



Public Health
England

Protecting and improving the nation's health

Shooting Up: Infections among people who inject drugs in the UK, 2018

An update, December 2019



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List of abbreviations

ART	Antiretroviral therapy
BBV	Blood borne virus
CI	Confidence interval
DAA	Direct acting antivirals
DVT	Deep vein thrombosis
GAS	Group A streptococci
GHSS	Global Health Sector Strategy
HIV	Human immunodeficiency virus
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HDSS	High dead space syringe
HRD	Harm Reduction Database
iGAS	Invasive group A streptococci
LDSS	Low dead space syringe
MRSA	Meticillin-resistant <i>Staphylococcus aureus</i>
MSM	Men who have sex with men
MSSA	Meticillin-sensitive <i>Staphylococcus aureus</i>
NESI	Needle Exchange Surveillance Initiative
NDTMS	National Drug Treatment Monitoring System
NSP	Needle and Syringe Programme
OST	Opioid substitution treatment
PHE	Public Health England
PWID	People who inject drugs
RNA	Ribonucleic acid
UAM	Unlinked Anonymous Monitoring Survey
WGS	Whole Genome Sequencing
WHO	World Health Organisation

Summary

Preventable bacterial infections are increasing

Over half of people who inject drugs (PWID) report having a recent symptom of a bacterial infection. Severe bacterial infections in PWID have been increasing since 2013/14. The cause of the rise is not clear and there are likely to be several factors involved, including an ageing population of PWID with poorer vein and skin health, changes in injection practices with a rise in groin injection in recent years, and a large proportion of PWID reporting homelessness, and likely conditions of poorer general hygiene and unsterile injecting.

There is early evidence for a reduction in chronic hepatitis C prevalence, however rates of new infection are unchanged

Hepatitis C (HCV) continues to be a major problem among PWID in the UK, with around 1 in every 4 currently infected with HCV. There is early evidence for a modest reduction in chronic hepatitis C prevalence concomitant with the scale-up of direct acting antiviral (DAA) treatment among PWID. Early evidence for an increase in testing and uptake of treatment among PWID in line with HCV elimination activities can also be observed in 2018. However, the decrease in prevalence is modest and the high proportion of individuals who report they have not been tested recently indicates that there is scope for improvement. There is no indication of a reduction in the number of new HCV infections over recent years, including amongst individuals who have recently started injecting. Together with continued scale-up of interventions to improve testing and treatment for HCV, ongoing efforts to improve harm reduction such as opioid substitution therapy (OST) and needle and syringe programmes (NSP) will be essential to reach the WHO goals and eliminate HCV by 2030.

HIV levels remain low, but risks continue

In the UK, around 1 in 100 PWID are living with HIV. Although the prevalence of HIV remains low, outbreaks of HIV among people who inject drugs continue to occur, notably the ongoing incident in Glasgow. Most PWID living with HIV have been diagnosed and are accessing HIV care. However, HIV is often diagnosed at a late stage among PWID. It is crucial that HIV testing is offered regularly, and that care pathways for HIV are maintained and adapt to changing patterns of risk.

Hepatitis B vaccine uptake needs to be sustained, particularly in younger age groups

In the UK, around 1 in every 200 PWID is living with hepatitis B infection. About three-quarters of PWID report being vaccinated against hepatitis B, but uptake of this preventative intervention has not improved in recent years and is particularly low among younger age groups and in those who have recently begun injecting. It is essential that high vaccination levels are maintained, and the shortfall in younger age groups addressed.

Continued sharing and re-use of injecting equipment remains a concern

Sharing levels reported in England, Wales and Northern Ireland have not improved in recent years and only around 3 in 5 PWID reported adequate needle/syringe provision for their needs. Re-use of an individual's own injecting equipment is commonly reported in the UK and can also put individuals at risk of infection.

Changes in psychoactive drug preferences could lead to riskier injecting practices

The changing patterns of psychoactive drug use remain a concern because changes in psychoactive drug preferences can lead to riskier injecting practices such as increased frequency of injecting, sharing equipment, or groin injecting. Injection of crack cocaine has increased in England and Wales, and injection of powder cocaine has increased in Scotland.

Provision of effective interventions need to be maintained and optimised

The provision of effective harm reduction interventions to reduce risk and prevent and treat infections needs to be maintained and optimised. These interventions include NSP, OST and other treatments for drug misuse and dependence. Vaccinations and diagnostic tests for infections need to be routinely and regularly offered to people who inject or have previously injected drugs. Care pathways and treatments should be optimised for those testing positive for blood borne viruses.

Introduction

Drug use in the United Kingdom (UK) is among the highest reported in Western Europe (1). In 2018-19, around 3.2 million (9.4%) 16-59 year olds in England and Wales reported using a drug in the last year (2). Current proportions are substantially lower than in the 1990s, but have changed very little in the last 10 years. The Scottish Crime and Justice Survey (2017-18) estimated 7.4% of 16-59 year olds reported using a drug in the past 12 months, an increase from 6.0% in 2014-15 but unchanged since 2008-09 (3). The estimated number of people who use opiate and/or crack cocaine aged 15-64 in England in 2016/17 was 313,971 (95% confidence interval (CI): 309,242-327,196). Within this group, there are an estimated 261,294 people (95% CI: 259,018- 271,403) who use opiates and an estimated 180,748 people (95% CI: 176,583-188,066) who use crack cocaine. The number of people who inject drugs (PWID) in England was last estimated in 2011 at 103,185 (95% CI: 100,085-107,544) (4). Work is ongoing to provide an up-to-date estimate of the number of PWID, with results expected in late 2020.

There were 192,603 individuals in treatment for drug use in England in 2017-18; 141,189 for opiate use and 51,414 for non-opiate use. Of those who newly presented to treatment for opiate use, 26% were currently injecting and 34% had previously injected drugs. Of those newly presenting to treatment for non-opiate use, 2% were currently injecting and 7% had previously injected drugs (5). Drug services across the UK are treating an ageing cohort of PWID (6-9). There are additional challenges associated with the complex and varied needs of older PWID, and additional risk factors, including for infections, that are compounded by a long history of drug use and/or injection.

PWID are vulnerable to a wide range of blood borne viral (BBV) and bacterial infections, which can result in high levels of morbidity and mortality. HIV, hepatitis B (HBV) virus and hepatitis C virus (HCV) are effectively transmitted through the sharing of injecting equipment, such as needles and syringes. Unsterile injection practices are also associated with bacterial infections such as *Staphylococcus aureus* and Group A streptococci (GAS), which are often worsened by poor wound care and delays in seeking healthcare. PWID are at risk of rare but life-threatening infections with spore-forming bacteria such as tetanus, botulism and anthrax which can be associated with contaminated drugs. Public health surveillance of infectious diseases, and the associated risk and protective behaviours among PWID, provides important information to understand the extent of these infections, the risk factors for their acquisition and for monitoring the effectiveness of prevention measures.

The UK has committed to the World Health Assembly's Global Health Sector Strategy on Viral Hepatitis which aims to eliminate viral hepatitis as a major public health threat by 2030 and introduces the first ever global targets for viral hepatitis (10). In order to

achieve these targets, it is essential for us to monitor hepatitis B and C, and risk and protective behaviours among PWID.

The epidemiology of infections among PWID is influenced by evolving injection practices, commissioning and provision of drug services and the availability of new treatments. This annual national report describes trends in the extent of infections and associated risks and behaviours among PWID in the UK, using data to the end of 2018¹. In addition, more recent data has been included for outbreaks and incidents occurring during 2019. Further details can be found in the set of data tables that accompany this report: www.gov.uk/government/publications/shooting-up-infections-among-people-who-inject-drugs-in-the-uk

This report focuses on infections among people who inject psychoactive drugs. Information on infections among people who inject image and performance enhancing drugs, such as anabolic steroids, peptides and melanotan, can be found in the 2016 Shooting Up report, available at: www.gov.uk/government/publications/shooting-up-infections-among-people-who-inject-drugs-in-the-uk with more recent behavioural data published through the IPED INFO survey, available at: www.ipedinfo.co.uk

¹ Where data have been previously published, only the proportions are usually given in this report. The numerators and denominators for these proportions can be found in the source publications.

Data sources

The data for this report is extracted from various national surveillance systems:

The annual **Unlinked Anonymous Monitoring (UAM) Survey** of PWID monitors HIV, hepatitis B and hepatitis C, and associated risk and protective behaviours in PWID in contact with specialist services in England, Wales and Northern Ireland. Those who agree to participate provide a dried blood spot sample which is tested for HIV and hepatitis B and C, and self-complete a behavioural questionnaire.

The **Needle Exchange Surveillance Initiative (NESI)** monitors the prevalence of blood-borne viruses (BBV) and injecting risk behaviours among PWID in Scotland. Participants are mainly recruited from selected needle and syringe programmes and pharmacies that provide injecting equipment. Participants complete a short interviewer-administered questionnaire and provide a voluntary dried blood spot sample for anonymous hepatitis C and HIV testing.

The **Harm Reduction Database Wales (HRD)**: A BBV module was implemented in 2017 in all substance misuse services, as well as selected enhanced service Community Pharmacy providers across Wales to support ongoing surveillance of BBV infections and treatment amongst individuals accessing these services. The HRD collects information on demographics; risk behaviours; vaccination history; BBV screening, results, onward referral to treatment, and treatment milestones and outcomes. Client details are collected so repeated records can be identified.

Information collection from **routine laboratory reports** is made possible through laboratory-confirmed infections in England, Wales and Northern Ireland, which are statutorily notified and routinely reported to PHE and held on a central system known as **Second Generation Surveillance System (SGSS)**, which covers nearly all microbiologically-confirmed infections. Data on infections caused by hepatitis B and C were extracted from this reporting system. These reports contain demographic and risk information, although risk factor information is not always provided. For acute hepatitis B, laboratory surveillance data for England is combined with risk factor data collected by Health Protection Teams.

Sentinel Surveillance of BBV Testing collates testing data from sentinel laboratories in England and includes data on both positive and negative test results for hepatitis C. For this report, trends in testing were analysed using data from 14 of the 19 sentinel laboratories where complete and consistent data have been available from January 2014 to December 2018. The place of collection is reported for each test; here we report the results from tests performed in drug services and prisons.

The **National Drug Treatment Monitoring System (NDTMS)** collects patient-level information about the people using drug and alcohol treatment services across England. All services that provide structured treatment for drug and/or alcohol users are asked to submit data to NDTMS.

Voluntary confidential reports of new HIV diagnoses and people receiving HIV-related care are received from laboratories and clinicians in England, Wales, and Northern Ireland by Public Health England (PHE). Scottish data are collected separately and incorporated with data from England, Wales and Northern Ireland to create a UK dataset.

Information on bacterial pathogens is available through **surveillance of clinical and laboratory reports** which include risk factor data on injecting drug use. Reporting of methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA) bacteraemias has been mandatory for NHS Trusts since 2005 and 2011, respectively. Data on MRSA and MSSA infections in PWID are also available through referral of isolates for reference microbiology. Isolate referrals are also one of the primary sources of data on group A streptococcal (GAS) infections. For tetanus, wound botulism and anthrax among PWID, enhanced surveillance involves the follow up of laboratory or clinical reports with a surveillance questionnaire.

During **investigations of infectious disease outbreaks**, additional data is often collected to understand the cause and extent of the outbreak. This is done by collecting details from affected individuals using questionnaires and additional laboratory investigations, such as molecular typing or whole genome sequencing (WGS), which can help to determine whether cases in an outbreak are linked to each other.

Preventable bacterial infections are increasing

Bacterial infections including *Staphylococcus aureus* and Group A streptococci (GAS) in PWID are often related to circumstances that lead to poor general hygiene and unsterile injection practices. Morbidity can be severe for bacterial infections in PWID, with outcomes worsened by delays in seeking healthcare to treat wounds and other symptoms (11). Mortality can occur from invasive infections resulting in sepsis, bacteraemia or necrotizing fasciitis. Bacterial infections can have a substantial impact on health services (12), with studies indicating that about 1 in 10 PWID are admitted to hospital each year because of a bacterial infection (11).

Symptoms of an injecting site infection

During 2018, more than half (54%) of those injecting psychoactive drugs in England, Wales and Northern Ireland reported having a sore, open wound or abscess at an injection site (all possible symptoms of a bacterial infection) during the past year (Accompanying Data, Table 2). In Scotland among those surveyed during 2017-18 at needle and syringe programmes, 27% reported having an abscess or open wound at an injection site during the past year (Accompanying Data, Table 2). In Wales clusters of severe injecting site infections have been observed in recent years (Box 1). The Harm Reduction Database Wales will collect information on bacterial infections from 2020.

Box 1: Investigation of severe infections amongst PWID in Wales requiring radical surgical intervention and/or intensive care

A cluster of severe infections among PWID was identified in Wales during an 18-month period November 2017 to April 2019. A total of 35 cases were confirmed and followed up by Public Health Wales using the case definition “A patient known to be a person who injects drugs (PWID) with evidence of infection – by isolation of bacteria or fungi isolated from a normally sterile site or abscess, or imaging / similar evidence of infection - necessitating surgical intervention or admission to an intensive care unit or high dependency unit within this period.”

Over half of cases underwent surgical interventions including 4 cases of full hip disarticulation (surgical removal of the entire leg at the hip level) and 2 further amputations. For enhanced surveillance and follow-up, of the 35 confirmed cases (median age 38 years, range 23 to 57 years); 18 were lost to follow up, 2 were deceased, and the remaining 15 cases undertook detailed interviews regarding their injecting drug use practices, recent changes in drug use and other risk factors, alongside the clinical data.

All cases reported groin injecting. Whilst the majority had been injecting for over 5 years, 2 cases were new initiates to drug injection. Six cases reported recent changes in drugs source and that this resulted in an increased use of acidifier. Five of the 9 reviewed cases and 10 of the interviewed cases were either admitted to hospital or presented to emergency departments for injecting related infections (including deep vein thrombosis (DVT), abscesses and aneurysm) in the 6 months prior to the event.

Recommendations include the establishment of routine monitoring systems for severe infections which incorporate risk factor data including injecting drug use; the establishment of multidisciplinary case review panels for individuals with complex needs; and the provision of community or district nurse care in substance misuse services, alongside the roll-out of a self-care wound packs programme.

Risks associated with injecting site infections

Bacteria can be transmitted through close contact with skin, aerosols or respiratory droplets from infected people, or from contaminated clothes, bedding and towels, and can be carried on body sites including the skin or in the nose without carriers experiencing symptoms. Studies looking at carriage of meticillin-resistant *Staphylococcus aureus* (MRSA) bacteria among PWID have found levels higher than the general population, increasing the risk of infection (13).

Serious bacterial infections in PWID have been increasing in the UK since 2013/14 (14). The cause of the rise is not clear and there are likely to be several factors involved. Factors that are associated with homelessness such as poor general hygiene and unsterile injection practices, may be a risk factor for injecting site infections. A large proportion of cases observed among the recent rise in group A streptococcal infections were in those who reported homelessness (Box 3). The proportion of PWID reporting homelessness within the last year has increased in England since 2016, from 36% to 47% in 2018 (15), and in Scotland was 23% in 2017-18 (6).

A combination of factors can increase the risk of bacteria entering injecting sites and causing infection. Several studies report that infections are more likely with increasing frequency of injection and with increased time since onset of injecting (16, 17). Bacterial infections are also associated with skin popping or multiple attempts to find a vein resulting in missed hits, and the consequential tissue damage at the injection site (17-20). Cleaning injection sites before injecting has been shown to reduce the risk of skin and soft tissue infections (16). Poor vein health reduces the availability of injection sites in the arms and legs and increases the likelihood of missed hits which can result in infections. The role of acidifiers in vein damage is discussed further in Box 2.

Injecting into the groin and other higher risk sites can combine risks from higher bacterial carriage at these parts of the body with poorly or non-healing injection sites increasing the risk of infection (21). Injection into the groin is also associated with deep

vein thrombosis, and in addition to damage to the femoral vein, the femoral artery and nerve may sustain damage due to their close proximity, causing further problems (22, 23). More than a third (37%) of PWID in England, Wales and Northern Ireland reported injecting into their groin in 2018 and in Scotland 45% reported mainly injecting into this site in 2017-18. The proportion of PWID reporting groin injecting has been rising over the last decade (15); this increase is thought to be due, in part, to the ageing cohort of PWID in the UK (24). Injecting over a long period of time can result in vascular damage in the arms, making injection at this site difficult. Consequently, PWID inject into alternate sites such as peripheral veins in the hands, legs and feet, until eventually resorting to use of central veins (25).

Box 2: Considering the role of acid use in drug preparation practice in increasing the risk of Skin and Soft Tissue Infection: The Care & Prevent study, 2017-2019

Care and Prevent is a National Institute for Health Research (NIHR) funded study exploring skin and soft tissue infection (SSTI) risk, care and prevention among 455 people who inject drugs (PWID) in London (26). Data were collected between October 2017 and March 2019 using a survey (n=455) and by qualitative interviews (n=32). Participants reported on life history, drug use trajectory, experiences of health harms, medical care, and injecting practices. The researchers' prior work (27, 28) led to a hypothesised link between venous damage, SSTI risk and overuse of acidifier in injection preparation. Detailed questions about acidifier use were included in the survey and qualitative interviews. Findings summarised here are published in more detail (29).

Acid is necessary to prepare brown heroin (used in Europe) and crack cocaine for injection. The addition of acid promotes conversion of these drugs into a soluble, injectable form with the amount required dependant on drug purity and type of acid used. In the UK, acid for injection preparation is available from NSPs in 100mg citric or 300mg ascorbic acid sachets. Laboratory experiments show that less than half this amount (27mg citric or 67mg ascorbic acid) is required to dissolve the diamorphine content in a typical £10 bag of street heroin (28).

Care and Prevent survey participants report a high prevalence of lifetime SSTI (65%, n=296/455) and associated hospitalisation (46%, n=137/296). Citric acid was the most commonly used acidifier during drug preparation (84%, n=237). Of the 418 participants who provided an estimate, 36% (n=150) reported using more than half a sachet to prepare a £10 bag of heroin, of these 85% (n=127) used a whole sachet or more. In qualitative interviews, participants reported painful injections and peripheral venous loss, attributing both to the use of acidifier – particularly citric acid. For some, this led to the use of deeper veins for injection, including the femoral vein. Statistically significant associations were found between excessive acidifier use (> ½ sachet), femoral injecting and deep vein thrombosis (DVT).

Understanding the causes of venous damage is fundamental to harm reduction initiatives for PWID. Damage and sclerosis of peripheral veins can lead to multiple injection attempts, increased blood in the environment and transitions to femoral (groin) and subcutaneous injecting (skin popping) (20, 27, 30). Femoral vein injecting increases risk of venous insufficiency and DVT (31, 32), which can lead to venous ulcers, tissue

necrosis, amputation, and potentially fatal pulmonary embolism. Subcutaneous injecting is associated with SSTIs such as abscesses and cellulitis.



The weight of NSP provided citric acid sachets (100mg) is determined by manufacturing constraints. It is not indicative of how much is required to prepare a single injection. The promotion of citric acid sachets as ‘single use’ can exacerbate overuse. Care and Prevent participants report a common assumption that one sachet of acid is required to prepare one bag of heroin. This is superfluous to requirements, potentially exacerbating venous damage and injecting-related health harms.

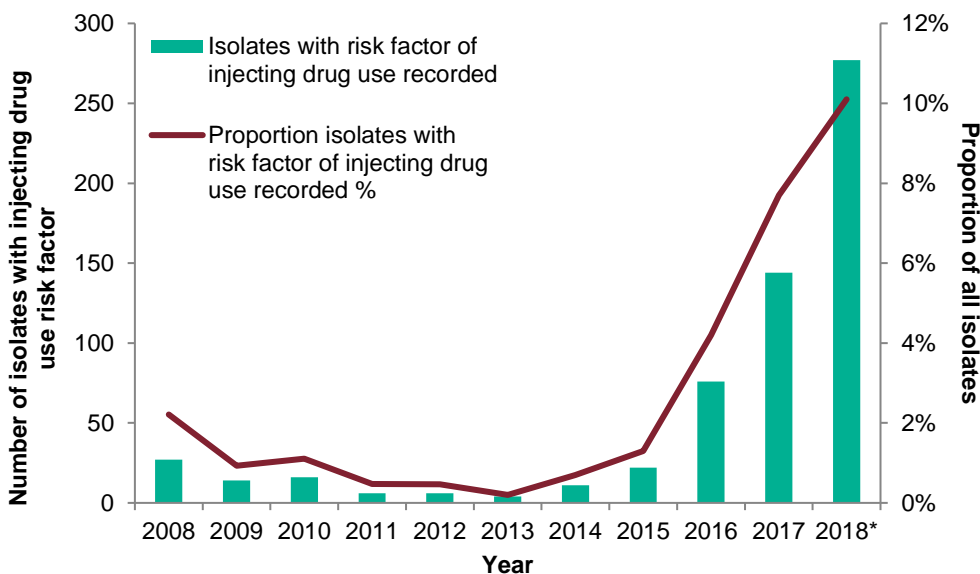
In response to the study outcomes and in collaboration with Exchange Supplies, a social enterprise working to improve the harm reduction response to drug use by developing products and information for PWID, messages were developed to be printed on citric acid and ascorbic acid sachets to inform PWID to reduce their use (above).

Group A streptococci (GAS)

Invasive Group A streptococcal infection (iGAS) has been notifiable since 2010. Samples from patients with these infections are sent to the PHE Respiratory and Vaccine Preventable Bacteria Reference Unit, where they are typed. From 2014 there has been a year on year increase in reports of iGAS in England and at the same time an increasing proportion of the reports have drug injection as a risk factor on the referral form, consistent with a disproportionate rise in these infections among PWID (Figure 1). In 2018, there were 277 isolates of iGAS for which injecting drug use was indicated; this represents 10% of all invasive isolates reported from England and Wales (Accompanying Data, Table 2). There continues to be a high number of iGAS infections in PWID in 2019 and clusters of wound infections were also increasingly reported particularly among homeless people and in people in prisons, where current or recent drug use were commonly reported risk factors (Box 3).

In Scotland, 36 iGAS reports were received through Health Protection Scotland's national iGAS enhanced surveillance system in 2018 for which a risk factor of injecting drugs was reported; this represents 11% of all cases, a proportion which has been increasing in recent years (Accompanying Data, Table 2).

Figure 1. iGAS isolates received by PHE Respiratory and Vaccine Preventable Bacteria Reference Unit with risk factor of injecting drug use recorded, 2008-2018



Data source: PHE Respiratory and Vaccine Preventable Bacteria Reference Unit

*Enhanced case finding occurred for 2018 in response to the increase in reports from prisons, PWID and homeless populations (Box 3)

Box 3: Increase in group A *Streptococcus* (GAS) and *Staphylococcus aureus* infections in prisons, people who use drugs, and those who are homeless or live in hostels, England 2018-2019

In 2018-2019, increased reports of GAS and iGAS infections were observed in England among people in prison, PWID and persons of no fixed abode, with co-infection with *S. aureus* reported in some cases. An investigation was implemented to identify factors associated with transmission and take action to control them.

National case management and laboratory surveillance systems were searched using an agreed case definition (see insert). Questionnaires were completed for cases reported from June 2019.

Isolates received at the national reference laboratory were typed using *emm* gene sequencing for GAS or multilocus sequence typing (MLST) for *S. aureus*. Whole Genome Sequencing (WGS) was performed on a subset of isolates of the 2 most common *emm* types (*emm* 108.1 and *emm* 66).

In total 1,147 cases were identified with onset between 1 January 2018 and 1 October 2019, 1,107 with GAS infection and 60 with *S. aureus* infections (20 had co-infection) (Figure 2). In total, 433 cases were associated with prisons, 81 with hostels and 295 with homelessness. Twenty-two prisons geographically distributed across England reported 2 or more cases. In total, 779 cases (68%) reported a history of injecting drug use and 34 cases (3%) did not (status unknown for 334 cases (29%)). Of those who reported a history of injecting drug use, 748 cases (96%) were currently using drugs.

Of 1,107 GAS infections, 686 were invasive, 421 non-invasive or unspecified; 392 were admitted to hospital and 10 deaths (all-cause) were reported. Of the 60 *S. aureus* infections, 4 were invasive and 56 were non-invasive or unspecified. Two were admitted to hospital and no deaths have been identified.

Three predominant *emm* types were identified amongst GAS cases; *emm* 108.1 (n=225), *emm* 66.0 (n=214), and *emm* 94.0 (n=62). *S. aureus* MLST typing information was available for 44 cases; predominant MLST types were MLST 5 (n=9), MLST 8 (n=7) and MLST 398 (n=5). WGS results from 111 GAS isolates of *emm* 108.1 that met the case definition suggest this strain represents a recent expansion of a new lineage, which is supported by evidence as measured by low SNP variation (number of times the genomic bases differ between any 2 strains when compared to a reference). All *emm* 108.1 isolates from 2018-19 were within a single 'clade', with a maximum SNP distance of 12 and an average of 3.6 observed. Twenty-one genomic clusters were identified (including 2-23 isolates per cluster) using a 0 SNP threshold. WGS results from 63 *emm* 66 isolates that met the case definition revealed clades that mirrored specific geographic regions suggesting that this *emm* type has been circulating for a longer period and has been able to establish itself locally within this population. Within these clades there were a number of clusters with a maximum distance of 0-3 SNPs indicative

Case definition

People in prison (including staff)
– and/or people who use or have a history of using drugs (injecting or not)
– and/or live in a hostel
– and/or are homeless

with invasive or skin and soft tissue GAS infection

from 1 January 2018.

For prison settings, cases of *S. aureus* (MRSA and MSSA) bacteraemia and skin and soft tissue infections were also included.

of recent transmission but there was no inter-regional relationship as seen with the emm 108.1 isolates.

Questionnaire data on injecting risk behaviour for 51 non-prison cases showed high levels of groin injecting (85%), acidifier use (77%) and reuse of filters (57%), known risk factors for developing an injection site infection as discussed in Box 2 and the main body of this chapter.

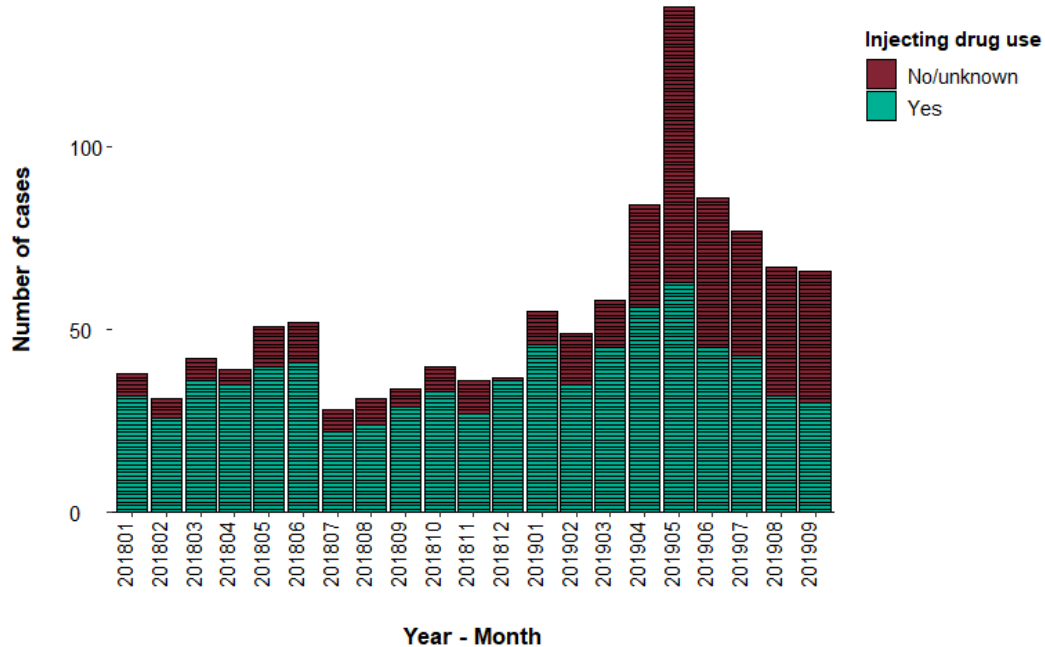


Figure 2: Cases of GAS and S. aureus infection meeting the case definition by injecting drug use status, 1 Jan 2018 – 1 Oct 2019

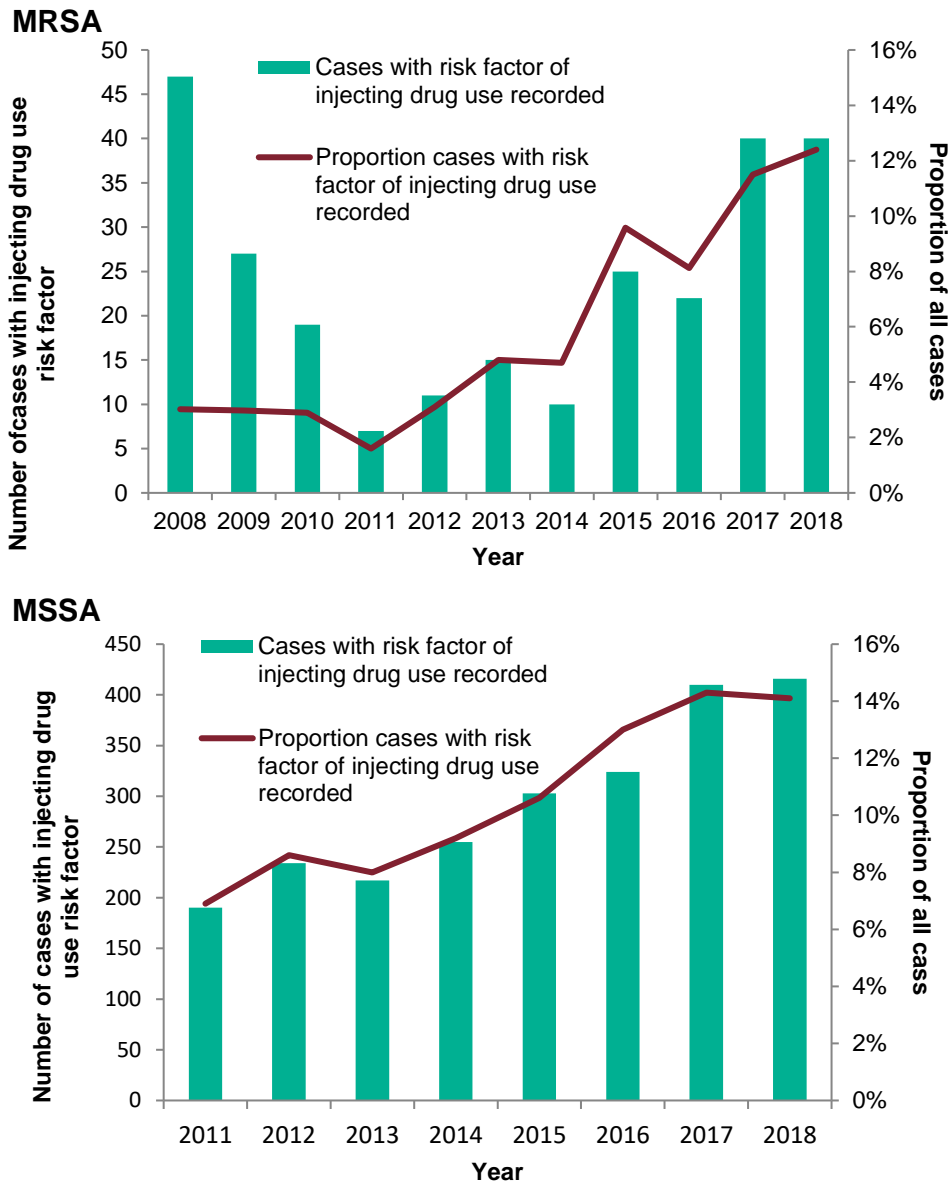
Recommendations for services that work with homeless, prison and PWID populations are: to encourage people with any skin lesions or other signs of infection to seek prompt medical attention, and to report any clusters of cases to allow for prompt identification and control of outbreaks. In addition, services that work with PWID populations should ensure easy access to needle and syringe programmes and emphasize safer and hygienic injection practices, including use of as little acidifier as possible (half a sachet is enough to prepare a typical £10 bag of street heroin), and rotation of injection sites to avoid vein damage. Specific **guidance** has been published for prisons recommending: health assessment on first entry; isolation and restriction of prison transfers for cases until 48 hours of compliance with antibiotic treatment; thorough and regular cleaning in communal areas and deep cleaning for cells of cases; and implementation of laundry protocols (33).

Meticillin-sensitive and -resistant *Staphylococcus aureus* (MSSA, MRSA)

Data on meticillin-sensitive *Staphylococcus aureus* (MSSA) and meticillin-resistant *Staphylococcus aureus* (MRSA) infections in PWID in England are available from 2 data sources; NHS Trusts report the number of MRSA and MSSA bacteraemias through mandatory enhanced surveillance and isolates of MRSA and MSSA infection (including, but not limited to bacteraemias) are sent to the PHE *Staphylococcus* Reference Laboratory for characterisation. Data from the mandatory enhanced surveillance of MSSA and MRSA bacteraemias in England indicate that in 2018, of those with risk factor information, 14% (n=416) of the MSSA bacteraemias and 12% (n=40) of the MRSA bacteraemias were associated with injecting drug use (Accompanying Data, Table 2). This represents an increase in the proportion of cases for which injecting drug use was indicated over the last 8 years; from 6.9% in 2011 for MSSA and 1.6% in 2011 for MRSA when the reported number of cases were lowest (Figure 3). Reported numbers should be considered with caution as risk factor information is missing for a large proportion of the MRSA (66% missing) and MSSA (73% missing) bacteraemias reported, therefore the proportion associated with injecting drug use is likely to be underestimated.

In Scotland, there were 144 MSSA and 2 MRSA bacteraemia cases associated with injecting drug use reported in 2018: this is 9.5% and 2.9% of all MSSA and MRSA bacteraemia cases reported (Accompanying Data, Table 2).

Figure 3. Reported MRSA (2007-2018) and MSSA (2011-2018) bacteraemias with an injecting drug use risk factor by year, England



Data source: PHE mandatory enhanced surveillance of MSSA and MRSA

Toxin-producing bacteria (botulism, tetanus, anthrax)

Illnesses among PWID which are caused by the toxins produced by spore-forming bacteria, such as botulism, continue to be an issue of concern. Spores produced by these bacteria are found in the environment and can contaminate drugs at any point in the supply chain, from production to use. Although these infections are usually rare, they can be life-threatening, and outbreaks can occur. During 2018 there were 5 cases of wound botulism in PWID in England; one probable case in January 2018 and 4 cases (2 confirmed and 2 probable) in October-November 2018; further cases have been seen in Scotland in 2019 (see Box 4). There was one case of clinically confirmed tetanus in 2018 in England with a history of recent drug injection. There were no cases of clinically confirmed anthrax reported among PWID in the UK during 2018 (Accompanying Data, Table 2).

Box 4: Confirmed cases of botulism in England in 2018 and Scotland in 2019

During the period February to August 2019, there have been 5 confirmed and 2 probable cases of wound botulism investigated in Scotland. All 7 affected individuals are known to have injected drugs and 6 of the 7 cases were reported from the same region, West Central Scotland. One individual died. The source of the infection is believed to be heroin contaminated with *Clostridium botulinum* spores. Four cases of wound botulism in PWID were reported in October-November 2018 from England. Two cases were confirmed and 2 were probable. Three cases were reported from the South of England and one from the Midlands; all reported heroin injection.

There is early evidence for a reduction in chronic hepatitis C prevalence, however rates of new infection are unchanged

On 28 May 2016, the World Health Assembly adopted a Global Health Sector Strategy on viral hepatitis for the period 2016 to 2021 (10). This strategy aims to eliminate viral hepatitis as a major public health threat by 2030, and introduces the first ever global targets for viral hepatitis, including a 30% reduction in new cases of hepatitis B and C by 2020 and a 10% reduction in mortality (34).

In the UK, wider access to newly available directly acting antiviral (DAA) drugs has transformed the treatment landscape. DAAs are providing an opportunity to reduce morbidity and mortality from hepatitis C among those aware of their diagnosis, and to decrease the risk of onward transmission. New DAA therapies are orally administered, shorter in duration (8-12 weeks vs. 24-28 weeks) and have fewer side effects than traditional interferon-based therapy. Although interferon-based therapy was previously available to PWID, many barriers, including patient, provider, health system, societal and structural, resulted in low diagnosis and treatment for hepatitis C in this group (35).

In the UK, increased treatment with DAA drugs has been observed over recent years, and PWID are a prime target group for a further increase in uptake (35). DAA drugs are currently available, without restriction, in accordance with national recommendations in UK countries (34). A restriction on using DAA drugs to treat people with a hepatitis C reinfection has recently been removed. Critically this allows all PWID who have hepatitis C to be offered DAA treatment, including those who have received DAA treatment before. Providing DAA treatment for all affected PWID, including individuals involved in high-risk behaviour, is vital to reduce onward transmission and crucial to achieving elimination by 2030.

National action plans to tackle HCV are available across the UK (34), and include strategies to enhance case finding and improve access to and uptake of DAAs. Partnerships are being set up across the UK countries to provide increased testing and improved access to treatment within community settings such as drug services, homeless services, and prisons (see Box 5) (36).

The first indication that a scale-up of treatment is reaching PWID can be observed in the data from the 2 bio-behavioural surveys in the UK. In the 2018 UAM survey (England, Northern Ireland and Wales), among those participants testing positive for HCV antibodies who were aware of their infection, 39% had seen a specialist nurse or hepatologist for their HCV infection and been offered and accepted treatment; this is an

increase from 20% in 2011 (15). In the 2017-18 NESI survey (Scotland), 50% of those who self-reported as being of having been eligible for treatment (ie those that answered they have HCV or had cleared HCV through treatment) reported ever having received therapy for their HCV infection, which is a marked increase from 28% in 2015-16. Of those who had ever received therapy, 44% had received it in the last year; this compares to 36% in 2015-16 (6).

Hepatitis C prevalence

New estimates suggest that around 143,000 people are living with chronic hepatitis C in the UK in 2018 (34). Current and former PWID are the group most affected by hepatitis C in the UK; with around 90% of infections in England thought to have been acquired through injecting drug use (Accompanying Data, Table 1a).

Data from bio-behavioural surveys

UK-wide data indicate that around half of those who inject psychoactive drugs have ever been infected with hepatitis C, with 56% of those surveyed in 2018 in Wales having antibodies to hepatitis C, 55% in England, and 22% in Northern Ireland. For England and Wales this is an increase in recent years, whereas a decline has been observed in Northern Ireland (15). HCV prevalence measured in the NESI survey in Scotland has not changed substantially in recent years, and was 57% in 2017-2018 (Accompanying Data, Table 1b) (6). Prevalence data on HCV antibodies is a measure of the proportion of people ever infected with the virus and provides no information about whether an individual is currently infected with HCV or has cleared their infection.

To obtain an estimate of chronic HCV prevalence among PWID, samples from the UAM and NESI surveys were tested for the presence of virus RNA, an indicator of persistent and current infection as opposed to cleared infection. RNA testing of samples stored from previous years has allowed for trends in current infection to be estimated. Between 2015-16 and 2017-18, there was an 18% reduction in the prevalence of current HCV in Scotland, from 39% to 31% (Figure 4b) (Accompanying Data, Table 1b). The UAM Survey data from England, Wales and Northern Ireland found that in 2018, 27% of PWID had a current HCV infection; this is a modest decrease from 29% in 2016, when the level of current HCV infection was at its highest (Figure 4a) (Accompanying Data, Table 1b). These early indications of a potential decline in chronic prevalence could be attributable to the increase in uptake of HCV therapy, which has been seen across all areas in the UK (34).

Figure 4 Trend in chronic and cleared HCV prevalence among people injecting drugs in the UK: 2011-2018

a) England, Wales and Northern Ireland

b) Scotland



Data are shown for those years where there are HCV RNA testing data available; UAM data will be available for other years once retrospective testing of survey data are complete.

Estimates for chronic and cleared HCV infection have been adjusted to take into account antibody-positive samples with missing HCV RNA status. The ratio of chronic/cleared infection was applied to the antibody-positive samples with missing HCV RNA status by year and by geography (A: English regions, Wales, Northern Ireland, B: Scottish health board (GGC/Tayside/rest of Scotland)).

Data from diagnostic testing

HCV antibody-positivity data from people who take up diagnostic testing is also available (Accompanying Data, Table 1a+1b). In Wales, antibody prevalence was 28% among those who have ever injected drugs tested in specialist drug services and included in the HRD, of which 37% were found to be chronically infected with HCV (RNA positive). Among people who have ever injected drugs presenting for treatment in England in 2017/18 who had received an HCV test, 52% reported knowing their HCV antibody status, of which 34% reported they were antibody positive, and 41% reported knowing their HCV RNA status, of which 26% reported they were currently infected with HCV (RNA positive).

Sentinel surveillance of BBV testing in England reported 19% anti-HCV-positivity among tests performed in drug services in 2018, where an RNA test was reported (82%), 37% were found to be chronically infected with HCV (RNA positive).

There are 2 explanations why the anti-HCV positive proportion is lower than that reported through NDTMS and the UAM survey: 1) results reported through sentinel surveillance of BBV testing include all those tested in drug services with no individual-level risk data available; it is likely that the estimate includes individuals who have never injected drugs, thus increasing the denominator, and 2) sentinel surveillance of BBV testing only includes data on the first positive test for an individual, while the other sources include data from both pre-existing and new diagnoses regardless how long they have been infected to provide an estimate of antibody prevalence – the effect of both explanations combined results in a reduced positive proportion as compared to data from bio-behavioural surveys.

Hepatitis C incidence

The early evidence of a modest reduction in chronic HCV prevalence among PWID in the UK is likely to be mainly a result of increased uptake of DAA treatment rather than a reduction in incidence of new infectious. The overall level of hepatitis C transmission among PWID in the UK appears to have changed little in recent years.

Because most new hepatitis C infections in the UK are acquired via injecting drug use, people are unlikely to be infected before they start injecting; hepatitis C antibody detected in recent initiates suggests that the infection was recently acquired. The HCV antibody prevalence among recent initiates to injecting can thus be used as a proxy measure of incidence. Data from the UAM and NESI surveys among PWID in contact with services in the UK do not indicate a fall in incidence of infection over recent years, with levels of infection in 2017 in the UK² (22%, 95% CI 16-28) being similar to those observed in 2008 (24%, 95% CI 20-28), and levels of infection in the UAM survey in 2018 being higher (31%, 95% CI 25-31), albeit not significantly higher in statistical analysis (34). Confidence intervals are fairly wide, due to the relatively small (and declining) numbers of recent initiates in the sample; and the power to detect a reduction is therefore low. Antibody prevalence among people who first injected drugs during the preceding 3 years and were screened in specialist drug services is also available for Wales; this was 19% in both 2017 and 2018.

Very recent transmission of HCV (within the past 3 months) can also be estimated by laboratory evidence identifying those who test positive for HCV RNA (currently infected) but are negative for HCV antibodies, ie have not yet seroconverted to anti-HCV. The period of time that samples from recently infected individuals will have detectable HCV

² For those years where incidence estimates are available from both UAM and NESI surveys, data are combined after weighting them by the sizes of the adult (16 to 64 years) populations for the countries they cover.

RNA but no antibody response is estimated to be 51-75 days (37-39). Individuals in this viraemic pre-seroconversion window are likely to have recently acquired their infections. This testing has been done in Scotland since 2008-09 within the NESI survey, and was included in England, Wales and Northern Ireland within the UAM since late 2016. These data suggest that incidence of infection in the UK has not declined in recent years and was estimated to be 17.6 per 100 person years in 2018³ (34).

Uptake of voluntary confidential testing

UK clinical guidelines recommend that all PWID accessing treatment services are tested for HCV and HIV at first assessment, and that repeat testing should be considered when the risk of exposure and reinfection continues (40). When risk is assessed as high, testing may need to be carried out up to once or twice a year (40, 41).

Data from bio-behavioural surveys

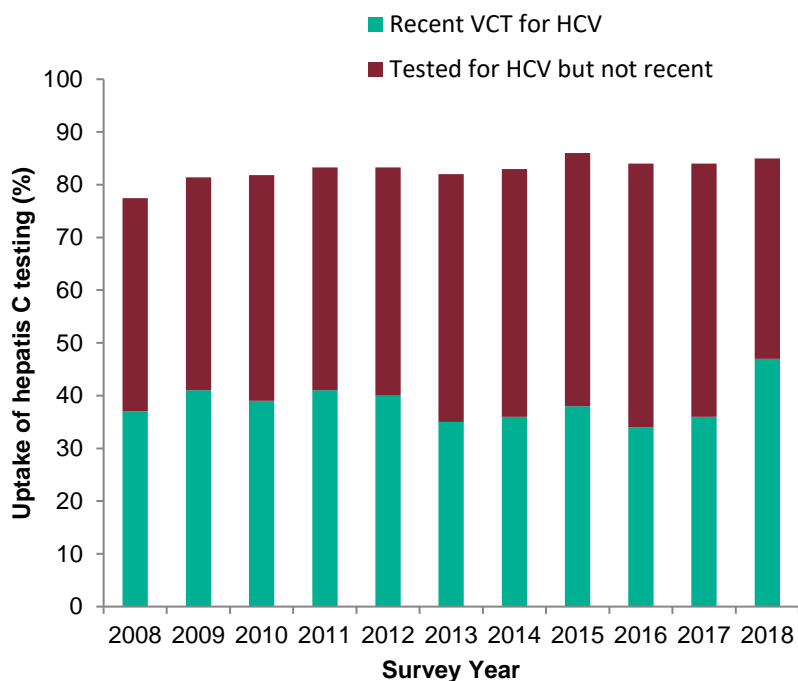
The proportion of PWID who report uptake of voluntary confidential testing for hepatitis C has increased across the UK in the last decade. In Scotland, a sustained increase from 2008-09 onwards has been seen, with year-on-year increases in both the proportion of PWID reporting to have ever tested from 74% in 2008-09 to 92% in 2017-18 and the proportion of PWID reporting to have been tested in the last 12 months from 35% in 2008-09 to 56% in 2017-18 (Figure 5b; Accompanying Data, Table 3b). The sustained increase in Scotland is synchronous with the Hepatitis C Action Plan 2006-2011 (42, 43) and the Scottish Government Sexual Health and Blood Borne Virus Framework 2011-15 as well as the 2015-2020 update (44), which all aimed to increase diagnoses and treatment of hepatitis C among PWID.

England, Wales and Northern Ireland have seen little improvement in the proportion ever tested for HCV in the last 8 years, but there is evidence of the impact of increased HCV testing activities on PWID in 2018, as the proportion tested in the current or previous year increased from 36% in 2017 to 47% in 2018, the highest it has been in the past decade. (Figure 5a; Accompanying Data, Table 3b).

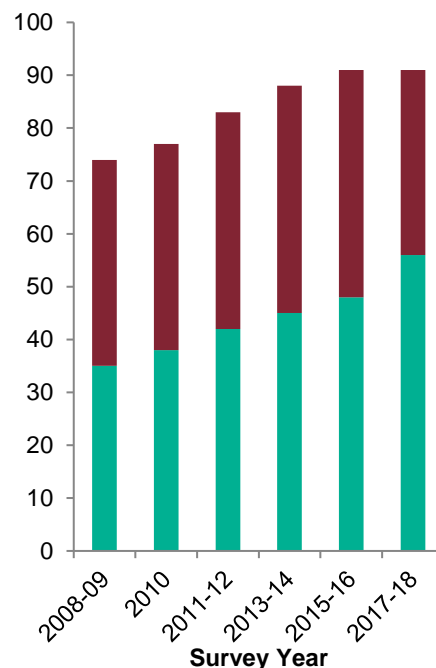
³ For those years where incidence estimates are available from both UAM and NESI surveys, data are combined after weighting them by the sizes of the adult (16 to 64 years) populations for the countries they cover.

Figure 5. Uptake of voluntary confidential testing for hepatitis C among people who inject drugs: a) England, Wales and Northern Ireland, and b) Scotland

a) England, Wales and Northern Ireland



b) Scotland



Data source: Unlinked Anonymous Monitoring survey of people who inject drugs (England, Wales and Northern Ireland) and Needle Exchange Surveillance Initiative (Scotland).

Survey data suggests that the proportion of PWID who are unaware of their hepatitis C infection has decreased over the last decade, but remains high. In Scotland, among people who had a current infection (ie HCV antibody and RNA positive) on dried blood spot testing, 60% self-reported that they had ever been diagnosed in 2017-18, an increase from 54% in 2010 and 56% in 2015-16 (Accompanying Data, Table 13b) (6). In England, Wales and Northern Ireland, of those with a current infection (HCV antibody and RNA positive) in 2018, 46% were aware of their HCV infection status (Accompanying Data, Table 3b).

Many of those in England, Wales and Northern Ireland who were unaware of their current HCV infection reported that they had either never tested or not tested recently; 16% (50/320) reported never having had a test for hepatitis C; and of those unaware but tested, 40% (108/270) reported that their last test had been more than 2 years ago or did not report the year of their last test.

Although the WHO target of 50% of infected people in the WHO European region knowing their status by 2020 (45) is likely to have been met in the UK when considering PWID, more needs to be done if we are to reach the 90% target by 2030 (10).

Data from diagnostic testing

In England, the National Drug Treatment Monitoring System (NDTMS) found that among those in treatment for their drug use who have ever injected drugs, the proportion who had been offered and accepted a hepatitis C test has increased to 63% (55,969/88,548) in 2017/18 from 53% in 2009-10 (61,106/114,848) when data was first collected (Accompanying Data, Table 3b). The offer of HCV testing at the start of drug treatment is very high, with 97% (85,841/88,548) of those eligible for testing who have ever injected drugs being offered a hepatitis C test at the beginning of their most recent treatment period. The uptake of HCV testing is lower with 65% (55,969/85,841) accepting the offer of testing. Stigma and discrimination are well evidenced barriers to HCV testing (46). Individuals may fear confidentiality breaches in relation to their HCV status if positive, and that this may result in discrimination. In addition, patient and provider concerns regarding the co-morbidities, adherence and side effects of treatment may affect HCV testing uptake, though these concerns should be much reduced by the ease and effectiveness of new DAA treatments.

The implementation of opt-out BBV testing in prisons in England, Wales and Scotland has increased the uptake of testing (see Box 5). An increase in the number of individuals tested in drug services is also seen in sentinel surveillance of BBV testing in England, with an increase of 79% seen between 2014 and 2018, from 5,450 to 9,777 individuals tested by year (Accompanying Data, Table 1a).

Box 5: Update on 'Opt-out' blood borne virus testing in prisons

Opt-out testing in prisons has been found to be cost-effective as compared to voluntary risk-based testing, particularly if >10% of prisoners diagnosed with HCV are treated in prison (47). Since 2013/14, PHE in partnership with NHS England and Her Majesty's Prison and Probation Service (HMPPS) have implemented BBV testing in adult prisons on an 'opt-out' basis, with the programme rolled out across all adult prisons by 2018. The latest data shows that there has been a near four-fold rise in HCV tests performed in prisons since opt-out testing was introduced - from 5.3% in all new receptions and transfers in 2010/11 to 19% in 2017/18 (48).

An increase in testing in prisons between 2014 and 2018 can also be observed from sentinel surveillance of BBV testing in 14 of the 19 laboratories in England. The number of individuals testing in prisons reported in sentinel surveillance increased by over threefold from 4,890 individuals in 2014 to 16,744 in 2018 (Accompanying Data, Table 1a). This increase in hepatitis C testing was predominantly observed in 2017 and 2018 where there was a 159% increase from 2016 to 2017, and a further 29% increase from 2017 to 2018. This increase in 2017 and 2018 may be associated with elimination initiatives in prisons including point of care testing for all persons in some prisons, and improved uptake of opt out testing. The proportion of tests conducted in prisons which were anti-HCV positive declined from 11% in 2014 to 6.2% in 2018. For 2018, 69% of anti-HCV positive individuals had an RNA test reported, of which 64% were found to be chronically infected with HCV (RNA positive).

While the increase in testing in prison is welcomed, the proportion of people in prison tested are still below the lower BBV testing threshold proposed by NHS England (50-74%), and well below the target threshold of at least 75% uptake (49). The challenge moving forward will be increasing BBV testing levels to within the upper NHS England performance standard. To this end, focus will move from programme implementation to improving the quality of the offer and uptake of testing within prisons as well as linkage to care and treatment monitoring. This will entail a 'whole system approach' that will see collaboration between public, private and third sector agencies to improve peer support networks, identify BBV lead nurses, standardise testing offer and organise various stakeholder engagement events with a focus on improving testing and treatment rates in prisons.

Opt-out BBV testing in prisons has also been implemented in Wales and Scotland. In Wales, introduction of the routine opt-out BBV testing model in Welsh Prisons in 2016 has resulted in increases in coverage of testing on admission from 13% in 2015 to 44% in 2018. In Scotland, routine opt-out BBV testing in prisons has been recommended since 2015. Guidance to support the delivery and monitoring of opt-out BBV testing in Scotland's prisons was published in 2019 (50), with results of the monitoring expected in 2020.

Altogether, these data show early evidence for a modest reduction in chronic hepatitis C prevalence concomitant with the scale-up of DAA treatment among PWID. Early evidence for an increase in testing and uptake of treatment among PWID in line with HCV elimination activities can also be observed in 2018, yet the high proportion of individuals who report they have not been tested recently indicate there is scope for improvement. It is of utmost importance that diagnostic testing services and care pathways for those infected are continued and where appropriate expanded (40).

Hepatitis C continues to be a major problem among PWID in the UK with around 1 in 4 currently infected with HCV and no suggestion of a reduction in new HCV infections over recent years. Together with ongoing scale-up of interventions aimed to improve testing and treatment for HCV, continued efforts to improve harm reduction such as OST and NSP will be essential to reach the WHO goals and eliminate HCV by 2030.

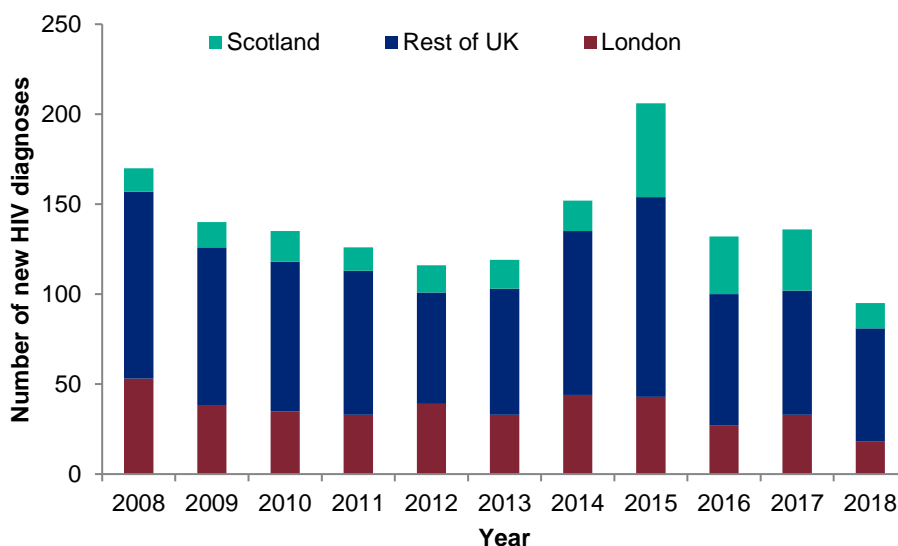
HIV levels remain low, but risks continue

Overall HIV infection is uncommon among PWID in the UK, and HIV prevalence in this risk group is low compared to many other European countries (51). In England, Wales and Northern Ireland, 1.2% of the people who inject psychoactive drugs surveyed in 2018 were living with HIV (Accompanying Data, Table 1d). Among those attending needle and syringe programmes in Scotland during 2017-18, 2.3% were HIV antibody positive (Accompanying Data, Table 1d)(6). Both these HIV prevalence estimates are higher than the overall adult HIV prevalence in the UK which was estimated to be 0.18% in 2016 (52).

New infections and diagnoses

Overall, there were 95 new HIV diagnoses in the UK during 2018 which were likely to have been acquired through injecting drug use; this is a continued decline and lower than the annual average of 143 new HIV diagnoses between 2008 and 2017 likely acquired through injecting drug use (Figure 6; Accompanying Data, Table 1d) (53).

Figure 6. Annual number of new HIV diagnoses which were likely to have been acquired through injecting drug use: 2008 to 2018



Data source: HIV and AIDS Reporting System (HARS)

In Scotland there were 14 new HIV diagnoses in PWID in 2018, 10 of which were in the NHS Greater Glasgow and Clyde area; this is lower than the average of 20 new diagnoses per year in PWID in the Greater Glasgow and Clyde area from 2010 to 2014, prior to the HIV outbreak (see Box 6) (54). During the first 6 months of 2019 however, 12 new HIV diagnoses were reported among PWID in Greater Glasgow and

Clyde, indicating ongoing transmission in this group (54). New harm reduction services were introduced following recognition of the HIV outbreak in 2015 (see Box 6) (55) .

Box 6: Glasgow HIV outbreak

First identified in early 2015, an outbreak of HIV among PWID in Glasgow remains ongoing in 2019. Since its onset, over 150 individuals have been diagnosed as part of the outbreak. Injecting drug use, or sexual contact with someone known to inject drugs, have been established as the main risk factors for HIV acquisition. This increase in diagnoses is related to transmission among a population who inject psychoactive drugs within Glasgow city centre, mainly heroin with or without cocaine. This population is often homeless, with high levels of involvement in the criminal justice system.

Routine viral sequencing revealed the majority of cases were subtype C virus with identical primary NNRTI mutations (E138A and V179E), indicating a common source for the outbreak. Phylogenetic analysis demonstrated this strain of subtype C had been transmitted recently and rapidly among Scottish PWID but had not yet spread anywhere else in the UK [37]. A recent epidemiological analysis demonstrated HIV prevalence to have increased from 1.1% in 2011 to 10.8% in 2018 in this population in Glasgow City centre- a trend associated with homelessness, incarceration and injecting of cocaine (55). This is the largest HIV outbreak among PWID in the UK for over 30 years.

This outbreak is being managed through increasing awareness of the risks of HIV, education of the at-risk population and specialist drug treatment services regarding HIV, increasing provision of needle and syringe programmes (for example, greater evening availability), improving the frequency of HIV testing and its accessibility and proactively supporting the early treatment of those newly diagnosed so as to reduce the risk of onward transmission. In response to limited engagement with antiretroviral therapy (ART) among those diagnosed in the early stages of the outbreak, an intervention model was developed that supported a BBV clinical nurse specialist and then an HIV consultant led service within homeless health services. A new model of ART delivery within community pharmacy services allows ART to be dispensed with OST. By June 2019, 100% of those diagnosed as part of the outbreak had been commenced on ART, 98% were currently on ART and 83% had a confirmed undetectable viral load in the previous 6 months.

The Glasgow outbreak has occurred despite widespread availability of core HIV prevention services - NSP, OST and ART, and highlights the complex control measures and multidisciplinary response required to manage such an incident. In particular, traditional models of care require adaptation to enhance engagement and reduce onward transmission when managing an HIV epidemic in this highly complex and multiple disadvantaged group.

Testing and care

The majority of PWID report ever being tested for HIV (80% in 2018 in England, Wales and Northern Ireland [Accompanying Data, Table 3b]), and 38% reported being tested for HIV in the current or previous year (15). In Scotland 84% of PWID reported ever being tested for HIV in 2017-18, with 49% reporting testing in the last year (6).

Although the majority of PWID living with HIV in the UK are aware of their infection (6, 15), an estimated 100 (95% CrI 30-400) are living with undiagnosed HIV⁴ (56) and late diagnoses remain a problem. In 2018, 49% of the HIV diagnoses among people who had acquired their infection through injecting drugs were made at a late stage of HIV infection (Accompanying Data, Table 1d). This compares to 43% overall, and 33% of those exposed through sex between men (53). People who are diagnosed late have a ten-fold increased risk of dying within a year of diagnosis compared to those who are diagnosed promptly (57). In addition, those diagnosed late are likely to have been living with undiagnosed HIV infection for at least 3 to 5 years, and may have been putting others at risk through sexual transmission, in addition to the risks from sharing injecting equipment (58).

Data from the UAM survey shows that there are missed opportunities for HIV testing. The majority of those who report never being tested for HIV or not testing recently (>2 years ago), reported that they had attended their GP, had been prescribed a substitution drug, or had used a needle and syringe programme in the previous year (59).

Owing to improved survival, the number of people living with diagnosed HIV infection in the UK who acquired their infection through injecting drug use has increased over the past decade, with 1,864 people accessing HIV treatment and care in 2018 (Accompanying Data, Table 1d). Coverage of antiretroviral therapy (ART) among PWID accessing care in 2018 was high at 96% (1,784/1,864). The proportion of PWID who are virally suppressed is lower than that seen in other risk groups. Viral suppression (as measured by a viral load ≤ 200) was reached by 93% (1,507/1,620⁵) of PWID on ART; this compares with 97% of those who had acquired HIV through heterosexual contact and 98% of those who acquired HIV through sex between men (53). Lower viral suppression in PWID could be due to non-adherence to anti-retroviral treatment or reduced engagement or retention in care as a result of their drug taking behaviour (60), mental health issues or personal circumstances (59).

Although new HIV diagnoses continue to occur among PWID, the overall HIV prevalence in this group in the UK is currently comparatively low. Most of those with

⁴ Estimated using a Bayesian multi-parameter evidence synthesis (MPES) model. Estimation of the undiagnosed population is based on indirect information and sparse survey data, and therefore highly uncertain.

⁷ Of the 1,784 people on ART in 2018 who acquired HIV through injecting drug use, 1,620 had viral load information reported

HIV are aware of their infection and uptake of treatment and care for HIV among those diagnosed is high. However, the recent HIV outbreaks among PWID in Glasgow (55) and South West England (61) and the high proportion of PWID diagnosed late with HIV are a concern. These findings highlight the importance of accessible HIV testing services. HIV testing and prevention services for all PWID need to be maintained in a range of appropriate settings and should be responsive to changes in both drug use and sexual risks.

Hepatitis B vaccine uptake needs to be sustained, particularly in younger age groups

Hepatitis B prevalence

Hepatitis B virus can be transmitted between PWID through the sharing of needles and other injecting equipment contaminated with infected blood. Data from the UAM survey indicate that the proportion of PWID who have ever been infected with hepatitis B in England, Wales and Northern Ireland has declined over the past 10 years, falling from 18% in 2008 to 9% in 2018 (Accompanying Data, Table 1c). Only 0.42% of UAM survey participants in 2018 were currently infected with hepatitis B⁸, which is similar to the levels seen in recent years (7). There has only been one reported case of acute hepatitis B amongst PWID in Scotland since 2014, suggesting low levels of transmission. The decline in hepatitis B across the UK likely reflects a decline in exposure to and transmission of hepatitis B over time, as a result of increased uptake of hepatitis B vaccination, including in prison settings (62), and/or harm reduction interventions.

Hepatitis B vaccine uptake

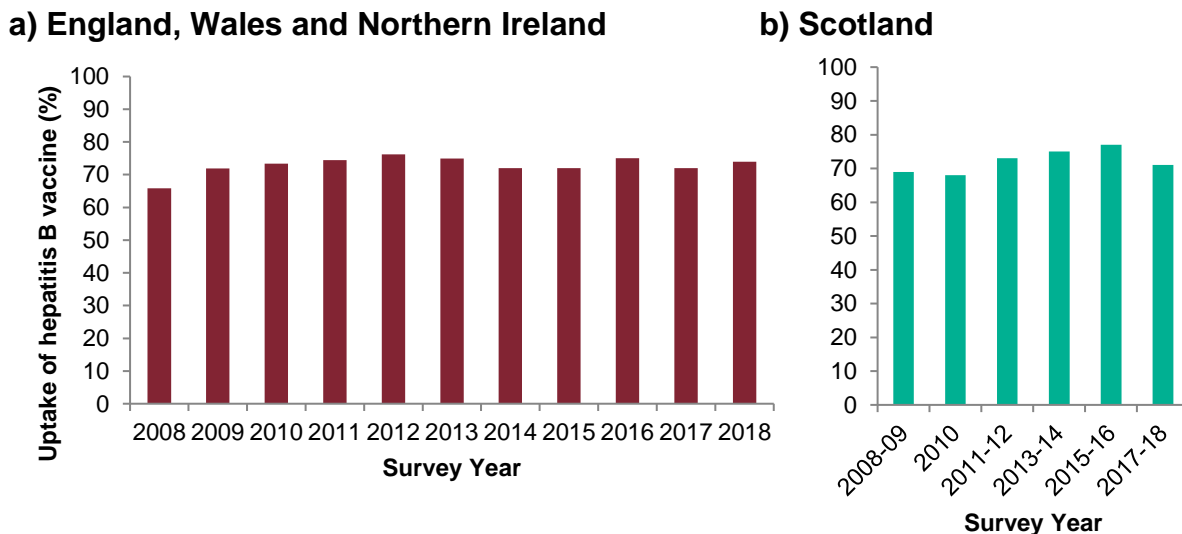
Hepatitis B vaccination is recommended with high priority for all people who currently inject drugs, including those who inject intermittently and those who are likely to 'progress' to injecting, for example those who are currently smoking heroin and/or crack (40, 63). Immunisation against hepatitis B is also recommended for all sentenced prisoners and all new inmates entering prison in the UK (63). A course of 4 doses is recommended, with vaccine given at 0, 1, 2 and 12 months, although an accelerated course (with doses given at 0, 7, 21 days, and a booster dose at 12 months) may be appropriate for service users with chaotic lifestyles and those who have difficulty engaging with services (40, 63).

In England, Wales and Northern Ireland, self-reported uptake of the hepatitis B vaccine (ie receiving at least 1 dose), has plateaued at around 72% between 2008 and 2018 (Figure 7a; Accompanying Data, Table 3b) (15). In 2018, hepatitis B vaccine uptake was particularly low in the under-25 age group at 48%, a decrease from 76% in 2011 when vaccine uptake was highest (15). Vaccine uptake also decreased in the 25-34

⁸ Current infection is defined as testing positive for both antibodies to the hepatitis B core antigen (anti-HBc) and for hepatitis B surface antigen (HBsAg).

years age group from 79% in 2011 to 68% in 2018. It was also particularly low among those who began injecting in the last 3 years at 50%, down from 67% in 2011 (Accompanying Data, Table 3b) (15). Among those attending NSPs in Scotland during 2017-18, 71% reported uptake of the hepatitis B vaccine (Figure 7b; Accompanying Data Table 3b)(6). Increased HBV vaccination uptake in Scotland has been driven by the introduction of universal prison vaccination (62).

Figure 7. Uptake of the vaccine against hepatitis B among people who inject drugs



Data source: Unlinked Anonymous Monitoring survey of people who inject drugs (England, Wales and Northern Ireland) and Needle Exchange Surveillance Initiative (Scotland).

Data from NDTMS in England indicate that, of those presenting for treatment for their drug use who were at risk⁷ of hepatitis B and had ever injected drugs, just under half (46%) were offered and had accepted vaccination against hepatitis B (Accompanying Data, Table 3b). Of those offered, the proportion who accepted vaccination has decreased from 70% (15,478/22,142) in 2009/10 to 51% (8,030/15,872) in 2017/18.

Ensuring access to hepatitis B vaccine is critical. In 2017, there was a shortage of vaccine due to manufacturing issues. Although these have been resolved, and PWID were considered a high priority group for vaccination, there likely remains a backlog of people whose vaccinations were deferred due to lack of vaccine being readily available when they attended services (64).

Although hepatitis B vaccination is recommended as high priority for all people who currently inject drugs, around a quarter of PWID have never been vaccinated. Even though hepatitis B infection among this group is now rare, it is essential that high vaccination levels are maintained, particularly in younger age groups of PWID to keep high population immunity levels.

⁷ Attendees are assumed to be 'at risk' unless there is positive evidence that they are not 'at risk' (ie previously vaccinated, with natural or acquired immunity or assessed as not appropriate to offer hepatitis B vaccine).

Continued sharing and re-use of injecting equipment remains a concern

Sharing and re-use of injecting equipment

Sharing of equipment used for injecting drugs is an important contributor to BBV transmission (65-67). Data on sharing of injecting equipment is available through bio-behavioural surveys (UAM & NESI) and from agency reports (NDTMS, HRD, Scottish Drug Misuse Database) (Accompanying Data, Table 3a).

In Scotland, reported sharing of needles and syringes in the previous month fell from 20% during 2007-08 to 16% in 2017-18 among individuals attending drug treatment services as reported through the Scottish Drug Misuse Database (Accompanying Data, Table 3a). In the 2017-18 NESI survey, 10% of respondents who had injected in the last 6 months reported needles and syringe (direct) sharing, and 26% reported sharing injecting equipment including needles, syringes, filters, spoons or water (direct and indirect sharing). The proportion reporting direct and indirect sharing has declined markedly from 48% in 2008-09.

Sharing levels reported in England, Wales and Northern Ireland have not improved in recent years: the level of needle and syringe (direct) sharing reported by UAM survey participants who had injected during the preceding 4 weeks was 18% in 2018; similar to levels seen in 2008 (19%) and an increase from 14% in 2012 when reported sharing levels were lowest. Sharing of needles, syringes and other injecting paraphernalia such as filters and spoons (direct and indirect sharing) was reported by 39% of PWID in 2018, a proportion which has remained relatively stable since 2008.

In Wales, self-reported risk behaviours have increased according to data recorded on the HRD, with 24% of individuals injecting psychoactive substances reporting ever direct sharing in 2018 as compared to 20% in 2014, and 30% reporting ever indirect sharing in 2018 as compared to 24% in 2014 (68).

Apart from risks associated with sharing equipment, re-use of an individual's own injecting equipment can also put them at risk of infections, particularly from bacterial infections from contamination when handling the equipment, but also from blood-borne viruses due to accidental sharing in situations where people store injecting equipment together (6, 69). Although reported direct sharing remained low in Scotland, and reported direct and indirect sharing in the NESI survey has declined in the past decade, the proportion reporting re-use of their own equipment in the last 6 months increased in recent years from 45% in 2011-12 to 58% in 2017-18 (6). In Wales, 48% of people injecting opioids reported ever reusing injecting equipment through the HRD, a

proportion which has remained stable since 2014-15 when data was first collected (68). No data on reuse of equipment is currently included in the UAM survey.

Provision of injecting equipment

Adequate provision of new, sterile injecting equipment is vital to reduce sharing and reuse and the associated risks (69). Provision of NSP services in line with current guidance (70) is crucial to reducing transmission of BBVs and bacterial infections. Needle and syringe provision is considered 'adequate' when the reported number of needles and syringes received met or exceeded the number of times the individual injected. In 2018, the proportion of PWID in the UK reporting adequate needle/syringe provision was sub-optimal; around 3 in 5 (63%) PWID who had injected during the preceding 28 days reported adequate needle/syringe provision in England, Wales and Northern Ireland (34). In 2017-18, the proportion of PWID who had injected in the past 6 months in Scotland who reported adequate needle/syringe provision was 80% (34).

Low dead space syringe (LDSS) provision in drug services and needle and syringe programmes is an important and acceptable strategy for reducing the risk of HCV transmission among PWID (71-74). After use, an LDSS retains less blood than a syringe with high dead space (HDSS) and LDSS use therefore may be associated with lower risks of HCV transmission (74). For example, analysis of data from the UAM survey found that exclusive LDSS use was associated with lower prevalence of HCV among PWID that started injecting recently, supporting the hypothesis that LDSS use reduces the risk of acquiring HCV (75). People who inject into their groin were less likely to use LDSS (75), probably because they needed longer needles that can only be obtained for detachable syringes. Detachable syringes and needles with lower dead space have been developed and are now being distributed in many UK settings. Although these syringes have greater dead space than LDSS, they are an improvement on HDSS, with a recent cost-effectiveness analysis from Bristol suggesting their distribution (instead of traditional HDSS) is likely to be a cost-saving strategy for reducing the transmission of HCV (76). It is important that further syringe development occurs to minimize the dead space associated with these syringes while still meeting their need amongst PWID.

The UAM Survey collected data from drug and alcohol services across England and Wales who agreed to participate in the survey during 2019 on the provision of LDSS at their sites. Of the 77 sites that provided this information, 38 (49%) stated that they provided any type of LDSS, suggesting that an upscale of the provision of LDSS is required in line with current guidance (70). Scotland has provided LDSS to all NSP users since 2017 (77) and Wales has implemented wider provision of LDSS since 2017-18 (68).

Sexual behaviour

PWID are also at risk of acquiring and transmitting blood borne viruses through sexual transmission. Among PWID surveyed across England, Wales and Northern Ireland in 2018, 60% reported anal or vaginal sex during the preceding year and of these, 40% reported 2 or more sexual partners (15). Of those with 2 or more partners during the preceding year, only 19% reported always using condoms.

The proportion of men participating in the UAM Survey who reported sex with men during the preceding year has risen from 2.9% (69/2,344) in 2008 to 5.7% (115/2,019) in 2018. Prevalence of HIV in this group (6.1%, 7/115) is higher than among men who do not report having sex with men (1.0%, 20/1,903). This finding potentially reflects the greater use of drug services in recent years by men who have sex with men (MSM), a group with relatively high HIV prevalence. This increase may reflect the emergence of sexualised drug use among some groups of MSM (78, 79). This is supported by survey data for MSM, which suggest a distinct profile: a greater proportion of MSM report having injected mephedrone, methamphetamine and ketamine, drugs associated with 'slamming' - ie the injection of drugs before or during planned sexual activity to sustain, enhance, disinhibit or facilitate sex (80, 81), in the past year. MSM were more likely to report sharing of needles/syringes in the last month than heterosexual men and were more likely to report having overdosed in the past year. Compared to heterosexual men, a higher proportion of MSM report ever selling sex for money, goods or drugs and were more likely to report having 10+ sexual partners in the past year. Survey data suggests that 'slamming' is evident among MSM accessing general drug services; this is a factor which could lead to an increase in the UK's low HIV prevalence among PWID (82) and is also a concern for increasing HCV transmission in this population.

In 2018, UAM survey participants were asked for the first time whether they were under the influence of drugs (injected or non-injected) when having sex. Of those individuals who reported having sex in the last year, 69% (1,086/1,583) reported being under the influence of any drugs, with crack (47%, 738/1,583) and cocaine (22%, 356/1,583) being most frequently reported, reflecting the common use of these 2 drugs among PWID. Use of drugs linked with high risk sexual behaviour, ie crystal meth, GHB/GBL and mephedrone, were rarely reported in the UAM survey.

Changes in psychoactive drug preferences could lead to riskier injecting practices

Patterns in psychoactive drug use

Heroin remains the most commonly injected drug in the UK: in 2018, 94% of those who injected drugs in the previous month in England, Wales and Northern Ireland reported injecting heroin (15), and in Scotland, 91% of those who reported drugs in the past 6 months reported injecting heroin (6).

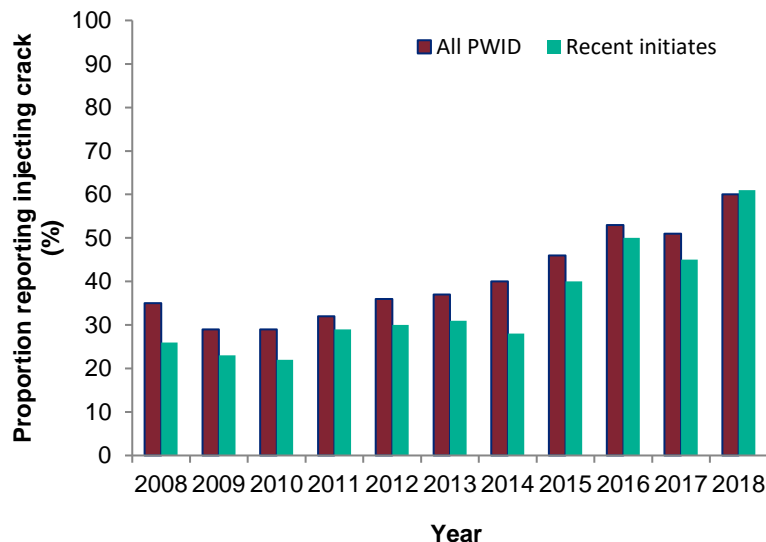
Increase in the injection of types of cocaine

Data from the UAM survey indicate that injection of crack has further increased in recent years in England and Wales, with 60% of those who had injected in the preceding 4 weeks reporting crack injection in 2018 as compared to 51% in 2017 and 35% in 2008 (Figure 8) (15). Crack injection also increased among recent initiates, with 61% of those who had injected in the preceding 4 weeks reporting crack injection in 2018, compared with 26% in 2008 (15).

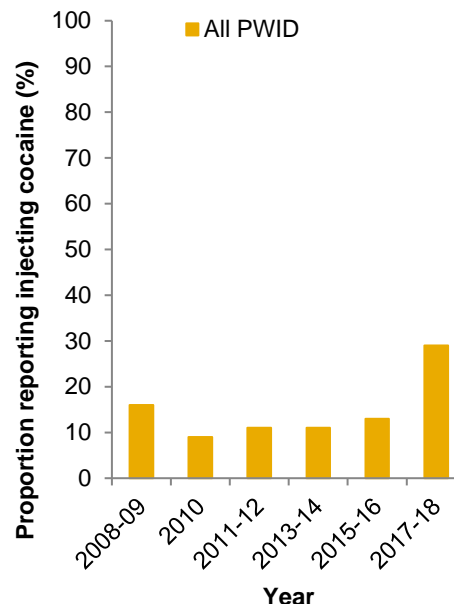
In Scotland, injection of crack was reported by only 6% of those who injected in the last 6 months in 2017-18 (6). Injection of powder cocaine is more common in Scotland, and has increased in recent years: from 9% in 2010 when reported use was lowest, to 29% in 2017-18, with highest levels reported in Greater Glasgow and Clyde (49%) (Figure 8) (6). Cocaine injecting has been linked to the recent outbreak of HIV among PWID in Glasgow city centre (see Box 6) (55). In England, Wales and Northern Ireland, injection of cocaine (other than crack cocaine) has remained relatively constant in recent years, with 13% of those who had injected in the preceding 4 weeks reporting cocaine injection in 2018.

Figure 8. Crack injection in the last 4 weeks in England, Wales and Northern Ireland (a), and powder cocaine injection in the last 6 months in Scotland (b), 2008-2018

a) England, Wales and Northern Ireland



b) Scotland



Data source: Unlinked Anonymous Monitoring survey of people who inject drugs (England, Wales and Northern Ireland) and Needle Exchange Surveillance Initiative (Scotland)

UAM Survey data for 2018 indicate crack injection in the last month was more commonly reported by males (62%) than females (53%) and by those recruited in the South East (74%), Yorkshire and the Humber (73%) and South West (72%) regions of England. The median age for both those reporting injecting crack in the past month and those did not was the same (39 years). The majority of those reporting injecting crack in the last month also reported injecting heroin during this period (98%).

Injection of crack in the last month was found to be associated with a number of risk behaviours among 2018 UAM survey participants, including sharing of needles and syringes alone in the last month (21% among those who reported injecting crack vs 15% in those who did not) and alongside other injecting paraphernalia (43% vs 32%); ever receiving money, goods or drugs in exchange for sex (19% vs 13%), and groin injection (43% vs 29%). People who had injected crack in the last month were more likely to be hepatitis C antibody positive (68% vs 52%).

Although the proportion reporting NSP use in the last year was similar among those reporting crack injection to those not (~95%), a higher proportion of those who injected crack recently (within the last month) reported current engagement in treatment for their drug use than those not reporting recent crack injection (77% vs 70%). Those who injected crack in the last month were also more likely to have ever been tested for both HIV (83% vs 77%), suggesting higher engagement in HIV diagnostic testing among this group.

An increase in the proportion of individuals reporting crack cocaine as a problematic substance has also been seen nationally in treatment for substance misuse data (Box 7).

Box 7: Qualitative research to understand the increase in crack injection in England.

National statistics for substance misuse treatment (5) have shown significant increases in the number of people in treatment for crack cocaine problems, with a 44% increase since 2016 to 4,301 in 2018. This increase in treatment demand reflects increasing prevalence estimates for crack cocaine users (83), which show a statistically significant 8.5% rise from 2011 to 2012 and 2016 to 2017 (166,640 to 180,748), a trend reflected in the UAM survey (7). The Serious Violence Strategy (84) committed the Home Office and Public Health England (PHE) to conduct an investigation into the increases in crack use and to consult with service users and providers to understand more about who currently uses crack. Findings from the published report (85) include:

- Increasing crack use was mainly seen amongst existing heroin users, who have now transitioned to use crack daily
- There is a 'hidden' group of people who use crack who have not been in treatment, including some women and younger people
- The main driver of the increase in crack use was aggressive marketing by dealers (for example, crack being given free to heroin users or as part of a deal)
- Crack is widely available and delivery can be "quicker than a pizza"
- Crack is sold in smaller quantities to make it more affordable
- There was a perception that purity of crack had increased while heroin purity had fallen
- There is less stigma associated with crack use than there used to be, partly due to the way it is marketed by dealers
- A lack of resources had made it difficult for the police to prioritise small scale drug-dealing
- 'County lines' drug dealing operations had not been the only factor in the increase in crack use, because use had also increased in areas where county lines were not prevalent

There is a real need for local treatment systems that can respond to both the increasing numbers and the specific needs of crack and powder cocaine users. This requires local authorities to understand the levels of unmet need, which will vary substantially between different areas. Strong local partnerships can provide effective links between treatment, prevention and the criminal justice system, for example through greater availability of arrest referral schemes and improved monitoring of Drug Rehabilitation Requirements (in England and Wales) or Drug Treatment and Testing Orders (in Scotland), and make sure that people get the support they need.

Reduction in other types of stimulants

The injection of amphetamine ('speed') or amphetamine-type drugs by those who injected drugs in the previous month continued to decrease from 24% in 2014 to 13% in 2018 in England, Wales and Northern Ireland. Also, injection of mephedrone continued to decrease; 2.0% (38/1,862) of those surveyed in the UAM survey in 2018 reported that they had injected mephedrone at some point during the preceding year, which is a year-on-year decrease from 9.0% (184/2,054) in 2014 when reported use was highest. In Scotland, injection of amphetamines was reported by 4% of those who injected in the last 6 months in 2017-18. Injection of mephedrone is not collected separately in the NESI survey, but included in the 'legal highs' category; 10% of NESI participants reported injecting drugs in this category in 2015-16 (6).

Provision of effective interventions needs to be maintained and optimised

Needle and syringe programmes (NSP) and opioid substitution therapy (OST)

Infections remain common among PWID. This reflects ongoing injecting risk particularly through reuse and sharing of injecting equipment, as well as risks through sexual behaviours. Interventions to prevent infections among this group, such as NSP and OST and other drug treatments need to be sustained. NSPs provide clean injecting equipment and advice to minimise the reuse and sharing of injecting equipment and improve injecting hygiene, and so reduce the risk of BBV and bacterial infections (70, 86). OST is a pharmacological intervention for those dependent on opioid drugs. An oral substitute medicine is provided as part of a structured drug treatment programme, to encourage cessation or reduction of illicit opioid use and injection, and so reduce harms associated with injecting drug use (87). While evidence indicates that NSP and OST can reduce a number of harms associated with injecting drug use, including overdose, the impact of these 2 interventions is dependent upon their coverage (88, 89). High coverage for NSPs is where there is a clean needle and syringe available for every injection, and high coverage for OST is where the proportion of opioid users in treatment is high and injecting by opioid users in treatment has significantly reduced or ceased. In combination, high coverage of NSP and OST has been shown to be both effective and cost-effective in reducing HCV transmission among PWID (and potentially cost saving) (90, 91). Evidence also indicates that these 2 interventions, either alone or in combination, can reduce other harms among PWID, such as HIV transmission, SSTIs, and all cause and overdose mortality (92-95). Presentation at NSP and OST services also provides opportunities to signpost and refer PWID between these, and into other, services, and can provide other interventions such as take home naloxone (96).

It is important that the provision of these services is regularly reviewed to ensure it is sufficient to prevent infections. Good intervention coverage, particularly among recent initiates to injecting is important to reduce the risk of infection. Unless interventions to reduce risk reach individuals when they have just initiated injecting, HCV incidence may continue to remain high amongst recent initiates.

Those who commission services to reduce the harms associated with injecting drug use should give appropriate priority to preventing the spread of infections. National drug strategies, including the 2017 UK Drug Strategy, acknowledge that tackling drug-related harm and reducing infections are important components of a recovery-focused response to drug use (97-100). Services commissioned in line with these strategies,

relevant action plans (44, 101-103), related guidance (40, 70, 104-106) and local needs assessments (107) should include appropriate free provision of NSP and OST.

These services, and primary care and sexual health services, should provide information and advice on safer injecting practices, preventing infections and the safe disposal of used equipment.

Promoting vaccination, testing, treatment and care

Information and advice on safer injecting practices and avoiding injection site infections are important as **preventable bacterial infections are increasing**. This should include wound care services and treatment for injection site infections and the provision of tetanus vaccination when appropriate (40, 63, 108). People with any skin lesions or other signs of infection should be encouraged to seek prompt medical attention, and services that work with PWID, homeless and prison populations should report any clusters of cases to allow for prompt identification and control of outbreaks. Services that work with PWID populations should ensure easy access to NSPs and emphasize safe and hygienic injection practices, including use of as little acidifier as possible (half a sachet is enough to prepare a typical £10 bag of street heroin), and rotation of injection sites to avoid vein damage.

Hepatitis C continues to be a major problem among PWID in the UK with around 1 in 4 currently infected with HCV. There is **early evidence of a modest reduction in chronic hepatitis C prevalence** concomitant with the scale-up of DAA treatment among PWID. Early evidence for an increase in testing and uptake of treatment among PWID in line with HCV elimination activities can also be observed in 2018, yet **many hepatitis C infections remain undiagnosed among PWID** and the high proportion of individuals who indicate they have not been tested recently indicate there is scope for improvement as retesting is required among those at continued risk. It is of utmost importance that diagnostic testing services and care pathways for those infected are continued and where appropriate expanded. Routine opt-out testing approaches should be considered where appropriate. Well-designed, supportive care pathways for those infected are needed, and those diagnosed with hepatitis C and who continue to inject should have access to effective treatment and care in line with current guidelines (40, 109-111). One of the biggest obstacles to entering care pathways for HCV is the lack of treatment settings suitable for PWID. Multidisciplinary and peer-supported programmes have been shown to be successful, as well as offering BBV testing, treatment and care in a variety of settings including drug treatment clinics, NSP and prisons (112, 113). There is **no indication of a reduction in new HCV infections** over recent years. Together with ongoing scale-up of interventions aimed to improve testing and treatment for HCV, continued efforts to improve harm reduction, such as OST and NSP, will be essential to reach the WHO goals and eliminate HCV by 2030.

In the UK, **HIV prevalence remains low, but risks continue** among PWID, and HIV outbreaks still occur; notably the ongoing incident in Glasgow. Injecting drug use among some groups of MSM is also a concern, and commissioners should take steps to understand the needs of local MSM population and commission appropriate services (114). To ensure HIV levels remain low, it is important that testing for HIV is offered regularly to all those at risk, that care pathways for those with HIV are maintained, and that services adapt to changing patterns of risk (40). Late HIV diagnoses among PWID remain a problem, providing risks for both the individual and others through sexual transmission and risks from sharing of injecting equipment.

Hepatitis B infections among PWID remain rare, but vaccine uptake needs to be sustained, particularly in younger age groups. The provision of vaccination for this population should be maintained in line with guidance (63) and ways of further improving uptake among PWID explored.

Continued sharing and re-use of injecting equipment remains a concern. Sharing levels reported in England, Wales and Northern Ireland have not improved in recent years and only around 3 in 5 PWID reported adequate needle/syringe provision for their needs. Also re-use of an individual's own injecting equipment is commonly reported in the UK, which can put individuals at risk infection (69). A range of easily accessible services for all PWID, including those using drug treatment, need to be provided in line with guidance, including needle and syringe provision (70, 106). Low dead space equipment should be offered and encouraged where appropriate (40, 70), including detachable needles and syringes that have lower dead space. NSP should continue to offer interventions that support entry into treatment and other interventions that encourage a reduction or cessation of injecting as a route of consumption. They should aim to distribute sufficient appropriate injecting-related equipment to prevent sharing and re-use and support hygienic injecting practices.

The changing patterns of psychoactive drug injection remain a concern because **changes in psychoactive drug preferences could lead to riskier injecting practices.** Injection of crack cocaine has increased in England and Wales, and injection of powder cocaine has increased in Scotland. There is a need for local treatment and harm reduction systems that can respond to both the increasing numbers and the specific needs of crack and powder cocaine users. Strong local partnerships can provide effective links between treatment, prevention and the criminal justice system, for example through greater availability of arrest referral schemes and improved monitoring of Drug Rehabilitation Requirements (in England and Wales) or Drug Treatment and Testing Orders (in Scotland), and make sure that people get the support they need.

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