Population Size Estimation of People who Inject Drugs in Georgia 2014

STUDY REPORT

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AIDS Center	Infectious Diseases, AIDS & Clinical Immunology Research Center
BPU	Bemoni Public Union
BBSS	Bio-Behavioral Surveillance Survey
CI	Confidence interval
CIF	Curatio International Foundation
CRC	Capture Recapture
EMCDDA	European Monitoring Center for Drugs and Drug Addiction
GEL	Georgian Lari (exchange rate of 2.26GEL = 1USD at the time of this report)
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoG	Government of Georgia
HCT	**HIV** Counseling and Testing
HIV	Human Immunodeficiency Virus
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th revision
IDUs	Injecting Drug Users
IEC	Information, Education, Communication
MARP	Most at risk population
MoIA	Ministry of Internal Affairs of Georgia
MoLHSA	Ministry of Labor, Health and Social Affairs of Georgia
NCDCPH	National Center for Disease Control and Public Health
NSU	Network Scale-Up
NGO	Non-Government Organization
OST	Opioid Substitution Treatment
PSE	Population Size Estimation
PWID	People Who Inject Drugs
RDS	Respondent Driven Sampling
RDSCM	Respondent Driven Sampling Coupon Management
RDSAT	Respondent Driven Sampling Analysis Tool
SPSS	Statistical Package for the Social Sciences

EXECUTIVE SUMMARY

It is difficult to overestimate the importance of obtaining accurate information on the prevalence of illicit drug use. Such information is valuable both in terms of monitoring the impact of drug misuse at both national and local levels as well as in assessing the effectiveness of prevention efforts. It is not possible to give an accurate, definite, answer to the question of how many drug users are present in a community. Therefore, we must establish an 'estimate' that will provide us with an approximate picture of drug use. The usefulness of prevalence estimates is dependent on the appropriateness of the method employed and the reliability of the data sources used. Many experts now believe that no one method will give us a true picture and several methods should be combined to get the best picture possible.

This study was to estimate the size of PWID population in Georgia in 2014 using different estimation methods and triangulating the findings to provide the most plausible estimates. For the purpose of this study, we regarded any person who has used any psychoactive drug through injections (into muscles or veins) in a non-medical context. The study was implemented within the GFATM-funded project "Generate evidence base on progress in behavior change among MARPs and effectiveness of preventive interventions" by Curatio International Foundation (CIF) and bemoni Public Union (BPU).

The present study used multiple PWID population size estimation methods. We applied Network Scale-Up (NSU), modified Capture-recapture (CRC) and Multiplier-Benchmark methods to estimate number of PWID in Georgia.

Calculation of the PWID population size nationwide revealed these figures: Estimation method N 1, using Network Scale-up (NSU) method - 43,800; Estimation method N 2, using multiplier benchmark method with demographic indicator (population density) - 52,903; Estimation method N 3, using multiplier benchmark method with prevalence rate coefficients - 52,494.

Findings from all estimation methods were discussed at the consensus meeting and the final consensus estimates were endorsed by the participants. It was decided that the mean of estimates calculated by all presented methods should be regarded as the estimated size of the PWID population in Georgia in 2014. According to the final consensus estimate, the **Estimated number of IDUs in Georgia equals 49,700 (49,208 – 50,192); National**

prevalence estimates for the injection drug use equals 2,02% (2,00% - 2,04%) per 18-64 years old population and 1,33% (1,32% - 1,35%) per general population.

1. INTRODUCTION

It is difficult to overestimate the importance of obtaining accurate information on the prevalence of illicit drug use. Such information is valuable both in terms of monitoring the impact of drug misuse at both national and local levels as well as in assessing the effectiveness of prevention efforts. It is not possible to give an accurate, definite, answer to the question of how many drug users are present in a community. Therefore, we must establish an 'estimate' that will provide us with an approximate picture of drug use. The usefulness of prevalence estimates is dependent on the appropriateness of the method employed and the reliability of the data sources used. Many experts now believe that no one method will give us a true picture and several methods should be combined to get the best picture possible. The present study used multiple PWID population size estimation methods.

If it deems possible, it is always expedient to address the issue of estimation of the size of key populations within the framework of larger studies, aimed to achieve some other goals (e.g. behaviour monitoring of most at-risk groups) – you can just add a set of relevant size estimation questions to the questionnaire. This will save you a lot of money and effort. For example, in order to estimate the size of PWID population in a certain city using different estimation methods it would be enough to add relevant questions to the BBSS questionnaire.

The present study was implemented within the GFATM-funded project "Generate evidence base on progress in behavior change among MARPs and effectiveness of preventive interventions" by Curatio International Foundation (CIF) and bemoni Public Union (BPU). This program aims at conducting Bio-Behavior Surveillance Surveys (BBSS) among PWID in 7 main urban centres of Georgia, using Respondent Driven Sampling (RDS) method and the population size estimation questionnaires were incorporated into the above mentioned BBSS.

2. METHODOLOGY

2.1 Objective of the Study

This study was to estimate the size of PWID population in Georgia in 2014 using different estimation methods and triangulating the findings to provide the most plausible estimates.

2.2 Defining the Target Population

For the purpose of this study, we regarded any person who has used any psychoactive drug through injections (into muscles or veins) in a non-medical context.

Inclusion criteria - to be eligible, each participant must meet the following criteria:

1. Aged 18 years or older
2. Lives in the participating city/district
3. Has not previously completed an interview under the current study
4. Able to complete the interview in Georgian
5. Arrives at the study site with a valid study recruitment coupon.
6. Currently injects drugs (this was identified by reported drug injection in the month prior the survey)
7. Has either:

    ⇒ Physical evidence of recent injection (fresh track marks, scabs, or abscesses), OR

    ⇒ Knowledge of drug prices, preparation, injection, and etc.

2.3 Methods

A variety of methods are available for estimating the prevalence of heavier or more problematic patterns of illegal drug use. These include: population-based surveys (although, these are often unreliable for rarer, stigmatized and hidden patterns of drug use); case-finding studies; capture-recapture estimates; multiplier techniques; nomination techniques; synthetic estimates, based on social or demographic variables assumed to correlate with drug prevalence; and a variety of more sophisticated statistical modeling approaches.

We applied Network Scale-Up (NSU), modified Capture-recapture (CRC) and Multiplier-Benchmark methods to estimate number of PWID in Georgia.

Method 1: Network Scale-up

The general concept behind network scale-up method is that an individual's social network is representative of the whole population. That is, one person's group of friends somehow reflects the characteristics of the community as a whole. By asking the respondent questions about an acquaintance, rather than the respondent themselves, the interview takes on some anonymity allowing the responses to be honest without fear of stigma or other negative consequences for the respondent or his/her friends. [1, 2] Using cluster random sampling, in a household survey, we recruited 1015 adults (more than 18 years old) in Tbilisi to estimate the network size and also the size of PWID population. This survey was conducted from April to June 2014. In a face-to-face anonymous interview, we asked the study subjects about the number of people they knew in last year who inject drugs. We clarified first that by "knowing" we mean "you know them by face or name, they know you by face or name and if you want, you can contact each other". We also asked them about the number of people they know from 24 groups with "known size" population to estimate the social network size (more details below).
In NSU, we need three parameters to estimate the population size of the target group:

- The average social network size of respondent i = c_i
- Number of people from they target group (e.g. PWID) who are known to the respondent i = m_i
- The total adult (>18 years old) population of Tbilisi = t

Using the maximum likelihood estimator proposed by Killworth et al. (Killworth PD, 1998), the population size estimation is equal to

- PSE (Network Scale-Up) = $e = \frac{\sum_i m_i}{\sum_i \hat{c}} t$ (equation 1)

[1] Network Scale-up Method Workshop Manual. WHO, Regional Knowledge Hub for HIV/AIDS Surveillance, & Kerman University of Medical Sciences, K.I. 2013.
[2] Report from the consultation on network scale-up & other size estimation methods from general population surveys New York City. UNAIDS & The US Office of the Global AIDS Coordinator, 2012

To estimate the social network size, we applied the known-size population approach; starts with 24 known size populations (j=24), to back calculate the average social network size. Basically, we have done this through following five steps:

I. Solve the equation 1 to estimate the network size for every respondent (i) using all eligible populations with known size (j):

$$c_i = \frac{\sum_{ij} m_{ij}}{\sum_j e_j} t$$

II. Make the average of Ci and use the average ($\hat{c}$) to back calculate the size of every populations by:

$$e_j = \frac{\sum_{ij} m_{ij}}{\sum_i \hat{c}} t$$

III. Devide the estimated size (e) to the real size (E) of each 24 population with known size to measure the bias factor:

$$\text{Bias factor}_i = \frac{E_i}{e_i}$$

IV. If any of the bias factors are more than 1.5 or less than 0.5, drop the population with most deviance and go to step 1, and repeat the process.

V. Stop when all bias factors are within the range of 0.5 to 1.5 and report the average social network size.

Applying such process, we ended up with 21 eligible populations. Overall, we estimated the social network size of people living in Georgia as 355 (95%CI, 342-366).

Now, given all parameters in the equation 1, we calculated the size of PWID population. The variance of the estimated population size was calculated using bootstrap simulation.

In order to adjust the NSU estimates for its two known biases, information transparency bias (i.e. people who inject drugs may not openly talk to others about their injection behaviors) and popularity ratio (i.e. in compare to others, people who inject drugs may have smaller network size and so have a fewer chance to be counted in social networks) PWID recruited through the RDS method to participate in the Biomarker Behavioral Surveillance Survey were interviewed. In total of 1951 PWID who provided verbal informed consent and agreed to participate in the study were recruited in seven cities of Georgia during

November, 2014 – May, 2015. Details of the RDS study methodology is given in the study report of the Biomarker Behavioral Surveillance Survey among PWID in Georgia, 2015.

We applied a short version of the Game of Contact method.[3] It involved asking recruited PWID about the number of people they know from the 16 "known population" groups. These 16 "known population" groups were selected from the list of 21 population groups. Following these questions, the respondents were asked about how many persons from each known population know that they inject drugs.

Such information was used to estimate transparency and popularity ratios to correct the NSU estimates for the two biases mentioned above. We estimated the transparency and popularity biases for each city as presented in Table 1.

Table 1 - Transparency ratio in people who inject drugs in Georgia in 2015

Area	Transparency	Popularity
Tbilisi	%46.2 (41.0-51.4)	%140.03 (132.22-147.84)
Gori	%34.8 (29.3-40.2)	%152.77 (143.02-%162.52)
Telavi	%32.0 (26.6-37.4)	%197.64 (185.12-210.17)
Zugdidi	%46.1 (40.3-51.9)	%192.63 (180.68-204.58)
Batumi	%45.4 (39.5-51.3)	%128.08 (119.07-137.09)
Kutaisi	%44.4 (38.6-50.1)	%174.65 (164.08-185.22)
Rustavi	%34.5 (28.6-40.4)	%146.74 (137.17-156.31)
Georgia	**%40.5 (38.3-42.6)**	**%164.05 (160.01-168.09)**

The transparency of PWID was 40.5%, which means only ~40% of PWID's acquaintances know that they are actually injecting drugs. For the popularity ratio, unexpectedly, our national and sub-national estimates were all more than 100% (Table 1). It means that the social network size of PWID, on average, is about 164.05% bigger than the network size of general population, which is questionable. Using the expert opinion and literature review, we decided to go with up a popularity ratio of 80.0%, the average of the local estimates (100% - based on expert opinion) and the one reported for PWID in the literature - 70% (Table 2).

[3] Salganik, M.J., Mello, M.B., Abdo, A.H., Bertoni, N., Fazito, D., & Bastos, F.I. The Game of Contacts: Estimating the Social Visibility of Groups. Soc.Networks., 2011. 33, (1) 70-78 available from: PM:21318126

Table 2 - Transmission and popularity ratio in the literature

Transparency	Popularity	Article Title	Authors	Journal, Publishing Year
75%	0.69	Assessing Network Scale-up Estimates for Groups Most at Risk of HIV/AIDS: Evidence From a Multiple-Method Study of Heavy Drug Users in Curitiba, **Brazil**	Matthew J. Salganik, Dimitri Fazito, Neilane Bertoni, Alexandre H. Abdo, Maeve B. Mello, and Francisco I. Bastos	American Journal of Epidemiology, 2011
54%	0.69	Network Scale-Up Correction Factors for Population Size Estimation of People Who Inject Drugs and Female Sex Workers in **Iran**	Ahmad Maghsoudi, Mohammad Reza Baneshi, Mojtaba Neydavoodi, AliAkbar Haghdoost	PLOS One, 2014
54%	0.7	Size Estimation of Most-at-Risk Groups of HIV/AIDS Using Network Scale-up in Tabriz, **Iran**	Ali Jafari Khounigh, Ali Akbar Haghdoost, Shaker Salari Lak, Ali Hossein Zeinalzadeh, Reza Yousef Farkhade, Mehdi Mohammadzadeh, Kourosh Holakouie Naieni	Journal of Clinical Research & Governance, 2014
76%	Not Reported	The Game of Contacts: Estimating the Social Visibility of Groups	Matthew J. Salganik, Maeve B. Mello, Alexandre H. Abdo, Neilane Bertoni, Dimitri Fazito, and Francisco I. Bastos	Soc Networks, 2011
57%	Not Reported	Estimating the Size of Populations with High Risk for HIV Using the Network Scale-up Method	Volodymyr Paniotto, Tetyana Petrenko, Volodymyr Kupriyano, Olha Pakhok	2009

Method 2: Capture-Recapture

Another method that was integrated into the RDS survey was modified capture-recapture, a novel method proposed by Dombrowski.[4] In this method study participants were asked to

[4] Dombrowski K, Khan B, Wendel T, McLean K, Misshula E, Curtis R. Estimating the Size of the Methamphetamine-Using Population in New York City Using Network Sampling Techniques. Advances in Applied Sociology. 2012 Dec 1;2(4):245-252.

provide their own personal information (height, approximate weight, hair color and ethnicity) and "telefunken code", which was derived from the last four digits of their own mobile phone number. The code is created where phone digits are coded as odd or even and low (0-4) or high (5-9).

The respondents were then asked to randomly select five PWID contacts from their mobile phone directory; in respondents with five or less PWID contacts all of the contacts were selected. The respondent was then questioned about the randomly selected contacts, in order to obtain data on the contacts' personal characteristics and "telefunken code". The coded phone number (telefunken) together with the height, approximate weight, hair color, and ethnicity produced (almost) a unique anonym code for each respondent that handled in matching the respondent to contacts described by another respondent interviews.

For the purposes of population estimate, study participants were treated as the "capture" population, while each of the contacts provided during the interviews ("reports") were considered a "recapture assay". Given the number of the original respondents discovered via recapture assays (as a proportion of the total number of assays), a basis was established for estimating the overall size of the PWID population:

- Number of PWID captured in the survey with valid telefunken codes = n
- Number of valid telefunken reported by PWID in the study = s
- Excluding false matches, number of PWID's telefunken that mentioned by other PWID = r

And then, using the bellow formula, we estimated the size of population for each city:

PSE (Capture Re-capture) = $e = \frac{n \times s}{r}$ (equation 3)

We applied the following formula to estimate the standard error for the population size for every study city and calculated the confidence bound for the estimated population size:

$$SE_e = \sqrt{\frac{n \times s \times (n - r) \times (s - r)}{r^3}}$$

By adding the number of PWID estimated in all the seven study cities and dividing it by the total number of adult populations in such cities, we calculated the PWID prevalence. Then

we applied this prevalence to the total number of adults in Georgia to estimate the overall size of PWID in the country.

Method 3: Multiplier-benchmark Method with Synthetic Estimation

Of all the methods of indirect estimation the multiplier-benchmark approach is probably the easiest to implement and probably the one with the longest history of use in the field of drug epidemiology. There is a flexibility in how it is applied that makes it useful in many circumstances. In the standard application, it uses information about the known size of an identifiable subsection of the target population of drug users, and generalizes from that subsection to give an estimate of the complete target population by applying a multiplying factor.

In multiplier-benchmark studies, the research makes use of pre-existing data for some behaviour or event that is common in the target population of problem drug-taking, for example, police arrest data for drug use or possession, accident and emergency ward data and, more directly, drug treatment data and data on drug-related deaths. Such pre-existing information, which can be simply an anonymous count of the key behaviour over a fixed time period, is called **the benchmark information**. Along with that national data set is required an estimate of the proportion of the target population who have experienced the event, that is, who have been arrested, who have died etc.; the inverse of that proportion is called **the multiplier**. Estimating the associated multiplier requires, usually, a small, separate sub-study using **nomination technique** and again, usually, anonymous records are sufficient.

The following stages of prevalence estimation method for each of the selected 7 cities had been used in this study.

1. Data collection of IDUs (gaining the benchmark data - B) - all available data on injection drug use in Georgia were reviewed. Data of IDUs are recorded under the current system for the year 2014 (details see below in chapter "Benchmark Data Collection"). ***2. Estimation of the value of multiplier (M) -*** the proportion of the target population in the benchmarks is obtained from research studies using nomination techniques (study using the Respondent Driven Sampling (RDS) methodology based on appropriate eligibility criteria and accurate sample size calculations was conducted). The survey collected the data among IDUs using nomination method/questionnaire developed by SCAD epidemiology

experts. ***3. The derivation of multiplier -*** this stage involves two steps: a) Estimation of the **percentage (P)** of IDUs recorded from Stage 2. Separate estimates for different benchmarks were made in each city. b) **Multiplier (M)** is estimated for each benchmark by the inverse of percentages (Pisani, 2002). The formula **M = 100/P; *4. Estimate the number of drug injectors -*** numbers of IDUs estimates for each benchmark are obtained by multiplying the recorded number of IDUs (collected from the available data source) by an appropriate multiplier (The formula **E = BxM**). ***5. Calculation of a prevalence of drug injection for each city -*** it was based on data on population distribution (State Department of Statistics of the Ministry of Economic Development of Georgia). Census data gave the population for urban areas. The population between 18 and 65 was used as the denominator for the prevalence based estimate. The appropriate estimates of injecting drug use were then applied to that adult population. An upper and lower limit is provided by statistical means.

Development of the nomination questionnaire

Nomination questionnaire was developed in 2008 during the first round of size estimation exercise, slightly changed during the second round of the survey. This one was slightly changed (one question was added) and pre-tested.

Benchmark Data Collection

The benchmark data for this study were collected from the following accessible data sources:

1. **NCDCPH database for abstinence oriented treatment facilities (addiction clinics) -** This database obtains anonymous data on individuals who are in contact with a range of drug services. The number of centers involved in treatment of drug addicts in 2014 was 6 (five of those were located in Tbilisi and 1 – in Batumi). Medical treatment of some drug dependent individuals had been financed by the State in 2014 (about 300 patients). The average fee for the treatment of each patient under the State Program was 2,000 GEL. Other patients had to pay for themselves. The treatment was quite expensive. Many individuals, willing to undergo treatment, could not afford it. Thus, the number of treated cases does not reflect the actual level of demand for treatment in the country.
2. **NCDCPH database for HIV testing with IDU identifier -** Since 2010, NCDC maintains the epidemiology register for HIV testing developed by the CIF under the

Global Fund Project entitled "Establishment of Evidence-based Basis for HIV/AIDS National Program by Strengthening Surveillance System". The project was carried out from February 2008 to December 2010. The aim of the project was to reform the national HIV/AIDS surveillance system, and it encompassed three basic components, each of them embracing a series of activities. The NCDCPH has been identified as the key national agency responsible for coordinating HIV/AIDS surveillance.

3. **Center for Mental Health and Prevention of Addiction Opioid Substitution Program database of attending IDUs -** In December 2005, the first Methadone substitution therapy programme was launched in the country. Georgia currently has three types of opioid substitution treatment: GFATM Opiate Substitution Therapy (OST) Program, the State Substitution Program and substitution programs operating by private institutions. Two different types of OST are avalilable: Methadone substitution and Suboxone® (combination of Buprenorphine and Naloxone) substitution. In 2014, 5 Methadone substitution Centers (3 in Tbilisi), 1 in Batumi and 1 in Gori operated under the Global Fund Programme; and 12 Centers existed within the framework of the State Program (6 in Tbilisi and one in Telavi, Kutaisi, Zugdidi, Poti, OzurgeTi, Kobuleti). In 2012, Suboxone® substitution program was established.

4. **Ministry of Internal Affairs database of IDUs -** The data on Injection drug users come into contact with the police throughout the country is available by special request from the MoIA. Under Article 45[5] of the Administrative Code of Georgia, purchase and possession of drugs in minor quantities or use of drugs without medical prescription is punishable with fine, or administrative detention. Article 273[6] of the Criminal Code of Georgia stipulates that drug use is only qualified as a criminal offence if a person previously subjected to administrative punishment for drug use continues to use drugs without medical prescription during one year following the penalty. Information relating to the use of injection drugs is available from the Department of Information and Analysis of MoIA. According to Article 45 of

[5] Article 45 of the Administrative Code of Georgia - "Illegal production, purchase, storage, use without doctor's prescription of small amounts of psycho-active substances under control in Georgia for individual use"

[6] Article 273 of the Criminal Code of Georgia – "Illegal production, purchase, storage of narcotic drugs, their analogs or precursors for personal use and/or illegal use without doctor's prescription"

the Code of Administrative Offences, in case of considerable doubt that a person is under the influence of drugs and/or psychotropic substances, or has used drugs, the police officer is authorized to demand that the person in question undergo an examination. A clinical laboratory and/or laboratory test determining the fact of drug use and/or drug and/or psychotropic intoxication is carried out based on the official referral from an authorized police officer. Ministry of Internal Affairs, specifically, the Department of Information and Analysis records all cases where the fact of drug use without appropriate medical purposes has been established.

5. **The databases of IDUs receiving HCT of the Center for Mental Health and Prevention of Addiction, Georgian Harm Reduction Network and Georgia HIV Prevention Project (GHPP); available in all selected cities -** The above mentioned institutions' low threshold services operate under the framework of 2 main international projects (Global Fund Project and Project funded by the USAID). The program managers from all these services run the computer based database for monitoring of the program operation: # of first time service users, # of repeated users, information on risky behaviors of clients, utilization of commodities, etc. Low threshold agencies often view drug misuse, and therefore the treatment of drug misuse as a social rather than a medical problem, and thus could be attracting a more representative group of drug misusers. These agencies may collate the same standard of information on their clients as the more formal drug treatment agencies described above, although in some instances some clients may only be known by a forename or an assumed name. The needle/syringe programs provide basic supplies (syringes, needles, condoms, etc) to their clients on continuous basis. Along with the needle exchange the IDUs receive the information and counceling on safe injection and sexual practices. The HCT centers provide HIV/hepatitis B,C risk reduction counselling and testing to their clients. Relevant IEC materials and condoms are distributed as well by these services.

Benchmark Data

As a drug user may be in contact with more than one agency, and therefore be included in the data from more than one source, sufficient information is needed on each individual to

identify multiple occurrences. Matching records between data sources can be complex, and within the area of record linkage, it is recognized that problems exist even when several different fields of data on each individual has been collected.

1. Health-related Indicators

⇒ Injection drug users (IDUs) in abstinence oriented treatment in 2014

Source of information: NCDC, Center for Mental Health and Prevention of Addiction

Table 3 Detoxification treatment benchmark data

City	Treatment Facility	# of Treated IDUs		Total #
		Male	*Female*	
Tbilisi	**State program**	363	8	**371**
	Internal standard	251	15	**266**
Batumi	**State program**	30	0	**30**
	Internal standard	60	1	**61**
	Grand Total	**704**	**24**	**728**

Explanation: Double counting cannot be excluded, as many drug users will come into contact with a variety of treatment facilities. Utilizing unique personal identifiers to prevent double counting is impossible in Georgia.

⇒ Drug users in Opioid substitution treatment in 2014

Source of information: Methadone Substitution Programme database of the Center for Mental Health and Prevention of Addiction

Table 4 Opioid substitution treatment benchmark data

City	Treatment Facility	# of Male IDUs	# of Female IDUs	Total
Tbilisi	**Global Fund OST Center**	471	27	498
	State Methadone program	1165	2	1187
	State Suboxone program	1031	19	1050
Batumi	**Global Fund OST Center**	184	1	185
Telavi	**State program**	93	0	93
Gori	**Global Fund OST Center**	124	0	124
Kutaisi	**State program**	341	0	341
Zugdidi	**State program**	206	0	206
	Grand Total	**3633**	**51**	**3684**

⇒ **Drug users using needle exchange and other low-threshold programs in 2014**

Source of information: Monitoring systems of low threshold agencies - computer based database for monitoring of the program operation

Table 5# of IDUs in the needle/syringe programs plus one additional harm reduction service in 2014

City	# of IDUs outreached
Tbilisi	10957
Gori	2426
Telavi	1035
Zugdidi	1967
Batumi	2627
Kutaisi	3262
Rustavi	1495
Grand Total	**23769**

Explanation: The main services offered to IDUs under the harm reduction programs in Georgia are HIV counseling and testing (HCT), hepatitis B,C counselling and testing, TB counselling and needle/syringe programs. The different agencies maintained different databases. The table above represents the aggregated data.

⇒ **Drug users tested on HIV in 2014**

Source of information: HIV/AIDS register run by the National Center for Disease Control and Public Health (NCDC).

Table 6 HIV testing benchmark data

City	# of IDUs tested on HIV	# of IDUs infected by HIV
Tbilisi	4878	15
Gori	872	1
Telavi	766	1
Zugdidi	1465	6
Batumi	1741	7
Kutaisi	1256	7
Rustavi	97	3
Grand Total	**11075**	**40**

Explanation: The cases are identified through routine surveillance data reported by HIV diagnostic labs operating throughout the country.

Crime-related Indicators

⇒ **Injection drug users registered by the police tested positively for presence of illegal drugs in 2014**

Source of information: Ministry of Internal Affairs

Table 7 Benchmark data on IDUs came into contact with the police

City	Total # of registered drug users, based on the positive test results	of those, # of registered IDUs, based on the positive test results
Tbilisi	6152	3687
Gori	600	163
Telavi	382	56
Zugdidi	1266	482
Batumi	1900	1294
Kutaisi	1561	578
Rustavi	705	236
Grand Total	**12566**	**6496**

Explanation: Taking into consideration that Georgian drug legislation does not distinguish between being detained in connection with the use of drugs and being convicted for purchase or possession of drugs, we use only police records regarding the persons tested positively for presence of illegal drugs.

Extrapolation from Local to National Prevalence estimates

Local estimates using multiplier-benchmark methods give important information on extent of drug problem. However, they are employed in studies of drug use on a smaller, geographically local scale. Nonetheless, there is still very often a need for overall national estimates to be made, and one way of doing that is to extrapolate from local prevalence studies to an overall picture. Extrapolation methods are not a specific method of prevalence estimation in themselves, but when some prevalence information is known they are used to extend that information into areas - usually, other geographic regions—where the prevalence information is not known. The extrapolation methods are based on statistical regression techniques. The method described below comes under various headings: usually, "synthetic estimation", or "multi-indicator" method, or sometimes under the more technical name of "regression on principal components".

The ***Multivariate Indicator Method***[7] ***(MIM)*** is a special case of synthetic estimation. Generally, synthetic estimation methods are methods which transfer information about a variable of interest, e.g. drug use prevalence, from a population in which it can be observed (calibration population/anchor point) to a target population in which it cannot be observed. From anchor points, a functional relationship between some variables and the variable of interest is derived which is extended to the target population. Applied to the field of drugs, the prevalence of problem drug use in a country may be estimated by relating a set of drug use indicators, which are available in all regions of a country, to prevalence estimates in a few regions (calibration population). The indicators may be directly (e.g. mortality, morbidity, and arrest) or indirectly related to drug use (e.g. population density, unemployment rate, housing density). Typically, analyses are based on prevalence rates and indicator rates per 100,000 inhabitants.

With regard to the MIM, two main variants of the method are common. One way is to estimate the relationship between drug use indicators and prevalence estimates in the anchor points via (linear) regression and to apply the regression coefficients to the drug use indicators in the target population. This yields prevalence estimates for the non-anchor points. Summing up all regional prevalence estimates yields the national prevalence estimate. Smit and colleagues (2003) used this method to estimate local and national problem drug use prevalence in the Netherlands, employing population density and housing density as indicators.

The key assumption of the method is that the relationship between prevalence (dependent variable) and the predictors (independent variables) in the calibration sample is transferable to all other areas. It is also assumed that a single factor underlies the drug-related indicators and that principal components analysis can be used to extract the main factor that explains the largest amount of variance in the indicators.

The application of the multivariate indicator method requires a breakdown of national states by regions or provinces and data on problem/injection drug use (indicators), which must be available for each of the regions and refer to the same time period. ***The national IDU prevalence estimates in the present study were derived from the estimates of the urban areas.*** Since injection drugs are more available in cities and drug injection is not common in rural areas (locally cultivated pot is particularly widely spread in villages),

[7] Key Epidemiological Indicator: Prevalence of problem drug use, EMCDDA, 2004

actually there is a little number of IDUs in rural areas as well. Consequently, not considering this population may have resulted in an under-estimate. However, assuming that injection drug users are mainly concentrated in the urban parts of Georgia we are willing to ignore this downward bias.

Two separate national estimations were produced:

Estimation N 1. It is recommended to use drug-related indicators as predictors in this regression model, i.e. drug related offences, drug-related deaths, clients in treatment, HIV cases related to injection drug use, imprisoned drug users (EMCDDA, 1999). Unfortunately, however, ***these statistics are not available in Georgia for the whole country.*** Due to a lack of available drug-related indicators the Dutch research group used an alternative model with social indicators such as housing density and population density.[8] Similarly, taking in consideration that none of the drug-related indicators could be obtained for all urban areas in Georgia, national IDU prevalence was calculated using only one ***demographic indicator such as population density*** (Census data). Unfortunately the data on housing density was not collected in the Country.

Estimation N 2. The second method used ***the drug injection prevalence rate coefficient*** for each city in order to estimate the number of injection drug users nationwide (modified from the method suggested by E. Pizani). [9] It was based on input from people working in the area of drug addiction. Addiction experts ranked all 64 cities in Georgia by prevalence rates with corresponding coefficients. Five categories of prevalence rate coefficients had been chosen and each city was assigned to one of the following categories:

Prevalence Rate	Very High	High	Medium	Low	Very Low
Coefficient	**8**	**5**	**2**	**1,0**	**0,5**

Description of the Multivariate Indicator Method Applied

Five indicators, denoted by A, B, C, D and E had been used for MIM. Additionally to the indicators, the population size F of the age group 18-64 in each city (totally 64 cities) as well

[8] Estimating Local and National Problem Drug Use prevalence from Demographics, Filip Smit et al., Addiction Research and Theory, 2003, Vol. 11, N6

[9] Estimating the number of drug injectors in Indonesia. Elizabeth Pisani, International Journal of Drug Policy N 17, 2006

as independently obtained prevalence estimates G for 7 cities (the so-called anchor points) are needed.

The different indicators highlight different aspects of the drug problem. No indicator is supposed to measure prevalence. The indicators are, however, indicative of whether problem drug use increases or decreases (Person et al., 1977). By applying principal component analysis a common factor is extracted which is assumed to be proportional to prevalence of problem drug use. As principal component analyses underlies the assumption of a linear relationship between observable variables and the principal components there should be a linear relationship between indicators of problem drug use and the unknown prevalence.

Obviously, the validity of prevalence estimation can be improved by increasing the number of anchor points. Then, more drug use indicators (proxy variables) can be used in the linear regression model. One of the problems is, however, the choice of appropriate drug use indicators (proxy variables). If the number of drug use indicators equals or exceeds the number of anchor points linear regression is not possible. As drug use indicators are more easily available than reliable regional prevalence estimates it is often necessary to reduce the number of drug use indicators. Up to now, different methods of reducing the number of indicators have emerged: Mariani (1999) as well as Person, Retka and Woodward (1977, 1978) applied a principal component analysis (PCA).[10]

The steps below summarize the process used to derive the national estimate for the percentage of injection drug users in Georgia using the Multiple Indicator Method.

Step 1. Data indicating the prevalence of injection drug use must be collected for a defined time period for each city. The following variables were used as indicators:

A - Number of IDUs registered by Police for drug consumption

B - Number of IDUs tested on HIV

C - Number of clients in treatment

D - Number of clients of the low threshold services

[10] Prevalence of problem drug use at the national level, EMCDDA, 2002

E - Population density (for the estimation N 1) and prevalence rate coefficients (for the estimation N 2).

Step 2. In addition, the population size F for urban areas had been obtained from data on population distribution (State Department of Statistics of the Ministry of Economic Development of Georgia).

Step 3. For five selected cities reliable independent estimates G (resulting from the multipliyer- benchmark study) are necessary. These cities are called „anchor points".

Step 4. For each of the variables A to E, G and for each region the figure per 100,000 inhabitants has to be calculated.

A_F=A*100,000/F

G_F=G*100,000/F

Step 5. Principal components analysis requires standardised values for A_F to G_F (subtracting the mean and dividing by the standard deviate).

Step 6. Principal components analysis of A_F to E_F with the extraction of the first factor, whose coefficients are saved. No rotational solution is needed, as any rotation only serves as an improvement for the fit of a set of indicators, and is therefore here redundant as only one indicator will be extracted.

Step 7. A linear regression (dependent variable: G_F, independent variable: coefficients of the first factor) results in estimated prevalence rates per 100,000 inhabitants. Finally, these have to be transformed to prevalence estimates for the cities (multiplying with F and dividing by 100,000). Summation of the urban area prevalence estimates yields the national prevalence estimate.

In order to derive national estimates original data was entered into the SPSS version 13.0 data files, than ***SPSS-Syntax of the variant "PCA per 100,000"*** reflecting the above mentioned steps had been created based on instructions provided in the EMCDDA Scientific Report.[11] The regression analysis was done by this SPSS syntax to make predictions of the estimated level of the drug abuse prevalence rates. Two separate estimations (by demographic indicator and by prevalence rate coefficients) were made.

[11] Prevalence of problem drug use at the national level, EMCDDA, 2002

3. RESULTS

3.1 Network Scale-Up estimates

The population size estimates of PWID in different cities and overall size for Georgia is presented in Table 88. The total number of PWID in Tbilisi was estimated as 11,500 (95%CI, 10,000 - 13,500). The population size of PWID in the other six cities ranged from 900 to 1,700. The highest estimated PWID prevalence was %1.54 (95%CI, 1.20-1.88) in Telavi.

Table 8 - Population size estimation of people who inject drugs in Georgia in 2015 using Network Scale-up method

Area	Transparency ratio	Population	PWID PSE	PWID Prevalence
Tbilisi	%46.2 (41.0-51.4)	1,118,300	11,500 (10,000-13,500)	%1.03 (0.89-1.21)
Gori	%34.8 (29.3-40.2)	126,500	1,700 (1,500-2,100)	%1.34 (1.19-1.66)
Telavi	%32.0 (26.6-37.4)	58,400	900 (700-1,100)	%1.54 (1.20-1.88)
Zugdidi	%46.1 (40.3-51.9)	105,500	1,100 (900-1,300)	%1.04 (0.85-1.23)
Batumi	%45.4 (39.5-51.3)	154,100	1,600 (1,400-1,900)	%1.04 (0.91-1.23)
Kutaisi	%44.4 (38.6-50.1)	149,100	1,600 (1,400-1,900)	%1.07 (0.94-1.27)
Rustavi	%34.5 (28.6-40.4)	125,000	1,700 (1,400-2,200)	%1.36 (1.12-1.76)

* The social network size that was used for calculation was 355 (95%CI 342-366), based on the Georgia Network Scale-Up study 2014. ** For the popularity ratio, we used 85.0%, the average of the local estimates (100% - based on expert opinion) and the one reported for PWID in the literature (70%).

3.2 Capture re-capture estimates

As presented in the table 9, using the six-identifier categorical variables and the telefunken code, we identified the matches between the two rounds (capture and re-capture). This led to the population size of 3,300 (CI95% 3,000-3,700) in Tbilisi, in another word, the PWID prevalence of %0.30 (95%CI 0.27-0.33). The highest PWID prevalence was estimated as 9.93% (95%CI, 7.36-12.67) for Telavi, which is questionable. Batumi with 2,700 (95%CI 2,200-3,300) PWID had the lowest estimated PWID number among the seven study cities.

Table 9 - Population size estimation of people who inject drugs in Georgia in 2015 using capture re-capture method

Area	# Capture	# Re-capture	# Match	# True match	PWID PSE	PWID Prevalence
Tbilisi	349	1432	189	155	3,300 (3,000-3,700)	%0.30 (0.27-0.33)
Gori	275	1077	83	62	4,800 (3,800-5,900)	%3.79 (3.00-4.66)
Telavi	275	905	91	44	5,800 (4,300-7,400)	%9.93 (7.36-12.67)
Zugdidi	275	708	69	63	3,100 (2,500-3,800)	%2.94 (2.37-3.6)
Batumi	262	675	76	68	2,700 (2,200-3,300)	%1.75 (1.43-2.14)
Kutaisi	277	881	84	73	3,400 (2,800-4,100)	%2.28 (1.88-2.75)
Rustavi	238	920	77	65	3,400 (2,800-4,100)	%2.72 (2.24-3.28)

Number of true matches were calculated by subtracting the observed number of matches from the number of false matched with the joint probability matrix of the fifth variables used to make the unique code for study participants an contacts. PWID: People who Inject Drugs; PSE: Population Size Estimation;

3.3 Multiplier-benchmark estimates

Calculation of the estimated size of the PWUD population in the surveyed cities revealed these figures (mean estimates):

Table 10 Estimates of the number of IDUs in 7 cities in 2014

City	Estimated size	95% CI	
Tbilisi	**40166**	33985	48035
Gori	**4646**	4133	5259
Telavi	**3209**	2720	3828
Zugdidi	**5277**	4537	6206
Batumi	**6804**	5633	8424
Kutaisi	**9803**	8223	11843
Rustavi	**3057**	2628	3597

Multipliers were derived from the RDS survey of 2037 IDUs recruited from across 7 cities. Totally, 7422 IDUs had been nominated by survey participants. Participants' responses to the questionnaire were used to produce a final series of IDU size estimates, including 95% confidence intervals.

The following section provides specific estimates for each selected city. Different number of separate multiplier estimates was made to calculate the quantity of problem drug users in different cities.

The population size estimate for IDUs was the mean of 5 multiplier estimations in Tbilisi and Batumi, 4 - in Gori, Zugdidi, Telavi and Kutaisi, 3 – in Rustavi. This study suggests using the statistical lower and upper limits (at 95% confidence interval) to reflect the minimum and maximum ranges.

Tables below (Table 11-23) and the figure 1 set out the multiplier estimates of IDUs in 7 cities across the country derived from different sources, together with the mean and median of the estimates in 2014 and the comparative estimations for years 2011 and 2014.

Table 11 Estimates of the number of IDUs in Tbilisi in 2014

Tbilisi	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	3687	3.79	3.45	4.19	13987	12723	15459
HIV testing data	4878	6.42	5.62	7.38	31309	27435	36000
Treatment data	637	20.49	16.00	26.81	13053	10192	17078
Methadone substitution data	2713	7.34	6.37	8.54	19919	17269	23168
Needle/syringe data	10957	11.19	9.34	13.55	122562	102306	148469
				Mean	40166	33985	48035
				Median	19919	17269	23168

Table 12 Estimates of the number of IDUs in Tbilisi in 2011 and 2014

Tbilisi	2011			2014		
	Estimated size	95% CI		Estimated size	95% CI	
Police data	14019	14019	14019	13987	12723	15459
HIV testing data	35472	35472	35472	31309	27435	36000
Treatment data	14119	14119	14119	13053	10192	17078
Methadone substitution data	17793	17793	17793	19919	17269	23168
Needle/syringe data				122562	102306	148469
Mean	**38445**	**29686**	**51391**	**40166**	**33985**	**48035**
Median	**17793**	**14727**	**21775**	**19919**	**17269**	**23168**

Table 13 Estimates of the number of IDUs in Gori in 2014

Gori	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	163	5.69	5.04	6.47	928	821	1054
HIV testing data	872	4.47	4.03	5.00	3902	3513	4358
Methadone substitution data	124	11.25	9.41	13.62	1395	1167	1689
Needle/syringe data	2426	5.09	4.55	5.74	12359	11032	13935
				Mean	**4646**	**4133**	**5259**
				Median	**4600**	**4096**	**5202**

Table 14 Estimates of the number of IDUs in Gori in 2011 and 2014

Gori	2011			2014		
	Estimated size	95% CI		Estimated size	95% CI	
Police data	835	835	835	928	821	1054
HIV testing data	813	813	813	3902	3513	4358
Methadone substitution data	803	803	803	1395	1167	1689
Needle/syringe data				12359	11032	13935
Mean	**2989**	**1491**	**1491**	**4646**	**4133**	**5259**
Median	**3540**	**824**	**824**	**4600**	**4096**	**5202**

Table 15 Estimates of the number of IDUs in Telavi in 2014

Telavi	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	56	4.01	3.55	4.56	224	199	255
HIV testing data	766	6.49	5.51	7.72	4968	4218	5915
Methadone substitution data	93	7.00	5.90	8.40	651	549	782
Needle/syringe data	1035	6.76	5.71	8.08	6993	5914	8360
Mean					**3209**	**2720**	**3828**
Median					**2809**	**2384**	**3348**

Table 16 Estimates of the number of IDUs in Telavi in 2011 and 2014

Telavi	2011			2014		
	Estimated size	95% CI		Estimated size	95% CI	
Police data	1042	1042	1042	224	199	255
HIV testing data	405	405	405	4968	4218	5915
Methadone substitution data	344	344	344	651	549	782
Needle/syringe data				6993	5914	8360
Mean	**557**	**3076**	**3076**	**3209**	**2720**	**3828**
Median	**557**	**723**	**723**	**2809**	**2384**	**3348**

Table 17 Estimates of the number of IDUs in Zugdidi in 2014

Zugdidi	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	482	3.82	3.38	4.36	1841	1628	2101
HIV testing data	1465	4.27	3.74	4.92	6255	5477	7210
Methadone substitution data	206	6.97	5.83	8.45	1436	1200	1740
Needle/syringe data	1967	5.89	5.01	7.00	11577	9845	13775
				Mean	**5277**	**4537**	**6206**
				Median	**4048**	**3552**	**4655**

Table 18 Estimates of the number of IDUs in Zugdidi in 2011 and 2014

Zugdidi	2011			2014		
	Estimated size	95% CI		Estimated size	95% CI	
Police data	3168	2824	3576	1841	1628	2101
HIV testing data	2472	2128	2898	6255	5477	7210
Methadone substitution data	1206	992	1487	1436	1200	1740
Needle/syringe data				11577	9845	13775
Mean	**6133**	**4891**	**7863**	**5277**	**4537**	**6206**
Median	**2820**	**2476**	**3237**	**4048**	**3552**	**4655**

Table 19 Estimates of the number of IDUs in Batumi in 2014

Batumi	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	1294	3.25	2.89	3.70	4211	3734	4793
HIV testing data	1741	5.61	4.72	6.75	9764	8224	11748
Treatment data	91	31.65	20.62	51.81	2880	1876	4715
Methadone substitution data	185	5.06	4.31	6.02	937	797	1114
Needle/syringe data	2627	6.18	5.15	7.52	16226	13534	19752
				Mean	**6804**	**5633**	**8424**
				Median	**4211**	**3734**	**4793**

Table 20 Estimates of the number of IDUs in Batumi in 2011 and 2014

Batumi	2012			2014		
	Estimated size	95% CI		Estimated size	95% CI	
Police data	1557	1557	1557	4211	3734	4793
HIV testing data	1826	1826	1826	9764	8224	11748
Treatment data	259	259	259	2880	1876	4715
Methadone substitution data	1015	1015	1015	937	797	1114
Needle/syringe data				16226	13534	19752
Mean	**5937**	**5361**	**5361**	**6804**	**5633**	**8424**
Median	**2243**	**1557**	**1557**	**4211**	**3734**	**4793**

Table 21 Estimates of the number of IDUs in Kutaisi in 2014

Kutaisi	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	578	3.73	3.34	4.21	2158	1929	2432
HIV testing data	1256	4.06	3.60	4.61	5099	4528	5785
Methadone substitution data	341	8.60	7.13	10.50	2932	2432	3582
Needle/syringe data	3262	8.90	7.36	10.91	28021	24003	35573
				Mean	**9803**	**8223**	**11843**
				Median	**4015**	**3480**	**4684**

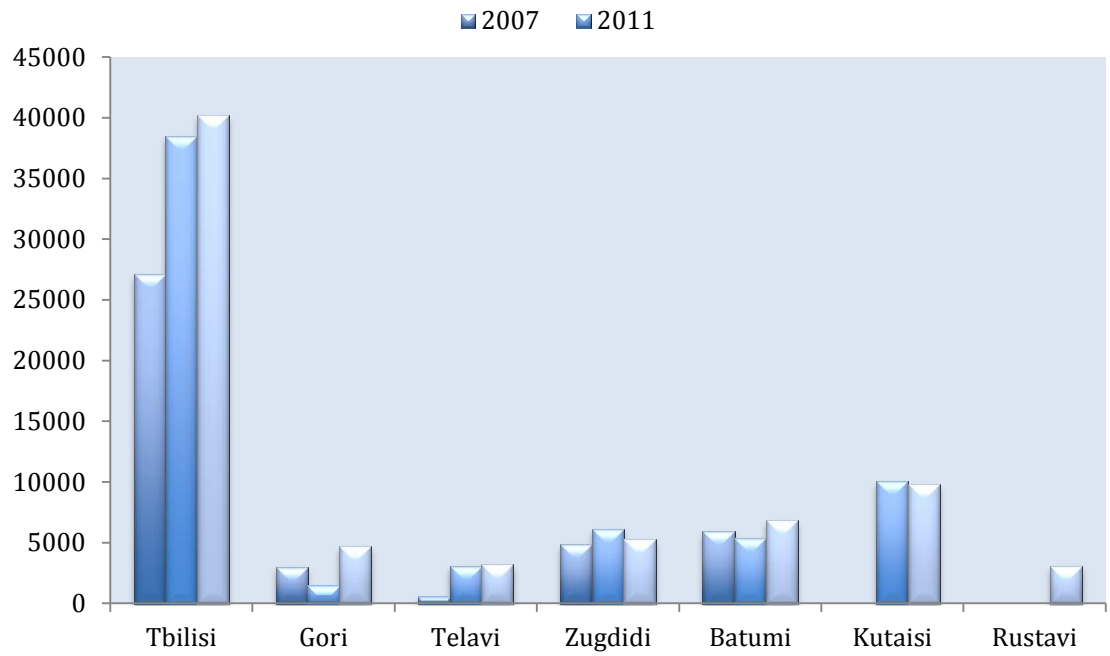
Table 22 Estimates of the number of IDUs in Kutaisi in 2011 and 2014

Kutaisi	2011			2014		
	Estimated size	95% CI		Estimated size	95% CI	
Police data	4312	3873	4834	2158	1929	2432
HIV testing data	2700	2263	3263	5099	4528	5785
Methadone substitution data	1782	1438	2245	2932	2432	3582
Needle/syringe data				28021	24003	35573
Mean	**10052**	**7514**	**13962**	**9803**	**8223**	**11843**
Median	**3506**	**3068**	**4049**	**4015**	**3480**	**4684**

Table 23 Estimates of the number of IDUs in Rustavi in 2014

Rustavi	Benchmark	Multiplier	95% CI		Estimated size	95% CI	
Police data	236	3.20	2.87	3.60	756	677	851
HIV testing data	97	8.40	6.87	10.45	815	667	1014
Needle/syringe data	1495	5.08	4.37	5.97	7600	6540	8925
				Mean	**3057**	**2628**	**3597**
				Median	815	667	1014

Figure 1. Estimates of the number of IDUs in 7 cities in 2007, 2011 and 2014



Estimation of the prevalence of injection drug use

Prevalence estimates for the injection drug use were produced for 7 cities of Georgia. National Statistics Office of Georgia gave the population data between 18 and 64 for urban areas across the country (the data is based on the preliminary results of the Population Census of November 5, 2014 and natural and migration balance for the last 2 months of 2014). The appropriate estimations of injecting drug use shown in the tables above were then applied to that population. The statistical lower and upper limits (at 95% confidence interval) were used to reflect the minimum and maximum ranges. Calculation of the IDU prevalence estimation (%) in the surveyed cities revealed these figures (mean estimates):

Table 24 IDU prevalence estimates in 7 cities in 2014

City	IDU prevalence estimates	95% CI	
Tbilisi	**5.44**	**4.60**	**6.51**
Gori	**5.56**	**4.95**	**6.30**
Telavi	**8.33**	**7.06**	**9.93**
Zugdidi	**7.58**	**6.52**	**8.91**
Batumi	**6.69**	**5.54**	**8.28**
Kutaisi	**9.96**	**8.36**	**12.03**
Rustavi	**3.71**	**3.19**	**4.36**

Tables 25 - 32 below present

Table 32 below present the IDU prevalence estimation (%) in 7 cities across the country derived from different sources, together with the mean and median of the estimates.

Table 25 Estimated Prevalence Rates in Tbilisi in 2014

Tbilisi				**Adult population (18-64)**		**738078**
	Estimated size	**95% CI**		**Prevalence of IDU (%)**	**95% CI**	
Police data	13987	12723	15459	1.90	1.72	2.09
HIV testing data	31309	27435	36000	4.24	3.72	4.88
Treatment data	13053	10192	17078	1.77	1.38	2.31
Methadone substitution data	19919	17269	23168	2.70	2.32	3.14
Needle/syringe program data	122562	102306	148469	16.61	13.86	20.12
Mean	**40166**	**33985**	**48035**	***5.44***	***4.60***	***6.51***
Median	**19919**	**17269**	**23168**	***2.70***	***2.32***	***3.14***

Table 26 Estimated Prevalence Rates in Gori in 2014

Gori				Adult population (18-64)		83490
	Estimated size	95% CI		Prevalence of IDU (%)	95% CI	
Police data	928	821	1054	1.11	0.98	1.26
HIV testing data	3902	3513	4358	4.67	4.21	5.22
Methadone substitution data	1395	1167	1689	1.67	1.40	2.02
Needle/syringe Programs data	12359	11032	13935	14.80	13.21	16.69
Mean	***4646***	***4133***	***5259***	***5.56***	***4.95***	***6.30***
Median	***4600***	***4096***	***5202***	***3.17***	***2.81***	***3.62***

Table 27 Estimated Prevalence Rates in Telavi in 2014

Telavi				Adult population (18-64)		38544
	Estimated size	95% CI		Prevalence of IDU (%)	95% CI	
Police data	224	199	255	0.58	0.52	0.66
HIV testing data	4968	4218	5915	12.89	10.94	15.35
Methadone substitution data	651	549	782	1.69	1.42	2.03
Low Threshold Programs data	6993	5914	8360	18.14	15.34	21.69
Mean	***3209***	***2720***	***3828***	***8.33***	***7.06***	***9.93***
Median	***2809***	***2384***	***3348***	***7.29***	***6.19***	***8.69***

Table 28 Estimated Prevalence Rates in Zugdidi in 2014

Zugdidi				Adult population (18-64)		69630
	Estimated size	95% CI		Prevalence of IDU (%)	95% CI	
Police data	1841	1628	2101	2.64	2.34	3.02
HIV testing data	6255	5477	7210	8.98	7.87	10.35
Methadone substitution data	1436	1200	1740	2.06	1.72	2.50
Needle/syringe Programs data	11577	9845	13775	16.63	14.14	19.78
Mean	***5277***	***4537***	***6206***	***7.58***	***6.52***	***8.91***
Median	***4048***	***3552***	***4655***	***5.81***	***5.10***	***6.69***

Table 29 Estimated Prevalence Rates in Batumi in 2014

Batumi				Adult population (18-64)		101706
	Estimated size	95% CI		Prevalence of IDU (%)	95% CI	
Police data	4211	3734	4793	4.14	3.67	4.71
HIV testing data	9764	8224	11748	9.60	8.09	11.55
Treatment data	2880	1876	4715	2.83	1.84	4.64
Methadone substitution data	937	797	1114	0.92	0.78	1.10
Needle/syringe Programs data	16226	13534	19752	15.95	13.31	19.42
Mean	***6804***	***5633***	***8424***	***6.69***	***5.54***	***8.28***
Median	***4211***	***3734***	***4793***	***4.14***	***3.67***	***4.71***

Table 30 Estimated Prevalence Rates in Kutaisi in 2014

Kutaisi				Adult population (18-64)		98406
	Estimated size	95% CI		Prevalence of IDU (%)	95% CI	
Police data	2158	1929	2432	2.19	1.96	2.47
HIV testing data	5099	4528	5785	5.18	4.60	5.88
Methadone substitution data	2932	2432	3582	2.98	2.47	3.64
Needle/syringe Programs data	28021	24003	35573	29.49	24.39	36.15
Mean	***9803***	***8223***	***11843***	***9.86***	***8.36***	***12.03***
Median	***4015***	***3480***	***4684***	***4.08***	***3.54***	***4.76***

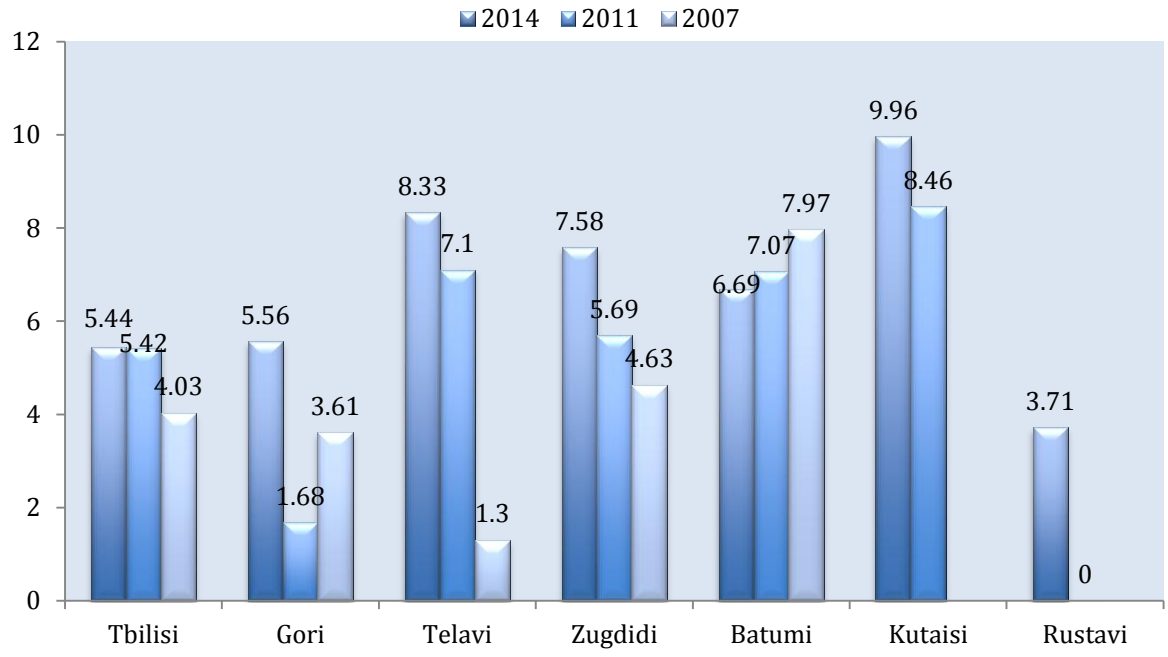
Table 31 Estimated Prevalence Rates in Rustavi in 2014

Rustavi				Adult population (18-64)		82500
	Estimated size	95% CI		Prevalence of IDU (%)	95% CI	
Police data	756	677	851	0.92	0.82	1.03
HIV testing data	815	667	1014	0.99	0.81	1.23
Needle/syringe Programs data	7600	6540	8925	9.21	7.93	10.82
Mean	***3057***	***2628***	***3597***	***3.71***	***3.19***	***4.36***
Median	***815***	***667***	***1014***	***0.99***	***0.81***	***1.23***

Table 32 IDU prevalence rates in 7 cities in 2011 and 2014

City	2011		2014	
	Population (18-64 years)	Prevalence estimates	Population (18-64 years)	Prevalence estimates
Tbilisi	709 100	**5.42**	738078	**5.44**
Gori	88 600	**1.68**	83490	**5.56**
Telavi	43 300	**7.1**	38544	**8.33**
Zugdidi	107 700	**5.69**	69630	**7.58**
Batumi	75 800	**7.07**	101706	**6.69**
Kutaisi	118 800	**8.46**	98406	**9.96**
Rustavi			82500	**3.71**

Figure 2 Prevalence Estimates of IDUs in 7 cities in 2007, 2011 and 2014



Results of the national prevalence estimation

National prevalence estimates for the injection drug use were produced for 64 cities of Georgia. National Statistics Office of Georgia gave the population data between 18 and 64 for all urban areas across the country (the data is based on the preliminary results of the Population Census of November 5, 2014 and natural and migration balance for the last 2 months of 2014). Calculation of the IDU prevalence estimation nationwide revealed these figures:

1. estimation method N 1, using demographic indicator (population density) – **2,15%** (estimated number of IDUs equals **52903**)

2. estimation method N 2, using prevalence rate coefficients - **2,13%** (Number of IDUs – **52494**).

Tables 33-34 below present the national IDU prevalence estimation (%) produced by 2 different indicators:

Table 33 National Estimation by Population Density in 2014

Cities	Population 18-64	Density of the Population per 1 sq.km	Prevalence per 100 000	Prevalence %	Estimated Number
Tbilisi	738078	4425,8	3431,66	3,43	25328,33
Batumi	101706	7293,8	8695,68	8,70	8844,03
Keda	11154	44,3	-64,1088	-0,06	-7,15
Kobuleti	49632	122,3	1849,201	1,85	917,8
Shuakhevi	10032	37,2	-67,7821	-0,07	-6,8
Khelvachauri	34056	219,8	108,5981	0,11	36,98
Khulo	15510	47,1	-89,8145	-0,09	-13,93
Lanchkhuti	20724	76	48,38733	0,05	10,03
Ozurgeti	41316	144,4	2161,008	2,16	892,84
Chokhatauri	12606	29,2	60,71992	0,06	7,65
Kutaisi	98406	2746,9	5202,94	5,20	5120,01
Baghdati	14322	35,9	1467,76	1,47	210,21
Vani	16170	61,9	118,2092	0,12	19,11
Zestaponi	38016	180,2	66,291	0,07	25,2
Terjola	23496	127,4	12,98326	0,01	3,05
Samtredia	32076	166	1773,156	1,77	568,76
Sachkhere	25014	48,1	174,6181	0,17	43,68
Tkibuli	13662	65	22,48564	0,02	3,07
Tskhaltubo	37686	116,9	86,60637	0,09	32,64
Chiatura	26268	184	135,1867	0,14	35,51
Kharagauli	12870	30,5	-97,4862	-0,10	-12,55
Khoni	15576	74,1	577,4605	0,58	89,95
Akhmeta	20658	18,9	11,13325	0,01	2,3
Gurjaani	35706	85,8	530,4614	0,53	189,41
Dedoplistskaro	13926	12,2	-133,447	-0,13	-18,58
Telavi	38544	84,4	3474,111	3,47	1339,06
Lagodekhi	27522	57,4	20,71952	0,02	5,7
Sagarejo	34848	39,7	-131,591	-0,13	-45,86
Sighnaghi	19602	34,8	-91,8348	-0,09	-18
Kvareli	19668	37,7	-82,6714	-0,08	-16,26

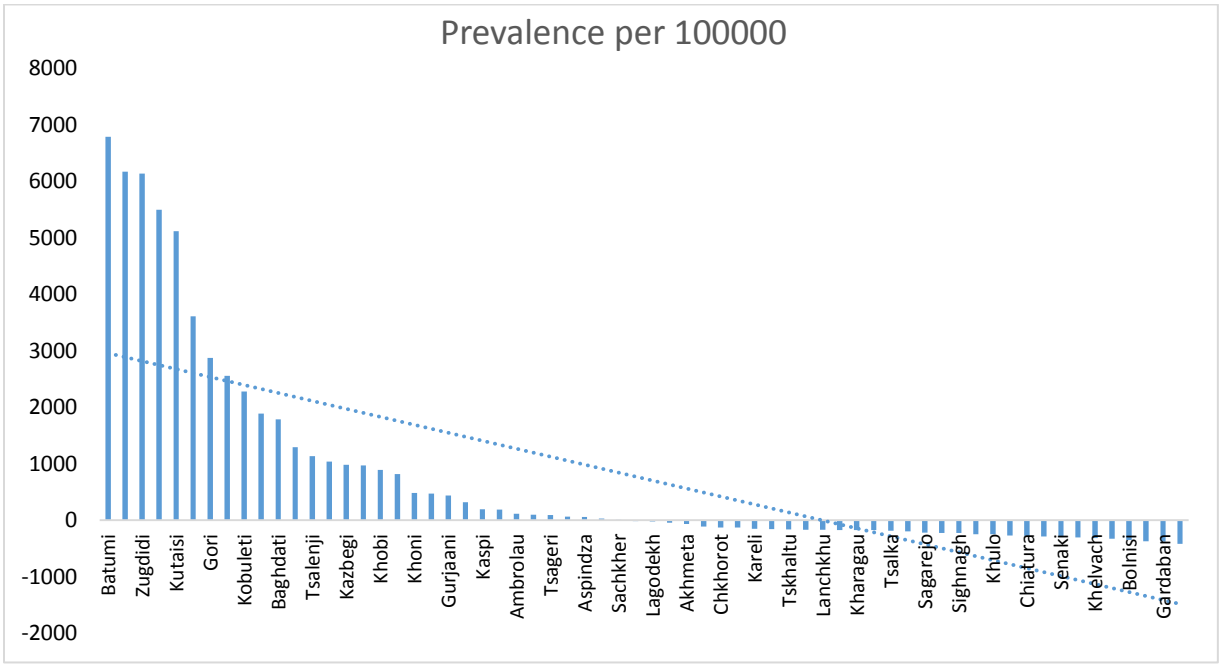
Cities	Population 18-64	Density of the Population per 1 sq.km	Prevalence per 100 000	Prevalence %	Estimated Number
Dusheti	16896	11,3	787,1218	0,79	132,99
Tianeti	6138	15,5	-50,2185	-0,05	-3,08
Mtskheta	36762	90,1	1136,009	1,14	417,62
Kazbegi	2442	4,9	-150,304	-0,15	-3,67
Ambrolauri	7260	16,3	-41,802	-0,04	-3,03
Lentekhi	2904	6,7	-82,633	-0,08	-2,4
Oni	4026	5,4	-120,533	-0,12	-4,85
Tsageri	6798	22	-49,8159	-0,05	-3,39
Poti	27522	716,6	6061,064	6,06	1668,13
Abasha	14586	89	288,809	0,29	42,13
Zugdidi	69630	346,9	4833,848	4,83	3365,81
Martvili	22044	50,7	-112,313	-0,11	-24,76
Mestia	6138	4,7	-24,2841	-0,02	-1,49
Senaki	26334	100,1	-20,5161	-0,02	-5,4
Chkhorotskhu	14652	48,6	4,36347	0,00	0,64
Tsalenjikha	17358	62,1	1048,419	1,05	181,98
Khobi	20130	62,6	895,3131	0,90	180,23
Adigeni	10824	25,9	-89,5067	-0,09	-9,69
Aspindza	6864	15,8	-114,299	-0,11	-7,85
Akhalqalaqi	29634	49,4	-162,527	-0,16	-48,16
Akhaltsikhe	25740	63,9	-25,035	-0,03	-6,44
Borjomi	16566	27,2	62,72306	0,06	10,39
Ninotsminda	16170	25,3	-164,795	-0,16	-26,65
Rustavi	82500	1920,5	1983,306	1,98	1636,23
Bolnisi	35640	92,4	-84,6428	-0,08	-30,17
Gardabani	54252	87,7	-123,698	-0,12	-67,11
Dmanisi	12540	23,4	-124,923	-0,12	-15,67
Tetri Tskaro	13860	21,6	-135,711	-0,14	-18,81
Marneuli	69234	126,4	-135,383	-0,14	-93,73
Tsalka	12474	19,8	-149,667	-0,15	-18,67
Gori	83490	146,7	2257,54	2,26	1884,82
Kaspi	28908	65	307,4236	0,31	88,87
Kareli	27258	46,2	8,33385	0,01	2,27
Khashuri	35046	107,1	285,7014	0,29	100,13

Table 34 National Estimation by Prevalence Rate Coefficient in 2014

Cities	Population 18-64	Rank	Prevalence Coefficient	Prevalence per 100 000	Prevalence %	Estimated Number
Tbilisi	738078	H	5	3608,886	3,61	26636,39
Batumi	101706	VH	8	6790,851	6,79	6906,7
Keda	11154	VL	0,5	-178,624	-0,18	-19,92
Kobuleti	49632	M	2	2276,808	2,28	1130,03
Shuakhevi	10032	VL	0,5	-132,19	-0,13	-13,26
Khelvachauri	34056	VL	0,5	-317,901	-0,32	-108,26
Khulo	15510	VL	0,5	-250,173	-0,25	-38,8
Lanchkhuti	20724	VL	0,5	-172,989	-0,17	-35,85
Ozurgeti	41316	M	2	2556,608	2,56	1056,29
Chokhatauri	12606	VL	0,5	25,49604	0,03	3,21
Kutaisi	98406	VH	8	5119,295	5,12	5037,69
Baghdati	14322	VL	0,5	1785,74	1,79	255,75
Vani	16170	VL	0,5	-48,3764	-0,05	-7,82
Zestaponi	38016	VL	0,5	-287,421	-0,29	-109,27
Terjola	23496	VL	0,5	-331,89	-0,33	-77,98
Samtredia	32076	L	1	1886,362	1,89	605,07
Sachkhere	25014	VL	0,5	2,87242	0,00	0,72
Tkibuli	13662	VL	0,5	-171,342	-0,17	-23,41
Tskhaltubo	37686	VL	0,5	-168,093	-0,17	-63,35
Chiatura	26268	VL	0,5	-280,404	-0,28	-73,66
Kharagauli	12870	VL	0,5	-174,581	-0,17	-22,47
Khoni	15576	VL	0,5	479,6487	0,48	74,71
Akhmeta	20658	VL	0,5	-66,9428	-0,07	-13,83
Gurjaani	35706	L	1	437,7383	0,44	156,3
Dedoplistskaro	13926	VL	0,5	-159,118	-0,16	-22,16
Telavi	38544	VH	8	5495,698	5,50	2118,26
Lagodekhi	27522	L	1	-26,4369	-0,03	-7,28
Sagarejo	34848	L	1	-222,621	-0,22	-77,58
Sighnaghi	19602	VL	0,5	-230,5	-0,23	-45,18
Kvareli	19668	VL	0,5	-228,757	-0,23	-44,99
Dusheti	16896	VL	0,5	966,8814	0,97	163,36
Tianeti	6138	VL	0,5	185,9598	0,19	11,41
Mtskheta	36762	L	1	1290,383	1,29	474,37
Kazbegi	2442	VL	0,5	979,7098	0,98	23,92
Ambrolauri	7260	VL	0,5	114,4163	0,11	8,31
Lentekhi	2904	VL	0,5	813,7014	0,81	23,63

Cities	Population 18-64	Rank	Prevalence Coefficient	Prevalence per 100 000	Prevalence %	Estimated Number
Oni	4026	VL	0,5	471,8852	0,47	19
Tsageri	6798	VL	0,5	89,16904	0,09	6,06
Poti	27522	M	2	6175,092	6,18	1699,51
Abasha	14586	VL	0,5	63,16169	0,06	9,21
Zugdidi	69630	VH	8	6139,322	6,14	4274,81
Martvili	22044	VL	0,5	-306,781	-0,31	-67,63
Mestia	6138	VL	0,5	318,2935	0,32	19,54
Senaki	26334	VL	0,5	-300,241	-0,30	-79,07
Chkhorotskhu	14652	VL	0,5	-131,405	-0,13	-19,25
Tsalenjikha	17358	VL	0,5	1132,007	1,13	196,49
Khobi	20130	VL	0,5	890,241	0,89	179,21
Adigeni	10824	VL	0,5	-112,443	-0,11	-12,17
Aspindza	6864	VL	0,5	53,88791	0,05	3,7
Akhalqalaqi	29634	VL	0,5	-377,674	-0,38	-111,92
Akhaltsikhe	25740	VL	0,5	-248,173	-0,25	-63,88
Borjomi	16566	VL	0,5	-16,2709	-0,02	-2,7
Ninotsminda	16170	VL	0,5	-273,064	-0,27	-44,15
Rustavi	82500	M	2	1037,322	1,04	855,79
Bolnisi	35640	VL	0,5	-350,415	-0,35	-124,89
Gardabani	54252	VL	0,5	-382,076	-0,38	-207,28
Dmanisi	12540	VL	0,5	-174,027	-0,17	-21,82
Tetri Tskaro	13860	VL	0,5	-198,061	-0,20	-27,45
Marneuli	69234	VL	0,5	-421,67	-0,42	-291,94
Tsalka	12474	VL	0,5	-188,564	-0,19	-23,52
Gori	83490	H	5	2874,922	2,87	2400,27
Kaspi	28908	VL	0,5	192,8735	0,19	55,76
Kareli	27258	VL	0,5	-153,7	-0,15	-41,9
Khashuri	35046	VL	0,5	95,69956	0,10	33,54

Figure 3 Regression line indicating relationship between factor scores and population standardized anchor point estimates (by Prevalence Rate Coefficient in 2014)



4. DATA TRIANGULATION AND THE FINAL CONSENSUS ESTIMATE

To present the study results and to arrive at a consensus estimate of the number of injection drug users (IDUs) in Georgia, a ***Consensus Meeting*** was held in Tbilisi in July 2015. Professionals active in addiction and HIV/AIDS fields attended this meeting.

Findings from all estimation methods were discussed and the final consensus estimates were endorsed by the participants of this consensus meeting.

Thus, the following options were presented to the participants of the consensus meeting:

Table 35 - Population size estimation of people who inject drugs (PWID) in Georgia in 2015 using network scale-up (NSU) and multiplier-benchmark methods

Estimation Methods	2014
	Estimated N of IDUs
Estimation method N 1, using Network Scale-up (NSU) method	**43,800**
Estimation method N 2, using multiplier benchmark method with demographic indicator (population density)	**52,903**
Estimation method N 3, using multiplier benchmark method with prevalence rate coefficients	**52,494**

Determining the final consensus estimate. After a lengthy discussion it was decided that the mean of estimates calculated by all presented methods should be regarded as the estimated size of the PWID population in Georgia in 2014.

Estimated number of IDUs in Georgia equals
49,700 (49,208 – 50,192)

National prevalence estimates for the injection drug use equals
2,02% (2,00% - 2,04%) per 18-64 years old population
and 1,33% (1,32% - 1,35%) per general population.

5. LIMITATION OF THE STUDY

No matter what method is used, all data are potentially biased for a variety of reasons. Limitations that are commonly associated with NSU are connected to the assumptions on which this method relies on. They include the following:

- Respondents may do not know the behaviour of their acquaintances', because members of hidden population (people who inject drugs) may not talk to others about their behaviours, that is information transparency bias. In order to adjust this bias additional exercise was held along with the Bio-BBS study (PWIDs recruited by RDS were interviewed with the specific questions, which were incorporated into the main BBS questionnaire).
- Members of hidden population may have not an equal chance of knowing someone in their network and predominantly, may have less chance to be counted in someone else's social networks, because they might have smaller network size compare to the general population. That yields to the popularity ratio, which also was adjusted for this current study using experts' opinion and estimates attained from the literature review.

The modified capture-recapture method uses only one single source for analyses, which makes this method easily applicable compared to the standard CRC method. But along with its applicability, it is very hard (in fact impossible) to generalise the results to the national level as PWIDs recruited through the RDS are residents of the concrete geographic locations and responses about their peers could not be generalizable to the countrywide distances. And finally, the accuracy of CRC estimates is very dependent on the accuracy of responses we got from the study participants. This partially is shown in total number of false matches, which was quite high for our sample.

The multiplier methods is relatively straightforward to use, but will depend on good institutional record-keeping. The greatest difficulty in using multiplier methods correctly is finding data from institutions and populations that correspond with one another. To use institutional and survey data together to estimate the size of a population, the members of the population all have to have a chance of being included in both the survey and in the institutional data (for example because they have access to that service).

Sources of information used for estimations may limit the generalisability of the final estimates. Here are some examples of how this happens: (1) Drug treatment programs

typically attract chronic, long term IDUs at the conclusion of their drug using careers, under-representing newer drug users. (2) Jails and criminal justice settings will have fewer newer IDUs under-representing long-term users and those not involved in criminal activities to support their drug use. (3) Methadone treatment programs will only yield information about opioid users, private programs will only include IDUs that can afford to be in treatment.

The prevalence estimation obtained in this study should be treated with caution as there are several critical factors that should be taken into account:

- Reliability of low threshold program multiplier estimates is weak: Multiplier estimates for the low threshold programs across the cities are much higher than multiplier estimates for other benchmark sources such as police data, methadone substitution and treatment data. On the other hand, the introduction of the State Program of the Hepatitis C elimination dramatically increased the demand for HCV testing among PWID. As a result the number of beneficiaries applied to the harm reduction services was significantly raised.
- Number of benchmark data that varies across cities: ideally multiple benchmark data sources (and hence a variety of multipliers) should be used in a prevalence estimation exercise. Unfortunately different numbers of benchmarks are available in different cities of Georgia.
- Reporting bias as the data are self-reported; underreporting or over-reporting of behaviors is possible yet difficult to ascertain.

6. CONCLUSION AND RECOMMENDATIONS

Current study being an updating exercise, have been geographically limited to the cities that have been covered in the previous study (Tbilisi, Batumi, Zugdidi, Gori, Kutaisi and Telavi) and one additional city (Rustavi) had been added. The previous study when the multiplier/benchmark method had been applied to estimate an IDU population in Georgia was conducted in 2012 (estimated N of PWID was 45,000).

As in the previous cases, these estimates should not be considered as accurate and reliable. On the other hand, the multiplier method used in this study has its advantages. Firstly, the

result suggests that combining this method with the HIV/AIDS behavioural surveillance to produce population size estimations is feasible and cost effective – in this way the necessary parameters for the estimation can be simply obtained. Secondly, combining this method with the BSS, estimates can be obtained regularly (under the framework of the National Surveillance System) and trends in the size of IDU populations with time can be observed. Furthermore, this method can be generalized to the other cities, and thus estimates can be obtained for broader geographical areas.

Possible limitations to the study could have affected the results. The small numbers of women participating in the surveillance may indicate a strong desire to remain hidden, their limited numbers, or a reflection of poor recruiting. Because few women have been arrested or attended treatment facilities, there are only some data regarding injection drug use amongst women in Georgia. Reporting bias: as in any interview-based surveys, it is possible that respondents may not have accurately answered some of the sensitive questions, or may have had difficulties in recalling information.

Although the estimates derived from low-threshold services are most doubtful, and might result in overestimation due to significantly higher multiplier estimates than derived from other sources, experts attending the consensus meeting have come to believe that it is certainly desirable to leave this indicator based on the fact that these services are most available and accessible for IDUs in several cities.

In contrast to previous evaluation, new estimates are higher than estimated size of IDU population in Georgia, calculated in 2012. The drug market changed since 2012. Specifically, traditional illegal drugs such as Heroin (especially, cheap brown heroin, so called “sirets”) and Subutex became easily available. The consumption of so called “Pharmacy drugs” such as psychotropic drugs (tranquilizers, other CNS depressants) did not change, while self-made amphetamine-type stimulants (ephedrone (“vint”) and methcathinone (“jeff”) as well as dezomorphine (“krokodil”) decreased after the legislative amendments. The economic hardship and high level of unemployment resulted in the massive labour migration especially to Turkey where they have the opportunity to consume drugs. On the other hand increased the number of persons who leave to neighbour countries (Turkey, Azerbaijan) only for drug consumption. In Turkey the illegal drugs are much more cheap and easily accessible, there is no penalty for drug intake, Georgian citizens can cross the border just only with ID cards. According to the latest BBS survey, almost half of respondents reported

injecting drugs in other countries during the last year. The large number of drug users had been released from Georgian prisons in 2013 as part of a large-scale amnesty. It should be mentioned that the frequency of drug consumption has changed: increased the number of occasional injectors (who injected several times per month) and decreased the number of respondents who reported regular injection practices (twice a week, several times per week or everyday). Only 40% of survey participants reported about the periods of regular injection of Opioids during several days resulted in withdrawal syndrome during the last year. These findings clearly indicate that the majority of PWID are occasional misusers and currently do not have the condition of active dependence.

Understanding something about the dynamics of the drug problem makes it possible not only to assess the likely impact of the problem, but also to alert policy makers to a worsening situation, or alternatively to provide evidence that prevention and other initiatives may be working. Although the need for information on the scale of the drug problem is clear, the data are, in practice, extremely hard to generate.

Given that the concordance of different methods probably gives the best indicator of a satisfactory estimate being derived, prevalence estimates derived from a range of methods should be obtained and the different estimates compared and contrasted to help in selecting the "best estimate". We should use both network scale-up and multiplier-benchmark methods.

The report clearly highlights many cities where despite substantial presence of IDUs, no targeted interventions are in place. The data must be used for prioritizing resource allocation and planning for extension of prevention services in these cities in order to achieve universal access targets. These findings should form an integral part of the future geographic prioritization scheme and the target settings. For cities with substantial prevalence rate that have not been included in this survey, it is recommended that such studies be undertaken to validate the assumptions made for extrapolation to calculate national prevalence estimation.

The recording of information on problem drug use should be improved. The treatment monitoring system should not only provide figures of drug users seeking treatment categorized by main substance groups, but should also be able to avoid double counting. Establishment of the Unique Identifier Code (UIC) system of anonymous client registration and tracking service is required. Therefore the actual time and effort spent collecting data

will be reduced and this would further minimize the costs of a prevalence estimation exercise in the future.

The presented methods to derive national prevalence estimates are cost-effective, as they do not require new data collection, unless separate studies are needed to estimate new anchor points for synthetic estimation. Evidently, increasing the number of anchor points makes the regression more stable. Local estimation methods should be used and further developed to produce regional anchor points for the multivariative indicator method.

Since the dynamics of epidemic transmission keep changing, this kind of exercise should be repeated periodically, preferably at two year intervals in order to identify new trends in IDU population size as well risky behaviour. The three exercises (in 2008-2009, 2012 and 2014) have shown that the problem of illegal drugs within the country can change rapidly. This indicates the importance of developing accurate on-going monitoring systems to identify rapid changes in the estimated number and behavior of drug users within Georgia.

Appendices

1. NSU survey questionnaire

N.1 Number of people you know with specific name

Now, I want you to recall and write down the number of people with specific namethat you know. These people should be

[People that you know them by sight and name, and who also know you by sight and name]
AND
[People that you had some contact with either in-person, over the phone or internet(e.g.: e-mail, Skype, chat through social networks) in the last 2 years]
AND
[People of all ages who lives in Georgia].

Example: Suppose we are asking you to recall the number of people you know with the "first name of Elena" in last 2 years? Take your time and try to recall the overall number of people you know, having "Elena" as a first name. Let's say you recall/count 11 people with the first name of Elana. Perfect! First, you should exclude famous people that you know about, but who do not know about you. So, you should not consider Elena Satine, as she doesn't know about you! ☺. Then, exclude those who are not living in Georgia. Here, as all Elena that you know are living here in Georgia, you should not exclude anyone. And last, of those 10 people with the fist name of Elena, exclude anyone (let's say 3) whom you did not contact with over the last 24months either in-person, phone or internet. So, the number of people you may write down is 7 (11 – 1 – 3 = 7).

Important notes:
We know it is not an easy task. Please do your best to recall as much as you can.

If at the end, you could not recall anyone from the mentioned group, write 0.

description	answer	How many of those already know that you inject drugs?
How many people do you know with the **"first name of Mamuka" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Luka" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Zurab, Zura, Zuka, Zuriko" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Vazha" ?**	_____ person(s)	_____ person(s)

How many people do you know with the **"first name of Sophiko, Sophio, Sopho" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Manana" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Shorena" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Nino, Niniko, Nina" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Maya" ?**	_____ person(s)	_____ person(s)
How many people do you know with the **"first name of Davit, Dato, Datuna, Datiko"**?	_____ person(s)	_____ person(s)

N.2 Number of people you know by groups

Now I will ask you the number of people you know. Again, I am asking about
[People that you know them by sight and name, and who also know you by sight and name]
AND
[People that you had some contact with either in-person, over the phone or internet(e.g.: e-mail, Skype, chat through social networks) in the last 2 years]
AND
[People of all ages who lives in Georgia].

	Overall	How many of those already know that you inject drugs?	Only male	How many of those already know that you inject drugs?
How many people do you know, **who were married in2014 year**?	_____ persons	_____ persons	_____ male	_____ male
How many **teachers** do you know?	_____ persons	_____ persons	_____ male	_____ male
How many people do you know, **who died in 2014 year**?	_____ persons	_____ persons	_____ male	_____ male
How many people do you know, **who died due to cancer in 2014 year**?	_____ persons	_____ persons	_____ male	_____ male
How many people do you know, **who were injured or died in road accidents in 2014**?	_____ persons	_____ persons	_____ male	_____ male
How many **higher educational students** do you know?	_____ persons	_____ persons	_____ male	_____ male

2. CRC survey questionnaire

Section S. Matching names for capture-recapture

Now, I am going to ask you some questions about some appearance characteristics like height, weight, hair and eye color and also race. Moreover, I will ask you about your list 4 digits of your phone number (just last 4) and record it as a coded number (telefunken). For example, for any phone numbers which end in 1234, it is Even-Odd-Even-Odd -Low-Low-Low-Low (explain how you did it and why).

A mix of these six variables will be used to assign you a unique non-identifying code, which later will be used in the analysis. Nobody can use this code to identify you or your friends.

Variables	Response	The participant own info
Telefunken Code	0; 1; 2; 3; 4 .....L 5; 6; 7; 8; 9 .....H 0; 2; 4; 6; 8 .....O 1; 3; 5; 7; 9 .....E	
Approximate height	High.....H Middle.....M Short.....S	
Approximate weight	Obese.....O Normal.....N Thin.....T	
Hair color	Dark.....D Light.....L Colored.....C Ginger/red...G No hair.....N	
Ethnicity	Georgian.....G Azeri.....Z Armenian.....A Other.....O	

Now I would like to ask you the same questions about your five contacts from your phone directory (PWIDs whose phone number you have in your phone directory). Using a randomized list of alphabet letters, I will help you to choose them by random among your entire contact list. Please tell me their approximate height, approximate weight, hair color, eye color, and race/ethnicity and telefunken code:

Variables		Contact 1	Contact 2	Contact 3	Contact 4	Contact 5
Telefunken Code	0; 1; 2; 3; 4 .....L 5; 6; 7; 8; 9 .....H 0; 2; 4; 6; 8 .....O 1; 3; 5; 7; 9 .....E					
Approximate height	High.....H Middle.....M Short.....S					
Approximate weight	Obese.....O Normal.....N Thin.....T					
Hair color	Dark.....D Light.....L Colored.....C Ginger/red...G No hair.....N					
Ethnicity	Georgian.....G Azeri.....Z Armenian.....A Other.....O					

3. Nomination method/questionnaire

Questionnaire Identification Number: ☐

Coupon Number: ☐

1. What is the number of your **close friends** with whom you have been using drugs in 2007 (or whom you know for sure they are or were using drugs, including those who passed away and those who ceased to use drugs meanwhile)?

   _____

2. Are you sure? Could you please think about this number for me for a while? Sounds to me (too high or low /too quick/ too round). Maybe you could name them by their first names (even unreal, imaginary) to obtain more specific number?

   Names: I. _____
   II. _____
   III. _____
   IV. _____
   V. _____
   Final number: _____

3. Was (name) ____ tested by police for presence of illegal drugs in 2014?

   1. Yes
   2. No
   88. Don't know
   99. No response

4. Was (name) ____ tested for HIV in 2014?

   1. Yes
   2. No
   88. Don't know
   99. No response

5. Was (name) ____ in abstinence-oriented treatment in 2014?

   1. Yes ***(Go to Q. 8)***
   2. No
   88. Don't know } ***Continue***
   99. No response

6. Was (name) ____ considering entering the abstinence oriented treatment in 2014, but did not do so?
   1. Yes ***(Continue)***
   2. No ***(Go to Q.8)***
   88. Don't know **(Continue)**
   99. No response ***(Continue)***

7. Why s/he did not?
   1. Changed his mind
   2. Because of high cost
   3. Entered the substitution treatment
   4. Any other reason
   88. Don't know
   99. No response

8. Was (name) ____ in substitution treatment in 2014?
   1. Yes ***(Go to Q. 10)***
   2. No
   88. Don't know } ***Continue***
   99. No response

9. Did (name) ____ receive free prevention services in 2014?

   9.1 Was (name) ____ in the needle exchange program (when used needles are changed by new ones) in 2014?
   1. Yes
   2. No
   88. Don't know
   99. No response

   9.2 Was (name) ____ in the other low-threshold programs (e.g. voluntary counseling and testing on Hepatitis B, C and HIV, counselling offered by physicians and psychologists) in 2014?
   1. Yes
   2. No
   88. Don't know
   99. No response

10. Was (name) ____ deceased due to a fatal drug overdose in 2014?
   1. Yes
   2. No
   88. Don't know
   99. No response

Questions 3-10 will be asked for every nominated drug user.

Thank you indeed!