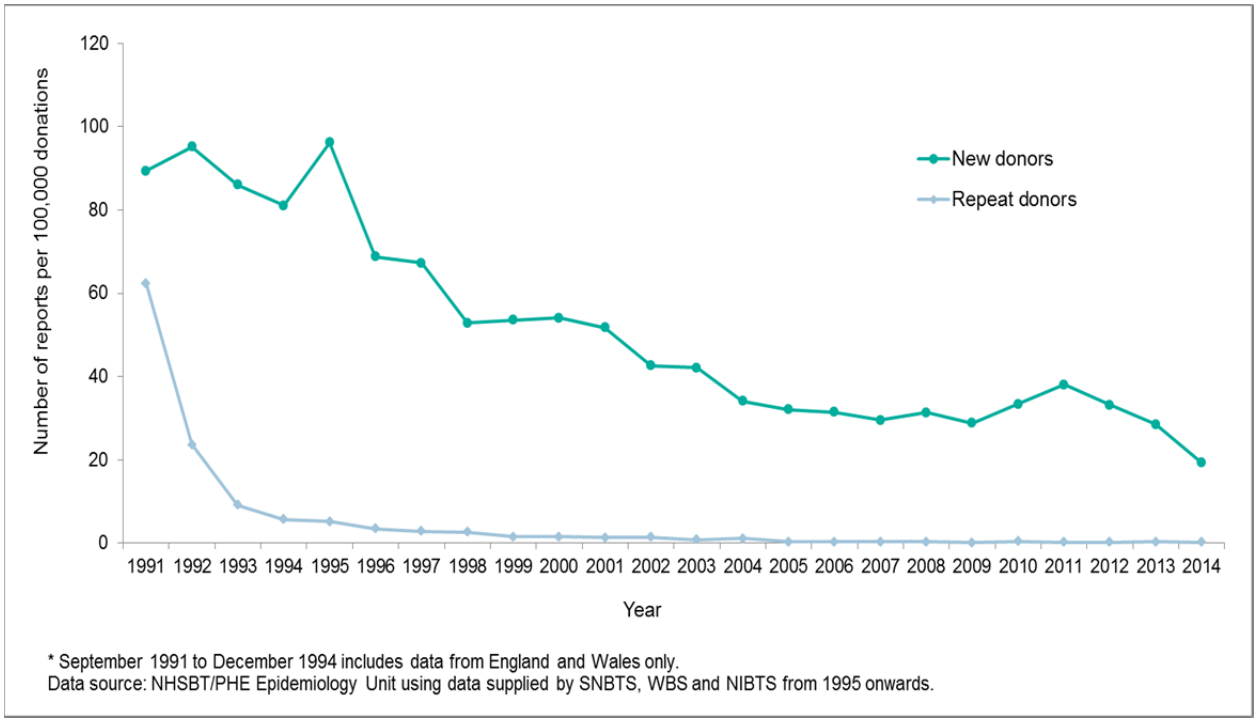
Note: Excludes dried blood spot testing, testing from hospitals referring all samples, reference testing, and children aged <1 year.
Data source: Sentinel surveillance of blood borne virus testing.

Testing and diagnosis in UK blood donors (low-risk population)

Monitoring infections in blood donors is important, as infections in populations at low risk of BBVs can be a marker of more significant problems in the wider population.

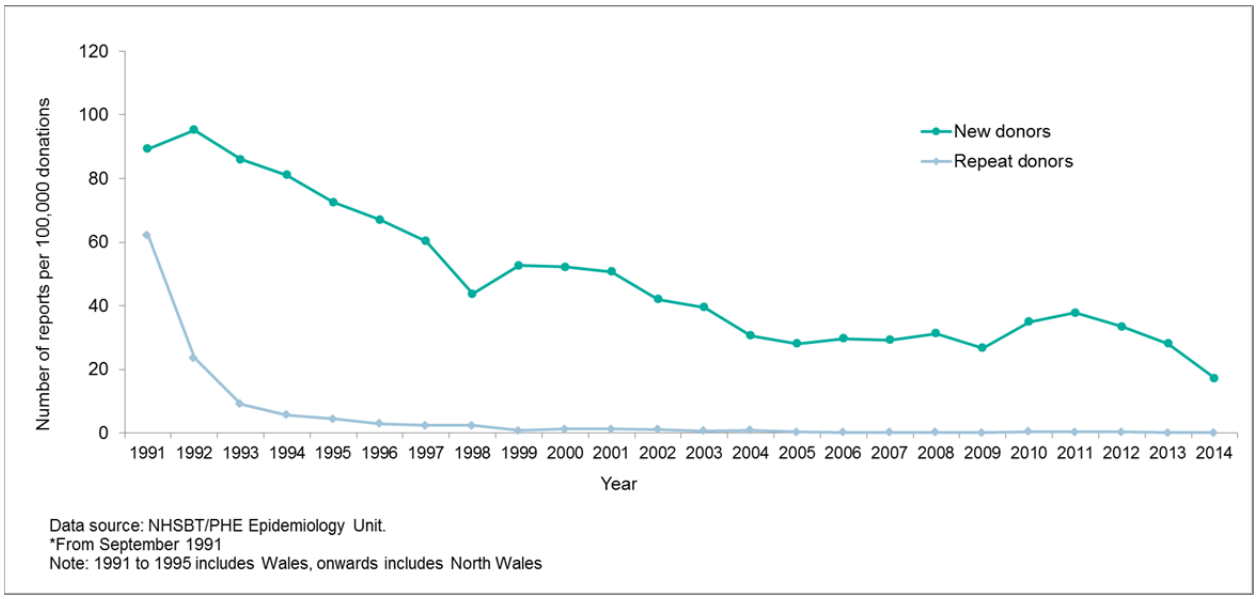
Overall in the UK, the rates of detection of hepatitis C in both new and repeat donors have fallen (Figure 46). Infections in new donors have fallen from a rate of 96.2 per 100,000 donations in 1995 to 19.3 in 2014, while the rate in repeat donors fell from 5.2 per 100,000 donations to 0.3 over the same period.

Figure 46. Rate of hepatitis C among donations from new and repeat blood donors in the UK: 1991* to 2014



In 2014, the decline in HCV in donors in England and North Wales continued with a decrease in rate compared with 2013 from 28.1 to 17.3 per 100,000 new donors and 0.11 to 0.06 per 100,000 repeat donors; 25 blood donors tested positive for hepatitis C, with the majority (24, 96%) of infections detected in new donors.(Figure 47).

Figure 47. Rate of hepatitis C among donations from new and repeat blood donors in England: 1991* to 2014

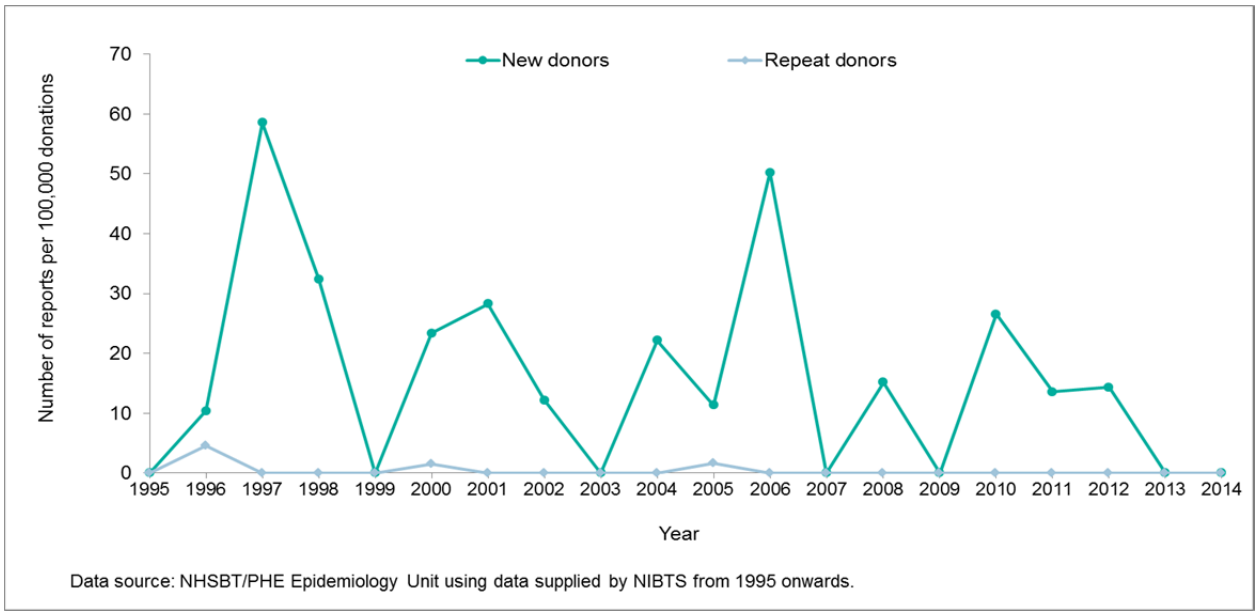


One third of the blood donors testing positive for hepatitis C in 2014 in England and North Wales were of white British ethnicity and 60% were male (Table 25). Forty per cent were of ‘other white’ background, seven born in Europe, one born in South America and two not known. In recent years, a disproportionately high number of HCV infections in new donors were observed in those of South Asian background (Pakistan, Bangladesh or India) and, where known, usually born there. This continued in 2014, although the numbers were small, and was also true for those of ‘other white’ backgrounds. The number and proportion of donors reporting injecting drug use varies each year but was at its lowest ever level in 2013 and decreased further in 2014. Persons with a history of injecting drugs are permanently deferred from donating in the UK although it is evident that there is not 100% compliance. The reported exposures and possible risks in new donors reflected less obvious routes such as possible blood contact often abroad via childhood immunisations or if no specific route reported, simply originating from a country with higher prevalence of HCV than the UK. A third of donors had no exposure assigned mainly due to incomplete follow up in donors who were mostly of ‘other white’ background. In 2014, one repeat donor tested positive for HCV, seroconverting in the 10 months since their most recent previous negative donation, with a partner who had a history of drug use (although not thought to have injected). Sexual contact or sexual contact with a drug user has been noted in 29% (19/66) of seroconversions and/or window period donations indicating recent infection since surveillance began in 1996.

In Northern Ireland in 2014 as in 2013, HCV infection was not detected in donations from either new or repeat blood donors. While, HCV has not been detected in repeat

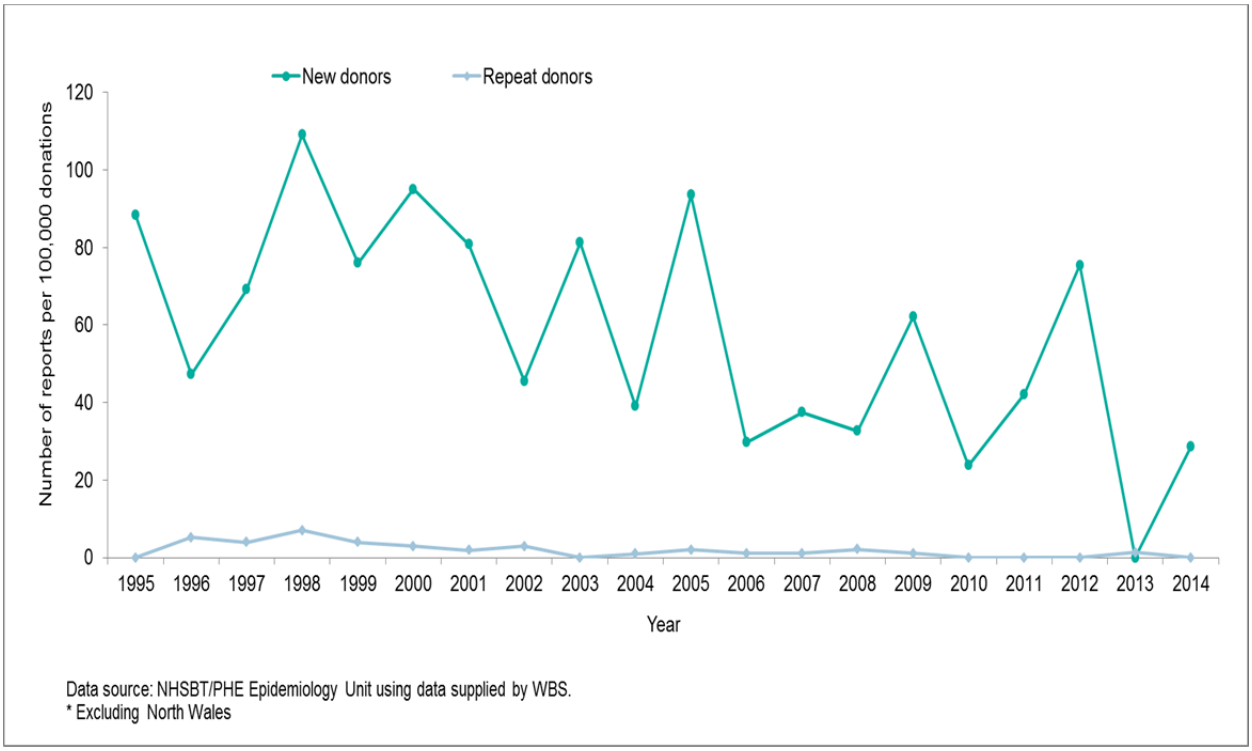
donors since 2005, the rate of infection in new donors fluctuates between zero and five HCV positive donor detections per year. (Figure 48)

Figure 48. Rate of hepatitis C among donations from new and repeat blood donors in Northern Ireland: 1995 to 2014.



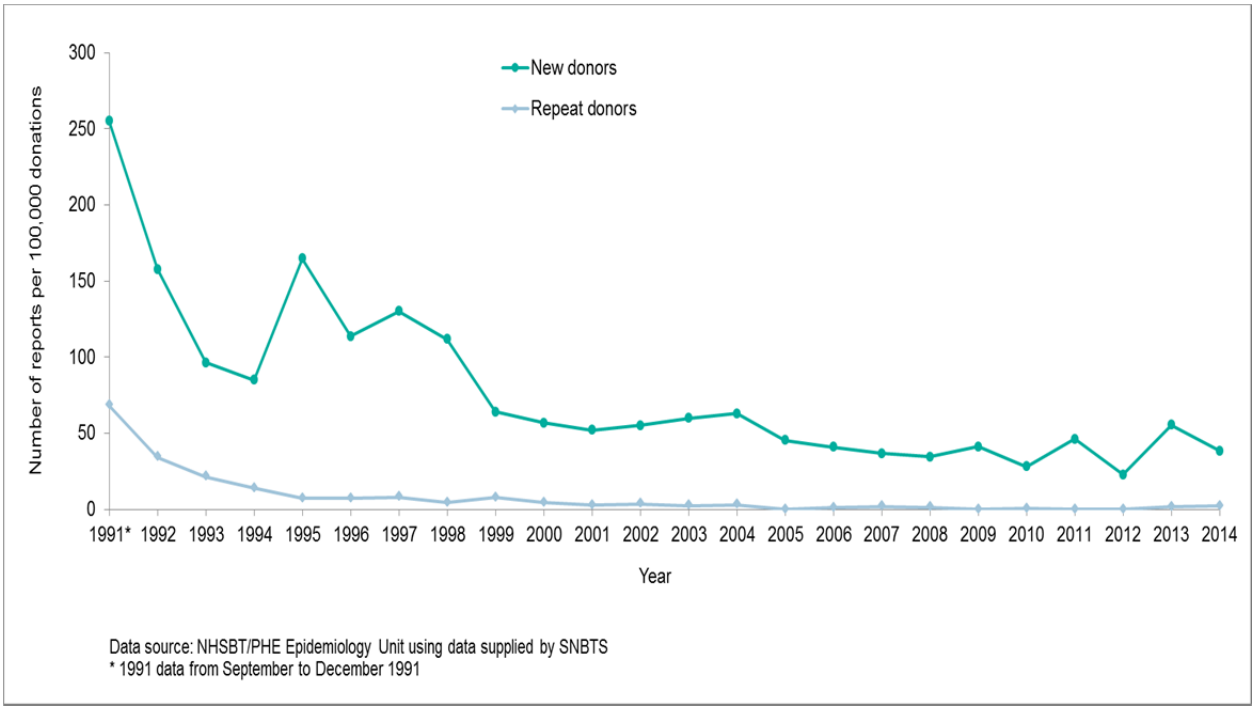
With the exclusion of donations from North Wales, which are included in the English blood donor data, the rate of hepatitis C positive donations detected in new blood donors donating in Wales has declined overall (Figure 49), despite large yearly fluctuations. Caution is required in the interpretation of these figures as the numbers are small. In 2014, two new donors with hepatitis C markers were identified, one a window period donation in a donor who reported recent dental treatment in Europe and one whose partner had a history of injecting drugs and was known to be HCV positive. Hepatitis C is rarely detected in repeat donors (Figure 49).

Figure 49. Rate of hepatitis C among donations from new and repeat blood donors in Wales:* 1995 to 2014



In Scotland, the overall rate of detection of hepatitis C has declined in both new and repeat blood donors since 1991 (Figure 50). In repeat donors the HCV infection rate is much lower in comparison with new donors and zero in some years, however in 2014, four repeat donors were identified with hepatitis C at 2.2 per 100,000 donors the highest rate in repeat donors since 2004. Three were male, one female, all were white and UK born in the 30-34 or 45 years and over age groups. One had seroconverted in the last two years since their last donation and one was a window period donation while two others were not formally classified as seroconverters because their previous donations were more than three years prior to the positive donation; no possible exposure route was reported by any of these donors. A further donor, assigned as new by donation testing, had a donation 20 years prior but no archive was available; this donor reported a possible risk of tattooing in Eastern Europe.

Figure 50. Rate of hepatitis C among donations from new and repeat blood donors in Scotland: 1991* to 2014.



Treatment and care

Many HCV infections occur in marginalised communities, in particular PWID and black and minority ethnic populations. It is therefore important to ensure that care pathways exist that allow these individuals, as well as others, to access the treatment and care they need.

Access to treatment and care

England

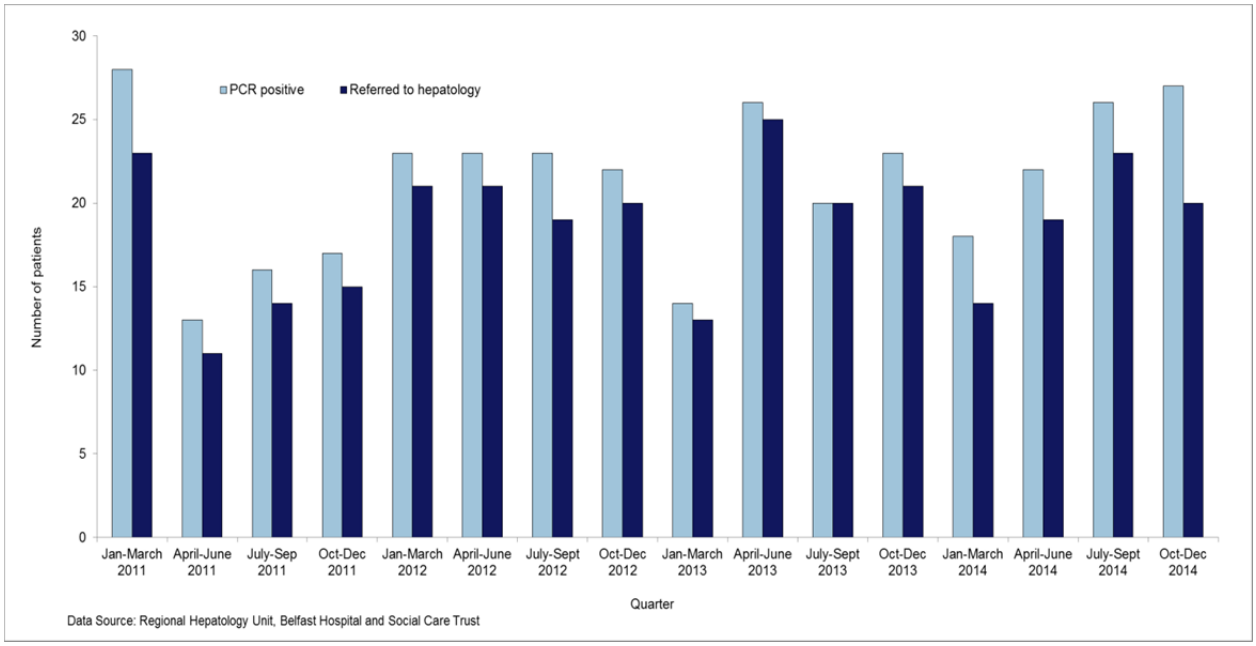
In England, information on access to HCV treatment services by PWID has been obtained from those participating in the UAM Survey in 2014. The survey asked participating PWID who reported having had a positive result to a diagnostic test for hepatitis C: 'Have you ever seen a specialist nurse or doctor (eg a hepatologist) about your hepatitis C?' Among the survey participants in England with antibodies to hepatitis C who were are aware of their infection, 69% (371/536) reported that they had seen a specialist nurse or doctor about their infection, and 18% (98/536) reported being given **any** medication related to their HCV infection.

To monitor referral from prisons and other places of detention, a Health and Justice Indicator of Performance was introduced in April 2014 to monitor the percentage of those with chronic HCV infection who are referred to a specialist service and these data will be available in future years. The recently published evaluation of prison pathfinders implementing the opt-out BBV testing programme, suggests that the numbers being referred for hepatitis C treatment increased significantly following the introduction of the opt-out testing policy, with 226 individuals being referred during the 12 month period between January and December 2013 compared to 185 during the 6 month period between April and September 2014 (based on data from eight of the 11 participating prisons).[17]

Northern Ireland

In Northern Ireland, from the third quarter of 2009, new laboratory-confirmed cases of hepatitis C have been followed-up three months after initial confirmation to check whether a referral to the regional hepatology unit has been made. Contact is made with originating clinicians of HCV RNA positive cases where possible. Eighty two percent of all newly diagnosed HCV RNA positive patients in 2014 were referred to hepatology services and this work is routine (Figure 51).

Figure 51. Referral of newly-diagnosed HCV RNA positive patients to hepatology services in Northern Ireland



Wales

Of the PWID participating in the UAM Survey in Wales during 2013-2014 who were aware of their hepatitis C status, 73% (60/83) reported ever seeing a specialist nurse or doctor about their infection. Across Wales it is estimated that between 2011 and 2013 approximately 2,300 referrals were made for specialist assessment for those with HCV infection, with approximately 890 referrals received in 2013.

Scotland

In Scotland, an estimated 21,200 people living in Scotland with chronic hepatitis C had been diagnosed with their infection by 2014; of these an estimated 6,020 (28%) had attended a specialist centre in 2014 (Figure 36). A record-linkage study has also shown that the proportion of people attending a specialist centre within 12 months of a chronic HCV diagnosis in Scotland increased from 25% among those newly diagnosed in 1996-98 to 38% in 2005-07 and 45% in 2008-09.[59]

Antiviral treatment for HCV infection

Antiviral treatments are available in the UK that will successfully clear hepatitis C virus in the majority of patients.[18],[19],[20],[21],[22],[23],[24] [25],[26],[27],[28],[29] It is therefore important to monitor uptake of these therapies at both national and local level to assess whether

sufficient numbers of infected individuals are accessing treatment, and to identify and address any geographical variation in hepatitis services or inequalities in service delivery that may exist.

England

In the past, pharmaceutical company, pharmacy purchasing and pharmacy prescribing data have all been used to estimate the number of individuals treated in England.[31] These calculations suggest that around 28,000 individuals with HCV could have been treated between 2006 and 2011; approximately 3% per year of the total estimated chronically infected.[31] Although rises in numbers treated were observed between 2006 and 2010, a fall in treatment numbers was observed between 2010 and 2011.[31]

In addition to the usual contractual reporting that providers are required to provide to commissioners, work is underway to agree arrangements for the collection of further epidemiological, treatment and outcome data to add to the understanding of HCV in England and the effectiveness of the new treatments. A dataset has been agreed with the involvement of clinicians, patient representatives and Public Health England; and work is underway to validate that it meets clinical requirements and to confirm how these data will be collected, stored and analysed.

In the meantime, as new drugs for the treatment of hepatitis C are approved and come on line, novel methods are required to estimate the numbers of individuals undergoing treatment. PHE therefore developed and validated an algorithm to monitor rates of treatment for patients with hepatitis C across England. The algorithm uses routine laboratory HCV-RNA testing data to identify those commencing and responding to treatment after 2002.[30] Participating laboratories are estimated to cover approximately 75% of the English population for primary and reference HCV testing and are broadly representative of most laboratories providing routine and reference HCV testing. Individuals with active infection indicated by a positive HCV-RNA test result and three or more sequential HCV-RNA test results within a 390 day period, suggestive of monitoring during treatment, were identified. Results of qualitative and quantitative HCV-RNA test results were combined to identify HCV-RNA positive individuals, and those treatment experienced individuals with a final negative HCV-RNA test result within the 390 window periods were considered to have responded to therapy, and achieved a SVR, however, if an individual had a subsequent positive HCV-RNA test result, they were reclassified as relapsed responders. For each individual, the year of the first HCV-RNA test result in the series was assumed to approximate to the year treatment was initiated. Individuals were assigned a year of first likely treatment event, and most recent treatment event.

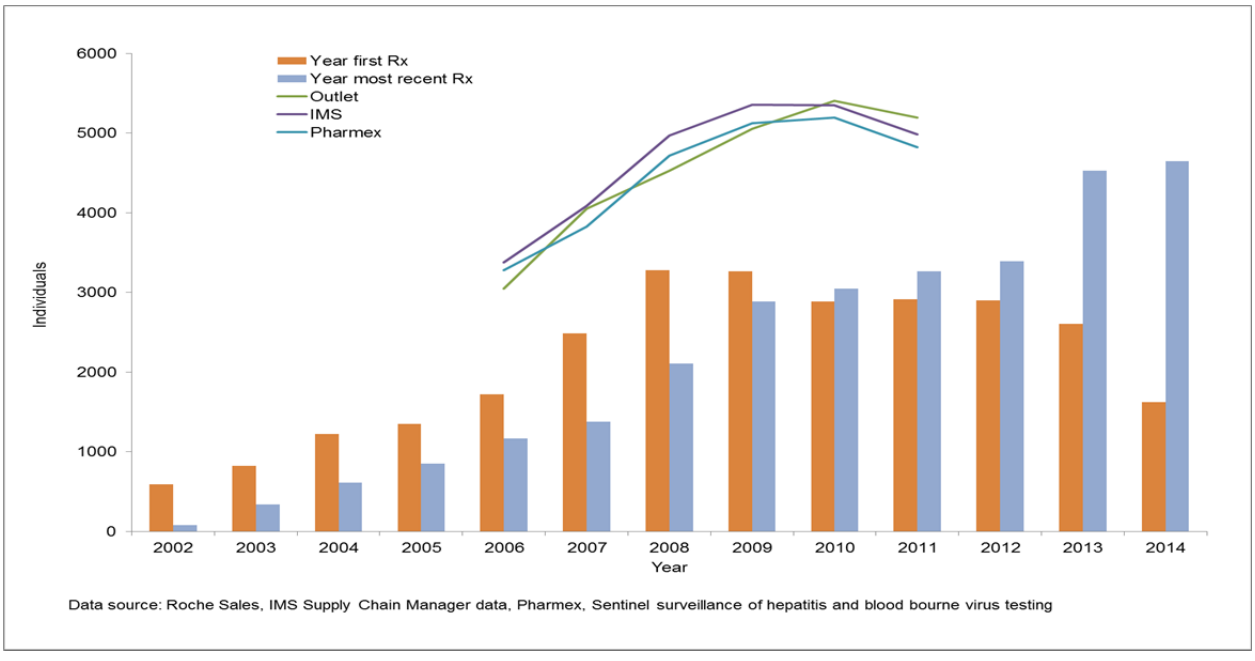
Between 2002 and 2015, 340,314 RNA test results among 101,003 individuals who tested RNA positive, indicating and active infection, were analysed. Of these, 26,636 (26.4%) had a pattern of repeat HCV-RNA testing suggestive of monitoring while on

treatment. Individuals were assigned a year of first and most recent treatment events based upon the date of first HCV-RNA test in the string of repeat RNA testing (Figure 52).

These data suggest that over time, the number of individuals known to sentinel surveillance experiencing treatment for the first time, increased between 2002 and 2009, after which, the number have declined year on year. In contrast, the number of individuals experiencing a subsequent treatment event, possibly following stopping treatment or a previous treatment failure, has increased year on year. Estimated treatment rates for 2014 are likely to be an under-estimate as not all individuals would have had a complete 390 follow-up during this year.

Rates of SVR were estimated for people in sentinel surveillance identified as undergoing their most recent course of treatment, post 2002, between 2010 and 2013. Provisional data suggest SVRs of 52% in those with genotype 1 and 71% in those with non-1 genotypes. Equivalent SVR rates for 2013 alone were 53% and 74% in those with genotypes 1 and non-1 respectively.

Figure 52. Trends in estimated rates of HCV treatment base upon patterns of repeat HCV-RNA testing, by year of first likely treatment event, and most recent treatment event.[1,2]



[1]Estimates rely on repeat PCR testing with a 390-day window period. Treatment initiations over the period include first and most recent treatment events. Quality control samples, children aged less than one, those without a positive PCR test result and individuals tested through renal units were excluded from this analysis.

[2]Caveats and Limitations: (i) RNA testing for individuals can only be linked where sufficient patient identifiers accompany the test result, (ii) it is likely that some RNA testing for individuals known to the Sentinel Surveillance system are undertaken by laboratories outside the collaboration and therefore

treatment episodes may be missed, (iii) Many individuals are likely to have multiple treatment episodes and although the overall number of individuals treated during the study time frame will not change, their distribution between the study years will. Data are therefore presented by year of first and most recent treatment episodes, (iv) Individuals stopping treatment for any reason, without the required number of RNA tests will be classified erroneously as treatment naïve

To monitor treatment in prisons and other places of detention, a Health and Justice Indicator of Performance was introduced in April 2014 to monitor the percentage of those testing HCV PCR positive being initially assessed by a specialist who have a treatment plan developed within 18 weeks and these data will be available in future years. The recently published evaluation of prison pathfinders implementing the opt-out BBV testing programme, suggests that almost all pathfinder prisons (10/11) provided hepatitis C treatment as an in-reach model except one which is done in-house as part of a wider multi-disciplinary team.[17] Also, of those being referred for hepatitis C treatment, around 1 in 3 (69/226) commenced treatment in the 12 month period before the opt-out policy was introduced and around 1 in 4 (42/185) in the 6 month period after.[17]

Hepatitis C-related disease in England is predicted to rise[60] and it is unlikely that treatment at current levels using standard therapies will be able to avert this; however, new treatments with markedly improved rates of SVR in genotype 1 patients and those with cirrhosis are likely to result in substantial reductions in the number of people developing severe HCV-related disease. Therefore statistical modelling was undertaken to assess the impact of new therapies compared to standard treatment.[31] A back-calculation approach was used to project disease burden over the next 15 years and determine outcomes under various scenarios of treatment uptake.[31]

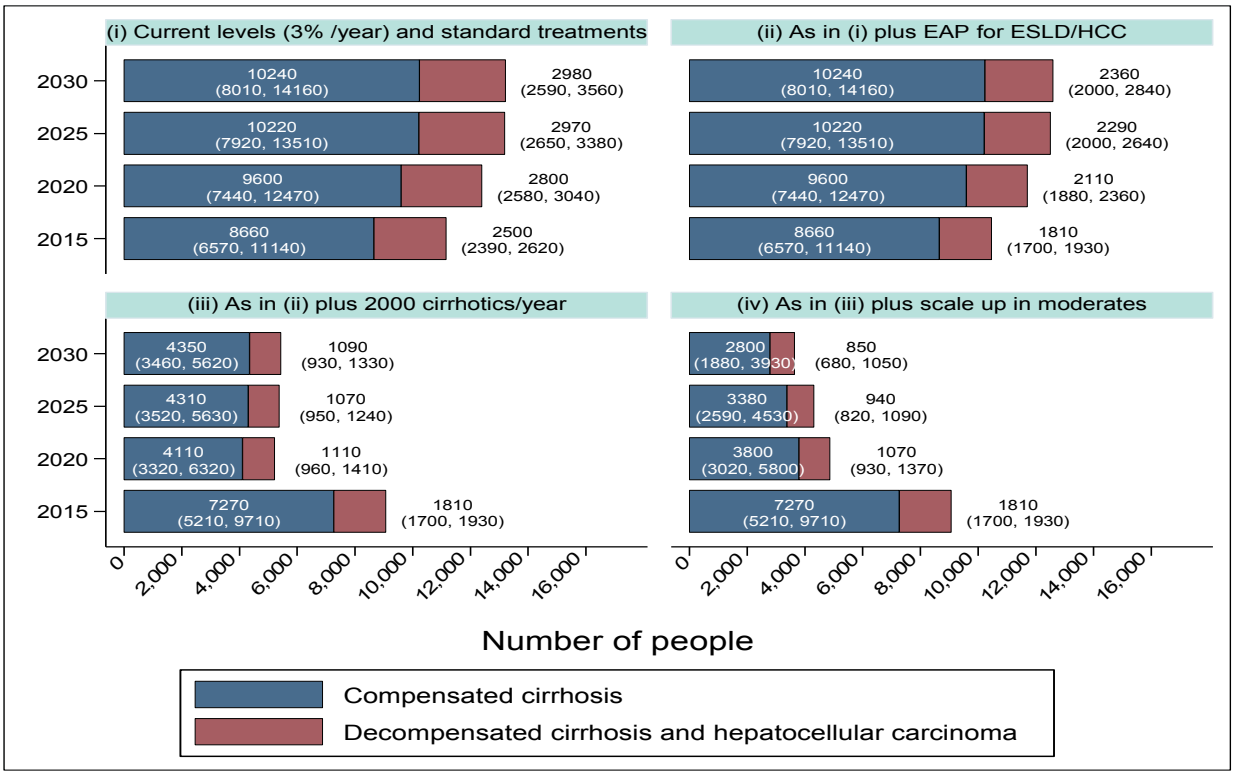
Figure 53 shows the predicted number of people living with HCV-related cirrhosis or HCC under four different treatment scenarios, which incrementally increase the number of people in various disease stages accessing new direct acting antiviral (DAA) drugs: (i) treatment with pegylated interferon and ribavirin for non-1 genotypes and boceprevir/teleprevir for genotype 1; 2000 mild, 2000 moderate and 500 compensated cirrhosis treated per year, no treatment for ESLD/HCC; (ii) Early Access Programme (EAP) to provide new direct acting antivirals for those with ESLD/HCC, which began in the latter half of 2014 and is assumed to treat 70% of ESLD/HCC patients per year subsequently; (iii) as in (ii), plus 2000 patients with cirrhosis per year from 2015 (up to a maximum of 70% of the remaining population of cirrhotics per year), and (iv) as in (iii), plus a gradual scale up from 1000 to 5000 moderate stage per year from 2016-2020. SVR rates with new treatments are assumed to be 90% in moderate stage, 80% for those with compensated cirrhosis and 70% for those with ESLD/HCC, based on initial results from the EAP.[61]

Treatment of ESLD/HCC has a substantial impact, with nearly 700 cases achieving SVR in 2015 and over 600 fewer cases in subsequent years. The exact impact is sensitive to assumptions regarding how quickly those with ESLD/HCC enter treatment as the model is defined in discrete one-year intervals and up to 70% may enter

treatment; in the most optimistic case, if all cases begin treatment immediately the predicted number would reduce by 70%, the assumed proportion that achieve SVR, however, the long-term prognosis of those that achieve SVR once ESLD/HCC has developed is not yet known, as they may have high mortality and other complications even after the virus has been cleared.

Treating those with compensated cirrhosis has a significant impact, with 5,220 people predicted to be living with HCV-related cirrhosis or HCC in 2020 compared to 11,710 by treating ESLD/HCC alone; compensated cirrhosis is markedly reduced, but treating those with compensated cirrhosis prevents patients from progressing to ESLD/HCC and therefore ESLD/HCC is also reduced. However, reductions do not continue beyond 5 years, and there is actually a slight rebound; this is due to rising numbers of older patients progressing from moderate disease stage to cirrhosis, and even with an 80% SVR rate, some will fail treatment. If new treatments are scaled up in those with moderate disease stage, the number of individuals with HCV-related cirrhosis or HCC continues to decline, with 3,650 remaining by 2030. This is because more patients are prevented from developing cirrhosis, whereupon they would have a lower probability of achieving SVR.

Figure 53. Predicted number of people living with HCV-related cirrhosis or decompensated cirrhosis/HCC in England under different treatment scenarios (95% credible intervals are given in parentheses)



(i) Treatment with pegylated interferon and ribavirin for non-1 genotypes and boceprevir/teleprevir for genotype 1; 2000 mild, 2000 moderate and 500 compensated cirrhosis treated per year, no treatment for

ESLD/HCC; (ii) Early Access Programme (EAP) to provide new direct acting antivirals (DAAs) for those with ESLD/HCC, which began in the latter half of 2014 and is assumed to treat 70% of ESLD/HCC patients per year subsequently; (iii) as in (ii), plus 2000 patients with cirrhosis per year (up to a maximum of 70% of the remaining population of cirrhotics per year); (iv) as in (iii), plus a gradual scale up from 1000 to 5000 moderate stage per year from 2016 to 2020.

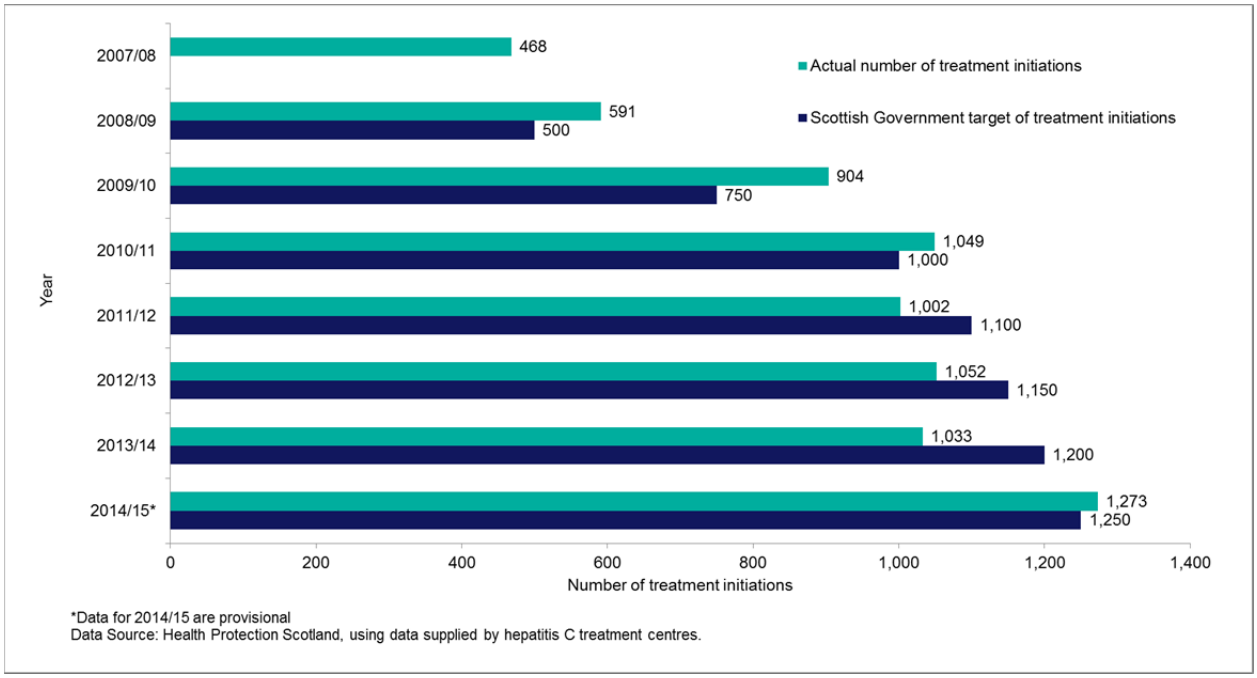
These results are highly dependent on assumptions. Firstly, the SVR rates assumed here for those with compensated cirrhosis are somewhat cautious, as near-100% rates have been observed in many trials, including in those with cirrhosis. SVR rates are assumed to be worse for those with compensated cirrhosis compared to earlier disease stages; this is certainly the case for pegylated interferon and ribavirin, but new treatments have shown rates that are only slightly lower for those with cirrhosis. The assumed difference is the main driver in the difference between scenarios (iii) and (iv). Secondly, treatment rates of up to 70% per year have been assumed for cirrhosis and ESLD/HCC, this may be somewhat optimistic, as not all those with cirrhosis are diagnosed and achieving this rate in practice may be difficult; conversely, most of those with ESLD/HCC are likely to be diagnosed, but as mortality is so high it may not be possible to start treatment in time. Finally, no re-treatment is incorporated in the model as there is minimal evidence on re-treatment following failure with new antivirals. If those failing treatment have a good chance of SVR when re-treated, then the number of people living with HCV-related cirrhosis or HCC will be driven down further.

Scotland

The number of chronically infected people who began hepatitis C antiviral therapy in Scotland increased from 468 in 2007/08 to 1,273 in 2014/15 (Figure 54). The number initiated on antiviral therapy in 2014/15 exceeded the Scottish Government target of 1,250 for that financial year. Among those initiated on therapy in 2014/15, 28% were prescribed pegylated interferon and ribavirin alone, 45% were prescribed pegylated interferon and ribavirin in combination with other drugs (34% with sofosbuvir, 5% with simeprevir, and 6% with a protease inhibitor), 7% were prescribed sofosbuvir and ribavirin alone, and 20% were prescribed sofosbuvir and ribavirin in combination with other drugs (11% with ledipasvir, 5% daclatisvir and 4% simeprevir). The proportion of initiates treated with a protease inhibitor (either telaprevir or boceprevir) had therefore decreased from 23% in 2013/14 to 6% in 2014/15.

Among people initiated on hepatitis C antiviral therapy in Scotland (and with risk factor data), the proportion who had reported having ever injected drugs increased from 58% among those initiated in years 2000-2001 to 81% in years 2013-2014. While, the number (and proportion) initiated on therapy within the prison setting increased from 17 (4% of treatment initiations) in 2007/08 to 112 (12%) in 2009/10, and has remained stable since; in 2014/15, 141 (11%) were initiated within the prison setting.

Figure 54. The actual number, and the Scottish government's target, of chronically infected people initiated on hepatitis C antiviral therapy in Scotland for the financial years, 2007/08 to 2014/15*



SVR data on those initiated on hepatitis C antiviral therapy in 2014/15 are still being collected. Among 965 patients initiated on pegylated interferon and ribavirin across 14 specialist centres in Scotland during January 2012 to June 2013, 59% were known to have achieved an SVR; this rate ranged from 47% among 248 patients with genotype 1 to 64% among 717 patients with other genotypes. Among 389 genotype 1 patients initiated on a protease inhibitor (either telaprevir or boceprevir) during this period, 66% were known to have achieved an SVR.

A recently published study showed that the country-wide scale-up of antiviral therapy in Scotland, involving considerable change in the characteristics of those being treated, did not compromise SVR rates.[62] Another study, involving a cohort of 3,385 chronic hepatitis C patients treated in Scotland between 1996 and 2011 and followed-up for a median of 5.3 years, showed that attainment of SVR was associated with a reduced risk of liver mortality, non-liver mortality, all-cause mortality, severe liver morbidity, cardiovascular disease, alcohol intoxication, and violence-related injury.[63] The absolute risk benefit associated with SVR (vis-à-vis all-cause mortality, liver mortality, severe liver morbidity and cardiovascular disease) was greatest for individuals with an aspartate aminotransferase-to-platelet ratio index (APRI) >0.7 (a score which is roughly equivalent to a liver fibrosis staging of ≥Metavir F2). A further study forecasted the future population impact in Scotland of different hepatitis C treatment strategies, with the new interferon-free regimens.[32] Treatment strategies that prioritise persons who inject drugs have the optimal impact on averting incident chronic hepatitis C infection,

but fall short in terms of limiting new cases of severe liver morbidity (ie decompensated cirrhosis and hepatocellular carcinoma). Conversely, strategies prioritising persons with advanced liver fibrosis have the most advantageous impact on severe liver morbidity, but are suboptimal in terms of curtailing incident transmission.

Wales

Data collection systems to provide information on the numbers of individuals commencing treatment and achieving a SVR have been under development in Wales. It is estimated that in 2011- 2013 approximately 700 individual's commenced treatment; these data are provisional and should be treated with caution as data collection systems were under development during this period. Further information is available at www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=68681

Northern Ireland

Data collected from the Regional Hepatology Unit in Belfast show that since January 2004, 420 people have been commenced on treatment for hepatitis C and have had an outcome recorded. For Genotype 3 patients treated with pegylated interferon and ribavirin between January 2004 and June 2015, 78% achieved SVR. For patients with genotype 1 treated with triple therapy (protease inhibitors, telaprevir or boceprevir, plus peginterferon and ribavirin) from September 2012 to April 2015, 70% of those with a known outcome achieved SVR.

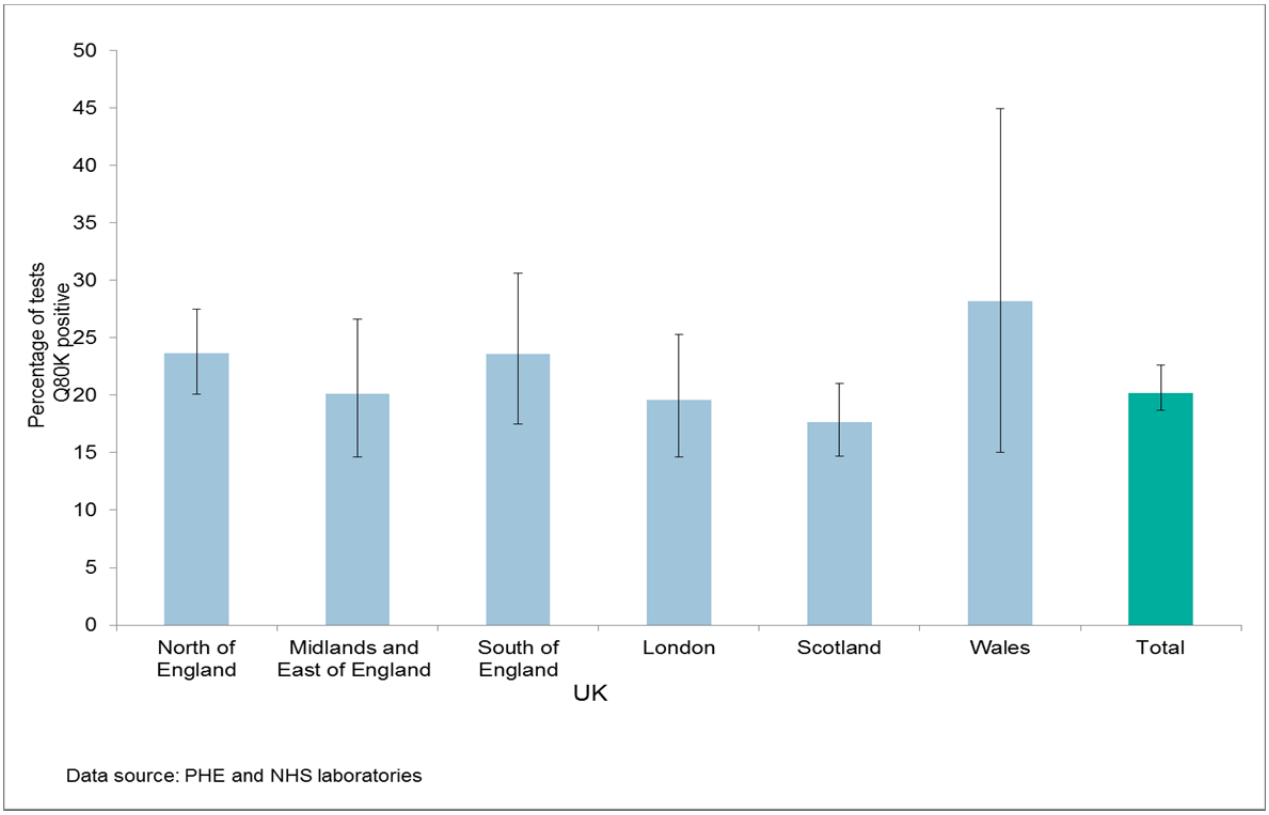
Data from within UK

Simeprevir (SMV) is a second generation protease inhibitor that targets HCV NS3/4A protease enzyme important for virus replication.[64] SMV has been recently approved by the European Medicines Agency for clinical use[65] and is recommended by the National Institute for Health and Care Excellence (NICE) for the treatment of genotypes 1 and 4 chronic hepatitis C in combination with peginterferon alfa and ribavirin in adults.[26]

SMV licensing carries the stipulation of baseline screening for the naturally occurring HCV NS3 resistance polymorphism Q80K in patients infected with genotype 1a. This is because clinical trials have demonstrated that Q80K is associated with significantly reduced sustained virological response in both HCV treatment naïve and retreated previous relapsers[66],[67] The prevalence of the Q80K polymorphism at baseline has been reported to be ~20% in the European region but is much higher in North America at 34%.[68] Over 1,700 genotypic tests for Q80K polymorphism have been carried out at 11 PHE and NHS laboratories in the UK during the first year of SMV use (June 2014 to May 2015). This testing shows the prevalence of Q80K polymorphism in this UK sample of genotype 1a

infection to be 20.8%, with no significant differences in prevalence between the reporting regions (Figure 55).

Figure 55. Prevalence of Q80K polymorphism in a UK sample* of genotype 1a infection: June 2014 to May 2015



*Based on 1750 genotypic tests for Q80K polymorphism carried out at 11 PHE and NHS laboratories in the UK during the first year of SMV use.

Support to help commission hepatitis C treatment and care

A commissioning template for estimating hepatitis C prevalence and numbers eligible for treatment by local areas in England is available at: www.gov.uk/government/collections/hepatitis-c-guidance-data-and-analysis

This template was updated in 2014 and has been produced to help local authorities (LA) and health and wellbeing boards estimate the prevalence of HCV infection in their local population, and the likely disease burden and associated treatment costs.

PHE Colindale in collaboration with the Local Government Association (LGA) has also produced a fact sheet for councillors on hepatitis B and C to support their scrutiny and oversight role.[69]

Data tables

Table 1. Laboratory confirmed cases of chronic hepatitis C in Northern Ireland (n=940) by genotype: 1990 to 2014

Genotype	Number of reports (%)
1	413 (44)
2	64 (7)
3	423 (45)
4	35 (4)
5	2 (0.2)
6	3 (0.3)
Total	**940 (100)**
Data source: NI Regional Virus Laboratory	

Table 2. Risk factor information in laboratory reports* of hepatitis C from England: 1996 to 2014

Risk factor (where reported)	Number of reports	Percentage
Injecting drug use	16883	90.6
Transfusion	240	1.3
Blood product recipient	132	0.7
Sexual exposure	188	1.0
Renal failure	74	0.4
Vertical (mother to baby) or Household	42	0.2
Occupational	17	0.1
Other	1060	5.7
TOTAL	**18636**	**100**
Data source: CoSurv/SGSS		

*Statutory notification by diagnostic laboratories was introduced in October 2010[50], [51]

Table 3. Route of HCV transmission recorded for patients presenting for treatment to Regional Hepatology Unit, Belfast. 1990 to 2014

Route (where recorded)	Number (%)
PWID	610 (53)
Blood/blood products	130 (11)
Sex	48 (4)
Needlestick injury	16 (1)
Tattoo	32 (3)
Overseas healthcare	45 (4)
Mother to baby and household	8 (1)
Other	5 (0.4)
Unknown	253 (22)
TOTAL	**1147(100)**
Data Source: Regional Hepatology Unit, Belfast Hospital and Social Care Trust	

Table 4. Enhanced Surveillance of BBV in people who inject drugs in Wales*: 2011 to 2014[70]

Number of years injecting drugs	Number of Individuals tested				Number of Individuals HCV +ve				Prevalence (%)			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
0-2y	113	91	105	99	11	8	17	18	10	9	16	18
3-4y	68	61	67	50	9	9	13	12	13	15	19	24
>=5y	556	363	490	367	198	82	114	116	36	23	23	32
Unknown	8	12	14	22	0	0	1	4	0	0	7	18
Total	**745**	**527**	**676**	**538**	**218**	**99**	**145**	**150**	**29**	**19**	**21**	**28**
Data source: Enhanced Surveillance of BBV in Wales database held by Public Health Wales, CDSC												

*If an individual was known to have been tested more than once, the last test within each year was considered.

Table 5. Hospital admissions for end-stage liver disease* or hepatocellular carcinoma in individuals** with hepatitis C in England 1998 to 2014

Year	Individuals** with HCV	Individuals** with HCV-related ESLD	Deaths*** where diagnosis codes described HCV-related ESLD (percentage of individuals with HCV-related ESLD)	Individuals** with HCV-related HCC	Deaths*** where diagnosis codes described HCV-related HCC (percentage of individuals with HCV-related HCC)
1998	4,072	469	110 (23)	105	26 (25)
1999	4,708	489	124 (25)	145	36 (25)
2000	4,635	521	138 (26)	107	23 (21)
2001	5,304	543	149 (27)	137	33 (24)
2002	6,007	574	162 (28)	177	36 (20)
2003	6,563	607	175 (29)	173	46 (27)
2004	7,293	692	199 (29)	201	46 (23)
2005	8,025	868	252 (29)	243	56 (23)
2006	8,460	928	254 (27)	256	62 (24)
2007	8,962	1,029	287 (28)	275	63 (23)
2008	10,091	1,224	290 (24)	339	70 (21)
2009	10,447	1,317	349 (26)	361	71 (20)
2010	11,195	1,413	363 (26)	463	83 (18)
2011	11,616	1,608	349 (22)	519	81 (16)
2012	12,473	1,759	396 (23)	507	86 (17)
2013****	13,720	1,922	442 (23)	573	72 (13)
2014 ****	14,767	2,021	461 (23)	631	109 (17)

Data source: Hospital Episode Statistics (HES), Health and Social Care Information Centre

*Defined by codes for, ascites, bleeding oesophageal varices; hepato-renal syndrome, hepatic encephalopathy or hepatic failure.

**Patient counts are based on the unique patient identifier, HESID. This identifier is derived from a patient's date of birth, postcode, sex, local patient identifier and NHS number, using a standard algorithm. Where data are incomplete, HESID might wrongly link episodes or fail to recognise episodes for the same patient. Care is therefore needed, especially where the data includes duplicate records. Patient counts must not be summed across a table where patients may have episodes in more than one cell.

***Hospital Episode Statistics data cannot be used to determine the cause of death of a patient while in hospital. Deaths recorded on the Hospital Episode Statistics database may be analysed by the main diagnosis for which the patient was being treated during their stay in hospital, which may not necessarily be the underlying cause of death. For example, a patient admitted for a hernia operation (with a primary diagnosis of hernia) may die from an unrelated a heart attack. The Office for National Statistics collects information on the cause of death, wherever it occurs, based on the death certificate and should be the source of data for analyses on cause of death.

****Hospital Episode Statistics (HES) data for 2013 and 2014 were analysed using the HES Data Interrogation System (HDIS). HDIS is a remotely accessed secure data portal provided and hosted by the Health and Social Care Information Centre (HSCIC) for the purposes of analysing HES data in a secure environment.

Table 6. Hospital admissions* of patients with hepatitis C-related HCC or ESLD to Northern Ireland Hospitals 2000 to 2014[P]

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014[P]
Individuals admitted with HCV	Admissions*	88	91	81	105	90	111	120	108	131	146	126	205	375	378	292
	Individuals	68	68	59	66	75	96	98	90	91	97	86	111	133	131	150
	Beddays	452	742	460	404	797	670	988	681	657	1315	647	906	891	855	1270
Individuals with HCV related ESLD	Admissions*							11	6	29	22	18	25	11	31	43
	Beddays	14	27	78	47	69	50	196	70	88	134	114	216	97	167	195
Individuals with HCV related HCC	Admissions*								6	10	11	14	15	17	36	24
	Beddays			22	12	28	91	16	27	70	83	87	58	69	169	120
Individuals with HCV and either ESLD or HCC	Admissions*							14	12	38	32	26	39	28	56	66
	Individuals							8	8	9	9	9	16	14	21	23
	Beddays	14	31	100	59	79	141	212	97	145	206	157	267	166	309	284

Data source: Hospital Inpatient System

[P]Data for 2014 are provisional and, as such, are subject to change

*Admissions have been estimated using deaths and discharges

Disclosure control has been applied

Table 7. Number of Welsh residents[1] with hepatitis C who have ESLD and/or HCC and have died from these conditions, in Wales 1998 to 2014[4]

	Number of patients[2] with HCV	Number of patients[2] with HCV related ESLD	Deaths from HCV[3] related ESLD	Number of patients[2] with HCV related HCC	Deaths from HCV[3] related HCC
Year	Total	Total	Total (%)	Total	Total (%)
1999-2002	921	47	20(43)	14	6(43)
2003-2006	1236	106	21(20)	16	8(50)
2007-2010	1322	144	40(28)	39	7(18)
2011-2014	1584	220	66(30)	72	13(18)

Data source: Patient Episode Database for Wales (PEDW). NHS Wales Informatics Service.

1. Data based on patients resident in Wales, admitted to providers in Wales or England. Admissions to non-NHS providers are not included.
2. Count of distinct patients per year. If a patient is admitted twice within the same year, they are counted once only. Patients admitted in two years are counted once in each relevant year
3. Deaths based on deaths in hospital. Deaths that occur elsewhere are not included in the analysis.
4. Data may be subject to change, as further data submissions may be received.

Table 8. Number of first registrations for a liver transplant where post-hepatitis C cirrhosis was given as either primary, secondary or tertiary indications for transplant England by PHE centres: 2000 to 2014*

Number of first registrations** for a liver transplant in England where post-hepatitis C cirrhosis was given as either the primary, secondary or tertiary indication for transplant				
PHE Centre (by patient residence)	**2000-2004**	**2005-2009**	**2010-2014**	**Total**
East Midlands	17	20	38	75
East of England	46	38	74	158
London	120	121	143	384
North East	12	12	20	44
North West	36	54	109	199
South East	49	74	103	226
South West	29	35	74	138
West Midlands	24	52	57	133
Yorkshire and Humber	14	35	70	119
Total	**347**	**441**	**688**	**1476**
*** These figures are based on registry data as at 9 April 2015**				
Data source: NHS Blood and Transplant UK Transplant Registry				

New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

Table 9. Indications for liver transplants undertaken in HCV infected individuals in England: 1996 to 2014*

		First liver transplants with post hepatitis C cirrhosis as either the primary, secondary or tertiary indication for transplant at registration who were HCV positive at registration or transplant (per cent of all liver transplants)			
Year	All Liver Transplants**	Total	Post-hep C Cirrhosis	Hepatocellular carcinoma	Other Indication
1996	445	43 (10%)	32 (7%)	7 (2%)	4 (1%)
1997	484	57 (12%)	44 (9%)	10 (2%)	3 (1%)
1998	455	47 (10%)	31 (7%)	9 (2%)	7 (2%)
1999	493	76 (15%)	51 (10%)	19 (4%)	6 (1%)
2000	477	66 (14%)	34 (7%)	22 (5%)	10 (2%)
2001	482	68 (14%)	44 (9%)	20 (4%)	4 (1%)
2002	518	83 (16%)	49 (9%)	28 (5%)	6 (1%)
2003	475	74 (16%)	47 (10%)	21 (4%)	6 (1%)
2004	545	82 (15%)	57 (10%)	22 (4%)	3 (1%)
2005	469	55 (12%)	29 (6%)	21 (4%)	5 (1%)
2006	493	60 (12%)	31 (6%)	25 (5%)	4 (1%)
2007	496	65 (13%)	30 (6%)	28 (6%)	7 (1%)
2008	537	112 (21%)	57 (11%)	51 (9%)	4 (1%)
2009	523	93 (18%)	40 (8%)	50 (10%)	3 (1%)
2010	549	96 (17%)	45 (8%)	50 (9%)	1 (0%)
2011	573	104 (18%)	49 (9%)	54 (9%)	1 (0%)
2012	621	103 (17%)	52 (8%)	49 (8%)	2 (0%)
2013	718	125 (17%)	63 (9%)	57 (8%)	5 (1%)
2014	726	122 (17%)	59 (8%)	61 (8%)	2 (0%)
TOTAL	**10079**	**1531 (15%)**	**844 (8%)**	**604 (6%)**	**83 (1%)**
*These figures are based on registry data as at 9 April 2015					
Data source: NHS Blood and Transplant UK Transplant Registry					
** Additional transplants undertaken on the same day in a single recipient are excluded (7 transplants in 1996-2014)					

New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

Table 10. Indications for liver transplants undertaken in HCV infected individuals in Northern Ireland and Wales: 1996 to 2014*

		First liver transplants with post hepatitis C cirrhosis as either the primary, secondary or tertiary indication for transplant at registration who were HCV positive at registration or transplant (per cent of all liver transplants)			
Year	All Liver Transplants	Total	Post-hep C Cirrhosis	Hepatocellular carcinoma	Other Indication
1996	31	1 (3%)	1 (3%)	0 (0%)	0 (0%)
1997	42	1 (2%)	1 (2%)	0 (0%)	0 (0%)
1998	45	3 (7%)	3 (7%)	0 (0%)	0 (0%)
1999	45	6 (13%)	5 (11%)	1 (2%)	0 (0%)
2000	35	4 (11%)	2 (6%)	1 (3%)	1 (3%)
2001	43	1 (2%)	0 (0%)	1 (2%)	0 (0%)
2002	46	4 (9%)	3 (7%)	1 (2%)	0 (0%)
2003	31	3 (10%)	1 (3%)	0 (0%)	2 (6%)
2004	48	3 (6%)	2 (4%)	1 (2%)	0 (0%)
2005	24	1 (4%)	1 (4%)	0 (0%)	0 (0%)
2006	39	8 (21%)	4 (10%)	4 (10%)	0 (0%)
2007	50	6 (12%)	5 (10%)	1 (2%)	0 (0%)
2008	52	8 (15%)	4 (8%)	3 (6%)	1 (2%)
2009	39	10 (26%)	7 (18%)	3 (8%)	0 (0%)
2010	40	5 (13%)	2 (5%)	3 (8%)	0 (0%)
2011	51	3 (6%)	1 (2%)	2 (4%)	0 (0%)
2012	56	3 (5%)	2 (4%)	1 (2%)	0 (0%)
2013	47	8 (17%)	3 (6%)	5 (11%)	0 (0%)
2014	61	7 (11%)	2 (3%)	4 (7%)	1 (2%)
TOTAL	**825**	**85 (10%)**	**49 (6%)**	**31 (4%)**	**5 (1%)**
*These figures are based on registry data as at 9 April 2015					
Data source: NHS Blood and Transplant UK Transplant Registry					

New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

Table 11. Indications for liver transplant undertaken in HCV infected individuals in Scotland: 1996 to 2014*

		First liver transplants with post hepatitis C cirrhosis as either the primary, secondary or tertiary indication for transplant at registration who were HCV positive at registration or transplant (per cent of all liver transplants)			
Year	All Liver Transplants	Total	Post-hep C Cirrhosis	Hepatocellular carcinoma	Other Indication
1996	44	5 (11%)	4 (9%)	0 (0%)	1 (2%)
1997	40	4 (10%)	2 (5%)	0 (0%)	2 (5%)
1998	54	7 (13%)	3 (6%)	2 (4%)	2 (4%)
1999	54	4 (7%)	1 (2%)	2 (4%)	1 (2%)
2000	58	7 (12%)	4 (7%)	1 (2%)	2 (3%)
2001	56	7 (13%)	3 (5%)	3 (5%)	1 (2%)
2002	59	5 (8%)	4 (7%)	1 (2%)	0 (0%)
2003	52	4 (8%)	1 (2%)	2 (4%)	1 (2%)
2004	55	6 (11%)	3 (5%)	3 (5%)	0 (0%)
2005	60	10 (17%)	9 (15%)	1 (2%)	0 (0%)
2006	64	6 (9%)	4 (6%)	1 (2%)	1 (2%)
2007	55	8 (15%)	5 (9%)	3 (5%)	0 (0%)
2008	78	12 (15%)	5 (6%)	7 (9%)	0 (0%)
2009	76	6 (8%)	3 (4%)	3 (4%)	0 (0%)
2010	85	19 (22%)	10 (12%)	9 (11%)	0 (0%)
2011	95	10 (11%)	5 (5%)	5 (5%)	0 (0%)
2012	96	11 (11%)	5 (5%)	5 (5%)	1 (1%)
2013	99	21 (21%)	9 (9%)	11 (11%)	1 (1%)
2014	115	24 (21%)	8 (7%)	12 (10%)	4 (3%)
TOTAL	**1295**	**176 (14%)**	**88 (7%)**	**71 (5%)**	**17 (1%)**
*These figures are based on registry data as at 9 April 2015					
Data source: NHS Blood and Transplant UK Transplant Registry					

New national registration criteria for selecting adult patients for elective liver transplantation were introduced in September 2007[40]

Table 12. Injecting* status of adults in drug treatment 2005/06 to 2013/14 in England

Injecting status of adults in drug treatment																
Injecting status	2006-2007		2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		2012-2013		2013-2014	
	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting
Currently injecting	54,570	18,589	57,500	18,524	59,923	18,421	56,419	14,892	53,853	12,850	50,972	11,928	49,195	11,591	48,268	11,990
Previously injected	42,510	16,976	48,124	18,413	54,371	20,415	58,161	20,448	61,002	19,719	60,967	18,268	60,201	17,949	59,402	17,548
Total ever injected	97,080	35,565	105,624	36,937	114,294	38,836	114,580	35,340	114,855	32,569	111,939	30,196	109,396	29,540	107,670	29,538

Data source: National Drug Treatment Monitoring System

*This table shows the number of people who have injected drugs where a person is classed as ever having injected if they are currently injecting or have previously injected. If a person has been classified as 'currently injecting' and 'previously injecting' they are assumed to be 'currently injecting'. For all in treatment, clients who reported as 'currently injecting' when they entered treatment over the years may have ceased to inject during the reporting period. 'Newly presenting' refers to a person starting a new treatment journey in the financial year.

Table 13. Number of injecting paraphernalia items (rounded to nearest 1,000) reported to have been distributed by injection equipment provider outlets in Scotland

	2004/05	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Needles/syringes	3,554,000	4,438,000	4,381,000	4,681,000	4,506,000	4,723,000*	4,358,000*	4,475,000*
Filters	NA	NA	356,000	2,224,000	2,500,000	2,534,000	2,565,000	2,864,000
Spoons/Cookers	NA	NA	509,000	2,143,000	2,438,000	2,527,000	2,508,000	2,810,000
Water	NA	NA	62,000	77,000	72,000	69,000	249,000	1,019,000

***Estimated, accounting for under-reporting**

Data source: Information Services Division, NHS National Services Scotland.

Table 14. Numbers participating in the RCGP Certificate in the detection and diagnosis of hepatitis B and C in primary care (up until December 2014)

Region	Level 1 components						Level 1			Level 2		
	E-module			Face-to-Face training			Both components completed					
	By end of 2012	2013	2014	By end of 2012	2013	2014	By end of 2012	2013	2014	By end of 2012	2013	2014
EAST OF ENGLAND	41	45	14	0	0	1	0	0	1	0	0	0
EAST MIDLANDS	38	40	8	23	15	1	17	11		2	0	0
LONDON	104	79	55	21	65	11	20	63	3	2	0	0
NORTH EAST	33	13	11	28	0	4	13	0	2	0	0	0
NORTH WEST	113	82	46	88	33	5	75	29	4	6	0	0
SOUTH EAST	65	64	53	45	0	20	29	0	10	2	0	0
SOUTH WEST	56	43	33	42	0	3	23	0	2	2	0	0
WEST MIDLANDS	70	77	65	40	10	7	31	9	3	7	0	0
YORKSHIRE & THE HUMBER	82	62	34	44	14	3	39	14	2	6	0	0
NORTHERN IRELAND	4	5	2	0	0	0	0	0		0	0	0
REPUBLIC OF IRELAND	0	4	0	0	0	0	0	0	0	0	0	0
SCOTLAND	45	105	67	3	153	Not available	3	153	Not available	2	Not available	Not available
WALES	66	14	27	68	20	30	66	20	18*	2	0	0
INTERNATIONAL	0	22	17	0	0	1	0	0	1	0	0	0
UNKNOWN	10	2	540	0	0	1	0	0	0	0	0	0
Total	**727**	**657**	**972**	**402**	**310**	**87**	**316**	**299**	**46**	**31**	**Not Applicable**	**Not Applicable**

*provisional data

Data source: Royal College of General Practitioners

Table 15. Laboratory reports* of hepatitis C by Public Health England Centre** (PHEC): 1996 to 2014

PHEC	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
East Midlands	41	182	179	197	184	147	248	340	409	503	310	425	643	610	519	677	690	552	609	7,465
East of England	103	394	581	592	570	438	360	429	524	591	633	671	735	669	600	837	745	701	761	10,934
London	158	253	333	299	264	319	338	404	743	805	1190	1016	962	856	967	2010	2787	3085	3838	20,627
North East	41	40	58	111	130	116	133	223	238	279	245	141	167	275	316	310	301	360	303	3,787
North West	136	124	650	1057	903	1072	1383	2019	1860	1505	1380	1737	1665	2117	1807	1514	1797	1981	1494	26,201
South East	170	632	874	786	610	587	538	448	388	325	377	786	1083	1144	1168	1298	1294	1124	1328	14,960
South West	87	483	449	713	855	726	847	703	941	695	873	1046	1113	1001	733	975	1114	999	966	15,319
West Midlands	111	230	566	628	590	534	645	514	541	572	488	615	675	863	783	778	751	784	659	11,327
Yorkshire and Humber	198	157	142	235	393	236	310	476	581	1016	1449	1361	1344	1091	981	1506	1376	1469	1513	15,834
TOTAL	**1,045**	**2,495**	**3,832**	**4,618**	**4,499**	**4,175**	**4,802**	**5,556**	**6,225**	**6,291**	**6,945**	**7,798**	**8,387**	**8,626**	**7,874**	**9,905**	**10,855**	**11,055**	**11,471**	**126,454**

Data source: CoSurv/SGSS

*****Statutory notification by diagnostic laboratories was introduced in October 2010[(50),(51)]

** Data are summarised by PHE Centre of residence, not PHE Centre of laboratory. Data are assigned to PHE centre by patient postcode where present; if patient postcode is unknown, data are assigned to PHE centre of registered GP practice; where both patient postcode and registered GP practice are unknown data are assigned to PHE centre of laboratory.

Table 16. HCV RNA status (from testing initial sample) of new cases of hepatitis C reported in Northern Ireland between 2010 and 2014*

	PCR POSITIVE	PCR NEGATIVE	INSUFFICIENT	TOTAL
2010	73	28	5	**106**
2011	76	37	0	**113**
2012	92	40	1	**133**
2013	82	42	0	**124**
2014*	93	45	0	**138**

Data source: Regional Virus Laboratory, Belfast and Social Care Trust

*2014 data is provisional

Table 17. Hepatitis C test status of adults in drug treatment in England - all persons 2006/07 to 2013/14

Hepatitis C test status of adults in drug treatment - all persons																	
		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		2012-2013		2013-14	
Hepatitis C test recorded		All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting
Yes	No.	35,096	15,143	57,929	22,378	75,668	27,690	93,162	31,629	105,380	32,397	113,131	34,211	116,250	34,787	118,245	34,826
	%	18.1%	18.9%	28.8%	27.2%	35.9%	32.8%	45.0%	39.9%	51.5%	43.8%	57.4%	49.3%	60.1%	50.2%	61.2%	49.1%
No	No.	159,077	65,079	142,876	59,957	135,147	56,830	113,727	47,626	99,093	41,631	83,979	35,223	77,325	34,460	74,953	36,104
	%	81.9%	81.1%	71.2%	72.8%	64.1%	67.2%	55.0%	60.1%	48.5%	56.2%	42.6%	50.7%	39.9%	49.8%	38.8%	50.9%
Total		**194,173**	**80,222**	**200,805**	**82,335**	**210,815**	**84,520**	**206,889**	**79,255**	**204,473**	**74,028**	**197,110**	**69,434**	**193,575**	**69,247**	**193,198**	**70,930**

Data source: National Drug Treatment Monitoring System

Table 18. Hepatitis C test status of adults in drug treatment in England - those who have ever injected* 2006/07 to 2013/14

Hepatitis C test status of adults in drug treatment - currently injecting* or previously injecting* only																	
		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		2012-2013		2013-2014	
Hepatitis C test recorded		All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting
Yes	No.	26,611	10,903	41,743	144,14	54,507	17,917	66,130	19,575	73,942	19,532	79,052	20,390	80,817	20516	81,650	20322
	%	27.4%	30.7%	39.5%	39.0%	47.7%	46.1%	57.7%	55.4%	64.4%	60.0%	70.6%	67.5%	73.9%	69.5%	75.8%	68.8%
No	No.	70,469	24,662	63,881	22,523	59,787	20,919	48,450	15,765	40,913	13,037	32,887	9,806	28,579	9,024	26,020	9,216
	%	72.6%	69.3%	60.5%	61.0%	52.3%	53.9%	42.3%	44.6%	35.6%	40.0%	29.4%	32.5%	26.1%	30.5%	24.2%	31.2%
Total		**97,080**	**35,565**	**105,624**	**36,937**	**114,294**	**38,836**	**114,580**	**35,340**	**114,855**	**32,569**	**111,939**	**30,196**	**109,396**	**29,540**	**107,670**	**29,538**

Data source: National Drug Treatment Monitoring System

*This table shows the number of people who inject drugs where a person is classed as having injected if they have 'currently injecting' or 'previously injecting' listed as their injecting status within their latest treatment journey. If a person has been classified as 'currently injecting' and 'previously injecting' they are assumed to be 'currently injecting'. For all in treatment, clients who reported as 'currently injecting' when they entered treatment over the years may have ceased to inject during the reporting period. 'Newly presenting' refers to a person starting a new treatment journey in the financial year.

Table 19. Hepatitis C intervention status for adults in drug treatment in England- all persons 2006/07 to 2013/14

Hepatitis C intervention status for adults in drug treatment - all persons																	
		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		2012-2013		2013-2014	
*Recorded hepatitis C status		All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting
Offered and accepted	No.	2,752	1,405	37,681	23,341	68,804	32,424	91,346	33,872	98,231	31,702	99,458	29,215	97,629	28,023	94,967	26,853
	%	1.4%	1.8%	18.8%	28.3%	32.6%	38.4%	44.2%	42.7%	48.0%	42.8%	50.5%	42.1%	50.4%	40.5%	49.2%	37.9%
Offered and refused	No.	1,878	962	23,531	15,345	42,711	22,080	56,488	25,450	62,199	26,291	62,510	25,853	62,928	26,805	66,320	28,686
	%	1.0%	1.2%	11.7%	18.6%	20.3%	26.1%	27.3%	32.1%	30.4%	35.5%	31.7%	37.2%	32.5%	38.7%	34.3%	40.4%
Assessed as not appropriate to offer	No.	n/a	n/a	n/a	n/a	1,253	614	8,603	6,176	13,287	7,858	15,167	7,923	18,043	8,991	19,173	9,793
	%	-	-	-	-	0.6%	0.7%	4.2%	7.8%	6.5%	10.6%	7.7%	11.4%	9.3%	13.0%	9.9%	13.8%
Not offered	No.	3,193	1,797	22,294	14,014	27,421	13,561	17,843	6,193	10,949	3,447	7,532	2,802	5,810	2,666	5,456	2,745
	%	1.6%	2.2%	11.1%	17.0%	13.0%	16.0%	8.6%	7.8%	5.4%	4.7%	3.8%	4.0%	3.0%	3.8%	2.8%	3.9%
Status recorded	No.	7,823	4,164	83,506	52,700	140,189	68,679	174,280	71,691	184,666	69,298	184,667	65,793	184,410	66,485	185,916	68,077
No recorded status	No.	186,350	76,058	117,299	29,635	70,626	15,841	32,609	7,564	19,807	4,730	12,443	3,641	9,165	2,762	7,282	2,853
	%	96.0%	94.8%	58.4%	36.0%	33.5%	18.7%	15.8%	9.5%	9.7%	6.4%	6.3%	5.2%	4.7%	4.0%	3.8%	4.0%
Total		**194,173**	**80,222**	**200,805**	**82,335**	**210,815**	**84,520**	**206,889**	**79,255**	**204,473**	**74,028**	**197,110**	**69,434**	**193,575**	**69,247**	**193,198**	**70,930**

Data source: National Drug Treatment Monitoring System

*Information about whether people have been offered a hepatitis C test is recorded at the beginning of their latest period of treatment.

Table 20. Hepatitis C test status of adults in drug treatment in England - those who have ever injected* 2006/07 to 2013/14

Hepatitis C intervention for adults in drug treatment - currently injecting* or previously injecting* only																	
		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011		2011-2012		2012-2013		2013-2014	
**Recorded hepatitis C status		All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting	All in treatment	Newly presenting
Offered and accepted	No.	2,060	957	24,386	13,449	44,376	18,258	59,210	18,218	63,603	16,589	65,402	15,449	64,303	14,401	62,561	13,836
	%	2.1%	2.7%	23.1%	36.4%	38.8%	47.0%	51.7%	51.6%	55.4%	50.9%	58.4%	51.2%	58.8%	48.8%	58.1%	46.8%
Offered and refused	No.	1,224	533	11,809	6,409	20,918	8,913	27,431	9,738	29,949	9,915	29,940	9,526	29,982	9,806	30,922	10,177
	%	1.3%	1.5%	11.2%	17.4%	18.3%	23.0%	23.9%	27.6%	26.1%	30.4%	26.7%	31.5%	27.4%	33.2%	28.7%	34.5%
Assessed as not appropriate to offer	No.	n/a	n/a	n/a	n/a	738	323	4,065	2,539	6,190	3,197	7,437	3,242	8,480	3,525	8,766	3,714
	%	-	-	-	-	0.6%	0.8%	3.5%	7.2%	5.4%	9.8%	6.6%	10.7%	7.8%	11.9%	8.1%	12.6%
Not offered	No.	2,076	1,019	11,340	5,832	13,230	5,384	8,471	2,249	5,599	1,306	3,695	976	2,829	1,077	2,564	1,060
	%	2.1%	2.9%	10.7%	15.8%	11.6%	13.9%	7.4%	6.4%	4.9%	4.0%	3.3%	3.2%	2.6%	3.6%	2.4%	3.6%
Status recorded	No.	5,360	2,509	47,535	25,690	79,262	32,878	99,177	32,744	105,341	31,007	106,474	29,193	105,594	28,809	104,813	28,787
No recorded status	No.	91,720	33,056	58,089	11,247	35,032	5,958	15,403	2,596	9,514	1,562	5,465	1,003	3,802	731	2,857	751
	%	94.5%	92.9%	55.0%	30.4%	30.7%	15.3%	13.4%	7.3%	8.3%	4.8%	4.9%	3.3%	3.5%	2.5%	2.7%	2.5%
Total		**97,080**	**35,565**	**105,624**	**36,937**	**114,294**	**38,836**	**114,580**	**35,340**	**114,855**	**32,569**	**111,939**	**30,196**	**109,396**	**29,540**	**107,670**	**29,538**
Data source: National Drug Treatment Monitoring System																	

*This table shows the number of people who inject drugs where a person is classed as having injected if they have 'currently injecting' or 'previously injecting' listed as their injecting status within their latest treatment journey. If a person has been classified as 'currently injecting' and 'previously injecting' they are assumed to be 'currently injecting'. For all in treatment, clients who reported as 'currently injecting' when they entered treatment over the years may have ceased to inject during the reporting period. 'Newly presenting' refers to a person starting a new treatment journey in the financial year.

**Information about whether people have been offered a hepatitis C test is recorded at the beginning of their latest period of treatment.

Table 21. Hepatitis C results from Dried Blood Spot Testing in Wales: 2011 to 2014

Year	Number of individuals tested by DBS*	Number of individuals first identified as having a reactive result for HCV antibody	Number with a follow-up sample for PCR testing (% of individuals first identified as having a reactive result for HCV antibody)	Number with RNA detected (% of those with a follow-up sample for PCR testing)
2011	1531	298	175 (59%)	134 (77%)
2012	1675	194	118 (61%)	96 (81%)
2013	1874	180	94 (52%)	81 (86%)
2014	1639	186	72 (39%)	52 (72%)
*** Samples attributed to Substance Misuse Services and prisons were included**				
Data source: Virology Specialist Centre, Public Health Wales				

Table 22. Number of active PWIDs who have self-reported HCV status in Wales from the Harm Reduction Database: April 2011 to March 2014

Self-reported HCV status recorded	Drug type – reported primary substance used number and percentage of total within 'substance	
	Image and performance enhancing drugs*	Psychoactive drugs**
	April 2014-March 2015	April 2014-March 2015
	Number (%)	Number (%)
Positive	≤5 (≤1)	206 (12)
Negative	691 (43)	1041 (60)
Status Not Known	900 (56)	477 (28)
Not recorded	2786	3621
	April 2013-March 2014	April 2013-March 2014
Positive	≤5 (≤1)	182 (11)
Negative	596 (41)	1036 (65)
Status Not Known	872 (59)	382 (24)
Not recorded	2909	3125
	April 2012-March 2013	April 2012-March 2013
Positive	≤5 (≤1)	186 (13)
Negative	467 (38)	908 (62)
Status Not Known	745 (61)	370 (25)
Not recorded	2974	2460
	April 2011-March 2012	April 2011-March 2012
Positive	≤5 (≤1)	173 (12)
Negative	529 (43)	968 (64)
Status Not Known	706 (57)	360 (24)
Not recorded	3128	2099
Data from Harm Reduction Database, Public Health Wales		

Full Harm Reduction Database Wales reports available at: www.publichealthwales.org/substancemisuse

* steroids, growth hormone, melanotan

** including heroin, cocaine, amphetamine, new psychoactive substances

Table 23. Reports* of hepatitis C in prisons and other places of detention to PHIPS team: 2010 to 2014

Hepatitis C Infection	Year of report				
	2010	2011	2012	2013	2014
Acute hepatitis C	0	<5	0	<5	<5
Hepatitis C antibody positive with no HCV RNA result	106	289	417	735	526
Hepatitis C antibody positive, HCV RNA negative	Not available	Not available	Not available	Not available	63
Hepatitis C HCV RNA positive	9	89	205	670	477
Data source: PHE, PHIPS Service					

*There was a considerable increase in hepatitis C reports during 2013 due to improved reporting and also retrospective reports which accounted for over 300 reports during 2013

Table 24. Hepatitis C testing in the Welsh prison estate: 2013 to 2014

Year	Total tested (n)	DBS tests (n)	Venepuncture tests (n)	Proportion of receptions tested (%)
2013	1255	424	831	13.2
2014	1150	538	612	13.7
Data source: : Prisons in Wales via Public Health Wales				

Table 25. Characteristics and probable exposure history of HCV infected blood donors by gender in England and North Wales, 2014

	*New donors				*Repeat donors		Total	
Characteristics of infected donors	Male	Female	Total	%	Total	%		%
Number	15	9	24	*100*	1	*100*	25	*100*
Prevalence per 100 000 donors	27.4	10.9	17.4		0.1		2.7	
Age group								
17-24	1	0	1	*4*	0	*0*	1	*4*
25-34	6	2	8	*33*	0	*0*	8	*32*
35-44	4	2	6	*25*	0	*0*	6	*24*
45 and over	4	5	9	*38*	1	*100*	10	*40*
Ethnic group								
White-British	4	4	8	*33*	1	*100*	9	*36*
Any other white background	7	3	10	*42*	0	*0*	10	*40*
Indian/Pakistani/Bangladeshi	3	0	3	*13*	0	*0*	3	*12*
Mixed	1	1	2	*8*	0	*0*	2	*8*
Ethnicity information not disclosed	0	1	1	*4*	0	*0*	1	*4*
Area of birth								
UK	4	2	6	*25*	1	*100*	7	*28*
Europe excl UK	5	2	7	*29*	0	*0*	7	*28*
Asia	4	0	4	*17*	0	*0*	4	*16*
Africa	0	1	1	*4*	0	*0*	1	*4*
Americas	0	1	1	*4*	0	*0*	1	*4*
Not known	2	3	5	*21*	0	*0*	5	*20*
Probable exposure category								
Injecting drug use	1	0	1	*4*	0	*0*	1	*4*
Intranasal drug use	0	2	2	*8*	0	*0*	2	*8*
Sex between men and women	0	2	2	*8*	1	*100*	3	*12*
Blood contact possible	5	0	5	*21*	0	*0*	5	*20*
Vertical transmission possible	1	0	1	*4*	0	*0*	1	*4*
**Born in an endemic country	2	2	4	*17*	0	*0*	4	*16*
No identified exposure	1	0	1	*4*	0	*0*	1	*4*
Incomplete follow up	5	3	8	*33*	0	*0*	8	*32*

* As classified according to evidence supplied to the NHSBT/PHE Epidemiology Unit

**Born in a country with a higher prevalence of hepatitis C than the UK but no specific risk identifed

Data sources

- Public Health in Prisons (PHiPs) reports: www.gov.uk/government/collections/public-health-in-prisons
- Laboratory Reporting via COSURV/SGSS: www.gov.uk/government/publications/laboratory-reports-of-hepatitis-a-and-c-2014
- HPA Sentinel Surveillance of Hepatitis C Testing: www.gov.uk/government/publications/sentinel-surveillance-of-blood-borne-virus-testing-in-england-2014
- Unlinked Anonymous Monitoring survey of PWID in contact with specialist drug services. www.gov.uk/government/statistics/people-who-inject-drugs-hiv-and-viral-hepatitis-monitoring
- NHS Blood and Transplant/PHE Blood Donor Infection Surveillance Scheme: www.gov.uk/government/collections/bloodborne-infections-in-blood-and-tissue-donors-bibd-guidance-data-and-analysis
- NHS Blood and Transplant: www.nhsbt.nhs.uk
- Enhanced Surveillance off Newly Acquired Hepatitis C infection in men who have sex with men: www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/HIVAndSTIs/SurveillanceSystemsHIVAndSTIs/hivsti_SNAHC
- Office for National Statistics mortality data: www.statistics.gov.uk/default.asp
- Hospital Episode Statistics, The NHS Information Centre for Health and Social Care: www.hesonline.nhs.uk/Ease/servlet/ContentServer?siteID=1937&categoryID=53
- Oral fluid testing data, Alere Toxicology Plc: www.aleretoxicology.co.uk/
- Transplant data, NHS Blood and Transplant: www.organdonation.nhs.uk/
- National Drug Treatment Monitoring System: www.ndtms.net
- Northern Ireland Blood Transfusion Service: www.nibts.org

- NHS National Services Scotland (Health Protection Scotland and Information Services Division): www.nhsnss.org/index.php
- Hepatitis C Testing Laboratories in Scotland: www.documents.hps.scot.nhs.uk/ewr/pdf2012/1218.pdf
- Needle Exchange Surveillance Initiative in Scotland (University of West of Scotland, Health Protection Scotland, and West of Scotland Specialist Virology Centre): www.uws.ac.uk/research/research-institutes/social-sciences/health-behaviours-and-policy/needle-exchange-surveillance-initiative/
- Scottish National Blood Transfusion Service: www.scotblood.co.uk
- Welsh Blood Service: www.welsh-blood.org.uk
- Public Health Wales Substance Misuse – Drugs and Alcohol: www.publichealthwales.org/substancemisuse
- Patient Episode Database for Wales, NHS Wales Informatics Service 2011: www.wales.nhs.uk/nwis/page/52490
- Enhanced Surveillance of BBV in People who inject drugs in Wales: www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=62269
- Pharmex: https://www.gov.uk/government/collections/commercial-medicines-unit-cmu
- Roche:www.roche.co.uk/
- MSD: www.msd-uk.com
- Public Health Agency: www.publichealth.hscni.net
- Royal College of General Practitioners: www.rcgp.org.uk
- Belfast Trust: www.belfasttrust.hscni.net
- Northern Ireland Hepatitis B and C Managed Clinical Network: www.hepbandcni.net
- Department of Health, Social Services and Public Safety: www.dhsspsni.gov.uk
- Northern Ireland Statistics and Research Agency: www.nisra.gov.uk

Glossary of abbreviations

Anti-HCV	Antibodies to hepatitis C virus
BBV	Bloodborne virus
CrI	Credible interval, the Bayesian equivalent to a confidence interval
DBS	Dried blood spot
DAA	Direct acting antiviral
EAP	Early access programme
ESLD	End-stage liver disease
GP	General practitioner
GUM	Genitourinary medicine
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HDIS	HES data interrogation system
HES	Hospital episode statistics
HIV	Human immunodeficiency virus
HPA	Health Protection Agency
HJIPs	Health and Justice indicators of performance
HRD	Harm reduction database
HSCIC	Health and Social care Information Centre
IPED	Image and performance enhancing drugs
LA	Local authorities
LGA	Local Government Association
MSM	Men who have sex with men
NDTMS	National Drug Treatment Monitoring System
NGO	Non-governmental organisation
NICE	National Institute for Health and Care Excellence
NHS	National Health Service
NOMS	National Offender Management Service
NSP	Needle and syringe programme
ONS	Office for National Statistics
PCR	Polymerase chain reaction
PEDW	Patient Episode Database for Wales
PHE	Public Health England
PHiPs	Public Health in Prisons
PHPQI	Prison health performance and quality indicators
PWID	People who inject drugs
RCGP	Royal College of General Practitioners
RNA	Ribonucleic acid
SMV	Simeprevir
STI	Sexually transmitted infections
SVR	Sustained viral response

UAM	Unlinked Anonymous Monitoring survey
UK	United Kingdom
VCT	Voluntary confidential test/testing

References

1. Harris RJ, Ramsay M, Hope VD, Brant L, Hickman M, Foster GR, et al. 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.

2. Department of Health,Social Services and Public Safety. Action Plan for the Prevention, Management and Control of Hepatitis C in Northern Ireland. 2007.

3. Bird SM, Goldberg DJ, Hutchinson SJ. Projecting severe sequelae of injection-related hepatitis C virus epidemic in the UK. Part 2: Preliminary UK estimates of prevalent injection-related hepatitis C carriers, and derivation of progression rates to liver cirrhosis by gender and age at hepatitis C virus infection. Journal of Epidemiology & Biostatistics. 2001;6(3):267-77.

4. National Public Health Service for Wales. Blood Borne Viral Hepatitis Action for Wales Research Programme - Developing the evidence base Findings, Implications and Recommendations. 2006. Available from: www2.nphs.wales.nhs.uk:8080/BloodBorneVirusesDocs.nsf/7c21215d6d0c613e80256f490030c05a/32b63c4a5328f1c580257355004b0306/$FILE/Final%20research%20summary-full%20report.pdf [Accessed 09/07/2015].

5. Public Health England. People who Inject drugs: HIV and viral hepatitis monitoring. 2015. Available from: www.gov.uk/government/publications/people-who-inject-drugs-hiv-and-viral-hepatitis-monitoring [Accessed 10/07/2015].

6. Palmateer NE, Hutchinson SJ, McLeod A, Codere G, Goldberg DJ. Comparison of deaths related to Hepatitis C and AIDS in Scotland. Journal of Viral Hepatitis. 2007;14(12):870-4.

7. Mann AG, Ramsay ME, Brant LJ, Balogun MA, Costella A, Harris HE. Diagnoses of, and deaths from, severe liver disease due to hepatitis C in England between 2000 and 2005 estimated using multiple data sources. Epidemiology and Infection. 2013;137(4):513-8.

8. Martin NK, Vickerman P, Foster GR, Hutchinson SJ, Goldberg DJ, Hickman M. Can antiviral therapy for hepatitis C reduce the prevalence of HCV among injecting drug user populations? A modeling analysis of its prevention utility. Journal of Hepatology. 2011;54(6):1137-44.

9. Hagan H, Pouget E, Jarlais DC. A systematic Review and Meta-Analysis of Interventions to Prevent Hepatitis C Virus Infection In People Who Inject Drugs. Journal of Infectious Diseases. 2011;204:74-83.

10. Turner K, Hutchinson S, Vickerman P, Hope V, Craine N, Palmateer N, et al. The impact of needle and syringe provision and opiate substitution therapy on the incidence of Hepatitis C virus in injecting drug users: pooling of UK evidence. Addiction. 2011;106(11):1978-88.

11. Allen EJ, Palmateer NE, Hutchinson SJ, Cameron S, Goldberg DJ, Taylor A. Association between harm reduction intervention uptake and recent hepatitis C infection among people who

inject drugs attending sites that provide sterile injecting equipment in Scotland. International Journal of Drug Policy. 2012;23(5):346-52.

12. Martin NK, Vickerman P, Grebely J, Hellard M, Hutchinson SJ, Lima VD, et al. HCV treatment for prevention among people who inject drugs: Modeling treatment scale-up in the age of direct-acting antivirals. Hepatology. 2013;58(5):1598-609.

13. ISD Scotland. NHS National Services Scotland, Injecting Equipment Provision in Scotland Survey 2013/14. 2015. Available from: http://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2015-06-23/2015-06-23-IEP-Report.pdf [Accessed 22/07/2015].

14. Humphrey C, Professor Lombard M, Dr Newton A, Dr O'Moore E, Railton C. An audit of Hepatitis C services in a representative sample of English prisons. 2013. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/337401/An_audit_of_hepatitis_C_services_in_a_representative_sample_of_English_prisons_2013.pdf [Accessed 22/07/2015].

15. Perrett SE, Erricker M, Lyons M. Evaluation of an e-learning package to improve understanding of blood-borne viruses amongst prison staff in Wales, UK. International Journal of Prisoner Health. 2014;10(1).

16. National Institute for Health and Clinical Excellence (NICE). Hepatitis B and C: ways to promote and offer testing to people at increased risk of infection. Public health guidance 43. 2013. Available from: http://guidance.nice.org.uk/PH43 [Accessed 09/07/2015].

17. Public Health England. Blood-borne Virus Opt-Out Testing in Prisons: Preliminary Evaluation of Pathfinder Programme Phase 1, April to September 2014. BBV Opt-Out Task and Finish Group, London: 2015. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/428942/BBV_pathfinder_evaluation_Phase_1_FINAL.PDF [Accessed 22/07/2015].

18. National Institute for Health and Clinical Excellence (NICE). TA75 Interferon alfa (pegylated and non-pegylated) and ribavirin for the treatment of chronic hepatitis C. 2004. Available from: www.nice.org.uk/nicemedia/pdf/TA075guidance.pdf [Accessed 09/07/2015].

19. National Institute for Health and Clinical Excellence (NICE). Peginterferon alfa and ribavirin for the treatment of mild chronic hepatitis C. London. 2006. Available from: www.nice.org.uk/guidance/ta106 [Accessed 16/07/2015].

20. National Institute for Health and Clinical Excellence (NICE). TA200 Peginterferon alfa and ribavirin for the treatment of chronic hepatitis C. Part review of NICE technology appraisal guidance 75 and 106. 2010. Available from: www.nice.org.uk/guidance/ta200 [Accessed 16/07/2015].

21. NHS England, Interim Clinical Commissioning Policy Statement: Sofosbuvir + Daclatasvir/Ledipasvir +/- Ribivirin for defined patients with Hepatitis C. 2014. Available from: www.england.nhs.uk/wp-content/uploads/2014/04/sofosbuvir-pol-stat.pdf [Accessed 09/07/2015].

22. NHS Scotland. Scottish Medicines Consortium. 2014. Available from: http://www.scottishmedicines.org.uk/General/Homepage_Search_Results?p=0&r=20&q=hepatitis+c [Accessed: 09/07/2015].

23. National Institute for Health and Clinical Excellence (NICE). Telaprevir for the treatment of genotype 1 chronic hepatitis C. 2012. Available from: http://guidance.nice.org.uk/TA252 [Accessed 10/07/2015].

24. National Institute for Health and Clinical Excellence (NICE). Boceprevir for the treatment of genotype 1 chronic hepatitis C. 2012. Available from: http://guidance.nice.org.uk/TA253 [Accessed 10/07/2015].

25. National Institute of Clinical Excellence (NICE). Peginterferon alfa and ribavirin for treating chronic hepatitis C in children and young people. NICE technology appraisal guidance TA300. 2013. Available from: http://www.nice.org.uk/guidance/ta300 [Accessed 22/07/2015].

26. National Institute of Clinical Excellence (NICE). Simeprevir in combination with peginterferon alfa and ribavirin for treating genotypes 1 and 4 chronic hepatitis C. NICE technology appraisal guidance TA331. 2015. Available from: http://www.nice.org.uk/guidance/ta331 [Accessed 22/07/2015].

27. National Institute of Clinical Excellence (NICE). Sofosbuvir for treating chronic hepatitis C. NICE technology appraisal guidance TA330. 2015. Available from: www.nice.org.uk/guidance/ta330 [Accessed 22/07/2015].

28. NHS England, Treatment of chronic hepatitis C in patients with cirrhosis Interim Clinical Commissioning Policy Statement. NHS England Clinical Reference Group for Infectious Diseases. 2015. Available from: www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2015/06/hep-c-cirrhosis-polcy-statmnt-0615.pdf [Accessed 22/07/2015].

29. Hepatitis Scotland. Hepatitis C Scotland National Guidelines and documentation relevant to the management of Hepatitis C. Available from: www.hepatitisscotlandc.org.uk/health-professionals/national-guidelines.aspx [Accessed 22/07/2015].

30. Lattimore. S, Ivring. W, Collins. S, Penman C, Ramsay. M. and on the behalf of the Collaboration for the Sentinel Surveillance of Blood-Borne Virus Testing. Using Surveillance Data to Determine Treatment Rates and Outcomes for Patients with Chronic Hepatitis C Virus Infection. Hepatology. 2014;59(4):1343-50.

31. Harris RJ, Thomas B, Griffiths J, Costella A, Chapman R, M R. Increased uptake and new therapies are needed to advert rising hepatitis C- related end stage liver disease in England: modelling the predicated impact of treatment under different scenarios. Journal of Hepatology. 2014;61(3):530-7.

32. Innes H, Goldberg D, Dillon J, Hutchinson SJ. Strategies for the treatment of Hepatitis C in an era of Interferon-free therapies: what public health outcomes do we value most? Gut. 2014;doi:10.1136/gutjnl-2014-308166 1-10.

33. Health Protection Agency. Hepatitis C in the UK 2011. 2011. Available from: www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1309969906418 [Accessed 16/07/2015].

34. Health Protection Scotland, NHS National Services Scotland. Surveillance of known hepatitis C antibody positive cases in Scotland: Results to 31 December 2013. Health Protection Scotland Weekly report 2014. 2014. Available from: www.hps.scot.nhs.uk/documents/ewr/pdf2014/1418.pdf [Accessed 10/07/2015].

35. Welsh Government. Together for Health – Liver Disease Delivery Plan A Delivery Plan for NHS Wales and its Partners to 2020. 2015. Available from: http://gov.wales/docs/dhss/publications/150505liveren.pdf [Accessed 22/07/2015]

36. Hutchinson SJ, Roy KM, Wadd S, Bird SM, Taylor A, Anderson E, et al. Hepatitis C Virus Infection in Scotland: Epidemiological Review and Public Health Challenges. Scottish Medical Journal. 2006;51(2):8-15.

37. Public Health England. Hepatitis C in the UK 2014 report. London: 2015. Available from: www.gov.uk/government/publications/hepatitis-c-in-the-uk [Accessed 22/07/2015].

38. Judd A, Parry J, Hickman M, McDonald T, Jordan L, Lewis K, et al. Evaluation of a modified commercial assay in detecting antibody to hepatitis C virus in oral fluids and dried blood spots. Journal of Medical Virology. 2003;71(1):49-55.

39. Public Health Wales. Enhanced surveillance of blood borne virus infection in drug users in Wales 2013. 2014. Available at: www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=62269 [Accessed: 14/07/2015].

40. NHS Blood and Transplant (NHSBT). Liver Transplantation: Selection Criteria and Recipient Registration (June 2015). 2015. Available at: www.odt.nhs.uk/transplantation/guidance-policies/ [Accessed 22/07/2015].

41. National Treatment Agency for Substance Misuse. Injecting drug use in England: a declining trend. 2010. Available from: www.nta.nhs.uk/uploads/injectingreportnov2010finala.pdf [Accessed 10/07/2015].

42. Public Health England (PHE). Adult Drug Statistics from the National Drug Treatment Monitoring System (NDTMS) 1 April 2013 to 31 March 2014. 2014. Available from: www.nta.nhs.uk/uploads/adult-drug-statistics-from-the-national-drug-treatment-monitoring-system-2013-14.pdf [Accessed: 22/07/2015].

43. Overstall AM, King R, Bird SM, Hutchinson SJ, Hay G. Incomplete contingency tables with censored cells with application to estimating the number of people who inject drugs in Scotland. Statistics in medicine. 2014;33(9):1564-79.

44. NHS National Services Scotland, Information Services Division. Needle Exchange Provision in Scotland: A Report of the National Needle Exchange Survey. Provision of injecting equipment in Scotland, 2007/08. Edinburgh: ISD Scotland: 2009. Available from: www.drugmisuse.isdscotland.org/publications/local/injecting_provision.pdf [Accessed 22/07/2015].

45. Griesbach D, Abdulrahim D, Gordon D, Dowell K. Needle Exchange Provision in Scotland: A Report of the National Needle Exchange Survey. Scottish Executive Social Research Substance Misuse Research Programme. Edinburgh: 2006. Available from: www.scotland.gov.uk/Resource/Doc/130349/0031220.pdf [Accessed 10/07/2015].

46. ISD Scotland, NHS National Services Scotland. Injecting equipment provision in Scotland, Survey 2008/09. Edinburgh: ISD Scotland: 2010. Available from: www.drugmisuse.isdscotland.org/publications/local/injecting_provision2010.pdf [Accessed 22/07/2015].

47. Information Services Scotland, NHS National Services Scotland. Injecting equipment provision in Scotland, Survey 2009/10. 2012. Available from: www.drugmisuse.isdscotland.org/publications/local/injecting_provision2011.pdf [Accessed 22/07/2015].

48. Page-Shafer K, Pappalardo BL, Tobler LH, Phelps BH, Edlin BR, Moss AR, et al. Testing strategy to identify cases of acute hepatitis C virus (HCV) infection and to project HCV incidence rates. Journal of Clincial Microbiology. 2012;46:499-506.

49. Health Protection Agency (HPA). Hepatitis C in the UK 2008. London: 2008. Available from: http://webarchive.nationalarchives.gov.uk/20140722091854/http://www.hpa.org.uk/Publications/InfectiousDiseases/BloodBorneInfections/HepatitisCInTheUK/ [Accessed 15/07/2015].

50. Health Protection Agency, Department of Health, Chartered Institute of Environmental Health. Health Protection Legislation (England) - Guidance 2010. 2010. Available from: www.gov.uk/government/organisations/public-health-england/about/our-governance [Accessed 22/07/2015].

51. Health Protection Legislation (Wales) Guidance 2010. 2014. Available http://wales.gov.uk/topics/health/protection/communicabledisease/legislation/?lang=en [Accessed 09/07/2015].

52. Royal College of General Practitioners (RCGP) RCGP Certificate in the Detection, Diagnosis and Managment of Hepatitis B and C in Primary Care. 2012. Available from: www.rcgp.org.uk/professional-development/substance-misuse-and-associated-health-landing-page/rcgp-certificate-in-the-detection-hepatitis-b-and-c.aspx [Accessed 16/07/2015].

53. McLeod.A., Weir A, Aitken C, Gunson R, Templeton k, Molyneaux P, et al. Rise in testing and diagnosis associated with Scotland's Action Plan on Hepatitis C and Introduction of Dried blood spot testing. Journal of Epidemiology and Community Health. 2014;68(12):1182-8.

54. Stewart D. The Problems and needs of newly sentenced prisoner: results from a national survey. 2008. Available from: http://webarchive.nationalarchives.gov.uk/20100505212400/http://www.justice.gov.uk/publications/docs/research-problems-needs-prisoners.pdf [Accessed 10/07/2015].

55. Ministry of Justice. Gender differences in substance misuse and mental health issuess among prisoners, 2013. Results from the Surveying Prisoner Crime Reduction (SPCR)

longitudinal cohort study of prisoners. 2013. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/220060/gender-substance-misuse-mental-health-prisoners.pdf [Accessed 22/07/2015].

56. NHS England. National Partnership Agreement between: The National Offender Management Service, NHS England and Public Health England for the Co-Commissioning and Delivery of Healthcare Services in Prisons in England 2015-2016. 2014. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/422620/national_partnership_agreement_commissioning-delivery-healthcare-prisons2015.pdf [Accessed 22/07/2015].

57. O'Leary MC, Sarwar M, Hutchinson SJ, Weir A, Schofield J, McLeod A, et al. The prevalence of hepatitis C virus among people of South Asian origin in Glasgow - results from a community based survey and laboratory surveillance. Travel medicine and infectious disease. 2013;11(5):301-9.

58. ONOMAP. 2012. Available from [accessed 10/07/2015]: www.onomap.org.

59. McDonald SA, Hutchinson SJ, Innes HA, Allen S, Bramley P, Bhattacharyya D, et al. Attendance at specialist hepatitis clinics and initiation of antiviral treatment among persons chronically infected with hepatitis C: examining the early impact of Scotland's Hepatitis C Action Plan. Journal of Viral Hepatitis. 2014;21(5):366-76.

60. Sweeting MJ, De Angelis D, Brant L, Harris HE, Mann AG, Ramsay ME. The burden of hepatitis C in England. Journal of Viral Hepatitis. 2007;14(8):570-6.

61. Foster GR, McLauchlan J, Irving W, Cheung M, Hudson B, Verma S, et al. and HCV Research UK EAP Group. Treatment of decompensated HCV cirrhosis in patients with diverse genotypes: 12 weeks sofosbuvir and NS5A inhibitors with/ without ribavirin is effective in HCV genotypes 1 and 3. 2015.

62. McDonald SA, Innes HA, Hayes PC, Dillon JF, Mills PJ, Goldberg DJ, et al. What is the impact of a country-wide scale-up in antiviral therapy on the characteristics and sustained viral response rates of patients treated for hepatitis C? Journal of Hepatology. 2015;62(2):262-8.

63. Innes HA, Mcdonald SA, Dillon JF, Allen S, Hayes PC, Goldberg D, et al. Toward a more complete understanding of the association between a hepatitis C sustained viral response and cause-specific outcomes. Hepatology. 2015;Feb 26. doi: 10.1002/hep.27766.

64. Food and Drug Administraion (FDA). FDA approves new treatment for hepatitis C virus. 2013. Available from: www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm376449.htm [Accessed 22/07/2015]

65. European Medicines Agency. Olysio. 2014. Available from: www.ema.europa.eu/ema/index.jsp?curl=pages/medicines/human/medicines/002777/smops/Positive/human_smop_000664.jsp&mid=WC0b01ac058001d127 [Accessed 22/07/2015]

66. Jacobson IM, Dore GJ, Foster GR, Fried MW, Radu M, Rafalsky VV, et al. Simeprevir with pegylated interferon alfa 2a plus ribavirin in treatment-naive patients with chronic hepatitis

C virus genotype 1 infection (QUEST-1): a phase 3, randomised, double-blind, placebo-controlled trial. Lancet. 2014;384(9941):403-13.

67. Manns M, Marcellin P, Poordad F, de Araujo ES, Buti M, Horsmans Y, et al. Simeprevir with pegylated interferon alfa 2a or 2b plus ribavirin in treatment-naive patients with chronic hepatitis C virus genotype 1 infection (QUEST-2): a randomised, double-blind, placebo-controlled phase 3 trial. Lancet. 2014;384(9941):414-26.

68. Sarrazin C, Lathouwers E, Peeters M, Daems B, Buelens A, Witek J, et al. Prevalence of the hepatitis C virus NS3 polymorphism Q80K in genotype 1 patients in the European region. Antiviral Research. 2015;116:10-6.

69. Local Government Association. Public Health England, Hepatitis frequently asked questions: Briefing for councillors. 2014. Available from: www.local.gov.uk/c/document_library/get_file?uuid=f0e5b7b9-c32e-4c8e-a005-b5c4e87b0126&groupId=10180 [Accessed 22/07/2015].

70. Public Health Wales. Enhanced surveillance of blood borne virus infection in drug users in Wales. 2012. Available from: www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=62269 [Accessed 10/07/2015].