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Best practice examples of surveys for monitoring drug-related infectious diseases in the EU/EEA

A supplement to the DRID technical protocol

November 2024

Legal notice

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Cross-sectional surveys

DRUCK-Study 2011-14, Germany

DRUCK in short: A cross-sectional study conducted in low-threshold settings with PWID across eight cities in Germany (2011-2014).
Key strengths: Good collaboration and relationship with low-threshold services which were the study sites.
Key weakness: Respondent-driven sampling was resource-intensive and time consuming to implement.
Contact: Ruth Zimmermann: zimmermannr@rki.de
Submission of best practice example: July 2023

Aim and objectives

- To determine seroprevalence of HBV HCV, HIV among PWID in the respective study cities
- To estimate the mean seroprevalence for these infections among PWID in Germany
- To identify different genotypes of HCV among PWID in Germany
- To identify behavioural determinants, risk factors and characteristics of PWID
- To evaluate knowledge and knowledge gaps about HBV, HCV and HIV among PWID

Study population (inclusion criteria)

PWID who had injected drugs within the last 12 months, who were above 16 years of age and living in the study city were eligible for inclusion.

Study design

The study was a cross-sectional multi-site study. It was conducted in 2011 (as a pilot in 2 cities), and from 2012-2014 data collection took place in another 6 cities. The recruitment took place over the course of 6 to 8 weeks per city.

Sampling strategy

Respondent-driven sampling (RDS) was used, and seeds (the first respondents and starting point for peer-to-peer recruitment) were selected from all relevant low-threshold drug services, outreach projects, and drug treatment services in the study cities.

Incentive

Participants received 10 euro for participation, and an additional 5 euro per extra recruited participant (maximum three (15 euro)).

Recruitment and study site

The recruitment and study sites consisted of low-threshold harm reduction services in 8 large German cities (1-2 per city). The study sites were selected based on a list of

criteria, pre-defined as a result of a situation analysis. The criteria for the study sites were:

- The presence and size of a drug scene in the city
- Estimated prevalence of injecting drug use
- Number of persons in opioid agonist treatment (OAT)
- Existence of low-threshold facilities' willingness and ability to participate in the study
- Interest of potential cooperating partners to set up structures for testing and counselling of infectious diseases in drug consumption rooms or other low-threshold drop-in facilities for PWID.

Composition of study staff

For the DRUCK study there were six staff members in total:

- One counsellor (trained in pre-test counselling)
- One coupon manager (trained in RDS excel tool, and all other study documents)
- One study nurse/lab person (taking and handling dried blood spots (DBS)
- One interviewer (trained in going through the whole questionnaire)
- One study doctor (for post-test counselling)
- One study site manager (overall lead in the study site)

Sample size

The calculated sample size was 2 033 participants. The sample size was calculated based on the lowest estimated prevalence of HIV (4 %), a power of 90 % and a 95 % CI. Total sample of participants that were included in the study was 2 077.

Data collection period

2011 (pilot in 2 studies), 2012-14, 6 other cities. 6-8 weeks of recruitment per city.

Specimen collection and testing

The DBS were collected by trained study staff at the study site.

Biomarkers	**Type of test**
Hepatitis C: Anti-HCV, HCV RNA (all samples). Immunoassay for anti HCV confirmation in case of negative PCR.	Architect anti-HCV and Monolisa Anti-HCV Plus Version 2 assays recomLine HCV IgG strip-immunoassay
Hepatitis B: Anti-HBc, HBsAg, anti-HBs (all samples)	ARCHITECT anti-HBs and Monolisa Anti-HBs Plus assays ARCHITECT anti-HBc assay and Monolisa Anti-HBc Plus assay
HIV: Anti-HIV, HIV Blot, Anti HTLV I and II	ARCHITECT HIV Ag/Ab combo assay (during the pilot study) and 3rd generation Murex HIV 1.2.O ELISA and Genscreen HIV 1.2.O ELISA Immunoblot HIV Blot 2.2. HIV-2 specific NEW LAV Blot 2
HTLV:	- Murex HTLV1 + 2 ELISA - HTLV Blot 2.4

Data collection – questionnaire

Data were collected through a paper-based structured questionnaire. It was completed with trained interviewers at the low-threshold service (study site). The questionnaire was made available in four languages: English, French, German, Russian.

DRID indicators that were collected through the study

Tested/measured:

- HCV viraemic prevalence
- HIV prevalence
- HTLV prevalence
- HBV prevalence (chronic and previous infection)
- HBV vaccination prevalence

Self-reported:

- Proportion tested (ever/last 12 months)
- Proportion diagnosed
- Proportion treatment experienced
- Proportion effectively treated
- Reasons for non-treatment
- All DRID behavioural indicators on sharing paraphrenia
- Supply of clean needles and syringes

Data analysis

Occurrence of disease (prevalence/incidence)

The prevalence was estimated for active and resolved HBV, active and cleared HCV and HIV infection. The incidence was estimated based on the assumed date of infection among the people who have recently started injecting drugs. Details of statistical methods, weighting according to RDS-network size explained in section on statistical analysis in https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3545-4.

Measure of association (risk factors)

Several MVAs were done, see publication list.

Weighting

No weighting was done for the analyses, and the data were presented for the total number of participants or for the participants per city included in the study. Pre- and post-test counselling as well as test results and linkage to care were included as intervention for all study participants.

Lessons learnt: RDS assumptions were not met in all cities, as there was heterogeneity of question for the individual network size. Therefore, a decision was made to carry out unweighted analyses per city https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3545-4. The link to interventions as part of the study required a large extra effort in terms of staff and funding. Medical doctors were only engaged for post-test counselling.

Dissemination of results

The study resulted in one final overall report and one report for each of the eight included cities (all in German). Several peer-reviewed international and German papers were published. In addition, results were disseminated through meetings with national and local (city level) stakeholders, on the website and through national and international conferences.

Data protection/ethics approval

Ethical approval was received from the ethics committee at Charité University Medicine, Berlin, Germany, in May 2011 (Number EA4/036/11) and in November 2012 (amendment; Number EA4/036/11). The Federal Commissioner for Data Protection and Freedom of Information approved the study protocol on 29/11/2012 (III-401/008#0035).

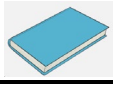
All participants signed an informed consent form to allow their anonymous data to be used for publication.

Costs for the study and source of funding

The German Ministry of Health provided the funding for the study. The cost per participant was approximately 450 euro.

Overall lessons learnt

When interventions are included in the study it needs to be carefully thought through and implemented. As an example, returning of test results needs to be offered at any time of the day, and not only restricted to certain hours and/or days. One weakness of RDS is that it is very staff and resource-intensive. One main strength of the study was the close collaboration with low-threshold (including harm reduction) services which were the study sites in this study.

Further reading 

Study documents:

- Study protocol: A multicentre sero-behavioural survey for hepatitis B and C, HIV and HTLV among people who inject drugs in Germany using respondent driven sampling
- Questionnaire: https://www.rki.de/DE/Content/InfAZ/H/HIVAIDS/Studien/DRUCK-Studie/Abschlussbericht.pdf?__blob=publicationFile
- (Questionnaire in English as well as other study documents, including SOPs, are available upon request)

Publications:

- Report: Robert Koch-Institut. Abschlussbericht der Studie „Drogen und chronischen Infektionskrankheiten in Deutschland“ (DRUCK-Studie), Berlin 2016. DOI: 10.17886/rkipubl-2016-007.2
- Wenz, B., Nielsen, S., Gassowski, M. et al. High variability of HIV and HCV seroprevalence and risk behaviours among people who inject drugs: results from a cross-sectional study using respondent-driven sampling in eight German cities (2011–14). BMC Public Health 16, 927 (2016). https://doi.org/10.1186/s12889-016-3545-4

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- Haussig JM, Nielsen S, Gassowski M, Bremer V, Marcus U, Wenz B, Bannert N, Bock CT, Zimmermann R; DRUCK study group (2018): A large proportion of people who inject drugs are susceptible to hepatitis B – results from a bio-behavioural study in eight German cities. Int. J. Infect. Dis. 66 (2): 5-13. Epub 2017 Oct 31. doi: 10.1016/j.ijid.2017.10.008.
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DRUCK 2.0, Germany

- **DRUCK 2.0 in short:** A cross-sectional study conducted in low-threshold settings with PWID in two Federal States (Bavaria and Berlin) in Germany (2021-2022).
- **Key strengths:** Recruitment in low-threshold services and OAT-practices was well-accepted by study participants and reached the study population well. HCV viraemic prevalence for all participants.
- **Key weakness**: No additional funding for continuous monitoring. Hep B vaccination coverage not assessable due to high determination threshold in DBS testing.
- **Contact**: Druck2.0@rki.de
- **Submission of best practice example**: July 2023

Aim and objectives

To prepare a periodical monitoring of infectious diseases among PWID in low-threshold harm reduction facilities and opioid agonist treatment (OAT) services in Germany.

- To estimate the prevalence of HIV, HBV, HCV and syphilis and sociodemographic and behavioural risk factors among PWID
- To identify nationwide and regional trends for targeted prevention and control measures
- To monitor the HIV/hepatitis/STI elimination process in Germany
- To report DRID indicators for international comparison (EMCDDA, ECDC, WHO)

Study population (inclusion criteria)

PWID who injected at least once during the past 12 months, and were above 16 years of age.

Lessons learnt: For the next DRUCK study, the inclusion criteria will be changed to also include people who ever injected drugs (not just during the past 12 months). This was decided to account for reportedly changing consumption behaviours and that a large proportion of clients in drug services and OAT-practices ever injected, but not the past 12 months.

Study design

Cross-sectional, in two federal states (Berlin and Bavaria).

Sampling strategy

Convenience sampling.

Lessons learnt: Characteristics of study participants were similar to those recruited during the first DRUCK study, which used RDS (results will be prepared for publication soon). Therefore, plans for future monitoring will use convenience sampling, due to very little difference in results and to reduce the workload for recruiting facilities.

Incentive

Participants received a 10-euro voucher for participation.

Lessons learnt: The incentive was well accepted by staff members, although receiving cash would have been preferred over receiving a voucher.

Recruitment/study site

The recruitment took place in the study sites which consisted of low-threshold services (including drug consumption rooms), consulting services, housing projects, and opioid agonist treatment(OAT) practices in Berlin and 6 different cities in Bavaria.

Facilities were identified through previous partnerships, networks of collaboration partners, online search and a list from the Association of Statutory Health Insurance Physicians for OAT practices, and invited for participation 3 months prior to study start.

Recruitment was done continuously during the routine work or organised as testing days/weeks by the facilities. The facilities decided themselves how to organise recruitment and participation which best suited their situation and clients.

Lessons learnt: Recruitment worked well in low-threshold services (including drug consumption rooms) and OAT-practices, and was well accepted by study participants. Consulting services and housing projects only recruited few participants, and will not be included in future monitoring. Some services initiated collaborations with local AIDS services to support with blood sampling and testing. This worked well and reduced workload for the study site. In the future, services will be invited 6 months prior to study start to have more time for preparation. It was important that the study sites could decide themselves how (and when) to organise recruitment and study participation. This will also be done during future monitoring.

Composition of study staff

The study team at RKI including 2 part-time scientists, 1 full-time study assistant, student assistants (~10 hours per week). The study team at RKI was responsible for the overall coordination, including planning, setting up the study materials, providing training, problem-solving and logistical support during the recruitment phase, questionnaire entry, data analysis and communication of the results. The recruitment in the facilities was done by staff members of the facilities during their routine work and was not financially compensated. The study team in each facility consisted mostly of two people per facility.

Lessons learnt: Having a central study team was essential. Despite a higher workload, the recruitment during routine work in the facilities was considered feasible by staff members.

Sample size

A sample size of 700 was calculated, and 668 participants were recruited, of which 596 participants fulfilled the inclusion criteria and were included in the study.

Lessons learnt: Reaching the calculated sample size was challenging, and even more so due to the COVID-19 restrictions. Especially OAT-practices were still

heavily involved in the COVID-19 vaccination campaign at the time of the study which challenged recruitment.

Data collection period

June-October 2021 in Berlin and November 2021 – April 2022 in Bavaria.

Lessons learnt: Vacation times should be avoided for study recruitment.

Specimen collected and testing

Dried blood spots (DBS) were collected by trained staff members at the study sites.

Lessons learnt: Blood collection using DBS required training of (medical and non-medical) staff members, preferably hands-on training, but worked well when practiced.

Biomarkers	Type of test
Hepatitis C: Anti-HCV, HCV RNA (all samples)	Qualitative ECLIA (Anti-HCV), qualitative Real-Time PCR (HCV-RNA)
Hepatitis B: HBsAG, Anti-HBs, Anti-HBc, HBV-DNA (all samples)	Quantitative ECLIA (HBsAg), quantitative ECLIA (Anti-HBs), qualitative ECLIA (Anti-HBc), qualitative Real-Time PCR (HBV-DNA)
HIV: Anti-HIV1/2, IgG AK HIV-1 /2, HIV-RNA	Qualitative ECLIA (Anti-HIV 1/2), qualitative Immunoblot (IgG AK HIV-1 and HIV-2), qualitative Real-Time PCR (HIV-RNA)
Syphilis: TPPA-Test (all samples), VDRL-Test for IgG and IgM (if TPPA-titer >= 1:80)	Semi-quantitative particle agglutination assay (TPPA), qualitative Immunoblot (VDRL IgG and IgM)

Lessons learnt: The threshold for determining a sample positive for anti-HBs from DBS samples was high (210 IU/µl), making it difficult to assess how many people were HBV-vaccinated. The assigned laboratory has re-validated their laboratory methods, with the result of a lower threshold in the future.

Data collection – questionnaire

A paper-based questionnaire in simple language was used for data collection with 20 main and 20 sub-questions (conditional, based on the response of the main question). The questionnaire was developed in German, and translated into 11 languages: Bulgarian, English, Farsi, French, German, Greek, Italian, Polish, Rumanian, Russian and Vietnamese.

Assistance for completing the questionnaire was made available and offered to the participants.

Lessons learnt: The paper-based questionnaires worked well. Questionnaire needs to be shortened and conditional questions referring to various time periods (last 12 months or last 30 days) were complex, frequently requiring assistance by staff members.

DRID indicators that were collected through the study

Tested/measured:

1) HCV viraemic prevalence
2) HIV prevalence
3) HBV prevalence (chronic and previous infection)
4) HBV vaccination prevalence (however, informative value low due to high limit of detection of DBS samples for anti-HBs)

Self-reported:

1) Proportion tested (ever/last 12 months) for HBV, HCV, HIV, syphilis
2) Proportion diagnosed for HBV, HCV, HIV, syphilis
3) Treatment experience if reported positive for HCV (currently/past, proportion effectively treated if past treatment), HIV
4) Use of unsterile n/s (receptive sharing) ever/last 30 days/last injection
5) Use of unsterile cooker, spoon, filter, water (receptive sharing) ever/last 30 days
6) Number of injecting days in the last 30 days and number of infections per day
7) Places to receive sterile n/s during the last 30 days
8) OAT (ever/currently)
9) Years since first injection
10) Primary drug
11) Prison history including injecting drug use in prison
12) Sexual intercourse (gender and number of partners)
13) Condom use
14) Sex work (last 12 months)
15) Injecting drug use last sexual partner
16) Overdose
17) Sociodemographic indicators (including gender, age, country of birth, homelessness, school history, source of income)

Lessons learnt: the question about number of injecting days (self-reported) could not be used for analysis as the answers were very likely invalid. Overall, questions related to drug consumption and/or sharing of paraphernalia were challenging. It seemed to be too difficult to report, as the time period (last 12 months versus 30 days) was often confused.

Data analysis

Occurrence of disease (prevalence/incidence)

The prevalence was estimated for HBV, HCV and HIV.

Measure of association (risk factors)

No MVAs were done due to the small number of study participants. A few bivariate analyses were performed with the main risk factors described in the literature. Results will be published soon.

Weighting

No weighting was done for the analyses, and the data were presented for the total number of participants or for the participants per city included in the study.

Direct link to intervention as part of the study (e.g. linkage to care or vaccination

- Pre-test counselling offered (trained staff), if participant wanted to get a PoC test (study arm 2) or wanted to get test results from DBS testing (study arm 3)
- Rapid testing for anti-HIV and anti-HCV offered for free (study arm 2)
- Post-test counselling (Medical doctors) if uptake of test results (study arm 3)

Referral for treatment or confirmatory testing was, however, challenging according to staff members.

Lessons learnt: This required a large extra effort in terms of staff and funding; PoC tests will not be offered as part of the study anymore for future rounds, but laboratory results will be sent to facilities. One barrier in Germany will be the legal regulations, that only allow medical doctors to return laboratory tests results. During the evaluation staff members saw it as a legal obligation though to return the results and already engaged in collaborations e.g. with OAT-practices or medical doctors at local AIDS services.

Pre-and posttest counselling/test results and linkage to care

- Rapid testing for anti-HIV and anti-HCV offered including pre- and post-test counselling (study arm 2)
- Pre- and if applicable post-test counselling was also conducted when returning the laboratory results (study arm 3)

Dissemination of results

- Final report including reports per federal state and per city that recruited more than 30 study participants
- Meetings with national stakeholders
- Meetings with city stakeholders
- National and international conferences
- Website
- Several peer-reviewed international and German publications are currently being prepared.

Data protection/ethics approval

Ethical approval was received from the ethics committee at the Medical Chamber Berlin (ETH-51/10) in December 2020. The law firm Schürmann assessed data protection (DSGVO) and conducted a data protection impact assessment (DSFA) for the study protocol and contracts needed for the study and gave their approval in May 2021. All participants signed an informed consent form to allow their anonymous data to be used for publication.

Costs for the study and source of funding

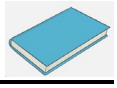
The German Ministry of Health provided the funding for the study. The cost per participant was approximately 644 euro.

Overall lessons learnt

- Recruitment of participants as part of daily routine work at the low-threshold facilities and OAT services is both a strength and weakness. Only people already reached by services were included.
- The questionnaire needs to be shortened, and the number of spots for DBS needs to be reduced.
- Study materials need to be easily understandable and well prepared. Sufficient training needs to be offered to ensure that the facilities are able to lift the task of continuous monitoring without additional funding.
- Language barriers could not be overcome using language mediation via telephone, staff with translation skills were missing in some services. Translated study material was useful, but could not fully overcome language barriers for study participation.

Main strengths

- Recruitment in low-threshold services and OAT-practices was well-accepted by study participants and reached the study population well.
- Collaborations with local AIDS services were very successful and should be recommended for the future.

Further reading 

Study documents:

- Study protocol: https://www.rki.de/DE/Content/InfAZ/H/HIVAIDS/Studien/DRUCK-Studie/Druck_2.0.html
- SOPs (in German) available upon request
- Questionnaire: https://www.rki.de/DE/Content/InfAZ/H/HIVAIDS/Studien/DRUCK-Studie/Fragebogen_Druck2.0_En.pdf?__blob=publicationFile

Publications:

- Not yet available, but will be uploaded here: https://www.rki.de/DE/Content/InfAZ/H/HIVAIDS/Studien/DRUCK-Studie/Druck_2.0.html

The HCV-UD outreach programme, Luxembourg

- **The HCV-UD outreach programme in short:** A cross-sectional study including follow-up of HCV viral load after DAA treatment.
  Key strengths: Recruitment in low-threshold services reached the high-risk population. Treatment and link to care to an infectious diseases specialist.

Key weakness: active drug consumption was limiting the access to DAA treatment. The study team was not part of the service, which prevented efficient workflow between the different actors. The return of the viral load results took at least two weeks.

Contact: Carole Devaux: Carole.Devaux@lih.lu
Submission of best practice example: June 2023

Aim and objectives

- To characterise the profiles and practices of active PWID
- To provide testing and link to medical care
- To investigate the HCV continuum of care among PWID
- To improve prevention initiatives and investigate the barriers to treatment

Lessons learnt: The current practices of drug consumption are difficult to ascertain in the frame of a research project on infectious diseases; it is easier in the context of the activities of a drug consumption room, where there is no penalisation of drug use.

Study population/inclusion criteria

Adults having consumed any drugs (IV or not)

Lessons learnt: The use of cannabis should be excluded as the first drug consumed.

Study design

Initial cross-sectional study with a follow-up of HCV viral load after DAA treatment.

Sampling strategy

Multicentric retrospective study.

Incentive

A list of names is kept in each centre in the registration files to avoid duplicate participation. Between 2015 and 2019, the incentive included screening for hepatitis C and evaluation for fibrosis as many were already aware of being HCV-positive, as well as screening for other infectious diseases. In 2022 a financial incentive was implemented, and participants received 10 euro for participation.

Recruitment/study site

Recruitment and study participation took place in drug consumption rooms and low-threshold harm reduction services.

Composition of study staff

One infectious diseases specialist, one nurse and one medical doctor were the study staff. The medical doctor was a permanent part of the staff on site, and the infectious disease specialist and nurse travelled from site to site as needed.

Sample size

480

Data collection period (year and duration)

2015-2019 for recruitment until 2021 for viral load follow-up for treatment success.

Specimen collected and testing

Blood samples drawn by nurses.

Biomarkers	**Type of test**
Hepatitis C: Anti-HCV and HCV RNA, viral load if serology positive and liver biomarkers, Fibroscan	Serologies, viral load before the implementation of the GenXpert in 2022 at the drug consumption room and in two drug treatment centres in 2023
Hepatitis B: HBV serology, viral load if serology positive and liver biomarkers, Fibroscan	Serologies, viral load performed at the hospital (only HCV-RNA is done with the GenXpert on site)
HIV: Anti HIV and western blot for confirmation	Serologies, viral load performed at the hospital only HCV-RNA is done with the GenXpert on site)
Syphilis: Syphilis serologies	Serologies

Data collection – questionnaire

Interviews were conducted using a standardised questionnaire including demographic and social characteristics, drug use patterns, and risk and harm reduction behaviours. Initially the questionnaire was paper-based, but then replaced by electronic format (computer).

Lessons learnt: Questionnaire was too long (45 questions), it needs to be shortened.

DRID indicators that were collected through the study

- See the questionnaire in French that should be filled out at the time of the screening for HCV-RNA and HIV/syphilis by TROD now, we should decrease the size of the questionnaire. Questions on sexual activity are very difficult to ask as well as the current drug consumption (the previous consumption is fine).

- Since patients are now proposed treatment on site, every patient that entered into treatment received other blood draws performed by the nurse or the MD of the site and analyses allowed to follow viral load during treatment and for SVR 3, SVR 6, SVR 12. These data are kept at the hospital to assess the HCV cascade of care and reinfection and for the patient.

- The data will be then collected for the hepatitis plan.

Data analysis

Occurrence of disease (prevalence/incidence):

- Prevalence and fibrosis stage in active high-risk drug users
- Treatment uptake in low-threshold settings
- Continuum of cascade of care
- SVR and lost to follow-up
- Phylogenetic analysis

Measure of association (risk factors)
MVA were performed for IgG and HCV RNA at inclusion with drug consumption and sociodemographic characteristics, clinical data, and risk factors from the literature. Data will be published.

Weighting
No weighting was done for the analyses.

Direct link to intervention as part of the study (e.g. linkage to care or vaccination)?
Yes

Pre-and posttest counselling/test results and linkage to care (included? And how?)

Yes, in collaboration with an NGO (the HIV Berodung with the support of a psychologist).

Dissemination of results

Reports were submitted to the Ministry of Health (MoH).

Meetings with the stakeholders:

- International conferences
- Website (Best practice EMCDDA for HCV care in 2019)
- One peer-reviewed international publication is currently being prepared.

Data protection/ethics approval

The study was approved by the national ethics committee. All participants provided written informed consent.

Costs for the study and source of funding

From 2023, the GenXpert project is funded by the MoH and costs 180 000 euro per year for the funding of one nurse, reagents, TROD and coupons.

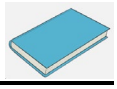
Training and incentives for future peers are planned for 2024, the total budget will be then 250 000 euro.

Overall lessons learnt

- 60 % were tested IgG positive but seropositivity was already known for the majority
- Linkage to care was initially done at the hospital and then in drug treatment sites
- The delay for the laboratory results needed to initiate treatment was too long (> 2 weeks for viral load)
- The decision for initiating the treatment was given by the infectious diseases specialist based on drug consumption and housing
- Daily observation of DAA treatment on drug treatment sites (little flexibility to expand DAA to several days)
- Viral load for monitoring the efficacy of DAA treatment was mainly done through consultations with blood drawing at the hospital, few on sites, LTFU, SVR not known
- Low-dose methadone was not provided on site for the ones that did not benefit from OAT
- The epidemiological questionnaire was too long (frequency/type of current drug consumption, sexual behaviour, previous testing for HIV or HCV)

Main strengths

- The study will now provide treatment within 24 hours on site and further blood samples for viral load will be performed at the sites.
- Incentives of 10 euro of food coupon are proposed for screening.
- The medical doctor working at the harm reduction site.

Further reading 

Study documents:

- Study materials available upon request.
- Questionnaire: available upon request

Publications:

- Manuscript is being prepared

Repeated cross-sectional surveys

ARISTOTLE (2013-2012), ARISTOTLE HCV-HIV (2018-2020), ALEXANDROS (2019-2021), Greece

Aristotle, Alexandros in short: Repeated community-based cross-sectional surveys with respondent-driven sampling (RDS) among PWID (mainly current, not linked to OAT) in Greece
Key strengths: High population coverage, valuable data to monitor trends and estimate incidence etc., possible to keep track of repeat participants across surveys/programs
Key weakness: RDS is resource intensive, additional effort to collect information that allows to uniquely identify individuals across surveys
Contact: Vana Sypsa (vsipsa@med.uoa.gr)
Submission of best practice example: June 2023

Aim and objectives

To increase diagnosis and linkage to care for infectious diseases in the population of PWID

Study population/inclusion criteria

PWID (mainly interested in **current** PWID), **not linked** to other services (higher risk, lower diagnosis/treatment rates).

Lessons learnt: The use of RDS (peer-driven chain referral with monetary incentives) allows to enrol PWID with current injecting drug use and, often, not linked to other services/OAT etc. Formative research or other existing data are necessary to assess whether there are migrant PWID and their country of origin in order to make sure that there are cultural mediators and/or interpreters and that these persons will not be excluded.

Study design

Multiple cross-sectional surveys (each person could participate in multiple rounds – but once in each round) with RDS.

Lessons learnt: Keeping track of repeat participants requires unique anonymous identifier e.g. through full birthdate, third letter of father's name, third letter of mother's name and sex. This code can then be used for merging datasets.

The advantages of using multiple surveys: increase in population coverage of the programme, increase in linkage to care (e.g. patients who were not linked in one survey, could be linked in the next survey), assessment of changes in risk behaviours and in HIV/HCV status (seroconversions) over time, estimation of HIV/HCV incidence, estimation of PWID population size with capture-recapture using as sources the RDS rounds.

Sampling strategy

Peer-driven chain referral/RDS

Lessons learnt: The method allows to reach deep into the network of PWID (long recruitment chains) and rapidly achieve high population coverage.

Incentive

Five euro was given as a primary incentive, and an additional 3 euro was given for an additional participant recruited (for up to 3 recruits).

Recruitment/study site

- ARISTOTLE: Athens
- ARISTOTLE HCV-HIV: Athens
- ALEXANDROS: Thessaloniki

Composition of study staff

- ARISTOTLE: 1 medical doctor, 1 psychologist (interviews, counseling, linkage to care), 4 social workers/sociologists/peers (interviews, linkage to care), 2 cultural mediators
- ARISTOTLE HCV-HIV: 1 medical doctor, 1 nurse, 5 sociologists/psychologists/ peers (interviews, linkage to care)
- ALEXANDROS 2018-2020: 1 medical doctor/nurse, 2 psychologists/sociologists and 1 peer (interviews, linkage to care)

Sample size (unique participants across all rounds of each programme)

- ARISTOTLE: 3 320
- ARISTOTLE HCV-HIV: 1 634
- ALEXANDROS: 1 101

Data collection period (year and duration)

- ARISTOTLE: 2012-2013, 16 months
- ARISTOTLE HCV-HIV: 2018-2020, 22 months
- ALEXANDROS: 2019-2021, 22 months

Specimen collected and testing

- ARISTOTLE: blood samples (medical doctor)
- ARISTOTLE HCV-HIV: blood samples (medical doctor or nurse)
- ALEXANDROS: rapid tests and blood samples from those testing positive (medical doctor or nurse)

Biomarkers	Type of test
Hepatitis C: ARISTOTLE: Anti-HCV (mainly for 'new' injectors) ARISTOTLE HCV-HIV and ALEXANDROS: Anti-HCV, HCV RNA	ARISTOTLE: anti-HIV and confirmation by Western Blot. For indeterminate results, HIV RNA. Anti-HCV testing. ARISTOTLE HCV-HIV: anti-HIV and confirmation by Geenius HIV 1/2 Confirmatory Assay. Anti-HCV and HCV RNA. Additional tests for the initiation of HCV treatment (HCV genotype, complete blood count, biochemical tests, prothrombin time). Fibroscan. HBsAg. ALEXANDROS: Rapid tests for anti-HIV and anti-HCV. Collected blood samples were tested for anti-HIV with confirmation by Geenius HIV 1/2 Confirmatory Assay as well as for anti-HCV and HCV RNA. Additional tests for the initiation of HCV treatment (HCV genotype, complete blood count, biochemical tests, prothrombin time) and HBsAg.
HIV: ARISTOTLE, ARISTOTLE HCV-HIV, ALEXANDROS: Anti-HIV and confirmatory tests	
Hepatitis B: ARISTOTLE HCV-HIV, ALEXANDROS: HBsAg among those with positive rapid HCV/HIV tests	

Data collection – questionnaire

Data collection took place using computer-assisted personal interviewing.

Lessons learnt: Computer-assisted interviewing allowed to have the data readily available

DRID indicators that were collected through the study

Sharing syringes and other equipment:

- In the past 12 months, how often did you use syringes that someone else had already injected with?
- In the past 12 months when you injected, how often did you use water that someone else had already used? (the same question for cotton, cooker)
- In the past 12 months when you injected, how often did you use drugs that had been divided with a syringe that someone else had already injected with?
- The last time you injected with someone, did you use a needle after anyone else had already injected with it?
- The last time you injected with someone, did you use a cooker, cotton, or water that anyone else had already used?

Testing and diagnosis

Apart from the information from HCV/HIV testing performed in the programmes, the following questions were asked:

- Have you ever been tested for HIV? (and date of most recent test)
- What was the result of your most recent HIV test?
- Are you currently taking antiretroviral medicines to treat your HIV infection?
- Have your ever been diagnosed with hepatitis?

- What type or types of hepatitis have you had?
- Have you ever taken medicine to treat your hepatitis C infection?
- Did your doctor tell you that you were cured of your hepatitis C infection after you finished taking medicine for hepatitis C?

NSP

- In the past 12 months, have you gotten any syringes through these prevention activities?
- During the last month, how many new syringes did you get through these prevention activities?

Data analysis

Occurrence of disease (prevalence/incidence)

- Anti-HIV and anti-HCV/chronic hepatitis C prevalence
- HIV incidence (through observed seroconversions and through mathematical modelling)
- Incidence of primary HCV infection (though observed seroconversions or using anti-HCV prevalence among 'new' injectors)

Measure of association (risk factors)

Odds ratios and hazard ratios for the risk of being HIV positive or of HIV seroconversion.

Weighting
RDS-weighted estimates of HIV prevalence

Direct link to intervention as part of the study (e.g. linkage to care or vaccination)

- Yes (linkage to HCV and HIV care)
- In ARISTOTLE, through arranging appointments with HIV clinics.
- In ARISTOTLE HCV-HIV, chronic hepatitis C patients visited the clinics with the help of a peer-navigator or the doctors visited the study site
- In ALEXANDROS, chronic hepatitis C patients were linked to treatment with DAAs and received their prescriptions through the programme. A peer-navigator accompanied HIV patients to their first appointment with the HIV clinic (appointments were arranged by the personnel).

Pre-and posttest counselling/test results and linkage to care (included? And how?)
Pre- and post-test counselling by the doctor/nurse (in ARISTOTLE, a psychologist was also involved as well as a volunteer from an HIV patients' association)

Dissemination of results

Reports were written for the National Public Health Organisation and the Ministry of Health. Publications in the press (articles in print or online). Conferences and invited talks to expert meetings (see further reading box).

Data protection/ethics approval

Yes (National and Kapodistrian University of Athens, Hellenic Scientific Society for the Study of AIDS and STDs).

Costs for the study and source of funding

- ARISTOTLE: National and EU funding

- ARISTOTLE HCV-HIV: Private funding
- ALEXANDROS: Private funding

Overall lessons learnt

- A procedure has to be set up to track repeat participants in multiple rounds (but this has to be done even if a single RDS round is performed) – this requires extra effort but cannot be avoided when RDS is included (and it actually contributes to the strengths of the programme)
- Lengthy questionnaire

Main strengths

- High population coverage
- Reaching PWID at high risk of infection/transmission and with limited access to testing and treatment (mainly currently injecting, not linked to other services)
- Valuable data to monitor trends, estimate incidence etc**.**

The difficulty in this design (repeated cross-sectional surveys using RDS for recruiting PWID) lies in the design of an RDS survey and not whether there will be a single round or multiple rounds.

Further reading 

Publications:

Incidence, prevalence and risk factors, trends over time

- Sypsa V, et al. Homelessness and Other Risk Factors for HIV Infection in the Current Outbreak Among Injection Drug Users in Athens, Greece. American Journal of Public Health. 2015;105(1):196-204.
- Hatzakis A, et al. Design and baseline findings of a large-scale rapid response to an HIV outbreak in people who inject drugs in Athens, Greece: the ARISTOTLE programme. Addiction. 2015;110(9):1453-67.
- Pavlopoulou ID, et al. High-risk behaviors and their association with awareness of HIV status among participants of a large-scale prevention intervention in Athens, Greece. BMC Public Health. 2020; 20(1):105. doi: 10.1186/s12889-020-8178-y.
- Sypsa V, et al. Rapid Decline in HIV Incidence Among Persons Who Inject Drugs During a Fast-Track Combination Prevention Program After an HIV Outbreak in Athens. J Infect Dis. 2017;215(10):1496-505.
- Sypsa V, et al. Food insecurity among people who inject drugs in Athens, Greece: a study in the context of ARISTOTLE programme. Public Health Nutr. 2021;24(5):813-8.
- Roussos S, et al. Ongoing HIV transmission following a large outbreak among people who inject drugs in Athens, Greece (2014-20). Addiction. 2022;117(6):1670-1682.

- Sypsa V, et al. A new outbreak of HIV infection among people who inject drugs during the COVID-19 pandemic in Greece. Int J Drug Policy. 2023;117:104073.

Network characteristics

- Tsang MA, et al. Network Characteristics of People Who Inject Drugs Within a New HIV Epidemic Following Austerity in Athens, Greece. Journal of AIDS. 2015;69(4):499-508.

Population size estimation

- Roussos S, et al. Estimating the number of people who inject drugs using repeated respondent-driven sampling (RDS) in a community-based program: implications for the burden of hepatitis C and HIV infections and harm reduction coverage. AIDS Behav. 2023;27(2):424-430.

Mathematical modeling of the 2011 HIV outbreak.

- Flountzi E, et al. Modeling the impact of interventions during an outbreak of HIV infection among people who inject drugs in 2012-2013 in Athens, Greece. Drug and alcohol dependence. 2022;234:109396.

Mortality among PWID in Greece

- Roussos S, et al. High levels of all-cause mortality among people who inject drugs from 2018 to 2022. Int J Drug Policy. 2024;126:104356. doi: 10.1016/j.drugpo.2024.104356.

Molecular analysis

- Paraskevis D, et al. Molecular investigation of HIV-1 cross-group transmissions during an outbreak among people who inject drugs (2011-2014) in Athens, Greece. Infect Genet Evol. 2018;62:11-16.

Needle Exchange Surveillance Initiative (NESI), Scotland

NESI in short: Anonymous repeat cross-sectional bio-behavioural survey among PWID in Scotland
Key strengths: National coverage and high capture rate of the target population
Key weakness: Anonymous participation (no linkage to other services)
Contact: Norah Palmateer: norah.palmateer@phs.scot ; Sharon Hutchinson: sharon.hutchinson@phs.scot
Submission of best practice example: June 2023

Aim and objectives

To measure and monitor the extent of HCV infection (and other BBVs), injecting risk behaviours and uptake of harm reduction services among PWID in Scotland.

Study population/inclusion criteria

Ever injected drugs (but recruitment of past-PWID is limited to approximately 30 % of the sample).

Lessons learnt: Important to stratify analyses by past or current (i.e., injected in the last 6 months) PWID

Study design

Repeat [approximately biennial] cross-sectional bio-behavioural survey.

Sampling strategy

Convenience sample of clients attending injecting equipment provision (IEP) sites (sites may also provide opioid agonist treatment and/or other harm reduction interventions). All potentially eligible clients are approached to participate if possible. Recruitment targets are calculated for each NHS Board (administrative health regions) based on other intelligence about the size and distribution of the problem drug using population across each of these areas.

Incentive

10-20 pounds (~12-24 euro) 'Love to Shop' voucher (voucher that can be spent at numerous chain shops in the UK).

Recruitment/study site

Recruitment is at sites providing IEP – primarily community pharmacies but also dedicated agencies providing drug treatment/harm reduction services. Approximately 50 % of the total 200 IEP sites in Scotland are typically covered in each survey. Sites are selected from across all the mainland NHS Boards (administrative health regions) in Scotland.

Composition of study staff

Fieldwork staff are not required to have specific skills or experience, but are provided with training.

Lessons learnt: Benefit of having dedicated, independent study staff (i.e., not pharmacists or service staff) to conduct the interviews.

Sample size

2 000 to 2 500 in each survey (an estimated ~10-15 % of the total population of PWID in Scotland).

Data collection period

Data collection for each survey takes place during a 12-month period (approximately), which is the time it takes to cover all of the NHS Boards (administrative health regions) in mainland Scotland in succession. Seven surveys have been completed to date in 2008-09, 2010, 2011-12, 2013-14, 2015-16, 2017-18, and 2019-20 and data collection for an 8th survey (2022-23) survey is underway.

Specimen collected and testing

Blood spots collected by the fieldwork staff (i.e., interviewers).

Biomarkers	**Type of test**
Hepatitis C: Anti-HCV and HCV RNA	Anti-HCV 2008-2009 through 2013-14: Ortho Save 3.0 EIA 2015-16 onwards: Abbott Architect i200r Anti-HCV assay HCV RNA Surveys up to 2018: HCV RNA was tested using an 'in-house' PCR assay using the extraction protocol for DBS on the Easymag and a real-time PCR For the 2019–2020 survey, HCV RNA was extracted and amplified using a laboratory defined protocol on the Abbott m200sp and m200rt platform.
Hepatitis B: Anti-HBc and HbsAg (2013-14 only)	DBS eluates were tested on the Abbott Architect i2000sr using the following assays: Architect Hepatitis B core II antibody, Architect HBsAg Qualitative II assay and Architect HBsAg Confirmatory assay. Low-level HBsAg-positive samples that could not be verified by neutralisation on the Architect were confirmed using the miniVIDAS HBsAg Ultra assay (bioMérieux, Marcy l'Étoile, France).
HIV: HIV Ag/Ab (from 2011-12)	Samples first screened using the HIV Ag/Ab Combo assay on the Architect i200sr. HIV positives were confirmed by re-testing on the Architect and by using a supplemental antibody assay. In 2011-12 through 2015–16 the supplemental assay was ImmunoComb II HIV 1and2 BiSpot (Orgenics) and from 2017 it was the Geenius HIV 1/2 (Bio-Rad).

Lessons learnt: Minimal training is required to take blood spots and therefore there is no requirement for staff to be trained in venepuncture. Pooled HCV RNA testing of anti-HCV negative samples is undertaken – given the expected low proportion RNA positive in this group – which helps to minimise costs.

Data collection – questionnaire

Interviewer-administered paper questionnaire that takes approximately 20 minutes to complete.

Lessons learnt: There are a set of 'core' questions that have stayed the same across all of the surveys to allow monitoring of key trends, but other questions have been added/removed – allowing flexibility to collect data on topics of emerging public health relevance as required.

DRID indicators that were collected through the study

Tested/measured (see further detail under Data analysis):

- Prevalence of chronic HBV infection
- Prevalence of and trends in chronic HCV infection
- Prevalence of HIV infection
- Incidence of primary HCV infection

Self-reported:

- Prevalence of sharing used needles/syringes (receiving): ever, last six months
- Prevalence of sharing used injecting paraphernalia (receiving): ever, last six months
- Prevalence of injecting drug use: last six months, last 4 weeks
- Drugs in injected: last six months
- Prevalence of past imprisonment
- Prevalence of homelessness
- Experience with stigma and discrimination
- Needle-syringe distribution (number of sterile needles/syringes obtained in an average week in the last six months)
- OAT coverage: ever, in last six months, current
- HBV vaccination coverage
- Condom use: last 6 months
- Naloxone access: last 12 months
- HIV and HCV testing: ever, last 12 months
- HIV and HCV diagnosis*
- HIV treatment: current
- HCV treatment: ever, last 12 months

* These measures combine self-report and test data. For HIV diagnosis, this represents the proportion of individuals who are HIV-positive on dried blood spot testing that report that they are HIV-positive in the questionnaire (i.e. are aware of their infection). For HCV diagnosis, it is the proportion of individuals with evidence of chronic infection on dried blood spot testing that report that they have HCV in the questionnaire.

Data analysis

Occurrence of disease (prevalence/incidence)

- Prevalence of anti-HCV
- HCV primary infection incidence (through detection of recent infections, i.e., HCV Ab-ve and RNA +ve, and additionally measured as prevalence of anti-HCV among those who recently commenced injecting in the last 3 or 5 years)
- Prevalence of chronic or resolved HCV infection (i.e., % Ab +ve/RNA +ve, % Ab +ve/RNA -ve) (from 2010)
- HIV prevalence (from 2011-12)
- Prevalence of anti-HBc (2013-14 only)
- Prevalence of HbsAg among anti-HBc positives (2013-14 only)

Measure of association (risk factors)

Risk factors for infection are reported in the NESI report and associations been analysed in peer-reviewed publications. See the 'further reading box'.

Weighting

No weighting was done.

Direct link to intervention as part of the study (e.g. linkage to care or vaccination
No – participation is anonymous. Participants are signposted to other services/interventions if they enquire.

Lessons learnt: The survey is not used to facilitate access to services, as these are free and widely accessible in Scotland. Indeed, such an approach could introduce a biased sample, as those already engaged or those who do not wish to engage further in services may choose not to participate.

Pre-and post-test counselling/test results and linkage to care (included? And how?)

No – participation is anonymous. Participants who wish to know their HCV or HIV status are directed to the appropriate testing services.

Dissemination of results

A public-facing report, infographic and data tables are published after each survey sweep. The latest is available at: Needle Exchange Surveillance Initiative (NESI) – Needle Exchange Surveillance Initiative (NESI) – Publications – Public Health Scotland. Non-suppressed local data and bespoke analyses are also made available to NHS Board authorities.

Numerous presentations at national and local meetings are given. Numerous publications in peer-reviewed journals have also been generated and are listed in Appendix 4 of the above report. Some key publications generated from NESI data can be found in the 'further reading box'.

Data protection/ethics approval

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.

Costs for the study and source of funding

Health Protection Scotland (which became Public Health Scotland on 1 April 2020) funded the 2008–2018 NESI studies and funded the coordination, analysis and reporting of the 2019–20 survey.

The implementation of the 2019–20 NESI survey, and retrospective HCV RNA testing of the 2011–2014 NESI surveys, was funded by the National Institute for Health Research (NIHR) Programme Grants for Applied Research Programme (Grant Reference Number RP-PG-0616-20008). The cost per participant is approx. GBP 100.

Overall lessons learnt

The NESI survey methodology was based on earlier community surveys undertaken in Glasgow and therefore the methodology was honed during these surveys.

Main strengths

- national coverage
- high capture rate of the target population (~10-15 % of the PWID population in Scotland)
- high quality of data generated from trained, independent interviewers
- use of the dried blood spot, facilitated testing for key biomarkers (e.g. HCV RNA)
- ability to pivot to generate data on high priority public health issues by adding/removing questions to the questionnaire or running new (validated) laboratory assays on the blood spot samples

Further reading 

Study documents:

- Questionnaire: https://publichealthscotland.scot/publications/needle-exchange-surveillance-initiative-nesi/needle-exchange-surveillance-initiative-nesi/
- Other study documents are available upon request

Publications:

- Report: https://publichealthscotland.scot/media/12421/2022-04-01-nesi-19-20-report.pdf
- Palmateer NE, McAuley A, Dillon JF, McDonald S, Yeung A, Smith S, Barclay S, Hayes P, Shepherd SJ, Gunson RN, Goldberg DJ, Hickman M, Hutchinson SJ. 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): 2893-2907.
- McAuley A, Palmateer NE, Goldberg DJ, Trayner KMA, Shepherd SJ, Gunson RN, Metcalfe R, Milosevic C, Taylor A, Munro A, Hutchinson SJ. 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-e324.
- Palmateer N, Taylor A, Goldberg DJ, Munro A, 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.

- Palmateer N, Goldberg DJ, Munro A, Taylor A, Yeung A and Wallace LA, 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
- Trayner K, McAuley A, Palmateer N, 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 Mar; 77: 102663.

Cohort studies

HCV care within a needle and syringe programme (NSP) clinic in Stockholm, Sweden

HCV care within an NSP clinic: A registry-based study (open cohort) including PWID visiting NSP in Stockholm, Sweden
Key strengths: High population coverage, and good surveillance tool for observing trends (in drug use, incidence, prevalence and morbidity)
Key weakness: The Swedish legislation which requires proof of identity
Contact: Martin Kåberg (martin.kaberg@ki.se)
Submission of best practice example: June 2023

Aim and objectives

To enhance the HCV care cascade and continuum of care for PWID in Stockholm, Sweden.

Lessons learnt: Creating a multidisciplinary low-threshold clinic with a 'one-stop-shop' approach was a success factor. Task shifting, with nurse-led HCV treatment and remote consultation for infectious disease specialist support was a success factor.

Study population/inclusion criteria

PWID attending NSP in Stockholm, Sweden. All PWID enrolled in the Stockholm NSP fulfill the following criteria

1) Active IDU
2) Age ≥18 years (≥ 20 before March 2017, due to previous Swedish legislation)
3) Proof of identity (required by Swedish legislation).

Lessons learnt: A large limitation was the Swedish legislation requiring proof of identity. This might be a barrier of people seeking and accessing care.

Study design

It is a registry-based study (open cohort).

Lessons learnt: A data driven approach, creating a digital national quality register (InfCare NSP) as a clinical decision tool and research data register was a success factor for the follow up of individuals over time.

Sampling strategy

Convenience sampling; all people attending the Stockholm NSP 2013-2021.

Lessons learnt: Including all in the quality register was a success factor. A passive follow-up might be a limitation but these data are from real-world clinical care.

Incentive

No incentive was provided to the participants.

Recruitment/study site

The Stockholm NSP consists of two fixed sites, located in the Stockholm inner city and one mobile unit running in the whole Stockholm Region. The Stockholm NSP is a low-threshold programme providing needle/syringe, paraphernalia, free condoms and health services such as basic healthcare, contraceptive counselling and other midwife services, testing, vaccination and treatment for infections, including HIV and HCV.

Lessons learnt: Two fixed NSP in the whole of the Stockholm Region is a limitation in regards to accessing the NSP services, especially since needle/syringes are not available from other clinics or pharmacies

Composition of study staff

The NSP staff consist of 102 nurses and one medical doctor. Specialist infectious disease competence partly on site, and through remote consultation. HCV management is mainly nurse driven. The NSP units also have a case manager and a midwife on site. The NSP provides general counselling, referrals to social services and opioid agonist treatment (OAT).

Lessons learnt: A multidisciplinary team has been a success factor

Sample size

HCV treatment: n= 409, HCV prevalence/incidence: n= 4150

Data collection period

HCV treatment: 2017-2022. HCV prevalence/incidence: 2013-2021

Specimen collected and testing

Blood samples: Collected by NSP staff, mainly nurses. Demographic data: Collected by all NSP staff. At NSP enrolment, all participants are tested for HAV, HBV, HCV and HIV.

Biomarkers	Type of test
Hepatitis C: Anti-HCV, HCV RNA, HCV genotypes	Venepuncture tests sent to Karolinska University Laboratory
Hepatitis B: HBV serology, HBV DNA	Venepuncture tests sent to Karolinska University Laboratory
Hepatitis A: HAV serology	Venepuncture tests sent to Karolinska University Laboratory
HIV: HIV ab/ag	Venepuncture tests sent to Karolinska University Laboratory Point-of-care tests for HIV

Data collection – questionnaire

At NSP enrolment, all participants complete a 34-item background questionnaire on: enrolment demographics (education level, civil, housing conditions and so forth); previous and ongoing drug use; injection and sexual risk behaviours; and contacts with healthcare or social services, prison and prohibition services.

Follow-up interviews regarding sociodemographic determinants, risk behaviours and HBV, HCV and HIV tests, are repeated every three to six months and data are entered into the electronic database and national NSP quality register – InfCare NSP.

Four InfCare NSP questionnaires were used for the data collection. All questionnaires are performed as interviews with trained staff:

1) The 'NSP enrolment questionnaire': basic sociodemographic data and drug history (15-25 minutes)

2) The 'NSP standard visit questionnaire': at every NSP visit, clients report which drug they last injected (2-3 minutes)

3) The 'Three-to-six-month NSP follow-up questionnaire': updated information on employment and housing status and injection risk behaviours (5-10 minutes)

4) The 'Twelve-month NSP follow-up questionnaire': updated information on employment, housing status, injection risk behaviours and primary drug the past 12 months (10-20 minutes)

Lessons learnt: Interview with trained staff gives great quality of data. Still, with repeated interviews there are risks of respondent fatigue.

DRID indicators that were collected through the study

- All questionnaires from InfCare NSP are attached (in Swedish).
- All participants are tested for HAV, HBV, HCV and HIV at enrolment and tests are repeated every three to six months.
- All needle/syringes handed out are registered so coverage can be evaluated on individual and group level.

- A dashboard is under construction to facilitate data out-put in real-time for prevalence, incidence and e.g. proportion HCV treated (HCV treatment data is registered).

Data analysis

Occurrence of disease (prevalence/incidence):

- HIV, HBV prevalence and incidence
- HCV prevalence
- HCV incidence (including seroconversion and reinfections post spontaneous clearance or post HCV treatment)
- HCV treatment results and reinfections

Measure of association (risk factors)

Based on our previous research sociodemographic-, drug- and HCV-related determinants were selected for analyses (e.g. gender, age, country of birth, housing, drug injected, duration of injection drug use, incarceration, OAT, HBV-status, HIV-status)

Incidence rates. Hazard ratios for the risk of HCV sero-conversion or HCV reinfected

Weighting

No weighting was done for the analyses.

Direct link to intervention as part of the study (e.g. linkage to care or vaccination)

- Integrated HCV care including on-site HCV testing, assessment, treatment, counselling and education
- Non-invasive liver disease assessment using transient elastography
- HAV/HBV vaccination
- Free condoms and health services such as basic healthcare, contraceptive counselling and other midwife services, and treatment for infections, including HIV and HCV
- Overdose prevention and take-home naloxone

Pre-and post-test counselling/test results and linkage to care (included? And how?)

All participants are tested for HAV, HBV, HCV and HIV at enrolment and tests are repeated every three to six months. All participants are offered information about risk reduction, both orally and through written information.

All participants with HCV were informed about access to HCV treatment through personal information from the staff and digitally through an information screen in the waiting rooms. HCV treatment was mainly nurse-led (i.e., nurses tested for HCV, including liver function tests and genotypes, performed liver stiffness measurement with Fibroscan, suggested HCV treatment strategy and monitored participant during and after treatment). A physician at the NSP confirmed initial treatment strategy, prescribed DAA and evaluated complicated treatment-related issues, when needed.

Dissemination of results

Previous studies on the Stockholm NSP PWID population have been published on reduction of risk behaviour, blood-borne diseases prevalence and HCV incidence and disease burden, and effect on HCV treatment during the COVID-19 pandemic (see further reading box).

Data protection/ethics approval

InfCare NSP is a national quality register and Karolinska University Hospital has 'central personal data responsibility'. All studies are approved through the Swedish Ethics Approval Authority.

Costs for the study and source of funding

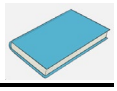
Government- and private funding.

Overall lessons learnt

Automatic integration of laboratory data into InfCare NSP would strengthen quality and reduce workload for staff. A question addressing whether persons had been HCV treated since last positive HCV test is good to include, as investigating this in another way is time consuming. This has now been integrated in the questionnaire.

Main strengths

- High population coverage (with high coverage of blood-borne viruses testing and demographic data)
- Great surveillance tool for drug use trends, risk behaviour trends, prevalence and incidence trends, morbidity (as linkage to the Swedish Cause of Death Registry recently became accessible for InfCare NSP quality register)
- Recently, obligatory fields were implemented in the InfCare NSP quality register to further secure good coverage and quality of data (which was delayed because of lack of funding)

Further reading 

Study documents:

- Questionnaire: available upon request

Publications:

- Lindqvist K et al. Real-world hepatitis C treatment outcomes and reinfections among people who inject drugs at a needle and syringe program in Stockholm, Sweden. Harm Reduct J. 2023 Jun 12;20(1):72. doi: 10.1186/s12954-023-00801-1.
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Overview of DRID indicators collected in the best practice examples

Building block: Burden and impact

Indicator	Core/ recommended/ optional	Definition	Study design (data source)	DRUCK	DRUCK 2.0	HCV-UD	NESI	HCV care within an NSP	ARISTOTLE	ARISTOTLE HCV-HIV	ALEXANDROS
Prevalence of HBsAg	Core	Proportion of PWID testing HBsAg positive	Cross-sectional or cohort data (blood sample)	X	X	X	X	X		X	X
Prevalence of viraemic HCV infection	Core	Proportion of PWID with viraemic HCV infection (HCV RNA positive or HCV-Ag positive)	Cross-sectional or cohort data (blood sample)	X	X	X	X	X	X	X	X
Trends in viraemic HCV prevalence over time	Core	Idem, trends	Repeated cross-sectional or cohort data (blood sample)				X	X	X	X	X
Prevalence of HIV infection	Core	Proportion of PWID living with HIV infection	Cross-sectional or cohort data (blood sample)	X	X	X	X	X	X	X	X
Incidence of HCV infection	Optional	Incidence rate of new infections with HCV (HCV RNA/cAg+)	Repeated cross-sectional or cohort data (blood sample)				X	X	X	X	X
Incidence of HIV infection	Optional	Incidence rate of new HIV infections	Repeated cross-sectional (with modelling) or cohort data (blood sample)					X	X	X	X

Building block: Risk factors

Indicator	Core/ recommended/ optional	Definition	Study design (data source)	DRUCK	DRUCK 2.0	HCV-UD	NESI	HCV care within an NSP	ARISTOTLE	ARISTOTLE HCV-HIV	ALEXANDROS
Prevalence of sharing used needles/syringes	Core	Proportion of PWID sharing used needles/syringes in the last 4 weeks (receiving or passing on)	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
Prevalence of sharing used injecting paraphernalia	Recommended	Proportion of PWID sharing any used injecting paraphernalia in the last 4 weeks other than needles/syringes (using together, receiving or passing on)	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
Prevalence of injecting drug use, by substance	Recommended	Proportion of PWID injecting in the last 4 weeks, by substance (heroin, methadone, buprenorphine, fentanyl and derivatives, cocaine, crack cocaine, methamphetamine, amphetamine, synthetic cathinones, others)	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
Prevalence of past imprisonment	Recommended	Proportion of PWID who report having ever been in prison	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
Prevalence of homelessness	Recommended	Proportion of PWID who lived without a steady home, on the streets or temporarily in a hostel or shelter, any time in the last 12 months	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
Experience with stigma and discrimination	Recommended	Proportion of PWID experiencing stigma and discrimination	Cross-sectional or cohort data (questionnaire)	X	X		X		X		

Building block: Prevention

Indicator	Core/ recommended/ optional	Definition	Study design (data source)	DRUCK	DRUCK 2.0	HCV-UD	NESI	HCV care within an NSP	ARISTOTLE	ARISTOTLE HCV-HIV	ALEXANDROS
Needle-syringe distribution	Core	Number of clean needles–syringes received per person who injects drugs in the last month	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
OAT coverage	Core	Proportion of PWID using opioid receiving OAT	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X	X	X	X	X	X
HBV vaccination coverage	Core	Proportion of PWID fully vaccinated against HBV	Cross-sectional or cohort data (blood sample, questionnaire or record linkage)	X	X		X	X	X		
Condom use	Recommended	Proportion of PWID reporting the use of a condom at last sexual intercourse	Cross-sectional or cohort data (questionnaire)	X	X	X	X	X	X	X	X
PrEP use	Recommended	Proportion of PWID receiving PrEP	Cross-sectional or cohort data (questionnaire or record linkage)	X	X						
Naloxone access	Recommended	Proportion PWID (using opioid?) who have a Naloxone kit	Cross-sectional or cohort data (questionnaire)	X	X		X	X			

Building block: Continuation of HIV care

Indicator	Core/ recommended/ optional	Definition	Study design (data source)	DRUCK	DRUCK 2.0	HCV-UD	NESI	HCV care within an NSP	ARISTOTLE	ARISTOTLE HCV-HIV	ALEXANDROS
Testing	Core	Proportion of PWID who have been tested for HIV the last 12 months (not taking into account tests done within the study and excluding those with a known diagnosis of HIV)	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X	X	X	X	X	X
Diagnosis	Core	Proportion of PWID living with HIV who know their status	Cross-sectional or cohort data (blood sample and questionnaire)	X	X	X	X	X	X	X	X
Treatment	Core	Proportion of PWID diagnosed with HIV receiving antiretroviral therapy	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X	X	X	X	X	X
Viral suppression	Recommended	Proportion of PWID living with HIV, and who are on treatment, achieving viral load suppression	Cross-sectional or cohort data (questionnaire or record linkage or blood sample)	X	X	X		X	X	X	X

Building block: HBV care

Indicator	Core/ recommended/ optional	Definition	Study design (data source)	DRUCK	DRUCK 2.0	HCV-UD	NESI	HCV care within an NSP	ARISTOTLE	ARISTOTLE HCV-HIV	ALEXANDROS
Testing	Recommended	Proportion of PWID who have been tested for HBV the last 12 months (not taking into account tests done within the study and excluding those with a known diagnosis of chronic HBV)	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X		X	X ever		
Diagnosis	Optional	Proportion of PWID with viraemic HBV who have been diagnosed with HBV infection (who were aware of their infection)	Cross-sectional or cohort data (blood sample and questionnaire)	X	X	X		X	X		
Treatment	Optional	Proportion of PWID diagnosed with HBV infection receiving HBV treatment	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X		X	X		
Viral suppression	Optional	Proportion of patients with HBV infection on treatment in whom HBV viral load (VL) is suppressed	Cross-sectional or cohort data (questionnaire or record linkage or blood sample)	X	X	X		X			

Building block: HCV care

Indicator	Core/ recommended/ optional	Definition	Study design (data source)	DRUCK	DRUCK 2.0	HCV-UD	NESI	HCV care within an NSP	ARISTOTLE	ARISTOTLE HCV-HIV	ALEXANDROS
Testing	Core	Proportion of PWID who have been tested for HCV the last 12 months (not taking into account tests done within the study)	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X	X	X	X	X	X
Diagnosis	Core	Proportion of anti-HCV+ and/or HCV-RNA+ PWID who have ever been diagnosed with viraemic HCV infection	Cross-sectional or cohort data (blood sample and questionnaire)	X	X	X	X	X	X	X	X
Treatment	Core	Proportion of anti-HCV+ and/or HCV-RNA+PWID who have ever received HCV antiviral treatment	Cross-sectional or cohort data (questionnaire or record linkage)	X	X	X	X	X	X ever	X	X
Sustained virological response	Recommended	Proportion of patients with hepatitis C cured among those who completed treatment	Cross-sectional or cohort data (questionnaire or record linkage or blood sample)	X	X	X		X	X	X	X