# Prevalence of HIV Infection and Risky Behaviors among People who Inject Drugs (PWID) in Albania

Roland Bani[1*], Albana Fico[2], Arian Boci[3]

[1] Institute of Public Health, Tirana, Albania
[2] Faculty of Medicine, University of Medicine, Tirana, Albania
[3] Institute for Health, Social Policy and Research Development

## Abstract

**Background**: People who inject drugs (PWID) are at higher risk of acquiring HIV due to risky injection and sexual practices.

**Methods**: This article presents the findings from the HIV Biological Behavioral Surveillance Surveys (IBBS) conducted among PWID. The prevalence of HIV, Hepatitis C (HCV) and Syphilis was measured. In addition, information was collected about their injection practices, sexual risk behaviors, HIV and other program coverage, stigma discrimination and violence, HIV knowledge and testing, and STI signs and symptoms. Data were collected using respondent driven sampling methodology (RDS) to recruit 755 PWID in four cities, Tirana, Durres, Elbasan, and Berat.

**Results**: The vast majority of PWID population report to have used any illicit drug for more than 5 years and three-quarters of them have injected for more than five years. Less than 10% report to have injected before the age of 19. Majority of them inject two or more times a day; the most commonly used injectable drugs in the past month were heroin (99.2%), cocaine (33.6%), heroin together with cocaine (14.2%) and heroin together with diazepam (9.2%). 25% of PWID are estimated to have injected with a used needle or syringe at last injection and about 16% of them have always or most of the time injected drugs with used needles during the past month; and about 42% of respondents have shared needles/syringes in the past month (48% in

**Address for correspondence:** Roland Bani*, Str. Aleksander Moisiu N.80, Tirana, Albania. E-mail: landiscape@yahoo.co.uk

Tirana). In addition to risk behaviours associated with injecting, the PWID population also engages in risk behaviours associated with sexual practices. 37% of the PWID population used a condom with their regular partner during their last sex and more than two-thirds (68%) with non-regular partners.

**Conclusions**: These findings highlight the need of strengthening information, education and harm reduction activities, tailored to specific needs of various districts. In addition, there is need to ensure harm-reduction programs include and further develop strategies for improving protective behaviors among PWID.

**Keywords**: HIV, Albania, sexual behavior, injecting drug use, respondent-driven sampling

## INTRODUCTION

By the end of 2021, the total number of registered HIV cases in Albania was 1506 (1). The prevalence was estimated at 0.05%, with an overall incidence of 3.7 per 100,000 people. The majority of registered HIV cases are males. Since only a small proportion of the population is being tested for HIV, especially among key populations (KPs), the available data are likely to be an underestimation of the actual number of HIV cases.

The disproportionate dominance of males among PLWH can serve also as an indicator of underestimated epidemic among PWID as most of the injectors are males (2). Additionally, the latest estimates are showing that there are 6677 to PWID living in Albania (3)

People who inject drugs (PWID) are a priority group, and HIV prevention among PWID is one of the strategic objectives of National Action Plan on HIV/AIDS (4). A programmatic mapping assessment (5) of key populations showed that PWID are the largest key population in Albania. The highest proportion of PWID inject, usually in abandoned places/houses, open spaces, streets, parks etc. This mostly happens during times when these places are not frequented by ordinary people and therefore PWID is also not a very visible group. Also, a small proportion of PWID use their homes for drug injecting and more hidden spots are frequent.

Despite the relatively low HIV and other STI prevalence among PWID in Albania, program data have shown that they are engaging in behaviors that put them at risk for HIV and STI transmission (6). Factors that may be impacting the spread of HIV include a large migratory population, increases in tourism, marginalized ethnic groups, and a stigmatized MSM population. Furthermore, countries surrounding Albania have recently experienced an increase in their HIV-positive populations. The mix of these behavioral, socio-economic, geographical and cultural factors increases the likelihood that HIV infection becomes more prevalent. There is a great need for surveillance among key populations for HIV to measure and monitor HIV prevalence, levels of risk behaviors and coverage with HIV prevention, and identify sub-groups and geographical areas where the HIV burden and potential for HIV transmission is the greatest.

## METHODS

### Inclusion criteria

Individuals would be included in the study if they; (a) had injected drugs for non-medical purposes in the past one month; (b) Aged ≥ 18 years; (c) were in possession of a valid peer recruitment coupon; (d) had lived in the survey area for at least three months before the survey; (e) were capable and willing to provide written or verbal informed consent to participate.

## Sample size calculation

The following formula was used to determine sample sizes

$$n = D \frac{\left[ \sqrt{2P(1-P)}Z_{1-\alpha} + \sqrt{P_1(1-P_1) + P_2(1-P_2)}Z_{1-\beta} \right]^2}{(P_2 - P_1)^2}$$

Where:

n = Sample size required per survey round

D = Design effect

$Z_{1-\alpha}$ = The z score for the desired confidence level, 1.96 for 95%

$Z_{1-\beta}$ = The z score for the desired power, 0.83 for 80%

P1 = The proportion of the sample reporting indicator baseline

P2 = The proportion of the sample reporting indicator at round 2

P = (P1+ P2)/2

The calculated sample size for PWID divided per city was:

|      | Tirana | Durres | Elbasan | Berat |
|------|--------|--------|---------|-------|
| PWID | 300    | 150    | 150     | 150   |

## Recruitment

The respondent Driven Sampling (RDS) was used to recruit PWID in Tirana, Durres, Elbasan, and Berat. RDS is a variant of a chain referral sampling method which, when implemented and analyzed properly, yields data representative of the populations from which the samples were gathered (7). Recruitment begins with a number of purposefully selected members of the study population referred to as "seeds". After enrolling and completing the steps in the survey, each seed is given a fixed amount (usually no more than three) of uniquely numbered coupons with which to recruit peers (other eligible PWID) into the survey (8), (9) . These recruited peers who also enroll in and complete the survey steps are considered the first wave of respondents. Successive waves of recruitment, ideally resulting in long recruitment chains of respondents, continue until the sample size is reached (10).

Respondents who presented a valid recruitment coupon to a survey site were screened for eligibility and provided informed consent for a face-to-face interview, HIV pre-test counselling and a finger prick test for HIV, syphilis, and HCV testing

Originally, four seeds were selected for Tirana site, and two for other sites, Durres, Berat and Elbasan. Seeds was selected with large social networks and based on diverse characteristics; from diverse geographic areas of the cities, married and unmarried, of different self-identities, and of different socio-economic level. Tirana had the largest achieved sample size with 305 participants in survey. The maximum number of waves was in Tirana (10 waves).
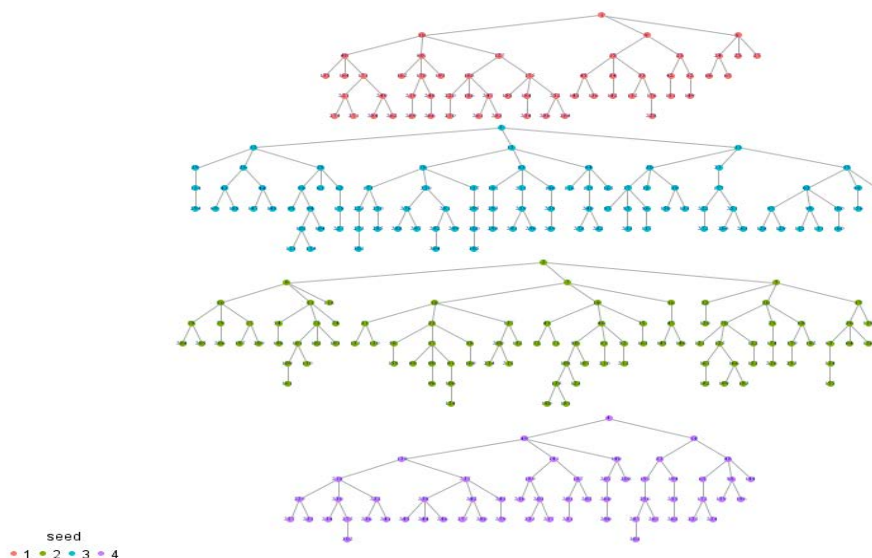
 **Figure 1.** Recruitment chain, Tirana

Recruitment graphics were generated for each site. Seeds are at the top of each chain.

**Laboratory procedures and testing for infections**

After completing the behavioural survey, participants underwent the biological portion of the surveillance research, which consisted of the following: pre-test counselling, rapid tests using whole blood taken by finger stick, post-test counselling, and referral for positive STI results. Test results were linked using participants' unique RDS participant identification codes and a laboratory code number, and the sample collection date. In the event of a reactive result, a venous blood specimen was obtained from the participant for further confirmatory testing. Confirmatory testing was performed at the National Reference Laboratory, at the Institute of Public Health, using Confirmatory Enzyme-Linked Immunosorbent Assay (ELISA) and Western Blot HIV1/2. All participants who had a confirmed positive test for HIV were referred for continued follow-up and care at University Hospital Center in Tirana.

**Data analysis**

Data were entered into SPSS version 24 software. Frequencies and cross-tabulations were performed to check validity and logic of all

variables in the datasets. Once cleaned and recoded, the data were transferred to RDS Analyst for analysis of population estimates, confidence intervals and category sample sizes. Analysis used the Giles successive sampling estimator which mitigates biases related to the assumption that RDS is NOT a with replacement method. In addition, the successive sampling estimator uses information about the size of the hidden population (a population fraction which is the sample size in relation to the population size) to produce estimates (11).

Other parameters used in the univariate analysis included the identification of unique id number, the participant coupon number and the recruitment coupon numbers given to each participant, and the maximum number of coupons. Network size data was asked of all participants to measure the number that each participant knows (who also knows him or her) and who fulfills the survey eligibility criteria. Those with larger network sizes receive less weight since their probability of inclusion in the survey is greater and those with smaller network sizes receive more weight since their probability of inclusion is smaller. For aggregate analysis of all four cities, network weights were computed from RDS Analyst for each separate city (each

sample was viewed as an independent network component) and then added to the complete database comprised of all sampled cities (12). Then a population weight was produced to account for the differences in population sizes for each city. The network weight and the population weight were multiplied to create an aggregate weight. These data were analyzed in STATA 13, with data set as survey data (.svyset) with standard errors calculated using bootstrapping.

## RESULTS

### 1. Socio-demographic Characteristics of PWID

A total of 755 PWID participated in the survey, 305 in Tirana, and 150 in Durres, Elbasan, and Berat, each. More than nine out of ten PWID participants were males, a trend maintained in almost all participating districts. Mean age of participant PWIDs was 32.8 years. On average, PWID were younger in Elbasan and older in Durres. Overall, one in seven PWID were younger than 25 years, but in Berat and Elbasan one in five PWID are that young. About 9% of PWID are illiterate (lowest in Elbasan, 2% and highest in Durres, 12%) and the prevailing highest completed education level is secondary school with just more than half PWID reporting (ranging from 42% in Durres to 64% in Berat).

**Table 1.** Age, sex and education among PWID

| | Tirane n=305 | | Durres n=150 | | Elbasan n=150 | | Berat n=150 | | Total n=755 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | %,(95%CI) | N | %, (95%CIs) | N | %, (95%CIs) | N | %, (95%CIs) | % | 95% CIs |
| **Sex** | | | | | | | | | | |
| Male | 295 | 97 (95.3,98.7) | 143 | 86.4(77.2,96.1) | 149 | 99.4(98.7,100.1) | 146 | 96.8(94.3,99.4) | 92.8 | 83.1,97.1 |
| Female | 10 | 3 (1.3, 4.8) | 7 | 13.6(3.8,22.7) | 1 | 0.5(0.1,1.2) | 4 | 3.1(0.5,5.6) | 7.2 | 2.8,16.8 |
| **Age** | | | | | | | | | | |
| Mean | | 33.4 | | 33.7 | | 31.1 | | 32.3 | | 32.8 |
| Median | | 33 | | 33 | | 30 | | 32 | | 32 |
| **Age group** | | | | | | | | | | |
| < 25 | 39 | 12.9 (8.6,17.2) | 20 | 16.9(8.2,25.5) | 28 | 19.7(11.6,27.7) | 31 | 19.9(14.38,25.4) | 14.3 | 6.5,22.4 |
| ≥ 25 | 266 | 87 (82.9,91.5) | 130 | 83.1(74.4,91.7) | 122 | 80.3(72.2,88.3) | 119 | 80.1(74.6,85.6) | 85.7 | 72.8,96.02 |
| **Education** | | | | | | | | | | |
| Illiterate (no) | 28 | 9.1 (5.6,12.7) | 12 | 12.1(0.6,22.9) | 4 | 2(0.2,3.8) | 12 | 8.3(4.3,12.6) | 8.6 | 2.7,16.9 |
| **Highest level of education** | | | | | | | | | | |
| Primary | 38 | 14.5(10.3,18.8) | 29 | 13.6(7.9,18.8) | 16 | 10.2(5.5,14.7) | 19 | 12.8(8.4,17.1) | 13.8 | 8.8, 20.1 |
| Secondary | 141 | 51.9(45.8,57.9) | 63 | 41.8(30.8,52.4) | 84 | 57.6(50,65.2) | 86 | 64.2(57.6,70.7) | 52.0 | 40.3,66.7 |
| Higher | 81 | 28.7 (23,34.3) | 38 | 35.9(22.9,49.7) | 40 | 29.1(21.2,37.1) | 32 | 22.1(16.0,28.2) | 29.2 | 18.6, 39.2 |
| University | 17 | 4.5 (2.8,7.3) | 8 | 8.5(2.1,15) | 6 | 3(1,5) | 1 | 0.7(-0.6,2.1) | 4.9 | 1.8, 12.2 |

More than one-third of PWID population (39%) has been ever married (ranging from 32% in Elbasan to 46% in Berat) and more than 90% were married at age 18 or older. At the time of the survey about two-thirds of PWID population (68%) was not married and did not live with a sexual partner (ranging from 50% in Durres to 73% in Elbasan. About 17% of all participating PWID have spent one month of more away from home in the past year with considerable survey site variations: 50% in Durres, 39% in Elbasan and about 20% in Tirana and Berat.

**2. Drug use**

About 42% of PWID have first used drugs at age 18 or earlier (ranging from 39% in Berat to 71% in Durres) whereas 7% have first injected drugs at this age (ranging from 10% in Tirana to 14% in Durres) Early drug use (at age 14 or younger) was highest in Durres (30%) and lowest in Tirana (9%) and even lower in other districts.

**Table 2.** Age at first drug use and first drug injection among PWID

| | Tirane n=305 | | Durres n=150 | | Elbasan n=150 | | Berat n=150 | | Total n=755 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | %, (95% CIs) | N | %, (95% CIs) | N | %, (95% CIs) | N | %, (95% CIs) | % | 95% CIs |
| **Age at first drug use** | | | | | | | | | | |
| ≤14 years | 30 | 9.0 (6.1,12.0) | 41 | 29.8(18,41.6) | 6 | 5.4(1.6,9.3) | 7 | 4.4(1.8,7.3) | 8.1 | 3.4,18.3 |
| 15-18 years | 106 | 35.2(29.5,40.9) | 57 | 40.9(30,52) | 53 | 34.7(26.7,42.6) | 51 | 34.2(27.3,41.0) | 33.9 | 22.9,47.3 |
| 19-24 years | 118 | 40.5(34.4,46.5) | 36 | 20.5(12.3,28.5) | 67 | 45.5(37.8,53.1) | 54 | 36.9(30.5,43.3) | 30.5 | 17.0,41.0 |
| ≥25 years | 51 | 15.2(10.7,19.8) | 16 | 8.6(3.3,13.9) | 24 | 14.3(8.2,20.4) | 38 | 24.3(18.1,30.6) | 27.4 | 17.0,41.0 |
| **Age at first drug injection** | | | | | | | | | | |
| ≤14 years | 3 | 0.7 (0.1,1.4) | 1 | 0.4(0.3,1.2) | 0 | | 1 | 0.6(0.3,1.7) | 1.8 | 0.2,11.6 |
| 15-18 years | 27 | 9.6 (5.5,13.7) | 22 | 13.3(7.1,19.6) | 5 | 3.6(0.5,6.8) | 3 | 2.1(0.2,4.0) | 5.5 | 1.6,16.8 |
| 19-24 years | 143 | 47.5(41.7,53.4) | 53 | 42.7(31.7,53.6) | 74 | 52.3(43.3,61.1) | 61 | 39.5(33.1,46.0) | 32.4 | 21.5,45.7 |
| ≥25 years | 132 | 42.2(36.6,47.7) | 74 | 43.4(33.1,53.7) | 71 | 44(34.8,53.3) | 85 | 57.6(51.1,64.1) | 60.3 | 46.7,72.4 |

Overall, 85% of PWID have used any illicit drug for more than 5 years (ranging from 74% in Elbasan to 93% in Durres). Three-quarters of participant PWID have injected drugs for more than 5 years and very few (2.6%) have injected for 12 months or less. The proportion of PWID injecting drugs for more than 5 years is higher in Tirana (61%) and lower in Berat (31%).

**Table 3.** Age at first drug use and first drug injection among PWID

| | Tirane n=305 | | Durres n=150 | | Elbasan n=150 | | Berat n=150 | | Total n=755 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | %, (95% cis) | N | %, (95% cis) | N | %, (95% cis) | N | %, (95% cis) | % | 95% cis |
| **Duration of any illicit drug use** | | | | | | | | | | |
| ≤ 1 year | 0 | | 0 | | 2 | 1.1(0,2.3) | 0 | | 0.1 | nc |
| 2-5 years | 43 | 13.4 (9.6,17.2) | 8 | 7.1(1.46,12.9) | 35 | 24.7(16.4,32.9) | 35 | 23.7(17.5,30.0) | 14.6 | 8.0, 23.2 |
| > 5 years | 262 | 86.7(82.8,90.4) | 142 | 92.8(87,98.5) | 113 | 74(65.6,82.6) | 115 | 76.3(70.0,82.5) | 85.4 | 76.3,92.4 |
| **Duration of injection drug use** | | | | | | | | | | |
| ≤ 1 year | 19 | 6.2 (3.4,9.0) | 6 | 4.7(0.5,8.7) | 24 | 18.7(11.6,25.7) | 18 | 12.3(7.8,16.7) | 2.6 | 0.6,9.8 |
| 2-5 years | 99 | 33.3(27.9,38.6) | 54 | 46.6(34.9,58) | 58 | 40.3(32.5,48.1) | 85 | 57.1(50.0,64.0) | 21.8 | 12.9,34.5 |
| > 5 years | 187 | 60.5(55.2,65.9) | 90 | 48.6(37.3,60.3) | 62 | 40.9(32.4,49.4) | 46 | 30.7(24.0,37.3) | 75.1 | 62.7,84.9 |

Overall, the most commonly used drug during the last month was heroin (99%) followed by cocaine (50%) and marijuana/cannabis (43%) whereas amphetamines were used by only 1% of PWID population. Almost all PWID (99%) injected heroin during last month, about one-third (34%) injected cocaine and 16% injected both heroin and.

With regard to survey site, heroin has been used by nearly all PWID population in Tirana, Durres and Elbasan and by more than nine-tenths of PWID population in Berat. Last month cocaine use was especially high in Elbasan (69%) and Durres (62%), marijuana prevalence was highest in Elbasan (79%) whereas heroin & diazepam prevalence was highest in Berat (43%). Heroin
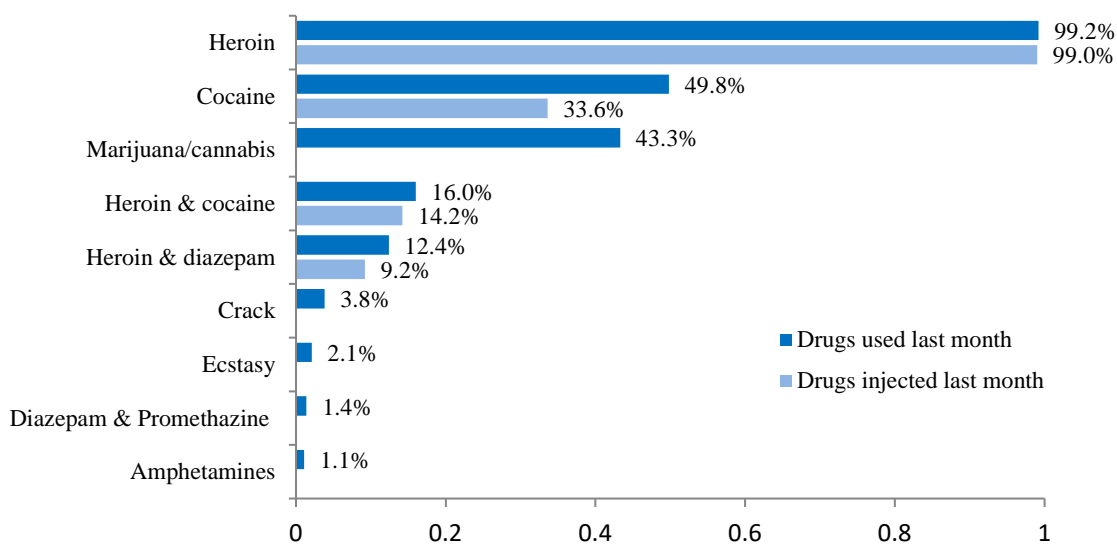
**Figure 2.** Prevalence of drugs used and drugs injected during last month (Drug categories are not mutually exclusive)
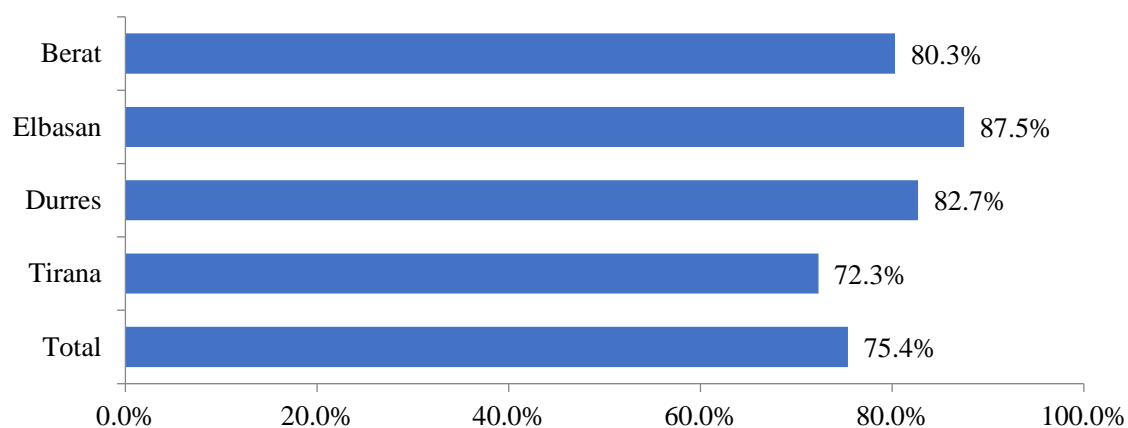
**Figure 3.** Use of sterile needle/syringe at last drug injection

injection prevalence follows closely district heroin use prevalence. Interestingly, the prevalence of injecting cocaine and cocaine together with heroin was highest in Tirana (39% and 17%, respectively) and Durres (30% and 13%, respectively), whereas injection of heroin together with diazepam was reported by 42% of PWID Berat and 27.4% in Durres.

Overall, just about three-quarters (75%) of PWID population did use sterile needle/syringe last drug injection; this figure was highest in Elbasan PWID (88%) and lowest in Tirana PWID (72%). The higher prevalence of risky injecting behaviors in Tirana is also supported by the finding that 48% of Tirana injecting PWID shared needles in the past month, the highest

sharing with a dealer was very rare in Durres (2%) and Elbasan (2%) but much more common in Tirana (20%) and Berat (17%). More than one-quarter of Berat PWID who were sharing needles in the last month did so with someone in a shooting gallery (26%), 15% shared with a professional injector; in Durres 28% shared with their regular sex partner. Overall, 61% of PWID sharing needles did so with 1 person in the last month and 34% shared with 2-3 persons. By survey site, sharing with one person was much more common in Tirana (65%) whereas sharing with 2-3 persons was more common in Elbasan (67%); in Berat more than one-third of PWID sharing needles did so with at least 4 other persons.
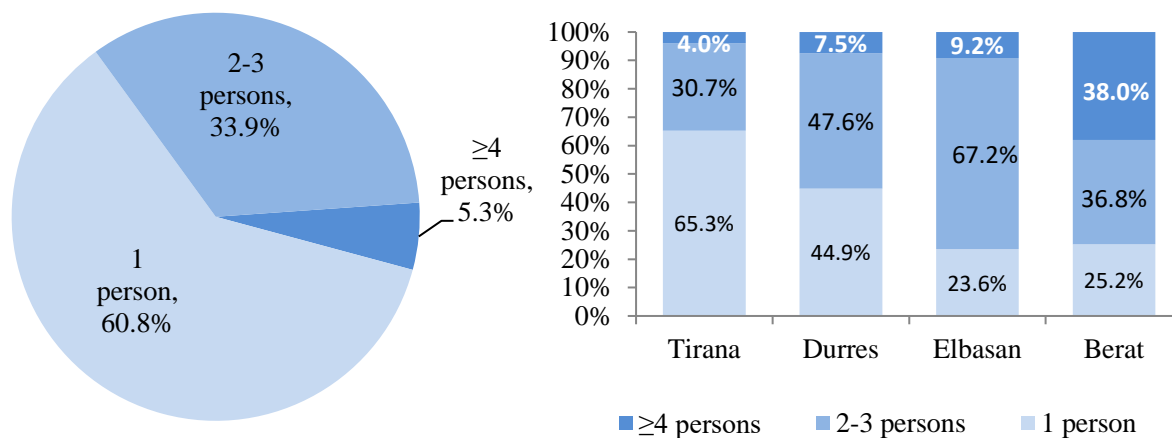


**Figure 4.** Number of people from whom respondent shared needles in last month

figure compared to other survey sites. On the other hand, 88% of those who shared did so with a friend, 18% shared with a dealer, 6% shared with someone in a shooting gallery and regular sex partner. Sharing needles/syringes with a friend in the last month was more prevalent in Elbasan (98%) and lowest in Durres (64%);

### 3. HIV testing knowledge and behaviors

Overall, 92% of PWID population knew about the availability of confidential HIV testing in their area, the figure being highest in Elbasan (100%) and lowest in Berat (59%)/. About two-thirds (66%) of PWID population have ever had a HIV test, the figure being highest in Tirana

(70%) and lowest in Elbasan (48%) Overall, of those who were tested more than four-fifths (86%) were tested voluntarily, with the figure being highest in Tirana (91%) and lowest in Berat (53%). Overall, more than half (53%) of PWID population that has been tested for HIV, did so in the last six months and 27% were tested 7-12 months ago. Recent testing (within last six months) is more prevalent in Elbasan (68.9%) and least prevalent in Berat (44%).

## HIV prevalence

The overall prevalence of HIV, Hepatitis C and syphilis infection among PWID population was 1.4%, 44.3% and 3.8%, respectively. HIV and hepatitis C prevalence was higher in Tirana (1.9% and 49.9%, respectively), whereas syphilis prevalence was higher in Durres (7.6%).

**Table 5.** HIV testing knowledge and behaviors among PWID

| | Tirane n=305 | | Durres n=150 | | Elbasan n=150 | | Berat n=150 | | Total n=755 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | %, (95% CIs) | N | %, (95% CIs) | N | %, (95% CIs) | N | %, (95% CIs) | % | 95% CIs |
| **Knowledge about availability of confidential HIV testing in their area** | | | | | | | | | | |
| Yes | 277 | 95.3(92.7,97.9) | 102 | 71.1(62.3,80.4) | 147 | 100 | 85 | 59.1(53.6,64.6) | 92.1 | 89.7,93.9 |
| **Respondents who have ever had an HIV test** | | | | | | | | | | |
| Yes | 203 | 70.2(65.3,75.0) | 90 | 61.7(51.3) | 72 | 48.2(42.1,54.4) | 80 | 55.9(50.1,61.6) | 66.2 | 61.7,70.6 |
| **Voluntarily took HIV test** | | | | | | | | | | |
| Yes | 182 | 90.6(86.3,94.8) | 71 | 67(48.9,83.8) | 55 | 78.6(67.3,90.4) | 44 | 53.1(41.9,63.6) | 86.1 | 81.2,89.7 |
| **Time of last HIV test** | | | | | | | | | | |
| Last 6 months | 105 | 54.7(44.3,58.9) | 52 | 52.2(36.4,67) | 47 | 68.8(54.3,84.0) | 35 | 42.9(34.6,51.0) | 52.9 | 46.6,59.2 |
| 7-12 months | 61 | 30.7(23.2,38.7) | 17 | 15.4(6.6,23.5) | 5 | 7.1(-0.3,14.7) | 22 | 27.7(18.8,36.7) | 27.2 | 21.9,33.5 |
| >1 year | 36 | 17.6(11.7,23.3) | 21 | 32.4(14.8,51.5) | 20 | 24.0(12.7,34.4) | 22 | 28.3(20.6,36.0) | 19.9 | 15.0,25.1 |

**Table 4.** Prevalence of HIV, Hepatitis C and syphilis among PWID

| | Tirane n=305 | | Durres n=150 | | Elbasan n=150 | | Berat n=150 | | Total n=755 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | %, (95% CIs) | N | %, (95% CIs) | N | %, (95% CIs) | N | %, (95% CIs) | % | 95% CIs |
| **HIV** | 5 | 1.93(0.3,3,8) | 1 | 0.2(0.08,0.5) | 0 | | 0 | | 1.4 | 0.5, 4.0 |
| **Hep C** | 161 | 49.9(44.8,55.1) | 46 | 19.8(12.427.5) | 58 | 41.6(33.3,50.90) | 22 | 14.9(8.9,21.0) | 44.3 | 39.5, 49.1 |
| **Syphilis** | 10 | 3.8(1.6,6.0) | 11 | 7.6 (1.5,13,6) | 0 | | 2 | 1.3 (0.2,2.9) | 3.8 | 1.2, 7.2 |

## DISCUSSION

PWID population is predominantly male, mature, educated and single. Most of PWID were males (93%), older than 25 years (86%) with a median age of 32, having at least primary education (91%) and single (61%). Elbasan PWID population was younger on average (mean age 31.1), less illiterate (2%) and reported higher percentage of single persons compared to other districts. Such socio-economic differences are important for planning target injection drug prevention programs.

Early start of drug use and drug injection. First drug use occurred at age 18 or earlier in about 42% of PWID (ranging from 39% in Berat to 71% in Durres) whereas 7% first injected drugs at this age (ranging from 10% in Tirana to 14% in Durres). About 8% first used drugs at age 14 or less, ranging from 30% in Durres to 4% in Berat. Early start of drug use and injection points to the need of strengthening promotion efforts and activities, tailored to district specific contexts.

High duration of drug use and drug injection. The vast majority of PWID population (85%) reported to have used any illicit drug for more than 5 years, ranging from 74% in Elbasan to 93% in Durres. Three-quarters of PWID (75%) have injected for more than 5 years (ranging from 61% in Tirana to 31% in Berat). Understanding the reasons as well as cross-district differences of consistent continuous drug use and injection among PWID population could be important in increasing the effectiveness of drug reduction efforts.

Risky injection and sharing practices. Approximately 25% of PWID injected with a used needle or syringe at last injection (Tirana 28%, Elbasan 12%). Almost 42% of PWID injected with a used needle within the past month (Tirana 48%, Durres 21%). About 16% of PWID have always or most of the time injected drugs with used needles during the past month (Tirana 19%, Durres 4%), marking a considerable increase compared to 2005 data (10%). About 42% of PWID have shared needles/syringes in the past month (Tirana 48, Durres 15%); sharing with a friend occurred in 88% of cases, 18% shared with a dealer, 6% shared with someone in a shooting gallery and regular sex partner, with considerable survey site differences. Overall, 61% of PWID sharing needles did so with 1 person (Tirana 65%, Elbasan 25%) in the last month and 34% shared with 2-3 persons (Elbasan 67%, Tirana 31%). These cross-district differences point to the need of tailored harm reduction activities. There is need for continuous support to harm-reduction interventions through NGOs and needle exchange programs.

High levels of HIV testing knowledge but low levels of HIV testing. Almost all PWID population (92%) knew that confidential HIV testing was available in their respective area, marking a considerable increase compared to 63% in 2005 and 72% in 2011. However, about two-thirds of PWID population (66%) never had a HIV test, the figure being highest in Tirana (70%) and lowest in Elbasan (48%). Among those who got tested, the testing was voluntarily

in 86% of cases (Tirana 91%, Berat 53%). These findings suggest that much more needs to be done in order to inform and educate PWID population about the importance of testing for HIV. The time trends are encouraging but there is need to maintain the positive pace.

## LIMITATIONS

Because behavioral data were self-reported in a face-to-face interview and in an NGO setting, social desirability bias may have resulted in the underreporting of risky behaviors. Although the estimates presented here are considered representative of the network of the population from which respondents were recruited, the small number of values for certain variables may limit the ability to derive accurate estimates. In some cases, confidence intervals were too wide for meaningful interpretation.

## CONCLUSIONS

Given the current coverage of HIV prevention activities among PWID, there is a need to strengthen and expand the services offered to PWID through continuous support for harm-reduction, needle exchange programs, and Opioid Substitution Therapy (OST). It is important to reach the more hidden PWID through innovative strategies, and RDS method can be an effective approach to reach those who have not been reached by the traditional approaches.

## REFERENCES

1. Institute of Public Health, "HIV/AIDS in Albania, Annual Report", 2021.
2. Anda Kivite, Antons Mozalevskis. "Assessment of HIV prevention services for key populations in Albania, 2018.
3. Iana Sazonova, "Key Population Size Estimation; PWID, MSM, SWs. Albania regional and national estimates", 2020.
4. Ministry of Health and Social Protection. "Nation Action Plan on HIV/AIDS 2020-2025", 2020.
5. Gexha Bunjaku, D. "Programmatic Mapping Exercise of Key Population in Albania", 2019.
6. Brown, A.; Bozicevic, I; Dvoriak, S. and V Delpech "HIV in Albania: An Epidemiological Revie", 2014.
7. Malekinejad M, Johnston LG, Kendall C, Kerr LR, Rifkin MR, Rutherford GW"Using respondent-driven sampling methodology for HIV biological and behavioral surveillance in international settings" a systematic review. AIDS and Behavior, 2008;12(4 Suppl):S105-30.
8. Heckathorn D. "Respondent driven sampling: a new approach to the study of hidden

populations". Social Problems 1997; 44: 174-199.

9. Heckathorn D. "Respondent driven sampling II. Deriving valid population estimates from chain-referral samples of hidden population". Social Problems 2002, 49:11-34.

10. Johnston LG. Respondent-driven sampling. Participant manual. Atlanta: Centers for Disease Control and Prevention, 2006.

11.Gile KJ. Improved inference for respondent-driven sampling data with application to HIV prevalence estimation. J Am Statist Assoc 2011; 106(493): 135-46.
https://doi.org/10.1198/jasa.2011.ap09475.

12. Handcock, M. S., Fellows, I. E. and Gile, K. J. (2013) RDS Analyst: Analysis of Respondent-driven Sampling  Data, version 1.0. Los Angeles.