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Needle Exchange Surveillance Initiative (NESI): Monitoring blood-borne viruses and injecting risk behaviours among people who inject drugs in Scotland, 2008–09 to 2022–23

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GCU Glasgow Caledonian University Research Centre for Health (ReaCH)

NESI

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Contents

Key findings

The key findings of the Needle Exchange Surveillance Initiative (NESI) for the period 2008-09 to 2022-23 are as follows:

Demographic and drug trends

- The average age of NESI participants has increased with each survey, from 34 years old in 2008-09 to 43 years old in 2022-23, reflecting an ageing cohort of people who inject drugs (PWID) in Scotland. In 2022-23, around four in ten participants were aged 45 or older at the time of interview.

- Cocaine injecting has increased dramatically over time, with 60% of those who had injected in the past six months reporting it in 2022-23, up from 37% in 2019-20. Heroin remains the most common drug injected in the last six months but has reached its lowest level since the surveys began (72% in 2022-23, as compared with 89%-97% in previous sweeps). Polydrug injection (injection of two or more drugs in the past six months) has increased from 12% in 2010 to 43% in 2022-23.

- Among respondents who had injected in the last six months, drug consumption via other routes was highly prevalent, with 45% reporting smoking/snorting crack cocaine (up from 28% in 2019-20), 31% reporting smoking/snorting powder cocaine (up from 19% in 2019-20) and 51% reporting taking benzodiazepines orally (down from 59% in 2019-20).

Uptake of harm reduction services

- There is evidence of an increase in buprenorphine prescribing among participants who had injected in the last six months (8% in 2022-23 had received standard buprenorphine in the last six months, compared with 4% in 2017-18 and 2019-20; 11% reported receiving long-acting buprenorphine in the last six months in 2022-23).

- The highest proportion of participants to date had received a take-home naloxone kit in the past year (69%), however only 9% were carrying naloxone with them at the time of interview (down from 21% in 2019-20).

Uptake of blood-borne virus services

- The proportion of participants who reported having been vaccinated for hepatitis B virus (HBV) fell to its lowest level since the surveys began, with 52% in 2022-23 reporting receipt of at least one dose of the vaccine, compared with 68%-77% in previous sweeps.

- Uptake of hepatitis C virus (HCV) and human immunodeficiency virus (HIV) testing have remained at similar levels for the last three sweeps (with 55% and 52% of 2022-23 respondents tested for HCV and HIV within the previous 12 months, respectively).

- In 2022-23, 92% of those who were aware of their HCV infection had received treatment, marking a substantial and continued increase in uptake since the introduction of direct-acting antiviral (DAA) therapies in 2015-16. More than three quarters (79%) of participants who would have been eligible for therapy (i.e. with evidence of either current or past chronic infection) reported having been treated for their HCV infection.

Blood-borne virus infection

- The prevalence of chronic HCV (i.e. active infection) had previously reduced from 37% in 2015-16 to 19% in 2019-20, contemporaneous with the scale-up of HCV treatment among PWID in community settings. While the prevalence of HCV has further declined to 15% in 2022-23, the rate of decline has slowed, which may be attributable to fewer people being treated for their HCV during the COVID-19 pandemic. The decline in chronic HCV prevalence represents a 59% reduction across Scotland since 2015-16 and an 86% reduction in Tayside, where there has been a rapid scale-up of DAA therapies among PWID.

- Despite the reduction in chronic HCV prevalence, the prevalence of HCV antibodies among those with less than three years since onset of injecting (a proxy for new infections) is very high at 40% in 2022-23.

- Forty-one individuals with HIV were detected in 2022-23, equating to a national prevalence of 2.1%. Most of these individuals (n=32) were recruited at sites in NHS Greater Glasgow & Clyde (the setting of an HIV outbreak that began in 2015), where the prevalence of HIV remains relatively stable (4.4% in 2022-23, compared to 4.8% in the two previous sweeps). These findings suggest that there was limited HIV transmission during and since the COVID-19 pandemic.

- Of participants in 2022-23 who were found to have chronic HCV (based on their anonymous dried blood spot test), 26% reported that they were aware of their infection, which compares to 48% to 62% in previous surveys. By contrast, the proportion aware of their HIV infection increased substantially from 41% in 2019-20, to 83% in 2022-23, likely reflecting enhanced testing efforts in response to the outbreak.

Other drug-related harms

- Among 2022-23 participants who had injected in the last six months, one in four (25%) reported experiencing a non-fatal overdose in the last year. This is a slight increase from 2019-20 (21%) and 2017-18 (18%).

1. Introduction

The aim of the Needle Exchange Surveillance Initiative (NESI) is to measure and monitor the prevalence of blood-borne viruses (hepatitis C (HCV) and human immunodeficiency virus (HIV)), other health harms, risk behaviours and uptake of harm reduction and health services among people who inject drugs (PWID) in Scotland. NESI is a key source of data to monitor and evaluate progress, nationally and locally, against Scotland's blood-borne virus strategies, including the Scottish Government's Sexual Health and Blood Borne Virus Action Plan and associated strategies on HCV elimination and HIV transmission elimination.[1,2,3]

NESI is also one of the key data sources for Scotland to support UK plans for the validation of World Health Organization (WHO) viral hepatitis elimination targets (to be achieved by 2030). NESI data can monitor progress against impact targets (≥80% reduction in HCV viraemic prevalence in a representative sample of PWID, a proxy for reduction in HCV incidence) and programmatic targets (≥90% of persons with chronic HCV infection diagnosed, ≥80% of persons diagnosed with chronic HCV infection treated, and ≥300 needles/syringes distributed per PWID per year). Targets must be achieved and maintained for at least two years.[4] Similarly, NESI data can be used to monitor progress against WHO targets aligned to global health sector strategies on HIV. These targets are: 95% of PWID living with HIV who know their status, and ≥200 needles/syringes distributed per year per PWID (both to be achieved by 2025).[5,6]

This report, alongside the **data tables**, presents the results of the latest NESI survey, undertaken in 2022-23. Results are presented at a Scotland level across the eight surveys undertaken to date (from 2008-09 through to 2022-23), and at NHS board level for the 2022-23 survey. The 2022-23 survey is the first sweep of NESI to be undertaken since the COVID-19 pandemic.

2. Overview of Methods

NESI is a cross-sectional, voluntary, bio-behavioural survey that is typically undertaken every two years. Trained interviewers recruit participants from selected agencies and pharmacies that provide injecting equipment (these settings may also provide other harm reduction services, such as prescribed methadone). Clients attending these services are invited to take part if they have injected drugs on at least one occasion either recently or in the past, and if it is the first time they have participated in the current survey. However, since the focus of NESI is on those currently and recently injecting, recruitment of people who have injected in the past, but not in the previous six months, is constrained (to 30-40% of participants in recent surveys). Similarly, since the focus of NESI is primarily on those injecting psychoactive drugs, the number of individuals reporting injection of image and performance enhancing drugs only is capped at 5% of total recruitment in each NHS board. More detailed methods are provided in Appendix 1.

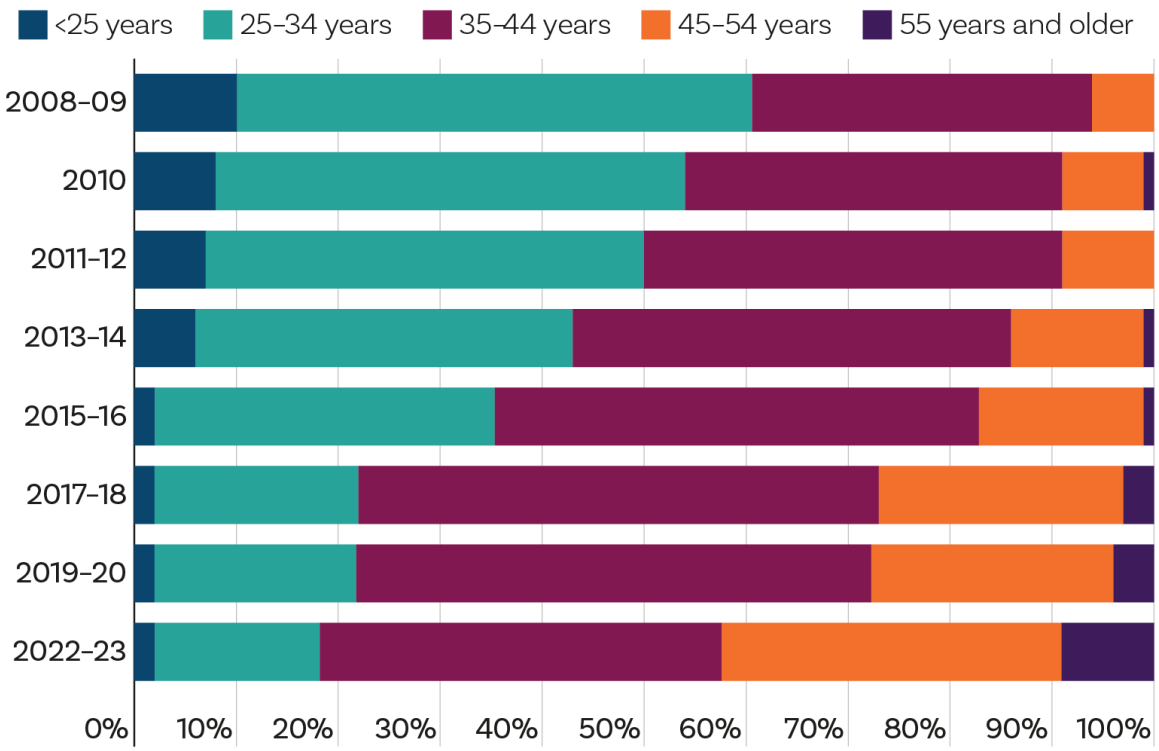
After providing informed written consent, participants complete an interviewer-administered questionnaire (Appendix 2) and then provide a voluntary blood spot sample for anonymous testing for blood-borne virus markers. Participants who wish to know their HCV or HIV status are directed to the appropriate testing services. Participants receive a shopping voucher as compensation for their time.

3. Results

3.1. Demographics

An ageing cohort of PWID is evident in NESI over time, with the proportion of those interviewed aged under 25, down from 10% (n=268) in 2008-09 to just 2% (n=40) in 2022-23 (Table 1.1 and Figure 1). Correspondingly, the proportion aged 45 years and older has increased, from 7% (n=171) in 2008-09 to 42% (n=868) in 2022-23. Additionally, age at first injection has remained largely static over time, which suggests that that the increasing average age is a result of an ageing cohort of users, rather than simply individuals who are commencing injecting at an older age.

Figure 1: Proportion of NESI respondents by age group, 2008 to 2023

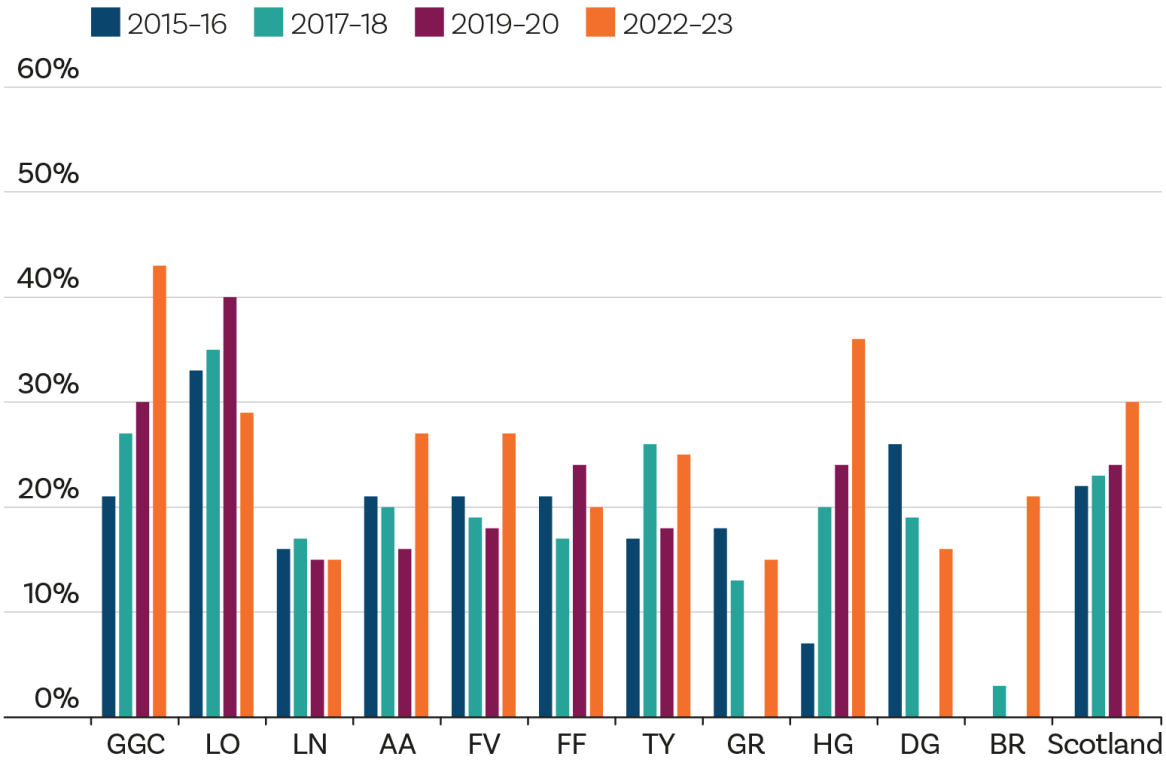


The proportion of male participants in NESI 2022-23 remained largely unchanged from previous surveys at 69% (n=1,406).

3.2. Risk environment

The proportion of respondents reporting homelessness in the last six months was slightly higher in 2022-23 (30%, n=614) as compared with previous surveys and has been increasing over time (Table 1.1 and Figure 2). This finding was more evident in some NHS boards than others, in particular, NHS Greater Glasgow & Clyde (GGC) (in 2022-23: 43%, n=320) and NHS Highland (in 2022-23: 36%, n=15) (Table 2.1 and Figure 2). The proportion who are homeless in each sweep may be affected by the sites where NESI recruits from, for example, if more people are recruited from sites that also provide homeless services, then we might expect a higher proportion of homeless respondents. While the 2022-23 NESI sweep in GGC recruited proportionally more respondents from the Simon Community (an organisation that provides services for those experiencing and at risk of homelessness), the proportion homeless among individuals recruited at this site was similar to other Glasgow city centre sites. Excluding the participants recruited from the Simon Community does not dramatically change the proportion of homeless respondents in GGC (43% vs. 38%).

Figure 2: Proportion of NESI respondents reporting homelessness in the last six months, by NHS board, 2015 to 2023[a]



[a] Recruitment in 2019-20 was suspended early because of the COVID-19 pandemic and therefore there is no data for NHS Borders, Dumfries & Galloway or Grampian in 2019-20. The proportion for NHS Borders in 2015-16 is 0%.

Key: GGC = Greater Glasgow & Clyde. LO = Lothian. LN = Lanarkshire. AA = Ayrshire & Arran. FV = Forth Valley. FF = Fife. TY = Tayside. GR = Grampian. HG = Highland. DG = Dumfries & Galloway. BR = Borders.

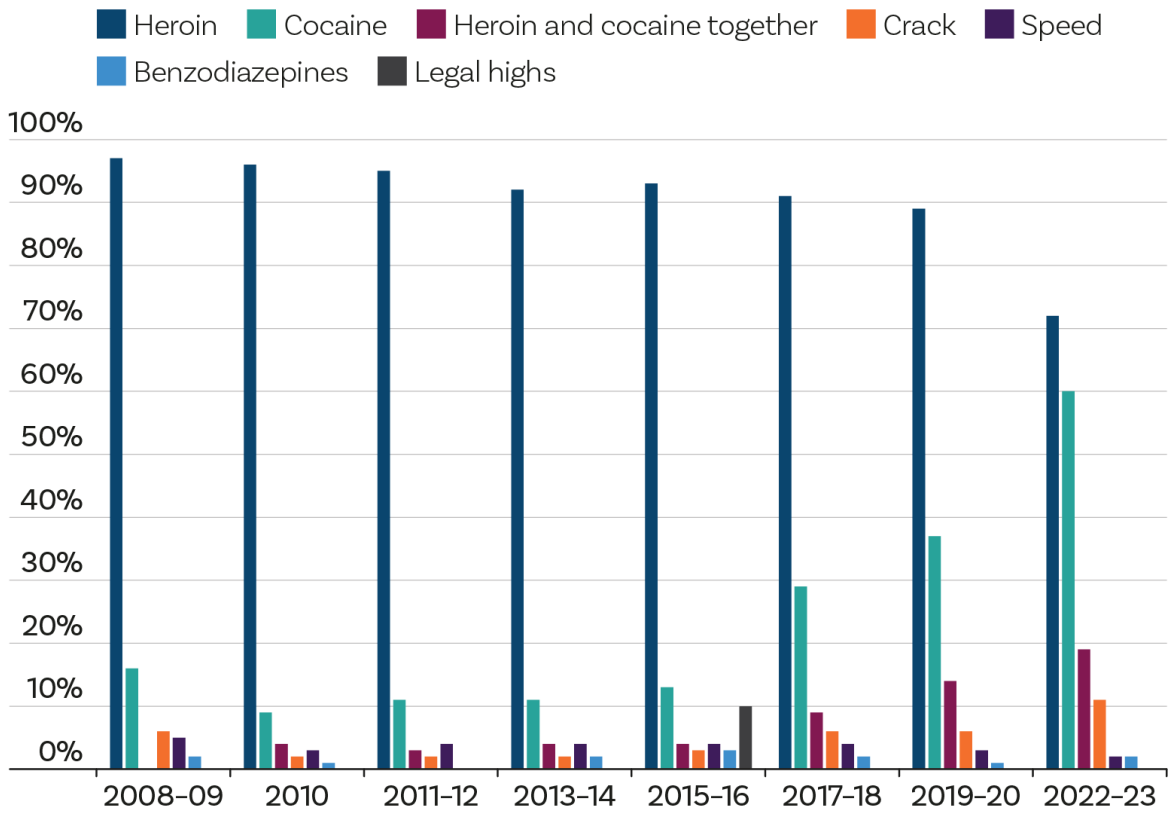
3.3. Drug trends

3.3.1 Injecting

Heroin continues to be the most prevalent drug injected, however it has declined to the lowest level since the NESI surveys began, with 72% of those interviewed in 2022-23 reporting having injected heroin in the past six months (compared with 89% of those interviewed in 2019-20, and between 91% to 97% in earlier surveys (Table 1.2 and Figure 3)). Reported injection of powder cocaine continues to increase markedly over time, from 9% in 2010 (n=217) and 37% (n=619) in 2019-20, to 60% (n=761) in 2022-23 (Figure 3), with levels highest in NHS GGC (76%, n=361) and NHS Forth Valley (78%, n = 62) (Table 2.2). Cocaine injecting has previously been linked to an outbreak of HIV among PWID in GGC.[7] The practice of injecting heroin and cocaine together, sometimes referred to as 'snowballing', also showed an increase, with a prevalence of 19% (n=238) in 2022-23, up from 14% (n=239) in 2019-20 and 9% (n=128) reported in 2017-18. There has been a smaller, but consistent, increase in the injection of crack cocaine, from 2% (n=45) in 2010 to 11% (n=136) in 2022-23. Crack cocaine injection was particularly prevalent in NHS Grampian (35%, n=29) (Table 2.2).

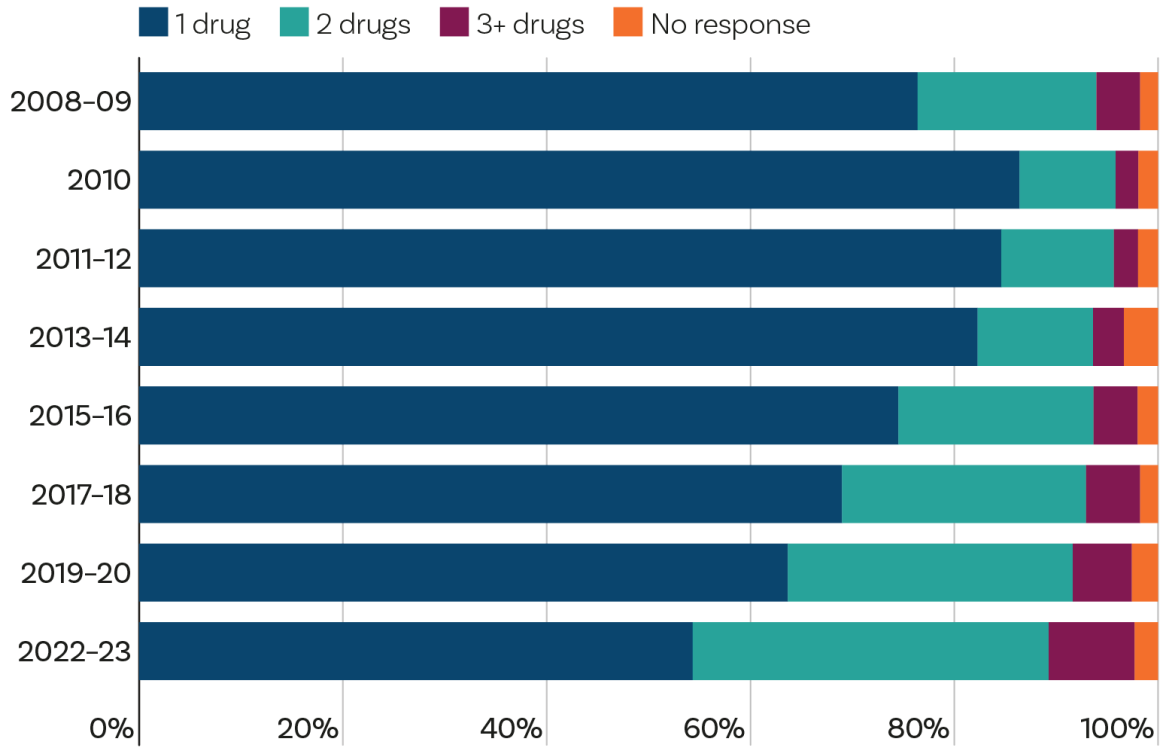
Polydrug injection (injection of two or more drugs) in the last six months has increased steadily from 12% (n=280) in 2010 to 43% (n=549) in 2022-23 (Table 1.2 and Figure 4).

Figure 3: Proportion of NESI respondents reporting injection of various drugs in the last six months, 2008 to 2023 (among those who reported injecting in the last six months)[b]



[b] "Heroin and cocaine together" was not a response option in 2008-09. "Legal highs" was introduced as a response option in 2015-16.

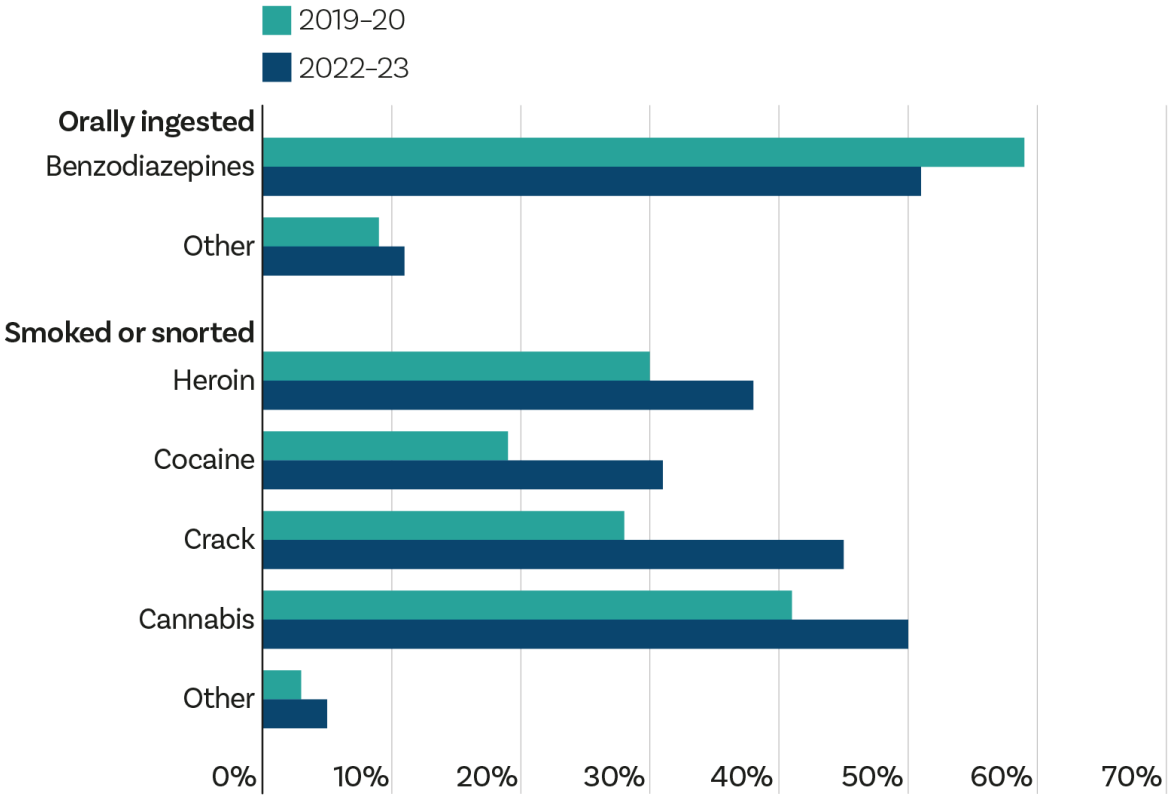
Figure 4: Proportion of NESI respondents by number of drugs injected in the last six months, 2008 to 2023 (among those who reported injecting in the last six months)



3.3.2 Smoking, snorting or taking drugs orally

The questions relating to consumption of drugs via non-injection routes were introduced in 2019-20. Among NESI 2022-23 respondents who had injected in the last six months, cannabis was the most commonly smoked/snorted drug (50%, n=638), followed by crack cocaine (45%, n=565), heroin (38%, n=481) and powder cocaine (31%, n=390). Notably, reports of smoking/snorting all these drugs were higher than in the 2019-20 survey (Table 1.2 and Figure 5). There was substantial regional variation in crack cocaine smoking, with the highest rates reported in NHS Grampian (78%, n=64), Tayside (70%, n=79) and Fife (68%, n=38) (Table 2.2). Approximately half of respondents reported orally ingesting benzodiazepines (51%, n=644), this had declined slightly from 59% in 2019-20 (Table 1.2).

Figure 5: Proportion of NESI respondents reporting drugs consumed via non-injection routes of administration in the last six months, 2019-20 and 2022-23 (among those who reported injecting in the last six months)[c]

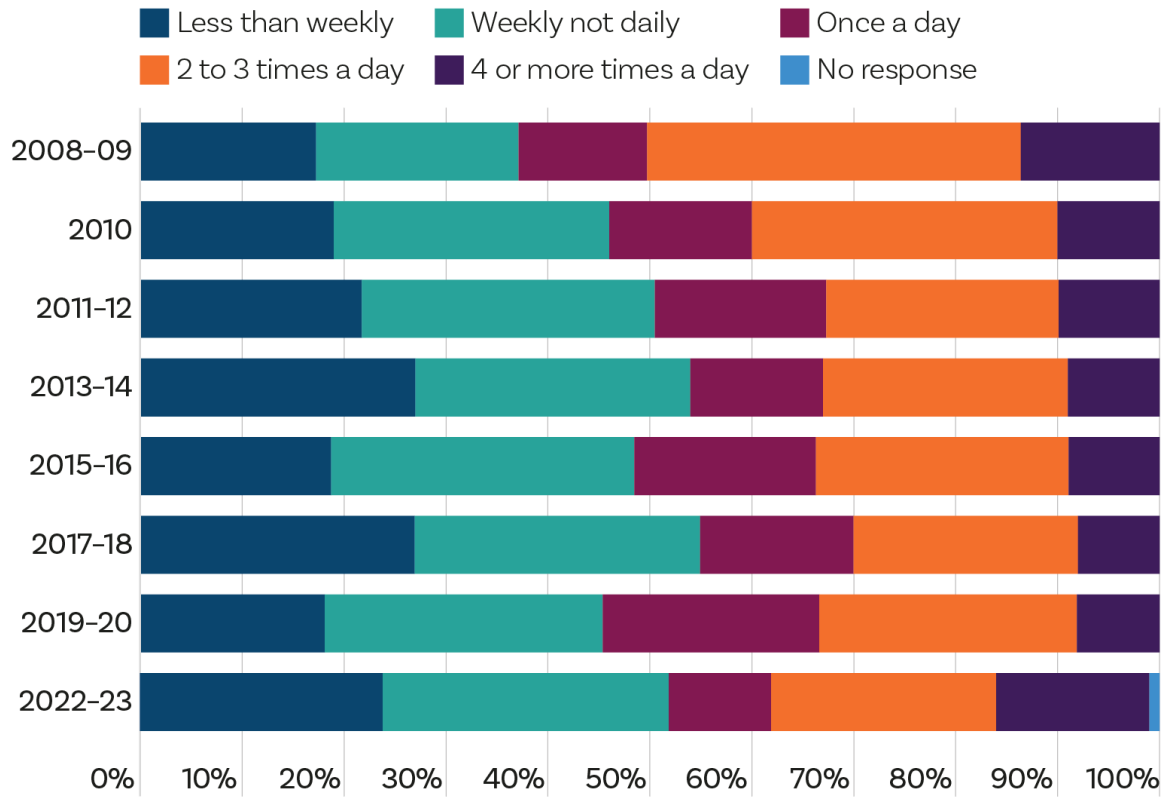


[c] 'Other' drugs that were smoked/snorted or orally ingested in 2022-23 include ketamine (1.6%, n=20) and gabapentinoids (8%, n=97), respectively.

3.4. Injecting risk behaviour

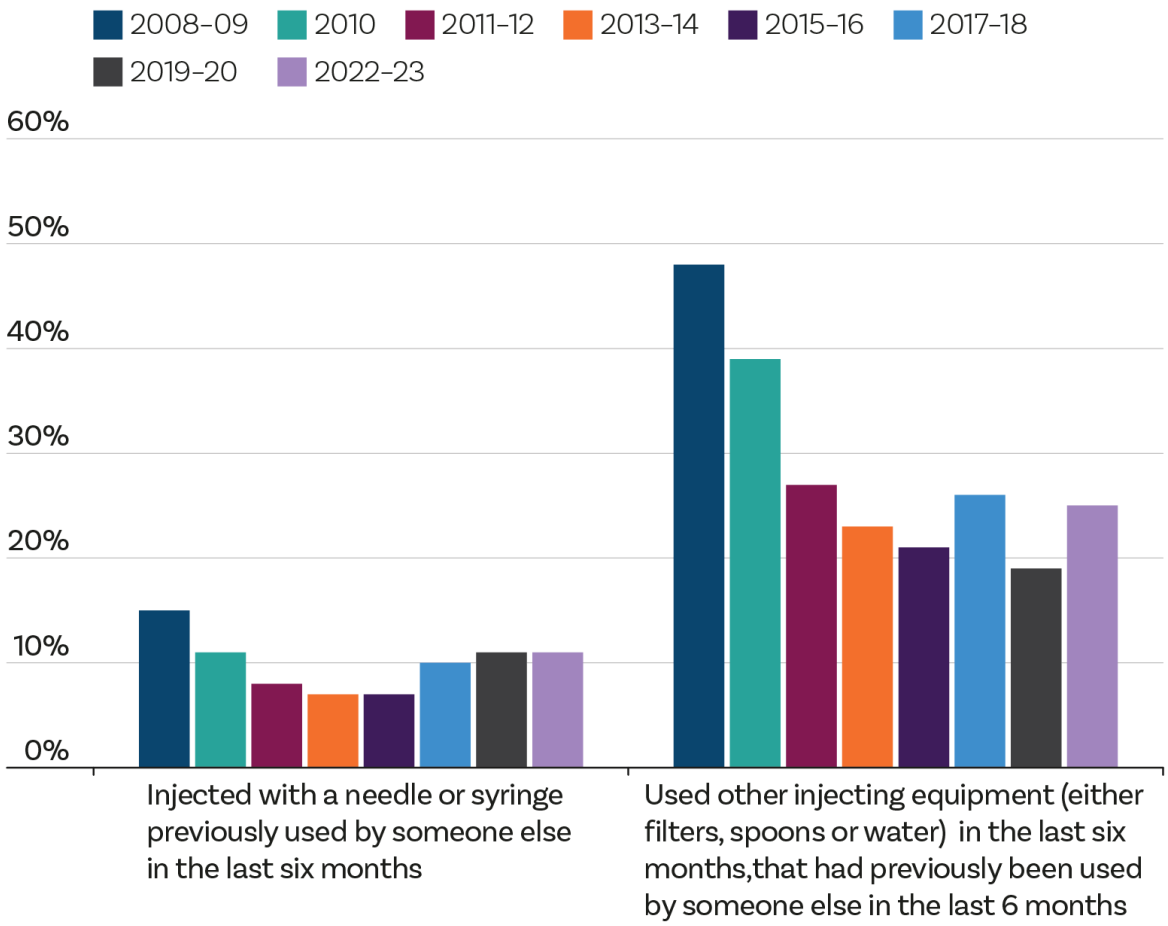
Among respondents who had injected in the past six months, the proportion who reported injecting once a day or more frequently (47%, n=600) has fluctuated slightly over time, but has accounted for approximately half of respondents in each survey (Table 1.3 and Figure 6). The proportion that reported injecting four or more times a day has increased slightly, from 8-9% over the previous four surveys to 15% (n=184) in 2022-23. Stimulants such as powder cocaine have a shorter duration of psychoactive effects, which is understood to increase injection frequency.[8] The observed increase in cocaine injecting may account for the increase in those injecting very frequently.

Figure 6: Proportion of NESI respondents by frequency of injecting in the last six months, 2008 to 2023 (among those who reported injecting in the last six months)



Levels of reported needle and syringe sharing in the past six months did not change from 2019-20, remaining at 11% (n=142), and have been relatively stable since 2010, ranging from 7% to 11% (Table 1.3 and Figure 7). Trends in reported personal reuse of one's own needles and syringes, however, increased from 44% (n=726) in 2019-20 to 52% (n=662) in 2022-23 (Table 1.3). Reported sharing of other injecting equipment (spoons/cookers, filters, water) in the past six months has remained approximately stable since 2011-12, varying between 19% to 27% (25% in 2022-23, n=314) (Table 1.3 and Figure 7).

Figure 7: Proportion of NESI respondents who reported sharing injecting equipment, 2008 to 2023 (among those who reported injecting in the last six months)



In 2022-23, around four in ten participants who had injected in the previous six months reported mainly injecting into their arms (43%, n=542) and around a third into their groin (34%, n=430) (Table 1.3). This is the reverse of the 2017-18 and 2019-20 results, where around four in ten participants reported mainly injecting into the groin (45%, n=665 and 741, respectively), and around a third into their arms.

3.5. Uptake of harm reduction and blood-borne virus services

3.5.1 Opioid agonist therapy

Self-reported uptake of prescribed methadone among those currently injecting (i.e. had injected in the last six months) had remained high (between 70 and 80%) over the surveys from 2010 to 2019-20. In 2022-23, the proportion of participants who reported receipt of prescribed methadone in the last six months was lower at 68% (n=864). When restricted to participants who were visiting the service to obtain sterile injecting equipment (on the occasion of their recruitment into the study), the proportion who had received prescribed methadone in the last six months was 63% (n=288), which is broadly comparable to the proportion in previous sweeps (Table 1.4). The proportion of respondents who reported being prescribed buprenorphine was up from 4% (n=66) in 2019-20 to 8% (n=101) in 2022-23. Eleven percent (n=139) reported receiving long-acting buprenorphine, which proliferated during the COVID-19 pandemic to limit face-to-face contact with patients, since observed daily dosing is not required.[9] In total, 81% (n=1,030) reported receiving opioid agonist therapy (either methadone or any buprenorphine) in the last six months (75% when restricted to those who were visiting the service to obtain sterile injecting equipment).

3.5.2 Sterile injecting equipment

The fluctuating trend in reported average numbers of sterile needles/syringes accessed by participants continued with a median of 10 per week in 2022-23, up from 7 per week in 2019-20 (Table 1.4). Respondents also reported uptake of filters (89%, n=1,129) and spoons (89%, n=1,128) in 2022-23, the same proportions as those in the 2019-20 survey. On average, respondents reported receiving the same number of filters and spoons per week in 2022-23 (median of 10 each) as compared to the three previous surveys. With regard to the uptake of sterile water (which has steadily increased since 2ml plastic ampoules were introduced in late 2012), 86% of participants (n=1,091) reported uptake in 2022-23 compared with 85% (n=1,403) in 2019-20.

One of the WHO targets for countries seeking validation of elimination of viral hepatitis is the provision of 300 sterile needles/syringes per PWID per year by 2030 (200 per year by 2025). Table 1.4 shows the estimated median number of sterile needles/syringes obtained per year by NESI respondents: for most survey years this figure has exceeded 200. In 2022-23, the median was 260, which is slightly short of the 2030 target of 300 per year, but exceeds the 2025 target of 200 per year.[4,5] When not restricted to individuals who reported reasons other than needle exchange for their visit to the service (on the occasion of their recruitment to the study), the median was 312.

Another approach to quantify the uptake of sterile needles/syringes is to calculate ‘coverage’, which considers the number of sterile needles/syringes obtained in relation to the number of injections undertaken by an individual. This measure of adequate coverage (i.e. 1+ sterile needle/syringe per injection) has fluctuated across the survey years and was 68% (n=550) in 2022-23, the second lowest proportion across all the surveys after 2019-20 (65%, n=755) (Table 1.4). Similar proportions of PWID with adequate needle/syringe coverage have been reported for England (68% in 2022).[10]

3.5.3 Foil

In 2022-23, 38% (n=483) of respondents reported uptake of foil (for smoking drugs) in the last six months, compared with 45% (n=750) of the sample in 2019-20, and similar to 35% (n=513) of the sample in 2017-18. Among people who reported smoking or snorting heroin in the last six months, 54% (n=258) reported uptake of foil in 2022-23, as compared with 63% (n=308) in 2019-20 (Table 1.4). Foil uptake in 2022-23 varied between areas, with the highest rate in NHS Dumfries & Galloway (62%, n=21) and the lowest rate in NHS Fife (21%, n=12) (Table 2.4). Foil uptake in Scotland has been associated with smoking or snorting heroin and lower injecting frequency.[11]

3.5.4 Take-home naloxone

Naloxone, commonly known as 'take-home naloxone', is an opioid antagonist that is supplied to people who use drugs, their friends, family members, and a range of health and other professionals likely to encounter overdose. Despite several legislative amendments increasing its accessibility to these different groups, it remains a prescription-only medicine in the UK. The proportion of NESI participants who reported that they had been prescribed a take-home naloxone kit in the past year rose again from 8% (n=175) in 2011-12, and 63% (n=1,544) in 2019-20, to 69% (n=1,421) in 2022-23 (Table 1.4 and Figure 8). Naloxone distribution rates were highest in NHS Dumfries & Galloway (80%, n=41) and lowest in NHS Lanarkshire (60%, n=146) (Table 2.4). In contrast, the carriage rate (i.e. the proportion of people in possession of naloxone at the time of their NESI interview) among those who had been given take-home naloxone fell considerably, from 21% (n=318) in 2019-20 to 9% (n=124) in 2022-23.

3.5.5 COVID-19 vaccination

Since the 2022-23 survey is the first sweep of NESI to be undertaken after the COVID-19 pandemic, participants were asked for the first time about their uptake of COVID-19 vaccination: 64% (n=1,316) of respondents reported having received at least one dose (Table 1.5). This proportion is lower than the equivalent rate in Scotland's adult general population (90%)[i] and is consistent with Scottish evidence showing that individuals in receipt of opioid agonist therapy prescriptions have lower single-dose vaccination rates than general population-matched controls (67% and 76%, respectively).[12]

3.5.6 Hepatitis B vaccination

Uptake of hepatitis B (HBV) vaccination has been declining since 2015-16 and is now at its lowest level since the NESI surveys began, with 52% of respondents in 2022-23 (n=1,071) reporting having ever been vaccinated (Table 1.5 and Figure 8). This trend is similar to that seen elsewhere in the UK.[13] Among those who had received at least one dose of HBV vaccine, 48% of respondents interviewed in 2022-23 had been vaccinated in prison. In previous surveys, this figure ranged between 41% and 48%. Previously, high coverage of the HBV vaccine among PWID was attributed to the introduction of universal prison vaccination in 1999, which has contributed to low levels of HBV infection among PWID in Scotland, compared with other European countries.[14]

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[i] As of August 2022, it was known that 4,218,522 of eligible adults in Scotland had received at least one dose of the vaccine, equating to 89.5% of the eligible adult population, and 77.4% of Scotland's general population (n=5,447,700 as of June 2022). (https://www.ed.ac.uk/usher/eave-ii/key-outputs/our-publications/unvaccinated-adults-scotland; https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2022)

3.5.7 HCV testing

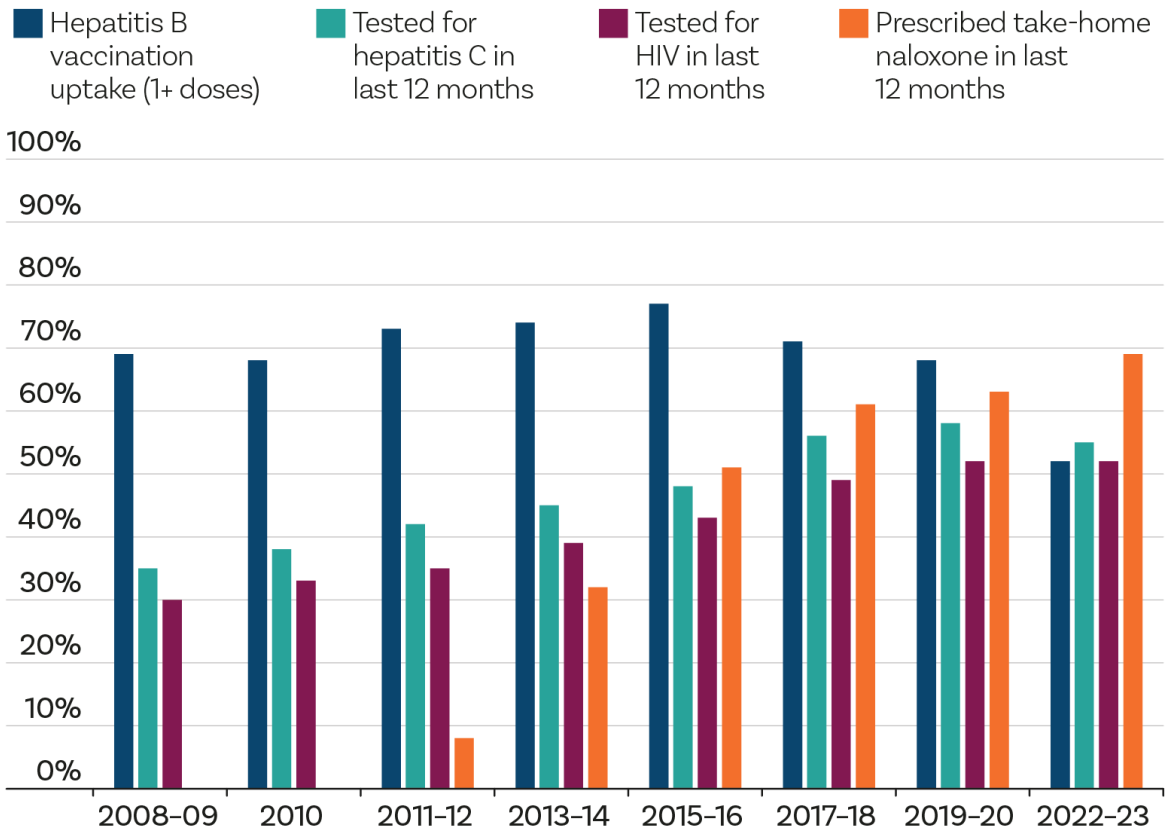
While uptake of HCV testing had been increasing consistently over time, the proportion of respondents who reported recent testing (i.e. in the last 12 months) in 2022-23 (55%, n=1,130) fell slightly compared to 2019-20 (58%, n=1,408) (Table 1.6 and Figure 8). This is consistent with other evidence that HCV testing (in drug services and prisons) declined during the COVID-19-pandemic, and may not have yet recovered to pre-pandemic levels.[9]

When those who reported that 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 HCV in the last year was 56%.[ii] This figure compares to 40%, 45%, 49%, 52%, 55%, 61% and 60% in 2008-09, 2010, 2011-12, 2013-14, 2015-16, 2017-18 and 2019-20 respectively.

HCV testing rates were highest in NHS GGC (60%, n=453), NHS Forth Valley (63%, n=82) and NHS Borders (63%, n=39) and were lowest in NHS Fife (43%, n=41) (Table 2.6), but may have been influenced by the sites used for NESI recruitment. For example, where NESI recruitment occurred at sites that routinely test for blood-borne viruses, testing rates are likely to be higher. In 2022-23, 44% (n=802) reported having received their last HCV test in a drug treatment setting (the most common setting for testing), compared with 54% (n=1,193) of respondents in 2019-20. Among the 336 participants who responded 'Other' to where they were last tested in 2022-23, the most common settings were: outreach van (n=64), needle exchange (n=47), the Simon Community Access Hub (n=46) and pharmacy (n=33).

[ii] The rationale for excluding those diagnosed from a past test is that they would not be eligible for continued routine testing. From the NESI data it is, however, not possible to determine whether those who reported testing positive in the last 12 months had been diagnosed previously. Therefore the figure of 56% may include some people who were ineligible for diagnostic testing in the last 12 months.

Figure 8: Proportion of NESI respondents who reported receiving hepatitis B vaccination, a hepatitis C/HIV test, or take-home naloxone, 2008 to 2023



3.5.8 HCV treatment

In 2022-23, 92% (n=654) of those who were aware of their infection (i.e. answered they have HCV or had cleared HCV through treatment), had ever received therapy for their HCV infection. This figure exceeds the WHO target of ≥80% of persons diagnosed with chronic HCV infection treated and also marks a substantial and continued increase from 70% (n=506) in 2019-20, 50% (n=387) in 2017-18, and 28% (n=229) in 2015-16 (Table 1.6). Of those who had ever received therapy, 27% (n=176) had received it in the last year; this compares to 49% (n=248) in 2019-20, 44% (n=170) in 2017-18, and 36% (n=82) in 2015-16. Self-reported treatment engagement may, however, overestimate treatment uptake as it only includes individuals who are aware of their infection (i.e. who report they have HCV or have cleared HCV through treatment). When all participants eligible for treatment (i.e. with evidence of either current or past chronic infection, based on a combination of their dried blood spot test result and self-report data) are included, 79% report having ever been treated for their HCV infection. Most respondents reported starting their most recent course of therapy at a community site (47%, n=310), similar to 2019-20 (52%, n=265).

3.5.9 HIV testing

The proportion of respondents who reported recent HIV testing (i.e. in the last 12 months) had been consistently increasing up until 2019-20 but stabilised in 2022-23 (52%, n=1,057) (Table 1.6 and Figure 8). Testing rates were highest in NHS Borders (65%, n=40) and NHS GGC (60%, n=452), and lowest in NHS Lanarkshire (34%, n=82) and NHS Fife (40%, n=38) (Table 2.6). As above, this is consistent with other evidence that HIV testing declined during the COVID-19-pandemic and may not have yet recovered to pre-pandemic levels.[9] Similar to HCV testing, HIV testing rates may have been influenced by the sites used for NESI recruitment.

3.6. Blood-borne viruses

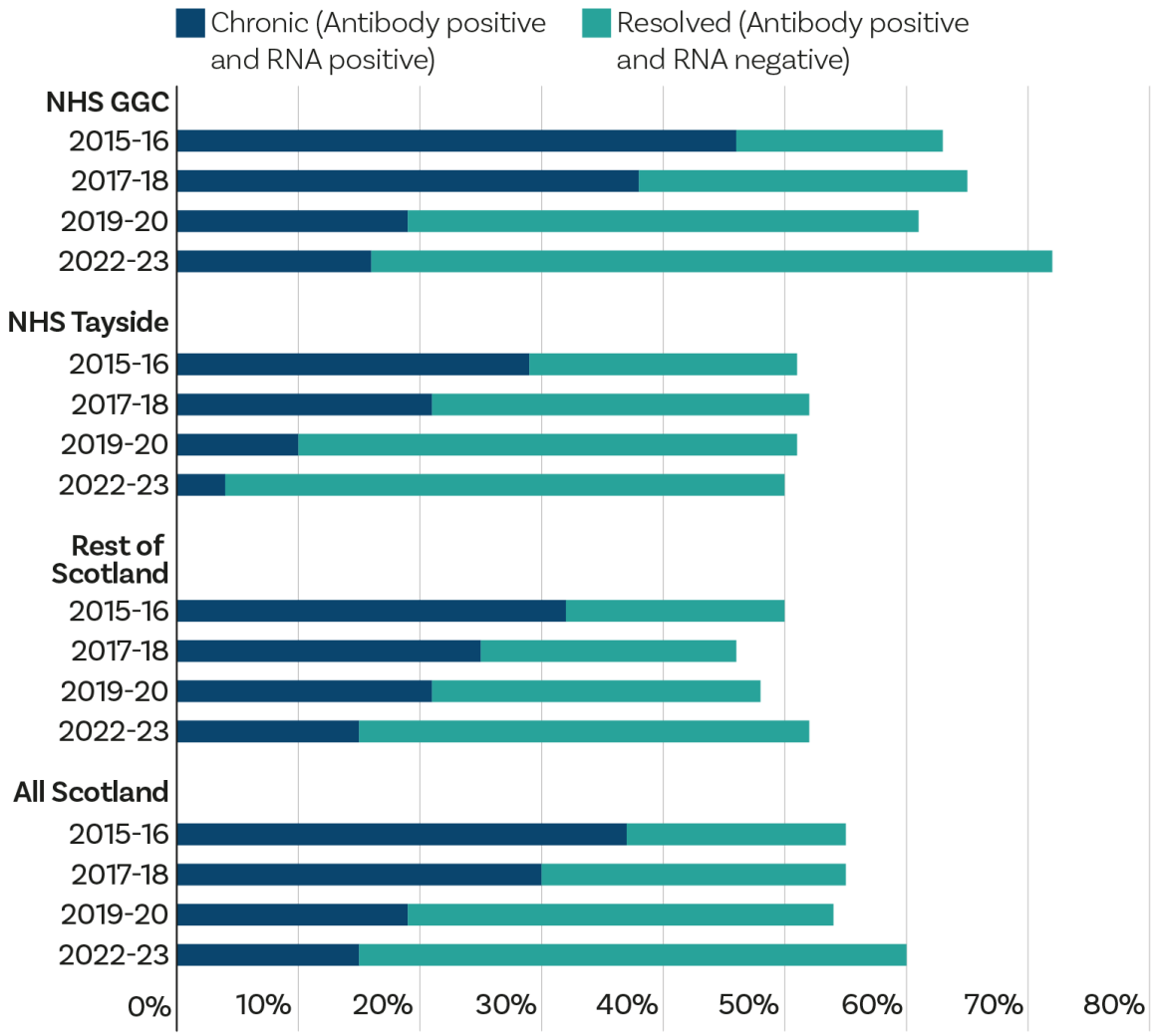
3.6.1 HCV prevalence

In 2022-23, HCV antibody prevalence among PWID remained high at 60% (n=1,203) (Table 1.7). As in 2019-20, HCV antibody prevalence in 2022-23 was highest in NHS GGC (73%, n=535) and NHS Ayrshire & Arran (63%, n=84) (Table 2.7). The prevalence of HCV antibodies, however, is only a marker of 'ever infection' and provides no information about whether an individual has an active infection or has cleared their infection.

We conducted ribonucleic acid (RNA) testing on the HCV antibody positive samples to determine how many individuals had chronic HCV (i.e. had an active infection at the time of the survey) or had cleared HCV. Prior to the COVID-19 pandemic, there had been a marked reduction in the prevalence of chronic HCV in Scotland, from 37% in 2015-16 down to 19% in 2019-20. This decline in chronic HCV prevalence was likely attributable to the increase in uptake of HCV therapy following the introduction of new direct-acting antiviral therapies (DAAs) in 2014-15, and corresponding efforts to increase treatment for HCV infection among people actively injecting drugs by offering it in a range of community settings such as drug treatment services, pharmacies and injecting equipment provision (IEP) sites.[15] In 2022-23, the prevalence of chronic HCV declined further but only marginally from 2019-20, down to 15% (n=286) (Table 1.7 and Figure 9), possibly because of less treatment of HCV-infected individuals in community settings during the COVID-19 pandemic. In NHS Tayside, where the scale up of DAAs among PWID was greatest, chronic prevalence continued to decline, reaching 4% in 2022-23 (Table 2.7 and Figure 9).

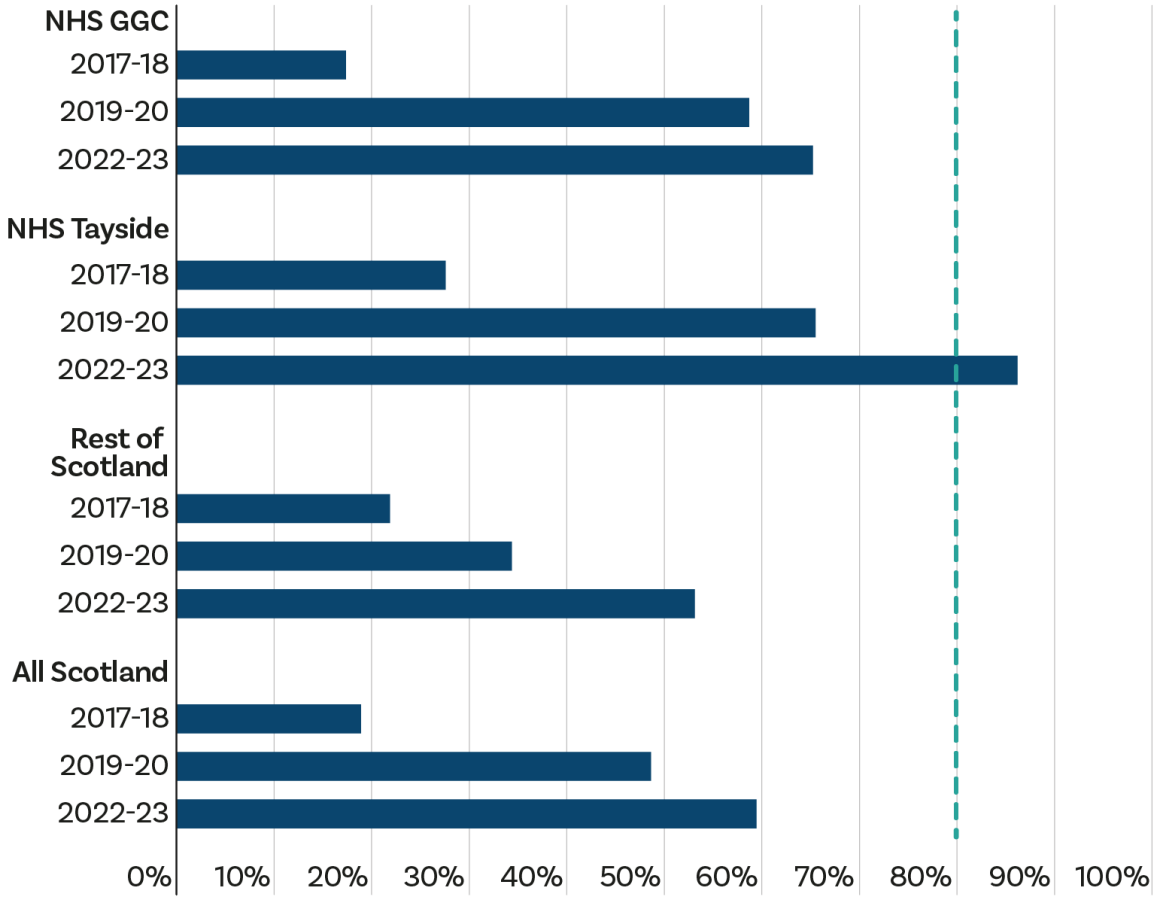
One of the WHO targets for validation of elimination of HCV (see also 'Sterile injecting equipment' and 'Diagnosed and undiagnosed HCV infection') is a reduction in the prevalence of chronic HCV by 80% from 2015 (a proxy for reduction in HCV incidence).[4] Scotland's progress against this target, broken down by regions, is shown in Figure 10. Overall, Scotland falls short of the target in 2022-23, having achieved a 59% reduction in chronic HCV prevalence. However, NHS Tayside exceeds the 80% target in 2022-23, with an 86% reduction from 2015-16.

Figure 9: Proportion of NESI respondents with chronic and cleared (resolved) hepatitis C infection during the era of direct-acting antiviral therapy, 2015 to 2023



Key: GGC = Greater Glasgow & Clyde.

Figure 10: Percentage decline in chronic hepatitis C prevalence from 2015-16 among NESI respondents, indicating progress towards the World Health Organization target of 80%[d]



[d] The dashed line indicates the World Health Organization target of ≥80% reduction in hepatitis C viraemic prevalence (i.e. chronic hepatitis C prevalence) in a representative sample of people who inject drugs.

Key: GGC = Greater Glasgow & Clyde.

3.6.2 HCV incidence

An indicator of recently acquired HCV infection is HCV prevalence among those who had recently commenced injecting: in 2022-23, this was 40% (n=64) among those who had been injecting for less than three years, which is higher than 31% (n=58) in 2019-20, and suggests a high rate of new infections (Table 1.7).

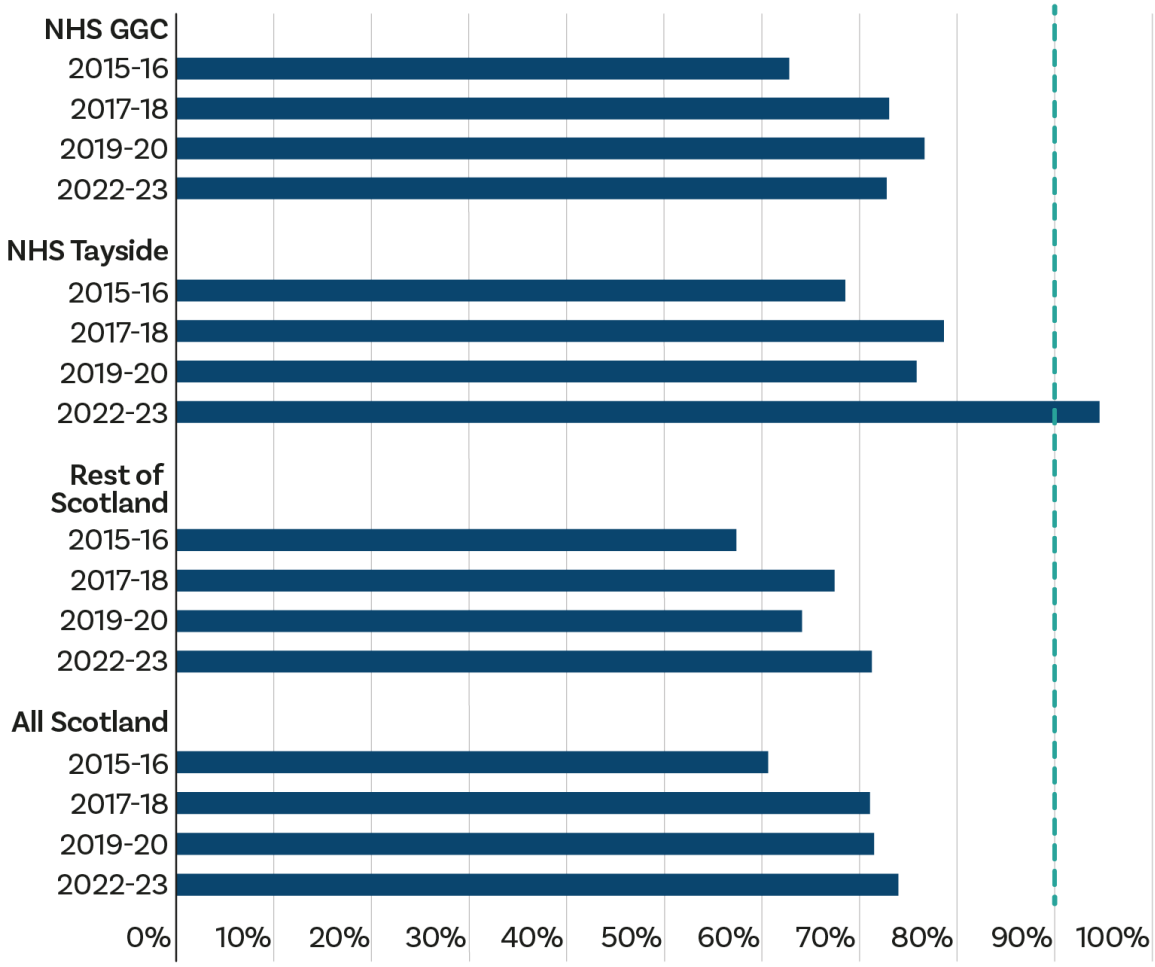
In 2019-20, 22 respondents were found to be HCV RNA positive and HCV antibody negative, another indicator of recently acquired infection, although note this relates only to new primary infections (i.e. not reinfections). These 22 'window period' infections translate into an incidence rate of 16.9 new HCV infections per 100 person-years (see Appendix 1 for details on how this number was calculated). HCV incidence among those who had injected in the last six months was 25.9 new HCV infections per 100 person-years in 2022-23. These estimates of HCV incidence are the highest across all the NESI surveys and are consistent with the high prevalence of HCV antibodies among those who recently commenced injecting (Table 1.7).

3.6.3 Diagnosed and undiagnosed HCV infection

Among people who had a current chronic HCV infection (i.e. HCV antibody positive and RNA positive on dried blood spot (DBS) testing at the time of the survey), 26% (n=74) in 2022-23 self-reported that they had been diagnosed (Table 1.7): a decrease from 56%, 60% and 48% in 2015-16, 2017-18 and 2019-20, respectively.

One of the WHO targets for validation of elimination of HCV (see also ‘Sterile injecting equipment’ and ‘HCV prevalence’) is ≥90% of people who inject drugs infected have been diagnosed (a proxy for ≥90% of people with HCV diagnosed). These figures differ from those presented above because they relate to current and past chronic infection. Scotland’s progress against this target, broken down by regions, is shown in Figure 11. NHS Tayside has exceeded the target in 2022-23 with 95% of those with current/past chronic infection diagnosed. Scotland overall fell short of the target at 74% (Table 2.7 and Figure 11).

Figure 11: Proportion of NESI respondents who have been diagnosed among those with current or past chronic hepatitis C infection, 2015 to 2023[e]



[e] The dashed line indicates the World Health Organization target of ≥90% of persons with chronic hepatitis C infection diagnosed.

Key: GGC = Greater Glasgow & Clyde.

3.6.4 HIV prevalence

HIV prevalence had gradually increased across Scotland from 2011-12 to 2019-20 (from 0.3% (n=6) in 2011-12 to 3.1% (n=73) in 2019-20), driven primarily by an outbreak of HIV among PWID in NHS GGC.[7,16] However, 2022-23 data indicate prevalence across Scotland has declined, dropping to 2.1% (n=41) in 2022-23 (Table 1.7). Prevalence of HIV in NHS GGC remains stable at 4.4% (n=32) in 2022-23, compared to 4.8% in the two previous sweeps. In Glasgow City Centre, where the outbreak was initially identified and concentrated, HIV prevalence declined to 4.8% in 2022-23, down from 11.3% in 2019-20, suggesting that HIV-positive individuals may have died or migrated to other areas. These findings also suggest that there was limited HIV transmission during the COVID-19 pandemic.

3.6.5 Diagnosed and undiagnosed HIV infection

Among people who were positive for HIV antibodies on DBS testing, in 2022-23, 83% (n=34) self-reported that they were HIV positive (i.e. had been diagnosed). Thus, in total in 2022-23, 17% (n=7) reported that they were unaware of their HIV infection, comparing favourably with 58% (n=42) in 2019-20 (Table 1.7). This finding likely reflects enhanced testing efforts that have been ongoing in response to the outbreak.[16] However, despite the improvement in the proportion diagnosed, it falls short of the 95% WHO diagnosis target. In 18 European and Central Asian countries that were able to report data for this stage of the continuum of HIV care in 2022, 64% of PWID living with HIV had been diagnosed.[6]

3.7. Other drug related health harms

3.7.1 Severe soft tissue infections

In 2022-23, 18% (n=370) of respondents reported having a severe soft tissue infection (SSTI) in the last year. This compares with 16% (n=388) in 2019-20, 20% (n=430) in 2017-18, 17% (n=464) in 2015-16 and 24% (n=564) in 2013-14. Among those who injected in the last six months, these proportions were slightly higher and range from 20% to 28% since 2013-14, with 27% (n=341) in 2022-23 (Table 1.8). Medium to high uptake of sterile injecting equipment and opioid agonist therapy, combined, has been associated with lower risk of acquiring an SSTI compared to low uptake.[17]

3.7.2 Non-fatal overdose

In 2022-23, 19% (n=389) of respondents reported having overdosed to the point of losing consciousness in the last year, generally similar to levels reported in 2019-20 (16%, n=385) and 2018-19 (15%, n=312). Among those who had injected in the last six months, these proportions were higher at 25% (n=319) in 2022-23, compared with 21% (n=341) and 18% (n=265) in 2019-20 and 2017-18, respectively (Table 1.8).

4. Conclusions

The 2022-23 sweep was the first NESI survey to be undertaken since the 2019-20 survey, which was suspended early, in March 2020, owing to the COVID-19 pandemic. This latest sweep has provided vital information on changes in prevalence of HCV and HIV, other health harms, risk behaviours and uptake of harm reduction and health services in the intervening period.

The changing pattern of psychoactive drugs is of ongoing concern: although reported injecting of (powder) cocaine was already increasing before the pandemic, it has continued to increase dramatically. Cocaine injecting has previously been associated with a higher frequency of injecting and risk of HIV transmission, however the observed increase in cocaine injecting does not seem to have translated into any major shifts in injecting frequency or an increase in HIV infection. Smoking or snorting crack cocaine was also very prevalent and had increased significantly from 2019-20.

In terms of harm reduction and blood-borne virus services, uptake of HBV vaccination, which had already been declining before the pandemic, declined further to reach the lowest level of uptake since the NESI surveys began in 2008. HIV and HCV testing, which had been previously increasing steadily year-on-year, plateaued. Uptake of these services may have been affected by the reduced availability of face-to-face services during the pandemic.

The reduced prevalence of chronic HCV infection observed pre-pandemic (in 2019-20), largely attributable to scale up of HCV treatment in community settings, has been maintained through to 2023. However, the limited progress in reducing prevalence of infection further in recent years is likely a result of the disruption to HCV testing and treatment services in community settings since the COVID-19 pandemic. While the 2030 WHO target of an 80% reduction in chronic HCV prevalence (from a 2015 baseline) was not reached at a Scotland level, data from NHS Tayside indicates that it is not only feasible to reach this target but to reduce prevalence of infection to below 5% among PWID. The majority of individuals with current chronic HCV infection were undiagnosed. There are also signs of a high rate of new HCV infections among people who have recently started injecting.

Enhanced testing efforts in response to the HIV outbreak in Glasgow have led to an improvement in the proportion diagnosed with HIV infection. HIV prevalence in NHS GGC has remained stable, which suggests that there was limited HIV transmission during and since the COVID-19 pandemic.

In the context of the highest levels of receipt of prescribed naloxone, reports of naloxone carriage have fallen (carriage of naloxone is critical because, for it to be effective, it must be available at the time of an opioid overdose). Reports of non-fatal overdose remain prevalent.

The findings of the NESI 2022-23 survey indicate that, while the COVID-19 pandemic may have impacted the delivery and uptake of some services for PWID, this has not resulted in an overall rise in blood-borne virus (i.e. HCV and HIV) infection levels in this population. Nevertheless, the findings also show that PWID in Scotland continue to be at high risk of multiple harms. Considerable challenges remain in reaching HCV and HIV transmission elimination goals, and will require enhanced and sustained efforts to test, diagnose and treat infected individuals, alongside parallel efforts to prevent infection through provision of harm reduction (needle exchange and opioid agonist treatment). Additional work is also required to understand the reasons behind the decline in HBV vaccination in this population, in order to inform action to improve HBV vaccination uptake.

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Forth Valley

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Grampian

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Staff at all participating pharmacies and IEP sites in NHS Lanarkshire

Lothian

Jim Shanley

Staff at all participating pharmacies and IEP sites in NHS Lothian

Tayside

Donna Thain

Staff at all participating pharmacies and IEP sites in NHS Tayside

Appendix 1: Survey methods

Study sites/setting

Participants were recruited from selected agencies and pharmacies that provide injecting equipment (these settings may also provide other harm reduction services, such as prescribed methadone). Services were selected if they were willing to take part in the initiative and if they had a private room in which interviews could be conducted. The 2022-23 survey was conducted from November 2022 through to December 2023 across the 11 mainland NHS boards. The geographical location of recruitment sites is presented in Figure A1. The geographical distribution of NESI participants across NHS boards in 2022-23, compared with the three previous sweeps, is presented in Table A1.

A total of 129 sites participated in the 2022-23 NESI sweep. The distribution of sites across NHS boards was similar to previous sweeps (Table A2).

NESI participants in 2022-23 were recruited from 110 pharmacies and 19 agencies providing fixed site, mobile or outreach injecting equipment provision service (Table A3). In total, 40% of all services providing injecting equipment in mainland Scotland participated as recruitment sites in 2022-23.[18]

Figure A1: Map of recruitment sites participating in the NESI survey, 2022-2023.

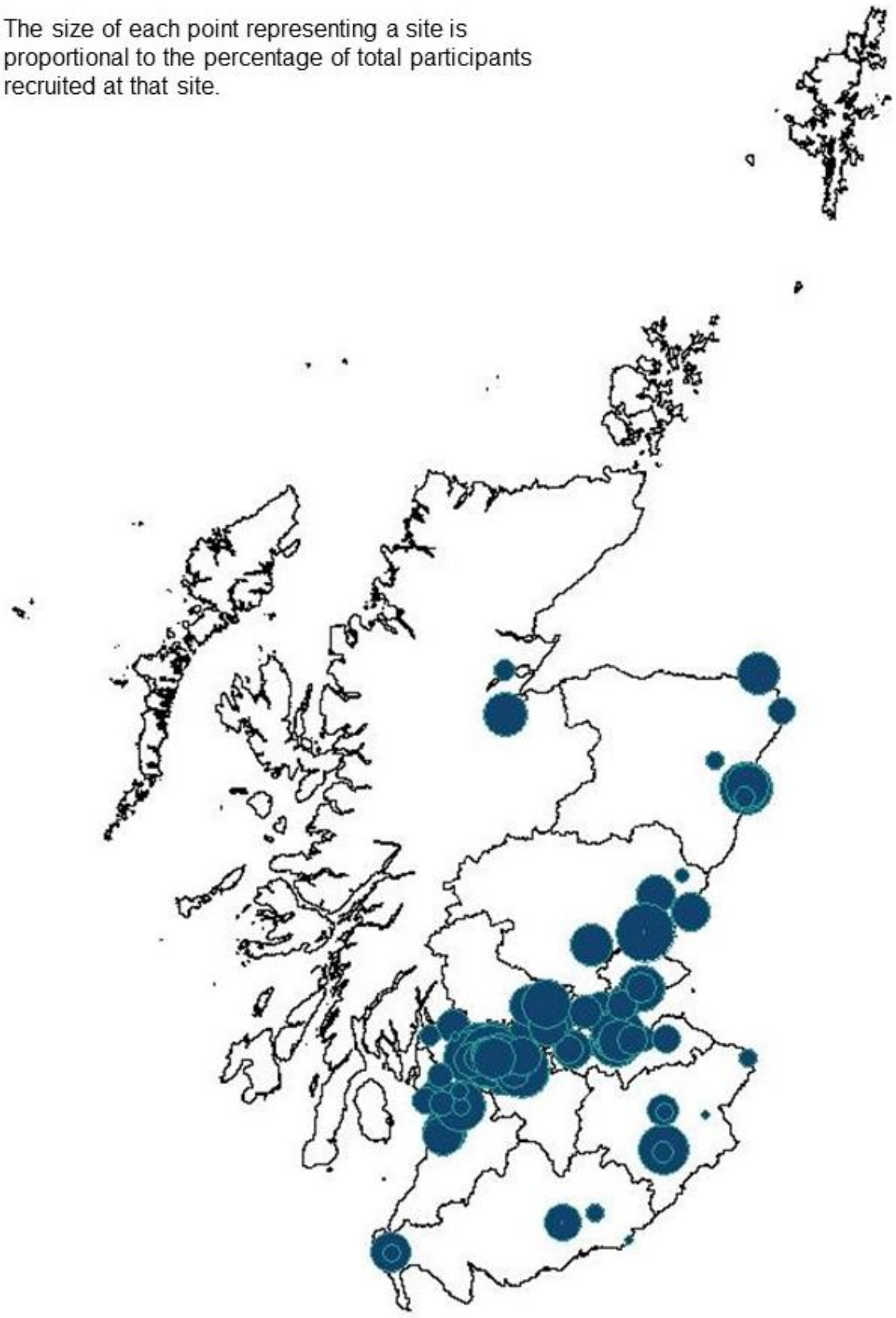

Table A1: Geographical distribution of NESI participants recruited in 2022-23, compared with past sweeps (2015-16 through 2019-20)

NHS board	2015-16	2017-18	2019-20 [f]	2022-23
Ayrshire & Arran	168 (6%)	178 (8%)	256 (11%)	135 (7%)
Borders	25 (1%)	30 (1%)	0 (0%)	62 (3%)
Dumfries & Galloway	54 (2%)	52 (2%)	0 (0%)	51 (2%)
Fife	107 (4%)	92 (4%)	125 (5%)	96 (5%)
Forth Valley	107 (4%)	102 (5%)	159 (7%)	130 (6%)
Grampian	226 (8%)	158 (7%)	0 (0%)	127 (6%)
Greater Glasgow & Clyde	944 (35%)	854 (40%)	1,030 (42%)	752 (37%)
Highland	107 (4%)	56 (3%)	50 (2%)	42 (2%)
Lanarkshire	219 (8%)	184 (9%)	337 (14%)	242 (12%)
Lothian	475 (18%)	213 (10%)	159 (7%)	223 (11%)
Tayside	264 (10%)	211 (10%)	319 (13%)	186 (9%)
Scotland [g]	**2,696 (100%)**	**2,130 (100%)**	**2,435 (100%)**	**2,046 (100%)**

[f] Recruitment in 2019-20 was suspended early because of the COVID-19 pandemic. Recruitment was therefore not undertaken in Borders, Dumfries & Galloway and Grampian, and was incomplete in Lothian.

[g] Scotland total excludes the island NHS boards (Orkney, Shetland and Western Isles).

Table A2: Geographical distribution of participating NESI sites in 2022-23, compared with past sweeps (2015-16 through 2019-20)

NHS board	2015-16	2017-18	2019-20 [h]	2022-23
Ayrshire & Arran	9 (7%)	13 (10%)	11 (11%)	14 (11%)
Borders	2 (2%)	3 (2%)	0 (0%)	5 (4%)
Dumfries & Galloway	5 (4%)	5 (4%)	0 (0%)	6 (5%)
Fife	7 (5%)	10 (8%)	8 (8%)	9 (7%)
Forth Valley	6 (5%)	9 (7%)	7 (7%)	9 (7%)
Grampian	11 (8%)	10 (8%)	0 (0%)	7 (5%)
Greater Glasgow & Clyde	30 (23%)	30 (23%)	32 (33%)	33 (26%)
Highland	6 (5%)	6 (5%)	4 (4%)	6 (5%)
Lanarkshire	18 (14%)	18 (14%)	18 (19%)	18 (14%)
Lothian	24 (18%)	15 (11%)	6 (6%)	14 (11%)
Tayside	12 (9%)	12 (9%)	10 (10%)	8 (6%)
Scotland [i]	**130 (100%)**	**131 (100%)**	**96 (100%)**	**129 (100%)**

[h] Recruitment in 2019-20 was suspended early because of the COVID-19 pandemic. Recruitment was therefore not undertaken in Borders, Dumfries & Galloway and Grampian, and was incomplete in Lothian.

[i] Scotland total excludes the island NHS boards (Orkney, Shetland and Western Isles).

Table A3. Geographical distribution of participating NESI sites compared with the total number of sites in Scotland, by type (pharmacy or agency), 2022-23

NHS board	Total pharmacies (PHS survey 2022-23) [j]	Pharmacy NESI recruitment sites, 2022-23 (% of PHS total)	Total agencies (PHS survey 2022-23 [j]	Agency NESI recruitment sites, 2022-23 (% of PHS total)	Total (PHS survey 2022-23) [j]	Total NESI recruitment sites, 2022-23 (% of PHS total)
Ayrshire & Arran	40	14 (35%)	8	0 (0%)	48	14 (29%)
Borders	8	3 (38%)	2	2 (100%)	10	5 (50%)
Dumfries & Galloway	11	5 (45%)	3	1 (33%)	14	6 (43%)
Fife	19	8 (42%)	3	1 (33%)	22	9 (41%)
Forth Valley	15	5 (33%)	6	4 (67%)	21	9 (43%)
Grampian	19	5 (26%)	14	2 (14%)	33	7 (21%)
Greater Glasgow & Clyde	57	31 (54%)	12	2 (17%)	69	33 (48%)
Highland	21	4 (19%)	7	2 (29%)	28	6 (21%)
Lanarkshire	24	17 (71%)	1	1 (100%)	25	18 (72%)
Lothian	22	12 (55%)	14	2 (14%)	36	14 (39%)
Tayside	16	6 (38%)	4	2 (50%)	20	8 (40%)
Scotland [k]	**252**	**110 (44%)**	**74**	**19 (26%)**	**326**	**129 (40%)**

[j] See Reference 17

[k] Scotland total excludes the island NHS boards (Orkney, Shetland and Western Isles)

Eligibility and study procedures

Clients attending the services were approached by trained interviewers and assessed for eligibility: participants were eligible if they had injected drugs on at least one occasion and if it was the first time that they had participated in the current survey year. All eligible participants were invited to take part in the survey: the interviewers first informed them about the purpose of the survey and explained that it is voluntary and confidential. Upon giving informed consent, participants were then asked to complete a short interviewer-led questionnaire to elicit key demographic and behavioural information and to supply a blood spot sample to be tested anonymously for HCV and other blood-borne viruses. An individual's blood spot sample was linked to the corresponding questionnaire through an assigned study number. Participants who wished to find out their HCV or HIV status were referred to the appropriate services. In 2022-23, a £20 shopping voucher was provided to participants as compensation for their time. Ethical approval to conduct the study was obtained from West Glasgow NHS Ethics Committee (REC Ref: 08/S0709/46). NHS Research and Development approval was obtained from all participating NHS boards.

Duplicate participation

Where individuals participated more than once in the survey, the responses and blood sample results from their first participation were retained for analyses. Any subsequent questionnaires and blood samples taken were excluded from all analyses. Duplicate responses were identified where participants' initials, date of birth, sex and NHS board of interview were identical. In the 2022-23 survey, while a total of 2,183 questionnaires were completed, 2,046 (94%) were completed by unique individuals and included in this report.

Reason for visiting the service

All respondents were asked the main reason for their visit to the service (recruitment site) on that day (Table A4). In 2022-23, respondents could choose as many reasons as were applicable (for example, someone may have been attending to obtain sterile

injecting equipment, as well as to get their methadone prescription). Overall, 24% of respondents reported attendance for the purpose of obtaining injecting equipment, 39% reported collection or consumption of an opioid agonist prescription (e.g. methadone, buprenorphine), 24% reported attending to participate in the NESI study and a further 25% reported another reason. The main 'other' reasons included: other prescription collection (3%), support (3%), WAND initiative (2%), HCV testing (1.6%) and accompanying someone else (1.4%).

Table A4. Self-reported reason for visit to the service where they were recruited into the study, 2022-23[m]

NHS board	Injecting equipment	Opioid agonist prescription	To participate in NESI	Other
Ayrshire & Arran	44 (33%)	67 (50%)	30 (22%)	15 (11%)
Borders	8 (13%)	26 (42%)	13 (21%)	24 (39%)
Dumfries & Galloway	10 (20%)	15 (29%)	26 (51%)	13 (25%)
Fife	16 (17%)	37 (39%)	41 (43%)	23 (24%)
Forth Valley	12 (9%)	28 (22%)	71 (55%)	33 (25%)
Grampian	40 (32%)	47 (37%)	25 (20%)	24 (19%)
Greater Glasgow & Clyde	194 (26%)	287 (38%)	110 (15%)	239 (32%)
Highland	6 (14%)	23 (55%)	11 (26%)	9 (21%)
Lanarkshire	72 (30%)	102 (42%)	57 (24%)	43 (18%)
Lothian	74 (33%)	123 (55%)	28 (13%)	29 (13%)
Tayside	17 (9%)	42 (23%)	80 (43%)	56 (30%)
Scotland	**493 (24%)**	**797 (39%)**	**492 (24%)**	**508 (25%)**

[m] Row totals do not add up to 100% as respondents can choose multiple reasons

Laboratory testing

For the 2008-09 through 2013-14 surveys, dried blood spots (DBS) were extracted and tested in a modification of the Ortho Save 3.0 EIA, as described by Judd et al.[19] Two 3mm discs were punched from DBS and eluted in 200µl of PBS/0.05% tween. Samples generating an optical density of <0.4, 0.4-0.79, and >0.8 were considered negative, weakly reactive and positive for HCV antibodies, respectively. The weak reactive samples were considered HCV antibody positive for this report. An aliquot of the eluted DBS was also tested on the Abbott Architect i2000sr using the Architect HIV Ag/Ab Combo assay. All HIV positives were confirmed by repeat testing on the Architect.

From 2015 until 2020, a slightly different method for HCV and HIV antibody detection was applied. Two 1cm DBS spots were added to 0.75ml of PBS/tween 0.05% buffer. The spots were left to elute either overnight at room temperature or at 4°C for 48 hours. The eluate was then spun for five minutes at 13,000rpm and tested on the Abbott Architect i2000sr using the following assays: Architect Anti-HCV assay and Architect HIV Ag/Ab Combo assay. HIV positive samples were confirmed by re-testing the eluate on the Architect.

For surveys up to 2018, HCV RNA was tested using an ‘in-house’ PCR (polymerase chain reaction) assay using the bioMerieux extraction protocol for DBS on the Easymag and a real-time PCR. The method of HCV RNA detection in DBS was described in Bennett et al.[20]

For the 2019-2020 survey, HCV RNA was extracted and amplified using a laboratory defined protocol on the Abbott m2000sp and m2000rt platform.[21] In all surveys, for participants who were HCV antibody negative, the PCR testing was carried out in pools of five and all positive pools were then tested individually. Both the in-house and the Abbott m2000 testing systems detect to 1000 IU/ml in DBS.

For the 2022-2023 survey, HCV RNA was extracted and amplified using the Abbott Alinity m platform.[22] This platform has a similar limit of detection to that of the previous methods described above. For HIV and HCV serology testing, the elution method described in the 2015-16 NESI sweep remained the same, only the platform

for testing changed. The HIV Ag/Ab combo and HCV antibody assays were tested on the Abbott Alinity i.[23] The cut-off for HIV was S/Co 1.0 and for HCV antibody S/Co 0.8. HIV (Ag/Ab) positive samples were confirmed using the bioMérieux mini VIDAS.

A summary of the assays used for HIV and HCV testing is listed in Table A5.

Table A5. Summary of laboratory assays used to test for HCV and HIV markers, by NESI survey

NESI survey	HCV antibody	HCV RNA	HIV antigen (Ag)/antibody (Ab) screen	HIV confirmation
2008-09 and 2010	All samples screened using modification of the Ortho Save 3.0 EIA	In-house PCR assay on all HCV antibody negatives (pooled)	No HIV testing done	No HIV testing done
2011-12 and 2013-14	All samples screened using modification of the Ortho Save 3.0 EIA	In-house PCR assay on all HCV antibody negatives (pooled) and positives	All samples screened on Architect HIV Ag/Ab Combo assay	Positives from screening confirmed on the Architect HIV Ag/Ab Combo assay
2015-16	All samples screened using Architect Anti-HCV assay	In-house PCR assay on all HCV antibody negatives (pooled) and positives	All samples screened on Architect HIV Ag/Ab Combo assay	Positives from screening confirmed on the Architect HIV Ag/Ab Combo assay
2017-18	All samples screened using Architect Anti-HCV assay	In-house PCR assay on all HCV antibody negatives (pooled) and positives	All samples screened on Architect HIV Ag/Ab Combo assay	Positives from screening confirmed on the Architect HIV Ag/Ab Combo assay
2019-20	All samples screened using Architect Anti-HCV assay	RNA extracted and amplified using a laboratory defined protocol on the Abbott m2000sp and	All samples screened on Architect HIV Ag/Ab Combo assay	Positives from screening confirmed on the Architect HIV Ag/Ab Combo assay

NESI survey	HCV antibody	HCV RNA	HIV antigen (Ag)/antibody (Ab) screen	HIV confirmation
		m2000rt platform – on all HCV antibody negatives (pooled) and positives		
2022-23	All samples screened on the Abbott Alinity i	RNA extracted and amplified using the Abbott Alinity m platform – on all HCV antibody negatives (pooled) and positives	All samples screened on the Abbott Alinity i HIV Ag/Ab Combo assay	Positives from screening confirmed on the bioMérieux mini VIDAS

Calculating HCV incidence

After an individual has been exposed to HCV, there is a 'window period' wherein the virus (i.e. RNA) is detectable but the individual has not yet formed antibodies. Individuals in this window period, i.e. individuals with very recently acquired HCV infection, will therefore test HCV antibody negative and HCV RNA positive. An estimate of HCV incidence can then be derived using the formula:

$$I = \frac{(365/T)n}{(N-n)+(365/T)n}$$

where T is the estimated duration of the window period, n is the number of recently acquired infections and N is the number of susceptible individuals (i.e. HCV antibody negatives).[24,25] An estimate of the duration of the window period (51 days) was derived from the literature.[26]

Appendix 2: 2022-23 NESI questionnaire

The questionnaire is available at:
https://publichealthscotland.scot/publications/needle-exchange-surveillance-initiative-nesi/needle-exchange-surveillance-initiative-nesi-13-august-2024/

Appendix 3: Participating sites

Ayrshire and Arran NHS board

Boots Pharmacy, Burns Precinct, Kilmarnock

Boots Pharmacy, Dockhead Street, Saltcoats

Boots Pharmacy, Frew Terrace, Irvine

Boots Pharmacy, High Street, Irvine

Boots Pharmacy, Main Street, Kilbirnie

Boots Pharmacy, Main Street, Stewarton

Boots Pharmacy, Portland Road, Kilmarnock

Boots Pharmacy, St Marnock Road, Kilmarnock

Lloyds Pharmacy, Wellington Square, Ayr

Toll Pharmacy, Ayr Road, Prestwick

Townhead Pharmacy, Station Plaza, Kilwinning

Well Pharmacy, Sandgate, Ayr

Borders NHS board

Eyemouth Pharmacy, Church Street, Eyemouth

Lindsay & Gilmour, Oliver Place, Hawick

Lloyds, Douglas Bridge, Galashiels

We Are With You (WAWY) Borders

Joint NHS/WAWY drop-ins in Hawick, Hume, Eyemouth and Kelso

Scottish Drugs Forum Engagement Group

Dumfries & Galloway NHS board

Boots Pharmacy, Castle Street, Dumfries

Gordon's Pharmacy Charlotte Street, Stranraer

Murray Pharmacy, Galloway Street, Dumfries

We Are With You (WAWY) D&G (Stranraer/Dumfries)

Well Pharmacy, Annan Road, Gretna

Well Pharmacy, Townhead Street, Lockerbie

Fife NHS board

Boots Pharmacy, Ajax Way, Methil

Boots Pharmacy, High Street, Cowdenbeath

Boots Pharmacy, High Street, Kirkcaldy

Boots Pharmacy, High Street, Leven

Dears Pharmacy, High Street, Dunfermline

Lindsay & Gilmour, Alderston Drive, Dunfermline

Lloyds Pharmacy, Viceroy St, Kirkcaldy

St Clair Pharmacy, St Clair Street, Kirkcaldy

We Are With You (WAWY) Fife (Leven)

WAWY outreach van

Forth Valley NHS board

Lindsay & Gilmour Pharmacy, Bannockburn Road, St Ninians, Stirling

Lindsay & Gilmour Pharmacy, Main Street, Sauchie, Alloa

Lloyds Pharmacy, Church Walk, Denny

Lloyds Pharmacy, La Porte Precinct, Grangemouth

Lloyds Pharmacy, Marshill, Alloa

Change, Grow Live (Alloa, Falkirk and Stirling)

Transform Forth Valley outreach van

Grampian NHS board

Alcohol & Drugs Action (ADA), Aberdeen

Buchanhaven Pharmacy, Skelton Street, Peterhead

Douglas Dickie Torry, Victoria Road, Aberdeen

Gardner Drive Pharmacy, Gardner Drive, Aberdeen

Rowlands Pharmacy, City Hospital, Park Road, Aberdeen

Step-In, Fraserburgh

Will Chemists, West High Street, Inverurie

Greater Glasgow & Clyde NHS board

Abbey Chemist, Gauze Street, Paisley

Abbey Chemist, Trongate, Glasgow

Boots Pharmacy, Duke Street, Glasgow

Boots Pharmacy, High Street, Dumbarton

Boots Pharmacy, Hillington Road South, Glasgow

Boots Pharmacy, Main Street, Barrhead

Boots Pharmacy, Mitchell Way, Alexandria

Boots Pharmacy, Neilston Road, Paisley

Boots Pharmacy, Regent Centre, Kirkintilloch

Boots Pharmacy, Sauchiehall St, Glasgow

Boots Pharmacy, Shettleston Road, Glasgow

Boots Pharmacy, Victoria Road, Glasgow

Boots Pharmacy, Westmuir Street, Glasgow

Dickson Chemist, Dumbarton Road, Glasgow

Dickson Chemist, Main Street, Glasgow

Dunnet Pharmacy, Dumbarton Road, Glasgow

E R McAnerney, Dunlop Street, Greenock

Gilbride Chemists, Copland Road, Glasgow

Glasgow Drug and Alcohol Crisis Service

Harmony Row Pharmacy, Harmony Row, Glasgow

Houlihan Pharmacy, Saracen Street, Glasgow

Lloyds Pharmacy, Abercromby Street, Glasgow

Lloyds Pharmacy, Carmunnock Road, Glasgow

Lloyds Pharmacy, Dunkenny Square, Glasgow

Lloyds Pharmacy, Maryhill Road, Glasgow

Lloyds Pharmacy, Shandwick Square, Glasgow

Nancy's Chemist, Admiral Street, Glasgow

Partick Pharmacy, Dumbarton Road, Glasgow

Rowlands Pharmacy, Springburn Way, Glasgow

Rx Pharmacy, Red Road Court, Glasgow

Sandyford Outreach sites

Simon Community Access Hub

Simon Community Womens Services

Highland NHS board

Alness Pharmacy, High Street, Alness

Boots Pharmacy, Eastgate, Inverness

Highland Alcohol and Drug Advice & Support Service, Inverness

Osprey House, Inverness

Superdrug, High Street, Inverness

Well Pharmacy, Argyll Street, Dunoon

Lanarkshire NHS board

Boots Pharmacy, Brouster Gate, East Kilbride

Boots Pharmacy, Wellhall Road, Hamilton

Boots Pharmacy, Graham Street, Airdrie

Boots Pharmacy, Main Street, Cambuslang

Boots Pharmacy, Main Street, Coatbridge

Boots Pharmacy, Union Street, Larkhall

Boots Pharmacy, Main Street, Rutherglen

Dicksons Pharmacy, Old Edinburgh Road, Uddingston

Lanarkshire outreach van

Lloyds Pharmacy, Main Street, Coatbridge

Lloyds Pharmacy, Brandon Parade, Motherwell

Lloyds Pharmacy, Main Street, Wishaw

M&D Green Pharmacy, Duke's Road, Burnside

McIntyre Cairns Pharmacy, Craigneuk Street, Wishaw

Monklands Pharmacy, Deedes Street, Airdrie

New Stevenston Pharmacy, Clydesdale Street, Motherwell

Rowlands Pharmacy, Burnbank Road, Hamilton

Village Pharmacy, Main Street, Cumbernauld

Lothian NHS board

Bankton Pharmacy, Hawthorn Road, Prestonpans

Boots Pharmacy, Shandwick Place, Edinburgh

Craigmillar Pharmacy, Niddrie Mains Road, Edinburgh

Deans Pharmacy, Main Street, Livingston

Dunamis Pharmacy, Elizabeth Drive, Bathgate

Eskside Pharmacy, High Street, Musselburgh

Lindsay & Gilmour Pharmacy, Crewe Road North, Edinburgh

Lindsay & Gilmour Pharmacy, Leith Walk, Edinburgh

MacKinnon Pharmacy, Calder Road, Edinburgh

Newington Pharmacy, Clerk Street, Edinburgh

Omnicare Pharmacy, Ardmillan Terrace, Edinburgh

Omnicare Pharmacy, Walter Scott Avenue, Edinburgh

Right Medicine Pharmacy, High Street, Haddington

Spittal Street Centre, Edinburgh

Turning Point, Leith

Tayside NHS board

Boots Pharmacy, Albert Street, Dundee

Davidsons Chemists, East High Street, Forfar

Davidsons Chemists, High Street, Brechin

Davidsons Chemists, High Street, Lochee, Dundee

Davidsons Chemists, Main Street, Bridgend, Perth

Drumhar Health Centre, Perth

The Centre, South Ward Road, Dundee

Well Pharmacy, Fisheracre, Arbroath

Appendix 4: Peer-reviewed publications arising from NESI

Organised by year of publication. This list does not include papers that utilise NESI data indirectly, for example to parameterise mathematical models.

2024

- Trayner KMA, Yeung A, Palmateer NE, et al. Impact of the COVID-19 Pandemic on HIV Test Uptake Among People Who Inject Drugs in the Context of an HIV Outbreak. AIDS Behav 2024; doi:10.1007/s10461-024-04311-4.

2023

- Artenie A, Stone J, Fraser H, et al. Incidence of HIV and hepatitis C virus among people who inject drugs, and associations with age and sex or gender: a global systematic review and meta-analysis. Lancet Gastroenterol Hepatol 2023; 8(6): 533-52. doi: 10.1016/S2468-1253(23)00018-3.

- McAuley A, Palmateer N, Goldberg DJ, et al. Increased risk of non-fatal overdose associated with non-prescribed benzodiazepine use in Scotland, UK. Int J Drug Policy 2023; 104236. doi:10.1016/j.drugpo.2023.104236.

- McDonald SA, Myring G, Palmateer NE, et al. Improved health-related quality of life after hepatitis C viraemic clearance among people who inject drugs may not be durable. Addiction 2023; 118(7): 1340-50. doi:10.1111/add.16169.

- Uusküla A, Rannap J, Weijler L, et al. Incarceration history is associated with HIV infection among community-recruited people who inject drugs in Europe: A propensity-score matched analysis of cross- sectional studies. Addiction 2023; 118(11): 2177-92. doi: 10.1111/add.16283.

2022

- Lewer D, Croxford S, Desai M, et al. The characteristics of people who inject drugs in the United Kingdom: changes in age, duration, and incidence of injecting, 1980-2019, using evidence from repeated cross-sectional surveys. Addiction 2022; 117(9): 2471-80. doi:10.1111/add.15911.

2021

- Dunleavy K, Hutchinson SJ, Palmateer N, et al. The uptake of foil from needle and syringe provision services and its role in smoking or snorting heroin among people who inject drugs in Scotland. Int J Drug Policy 2021; 98: 103369. doi:10.1016/j.drugpo.2021.103369.

- Palmateer NE, McAuley A, Dillon JF, et al. Reduction in the population prevalence of hepatitis C virus viraemia among people who inject drugs associated with scale-up of direct-acting anti-viral therapy in community drug services: real-world data. Addiction 2021; 116(10): 2893-907. doi:10.1111/add.15459.

- Trayner KMA, Palmateer NE, Hutchinson SJ, et al. High willingness to use drug consumption rooms among people who inject drugs in Scotland: findings from a national bio-behavioural survey among people who inject drugs. Int J Drug Policy 2021; 90: 102731. doi:10.1016/j.drugpo.2020.102731.

- Trayner KMA, Palmateer NE, McAuley A, et al. Evaluation of the scale-up of HIV testing among people who inject drugs in Scotland in the context of an ongoing HIV outbreak. Int J Drug Policy 2021; 96: 103304. doi:10.1016/j.drugpo.2021.103304.

2020

- Trayner KMA, McAuley A, Palmateer NE, et al. Increased risk of HIV and other drug-related harms associated with injecting in public places: national bio-behavioural survey of people who inject drugs. Int J Drug Policy 2020; 77: 102663. doi:10.1016/j.drugpo.2020.102663.

2019

- Hickman M, Dillon JF, Elliott L, et al. Evaluating the population impact of hepatitis C direct acting antiviral treatment as prevention for people who inject drugs (EPIToPe) - a natural experiment (protocol). BMJ Open 2019; 9(9): e029538-029538. doi:10.1136/bmjopen-2019-029538.

- McAuley A, Palmateer NE, Goldberg DJ, et al. Re-emergence of HIV related to injecting drug use despite a comprehensive harm reduction environment: a cross-sectional analysis. Lancet HIV 2019; 6(5): e315-24. doi:10.1016/S2352-3018(19)30036-0.

- McAuley A, Yeung A, Taylor A, Hutchinson SJ, Goldberg DJ, Munro A. Emergence of Novel Psychoactive Substance injecting associated with rapid rise in the population prevalence of hepatitis C virus. Int J Drug Policy 2019; 66: 30-7. doi:10.1016/j.drugpo.2019.01.008.

2018

- Dunleavy K, Munro A, Roy K, et al. Spore forming bacteria infections and people who inject drugs: Implications for harm reduction. Int J Drug Policy 2018; 53: 45-54. doi:10.1016/j.drugpo.2017.12.001.

- Palmateer NE, Goldberg DJ, Munro A, et al. Association between universal hepatitis B prison vaccination, vaccine uptake and hepatitis B infection among people who inject drugs. Addiction 2018; 113(1): 80-90. doi:10.1111/add.13944.

- Valerio H, McAuley A, Innes H, et al. Determinants of hepatitis C antiviral effectiveness awareness among people who inject drugs in the direct-acting antiviral era. Int J Drug Policy 2018; 52: 115-22. doi:10.1016/j.drugpo.2017.12.014.

2017 and earlier

- 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. Int J Drug Policy 2012; 23(5): 346-52. doi:10.1016/j.drugpo.2012.07.006.

- Aspinall E, Hutchinson SJ, Taylor A, Palmateer N, Hellard M, Allen E, Goldberg D. Uptake of paraphernalia from injecting equipment provision services and its association with sharing of paraphernalia among injecting drug users in Scotland. Drug Alcohol Depend 2012; 126(3): 340-6. doi:10.1016/j.drugalcdep.2012.05.041.

- Dunleavy K, Munro A, Roy K, et al. Association between harm reduction intervention uptake and skin and soft tissue infections among people who inject drugs. Drug Alcohol Depend 2017; 174: 91-7. doi:10.1016/j.drugalcdep.2017.01.020.

- McAuley A, Munro A, Bird SM, Hutchinson SJ, Goldberg DJ, Taylor A. Engagement in a National Naloxone Programme among people who inject drugs. Drug Alcohol Depend 2016; 162: 236-40. doi:10.1016/j.drugalcdep.2016.02.031.

- McDonald SA, Hutchinson SJ, Palmateer NE, Allen E, Cameron SO, Goldberg DJ, Taylor A. Decrease in health-related quality of life associated with awareness of hepatitis C virus infection among people who inject drugs in Scotland. J Hepatol 2013; 58(3): 460-6. doi:10.1016/j.jhep.2012.11.004.

- O'Leary MC, Hutchinson SJ, Allen E, Palmateer N, Cameron S, Taylor A, Goldberg DJ. The association between alcohol use and hepatitis C status among injecting drug users in Glasgow. Drug Alcohol Depend 2012; 123(1-3): 180-9. doi:10.1016/j.drugalcdep.2011.11.008.

- Palmateer N, Hutchinson S, McAllister G, Munro A, Cameron S, Goldberg D, Taylor A. Risk of transmission associated with sharing drug injecting paraphernalia: analysis of recent hepatitis C virus (HCV) infection using cross-sectional survey data. J Viral Hepat 2014; 21(1): 25-32. doi:10.1111/jvh.12117.

- Palmateer NE, Taylor A, Goldberg DJ, et al. Rapid decline in HCV incidence among people who inject drugs associated with national scale-up in coverage of a combination of harm reduction interventions. PLoS One 2014; 9(8): e104515. doi:10.1371/journal.pone.0104515.

- Turner KME, Hutchinson S, Vickerman P, 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. doi:10.1111/j.1360-0443.2011.03515.x.

Appendix 5: NESI Steering Group membership 2022-23

Name	Affiliation
Chris Biggam	Glasgow Caledonian University and Public Health Scotland
John Campbell	NHS Greater Glasgow & Clyde
Lynn Couper	Scottish Drugs Forum
Monica Desai	UK Health Security Agency
Elinor Dickie	Public Health Scotland
Rory Gunson	West of Scotland Specialist Virology Centre
Sharon Hutchinson	Glasgow Caledonian University and Public Health Scotland
Andrew McAuley	Public Health Scotland and Glasgow Caledonian University
Duncan McCormick	NHS Lothian and Public Health Scotland
Holly Mitchell	UK Health Security Agency
Norah Palmateer	Glasgow Caledonian University and Public Health Scotland
Andrew Radley	NHS Tayside
Kirsty Roy	Public Health Scotland
Samantha Shepherd	West of Scotland Specialist Virology Centre
Duncan Stewart	NHS Lothian
Jason Wallace	Scottish Drugs Forum
David Williams	Edinburgh ADP
Leon Wylie	NHS Lanarkshire

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