# Estimating the Prevalence of Injection Drug Use in Georgia

# 2012

**Prepared by:**

**Bemoni Public Union (BPU)**

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We strongly believe that the outputs of this exercise will assist the country in making data-driven and evidence-informed decisions and ultimately strengthen the national response to HIV and AIDS.

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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
**ELISA** – Enzyme Linked Immunosorbent Assay
**EMCDDA** – European Monitoring Center for Drugs and Drug Addiction
**EU** – European Union
**FGD** - Focus Group Discussion
**GEL** – Georgian Lari (exchange rate of 1.66GEL = 1USD at the time of this report)
**GFATM** – Global Fund to Fight AIDS, Tuberculosis and Malaria
**GoG –** Government of Georgia
**GRIA**– Georgian Research Institute on Addiction
**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
**NGO** – Non-Government Organization
**OST -** Opioid Substitution Treatment
**PCR** - Polymerase Chain Reaction
**RDS** – Respondent Driven Sampling
**RDSCM** - Respondent Driven Sampling Coupon Management
**RDSAT** - Respondent Driven Sampling Analysis Tool
**RPR** – Rapid Plasma Reagent
**SCAD** – South Caucasus Anti-drug Programme
**SHIP** – STI/HIV Prevention
**SPSS** – Statistical Package for the Social Sciences
**STI** – Sexually Transmitted Infections
**TPHA –** *Treponema pallidum* Hemaggultination Assay
**UNAIDS** – The Joint United Nations Programme on AIDS
**UNDP** – United Nations Development Program
**UNODC** - United Nations Office on Drugs and Crime
**USAID** – United States Agency for International Development
**WB** – Western Blot Test
**WHO** – World Health Organization

## DEFINITIONS

**Population:** the entire group of individuals or items of interest in the study.

**Target population:** the population from which representative information is desired and to which inferences will be made.

The **prevalence** of a certain social attribute is defined as the proportion of people possessing that attribute. It is often expressed as a percentage, or sometimes as "per thousand" or even "per million" of the total population. The actual number of individuals is sometimes used instead of the prevalence, however without information on the baseline population, this number may be meaningless.

**Prevalence** is a measure of how many drug users there are in a community or country and how they are distributed across the population e.g. by age, gender, geographical location or type of drug use. The term "**Lifetime Prevalence"** refers to: the proportion of the population who have used a particular drug at least once, whereas "**Current Prevalence"** refers to those who have used a particular drug in a specific period of time such as the last month/week.

According to EMCDDA[1] definition, **Problem drug use (PDU)** is defined as "Injecting drug use or long duration/regular use of opioids, cocaine and/or amphetamines". Amphetamines include both amphetamine and methamphetamine, but not ecstasy. Opioids include any legal or illegal use of any opioids (e.g. methadone, buprenorphine, slow release morphine).

**Injecting drug use** (IDU) is defined as "Injecting for non-medical purposes".

**Injecting Drug Users (IDUs):** Males and females who inject various drugs into their muscles or veins for intoxication purposes. A person qualifies as a current IDU if he/she has engaged in injecting drugs within 12 months of the interview date and is aged 18 years and above.

**Indicators** are data which give pointers or act as tools in the estimation of prevalence e.g. data collected routinely by government agencies such as arrest data, drug treatment data and mortality data. The data reflects only those who have come into contact with services and not all users of illicit drugs.

**Estimation methods** are the range of methods which can be used to estimate the prevalence of illicit drug use.

**Routine data sources** - statistics that are collected routinely i.e. in the course of duty.

[1] European Monitoring Center on Drugs and Drug Addiction

**Non-routine data sources** - statistics that are not routinely collected but are "once-offs" such as the results of studies of drug use in the general population or in a specific group. These can be gathered for research or planning purposes.

**BSS** is the ongoing systematic collection, analysis and interpretation of HIV/AIDS data and the dissemination of information to those who need to know so that actions may be taken.

**Sampling** is the process of selecting a portion of a population in order to make inferences about the larger population from which the sample was drawn. Sampling is of crucial importance in measuring trends over time. Sampling strategies should therefore be systemic and replicable over time.

## CONSENSUS ESTIMATE

**Estimated number of IDUs in Georgia equals**

**45,000 (44,434 - 45,524)**

**National prevalence estimates for the injection drug use equals**

**1,65 (1,63 - 1,67)**

# EXECUTIVE SUMMARY

## 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 drug prevention efforts.

A variety of methods are available for estimating the prevalence of heavier or more problematic patterns of illegal drug use. 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.

Current study being an updating exercise, have been geographically limited to the cities covered in the previous study (Tbilisi, Batumi, Zugdidi, Gori and Telavi) with one additional city (Kutaisi). The previous study when the multiplier/benchmark method was applied to estimate an IDU population in Georgia was conducted in 2008.

## Study Design and Methods

The aim of the present study is to estimate the prevalence of Injection Drug Use (IDU) in Tbilisi (the capital) and 5 main cities (Batumi, Telavi, Gori, Kutaisi and Zugdidi) of Georgia and provide IDU prevalence estimate throughout the Country.

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. 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); Has either: (a) Physical evidence of recent injection (fresh track marks, scabs, or abscesses), OR (b) Knowledge of drug prices, preparation, injection, and etc.

There are five stages of prevalence estimation method that had been used in this study.

***Stage 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 2007 (details see below in chapter “Benchmark Data Collection”).

***Stage 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.

***Stage 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**

***Stage 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**).

***Stage 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.

Additionally, the second attempt to ***derive the national estimate for the percentage of injection drug users in Georgia using the Multiple Indicator Method*** (MIM) had been carried out.

Since 2011, program entitled "Strengthening the National Response to HIV/AIDS. "Generate evidence base on progress in behavior modification among MARPs and effectiveness of preventive interventions, to inform policies and practice" is being implementing within the framework of the Global Fund Project to Fight AIDS, Tuberculosis and Malaria (GFATM) implementing by Curatio international Foundation (CIF) in cooperation with and local NGOs Bemoni and Tanadgoma. This program aims at conducting Bio-Behavior Surveillance Surveys (BBSS) among IDUs in 6 main urban centres of Georgia and the nomination study for estimating the size of the injecting drug user (IDU) population was incorporated into the above mentioned BBSS.

## Key Findings

**Calculation of the Size of IDU Population.** Multipliers were derived from the RDS survey of 1791 IDUs recruited from across 6 cities. Participants' responses to the questionnaire were used to produce a final series of IDU size estimates, including 95% confidence intervals.

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

### *THE FIRST SCENARIO - benchmark data from the low threshold services includes primary and secondary clients*

Calculation of the estimated size of the IDU population in the surveyed cities revealed these figures (mean estimates): **Tbilisi - 38445 (29686 - 51391); Gori – 1491(1285 - 1748); Telavi – 3076 (2417-4005); Zugdidi - 6133 (4891- 7863); Batumi – 5361 (4110 - 7196); Kutaisi 10052 (7514 - 13962).**

**Estimation of the prevalence of injection drug use.** Prevalence estimates for the injection drug use were produced for 5 cities of Georgia. Census data gave the population between 18 and 64 for urban areas across the country. 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): **Tbilisi - 5.42 (5.35 - 5.48); Gori - 1.68 (1.6 - 1.78); Telavi - 7.1 (6.9 - 7.31); Zugdidi - 5.69 (5.56 - 5.83); Batumi - 7.07 (6.92 - 7.22); Kutaisi - 8.46 (8.32 - 8.61).**

Table 1 IDU prevalence rates in 6 cities in 2007 and 2011

| City | 2011 | 2007 |
|---|---|---|
| | Prevalence estimates | Prevalence estimates |
| Tbilisi | 5.42 | 4,03 |
| Gori | 1.68 | 3,61 |
| Telavi | 7.1 | 1,30 |
| Zugdidi | 5.69 | 4,63 |
| Batumi | 7.07 | 7,97 |
| Kutaisi | 8.46 | |

## 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. The extrapolation methods are based on statistical regression techniques.

The Multivariative Indicator Method (MIM) had been used to derive national prevalence estimates. The aim of this method is to estimate the number of injection drug users in the population by combining information on prevalence that is available only in a few areas (the calibration population, or anchor points) and indicators or predictors of drug use that are available in all areas.

Two separate national estimations were produced: at first, national IDU prevalence was calculated using ***demographic indicator such as population density*** and the second method used ***the drug injection prevalence rate coefficient*** for each city.

National prevalence estimates for the injection drug use were produced for 64 cities of Georgia. Calculation of the IDU prevalence estimation nationwide revealed these figures: estimation method

N 1, using demographic indicator (population density) – **2,59% (estimated number of IDUs equals 70 590)** estimation method N 2, using prevalence rate coefficients - **2,35% (Number of IDUs – 64 089).**

**Table 2 National prevalence estimation in 2007 and 2011**

| Estimation Method | 2007 | | 2011 | |
|---|---|---|---|---|
| | Prevalence (%) | estimated number of IDUs | Prevalence (%) | estimated number of IDUs |
| **Estimation method N 1, using demographic indicator (population density)** | **1,46** | **39 152** | **2,59** | **70 590** |
| **Estimation method N 2, using prevalence rate coefficients** | **1,53** | **41 062** | **2,35** | **64 089** |

### *THE SECOND SCENARIO - IDU Size Estimation with re-calculated benchmark data from the low threshold services.*

The first scenario presented above uses exactly the same methodology that was applied during the first round of the size estimation exercise conducted in 2008-2009. It should be mentioned that during the previous study the data registration system for low threshold services collected only outreach coverage information and did not allow separation of the primary and secondary clients. Since 2010, the data registration system of the low threshold agencies significantly improved and gives the opportunity to disaggregate the numbers of newly contacted and secondary clients. Consequently, in order to avoid obvious overestimation, researches reached the decision to filter the database of the low threshold services and only numbers of newly approached IDU clients use as benchmarks. The multipliers remain the same (see above). Unfortunately, it is impossible to compare the results of the second scenario with the figures obtained during the first round of the size estimation exercise in 2008-2009.

Alternative calculation of the estimated size of the IDU population in the surveyed cities revealed these figures (mean estimates): Tbilisi – 34373 (prevalence rate 4.85), Gori – 901 (prevalence rate 1.02), Telavi – 2392 (prevalence rate 5.52), Zugdidi – 3919 (prevalence rate 3.64), Batumi – 2981 (prevalence rate 3.93), Kutaisi – 6810 (prevalence rate 5.73).

Re-calculation of the IDU prevalence estimation nationwide revealed these figures: estimation method N 1, using demographic indicator (population density) – **1,66% (estimated number of IDUs equals 45391)** estimation method N 2, using prevalence rate coefficients - **1,67% (Number of IDUs – 45457).**

## 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 March 2013. Representatives from different local and international organizations, donors, and other professionals active in

addiction and HIV/AIDS fields attended this meeting. The scenarios described below for the estimation and the estimated numbers and prevalence of IDUs in Georgia were discussed and the final consensus estimates were endorsed by the participants of this consensus meeting.

**Consensus:** The participants approved the approach described in the second scenario for calculating IDU population size estimates in Georgia.

## Conclusion

**New estimates are higher than estimated size of IDU population in Georgia in 2008. Although it was not possible to recalculate size of IDU population in 2008 using the similar methodological approach applied in 2012, it is obvious that recalculation would yield the lower estimate than defined by 2008 study (40,000 IDUs).** One of the reasons for that lies in the fact that the illegal drug market had drastically changed in Georgia since 2007. Specifically, traditional illegal drugs available some years ago such as Heroine and Subutex became very hardly available. Consequently, the consumption of so called "Pharmacy drugs" such as psychotropics (tranquilizers, other CNS depressants) and self-made amphetamine-type stimulants (ephedrone ("jeff") and methkathinone ("vint") increased. Additionally, new self-made opium-type synthetic drug dezomorphine ("crocodile") appeared. These new psychoactive substances are much more cheaper and can be easily obtained through the pharmacies. On the other hand, 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. According to the latest BSS survey, the number of IDUs who reported injecting drugs in other countries dramatically increased in all survey locations as compared with previous study. (in Batumi – from 34.2% to 51.9%, in Zugdidi – from 5.8% to 28.5%, in Telavi – from 3.9% to 19.8%, in Gori – from 7.0% to 28.2%, Kutaisi – from 18.5% to 31.4% and in Tbilisi - from 5.8% to 10.6%). The findings clearly indicate the critical need to intensify efforts among IDU population, especially in the regions with high IDU prevalence.

Unfortunately the approach chosen by the experts for consensus estimation (scenario N 2) does not allow tracing the trend in the number of IDUs in comparison with the 2007 year. The previous consensus estimate prevalence was 1,5 and the estimated number of IDUs - 40,000. If it were possible to filter the old data registration systems of low-threshold services in 2007, the estimated number of injecting drug users would be lower and the upward trend in the number of IDUs would be much obvious as shown by the scenarios N1 and N2 where it is possible to compare previous and present survey results.

The prevalence estimations obtained in this study should be treated with caution due to weak reliability of low threshold program multiplier estimates mainly due to complexity of the nomination question and variety of number of benchmark data across cities.

Estimates of the number of injection drug users in specific geographic areas are essential for deepening our understanding of both the etiology and effects of injection drug use and for designing and implementing drug and HIV-related public health programs and policies. Additionally, given that injection drug use is a risk factor for many infectious diseases, including HIV/AIDS, hepatitis B and C, knowledge of the size of local injecting populations would be useful for designing policies and services to reduce the burden of infectious disease in the population, allocating adequate funds for such services, and assessing the adequacy of existing services and policies. Data regarding the injecting population's size in a given geographic location would also facilitate evaluating the effects of relevant services and policies on subsequent rates of injection drug use in the population.

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. 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.

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. Thus when sufficient data have been collated, methods such as the truncated Poisson method or the capture-recapture method can be used to provide prevalence estimations.

The multiple indicator method to derive national prevalence estimates is cost-effective, as it does not require new data collection, unless separate studies are needed to estimate new anchor points. 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. These two exercises (in 2008-2009 and 2012) 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.

Finally, based on the consensus meeting results, it is recommended to conduct further IDU Size Estimation studies using improved nomination questionnaire and benchmark data from the low threshold services based on the numbers of newly approached IDU clients.

Figure 1. Estimated Prevalence of IDUs in Urban Areas of Georgia (2011)


# Introduction

## Overview of Drug Situation in Georgia

Georgia's population is estimated to be approximately 4.5 million in a geographical area of 70,000-sq. km., bounded by the Black Sea, Russia, Azerbaijan, Armenia and Turkey. Drug abuse and related health, social and economic consequences are a critical problem facing Georgia today. Drug addiction has escalated in Georgia since 1990. On the one hand, the collapse of the Soviet Union was followed by a breakdown of the anti-drug system specific for the totalitarian state that was mainly based on prohibitive measures. On the other hand, the social, political and economic events unfolding in the country gave rise to a series of incentives for intensive abuse of drugs. In particular, uncontrolled territories, unprotected frontiers, a sharp deterioration in the criminal situation, and corruption all widened access to drugs. Although recent years have witnessed economic development and reduction of crime, illicit sale and abuse of drugs are still on the increase.

The situation is worsened by the geographic location of Georgia, turning the country into one of the important routes for transiting drugs from Asia to Europe. A number of factors contribute to the illegal drug trade in Georgia, three of which we tend to consider the most crucial ones[2]:

[2] Darejan J. Javakhishvili, et al. Drug Situation in Georgia 2010

1. The Republic of Georgia and the whole South Caucasus is a natural tracking corridor from Asia to Europe for different commodities, including drugs;
2. The two unresolved inter-ethnic conflicts limit Georgia's capacity to control its own territory and borders;
3. The heritage of the Soviet repression-based approach of organizing public life and the related social inertia slows down and complicates efforts to create a balanced pragmatic drug strategy and, subsequently, a sustainable system of interventions and responses.

Georgia has a domestic drug problem. A newly emerged home-made opioid-type drug nicknamed "Krokodil" ("China White") - desomorphine originally viewed as a potential alternative to morphine – is gaining popularity. The increase in use of home-made amphetamine-type synthetic drugs such as ephedrone and synthetic pervitine ("Jeff" and "Vint") was observed. Over the past year, amphetamines and desomorphine have been replacing traditional opiates, as the prices of heroin and Subutex increased significantly. A large number of the drug using population has reportedly moved to home-made synthetic drugs. These drugs are extremely dangerous, and after only six months, drug users will face a severe degradation in their health.

Numerous analysts point to the increase in abuse of home-made synthetic drugs as an indicator of the Government's success in controlling traditional illegal drugs. The Government has not yet developed a comprehensive mechanism for combating home-made stimulants other than trying to limit the issuance of certain medications only to those with a doctor's prescription[3].

With 0.05% of the population infected, Georgia is a low HIV prevalence country. As of December 31, 2012 in total 3,559 HIV cases have been registered by the national HIV surveillance system[4]. According to updated estimates (Spectrum EPP) the number of people living with HIV/AIDS in the country was determined at 4400 in 2010 and 5000 in 2011, and the virus is primarily restricted to the most-at-risk populations (MARP). However, there is a risk of a further rapid spread of HIV infection in the future due to the high prevalence of injecting drug use, sexually transmitted infections (STIs), and Hepatitis B and C; as well as the increased migration between Georgia and neighboring countries, such as Russia and Ukraine, which are now experiencing growing HIV epidemics.[5]

## Review of the previously used estimates

It is challenging to estimate the number of IDUs in Georgia, which can be attributed to a lack of availability of credible data. Thus far, one round of IDU size estimation have been conducted in

[3] 2012 International Narcotics Control Strategy Report.
[4] National Center for Disease Control and Public Health, unpublished data.
[5] Global AIDS Response Progress Report Georgia 2012

Georgia (2008- 2009). In the absence of a more appropriate method, the multiplier-benchmark method was utilized for estimating the size of this high risk behavior group.

The first Study "Estimating the Prevalence of Injection Drug Use in Georgia", using multiplier/benchmark method had been conducted by Bemoni Public Union (BPU) in 2008-2009, under the support provided by the "Programme of Assistance for the Prevention of Drug Abuse and Drug Trafficking in the Southern Caucasus (SCAD-5 Programme), funded by the European Union. Multipliers for this study had been derived within the framework of the program entitled "Establishment of Evidence-based Basis for HIV/AIDS National Program by Strengthening Surveillance System", being implementing under the Global Fund Project to Fight AIDS, Tuberculosis and Malaria (GFATM) by Curatio international Foundation (CIF). Under this project Bemoni conducted Behavioral Surveillance Surveys (BSSs) with a Biomarker Component among injecting drug users (IDUs) in five main cities of Georgia: Tbilisi, Gori, Telavi, Zugdidi, and Batumi. The nomination study for estimating the size of the injecting drug user (IDU) population had been incorporated into the above mentioned BSSs.

The aim of the study was to estimate the prevalence of Injection Drug Use (IDU) in Tbilisi (the capital) and 4 main cities (Batumi, Telavi, Gori and Zugdidi) of Georgia and provide IDU prevalence estimate throughout the Country. Calculation of the IDU prevalence estimation in the surveyed cities revealed these figures (mean estimates): Tbilisi – 4,03 (3,98-4,09); Gori – 3,61 (3,47-3,75); Telavi – 1,30 (1,19-1,42); Zugdidi: 4,63 (4,37-4,76); Batumi – 7,97 (7,79-8,15). Two separate national estimations were produced: at first, national IDU prevalence was calculated using demographic indicator such as population density and the second method used the drug injection prevalence rate coefficient for each city. National prevalence estimates for the injection drug use were produced for 65 cities of Georgia, using Multivariate Indicator Method (MIM). Calculation of the IDU prevalence estimation nationwide revealed these figures: estimation method N 1, using demographic indicator (population density) – 1,46% (estimated number of IDUs equals 39 152) estimation method N 2, using prevalence rate coefficients - 1,53% (Number of IDUs – 41 062).

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 April 2010. This meeting was held with the participation and support of the CCM Georgia and UNAIDS Caucasus Regional Office. Representatives from Georgian Parliament and Government, different local and international organizations, donors, and other professionals active in addiction and HIV/AIDS fields attended this meeting. Lengthy discussions between the main stakeholders yielded the following estimates:

- → Estimated number of IDUs in Georgia equals 40,000 (39,000-41,000);
- → National prevalence estimates for the injection drug use equals 1,5 (1,48-1,52)

## Brief overview of size estimation methods

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 drug prevention efforts.

It should therefore be remembered that, no matter what approach to prevalence estimation is taken, the picture produced by this process can only ever be an imperfect approximation of the real state of affairs. As a result, our knowledge of the world of illicit drug use and our ability to estimate the number of people using illicit drugs within a locality is less complete than we may judge to be desirable.

A variety of methods are available for estimating the prevalence of heavier or more problematic patterns of illegal drug use, for example drug dependence. 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, including snowball sampling; synthetic estimates, based on social or demographic variables assumed to correlate with drug prevalence; and a variety of more sophisticated statistical modeling approaches.

The above mentioned methods for estimating the prevalence of drug use can be broadened in two wide categories:

- ⇒ DIRECT METHODS - enumeration (counting) of known drug users and conducting surveys (such as Enumeration of known drug users, population surveys, school-age surveys);
- ⇒ INDIRECT METHODS - estimating numbers from samples of known drug users (capture-recapture, multiplier method)[6].

Direct methods are relatively well equipped for estimation of the overall extent of drug use (of any kind and pattern) in the population; however, they fail to estimate within any acceptable margin of error more rare (low-prevalent) modes and patterns of drug use, such as injection drug use and problem drug use.

Why is it necessary to be concerned with the methodological issues of estimating drug problems? Difficulties in describing the extent, nature and impact of substance use and misuse present considerable scientific challenges. Drug use is usually illicit and hidden and subject to rapidly changing fashions. Routine surveillance sources remain only partially validated, are of changing and, in general, unknown coverage, and measure only a part of the phenomenon. Research studies are usually conducted in selected populations of unknown representativeness, and with little opportunity for methodological development or collection of time-trend data.

[6] Approaches to Estimating Drug Prevalence in Ireland: An Overview of Methods and Data Sources, 2003

### *Using multiplier-benchmark methods*

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.

An early paper by Hartnoll and others ("Estimating the prevalence of opioid dependence", *Lancet*, vol. 338 (1985), pp. 203-205) illustrates the application of the simplest technique, using deaths amongst drug users. To apply the multiplier procedure to estimate the number of drug users in a given year, he uses two things:

⇒ The number of deaths to drug users in that year, say 3,000; that acts as the fixed benchmark in the calculation;

The death rate amongst drug users in that year, say 2 per cent, or 1 in 50 dying in the year; that provides the multiplier in the calculation.

The estimate of the number of drug users in that year is calculated from those two figures as the population size required for a 2 per cent death rate to result in 3,000 deaths. If 1 in 50 die, then the overall population must have been estimated for approximately 3,000 x 50 = 150,000. The calculation is notable for its simplicity and directness.

Multiplier-benchmark is an alternative indirect approach that is mathematically simple, straight forward and relatively easy to implement with proper preparation7.

[7] Report of a meeting of the UNAIDS Reference Group on Estimates, Modelling and Projections: Estimation of the Size of High Risk Groups and HIV Prevalence in High Risk Groups in Concentrated Epidemics. Amsterdam, the Netherlands, 2008 .

### *Relative trends inferred from routine information systems and agency data*

Before looking at estimation methods, it is useful to consider the uses of data from *routine information systems*. Although such sources of data of themselves do not provide the actual number of drug injectors in a population, they are often used in providing *relative trend data*.

An example of routine information systems could be data from drug treatment agencies. This kind of data is often considered to be reflective of the larger unknown population. For example, it is sometimes assumed that if the number of injectors coming to treatment has increased, then this reflects an increase in the number of injectors in the population – other things being equal.

Trends can often be inferred from existing sources such as:

- ⇒ data from health centres and treatment clinics - including characteristics of drug injectors such as age, sex, type of drugs used, route of drug administration, and prevalence of hepatitis, and HIV/AIDS
- ⇒ data from enforcement agencies - such as the range of available drugs, their purity, street prices, drug trafficking routes, and localities of drug use
- ⇒ data from hospitals and emergency units: such as the number of cases treated, trends in infectious conditions such as hepatitis, HIV/AIDS, and the number of reported overdoses
- ⇒ data from national health surveillance systems and disease registers: such as the incidence and prevalence of hepatitis, and HIV/AIDS

The proportion of the target population in the benchmark may be obtained separately and independently by interview/questioning or by other specific studies. Sometimes it is possible to use figures from already published data, if they are appropriate for the target population, or even from a general population survey itself, if it contains a high number of drug user respondents from the target population. There are a range of different types of multiplier study that can be carried out, including nomination studies.

### *Nomination techniques*

The use of nomination methods as a means of obtaining information about difficult to-reach populations dates back many years having enjoyed a certain amount of fame and notoriety in the 1970s. Interest in these methods is now developing again in drug use epidemiology, its main virtue being its usefulness in dealing with relatively rare events. *Nomination techniques* are estimation methods based on information which individuals in a sample provide about their acquaintances. It is similar to the multiplier technique, and prevalence is estimated using the benchmark/multiplier approach. It differs in that it gets its multiplier from information gained from informants who are interviewed.

Broadly put, sample members are asked to name or *nominate* drug-using acquaintances and to say whether these acquaintances have been in touch with drug treatment centres, health services or any other similar body, within a stipulated time period. The proportion of treatment attendees

nominated by the sample is then used as a multiplier as described above, in conjunction with the benchmark of known attendance figures at the drug treatment agencies, to give an estimate of the total number of drug users.

There are four steps in using a multiplier/benchmark method to **estimate the prevalence** of behavior or characteristic amongst the total population:

- ⇒ *Select a benchmark* where data are available and you are confident in the data provider, or ask the appropriate questions during the rapid assessment.
- ⇒ *Select a multiplier* - using data from research studies (It is recommended that, whenever possible, the researcher should conduct a sample survey of the target population - injectors or problem drug users - as part of the prevalence estimation study, e.g. survey using nomination technique).
- ⇒ Calculate the number of cases by multiplying the benchmark by the multiplier. This will give the *estimated number of cases*.
- ⇒ A further step can be an *estimate of the absolute prevalence* of that behaviour or characteristic amongst the total population.

## Use of respondent driven sampling as a surveillance tool

The problem of collecting accurate information about the behaviour and composition of social groups arises in many areas of research. In most cases, standard sampling and estimation techniques, developed over the past years, provide a means for collecting such information. However, there are a number of important groups for which these techniques are not applicable. Traditional probability-based sampling methods require the development of a sampling frame, which is challenging for hard-to-reach or "hidden" populations (Robinson et al. 2006).

To minimize selection bias, researchers have started using a new sampling alternative among populations such as MSM, commercial sex workers, and injection drug users. This sampling method, respondent driven sampling (RDS) (Heckathorn 1997, 2002), is a type of chain-referral sampling, or snowball sampling, consisting of two components, recruitment and analysis. Recruitment is initiated with non-randomly selected members of target populations (seeds) who in turn recruit others in their network. After a number of rounds of recruitment those sampled should be representative and prevalence can be measured.

A dual compensation system, whereby a respondent is compensated for participating in the study and for recruiting his/her peers, is used. Moreover, proponents of RDS claim that this sampling method can produce probability samples of the target population and reduce several sources of bias found in chain referral methods (Heckathorn 1997, 2002; Semaan et al. 2002). This approach reduces bias associated with the choice of initial participants, volunteerism and masking by using steering incentives for participation and recruiting participants.

There are several advantages to respondent-driven sampling. Among the primary features that distinguish RDS from snowball sampling is that 'seeds' are limited in the number of respondents they can recruit by the number of coupons they receive (e.g. three to four), thereby minimizing the influence of initial seeds on the final sample composition. Limiting the number of recruits in this way encourages long recruitment chains, thereby increasing the 'reach' of the sample into more hidden pockets of the population (Magnani et al. 2005). Next, the sample provides information about the people in the population and the network connecting them. Another desirable property is that sample data can be combined with institutional data to estimate the size of a hidden population. Previous methods for estimating the sizes of hidden populations did not allow for unbiased estimates of population composition. Respondent-driven sampling is also cheaper, quicker and easier to implement than other methods commonly used to study hidden populations.

## Complementary Surveys

If it deems possible, it is always expedient to address the issue of estimation of the size of risk groups 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 IDU population in a certain city using the coefficient method, it would be enough to add just some questions to the BBSS questionnaire.

Since 2011, program entitled "Strengthening the National Response to HIV/AIDS. "Generate evidence base on progress in behavior modification among MARPs and effectiveness of preventive interventions, to inform policies and practice" is being implementing within the framework of the Global Fund Project to Fight AIDS, Tuberculosis and Malaria (GFATM) implementing by Curatio international Foundation (CIF) in cooperation with and local NGOs Bemoni and Tanadgoma. This program aims at conducting Bio-Behavior Surveillance Surveys (BBSS) among IDUs in 6 main urban centres of Georgia and the nomination study for estimating the size of the injecting drug user (IDU) population was incorporated into the above mentioned BBSS.

# METHODOLOGY

## Objective of the Study

The aim of the study is to estimate the prevalence of Injection Drug Use (IDU) in Tbilisi (the capital) and 5 main cities (Batumi, *Kutaisi, Telavi, Gori and Zugdidi) of Georgia and provide IDU prevalence estimate throughout the Country.*

Objectives:

1. to undertake population estimation studies using consistent methodologies;
2. to recommend methods for use in other sites across Georgia;
3. to provide an evidence base of estimates of the prevalence of injection drug use in Georgia;
4. To help establish a monitoring system that will track injection drug use trend data

## Defining the Target Population

Problem Drug Use (PDU) is defined as injecting drug use or long term/regular use of opiates and/or cocaine-type drugs and/or amphetamine-type drugs[8]. Taking into the consideration the fact that within the framework of the Global Fund Project to Fight AIDS, Tuberculosis and Malaria BPU intends to conduct Behavioral Surveillance Surveys (BSSs) with a Biomarker Component among injecting drug users (IDUs) and we have the opportunity to incorporate the Study of estimating the size of the injecting drug user (IDU) population into the above mentioned BSSs, it should be mentioned that in this report we imply only injection drug users.

Thus, 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:

[8] EMCDDA Recommended Draft technical Tools and Guidelines. Key Epidemiological Indicator: Prevalence of Problem Drug Use. EMCDDA/ July 2004

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

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

## Stages of IDU prevalence estimation method to be applied for Georgia

There are five stages of prevalence estimation method that had been used in this study.

***Stage 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 2011 (details see below in chapter "Benchmark Data Collection").

***Stage 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.

***Stage 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 - percentage of IDUs tested by police for presence of illegal drugs in 2011; % of IDUS tested for HIV in 2011; % of IDUs considering entering the abstinence-oriented treatment in 2011; % of IDUs in substitution treatment in 2011; % of IDUs in substitution treatment waiting list in 2011; % of IDUs in the needle exchange and other low-threshold programs in 2007; % of IDUs deceased due to a fatal drug overdose in 2011.

b) **Multiplier (M)** is estimated for each benchmark by the inverse of percentages (Pisani, 2002). The formula **M = 100/P**

***Stage 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**). For example, if this method is applied to in-treatment data then the benchmark is the total number of drug-users who underwent treatment in a given year, the multiplier is the in-treatment-rate (the proportion of treatment attendees nominated by the sample). Those two components—the known figure in treatment contact (the treatment benchmark) and the estimated proportion of abusers who were in treatment contact (giving the treatment multiplier) - are what gives the method its name.

**Case study. Toronto multiplier study based on HIV tests *(Basic multiplier-benchmark calculation)*[9]**

[9] Estimating Prevalence: Indirect Methods for Estimating the Size of the Drug Problem, Global Assessment Programme on Drug Abuse. UNODC, Vienna, 2003

Archibald and others (2001) outlined a multiplier method of estimating the prevalence of injecting drug use, making use of information from laboratories of the number of HIV tests by injecting drug users and of data from surveys of the proportion of injecting drug users that had had an HIV test in a given year. The findings for one city in one year, Toronto in 1996, are presented below.

The example requires two elements. The first is a known benchmark figure. That figure, in the present case, is the number of HIV tests made on injecting drug users in Toronto in 1996, which was recorded in routinely collected information as 4,050. That represents the known part of the population of injectors. to find the total number of injectors, it needs to be determined what fraction of them are unknown to HIV testing records. The second element required by the method is therefore a multiplier that tells how many more injecting drug users in Toronto did not have HIV tests in 1996. That figure can be worked out simply if the proportion of drug users who did have HIV tests during the period is determined. In the example, the proportion of users tested for HIV was known from other studies to be 25 per cent, or 1 in 4. The calculation illustrated below (Table 3) in is then made simply by noting that if 1 in 4 injectors have been tested, then the total number of injectors must be 4 x 4,050, or 16,200, people.

**Table 3 Basic multiplier-benchmark calculation**

| Item | Applied Values | Estimates |
|---|---|---|
| Benchmark (B) | Number of HIV tests by injecting drug users in 199 | 4050 |
| | Proportion of injectors reporting getting an HIV test in the previous year (P) | 25 per cent |
| Multiplier (M) | Multiplier calculated as 1.0/0.25 (i.e., 1 in 4)10 | 4,0 |
| Population estimate | Benchmark times multiplier (B*M) | 16 200 |

***Stage 5: Calculation of a prevalence of drug injection for each selected 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 64 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.

Additionally, the first attempt to ***derive the national estimate for the percentage of injection drug users in Georgia using the Multiple Indicator Method*** (MIM) had been carried out.

## Limitation of the study

No matter what method is used, all data are potentially biased for a variety of reasons. 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).

[10] This is the same as 100/25 (M = 100/P)

Multiplier methods using treatment, police, or mortality data are ad hoc methods. They are not based on statistical theory and no formula for the variation of the estimator can be derived. Benchmarks are usually collated on a national level. The corresponding multipliers are derived from local samples or expert ratings. Their validity for the total population is questionable due to regional and temporal variations. These methods are easy to apply and give only point estimates.[11]

Sources of information used for estimations may limit the generalisability of the final estimates. Here are some examples of how this happens:

- ⇒ Drug treatment programs typically attract chronic, long term IDUs at the conclusion of their drug using careers, under-representing newer drug users.
- ⇒ 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.
- ⇒ Clinic settings will under-represent healthier drug users.
- ⇒ Methadone treatment programs will only yield information about opioid users, private programs will only include IDUs that can afford to be in treatment.
- ⇒ Low threshold agencies may collate the same standard of information on their clients as the more formal drug treatment agencies described above, and some clients may only be known by a forename or an assumed name.

Depending on the point of contact sources used, we may have to adjust estimates to reflect their relationship to a wider population of interest. It will be best to use as many sources as we can. City-wide service points of contacts or institutional data that are widely accessed by IDUs and covers the highest numbers (and types) of IDUs should be used for gaining benchmark data.

Decent data are often just partly available or not at all, but, once the importance of collecting reliable data is recognized on the political level this problem can be solved. Then, by means of good sampling, sound survey instruments and by means of good police registration techniques, prevalence and patterns (of different kinds) of drug use can be studied on a regular basis. And once treatment institutions are in place, reliable treatment registration can supply interesting data sets as well.

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

[11] Study to Obtain Comparable National Estimates of Problem Drug Use Prevalence for all EU Member States, Final Report. EMCDDA Project (CT.97.EP.04)

- Reliability of low threshold program multiplier estimates is weak: Multiplier estimates for the low threshold programs across the cities are on average 6.5 fold high than multiplier estimates for other benchmark sources such as police data, methadone substitution and treatment data and at least three fold high for HIV testing data. This could be caused by complexity of the nomination question which lumps different services of a low threshold programs in one question, therefore introducing recall bias and affecting precision of multiplier estimates for low threshold services.
- 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.

Another issue is that the country has experienced major movements and changes in the population - due in large part to the high level of labour migration - since the last census was conducted in 2002. Consequently, the upcoming census may show a different scenario with regards to population growth and demographics of the country.

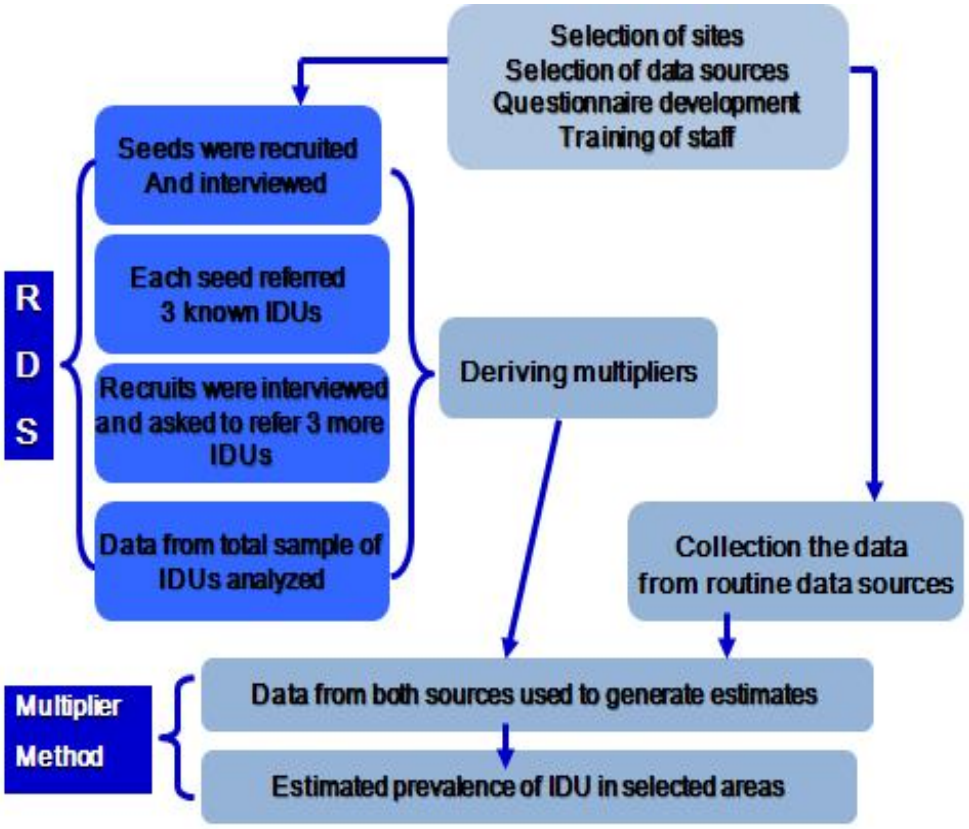
### *RDS*

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.

Another study limitation for IDUs was related to the inclusion criteria adopted. Due to the need of parental consent for enrolment of those aged 15-17, this age group was not represented in the sample, especially in light of the fact that the results showed that 56.2% of survey participants in Tbilisi started injecting drugs in age 15-19.

### *Study Design*

Figure 2 Study Design



## Pre-study activities

### *Negotiating access to data sources*

It is helpful when beginning a research study to have a very clear idea of what data and information sources are routinely available and which of those can be accessed for extracting information relevant to the study. A drug misuse prevalence study can only be undertaken with the co-operation of those who hold information on drug misuse. Each agency will have its own idea about the need or relevance of prevalence research, and each agency will have its own concerns about giving access to confidential data. Agencies which are not exclusively concerned with drug misuse may see requests for information on drug misuse as an additional burden which they may not be keen to take on. They may also be more political obstacles to collecting data from some agencies. The main issue which agencies see as a reason for not giving access to their data is confidentiality.

In order to derive multipliers for predefined drug-using sub-population groups (the benchmarks), Study team asked for relevant information from those institutions where data are available:

- → Ministry of Internal Affairs of Georgia
- → Center for Mental Health and Prevention of Addiction
- → National Center for Disease Control and Public Health (NCDC)
- → Infectious Diseases, AIDS and Clinical Immunology Research Center
- → Georgian Harm Reduction Network
- → Georgia HIV Prevention Project (GHPP)

### *Development of the nomination questionnaire*

Nomination questionnaire was developed in 2008 during the first round of size estimation exercise. The initial version of the questionnaire was slightly changed (one question was removed) and pre-tested.

## Geographical Scope

As it was mentioned above, in 2012 within the framework of the Global Fund Project to Fight AIDS, Tuberculosis and Malaria Bemoni carried out Behavioral Surveillance Surveys (BSSs) with a Biomarker Component among injecting drug users (IDUs) in six main cities of Georgia: Tbilisi, Kutaisi, Gori, Telavi, Zugdidi, and Batumi. The Study of estimating the size of the injecting drug user (IDU) population had been incorporated into these BSSs. It should be mentioned that the previous study (in 2008-2009) was conducted only in 5 cities (Kutaisi had been added). The map below (Figure 3.) shows the cities where survey was conducted.

Figure 3 Map of Georgia with Study Sites


## Study sites and staff

The interviewing process took place at the:

⇒ Bemoni office in Tbilisi (February, 2012)

⇒ NGO "Step in Future" in Gori (March, 2012)

⇒ NGO "Tanadgoma" brach in Kutaisi (April, 2012)

⇒ Bemoni Office in Telavi (May, 2012)

⇒ NGO "Tanadgoma" brach in Batumi (July, 2012)

⇒ NGO "Tanadgoma" brach in Zugdidi (August, 2012)

All sites were accessible to study participants by public transport. Participant flow at the study sites were designed to provide maximum privacy and minimize their exposure to any other study participants. The sites were open from 10am to 8pm (Monday to Saturday). Each office was supervised by the study coordinator and staffed at all times by field coordinator, addiction specialist, 3 interviewers, coupon manager, and social worker. All of them had previous experience working on similar research projects in the recent past.

## Ethical Considerations

The study investigators are cognizant of the fact that the target groups for this study are at some risk for social harm should they be identified as part of the target groups. We have designed this study

to maximally protect the participants balanced with the individual benefit and community benefits from this study. Specifically,

- ⇒ Initial identification of areas where sampling took place was done by NGOs currently working with and trusted by the populations.
- ⇒ Informed consent was taken in a staged manner.
- ⇒ No names had been recorded. All documentation is anonymous.

Given that parental consent is required in Georgia for individual below the age of 18, we did not recruit participants below this age for the survey.

Participation of all respondents in BBSS and Estimating the Prevalence of Problem Drug Use surveys is strictly voluntary. Measures were taken to assure the respect, dignity and freedom of each individual participating. During the survey emphasis was placed on the importance of obtaining informed consent (orally), and avoiding coercion of any kind. Complete confidentiality of study subjects was also emphasized. Names of respondents were not be recorded anywhere on the questionnaires or other forms. Study documents, including RDS data and blood specimens, were identified using unique ID numbers for each participant to maintain confidentiality.

## Steps in Data Collection

### *RDS*

Recruitment of respondents was conducted using RDS. Based on sample size calculation in the framework of Behavior Surveillance Surveys sample size was defined as 350 IDUs in Tbilisi, 270 in Batumi and 280 IDUs in each other selected city (Kutaisi, Gori, Telavi and Zugdidi).

#### *Sampling Procedure*

1. The process starts with recruiting initial participants who are considered as 'seeds', who were selected non-randomly. The criteria for seed recruitment are: those who have different socio-demographic characteristics, at different locations, who have awareness of networks of target populations.
2. Selected seeds underwent eligibility checking: In order to ensure that authentic IDUs are recruited and not just individuals wanting money, a verification procedure was done by the experienced addiction specialist (narcologist). This verification procedure included a preliminary informal discussion regarding the street names of drugs and prices, familiarity with drug preparation and injection techniques and finally visual inspection for recent track marks. If the narcologist was satisfied with the recruit's responses, the interview was conducted.

3. After the eligibility check witnessed verbal informed consent for the interview was obtained (for confidentiality reasons, including legal and moral undertones, it is recommended that informed consent should only be elicited verbally) - those who were eligible and willing to participate in the study had to go through the informed consent procedures in a private area: the participant received information about the studies as well as the informed consent procedure and was asked to accept willingness of participation; after that 2 staff members signed the informed consent form on behalf of participant. Additional information was collected that was specifically required for RDS methodology: personal network size, relationships to recruiters, and the number of recruitment refusals encountered. Following the informed consent process, the field coordinator administered a face-to-face interview with the participant about the participant's personal network. After that participants completed the Interview. All interviews took place in private rooms with only the interviewer and subject present.

4. Interviewed seeds were given an incentive (20 GEL) for participation in the study. Once initial participants completed their interview each seed received three unique, non-replicable, recruitment coupons with a two-week expiration date to recruit their peers who also fit the eligibility criteria for the study. These peers are no longer considered 'participants' and are referred to as recruiters. (When a study participant is recruited by a recruiter, but has not yet enrolled in the study, that person is referred to as a 'recruit'.)

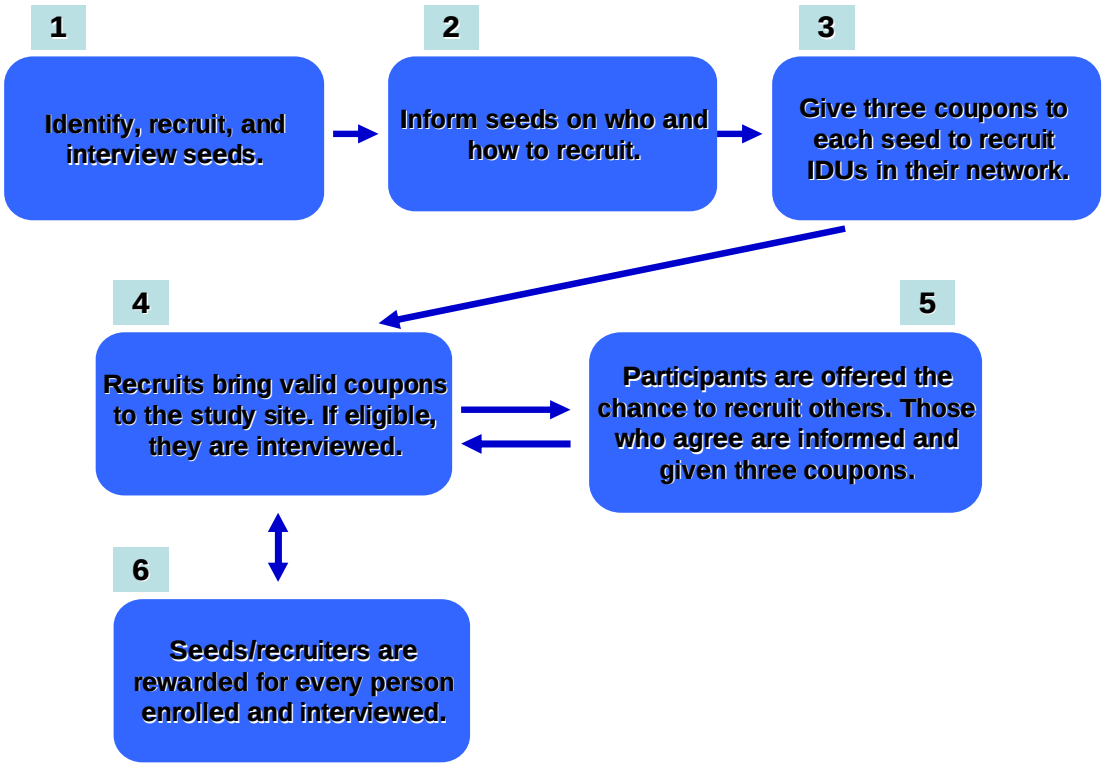
5. Seeds were offered incentives to recruit their peers into the same interview they have just completed; the recruiter was given 21 GEL for three recruited peers. The first wave of participants recruited for the study was brought in by 'seeds'. Thereafter, each person recruited for and enrolled in the study received personal ID and three recruitment coupons with which to recruit their peers into the study as well. Recruits should have to present for participation with coupon "in-hand". The limitation of three peers per recruiter was done to ensure that a broad array of subjects have an opportunity to recruit. Respondents received compensation for participating in the study and for each of their recruits who subsequently enrolled in the study.

6. Each coupon is uniquely coded in order to link recruiters with recruits. Personal ID as well as the coupon ID numbers were carefully recorded in each questionnaire. Coupon numbers (received and given) become part of the information entered into the computer record for each respondent. Every recruit who visited study centers were marked on spreadsheets for coupon management.

7. All new recruits were offered the same dual incentives, as were the seeds. Everyone had been rewarded both for completing the interview and for recruiting his or her peers into the survey. We will perform this recruitment for six waves total or until the sample size is reached.

8. Three coupons continued to be distributed until sample sizes were attained, after which participants were warned that the study would be ending within a few days. However, participants were informed from the beginning that once sample sizes were reached, no more coupons would be honored.

Figure 4 RDS Recruitment Methods



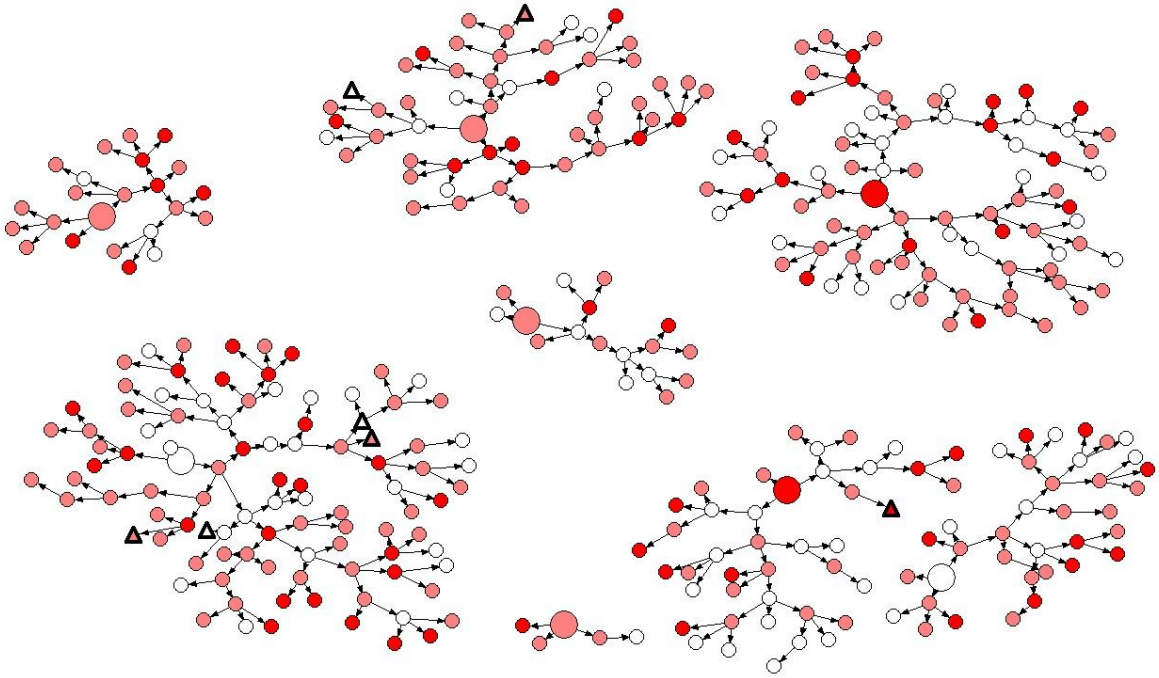

### *Sample Sizes*

Participating organizations (Bemoni in Tbilisi and Telavi and local service provider organizations in other cities) working with IDUs recruit 8-9 IDUs to serve as "seeds" (8 "seeds" in Tbilisi, Batumi and Zugdidi; 9 in Gori, Kutaisi and Telavi had been recruited). All the 51 seeds were productive.

Overall, 1791 IDUs were recruited (including seeds) during February-August 2012 (the illustrative sample in Tbilisi, using NetDraw[12], a network illustration program, is presented below in Figure 5).

[12] Network Visualization Program NetDraw 2.081

**Figure 5. Sample of Recruitment Pattern in the Study (Tbilisi)**



Larger symbols represent seeds and smaller symbols represent subsequent recruited IDUs:

- HIV negative with safe injection and sex behavior
- HIV positive with safe injection and sex behavior
- HIV negative with double risk behavior
- HIV positive with double risk behavior
- HIV negative with single risk behavior
- HIV positive with single risk behavior

Average duration of recruitment process in each site was 14 days. A total of 4857 coupons (984 in Tbilisi, 747 in Gori, 783 in Telavi, 795 in Zugdidi 729 in Batumi, and 819 in Kutaisi) were handed out to participants to recruit their peers. Of the 1921, 9% (179) were ineligible to participate in the study. Two eligible participants refused to participate in BBSS. Thus, 1740 eligible IDUs participated in the BSS study.

One hundred seventy seven respondents (19 in Tbilisi, 18 in Gori, 37 in Telavi, 33 in Kutaisi, 30 in Zugdidi and 40 – in Batumi) refused to answer the questions after administering the nomination questionnaire and dropped out of the multiplier/benchmark study, leaving a total of 1614 participants. The reasons for refusal were different, some of them did not like to say anything about their friends, some of them said that they injected alone, so they did not have information about other IDUs; others stated that in 2011 they were imprisoned or were out of the country, so did not have real and correct information about their friends.

### *Interview of Respondents*

Data collection for BBSS consisted of an interviewer-administered structured questionnaire and a blood sample collection to test for HIV infection among IDUs recruited into the study. The BBSS core questions assess the participant's demographic information, drug use history, drug and sex-related risky behaviors, HIV knowledge, opinion and attitudes, HIV testing history, and access to and use of HIV prevention services.

After the eligibility check and informed consent procedures, the questionnaire with unique ID number was assigned and the subjects were brought to interview rooms designed to maintain privacy. Face to-face and individual interviews were conducted in the interview rooms by trained interviewers. Each interview took about 20-30 minutes.

After that nomination questionnaire (with the same ID number) was administered to the respondents (see appendix). The average duration of the interview process was 10-15 minutes. The study participants were asked to nominate up to 10 close friends with whom they had been using drugs in 2011 (Table 4).

**Table 4 Number of acquaintances nominated by IDUs**

| N | Tbilisi | | Kutaisi | | Gori | | Telavi | | Zugdidi | | Batumi | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| 1 | 5 | 1,4 | 6 | 2,1 | 4 | 1,4 | 8 | 2,8 | 5 | 1,7 | 10 | 3,6 |
| 2 | 35 | 9,8 | 31 | 10,7 | 28 | 9,7 | 24 | 8,3 | 13 | 4,5 | 17 | 6,1 |
| 3 | 65 | 18,2 | 68 | 23,5 | 57 | 19,7 | 73 | 25,3 | 49 | 17,0 | 42 | 15,1 |
| 4 | 89 | 24,9 | 59 | 20,4 | 69 | 23,9 | 72 | 24,9 | 43 | 14,9 | 48 | 17,3 |
| 5 | 77 | 21,5 | 47 | 16,3 | 51 | 17,6 | 36 | 12,5 | 48 | 16,7 | 50 | 18,0 |
| 6 | 26 | 7,3 | 15 | 5,2 | 15 | 5,2 | 12 | 4,2 | 24 | 8,3 | 21 | 7,6 |
| 7 | 15 | 4,2 | 11 | 3,8 | 6 | 2,1 | 6 | 2,1 | 11 | 3,8 | 9 | 3,2 |
| 8 | 8 | 2,2 | 5 | 1,7 | 9 | 3,1 | 5 | 1,7 | 11 | 3,8 | 7 | 2,5 |
| 9 | 2 | 0,6 | 0 | 0 | 1 | 0,3 | 1 | 0,3 | 4 | 1,4 | 0 | 0 |
| 10 | 17 | 4,8 | 14 | 4,8 | 31 | 10,7 | 15 | 5,2 | 50 | 17,5 | 34 | 12,2 |
| Total | 339 | 94,7 | 256 | 88,6 | 271 | 93,8 | 252 | 87,2 | 258 | 89,6 | 238 | 85,6 |
| System Missing | 19 | 5,3 | 33 | 11,4 | 18 | 6,2 | 37 | 12,8 | 30 | 10,4 | 40 | 14,4 |
| **Total** | **358** | **100** | **289** | **100** | **289** | **100** | **289** | **100** | **288** | **100** | **278** | **100** |

The respondents were then asked how many of their closest friends had received treatment or been tested by police for drug presence during this time period. Identifier information for nominated peers was used to establish an unknown to known ratio for each site.

When both interviews were completed, participants were guided to rooms for the collection of biologic samples. The blood test was anonymous-linked. ID numbers were used to label containers of biological specimens (blood). Blood specimens were sent to the NCDC Laboratory in Tbilisi for

testing and the results were reported back to the organization. The IDUs were asked to return with their identification card and their results would be provided.

Detailed checking of the completed questionnaires was initiated by the study coordinator during the fieldwork. Care was taken to check errors and inconsistencies to avoid any difficulty at the stage of data analysis. By the end of each day, coupon manager entered recruitment data to the Coupon tracking form version 3.1[13]

### *Benchmark Data Collection*

Routine statistics have the advantage that they are readily available. If they have been collected consistently, then they can provide indirect indicators of trends over the years. However, they often provide only basic, aggregated information on a small number of variables. A more important limitation is that information systems which are not specifically concerned with drug use are very likely to under-record drug-related cases.

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

1. **Center for Mental Health and Prevention of Addiction database of IDUs gathers records from different abstinence oriented treatment facilities (addiction clinic of the Center for Mental Health and Prevention of Addiction, addiction center in Batumi and the licensed private treatment centers available in Tbilisi.**

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 2011 was 4 (three of those were located in Tbilisi and 1 – in Batumi). Total number of beds in these clinics was 60. Medical treatment of some drug dependent individuals had been financed by the State in 2011 (69 inpatients and 65 outpatients in Tbilisi; 6 inpatients and 6 outpatients in Batumi). The average fee for the treatment of each patient under the State Program was 2,200 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.

1. **Methadone Program database of attending IDUs; these data also include information on IDUs in waiting lists;**

In December 2005, the first Methadone substitution therapy programme was launched in the country. In 2011, 4 Methadone substitution Centers (2 in Tbilisi), 1 in Batumi and 1 in Gori operated under the Global Fund Programme; and 10 Centers existed within the framework of the State Program (5 in Tbilisi and one in Telavi, Kutaisi, Zugdidi, Poti, OzurgeTi)

[13] This excel file was created for the purpose of assisting the RDS research study in Zagreb, Croatia. Author: Hrvoje Fuchek

### 1. 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[14] 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[15] 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. 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.

Information relating to the use of injection drugs is available from the Department of Information and Analysis of MoIA. According to Article 45 of 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.

### 1. 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.

Georgian AIDS and Clinical Immunology Research Center provided information about HIV confirmatory testing among IDUs.

[14] 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"

[15] 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"

1. **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 exchange 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 risk reduction counseling to their clients. Relevant IEC materials and condoms are distributed as well by these services.

## Data Entry and Analysis

The data was analyzed using Respondent Driven Sampling Analysis Tool version 6.0.1 (RDSAT, Cornell University, 2004). The sampling frame for RDS is based on specific information collected from participants, including:

- ⇒ Who recruited whom (tracked in RDSCM)
- ⇒ The relationship of the participant to the recruiter. The RDS population estimates are based on an assumption that the recruiter and the participant know each other.
- ⇒ The participant's personal network size (i.e., how many injectors they know). The network size information from individuals is used to estimate the average network size by different sample characteristics (e.g., by gender, race/ethnicity, drug of choice, etc.).

From this frame, sampling probabilities can be calculated and, in turn, population estimates can be assessed for bias and the variability of these estimates can be determined. To calculate the population estimates derived from RDS, several sources of bias are taken into account: the differences in effective recruitment across groups (those more effective at recruitment would be overrepresented in the sample); homophily (groups that are more insular would be overrepresented

because it is more difficult to break out of those groups); and the network size (groups with larger networks would be overrepresented because more recruitment paths lead to their members).

The researchers assessed whether the sample reached equilibrium, resulting, therefore, in a sample which should allow the calculation of unbiased population-based estimates. The parameters used to calculate the RDS population-based estimates were 15,000 bootstraps and imputation of 5 percent of the outliers in both extremes for the restricted network size. The number of recruitment waves required was calculated in RDSAT for all independent and key dependent variables. Almost all variables reached equilibrium between the third and fourth recruitment waves, and the remaining at the maximum of eleven waves. Raw data was first prepared using SPSS version 13.0. This included generating new variables, re-coding missing values following analysis strategy and RDSAT Manual. Datasets were then converted to Microsoft Excel files, and then to RDS files. RDS database was developed by Curatio International Foundation research team and kindly provided to us.

Socio-demographic variables in this study are presented as both sample proportions and population-based estimates with 95% confidence intervals (CI) weighted for personal network size and recruitment patterns based on RDSAT. Additionally, data for the multiplier calculation was also analyzed using SPSS version 19.0 (95% confidence intervals (CI) were calculated by the SPSS Syntax Editor, Syntax for confidence intervals).

At the completion of the nomination interviewing process, database and statistic processing specialists created a database matching the questionnaire that included variable names, variable descriptions and value labels. The completed questionnaires were double entered, cleaned, processed and analyzed. Two experienced individuals made the data entry, one who read the completed interview form and the other entering the data. Once the SPSS databases were completed, a random check was made of 5% of the completed interview forms. In addition, a frequency was run on all variables to examine values, labels and frequencies. The “cleaned” database was submitted to Bemoni for data analysis.

## Quality Control

The interviewing process was closely monitored by Project Coordinator and Expert Team Leader in all sites. The survey quality control was implemented through two stages:

⇒ Control of interviewing processes through site visits;

⇒ Attendance at interviews.

The findings of quality control show the surveys were undertaken in compliance with the existing instructions and no errors were reported. Specifically:

⇒ All respondents were interviewed in separate rooms;

⇒ All respondents were asked whether they had any objection to the interview and were explained the meaning of confidentiality;

⇒ All interviewers did their best to be polite and respectful;

⇒ All questions were asked in compliance with the written text;

⇒ Interviews were held at a pace set by the respondent.

## FINDINGS

The findings of the study conducted in six locations across the country have been presented in four sub-sections:

### 1. RDS Survey

The discussion in this section will be centred on some key indicators such as age, gender, educational level, marital status, the use of drugs, and the exposure to different services.

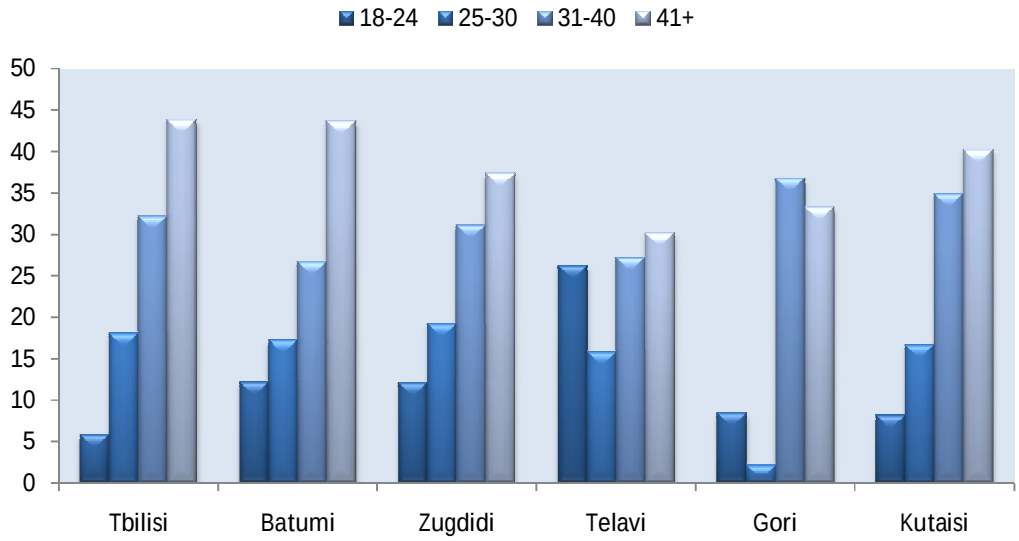
⇒ **Demographic and Social Characteristics of Respondents**

#### *Gender and Age*

Virtually all (97,6% in Tbilisi, 95,3% in Gori, 100% in Kutaisi, 99,9% in Telavi, 99,8% in Zugdidi and 99,9% in Batumi) IDUs interviewed were men. Only 22 women (6 in Tbilisi, 12 in Gori, 0 in Kutaisi, in 2 Zugdidi, 1 in Telavi and 1 in Batumi) were identified in the RDS methodology.

Majority of the respondents across the survey locations were in the age group of 41+. Few IDUs are younger than 24 years of age in Tbilisi (5.9%) while this percentage is higher in other locations - about 8.5% in Gori, 8.2% in Kutaisi, 26.3% in telavi, 12.1% in Zugdidi and 12.2% in Batumi.

**Figure 6 Distribution of Respondents by Age Groups**



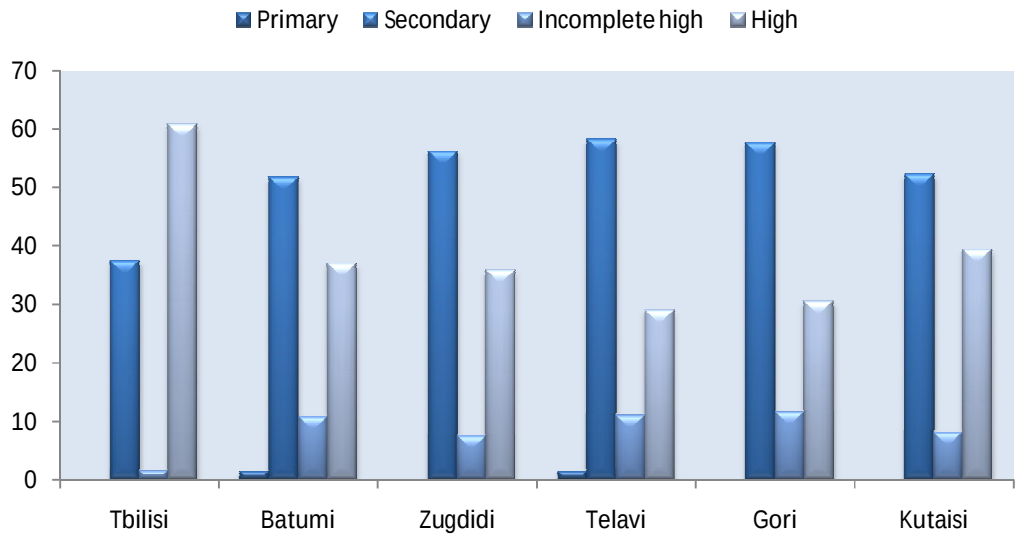

The median age of the respondents ranged between 35 and 39 years across the survey locations. The median age was observed to be highest in Tbilisi (39 years) while it was lowest in Telavi abd Batumi (35 years). In other cities (Gori, Zugdidi and Kutaisi) the median age was 36-38.

#### *Educational Level*

Figure 7 presents the educational status of respondents across the survey locations, which includes the respondents with secondary, incomplete high and university education. In general, IDUs tend to

be well educated. Overall, the proportion of respondents with university degree was highest in Tbilisi (60.9%), followed by Kutaisi (39.43%), than comes Batumi and Zugdidi (37.1% and 35.9% respectively), and the lowest proportion was reported in Telavi and Gori (29.1% and 30.6 %). Among the whole survey population only 4 respondents (2 in Batumi and 2 in Telavi) had not completed either a secondary schooling or vocational training.

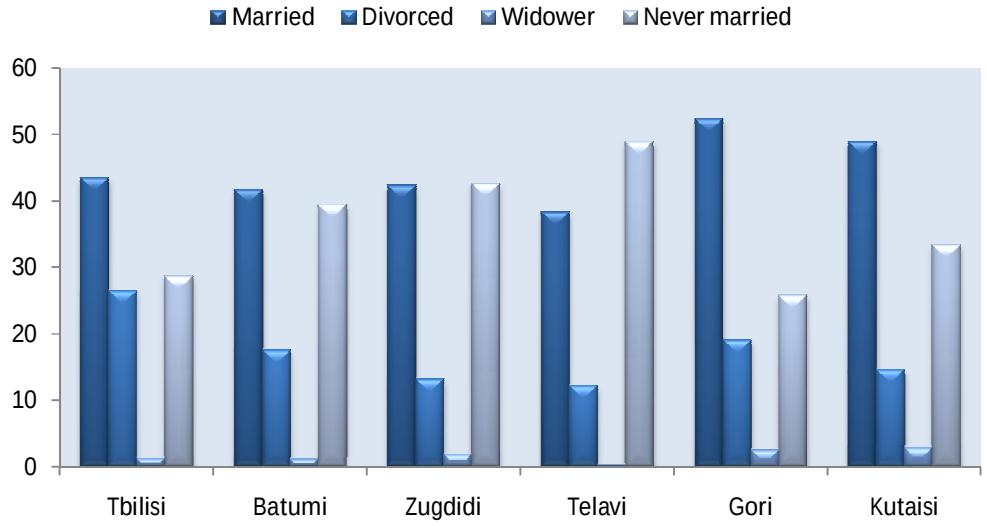
**Figure 7 Distribution of Respondents by Educational Level**




## *Marital Status*

IDUs tend to be either single (never married) or married. Almost half of respondents reported being currently married. Only few reported that they are divorced (Figure 8).

**Figure 8 Distribution of Respondents by Marital Status**



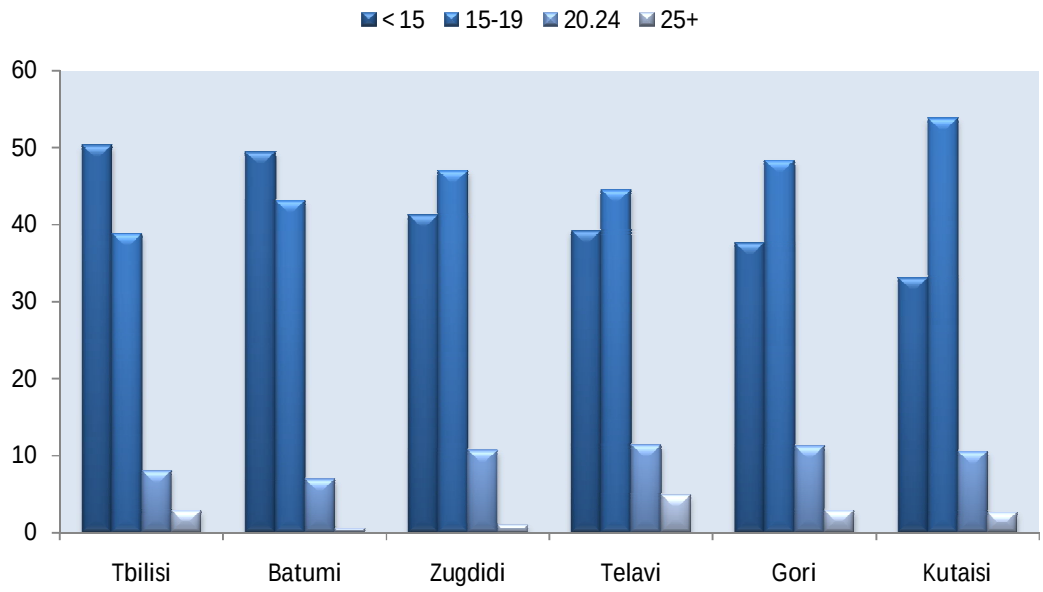

⇒ **Drug Usage Pattern**

All the IDUs interviewed across the six survey locations were asked their age when they first started taking any drug. They were also asked how long they had been injecting drugs, how old they were when they first took any injectable drug, frequency of drug injection in last week before the survey and type of drugs taken during last week.

### *Age at which started using drugs*

Figure 9 presents the findings on age at which the respondents started using any drug. About half of respondents in Tbilisi, Batumi and Zugdidi reported that they started using drugs before the age of 15 years. In other cities the percentage of IDUs started using drugs before 15 years old varies between 33-39%. Out of survey participants, 53% in Kutaisi, 48% in Gori, 47% in Zugdidi 45% in Telavi, 43% in Batumi and 39% in Tbilisi began using drugs between 15 to 19 years of age. The median age of starting drugs was reported 16 years in all survey locations except Batumi where the median age is 15 years.

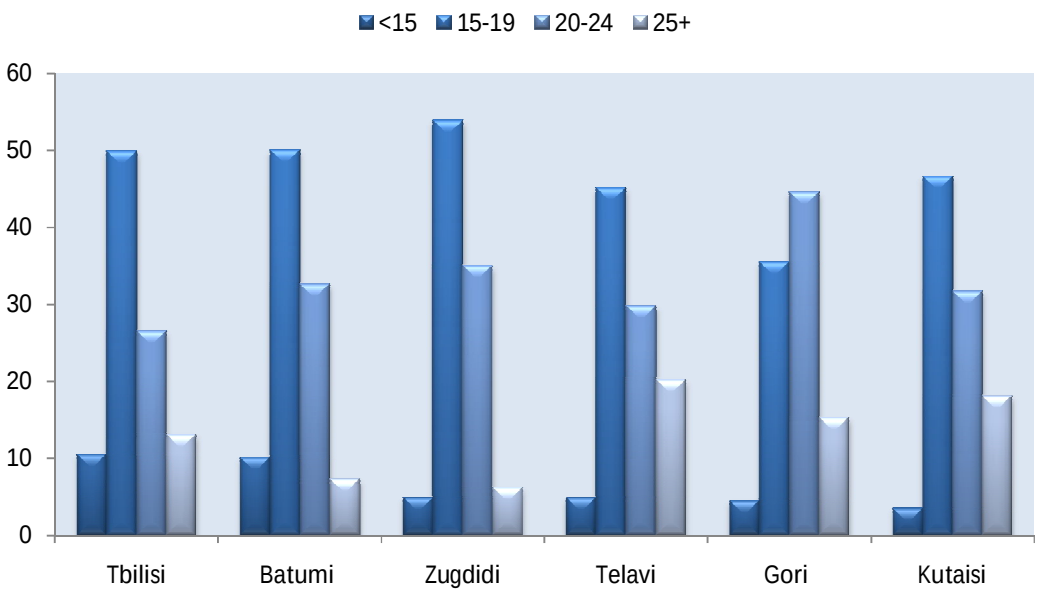
**Figure 9 Age When First Used Any Drug**




### *Age at which Started Injecting Drugs*

Almost half of all IDUs in all survey sites except Gori began *injecting drugs* when they were between 15-19 years of age; In Gori, 45% began injecting drugs during 20-24 years of age. Figure 10 presents the age distribution.

Figure 10 Age When First Injected Any Drug




The median age of starting injecting drugs was also calculated for each survey location and it ranged from 18 years in Zugdidi and Batumi to 20 years in Gori.

### *Membership of regular injecting group*

IDUs were also asked if they were a member of a regular injecting group, and if so, how many members regularly injected together. More than half of surveyed IDUs were the members of a regular injecting group in all cities except Batumi.

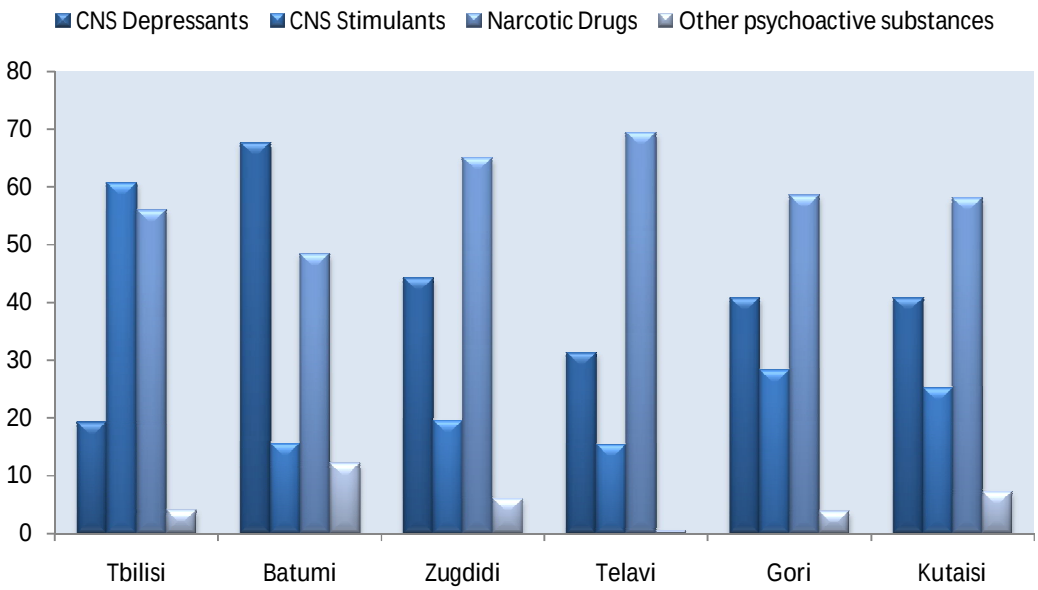
Table 5 Mean number of injecting group members

| Indicators | RDS Population Estimates % (95% CI) | | | | | |
|---|---|---|---|---|---|---|
| | Tbilisi | Gori | Telavi | Zugdidi | Batumi | Kutaisi |
| **Mean # of injecting group members** | **4.42 (1-15)** | **3.95 (1-10)** | **3.84 (1-10)** | **4.19 (2-30)** | **4.14 (1-15)** | **4.11 (1-10)** |

### *Type of drugs injected last month*

All the respondents were asked to recall all the type of drugs which they had injected in last month. Respondents could list more than one response in this multiple response question and the major findings are presented in Figure 11.

Figure 11 Injected Drugs Last Month




The highest percentages of the IDUs who had injected in the previous month injected self-made drugs such as dezomorphine ("crocodile") and ephedrone ("vint"). Heroin consulption was reported mostly in Batumi (61.7%) and Zugdidi (41.1%) while ephedrone was widely used in Tbilisi (55.7%). Illegal consumption of Morphine was observed in Gori and Kutaisi (21.3%and 19.2% respectively).

⇒ **Biomarker**

The biomarker component of the survey involved the analysis of blood specimens at the Laboratory of the National Center for Disease Control and Public Health (NCDC) in Tbilisi.

**HIV testing**: HIV antibody testing was performed using a three-level enzyme-linked immunosorbent assay (ELISA) testing strategy. If a sample was reactive in the first ELISA (Genescreen Plus HIV Ag-AB, Bio-rad) test, the sample was retested two more times using another kit of ELISA. Samples were considered HIV antibody positive if they were reactive in two out of three tests. Any sample non-reactive to the first test was considered as HIV-antibody negative. HIV-antibody positive samples were tested with Western Blot (HIV blot, Genelabs) as the confirmatory test for HIV.

Table 6 Prevalence of HIV

| Indicators | RDS Population Estimates % (95% CI) | | | | | |
|---|---|---|---|---|---|---|
| | Tbilisi | Gori | Telavi | Zugdidi | Batumi | Kutaisi |
| HIV | 1.9 (0.5-3.8) | 1.1 (0-2.8) | 0.4 (0-2.5) | 9.1 (4.7-16.9) | 5.6 (1.7-9.6) | 2.1 (0.4-4.5) |

## 2. 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 2011**

**Source of information:** Center for Mental Health and Prevention of Addiction

**Table 7 Detoxification treatment benchmark data**

| City | Treatment Facility | # of Inpatient IDUs | | # of Outpatient IDUs | | Total # |
|---|---|---|---|---|---|---|
| | | *Male* | *Female* | *Male* | *Female* | |
| **Tbilisi** | **State program** | 69 | 0 | 65 | 0 | **134** |
| | **Internal standard** | 268 | 7 | 503 | 23 | **801** |
| **Batumi** | **State program** | 6 | 0 | 6 | 0 | **12** |
| | **Internal standard** | 4 | 0 | 9 | 1 | **14** |
| | **Grand Total** | **347** | **7** | **583** | **24** | **961** |

**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 Methadone substitution treatment in 2011**

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

**Table 8 Methadone (opioid) substitution treatment benchmark data**

| City | Treatment Facility | # of Male IDUs | # of Female IDUs | Total | Among them, # of HIV+ IDUs |
|---|---|---|---|---|---|
| **Tbilisi** | **Global Fund OST Center #1** (Tbilisi, Center for Mental Health and Prevention of Addiction) | 136 | 3 | 139 | 29 |
| | **Global Fund OST Center #2** (Tbilisi, Uranti) | 120 | 2 | 122 | 18 |
| | State program | 864 | 10 | 874 | 7 |
| **Batumi** | **Global Fund OST Center #3** (Batumi) | 142 | 1 | 143 | 16 |
| **Telavi** | **State program** | 30 | | 30 | |
| **Gori** | **Global Fund OST Center #4** (Gori) | 69 | 1 | 70 | 5 |
| **Kutaisi** | **State program** | 152 | | 152 | 13 |
| **Zugdidi** | **State program** | 95 | | 95 | 17 |
| | **Grand Total** | **1608** | **17** | **1625** | **105** |

**Explanation:** Four free of charge Methadone substitution therapy programs (funded by the Global Fund) and 9 OST programs partially funded by the State and co-financed by the patients were operated in Georgia in 2011. These programs had been coordinated by the Center for Mental Health and Prevention of Addiction.

⇒ **Injection drug users on waiting lists for Methadone substitution treatment in 2011**

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

Table 9 Methadone substitution waiting list benchmark data

| City | # of IDUs at the beginning of year 2011 | # of IDUs during the year 2011 | Total # of IDUs on waiting lists in 2011 | Among them, # of IDUs included into the Program during the year 2011 |
|---|---|---|---|---|
| **Tbilisi** (Global Fund OST) | 249 | 91 | 340 | 64 |
| **Batumi** (Global Fund OST) | 3 | 52 | 55 | 53 |
| **Grand Total** | **252** | **143** | **395** | **117** |

⇒ **Drug users using needle exchange and other low-threshold programs in 2011**

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

Table 10 # of IDUs in the needle exchange and other low-threshold programs in 2011

| City | # of IDUs outreached | # of HCT |
|---|---|---|
| **Tbilisi** | 3048 | 1489 |
| **Gori** | 484 | 155 |
| **Telavi** | 657 | 205 |
| **Zugdidi** | 801 | 409 |
| **Batumi** | 925 | 354 |
| **Kutaisi** | 1124 | 234 |
| **Grand Total** | **7039** | **2846** |

**Explanation:** The main services offered to IDUs under the harm reduction programs in Georgia are HIV counseling and testing (HCT), and needle exchange. The different agencies maintained different databases. The table above represents the aggregated data.

⇒ **Drug users tested on HIV in 2011**

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

Table 11 HIV testing benchmark data

| City | # of IDUs tested on HIV | # of IDUs infected by HIV |
|---|---|---|
| **Tbilisi** | 2813 | 62 |
| **Gori** | 186 | 5 |
| **Telavi** | 41 | 2 |
| **Zugdidi** | 317 | 27 |
| **Batumi** | 357 | 10 |
| **Kutaisi** | 327 | 9 |
| **Grand Total** | **4041** | **115** |

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

HIV antibody testing was performed using a three-level enzyme-linked immunosorbent assay (ELISA) testing strategy. If a sample was reactive in the first ELISA (Genescreen Plus HIV Ag-AB, Bio-rad) test, the sample was retested two more times using another kit of ELISA. Samples were considered HIV antibody positive if they were reactive in two out of three tests. Any sample non-reactive to the first test was considered as HIV-antibody negative. HIV-antibody positive samples were tested with Western Blot (HIV blot, Genelabs) as the confirmatory test for HIV.

**Crime-related Indicators**

⇒ **Injection drug users registered by the police tested positively for presence of illegal drugs in 2011**

**Source of information:** Ministry of Internal Affairs

Table 12 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** | 4111 | 3136 |
| **Gori** | 152 | 55 |
| **Telavi** | 223 | 54 |
| **Zugdidi** | 638 | 214 |
| **Batumi** | 389 | 151 |
| **Kutaisi** | 1179 | 449 |
| **Grand Total** | **6692** | **4059** |

**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 te sted positively for presence of illegal drugs.

## 3. Calculation of the Size of IDU Population in 6 selected cities

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

Table 13 Estimates of the number of IDUs in 6 cities in 2011

| City | Estimated size | 95% CI | |
|---|---|---|---|
| **Tbilisi** | **38445** | 29686 | 51391 |
| **Gori** | **1491** | 1285 | 1748 |
| **Telavi** | **3076** | 2417 | 4005 |
| **Zugdidi** | **6133** | 4891 | 7863 |
| **Batumi** | **5361** | 4110 | 7196 |
| **Kutaisi** | **10052** | 7514 | 13962 |

Multipliers were derived from the RDS survey of 1791 IDUs recruited from across 6 cities. Totally, 7589 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. This study suggests using the statistical lower and upper limits (at 95% confidence interval) to reflect the minimum and maximum ranges.

Table 14 Table 24 and Figure 12 set out the multiplier estimates of IDUs in 6 cities across the country derived from different sources, together with the mean and median of the estimates in 2011 and the comparative estimations for years 2007 and 2011.

Table 14 Estimates of the number of IDUs in Tbilisi in 2011

| Tbilisi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 4111 | 3.41 | 3.13 | 3.74 | 14019 | 12867 | 15389 |
| **HIV testing data** | 2813 | 12.61 | 10.44 | 15.43 | 35472 | 29363 | 43411 |
| **Treatment data** | 935 | 15.1 | 12.27 | 18.87 | 14119 | 11472 | 17642 |
| **Methadone substitution data** | 1411 | 12.61 | 10.44 | 15.43 | 17793 | 14727 | 21775 |
| **Low Threshold Programs data** | 3048 | 36.36 | 26.25 | 52.08 | 110825 | 80000 | 158750 |
| | | | | ***Mean*** | 38445 | 29686 | 51391 |
| | | | | ***Median*** | 17793 | 14727 | 21775 |

Table 15 Estimates of the number of IDUs in Tbilisi in 2007 and 2011

| Tbilisi | 2007 | | | 2011 | | |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Estimated size | 95% CI | |
| Police data | 20747 | 19358 | 22380 | 14019 | 12867 | 15389 |
| HIV testing data | 13781 | 11966 | 15967 | 35472 | 29363 | 43411 |
| Treatment data | 8633 | 7865 | 9496 | 14119 | 11472 | 17642 |
| Methadone substitution data | 2185 | 1964 | 2454 | 17793 | 14727 | 21775 |
| Low Threshold Programs data | 90189 | 77320 | 106194 | 110825 | 80000 | 158750 |
| ***Mean*** | **27107** | **23694** | **31532** | **38445** | **29686** | **51391** |
| ***Median*** | **13781** | **11966** | **15967** | **17793** | **14727** | **21775** |

Table 16 Estimates of the number of IDUs in Gori in 2011

| Gori | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| Police data | 152 | 5.49 | 4.83 | 6.29 | 835 | 734 | 957 |
| HIV testing data | 186 | 4.37 | 3.91 | 4.92 | 813 | 727 | 915 |
| Methadone substitution data | 70 | 11.47 | 9.43 | 14.14 | 803 | 660 | 990 |
| Low Threshold Programs data | 484 | 7.26 | 6.24 | 8.53 | 3514 | 3019 | 4130 |
| | | | | ***Mean*** | **1491** | **1285** | **1748** |
| | | | | ***Median*** | **824** | **697** | **973** |

Table 17 Estimates of the number of IDUs in Gori in 2007 and 2011

| Gori | 2007 | | | 2011 | | |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Estimated size | 95% CI | |
| Police data | 3540 | 3092 | 4079 | 835 | 734 | 957 |
| HIV testing data | 1480 | 1165 | 1919 | 813 | 727 | 915 |
| Methadone substitution data | | | | 803 | 660 | 990 |
| Low Threshold Programs data | 3947 | 3353 | 4712 | 3514 | 3019 | 4130 |
| ***Mean*** | **2989** | **2537** | **3570** | **1491** | **1285** | **1748** |
| ***Median*** | **3540** | **3092** | **4079** | **824** | **697** | **973** |

Table 18 Estimates of the number of IDUs in Telavi in 2011

| Telavi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| Police data | 223 | 4.67 | 4.11 | 5.35 | 1042 | 917 | 1194 |
| HIV testing data | 41 | 9.87 | 8.10 | 12.21 | 405 | 332 | 501 |
| Methadone substitution data | 30 | 11.48 | 9.26 | 14.47 | 344 | 278 | 434 |
| Low Threshold Programs data | 657 | 16.0 | 12.39 | 21.14 | 10512 | 8141 | 13890 |
| | | | ***Mean*** | | **3076** | **2417** | **4005** |
| | | | ***Median*** | | **723** | **624** | **848** |

Table 19 Estimates of the number of IDUs in Telavi in 2007 and 2011

| Telavi | 2007 | | | 2011 | | |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Estimated size | 95% CI | |
| Police data | 114.52 | 99.4 | 133.28 | 1042 | 917 | 1194 |
| HIV testing data | 1000 | 615.75 | 1748.25 | 405 | 332 | 501 |
| Methadone substitution data | | | | 344 | 278 | 434 |
| Low Threshold Programs data | | | | 10512 | 8141 | 13890 |
| *Mean* | **557** | **358** | **941** | **3076** | **2417** | **4005** |
| *Median* | **557** | **358** | **941** | **723** | **624** | **848** |

Table 20 Estimates of the number of IDUs in Zugdidi in 2011

| Zugdidi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| Police data | 638 | 4.97 | 4.43 | 5.61 | 3168 | 2824 | 3576 |
| HIV testing data | 317 | 7.80 | 6.71 | 9.14 | 2472 | 2128 | 2898 |
| Methadone substitution data | 95 | 12.70 | 10.44 | 15.65 | 1206 | 992 | 1487 |
| Low Threshold Programs data | 801 | 22.08 | 17.01 | 29.33 | 17684 | 13622 | 23490 |
| | | | | *Mean* | **6133** | **4891** | **7863** |
| | | | | *Median* | **2820** | **2476** | **3237** |

Table 21 Estimates of the number of IDUs in Zugdidi in 2007 and 2011

| Zugdidi | 2007 | | | 2011 | | |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Estimated size | 95% CI | |
| Police data | 1204 | 1074 | 1360 | 3168 | 2824 | 3576 |
| HIV testing data | 3023 | 2502 | 3710.63 | 2472 | 2128 | 2898 |
| Methadone substitution data | | | | 1206 | 992 | 1487 |
| Low Threshold Programs data | 10338 | 8258 | 13195 | 17684 | 13622 | 23490 |
| *Mean* | **4855** | **3945** | **6089** | **6133** | **4891** | **7863** |
| *Median* | **3023** | **2502** | **3711** | **2820** | **2476** | **3237** |

Table 22 Estimates of the number of IDUs in Batumi in 2011

| Batumi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| Police data | 389 | 4.0 | 3.59 | 4.49 | 1557 | 1396 | 1748 |
| HIV testing data | 357 | 5.12 | 4.5 | 5.85 | 1826 | 1607 | 2090 |
| Treatment data | 26 | 9.98 | 8.27 | 12.2 | 259 | 215 | 317 |
| Methadone substitution data | 145 | 7.0 | 6.0 | 8.24 | 1015 | 870 | 1195 |
| Low Threshold Programs data | 925 | 23.94 | 17.79 | 33.11 | 22145 | 16459 | 30629 |
| | | | | *Mean* | **5361** | **4110** | **7196** |
| | | | | *Median* | **1557** | **1396** | **1748** |

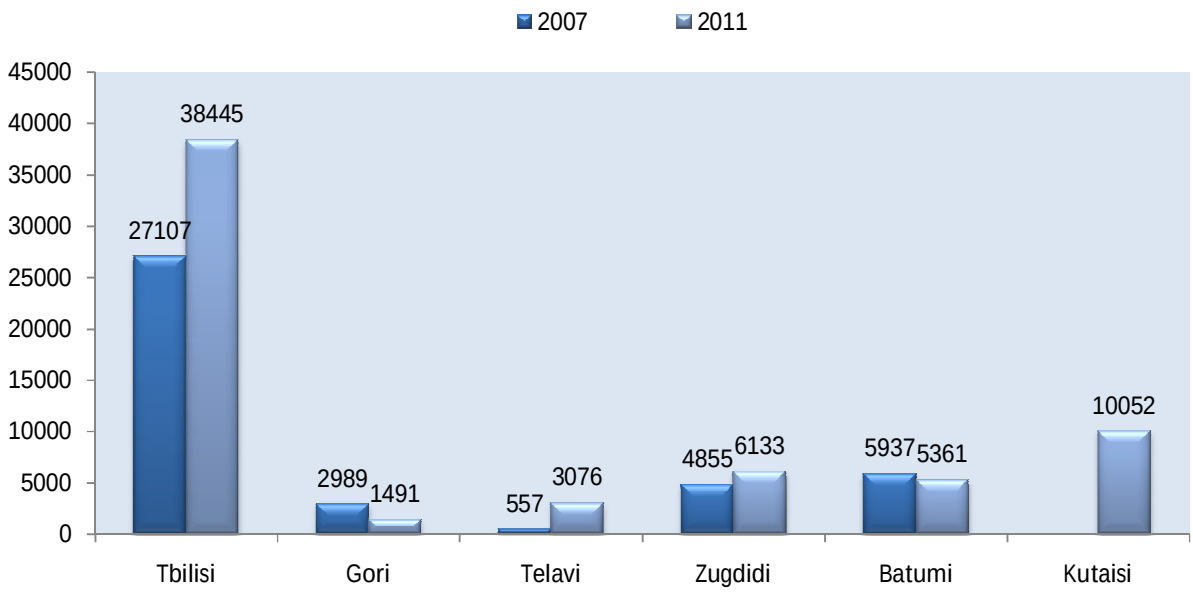
Table 23 Estimates of the number of IDUs in Batumi in 2007 and 2011

| Batumi | 2007 | | | 2011 | | |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Estimated size | 95% CI | |
| **Police data** | 4555 | 4219 | 4982 | 1557 | 1396 | 1748 |
| **HIV testing data** | 2243 | 1878 | 2711 | 1826 | 1607 | 2090 |
| **Treatment data** | 505 | 437 | 591 | 259 | 215 | 317 |
| **Methadone substitution data** | 1839 | 1521 | 2260 | 1015 | 870 | 1195 |
| **Low Threshold Programs data** | 20542 | 16986 | 25264 | 22145 | 16459 | 30629 |
| ***Mean*** | **5937** | **5008** | **7162** | **5361** | **4110** | **7196** |
| ***Median*** | **2243** | **1878** | **2711** | **1557** | **1396** | **1748** |

Table 24 Estimates of the number of IDUs in Kutaisi in 2011

| Kutaisi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 1179 | 3.66 | 3.29 | 4.10 | 4312 | 3873 | 4834 |
| **HIV testing data** | 327 | 8.26 | 6.92 | 9.98 | 2700 | 2263 | 3263 |
| **Methadone substitution data** | 152 | 11.72 | 9.46 | 14.77 | 1782 | 1438 | 2245 |
| **Low Threshold Programs data** | 1124 | 27.95 | 20.0 | 40.49 | 31414 | 22480 | 45506 |
| | | | | ***Mean*** | **10052** | **7514** | **13962** |
| | | | | ***Median*** | **3506** | **3068** | **4049** |

Figure 12 Estimates of the number of IDUs in 6 cities in 2007 and 2011



## 4. Estimation of the prevalence of injection drug use

Prevalence estimates for the injection drug use were produced for 6 cities of Georgia. Census data gave the population between 18 and 64 for urban areas across the country. 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 25 IDU prevalence estimates in 6 cities in 2011**

| City | IDU prevalence estimates | 95% CI | |
|---|---|---|---|
| Tbilisi | 5.42 | 5.35 | 5.48 |
| Gori | 1.68 | 1.6 | 1.78 |
| Telavi | 7.1 | 6.9 | 7.31 |
| Zugdidi | 5.69 | 5.56 | 5.83 |
| Batumi | 7.07 | 6.92 | 7.22 |
| Kutaisi | 8.46 | 8.32 | 8.61 |

Table 26

Table 32 below present the IDU prevalence estimation (%) in 6 cities across the country derived from different sources, together with the mean and median of the estimates.

Table 26 Estimated Prevalence Rates in Tbilisi in 2011

| Tbilisi | | | | Adult population (18-64) | | 709064 |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 14019 | 12867 | 15389 | 1.98 | 1.94 | 2.01 |
| **HIV testing data** | 35472 | 29363 | 43411 | 5.0 | 4.94 | 5.06 |
| **Treatment data** | 14119 | 11472 | 17642 | 1.99 | 1.95 | 2.03 |
| **Methadone substitution data** | 17793 | 14727 | 21775 | 2.51 | 1.47 | 2.55 |
| **Low Threshold Programs data** | 110825 | 80000 | 158750 | 15.63 | 5.43 | 15.73 |
| ***Mean*** | ***38445*** | ***29686*** | ***51391*** | ***5.42*** | ***5.35*** | ***5.48*** |
| ***Median*** | ***17793*** | ***14727*** | ***21775*** | ***2.51*** | ***1.47*** | ***2.55*** |

Table 27 Estimated Prevalence Rates in Gori in 2011

| Gori | | | | Adult population (18-64) | | 88633 |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 835 | 734 | 957 | 0.94 | 0.87 | 1.02 |
| **HIV testing data** | 813 | 727 | 915 | 0.92 | 0.85 | 0.99 |
| **Methadone substitution data** | 803 | 660 | 990 | 0.91 | 0.84 | 0.98 |
| **Low Threshold Programs data** | 3514 | 3019 | 4130 | 3.96 | 3.82 | 4.11 |
| ***Mean*** | ***1491*** | ***1285*** | ***1748*** | ***1.68*** | ***1.6*** | ***1.78*** |
| ***Median*** | ***824*** | ***697*** | ***973*** | ***0.93*** | ***0.86*** | ***1.01*** |

Table 28 Estimated Prevalence Rates in Telavi in 2011

| Telavi | | | | Adult population (18-64) | | 43 310 |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 1042 | 917 | 1194 | 2.41 | 2.24 | 2.58 |
| **HIV testing data** | 405 | 332 | 501 | 0.94 | 0.84 | 1.04 |
| **Methadone substitution data** | 344 | 278 | 434 | 0.79 | 0.7 | 0.89 |
| **Low Threshold Programs data** | 10512 | 8141 | 13890 | 24.27 | 23.81 | 24.74 |
| ***Mean*** | ***3076*** | ***2417*** | ***4005*** | ***7.1*** | ***6.9*** | ***7.31*** |
| ***Median*** | ***723*** | ***624*** | ***848*** | ***1.67*** | ***1.54*** | ***1.81*** |

Table 29 Estimated Prevalence Rates in Zugdidi in 2011

| Zugdidi | | | | Adult population (18-64) | | 107726 |
|---|---|---|---|---|---|---|
| | Estimated size | 95% CI | | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 3168 | 2824 | 3576 | 2.94 | 2.83 | 3.06 |
| **HIV testing data** | 2472 | 2128 | 2898 | 2.29 | 2.19 | 2.4 |
| **Methadone substitution data** | 1206 | 992 | 1487 | 1.12 | 1.05 | 1.19 |
| **Low Threshold Programs data** | 17684 | 13622 | 23490 | 16.42 | 16.6 | 16.67 |
| ***Mean*** | ***6133*** | ***4891*** | ***7863*** | ***5.69*** | ***5.56*** | ***5.83*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Median*** | ***2820*** | ***2476*** | ***3237*** | ***2.62*** | ***2.51*** | ***2.73*** |

Table 30 Estimated Prevalence Rates in Batumi

| **Batumi** | | | | **Adult population (18-64)** | | **75823** |
|---|---|---|---|---|---|---|
| | **Estimated size** | **95% CI** | | **Prevalence of IDU (%)** | **95% CI** | |
| **Police data** | 1557 | 1396 | 1748 | 2.05 | 1.94 | 2.17 |
| **HIV testing data** | 1826 | 1607 | 2090 | 2.41 | 2.29 | 2.54 |
| **Treatment data** | 259 | 215 | 317 | 0.34 | 0.3 | 0.39 |
| **Methadone substitution data** | 1015 | 870 | 1195 | 1.34 | 1.25 | 1.43 |
| | | | | | | |
| **Low Threshold Programs data** | 22145 | 16459 | 30629 | 29.21 | 28.84 | 29.58 |
| ***Mean*** | ***5361*** | ***4110*** | ***7196*** | ***7.07*** | ***6.92*** | ***7.22*** |
| ***Median*** | ***1557*** | ***1396*** | ***1748*** | ***2.05*** | ***1.94*** | ***2.17*** |

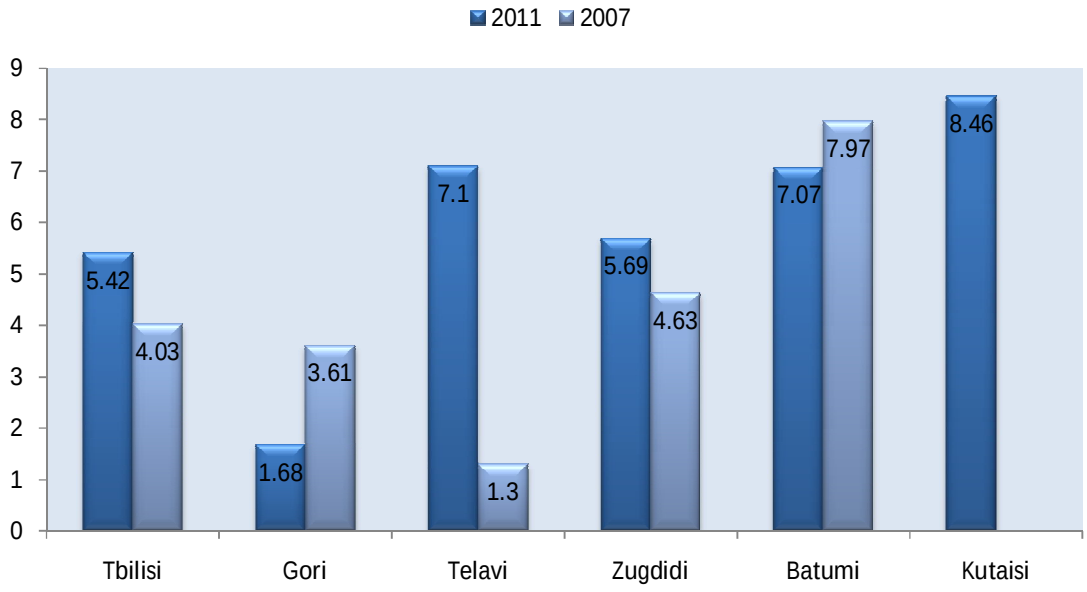
Table 31 Estimated Prevalence Rates in Kutaisi in 2011

| **Kutaisi** | | | | **Adult population (18-64)** | | 118763 |
|---|---|---|---|---|---|---|
| | **Estimated size** | **95% CI** | | **Prevalence of IDU (%)** | **95% CI** | |
| **Police data** | 4312 | 3873 | 4834 | 3.63 | 3.51 | 3.75 |
| **HIV testing data** | 2700 | 2263 | 3263 | 2.27 | 2.18 | 2.37 |
| **Methadone substitution data** | 1782 | 1438 | 2245 | 1.50 | 1.42 | 1.58 |
| **Low Threshold Programs data** | 31414 | 22480 | 45506 | 26.45 | 26.16 | 26.74 |
| ***Mean*** | ***10052*** | ***7514*** | ***13962*** | ***8.46*** | ***8.32*** | ***8.61*** |
| ***Median*** | ***3506*** | ***3068*** | ***4049*** | ***2.95*** | ***2.85*** | ***3.06*** |

Table 32 IDU prevalence rates in 6 cities in 2007 and 2011

| City | 2011 | | 2007 | |
|---|---|---|---|---|
| | Population (18-64 years) | Prevalence estimates | Population (18-64 years) | Prevalence estimates |
| **Tbilisi** | 709 100 | **5.42** | 672 000 | **4,03** |
| **Gori** | 88 600 | **1.68** | 82 800 | **3,61** |
| **Telavi** | 43 300 | **7.1** | 42 900 | **1,30** |
| **Zugdidi** | 107 700 | **5.69** | 105 000 | **4,63** |
| **Batumi** | 75 800 | **7.07** | 74 500 | **7,97** |
| **Kutaisi** | 118 800 | **8.46** | | |

Figure 13 Prevalence Estimates of IDUs in 6 cities in 2007 and 2011




## 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 important element of any extrapolation method is that it makes use of known prevalence figures in certain regions to estimate prevalence in other regions. To do that, the regions must have some data sources that are the same as (or very similar to) the regions for which prevalence estimates exist, although of course they lack the regional prevalence figure itself. The general principle is then to use data that are similar across the separate localities to project figures for drug use prevalence from localities where

it is known to localities where it is lacking.[16] 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".

## Extrapolation Method: The multivariate indicator for injection drug use17

The ***Multivariate Indicator Method (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.

As the anchor points have a great impact on the actual figures of the total prevalence by fixing the regression line, great care has to be taken in obtaining reliable and valid estimates with the same target group. Furthermore, the estimates should cover at least one area with an assumed high prevalence rate and at least one region at the lower end of prevalence rates, in order to improve the quality of the regression model. Using only estimates of regions with a high prevalence makes the method useless, and may even result in negative prevalence rates. Indicator values for the anchor points must be available. In practice, prevalence estimates are often available only on city level whereas indicators are collected on a regional level. If problem drug use is concentrated heavily in

[16] Estimating Prevalence: Indirect Methods for Estimating the Size of the Drug Problem. Global Assessment Programme on Drug Abuse, Toolkit Module 2. UNODC, 2003

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

these cities they may be used as anchor points. However, the relationship between indicators and drug use prevalence may be different for urban and rural areas.

## Application

The aim of this method is to estimate the number of problem drug users in the population by combining information on prevalence that is available only in a few areas (the calibration population, or anchor points) and indicators or predictors of drug use that are available in all areas (Mariani and others (1994)). The method was first used in the United States (Woodward and others (1984)) and has been described more fully elsewhere (Wickens (1993)).

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), 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.[18] 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

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

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). [19] 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 Multivariative 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 65 cities) as well as independently obtained prevalence estimates G for 5 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).[20]

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

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

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

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.[21] 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.

## Results of the national prevalence estimation

National prevalence estimates for the injection drug use were produced for 64 cities of Georgia. Census data gave the population between 18 and 64 for all urban areas across the country. Calculation of the IDU prevalence estimation nationwide revealed these figures: estimation method N 1, using demographic indicator (population density) – **2,59% (estimated number of IDUs equals 70590)** estimation method N 2, using prevalence rate coefficients - **2,35% (Number of IDUs – 64089).**

Table 33

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

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

**Table 33 National Estimation by Population Density in 2011**

| N | Cities | Total Population | Population 18-64 | Density of the Population per 1 sq.km | Prevalence per 100 000 | Prevalence % | Estimated Number |
|---|---|---|---|---|---|---|---|
| 1 | Tbilisi | 1 162 400 | 709 064 | 4425.8 | 6485,145 | 6,49 | 45983,83 |
| 2 | Batumi | 124 300 | 75823 | 7293.8 | 9217,394 | 9,22 | 6988,9 |
| 3 | Keda | 20 400 | 12444 | 44.3 | 42,5096 | 0,04 | 5,29 |
| 4 | Kobuleti | 92 100 | 56181 | 122.3 | 8,00767 | 0,01 | 4,5 |
| 5 | Shuakhevi | 22 800 | 13908 | 37.2 | 20,42654 | 0,02 | 2,84 |
| 6 | Khelvachauri | 95 200 | 58072 | 219.8 | 48,12269 | 0,05 | 27,95 |
| 7 | Khulo | 35 800 | 21838 | 47.1 | 7,50621 | 0,01 | 1,64 |
| 8 | Lanchkhuti | 38 900 | 23729 | 76.0 | 33,60091 | 0,03 | 7,97 |
| 9 | Ozurgeti | 78 400 | 47824 | 144.4 | 29,0251 | 0,03 | 13,88 |
| 10 | Chokhatauri | 23 000 | 14030 | 29.2 | 5,62186 | 0,01 | 0,79 |
| 11 | Kutaisi | 194 700 | 118 767 | 2746.9 | 6441,307 | 6,44 | 7650,15 |
| 12 | Baghdati | 28 800 | 17568 | 35.9 | 4,67974 | 0,00 | 0,82 |
| 13 | Vani | 33 800 | 20618 | 61.9 | 28,59669 | 0,03 | 5,9 |
| 14 | Zestaponi | 75 700 | 46177 | 180.2 | 51,05184 | 0,05 | 23,57 |
| 15 | Terjola | 45 100 | 27511 | 127.4 | 69,2251 | 0,07 | 19,04 |
| 16 | Samtredia | 60 700 | 37027 | 166.0 | 65,54155 | 0,07 | 24,27 |
| 17 | Sachkhere | 47 700 | 29097 | 48.1 | -5,05916 | -0,01 | -1,47 |
| 18 | Tkibuli | 30 100 | 18361 | 65.0 | 42,01476 | 0,04 | 7,71 |
| 19 | Tskhaltubo | 73 800 | 45018 | 116.9 | 18,48122 | 0,02 | 8,32 |
| 20 | Chiatura | 55 200 | 33672 | 184.0 | 90,02037 | 0,09 | 30,31 |
| 21 | Kharagauli | 27 500 | 16775 | 30.5 | -0,94079 | 0,00 | -0,16 |
| 22 | Khoni | 31 400 | 19154 | 74.1 | 50,21036 | 0,05 | 9,62 |
| 23 | Akhmeta | 42 200 | 25742 | 18.9 | -27,9818 | -0,03 | -7,2 |
| 24 | Gurjaani | 69 900 | 42639 | 85.8 | 3,90028 | 0,00 | 1,66 |
| 25 | Dedoplis Tskaro | 30 600 | 18666 | 12.2 | -29,9928 | -0,03 | -5,6 |
| 26 | Telavi | 71 000 | 43 310 | 84.4 | 4297,418 | 4,30 | 1861,21 |
| 27 | Lagodekhi | 51 900 | 31659 | 57.4 | -1,0683 | 0,00 | -0,34 |
| 28 | Sagarejo | 59 800 | 36478 | 39.7 | -19,1479 | -0,02 | -6,98 |
| 29 | Sighnaghi | 43 600 | 26596 | 34.8 | -13,6562 | -0,01 | -3,63 |
| 30 | Kvareli | 37 200 | 22692 | 37.7 | -4,85243 | 0,00 | -1,1 |
| 31 | Dusheti | 34 000 | 20740 | 11.3 | -32,7058 | -0,03 | -6,78 |
| 32 | Tianeti | 13 100 | 7991 | 15.5 | 2,09018 | 0,00 | 0,17 |
| 33 | Mtskheta | 57 300 | 34953 | 90.1 | 18,00745 | 0,02 | 6,29 |
| 34 | Kazbegi | 4 900 | 2989 | 4,9 | -5,4021 | -0,01 | -0,16 |
| 35 | Ambrolauri | 14 300 | 8723 | 16.3 | 0,31753 | 0,00 | 0,03 |
| 36 | Lentekhi | 9 000 | 5490 | 6.7 | -15,8531 | -0,02 | -0,87 |
| 37 | Oni | 8 400 | 5124 | 5.4 | -20,0076 | -0,02 | -1,03 |
| 38 | Tsageri | 15 600 | 9516 | 22.0 | 11,37548 | 0,01 | 1,08 |
| 39 | Poti | 47 800 | 29158 | 716.6 | 566,7905 | 0,57 | 165,26 |
| 40 | Abasha | 27 800 | 16958 | 89.0 | 84,6265 | 0,08 | 14,35 |
| 41 | Zugdidi | 176 600 | 107 726 | 346.9 | 4517,744 | 4,52 | 4866,78 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 42 | Martvili | 44 900 | 27389 | 50.7 | -0,1194 | 0,00 | -0,03 |
| 43 | Mestia | 14 600 | 8906 | 4.7 | -33,1325 | -0,03 | -2,95 |
| 44 | Senaki | 52 500 | 32025 | 100.1 | 31,67634 | 0,03 | 10,14 |
| 45 | Chkhorotsku | 30 600 | 18666 | 48.6 | 18,65398 | 0,02 | 3,48 |
| 46 | Tsalenjikha | 40 700 | 24827 | 62.1 | 16,10061 | 0,02 | 4 |
| 47 | Khobi | 41 600 | 25376 | 62.6 | 15,24218 | 0,02 | 3,87 |
| 48 | Adigeni | 20 700 | 12627 | 25.9 | 4,87113 | 0,00 | 0,62 |
| 49 | Aspindza | 13 000 | 7930 | 15.8 | 3,40613 | 0,00 | 0,27 |
| 50 | Akhalqalaqi | 64 400 | 39284 | 49.4 | -14,9274 | -0,01 | -5,86 |
| 51 | Akhaltsikhe | 48 200 | 29402 | 63.9 | 7,91858 | 0,01 | 2,33 |
| 52 | Borjomi | 31 800 | 19398 | 27.2 | -11,3178 | -0,01 | -2,2 |
| 53 | Ninotsminda | 34 700 | 21167 | 25.3 | -16,4804 | -0,02 | -3,49 |
| 54 | Rustavi | 120 800 | 73688 | 1920.5 | 603,864 | 0,60 | 444,98 |
| 55 | Bolnisi | 78 300 | 47763 | 92.4 | 1,9622 | 0,00 | 0,94 |
| 56 | Gardabani | 98 700 | 60207 | 87.7 | -9,95984 | -0,01 | -6 |
| 57 | Dmanisi | 28 800 | 17568 | 23.4 | -13,07 | -0,01 | -2,3 |
| 58 | Tetri Tskaro | 28 000 | 17080 | 21.6 | -14,7496 | -0,01 | -2,52 |
| 59 | Marneuli | 128 100 | 78141 | 126.4 | -5,94482 | -0,01 | -4,65 |
| 60 | Tsalka | 23 000 | 14030 | 19.8 | -11,0919 | -0,01 | -1,56 |
| 61 | Gori | 145 300 | 88 633 | 146.7 | 2759,079 | 2,76 | 2445,45 |
| 62 | Kaspi | 52 900 | 32269 | 65.0 | 3,95203 | 0,00 | 1,28 |
| 63 | Kareli | 52 300 | 31903 | 46.2 | -10,1719 | -0,01 | -3,25 |
| 64 | Khashuri | 62 500 | 38125 | 107.1 | 23,78082 | 0,02 | 9,07 |
| | | | | | | | 70590 |

**Table 34 National Estimation by Prevalence Rate Coefficient in 2011**

| N | Cities | Total Population | Population 18-64 | Rank | Prevalence Coefficient | Prevalence per 100 000 | Prevalence % | Estimated Number |
|---|---|---|---|---|---|---|---|---|
| 1 | Tbilisi | 1 162 400 | 709 064 | H | 5,0 | 5799,228 | 5,80 | 41120,24 |
| 2 | Batumi | 124 300 | 75823 | VH | 8,0 | 7187,955 | 7,19 | 5450,12 |
| 3 | Keda | 20 400 | 12444 | VL | 0,5 | -119,993 | -0,12 | -14,93 |
| 4 | Kobuleti | 92 100 | 56181 | L | 1,0 | -176,788 | -0,18 | -99,32 |
| 5 | Shuakhevi | 22 800 | 13908 | VL | 0,5 | -283,53 | -0,28 | -39,43 |
| 6 | Khelvachauri | 95 200 | 58072 | VL | 0,5 | -452,672 | -0,45 | -262,88 |
| 7 | Khulo | 35 800 | 21838 | VL | 0,5 | -312,312 | -0,31 | -68,2 |
| 8 | Lanchkhuti | 38 900 | 23729 | VL | 0,5 | -241,589 | -0,24 | -57,33 |
| 9 | Ozurgeti | 78 400 | 47824 | M | 2,0 | 2202,275 | 2,20 | 1053,22 |
| 10 | Chokhatauri | 23 000 | 14030 | VL | 0,5 | -16,5818 | -0,02 | -2,33 |
| 11 | Kutaisi | 194 700 | 118 767 | VH | 8,0 | 5615,035 | 5,62 | 6668,81 |
| 12 | Baghdati | 28 800 | 17568 | VL | 0,5 | -127,444 | -0,13 | -22,39 |
| 13 | Vani | 33 800 | 20618 | VL | 0,5 | -166,288 | -0,17 | -34,29 |
| 14 | Zestaponi | 75 700 | 46177 | VL | 0,5 | -130,86 | -0,13 | -60,43 |
| 15 | Terjola | 45 100 | 27511 | VL | 0,5 | -345,218 | -0,35 | -94,97 |
| 16 | Samtredia | 60 700 | 37027 | L | 1,0 | 1302,191 | 1,30 | 482,16 |
| 17 | Sachkhere | 47 700 | 29097 | VL | 0,5 | -264,52 | -0,26 | -76,97 |
| 18 | Tkibuli | 30 100 | 18361 | VL | 0,5 | -117,022 | -0,12 | -21,49 |
| 19 | Tskhaltubo | 73 800 | 45018 | VL | 0,5 | -35,6655 | -0,04 | -16,06 |
| 20 | Chiatura | 55 200 | 33672 | VL | 0,5 | 221,2611 | 0,22 | 74,5 |
| 21 | Kharagauli | 27 500 | 16775 | VL | 0,5 | -267,611 | -0,27 | -44,89 |
| 22 | Khoni | 31 400 | 19154 | VL | 0,5 | 33,49483 | 0,03 | 6,42 |
| 23 | Akhmeta | 42 200 | 25742 | VL | 0,5 | 26,6323 | 0,03 | 6,86 |
| 24 | Gurjaani | 69 900 | 42639 | VL | 0,5 | 863,3535 | 0,86 | 368,13 |
| 25 | Dedoplis Tskaro | 30 600 | 18666 | VL | 0,5 | -240,091 | -0,24 | -44,82 |
| 26 | Telavi | 71 000 | 43 310 | VH | 8,0 | 5041,185 | 5,04 | 2183,34 |
| 27 | Lagodekhi | 51 900 | 31659 | VL | 0,5 | -271,948 | -0,27 | -86,1 |
| 28 | Sagarejo | 59 800 | 36478 | L | 1,0 | -173,224 | -0,17 | -63,19 |
| 29 | Sighnaghi | 43 600 | 26596 | VL | 0,5 | -296,979 | -0,30 | -78,98 |
| 30 | Kvareli | 37 200 | 22692 | VL | 0,5 | -131,53 | -0,13 | -29,85 |
| 31 | Dusheti | 34 000 | 20740 | VL | 0,5 | -168,646 | -0,17 | -34,98 |
| 32 | Tianeti | 13 100 | 7991 | VL | 0,5 | 264,2899 | 0,26 | 21,12 |
| 33 | Mtskheta | 57 300 | 34953 | L | 1,0 | 91,14086 | 0,09 | 31,86 |
| 34 | Kazbegi | 4 900 | 2989 | VL | 0,5 | 1113,579 | 1,11 | 33,28 |
| 35 | Ambrolauri | 14 300 | 8723 | VL | 0,5 | 194,5252 | 0,19 | 16,97 |
| 36 | Lentekhi | 9 000 | 5490 | VL | 0,5 | 839,7364 | 0,84 | 46,1 |
| 37 | Oni | 8 400 | 5124 | VL | 0,5 | 518,6905 | 0,52 | 26,58 |
| 38 | Tsageri | 15 600 | 9516 | VL | 0,5 | -39,1754 | -0,04 | -3,73 |
| 39 | Poti | 47 800 | 29158 | M | 2,0 | 3568,811 | 3,57 | 1040,59 |
| 40 | Abasha | 27 800 | 16958 | VL | 0,5 | -79,7881 | -0,08 | -13,53 |
| 41 | Zugdidi | 176 600 | 107 726 | H | 5,o | 4214,986 | 4,21 | 4540,64 |
| 42 | Martvili | 44 900 | 27389 | VL | 0,5 | -344,23 | -0,34 | -94,28 |
| 43 | Mestia | 14 600 | 8906 | VL | 0,5 | 57,61327 | 0,06 | 5,13 |
| 44 | Senaki | 52 500 | 32025 | VL | 0,5 | -22,4017 | -0,02 | -7,17 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 45 | Chkhorotsku | 30 600 | 18666 | VL | 0,5 | -182,234 | -0,18 | -34,02 |
| 46 | Tsalenjikha | 40 700 | 24827 | VL | 0,5 | -16,7362 | -0,02 | -4,16 |
| 47 | Khobi | 41 600 | 25376 | VL | 0,5 | -135,039 | -0,14 | -34,27 |
| 48 | Adigeni | 20 700 | 12627 | VL | 0,5 | -212,001 | -0,21 | -26,77 |
| 49 | Aspindza | 13 000 | 7930 | VL | 0,5 | -69,7834 | -0,07 | -5,53 |
| 50 | Akhalqalaqi | 64 400 | 39284 | VL | 0,5 | -466,688 | -0,47 | -183,33 |
| 51 | Akhaltsikhe | 48 200 | 29402 | VL | 0,5 | 25,9747 | 0,03 | 7,64 |
| 52 | Borjomi | 31 800 | 19398 | VL | 0,5 | 588,4452 | 0,59 | 114,15 |
| 53 | Ninotsminda | 34 700 | 21167 | VL | 0,5 | -355,257 | -0,36 | -75,2 |
| 54 | Rustavi | 120 800 | 73688 | M | 2,0 | 1639,897 | 1,64 | 1208,41 |
| 55 | Bolnisi | 78 300 | 47763 | VL | 0,5 | -360,148 | -0,36 | -172,02 |
| 56 | Gardabani | 98 700 | 60207 | VL | 0,5 | -384,979 | -0,38 | -231,78 |
| 57 | Dmanisi | 28 800 | 17568 | VL | 0,5 | -219,655 | -0,22 | -38,59 |
| 58 | Tetri Tskaro | 28 000 | 17080 | VL | 0,5 | -178,113 | -0,18 | -30,42 |
| 59 | Marneuli | 128 100 | 78141 | VL | 0,5 | -189,821 | -0,19 | -148,33 |
| 60 | Tsalka | 23 000 | 14030 | VL | 0,5 | -247,508 | -0,25 | -34,73 |
| 61 | Gori | 145 300 | 88 633 | M | 2,0 | 2431,728 | 2,43 | 2155,31 |
| 62 | Kaspi | 52 900 | 32269 | VL | 0,5 | -327,728 | -0,33 | -105,75 |
| 63 | Kareli | 52 300 | 31903 | VL | 0,5 | -240,354 | -0,24 | -76,68 |
| 64 | Khashuri | 62 500 | 38125 | VL | 0,5 | 3,75892 | 0,00 | 1,43 |
| | | | | | | | | 64089 |

**Figure 14 Regression line indicating relationship between factor scores and population standardized anchor point estimates (by Prevalence Rate Coefficient in 2011)**

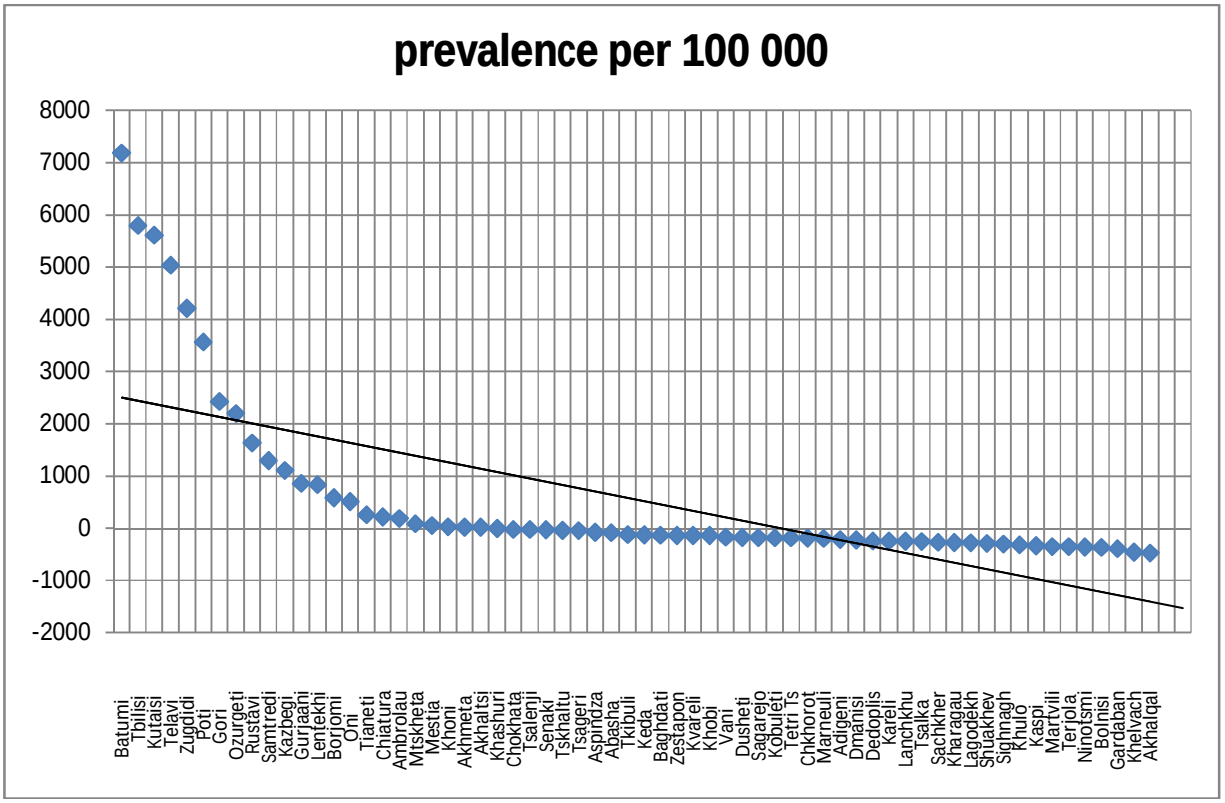


Table 35 National prevalence estimation in 2007 and 2011

| Estimation Method | 2007 | | 2011 | |
|---|---|---|---|---|
| | Prevalence (%) | estimated number of IDUs | Prevalence (%) | estimated number of IDUs |
| Estimation method N 1, using demographic indicator (population density) | **1,46** | **39 152** | **2,59** | **70 590** |
| Estimation method N 2, using prevalence rate coefficients | **1,53** | **41 062** | **2,35** | **64 089** |

## THE SECOND SCENARIO - IDU Size Estimation with re-calculated benchmark data from the low threshold services

The first scenario presented above uses exactly the same methodology that was applied during the first round of the size estimation exercise conducted in 2008-2009. It should be mentioned that during the previous study the data registration system for low threshold services collected only outreach coverage information and did not allow separation of the primary and secondary clients. Since 2010, the data registration system of the low threshold agencies significantly improved and gives the opportunity to disaggregate the numbers of newly contacted and secondary clients. Consequently, in order to avoid obvious overestimation, researches reached the decision to filter the database of the low threshold services and only numbers of newly approached IDU clients use as benchmarks. The multipliers remain the same (see above). Unfortunately, it is impossible to compare the results of the second scenario with the figures obtained during the first round of the size estimation exercise in 2008-2009.

Table 36 below represents number of newly registered IDU clients by the low threshold services in 2011.

Table 36 # of new IDU clients in the low threshold services in 2011

| City | # of new IDU clients |
|---|---|
| **Tbilisi** | 2488 |
| **Gori** | 159 |
| **Telavi** | 486 |
| **Zugdidi** | 400 |
| **Batumi** | 428 |
| **Kutaisi** | 660 |
| ***Grand Total*** | ***4621*** |

### 1. Re-calculation of the Size of IDU Population in 6 selected cities

Re-calculation of the estimated size of the IDU population in the surveyed cities revealed these figures (mean estimates):

Table 37 Estimates of the number of IDUs in 6 cities in 2011 (second scenario)

| City | Estimated size | 95% CI | |
|---|---|---|---|
| **Tbilisi** | **34373** | 26747 | 45558 |
| **Gori** | **901** | 778 | 1055 |
| **Telavi** | **2392** | 1887 | 3101 |
| **Zugdidi** | **3919** | 3187 | 4923 |
| **Batumi** | **2981** | 2341 | 3905 |
| **Kutaisi** | **6810** | 5194 | 9266 |

Table 38 -Table 44 provide the multiplier estimates of IDUs in 6 cities across the country derived from different sources, with re-calculated benchmark data from the low threshold services, together with the mean and median of the estimates in 2011.

Table 38 Estimates of the number of IDUs in Tbilisi in 2011 (second scenario)

| Tbilisi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 4111 | 3.41 | 3.13 | 3.74 | 14019 | 12867 | 15389 |
| **HIV testing data** | 2813 | 12.61 | 10.44 | 15.43 | 35472 | 29363 | 43411 |
| **Treatment data** | 935 | 15.1 | 12.27 | 18.87 | 14119 | 11472 | 17642 |
| **Methadone substitution data** | 1411 | 12.61 | 10.44 | 15.43 | 17793 | 14727 | 21775 |
| **Low Threshold Programs data** | 2488 | 36.36 | 26.25 | 52.08 | 90464 | 65302 | 129583 |
| | | | | ***Mean*** | ***34373*** | ***26747*** | ***45558*** |
| | | | | ***Median*** | ***17793*** | ***14727*** | ***21775*** |

Table 39 Estimates of the number of IDUs in Gori in 2011 (second scenario)

| Gori | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 152 | 5.49 | 4.83 | 6.29 | 835 | 734 | 957 |
| **HIV testing data** | 186 | 4.37 | 3.91 | 4.92 | 813 | 727 | 915 |
| **Methadone substitution data** | 70 | 11.47 | 9.43 | 14.14 | 803 | 660 | 990 |
| **Low Threshold Programs data** | 159 | 7.26 | 6.24 | 8.53 | 1154 | 992 | 1357 |
| | | | | ***Mean*** | ***901*** | ***778*** | ***1055*** |
| | | | | ***Median*** | ***824*** | ***697*** | ***973*** |

Table 40 Estimates of the number of IDUs in Telavi in 2011 (second scenario)

| Telavi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 223 | 4.67 | 4.11 | 5.35 | 1042 | 917 | 1194 |
| **HIV testing data** | 41 | 9.87 | 8.10 | 12.21 | 405 | 332 | 501 |
| **Methadone substitution data** | 30 | 11.48 | 9.26 | 14.47 | 344 | 278 | 434 |
| **Low Threshold Programs data** | 486 | 16.0 | 12.39 | 21.14 | 7776 | 6022 | 10275 |
| | | | | ***Mean*** | ***2392*** | ***1887*** | ***3101*** |
| | | | | ***Median*** | ***724*** | ***624*** | ***848*** |

Table 41 Estimates of the number of IDUs in Zugdidi in 2011 (second scenario)

| Zugdidi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 638 | 4.97 | 4.43 | 5.61 | 3168 | 2824 | 3576 |
| **HIV testing data** | 317 | 7.80 | 6.71 | 9.14 | 2472 | 2128 | 2898 |
| **Methadone substitution data** | 95 | 12.70 | 10.44 | 15.65 | 1206 | 992 | 1487 |
| **Low Threshold Programs data** | 400 | 22.08 | 17.01 | 29.33 | 8831 | 6803 | 11730 |
| | | | | ***Mean*** | ***3919*** | ***3187*** | ***4923*** |
| | | | | ***Median*** | ***2820*** | ***2476*** | ***3237*** |

Table 42 Estimates of the number of IDUs in Batumi in 2011 (second scenario)

| Batumi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 389 | 4.0 | 3.59 | 4.49 | 1557 | 1396 | 1748 |
| **HIV testing data** | 357 | 5.12 | 4.5 | 5.85 | 1826 | 1607 | 2090 |
| **Treatment data** | 26 | 9.98 | 8.27 | 12.2 | 259 | 215 | 317 |
| **Methadone substitution data** | 145 | 7.0 | 6.0 | 8.24 | 1015 | 870 | 1195 |
| **Low Threshold Programs data** | 428 | 23.94 | 17.79 | 33.11 | 10246 | 7616 | 14172 |
| | | | | ***Mean*** | ***2981*** | ***2341*** | ***3905*** |
| | | | | ***Median*** | ***1557*** | ***1396*** | ***1748*** |

Table 43 Estimates of the number of IDUs in Kutaisi in 2011 (second scenario)

| Kutaisi | Benchmark | Multiplier | 95% CI | | Estimated size | 95% CI | |
|---|---|---|---|---|---|---|---|
| **Police data** | 1179 | 3.66 | 3.29 | 4.10 | 4312 | 3873 | 4834 |
| **HIV testing data** | 327 | 8.26 | 6.92 | 9.98 | 2700 | 2263 | 3263 |
| **Methadone substitution data** | 152 | 11.72 | 9.46 | 14.77 | 1782 | 1438 | 2245 |
| **Low Threshold Programs data** | 660 | 27.95 | 20.0 | 40.49 | 18446 | 13200 | 26721 |
| | | | | ***Mean*** | **6810** | **5194** | **9266** |
| | | | | ***Median*** | **3506** | **3068** | **4049** |

## 2. Estimation of the prevalence of injection drug use with re-calculated benchmark data from the low threshold services

Calculation of the IDU prevalence estimation (with re-calculated benchmark data from the low threshold services) in the surveyed cities revealed these figures (mean estimates):

Table 44 IDU prevalence estimates in 6 cities in 2011

| City | IDU prevalence estimates | 95% CI | |
|---|---|---|---|
| **Tbilisi** | **4.85** | **3.77** | **6.43** |
| **Gori** | **1.02** | **0.88** | **1.19** |

| | | | |
|---|---|---|---|
| **Telavi** | **5.52** | **4.36** | **7.16** |
| **Zugdidi** | **3.64** | **2.96** | **4.57** |
| **Batumi** | **3.93** | **3.09** | **5.15** |
| **Kutaisi** | **5.73** | **4.37** | **7.8** |

Table 45Table 50below present the IDU prevalence estimation (%) in 6 cities across the country derived from different sources, with re-calculated benchmark data from the low threshold services, together with the mean and median of the estimates.

**Table 45 Estimated Prevalence Rates in Tbilisi in 2011**

| Tbilisi | Adult population (18-64) | 709064 | |
|---|---|---|---|
| | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 1.98 | 1.94 | 2.01 |
| **HIV testing data** | 5.0 | 4.94 | 5.06 |
| **Treatment data** | 1.99 | 1.95 | 2.03 |
| **Methadone substitution data** | 2.51 | 1.47 | 2.55 |
| **Low Threshold Programs data** | 5.37 | 3.88 | 7.70 |
| ***Mean*** | ***4.85*** | ***3.77*** | ***6.43*** |
| ***Median*** | ***2.51*** | ***1.47*** | ***2.55*** |

**Table 46 Estimated Prevalence Rates in Gori in 2011**

| Gori | Adult population (18-64) | 88633 | |
|---|---|---|---|
| | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 0.94 | 0.87 | 1.02 |
| **HIV testing data** | 0.92 | 0.85 | 0.99 |
| **Methadone substitution data** | 0.91 | 0.84 | 0.98 |
| **Low Threshold Programs data** | 3.96 | 3.82 | 4.11 |
| ***Mean*** | ***1.02*** | ***0.88*** | ***1.19*** |
| ***Median*** | ***0.93*** | ***0.86*** | ***1.01*** |

**Table 47 Estimated Prevalence Rates in Telavi in 2011**

| Telavi | Adult population (18-64) | 43 310 | |
|---|---|---|---|
| | Prevalence of IDU (%) | 95% CI | |
| **Police data** | 2.41 | 2.24 | 2.58 |
| **HIV testing data** | 0.94 | 0.84 | 1.04 |
| **Methadone substitution data** | 0.79 | 0.7 | 0.89 |
| **Low Threshold Programs data** | 13.63 | 10.56 | 18.01 |
| ***Mean*** | ***5.52*** | ***4.36*** | ***7.16*** |
| ***Median*** | ***1.67*** | ***1.54*** | ***1.81*** |

Table 48 Estimated Prevalence Rates in Zugdidi in 2011

| Zugdidi | Adult population (18-64) | 107726 | |
|---|---|---|---|
| | Prevalence of IDU (%) | 95% CI | |
| Police data | 2.94 | 2.83 | 3.06 |
| HIV testing data | 2.29 | 2.19 | 2.4 |
| Methadone substitution data | 1.12 | 1.05 | 1.19 |
| Low Threshold Programs data | 14.12 | 10.88 | 18.76 |
| *Mean* | ***3.64*** | ***2.96*** | ***4.57*** |
| *Median* | ***2.62*** | ***2.51*** | ***2.73*** |

Table 49 Estimated Prevalence Rates in Batumi

| Batumi | Adult population (18-64) | 75823 | |
|---|---|---|---|
| | Prevalence of IDU (%) | 95% CI | |
| Police data | 2.05 | 1.94 | 2.17 |
| HIV testing data | 2.41 | 2.29 | 2.54 |
| Treatment data | 0.34 | 0.3 | 0.39 |
| Methadone substitution data | 1.34 | 1.25 | 1.43 |
| Low Threshold Programs data | 18.66 | 13.87 | 25.81 |
| *Mean* | ***3.93*** | ***3.09*** | ***5.15*** |
| *Median* | ***2.05*** | ***1.94*** | ***2.17*** |

Table 50 Estimated Prevalence Rates in Kutaisi in 2011

| Kutaisi | Adult population (18-64) | 118763 | |
|---|---|---|---|
| | Prevalence of IDU (%) | 95% CI | |
| Police data | 3.63 | 3.51 | 3.75 |
| HIV testing data | 2.27 | 2.18 | 2.37 |
| Methadone substitution data | 1.50 | 1.42 | 1.58 |
| Low Threshold Programs data | 15.30 | 10.95 | 22.16 |
| *Mean* | ***5.73*** | ***4.37*** | ***7.8*** |
| *Median* | ***2.95*** | ***2.85*** | ***3.06*** |

## 3. Results of the national prevalence estimation with re-calculated benchmark data from the low threshold services

Re-calculation of the IDU prevalence estimation nationwide revealed these figures: estimation method N 1, using demographic indicator (population density) – **1,66% (estimated number of IDUs equals 45391)** estimation method N 2, using prevalence rate coefficients - **1,67% (Number of IDUs – 45457).**

Table 51Table 52 below present the national IDU prevalence estimation (%) produced by 2 different indicators:

Table 51 National Estimation by Population Density in 2011

| N | Cities | Total Population | Population 18-64 | Density of the Population per 1 sq.km | Prevalence per 100 000 | Prevalence % | Estimated Number |
|---|---|---|---|---|---|---|---|
| 1 | Tbilisi | 1 162 400 | 709 064 | 4425.8 | 3994.97 | 3.99 | 28327 |
| 2 | Batumi | 124 300 | 75823 | 7293.8 | 5691.61 | 5.69 | 4316 |
| 3 | Keda | 20 400 | 12444 | 44.3 | -57.04 | -0.06 | -7 |
| 4 | Kobuleti | 92 100 | 56181 | 122.3 | -6.84 | -0.01 | -4 |
| 5 | Shuakhevi | 22 800 | 13908 | 37.2 | -158.18 | -0.16 | -22 |
| 6 | Khelvachauri | 95 200 | 58072 | 219.8 | -106.59 | -0.11 | -62 |
| 7 | Khulo | 35 800 | 21838 | 47.1 | -120.47 | -0.12 | -26 |
| 8 | Lanchkhuti | 38 900 | 23729 | 76.0 | -45.24 | -0.05 | -11 |
| 9 | Ozurgeti | 78 400 | 47824 | 144.4 | 1405.75 | 1.41 | 672 |
| 10 | Chokhatauri | 23 000 | 14030 | 29.2 | 3.87 | 0.00 | 1 |
| 11 | Kutaisi | 194 700 | 118 767 | 2746.9 | 3673.48 | 3.67 | 4363 |
| 12 | Baghdati | 28 800 | 17568 | 35.9 | -31.83 | -0.03 | -6 |
| 13 | Vani | 33 800 | 20618 | 61.9 | -16.78 | -0.02 | -3 |
| 14 | Zestaponi | 75 700 | 46177 | 180.2 | 91.82 | 0.09 | 42 |
| 15 | Terjola | 45 100 | 27511 | 127.4 | -69.47 | -0.07 | -19 |
| 16 | Samtredia | 60 700 | 37027 | 166.0 | 600.75 | 0.60 | 222 |
| 17 | Sachkhere | 47 700 | 29097 | 48.1 | -70.46 | -0.07 | -21 |
| 18 | Tkibuli | 30 100 | 18361 | 65.0 | 10.30 | 0.01 | 2 |
| 19 | Tskhaltubo | 73 800 | 45018 | 116.9 | 126.31 | 0.13 | 57 |
| 20 | Chiatura | 55 200 | 33672 | 184.0 | 320.11 | 0.32 | 108 |
| 21 | Kharagauli | 27 500 | 16775 | 30.5 | -133.39 | -0.13 | -22 |
| 22 | Khoni | 31 400 | 19154 | 74.1 | 119.44 | 0.12 | 23 |
| 23 | Akhmeta | 42 200 | 25742 | 18.9 | 87.89 | 0.09 | 23 |
| 24 | Gurjaani | 69 900 | 42639 | 85.8 | 668.30 | 0.67 | 285 |
| 25 | Dedoplis Tskaro | 30 600 | 18666 | 12.2 | -123.00 | -0.12 | -23 |
| 26 | Telavi | 71 000 | 43 310 | 84.4 | 2500.20 | 2.50 | 1083 |
| 27 | Lagodekhi | 51 900 | 31659 | 57.4 | -65.06 | -0.07 | -21 |
| 28 | Sagarejo | 59 800 | 36478 | 39.7 | -74.62 | -0.07 | -27 |
| 29 | Sighnaghi | 43 600 | 26596 | 34.8 | -106.30 | -0.11 | -28 |
| 30 | Kvareli | 37 200 | 22692 | 37.7 | -9.24 | -0.01 | -2 |
| 31 | Dusheti | 34 000 | 20740 | 11.3 | -65.46 | -0.07 | -14 |
| 32 | Tianeti | 13 100 | 7991 | 15.5 | 45.23 | 0.05 | 4 |
| 33 | Mtskheta | 57 300 | 34953 | 90.1 | 118.69 | 0.12 | 41 |
| 34 | Kazbegi | 4 900 | 2989 | 4,9 | 54.49 | 0.05 | 2 |
| 35 | Ambrolauri | 14 300 | 8723 | 16.3 | 25.57 | 0.03 | 2 |
| 36 | Lentekhi | 9 000 | 5490 | 6.7 | 257.18 | 0.26 | 14 |
| 37 | Oni | 8 400 | 5124 | 5.4 | 13.97 | 0.01 | 1 |
| 38 | Tsageri | 15 600 | 9516 | 22.0 | -92.12 | -0.09 | -9 |
| 39 | Poti | 47 800 | 29158 | 716.6 | 2547.56 | 2.55 | 743 |
| 40 | Abasha | 27 800 | 16958 | 89.0 | 56.13 | 0.06 | 10 |
| 41 | Zugdidi | 176 600 | 107 726 | 346.9 | 2459.46 | 2.46 | 2649 |
| 42 | Martvili | 44 900 | 27389 | 50.7 | -123.41 | -0.12 | -34 |
| 43 | Mestia | 14 600 | 8906 | 4.7 | -82.80 | -0.08 | -7 |
| 44 | Senaki | 52 500 | 32025 | 100.1 | 122.26 | 0.12 | 39 |
| 45 | Chkhorotsku | 30 600 | 18666 | 48.6 | -47.71 | -0.05 | -9 |
| 46 | Tsalenjikha | 40 700 | 24827 | 62.1 | 90.74 | 0.09 | 23 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 47 | Khobi | 41 600 | 25376 | 62.6 | 16.04 | 0.02 | 4 |
| 48 | Adigeni | 20 700 | 12627 | 25.9 | -142.78 | -0.14 | -18 |
| 49 | Aspindza | 13 000 | 7930 | 15.8 | -171.48 | -0.17 | -14 |
| 50 | Akhalqalaqi | 64 400 | 39284 | 49.4 | -185.80 | -0.19 | -73 |
| 51 | Akhaltsikhe | 48 200 | 29402 | 63.9 | 119.58 | 0.12 | 35 |
| 52 | Borjomi | 31 800 | 19398 | 27.2 | 419.66 | 0.42 | 81 |
| 53 | Ninotsminda | 34 700 | 21167 | 25.3 | -170.58 | -0.17 | -36 |
| 54 | Rustavi | 120 800 | 73688 | 1920.5 | 1708.68 | 1.71 | 1259 |
| 55 | Bolnisi | 78 300 | 47763 | 92.4 | -92.46 | -0.09 | -44 |
| 56 | Gardabani | 98 700 | 60207 | 87.7 | -106.78 | -0.11 | -64 |
| 57 | Dmanisi | 28 800 | 17568 | 23.4 | -105.12 | -0.11 | -18 |
| 58 | Tetri Tskaro | 28 000 | 17080 | 21.6 | -83.79 | -0.08 | -14 |
| 59 | Marneuli | 128 100 | 78141 | 126.4 | 27.78 | 0.03 | 22 |
| 60 | Tsalka | 23 000 | 14030 | 19.8 | -158.00 | -0.16 | -22 |
| 61 | Gori | 145 300 | 88 633 | 146.7 | 1818.85 | 1.82 | 1612 |
| 62 | Kaspi | 52 900 | 32269 | 65.0 | -95.57 | -0.10 | -31 |
| 63 | Kareli | 52 300 | 31903 | 46.2 | -51.19 | -0.05 | -16 |
| 64 | Khashuri | 62 500 | 38125 | 107.1 | 145.65 | 0.15 | 56 |
| | | | | | | | 45391 |

**Table 52 National Estimation by Prevalence Rate Coefficient in 2011**

| N | Cities | Total Population | Population 18-64 | Rank | Prevalence Coefficient | Prevalence per 100 000 | Prevalence % | Estimated Number |
|---|---|---|---|---|---|---|---|---|
| 1 | Tbilisi | 1 162 400 | 709 064 | H | 4,0 | 4196.23 | 4.20 | 29754 |
| 2 | Batumi | 124 300 | 75823 | VH | 6,0 | 4737.37 | 4.74 | 3592 |
| 3 | Keda | 20 400 | 12444 | VL | 0,5 | -80.10 | -0.08 | -10 |
| 4 | Kobuleti | 92 100 | 56181 | L | 1,0 | -125.81 | -0.13 | -71 |
| 5 | Shuakhevi | 22 800 | 13908 | VL | 0,5 | -194.34 | -0.19 | -27 |
| 6 | Khelvachauri | 95 200 | 58072 | VL | 0,5 | -319.13 | -0.32 | -185 |
| 7 | Khulo | 35 800 | 21838 | VL | 0,5 | -218.00 | -0.22 | -48 |
| 8 | Lanchkhuti | 38 900 | 23729 | VL | 0,5 | -169.65 | -0.17 | -40 |
| 9 | Ozurgeti | 78 400 | 47824 | M | 2,0 | 1554.08 | 1.55 | 743 |
| 10 | Chokhatauri | 23 000 | 14030 | VL | 0,5 | -9.95 | -0.01 | -1 |
| 11 | Kutaisi | 194 700 | 118 767 | VH | 6,0 | 3906.09 | 3.91 | 4639 |
| 12 | Baghdati | 28 800 | 17568 | VL | 0,5 | -88.64 | -0.09 | -16 |
| 13 | Vani | 33 800 | 20618 | VL | 0,5 | -116.70 | -0.12 | -24 |
| 14 | Zestaponi | 75 700 | 46177 | VL | 0,5 | -96.08 | -0.10 | -44 |
| 15 | Terjola | 45 100 | 27511 | VL | 0,5 | -242.11 | -0.24 | -67 |
| 16 | Samtredia | 60 700 | 37027 | L | 1,0 | 624.48 | 0.62 | 231 |
| 17 | Sachkhere | 47 700 | 29097 | VL | 0,5 | -186.62 | -0.19 | -54 |
| 18 | Tkibuli | 30 100 | 18361 | VL | 0,5 | -81.79 | -0.08 | -15 |
| 19 | Tskhaltubo | 73 800 | 45018 | VL | 0,5 | -30.22 | -0.03 | -14 |
| 20 | Chiatura | 55 200 | 33672 | VL | 0,5 | 159.22 | 0.16 | 54 |
| 21 | Kharagauli | 27 500 | 16775 | VL | 0,5 | -185.12 | -0.19 | -31 |
| 22 | Khoni | 31 400 | 19154 | VL | 0,5 | 21.91 | 0.02 | 4 |
| 23 | Akhmeta | 42 200 | 25742 | VL | 0,5 | 15.24 | 0.02 | 4 |
| 24 | Gurjaani | 69 900 | 42639 | VL | 0,5 | 619.81 | 0.62 | 264 |
| 25 | Dedoplis | 30 600 | 18666 | VL | 0,5 | -166.97 | -0.17 | -31 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tskaro | | | | | | | |
| 26 | Telavi | 71 000 | 43 310 | VH | 6,0 | 3863.14 | 3.86 | 1673 |
| 27 | Lagodekhi | 51 900 | 31659 | VL | 0,5 | -192.16 | -0.19 | -61 |
| 28 | Sagarejo | 59 800 | 36478 | L | 1,0 | -120.58 | -0.12 | -44 |
| 29 | Sighnaghi | 43 600 | 26596 | VL | 0,5 | -208.59 | -0.21 | -55 |
| 30 | Kvareli | 37 200 | 22692 | VL | 0,5 | -93.31 | -0.09 | -21 |
| 31 | Dusheti | 34 000 | 20740 | VL | 0,5 | -118.37 | -0.12 | -25 |
| 32 | Tianeti | 13 100 | 7991 | VL | 0,5 | 191.94 | 0.19 | 15 |
| 33 | Mtskheta | 57 300 | 34953 | L | 1,0 | 62.47 | 0.06 | 22 |
| 34 | Kazbegi | 4 900 | 2989 | VL | 0,5 | 809.10 | 0.81 | 24 |
| 35 | Ambrolauri | 14 300 | 8723 | VL | 0,5 | 142.21 | 0.14 | 12 |
| 36 | Lentekhi | 9 000 | 5490 | VL | 0,5 | 597.85 | 0.60 | 33 |
| 37 | Oni | 8 400 | 5124 | VL | 0,5 | 377.86 | 0.38 | 19 |
| 38 | Tsageri | 15 600 | 9516 | VL | 0,5 | -20.68 | -0.02 | -2 |
| 39 | Poti | 47 800 | 29158 | M | 2,0 | 2534.97 | 2.53 | 739 |
| 40 | Abasha | 27 800 | 16958 | VL | 0,5 | -55.40 | -0.06 | -9 |
| 41 | Zugdidi | 176 600 | 107 726 | H | 4,0 | 2815.42 | 2.82 | 3033 |
| 42 | Martvili | 44 900 | 27389 | VL | 0,5 | -241.40 | -0.24 | -66 |
| 43 | Mestia | 14 600 | 8906 | VL | 0,5 | 47.25 | 0.05 | 4 |
| 44 | Senaki | 52 500 | 32025 | VL | 0,5 | -19.75 | -0.02 | -6 |
| 45 | Chkhorotsku | 30 600 | 18666 | VL | 0,5 | -126.98 | -0.13 | -24 |
| 46 | Tsalenjikha | 40 700 | 24827 | VL | 0,5 | -14.53 | -0.01 | -4 |
| 47 | Khobi | 41 600 | 25376 | VL | 0,5 | -96.41 | -0.10 | -24 |
| 48 | Adigeni | 20 700 | 12627 | VL | 0,5 | -143.86 | -0.14 | -18 |
| 49 | Aspindza | 13 000 | 7930 | VL | 0,5 | -38.80 | -0.04 | -3 |
| 50 | Akhalqalaqi | 64 400 | 39284 | VL | 0,5 | -327.63 | -0.33 | -129 |
| 51 | Akhaltsikhe | 48 200 | 29402 | VL | 0,5 | 24.36 | 0.02 | 7 |
| 52 | Borjomi | 31 800 | 19398 | VL | 0,5 | 419.10 | 0.42 | 81 |
| 53 | Ninotsminda | 34 700 | 21167 | VL | 0,5 | -247.47 | -0.25 | -52 |
| 54 | Rustavi | 120 800 | 73688 | M | 2,0 | 1412.95 | 1.41 | 1041 |
| 55 | Bolnisi | 78 300 | 47763 | VL | 0,5 | -254.65 | -0.25 | -122 |
| 56 | Gardabani | 98 700 | 60207 | VL | 0,5 | -272.43 | -0.27 | -164 |
| 57 | Dmanisi | 28 800 | 17568 | VL | 0,5 | -152.36 | -0.15 | -27 |
| 58 | Tetri Tskaro | 28 000 | 17080 | VL | 0,5 | -123.42 | -0.12 | -21 |
| 59 | Marneuli | 128 100 | 78141 | VL | 0,5 | -133.07 | -0.13 | -104 |
| 60 | Tsalka | 23 000 | 14030 | VL | 0,5 | -169.54 | -0.17 | -24 |
| 61 | Gori | 145 300 | 88 633 | M | 1,0 | 1443.69 | 1.44 | 1280 |
| 62 | Kaspi | 52 900 | 32269 | VL | 0,5 | -230.79 | -0.23 | -74 |
| 63 | Kareli | 52 300 | 31903 | VL | 0,5 | -170.36 | -0.17 | -54 |
| 64 | Khashuri | 62 500 | 38125 | VL | 0,5 | -2.39 | 0.00 | -1 |
| | | | | | | | | 45457 |

## 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 March 2013. Representatives from different local and international organizations, donors, and other professionals active in addiction and HIV/AIDS fields attended this meeting (list of participants attending the consensus meeting see in appendix 2).

The scenarios described below for the estimation and the estimated numbers and prevalence of IDUs in Georgia were discussed and the final consensus estimates were endorsed by the participants of this consensus meeting.

1. **The first scenario** – the same approach that was applied during the first IDU size estimation study.
2. **The second scenario** – IDU Size Estimation with re-calculated benchmark data from the low threshold services using numbers of newly approached IDU clients as benchmarks.
3. **The third scenario** – IDU size estimation using low threshold services benchmark data provided only by the needle exchange services. During analyzing the multiplier data it appeared that the recall rate on the question regarding low threshold services was the lowest. When asking the respondents if their nominated peers used the services provided by the needle exchange and other low-threshold programs (e.g. voluntary counselling and testing on Hepatitis B, C and HIV), most of them had information only about needle exchange service beneficiaries. Therefore, alternative size estimation calculation exercise was undertaken using low threshold services benchmark data provided only by the needle exchange services and the data from other low threshold agencies was extracted.
4. **The fourth scenario** - IDU size estimation using low threshold services benchmark data provided only by the needle exchange services and recalculated multipliers based on the responses of only those respondents who are aware of the syringe exchange program. In this case, the benchmarks are the same as presented in the third scenario; another approach was used in determining the multipliers – the database estimating the value of multiplier was filtered extracting the answers of those respondents who noted during the Behaviour Surveillance Survey that they have not heard about the needle exchange program.

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

| Scenarios | Estimation Methods | 2011 | | 2007 | |
|---|---|---|---|---|---|
| | | Estimated N of IDUs | Estimated Prevalence (%) | Estimated N of IDUs | Estimated Prevalence (%) |
| **Scenario N1** | **Estimation method N 1**, using demographic indicator (population density) | **70 590** | **2,59** | **39 152** | **1,46** |
| | **Estimation method N 2**, using prevalence rate coefficients | **64 089** | **2,35** | **41 062** | **1,53** |
| **Scenario N2** | **Estimation method N 1**, using demographic indicator (population density) | **45 391** | **1,66** | | |
| | **Estimation method N 2**, using prevalence rate coefficients | **45 457** | **1,67** | | |
| **Scenario N3** | **Estimation method N 1**, using demographic indicator (population density) | **48 077** | **1,76** | **33 300** | **1,24** |
| | **Estimation method N 2**, using prevalence rate coefficients | **49 815** | **1,83** | **35 024** | **1,31** |
| **Scenario N4** | **Estimation method N 1**, using demographic indicator (population density) | **27 314** | **1,0** | | |
| | **Estimation method N 2**, using prevalence rate coefficients | **28 174** | **1,03** | | |

**Consensus:** The participants approved the approach described in the second scenario for calculating IDU population size estimates in Georgia.

## Determining the final consensus estimate

Lengthy discussions between the main stakeholders yielded the following estimates:

**Estimated number of IDUs in Georgia equals**
**45,000 (44,434 - 45,524)**

**National prevalence estimates for the injection drug use equals**
**1,65 (1,63 - 1,67)**

## DISCUSSION

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 and Telavi) and one additional city (Kutaisi) had been added. The previous study when the multiplier/benchmark method had been applied to estimate an IDU population in Georgia was conducted in 2008-2009.

As in the previous case, these estimates should not be considered as accurate and reliable. There was wide variation in the estimates derived from the different multipliers. There may have been some inflation of the treatment prevalence estimates because treatment data would have included a small number of duplicate episodes where a person has been transferred between services. The prevalence estimates for IDUs that were derived using the benchmark data from low threshold services were higher than those derived using other multipliers.

Three of the estimates derived from the various multipliers seem more realistic: one derived from the police data, one derived from data on HIV tests, and one derived from the proportion that had been in treatment (unfortunately this indicator is still available only in 2 cities of Georgia). During the previous exercise, the estimate derived from the low threshold agencies raised some doubts and some experts suggested that estimates based on these data sources might be an overestimate. As demonstrated by this study, within the framework of Global Fund Project as well as Georgia HIV Prevention Project (GHPP), the data registration system of the low threshold agencies significantly improved and became more reliable. On the other hand, the recall rate on the question regarding low threshold services was the lowest.

Each indicator selected to calculate the IDU estimates has biases; each indicator that we considered in this study is based on a different way of "encountering" an IDU. HIV counseling and testing and drug abuse treatment are usually based on voluntary interaction with health agencies. Data on treatment demand and HIV testing and counseling events depend on the desires of potential clients and on the availability of capacity at the service agency, they can happen multiple times a year for some persons and much less often for others. Drug abuse treatment and HIV counseling and testing services may be funded more or less adequately, and this can change over time. Biases may also exist in these data due to the different histories of HIV counseling and testing by IDUs in different cities. For example, the counseling and testing data could include repeat testers; this will reduce the accuracy of the estimates.

Regardless of its size it is apparent that there is a population of IDUs in Georgia that is currently underserved by the health sector. Implementing a broad range of health services for drug users and strengthening the data collection capabilities of the providers of these services would help to generate the data necessary for indirect estimation.

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.

The methodology used for recruiting IDUs in the study - RDS offers certain unique features (Heckathorn 1997). It reduces the biases associated with non-random recruitment, allows greater penetration into diverse groups of IDUs, and allows respondents to recruit only a limited number of respondents irrespective of their network size (Magnani et al 2005). One advantage of the RDS method is that the sampling frame is built up during the recruitment process and this helps to avoid incomplete sampling frames. In this manner it provides unbiased population estimates. Additionally, at the stage of analysis, RDS takes into account, the different network-sizes and to what extent each respondent has recruited others like him/her. Another theoretical advantage of RDS is that it is based on a dual incentive system, financial rewards in combination with peer pressure, which can be expected to reduce non-response bias. All these factors make RDS a superior method for recruitment as compared to conventional methods like snow-ball sampling.

The study was conducted using minimum of resources. NGO already working on the ground implemented the study. Additionally, the staff members experienced in BSS as well as size estimation had been involved in data collection. Thus, no new structures were required to be established.

Some key issues must be kept in mind in using multiplier methods successfully for IDU population size estimation. Firstly, a clear and consistent definition of IDUs in different surveys should be used. Even when referring to the broadest possible target group, the „drug users“, any definition should include: a time period, an age group, frequency of use, and a definition of substances. Secondly, the catchment area for the selected data sources should be ideally the same as that covered in the survey from which multipliers are derived.

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.

The applicability of the Multiple Indicator Method for the extrapolation from local to national prevalence estimates as proposed by the EMCDDA was of limited use in the Georgian context because of a lack of drug-related indicators throughout the country. As in the previous study, among anchor points the prevalence estimation was derived based on the limited number of indicators – all 5 indicators were available only in 2 cities (Tbilisi and Batumi). Single drug related indicator such as number of IDUs registered by Police for drug consumption could be obtained even in 14 cities. Comparing to the previous study, the number of cities where Methadone substitution therapy indicator was available have been increased. Also, HIV testing indicators were available almost in all 64 cities of Georgia. Among the demographic indicators only population density was available.

The prevalence estimates that are used as anchor points in a multiple indicator analysis will have an impact on the prevalence figures derived for other areas. These anchor points must be available for at least two of the areas (preferably far more than two areas) and must be valid and reliable as they determine the parameters of the regression model. It should be mentioned that in current study 6 anchor points have been used in contrast to the previous study (5 anchor points).

Reliability and validity of estimates for the anchor points are of critical importance. On the other hand, the unobserved prevalence is related to the observed indicators, and that the relationship between the indicators and the anchor points is similar for other geographical areas. However, other factors also have a bearing on the indicators and may invalidate that assumption and the derived results, in particular, the number of drug users in treatment may be restricted by the capacity of treatment services, or affected by the level of underreporting that can vary across the country; otherwise the level of policing and attention given to drugs offences may vary across the country and etc. **However, research has shown, that the anchor points have a much greater impact on the national prevalence estimate than the choice of indicators**.[22]

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.

On the other hand, the experts voiced concern about the question N9 in the nomination questionnaire: "Was (name) ____ in the needle exchange (when used needles are changed by new

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

ones) and other low-threshold programs (e.g. voluntary counseling and testing on Hepatitis B, C and HIV, counselling offered by physicians and psychologists) in 2011?" This combined question is too complex and contains a variety of services offered by the different low-threshold centers. Improved registration database allows getting disaggregated data on services; e.g. the number of clients receiving sterile syringes, the number of clients tested on hepatitis B and C, etc. The participants agreed to divide this question into three questions and ask about each service separately. Consequently, in future studies there will be the possibility to derive additional multipliers with relevant benchmarks.

As mentioned above, unfortunately the approach chosen by the experts for consensus estimation (scenario N 2) does not allow tracing the trend in the number of IDUs in comparison with the 2007 year. The previous consensus estimate prevalence was 1.5 and the estimated number of IDUs - 40,000. If it were possible to filter the old data registration systems of low-threshold services in 2007, the estimated number of injecting drug users would be lower and the upward trend in the number of IDUs would be much obvious as shown by the scenarios N1 and N3 where it is possible to compare previous and present survey results.

## CONCLUSION AND RECOMMENDATIONS

**In contrast to previous evaluation, new estimates are higher than estimated size of IDU population in Georgia, calculated in 2008-2009.** One of the reasons for that lies in the fact that the illegal drug market had drastically changed in Georgia since 2007. Specifically, traditional illegal drugs available some years ago such as Heroine and Subutex became very hardly available. Consequently, the consumption of so called "Pharmacy drugs" such as psychotropic drugs (tranquilizers, other CNS depressants) and self-made amphetamine-type stimulants (ephedrone ("jeff") and methcathinone ("vint") increased. Additionally, new self-made opium-type synthetic drug dezomorphine ("crocodile") appeared. These new psychoactive substances are much cheaper and can be easily obtained through the pharmacies. On the other hand, 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. According to the latest BSS survey, the number of IDUs who reported injecting drugs in other countries dramatically increased in all survey locations as compared with previous study. (in Batumi – from 34.2% to 51.9%, in Zugdidi – from 5.8% to 28.5%, in Telavi – from 3.9% to 19.8%, in Gori – from 7.0% to 28.2%, Kutaisi – from 18.5% to 31.4% and in Tbilisi - from 5.8% to 10.6%). The findings clearly indicate the critical need to intensify efforts among IDU population, especially in the regions with high IDU prevalence.

Estimates of the number of injection drug users in specific geographic areas are essential for deepening our understanding of both the aetiology and effects of injection drug use and for designing and implementing drug and HIV-related public health programs and policies. Additionally, given that injection drug use is a risk factor for many infectious diseases, including HIV/AIDS, hepatitis B and C, knowledge of the size of local injecting populations would be useful for designing policies and services to reduce the burden of infectious disease in the population, allocating adequate funds for such services, and assessing the adequacy of existing services and policies. Data regarding the injecting population's size in a given geographic location would also facilitate evaluating the effects of relevant services and policies on subsequent rates of injection drug use in the population.

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. 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.

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 capture-recapture and multiplier-benchmark methods if possible; Because of problems in obtaining data the capture-recapture method cannot be used in Georgia. When using multiplier/benchmark method, numerous multipliers generated from different sources should be applied.

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. Thus when sufficient data have been collated, methods such as the truncated Poisson method or the capture-recapture method can be used to provide prevalence estimations.

The multiple indicator method to derive national prevalence estimates is cost-effective, as it does not require new data collection, unless separate studies are needed to estimate new anchor points. 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.

While every effort has been made to produce as accurate an indication of the prevalence of drug use as possible, these estimates are based on sparse data of poor quality. It is clear that more robust estimates of the size of the drug using population are required. This can only be done through indirect prevalence estimation, using a range of methods and data sources. Although some improvements have been observed during the current study, It is also clear, however, that the secondary data necessary for such estimation is still lacking in Georgia.

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. These two exercises (in 2008-2009 and 2012) 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.

Finally, based on the consensus meeting results, it is recommended to conduct further IDU Size Estimation studies using improved nomination questionnaire and benchmark data from the low threshold services based on the numbers of newly approached IDU clients.

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## Appendix 1. 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 2011?

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

4. Was (name) ____ tested for HIV in 2011?

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

5. Was (name) ____ in abstinence-oriented treatment in 2011?

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

   ***Continue***

6. Was (name) ____ considering entering the abstinence oriented treatment in 2011, 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 2011?
   1. Yes ***(Go to Q. 10)***
   2. No
   88. Don't know
   99. No response

   ***Continue***

9. Was (name) ____ in the needle exchange (when used needles are changed by new ones) and other low-threshold programs (e.g. voluntary counseling and testing on Hepatitis B, C and HIV, counselling offered by physicians and psychologists) in 2011?
   1. Yes
   2. No
   88. Don't know
   99. No response

10. Was (name) ____ deceased due to a fatal drug overdose in 2011?
    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!

## Appendix 2. List of Participants Attending the Consensus Meeting

1. Maya Tsereteli, CCM of Georgia Secretariat
2. Nia Khetaguri, Global Projects Implementation Center
3. Nino Nadashvili, Global Projects Implementation Center
4. Tamaz Zakarashvili, Ministry of Internal Affairs
5. Tamar Kikvidze, NCDC
6. Lela Sturua, NCDC
7. Nino Badridze, National AIDS Center
8. Lia Tavadze, UNAIDS Georgia
9. Vakhtang Tartarashvili, UNODC
10. Nato Durglishvili, National Research Center of Dermato-venerology
11. Nana Chkhikvishvili, National Research Center of Dermato-venerology
12. Irakli Gamkrelidze, Center for Mental Health and Prevention of Addiction
13. Gela Lezhava, Center for Mental Health and Prevention of Addiction
14. Khatuna Todadze, Center for Mental Health and Prevention of Addiction
15. Mamuka Lezhava, Center for Mental Health and Prevention of Addiction
16. Mzia Tabatadze, Georgia HIV Prevention Project
17. Tamar Kasrashvili, Georgia HIV Prevention Project
18. Marina Chokheli, OSI Georgian Foundation
19. Maka Gogia, Georgian Harm Reduction Network
20. Ina Inaridze, "Medecins Du Monde"
21. Manana Beruchashvili, Rehabilitation Center
22. Jana Javakhishvili, Global Initiative on Psychiatry
23. Mrs. Nino Tsereteli, Information and Counselling Center Tanadgoma
24. Mr. David Otiashvili, NGO Alternative Georgia
25. Irma Kirtadze, NGO Alternative Georgia
26. Dali Usharidze, NGO New Way

27. Marina Asatiani, NGO New Way
28. Nino Burchuladze, Kviris Palitra
29. Ivdity Chikovani, Curatio International Foundation
30. Ketevan Chkhatarashvili, Curatio International Foundation
31. George Gotsadze, Curatio International Foundation
32. Nino Chkhaidze, Curatio International Foundation
33. Merab Eliozishvili, Curatio International Foundation
34. Lela Tavzarashvili, Bemoni Public Union
35. Tamar Sirbiladze, Bemoni Public Union