

**ANALYTICAL REPORT**

**“Estimation of the Size of Populations Most-at-Risk for HIV Infection in Ukraine” as of 2012**

**based on the results of 2011 survey**

**Kyiv – 2012**

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## LIST OF ABBREVIATIONS

<b>RDS</b>	respondent-driven sampling
<b>TLS</b>	time-location sampling
<b>USAID</b>	U.S. Agency for International Development
<b>Alliance</b>	International HIV/AIDS Alliance in Ukraine
<b>ART</b>	antiretroviral therapy
<b>HIV</b>	human immune deficiency virus
<b>WHO</b>	World Health Organization
<b>CSO</b>	civil society organization
<b>DCIDC</b>	Department on Combatting Illegal Drug Circulation of the MIA of Ukraine
<b>SPS</b>	State Penitentiary Service of Ukraine
<b>SIFYA</b>	State Institute for Family and Youth Affairs
<b>FSW</b>	(female sex workers) women who provide sexual services for payment
<b>Media</b>	mass media
<b>SMT</b>	substitution maintenance therapy
<b>STI</b>	sexually transmitted infections
<b>KIIS</b>	Kyiv International Institute of Sociology
<b>LGBT community</b>	lesbian, gay, bisexual and transgender community
<b>PLHA</b>	people living with HIV/AIDS
<b>HCF</b>	health care facilities
<b>MIA</b>	Ministry of Internal Affairs of Ukraine
<b>M&amp;E</b>	monitoring & evaluation
<b>MoH</b>	Ministry of Health
<b>NGO</b>	Non-governmental organizations
<b>UN</b>	United Nations
<b>CSW</b>	(commercial sex workers) men and women who provide sexual services for payment
<b>PSA</b>	participatory site assessment
<b>IDU</b>	injecting drug users
<b>AIDS</b>	acquired immune deficiency syndrome
<b>UISR</b>	Ukrainian Institute for Social Research
<b>HCI</b>	health care institutions
<b>MSW</b>	(male sex workers) men who provide sexual services for payment
<b>MSM</b>	men who have sex with men
<b>CMS</b>	Centre for Medical Statistics of the MoH of Ukraine
<b>UNAIDS</b>	Joint United Nations Programme on HIV/AIDS
<b>UNICEF</b>	United Nations Children's Fund

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## INTRODUCTION

During the last 25 years since the identification of the first HIV infection case in 1987, 202 807 HIV infection cases were officially reported among citizens of Ukraine, including 46 300 cases of AIDS and 24 626 cases of AIDS related deaths<sup>1</sup>.

In order to improve the efficiency of the response of Ukraine to HIV/AIDS epidemic, which is approved by the National Programme for HIV Infection Prevention, Treatment and Care of the HIV-Positive People and People Living with AIDS<sup>2</sup>, it is very important to have accurate data on the number of people who are currently belonging to the group most-at-risk for HIV infection. Groups most-at-risk for HIV infection, such as injecting drug users (IDUs), commercial sex workers (CSWs) and men who have sex with men (MSM) are hidden in the society, therefore the official statistics cannot provide real figures on their number.

Estimation of the total number of representatives of groups most-at-risk for HIV infection both at the national and local (regional centre) / regional levels is an important strategic resource for further decision making on HIV/AIDS epidemic response.

The results of the estimation of the size of risk groups can be used for:

- 1) Estimation and forecasting HIV/AIDS related situation in the country:
  - calculation of the estimated size of people living with HIV/AIDS;
  - forecasting of HIV/AIDS epidemic spread;
  - estimation of the burden and possible scale of HIV epidemic in case if the efficient prevention activities are not implemented.
- 2) Efficient planning, implementation and evaluation of prevention programmes, development of HIV-service organizations<sup>3</sup>:
  - estimation of the level of target groups' coverage with prevention interventions;
  - argumentation and determination of quantitative indicators of prevention programmes' development;
  - calculation of the cost estimates to ensure the planned level of target groups' coverage and purchase of the required amount of HIV prevention means and production of the necessary amount of informational and educational materials;
  - calculation of the costs to purchase test kits for HIV infection diagnostics and costs related to the provision of treatment and care to people, living with HIV/AIDS, and social support to HIV infected people and their family members;
  - planning of the development of the networks of NGOs and other HIV-service organizations.
- 3) Evaluation and planning for the provision of tertiary treatment:
  - determination of the needs in antiretroviral therapy (ART);
  - calculation of the number of injecting drug users (i.e., opiate users) in need of substitution maintenance treatment (SMT)
- 4) Substantiation of the lobbying for the changes in government policy on HIV/AIDS.
- 5) Calculations of the sampling aggregates to perform behavioural, epidemiological and other studies among the representatives of risk groups and general population.

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<sup>1</sup> Newsletter «HIV infection in Ukraine» №37. – K., 2012.

<sup>2</sup> LAW OF UKRAINE «On the Approval of the National Programme for HIV Infection Prevention, Treatment and Care of the HIV-Positive People and People Living with AIDS for 2009-2013» of the 19<sup>th</sup> of February, 2009 N 026-VI

<sup>3</sup> Methodological guidelines on conducting research to monitor the national HIV epidemic response. / O. M. Balakirieva, M.Y. Varban, G.V. Dovbakh [et al.], ICF «International HIV/AIDS Alliance in Ukraine». – K.: 2008. – p.22-23

In 1999–2000 first estimations of the number of female sex workers (FSWs) were performed at the local level within the realization of the project on creation of network of organizations working with this group<sup>4</sup>. In 2001 the estimated data about the size of this risk group in the cities with the population of more than 200,000 people were presented and comprised 17,500 FSWs. According to the experts, at that moment the total number of FSWs in the country was at least 180,000 women<sup>5</sup>.

The first attempt to estimate the number of injecting drug users was made in 2002 by the Social Monitoring Centre with the support from the United Nations Children’s Fund (UNICEF), Joint United Nations Programme on HIV/AIDS (UNAIDS) in Ukraine and with active participation of the representatives of regional projects in 20 cities of the country<sup>6</sup>. The methodology of this study was based on the strategy that combined quantitative and qualitative data collection methods, simultaneous use of different information sources, and triangulation<sup>7</sup> and verification of results in the study process.

Starting from 2005, the method of participatory site assessment (PSA) has been used in Ukraine within the «SUNRISE»<sup>8</sup> project. The key objective of PSA is the evaluation of the situation with HIV/AIDS prevention services provided to the representatives of risk groups at the level of a separate territorial unit, and mobilization of IDUs, FSWs and MSM communities to perform epidemic response activities. In the process of PSA the assessment is being performed by the teams comprised from the representatives of groups that are most vulnerable to HIV (IDUs, FSWs, MSM), and it is a distinctive feature of this method.

The first comprehensive study that made it possible to estimate the size of key risk groups (IDU – injecting drug users, FSW – female sex workers and MSM – men who have sex with men) at the national level was implemented in 2005 with the financial support from the ICF “International HIV/AIDS Alliance in Ukraine” within the programme “Overcoming HIV/AIDS Epidemic in Ukraine”. The methodology of this comprehensive study implied the use of different information sources, secondary analysis of the existing information and performance of ad-hoc research. The following estimation methods and tools were used in the course of this study: estimation of the size using the “imagined friend” method<sup>9</sup>; estimation of the size with coefficient method with the use of existing statistical data and results of survey of target groups<sup>10</sup>; estimation of the size with coefficient method with the use of the results of the mass interviewing of the population about behavioural practices<sup>11</sup>; estimation of the size with coefficient method on the basis of capture-recapture results; estimation of the size with coefficient method on the bases of results of behavioural studies among the IDU and FSW. On the basis of the comprehensive study results the total number of most-at-risk groups

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<sup>4</sup> Creation of the NGO network working with female sex workers in Ukraine / Balakirieva O.M., Andrushchak L.I., Varban M.Y. – K.: Ukrainian Institute for Social Research, 2000. – P. 82.

<sup>5</sup> Ibid.

<sup>6</sup> Assessment of the possibilities to develop HIV prevention programmes among injecting drug users in Ukraine / O. M. Balakirieva (project research advisor), M. Y. Varban, O. O. Yaremenko, L. I. Andrushchak, O. R. Artiukh. – K.: Centre «Social monitoring», 2003. – 230 p.

<sup>7</sup> Triangulation in this context envisages synthesis and integration of data from different sources. It is used to establish the reliability and probability of the facts reflected by the data

<sup>8</sup> Joint efforts of the International HIV/AIDS Alliance in Ukraine, Program for Appropriate Technology in Health (PATH) and All-Ukrainian Network of People Living with HIV/AIDS to implement the project “Scaling-up the National Response to HIV/AIDS through Information and Services” (SUNRISE). For more details about the SUNRISE project, please, visit the Alliance website [www.aidsalliance.org.ua](http://www.aidsalliance.org.ua)

<sup>9</sup> The method of “anonymous friend” (or “imagined friend”) is used to survey the general population. Respondents are asked to write a list of their good acquaintances and the interviewer asks about certain activities of these people.

<sup>10</sup> Monitoring behavioural studies conducted among IDU and FSW (by the State Institute on Family and Youth Issues and Ukrainian Institute for Social Researches) and MSM (performed by the Centre for Social Researches at the Institute of Sociology of the NAS of Ukraine) in 2004.

<sup>11</sup> Sociological surveys of young people aged 14-24 years within the project “Monitoring of Young People’s Behaviour as a Component of Second Generation Surveillance”, and of adults aged 25-49 years “Attitudes and Behavioural Orientation of Adult Population to HIV/AIDS Problem and to People Living with HIV/AIDS”.

for HIV infection in Ukraine was estimated as follows: IDU – 325,000 to 425,000 people, FSW – 110,000 to 250,000 people and MSM – 177,000 to 430,000 people.

The second comprehensive study on the estimation of the size was conducted in 2009, where several methods were used: the social network scale-up method, the method of “imagined friend”, the coefficient method. Thus, in order to estimate the size of IDUs, coefficients of receiving syringes / needles and condoms from NGOs, staying under dispensary supervision and taking treatment in drug treatment in-patient clinics were used. In order to receive the estimated size of the MSM group, the secondary analysis and extrapolation of data of the national representative surveys of the youth aged 14-24 and adults aged 25-49, conducted in 2004 by the State Institute for Family and Youth and the Ukrainian Institute for Social Researches with the financial support of the ICF “International HIV/AIDS Alliance in Ukraine”, was organized. The estimated size of FSWs was received by calculating the quantitative characteristics of the group of female IDUs, who provide commercial sex services and FSWs, who are active injecting drug users. Except estimation of the size of main vulnerable groups, estimation of the size of bridge groups was also made.

The number of the groups most-at-risk for HIV infection was estimated as follows: IDU – 230,000 to 360,000 people, FSW – 65,000 to 93,000 people and MSM – 95,000 to 213,000 people. The Table 1 provides calculations of the size of groups most-at-risk for HIV infection of 2005 and 2009.

**Table 1. Estimated ranges of most-at-risk groups at the national level**

<b>Group/year</b>	<b>2005</b>	<b>2009</b>
IDU	325 000 - 425 000	230 000 - 360 000
FSW	110 000-25000	65 000 - 93 000
MSM	177 000 - 430 000	95 0000 - 213 000

Estimation of the size of young representatives of risk groups should be also mentioned, which were calculated in 2010 by the Ukrainian Institute for Social Research named after Oleksandr Yaremenko with the help of the secondary analysis of the data of behavioural surveys among risk groups<sup>12</sup>. Currently another research on the estimation of the size of young representatives of risk groups is being conducted by the Ukrainian Institute for Social Research named after O. Yaremenko.

This publication contains the results of the third comprehensive survey on the estimation of the size of groups vulnerable to HIV infection in Ukraine: IDU, FSW and MSM. It should be noted that Protocol of the survey on the estimation of the size of populations most-at-risk for HIV infection in Ukraine in 2011 was approved by the State Service of Ukraine on HIV/AIDS and Other Socially Dangerous Diseases and the results of calculations were approved by regional coordination councils on tuberculosis and HIV/AIDS prevention.

<sup>12</sup> Most-at-risk adolescents in Ukraine: challenges and time to act / Advocacy paper / UNICEF, Ukrainian Institute for Social Research named after O. Yaremenko. – K.: Verso 04, 2011.-P. 12-15.



## **SURVEY METHODOLOGY ON ESTIMATING THE SIZE OF GROUPS MOST-AT-RISK FOR HIV INFECTION IN 2012**

### **Survey aim and objectives:**

The aim of this survey is to estimate the size of populations most-at-risk for HIV infection (IDU, CSW and MSM) at the regional and national levels.

The main survey objectives included:

- consulting on the existing accounting and reporting forms with representatives of institutions that keep records of representatives of main risk groups in Ukraine;
- making and approving of a list of quantitative indicators that can be used for estimating the size of groups most vulnerable to HIV infection;
- organizing the collection of statistical information that will be used for estimating the size of groups most vulnerable to HIV infection;
- separating indicators (questions in the questionnaires) of behavioural surveys, which are being conducted in Ukraine among representatives of main risk groups in 2011;
- organizing the collection of additional sociological information not provided within the bio-behavioural surveys by interviewing representatives of groups most vulnerable to HIV infection;
- calculating the estimated size of the groups most-at-risk for HIV infection (IDUs, FSWs, MSM) at the level of regional centres and urban areas;
- coordinating and approving of the estimated size of the main groups most-at-risk for HIV infection with regional councils on tuberculosis and HIV/AIDS prevention;
- calculating the estimated size of the groups most-at-risk for HIV infection (IDUs, FSWs, MSM) at national level based on the approved regional estimates of the size of the main groups most-at-risk for HIV infection.

### **Identification of the key target groups of the survey**

The question of people referring to any of the groups most-at-risk for HIV infection has no single universal answer. In different countries within different studies the inclusion criteria for such groups can differ due to the nature of epidemiological situation in the region, behavioural characteristics of its residents and immediate objectives of the specific study. In Ukraine belonging to a certain risk group is defined by the practice of appropriate risk behavior within a certain time period (separately determined for each group) preceding the survey.

**IDU – injecting drug users.** From the point of view of HIV epidemic spread, key representatives of this group are people, who more or less regularly inject drugs. In Ukraine the main criterion for inclusion in the group of IDUs is injecting drugs without doctor's prescription within 30 days preceding the survey.

**CSW – commercial sex workers.** This group includes women (FSW) and men (MSW), who use sex as the source of income (permanent or temporary). From the point of view of involvement in the spread of HIV infection, it is considered that key representatives of this group are people, for whom provision of sex services is their main occupation (or one of key sources of income) and who have been involved in sex business for some time (more than once). In Ukraine in terms of HIV spread prevention women (FSW) are considered to be the main group practicing unsafe sexual behavior. Regular monitoring surveys are conducted among them. Since all size estimates calculated within the survey have been based on the interviewing results of the representatives of main risk groups, this

publication presents estimates of FSW, not CSW. The criterion for inclusion of women who provided commercial sex services (FSW) into the sample is 6 months preceding the survey.

**MSM – men who have sex with men.** Having an experience of homosexual relations during the whole life or a certain previous period (12 months, 6 months etc.) is quite often used as the criterion for inclusion into the MSM group. However, taking into account the risk of HIV infection, it is appropriate to include into the MSM group only those men who practice homosexual sex with certain periodicity (not once). Men who provide commercial sexual services to other men should be also included into this group. The criterion for inclusion in monitoring surveys among men who have sex with men in Ukraine is the experience of sexual contacts with men (oral or anal) within the last 6 months preceding the survey.

This group also includes men who provide sexual services to other men for money. In this survey the experience of homosexual relations for the last 6 months at least is used as the criteria to ascribing individuals to MSM group.

### **Survey methodology**

This survey methodology uses a comprehensive approach that expects consolidation of existing information from different sources (statistical and sociological), consolidation and verification of this information, conduction of primary and secondary data analyses, involvement of experts to assess the validity of the received results and approval of the results by all stakeholders.

### **Multiplier method**

According to the Protocol of the survey approved with the State Service of Ukraine on HIV/AIDS and Other Socially Dangerous Diseases<sup>13</sup>, coefficient method was used as the main calculation method of estimates of the size of groups most-at-risk for HIV infection (IDU, FSW and MSM).

Coefficient method – method of analysis of secondary information used for estimating the size of the hidden group, when there is quantitative information from at least two sources, it is known that the estimated groups intersect and we know the scope of this intersection. The first source is, for example, the list from the institution, which is in contact with the target group (statistical reporting, operational information). The second source is information from representatives of the hidden group directly on their contact with this institution (affirmative answer to the relevant questions out of the questionnaire). The general scheme of estimating the size of the group is as follows:

$$\text{Estimated size of the group} = \frac{\text{Quantative statistical indicator of the registered group representatives}}{\text{Percentage of group representatives who confirmed their registration}}$$

The accuracy of the estimate, calculated through the coefficient method, depends significantly on the validity of statistical data, the adequacy of the sampling forming method and the reliability of the survey data. In general, the coefficient method can be applied to any comparable sources of data related to the same population.

Thus, first of all a maximally wide list of possible sources of statistical information on the size of injecting drug users, female sex workers and men who have sex with men in Ukraine was made. Through consultations with representatives of institutions and organizations that accumulate information on the surveyed groups, those sources were defined that firstly separate groups most-at-risk for HIV infection out of their informational databases, and secondly have a system of regular statistical reporting on the number of representatives of these groups who came in contact with the defined institutions and organizations.

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<sup>13</sup> Approved by Deputy Head of the State Service of Ukraine on HIV/AIDS and other Socially Dangerous Diseases O.G. Yeshchenko on August, 17, 2011

***Prospects and limitations of the coefficient method.*** A variety of approaches and methods can be generally used to estimate the size of hidden groups, including: the census method, the method of nomination, the method of "secondary analysis", coefficient method, the network scale-up method, survey of the general population. However, it is necessary to remember that the results of these surveys are not intended to be final and unconditional, because of being the result of logical assumptions and mathematical calculations, but not practically fixed physical parameters.

As it is well known, collection of sociological information necessary for evaluating the size of hidden groups does not require much of instrumental introductions. In order to obtain necessary information it is enough to ask representatives of risk groups just a few questions that can be logically integrated into questionnaires of other surveys.

The coefficient method has already been repeatedly used to estimate the size of risk groups (IDU, MSM and FSW) at different levels in Ukraine; it was also used in this survey. Repeated use of this method has been justified as it demonstrated the possibility of obtaining estimates of the size of risk groups that are in good agreement with the results obtained by other methods and overall epidemiological situation in the country. The main result of this study became the calculated estimates of the size of injecting drug users and female sex workers, who largely agree with the estimates of previous years and meet expert evaluations. For the first time it was managed to get current enough and well-grounded estimation of the size of men who have sex with men in Ukraine.

The main limitation of the results obtained is the fact that estimates characterize the size of groups most-at-risk for HIV infection at the level of urban population of the country. However, this limitation is largely compensated by the assumption that the behavior of such level of risk is spread mainly among the urban population. This assumption is based on the well-known fact that in the countryside there is a very high level of attention to the life of each other. Hence, the urgent need of realization of such socially condemned practices will most likely cause movement of potential representative of risk group to the city.

Generally, the experience of survey conduction on the estimation of the size of groups most-at-risk for HIV infection indicates that all attainable sources of quantitative and behavioral information on the representatives of these groups should be maximum used in order to obtain satisfactory results. Namely the comprehensive use of data from different sources as well as use of different methods of evaluation enables getting results valid enough to be recommended for widespread use.

### **Output data**

In this survey the following data were used as the output ones in order to calculate the estimated size of groups most-at-risk for HIV infection (IDU, FSW, MSM) through the coefficient method: data of State Statistics, NGO clients' registration details working in the field of HIV prevention among vulnerable groups<sup>14</sup>, operational data, public information of users of Internet dating sites and results of behavioural surveys among IDU, FSW and MSM conducted in 2011<sup>15</sup>.

**Health statistics.** Health statistics was used for estimating the size of injecting drug users. In particular, the following indicators were used:

- **remaining under the dispensary supervision due to intravenous drug use**

*Form of statistical reporting.* Reporting form N11 «Report on morbidity of individuals with mental and behavioural disorders due to psychoactive substance use», annual<sup>16</sup>. The table 2120 «Number of

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<sup>14</sup> According to the Global Fund projects and the project "Scaling-Up the National Response to HIV/AIDS through Information and Services" (SUNRISE)). Information submitted to a single system for registration of clients of prevention programmes - «SyrEx» database.

<sup>15</sup> The list and main characteristics of the information used in this survey is given in Annex 1 of this publication.

<sup>16</sup> The form is given in Annex 2.1. to this Protocol.

people with mental disorders due to intravenous drug use». The indicator is “among people under the supervision at the end of the reporting period”.

- **coverage with medical services of the drug treatment in-patient clinics**

*Form of statistical reporting.* Reporting form N11 «Report on morbidity of individuals with mental and behavioural disorders due to psychoactive substance use», annual. The table 2300 «Composition of people in a drug treatment in-patient clinic». The indicators: «Mental and behavioural disorders due to the use of opioids, cannabinoids, cocaine, hallucinogens, combinations of several drugs and other psychoactive substances, altogether».

- **coverage with medical services at the drug in-patient and out-patient treatment clinics in 2011 due to treatment of opioid dependence, stimulants, combinations of several drugs**

*Form of statistical reporting.* Form №32 « Report on morbidity of individuals with mental disorders due to psychoactive substance use», semiannual<sup>17</sup>. The table 2100 «Contingent and treatment of individuals with mental disorders due to psychoactive substance use». The indicator «Mental and behavioural disorders due to opioid use – covered with in-patient/out-patient treatment». Includes data on the number of people under the dispensary supervision, who have already finished in-patient treatment at the end of the reporting period, including those, who have been treated at daily drug treatment in-patient clinics

Data of regular statistical reporting on the number of persons who are under state dispensary supervision due to drug use and on their coverage with medical services at the drug in-patient and out-patient clinics were provided by the Center for Medical Statistics of the MoH of Ukraine (CMS). Since such reports are already provided to CMS in aggregated form at the level of regional indicators, the Ukrainian Medical and Monitoring Centre on Alcohol and Drugs of the MoH of Ukraine additionally sent requests for necessary statistical information to each of the city's drug treatment in-patient clinic. As a result, the obtained statistical indicators at a regional level on the whole and at the level of individual cities (regional centers) demonstrated significant regional peculiarity of operation of drug treatment clinics. Special attention was attracted to the fact that there is considerable variation in the proportion of IDUs covered in regional centers and regions on the whole, which again proves the assumption regarding differences in the level of access of drug medical services for residents of large cities, and residents of other areas. This peculiarity was further taken into account when extrapolating local estimates (at the city level) to the regional level.

- **coverage of HIV-infected IDUs with antiretroviral therapy (ART)**

*Form of statistical reporting.* Reporting form №56 «Report on provision of ART therapy to HIV-positive people and those living with AIDS» (quarter)<sup>18</sup>. The indicator – Number of people, who receive ART at the end of the reporting period, having the status of active IDUs. *Data source:* Ukrainian AIDS Prevention Centre of the Ministry of Health of Ukraine.

Information on the number of people with the status of active IDUs receiving ART was provided by the Ukrainian AIDS Prevention Centre of the Ministry of Health of Ukraine. Taking into account the amount of the ART provision to IDU in different cities, estimates of the size of IDU based on the indicator of receiving ART were calculated only for selected cities - Sevastopol, Dnipropetrovsk, Donetsk, Lugansk, Kyiv. In other cities of Ukraine, where programmes on ART provision are being

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<sup>17</sup> The form is given in Annex 2.2 to this Protocol.

<sup>18</sup> The form is given in Annex 2.4 to this Protocol.

implemented, the size of IDU who receive it, is calculated by isolated cases. This statistical indicator was firstly used for calculation of estimated size of IDU.

- **group's coverage with the substitution maintenance therapy (SMT).**

Information on the size of IDU who have participated in the substitution maintenance therapy programme since its realization in Ukraine, was provided by the Ukrainian Institute on Public Health Policy<sup>19</sup>. Statistical data on IDU's coverage with SMT programmes have never been previously used when calculating the estimated size of IDU, because only now this programme has become significant enough and is being realized in all regions of the country.

**Registration details of clients of prevention programmes. Data of programme monitoring** were used for calculating the estimated size of IDU, FSW and MSM.

Since 2005 the ICF "International HIV/AIDS Alliance in Ukraine" has started using a single system for registration of clients of prevention programmes – the "SyrEx" database. This database was developed in order to monitor and analyze the data on the number of covered clients, volumes of distributed prevention measures and services provided to representatives of groups most-at-risk for HIV infection.

During 2011 a significant part of representatives of vulnerable groups has been covered with preventive services, which allows using data of programme monitoring as the reliable statistics on the issue.

**Table 2. Indicators of coverage of groups most-at-risk for HIV infection with prevention programmes supported by the ICF "International HIV/AIDS Alliance in Ukraine" in 2011**

<b>Risk group</b>	<b>Number of people covered with prevention programmes</b>	<b>% of the estimated size as of 2009</b>	<b>Number of regions covered with prevention programmes</b>	<b>Number of organizations implementing program prevention activities</b>
IDU	157 011	54% <sup>20</sup>	27	85
CSW	28 224	40% <sup>21</sup>	27	54
ЧЧЧ	19 130	20% <sup>22</sup>	15	26

Reliability of data stored in «SyrEx» database was confirmed by independent audits. In particular, during the period March - April 2011 the Alliance was audited on data quality (DQA), initiated by USAID. External evaluation that concerned indicators on which Alliance reports both to USAID and to the Global Fund, showed that a "reliable system of reporting and data collection has been organized" in Alliance (which is one to gather information on all programs, regardless of the donor). Data verification has shown their high quality. Accuracy of data was equal to almost 100% according to all indicators, reported by the Alliance.

At the same time, employees of the ICF "International HIV / AIDS Alliance in Ukraine" continue improving data collection system. Since March 1, 2011 all sub-recipients that provide HIV prevention services to most vulnerable groups, have started implementing a unique coding system in projects on HIV prevention at the national level. Registered clients can get all the available prevention

<sup>19</sup> <http://www.uiphp.org.ua/ua/resource/zvedeni-dann>

<sup>20</sup> In 2009 the size of IDU at the national level was estimated as 290 thousand people.

<sup>21</sup> In 2009 the size of FSW at the national level was estimates as 70 thousand people.

<sup>22</sup> In 2009 the size of MSM at the national level was estimated as 93 thousand people.

services, wherever he / she are within the territory of Ukraine. Despite the fact that a client will be able to receive services simultaneously in several NGOs, the client's ID will be the same in each NGO. Thus, the problem of duplication of clients who receive services in different organizations will be excluded from the statistical data of SyrEx database.

In order to estimate the size through the coefficient method based on the **indicator of groups' coverage with prevention services, the following statistical data were used:**

- Number of IDU who have received syringes within the NGO network during the last 6 months (indicator for the period of January-October, 2011, grouped into periods of 6 months).
- Number of IDU who have received condoms within the NGO network during the last 6 months (indicator for the period of January-October, 2011, grouped into periods of 6 months).
- Number of conducted consultations with the use of HIV rapid tests since the beginning of 2011 till the end of the survey.
- Information on the number of "unique objects" (cards with a unique code) distributed among NGO's clients.

At the beginning of 2011, Alliance began transferring of NGO clients to the system of unique codes. As a result, clients received new client cards. Data on the number of clients transferred to a unique code that corresponds to the number of cards distributed were used as statistical information. Sample of a card is given below.



**Data on the participation of representatives of risk groups in previous monitoring bio-behavioural surveys** were used to estimate the size of IDU, FSW and MSM. Data on the number of IDU, FSW and MSM who reported having participated in similar surveys in 2008, 2009 and 2010 (only for Mykolaiv) were used as the statistical information.

**Information of the number of Internet profiles of MSM at Internet dating sites was used to estimate the size of MSM.** Data on the size of MSM profiles at such Internet resources as mamba (love.gay.ru, facelink.ru, love.mail.ru ); qguys.ru; bluesystem.ru; loveplanet.ru were used in order to preliminarily calculate the estimated size. This information was provided by the NGO "LGBT-research Centre "Donbas SocProject".

The only remark to the collected data from open sources was the probability of using multiple profiles, which indicated different self-identity information, by one person. However, given the results, which were based on this quantitative information, it was concluded that a number of such duplicates is insignificant and does not cause distortion of the results of estimating the size of MSM. Such a conclusion came from the fact that the estimates obtained at the level of cities and regions appeared to be in accordance with each other and with estimates obtained in previous years.

**Results of behavioural surveys.** In recent years, an established national system of monitoring and evaluation of the effectiveness of measures to control HIV / AIDS epidemics has been formed in Ukraine, which, as a component of second generation surveillance involves the implementation of a complex of regular monitoring surveys on the behavior of risk groups, "bridge groups" and general population. These surveys include two major components: sociological (the study of behavior peculiarities) and epidemiological (respondents' blood testing for HIV and other sexually transmitted infections)<sup>23</sup>. These linked monitoring surveys are conducted once in every 2 years among injecting drug users, female sex workers and men who have sex men. The sample is formed using specialized methods that take into account the communication features of the target groups (RDS<sup>24</sup> and TLS<sup>25</sup>).

The information obtained by using these techniques provides a possibility to make reasonable conclusions on the characteristics of the general size. However, there is a fundamental limitation in the application of these specialized techniques when interviewing representatives of the hidden social groups. This limitation is that in order to obtain data sufficient for statistical analysis organizers of bio-behavioural surveys have to limit the survey geography by large cities, where there is an opportunity to establish contacts with the sufficient number of members of the surveyed group.

In 2011 such monitoring surveys were conducted among IDU, FSW and MSM almost in all cities of regional significance with the financial support of the ICF "International HIV/AIDS Alliance in Ukraine". Therefore, the following interviewing results of groups most-at-risk for HIV infection have been used in this survey:

- Results of the sociological interviewing of injecting drug users in the framework of the survey "Monitoring the behavior and HIV infection prevalence among injecting drug users as a component of second generation surveillance" which was conducted in 2011 by the Ukrainian Institute for Social Research named after O. Yaremenko with the financial support of the ICF "International HIV/AIDS Alliance in Ukraine". Overall, during the period of June-October, 2011 9069 IDU were interviewed in 26 cities of regional importance (in Kyiv region interviewing was conducted in Kyiv and Bila Tserkva). The sample size in each city ranged from 200 to 500 respondents.
- Results of the sociological interviewing of female sex workers in the framework of the survey "Monitoring the behavior and HIV infection prevalence among commercial sex workers as a component of second generation surveillance" which was conducted in 2011 by the Kyiv International Institute of Sociology together with the Ukrainian AIDS Prevention Centre and local civil society organizations with the financial support of the ICF "International HIV/AIDS Alliance in Ukraine". Overall, during the period of June-November, 2011 5023 FSW were

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<sup>23</sup> Analytical reports based on the results of monitoring surveys are posted on the web-site of the Alliance <http://www.aidsalliance.org.ua>, in the section "Publications of the International HIV/AIDS Alliance in Ukraine".

<sup>24</sup> *RDS (respondent-driven sample – sample guided and realized by the respondents)* – the most effective method to involve individuals from hidden social groups in the study. RDS is based on the principle, according to which members of the target group are better positioned to identify and to engage (recruit) other members of the group in the study. This technology combines a "snowball method" of respondents' involvement (when primary respondents recruit new survey participants) and a mathematical model, which allows compensating the fact that the sample, developed in this way, is not random. The methodology is based on the Markov chains theory and the theory of small networks in order to identify the probability of inclusion of every respondent in the sample, which makes this sample probabilistic. The data is processed with the RDSAT software package, which allows building indexes, or "scales", applied to every variable data array. In Ukraine RDS techniques are used to involve IDU, FSW and MSM to participate in bio-behavioural surveys.

<sup>25</sup> *TLS (time-location sampling – sample according to time and location)* – one of the best methods to study groups, geographically concentrated in certain locations. Was used in several cities where FSW were interviewed. This sampling method means that the selection of respondents occurs at specific territories ("spots" or places frequented by the representatives of the target group) at certain time periods. TLS may be randomized probabilistic sample if the sampling frame is accurate and includes all "spots" and size of the target groups, which visit them. As part of monitoring bio-behavioural surveys in Ukraine this methodology is used for involvement of FSW for the interviewing in several cities.

interviewed in 25 cities of regional importance. The sample size in each city ranged from 150 to 300 respondents.

- Results of the sociological interviewing of men who have sex with men in the framework of the survey “Monitoring the behavior and HIV infection prevalence among men who have sex with men as a component of second generation surveillance” which was conducted by the Centre for Social Expertize of the Institute of Sociology NAS of Ukraine with the financial support of the ICF “International HIV/AIDS Alliance in Ukraine”. Overall, during the period of June-October, 2011 5950 FSW were interviewed in 26 cities of regional importance (in Dnipropetrovsk region interviewing was conducted in Dnipropetrovsk and Kryvyi Rig). The sample size in each city ranged from 150 to 400 respondents.

For data collection in behavioral surveys representatives of groups were asked questions on certain experience, necessary for the statistics. The list of questions is provided in the relevant sections devoted to the description of calculations.

In order to create the indicators used for calculations data arrays of bio-behavioural surveys were used, weighted according to the method of forming the sample.

### **Approaches to estimates’ calculation**

First of all local estimates of the size of IDU, FSW and MSM (at the level of regional centers of Ukraine) were calculated. Initial data to calculate estimates at the city level were as follows:

- Statistical / quantitative indicators for each city given by institutions / organizations that keep records of members of groups;

- Coefficients defined by determining the proportion of interviewed group representatives in the city who indicated having been registered in the relevant institution / organization.

In certain cases when a significant number of local coefficients, calculated for a particular indicator, could not be used due to the fact that they had no statistically significant differences from 0 at the level of 5% of error probability, the coefficient was used to calculate estimates to statistical/quantitative indicators that corresponded to the general indicator for all surveyed cities. For example, in case of calculations of the estimated size of FSW based on the indicators of dual problematics, most local indicators obtained in the results of monitoring surveys had no statistical difference from 0. At the same time, some cities have received very high indicator of crossing between FSW and IDU. This variation of the indicators is most likely related to the peculiarities of data collection, which inevitably involves interviewing of relatively homogeneous community in areas of deployment. In this case, the usage of the common indicator instead of using some separate ones can bring balance to the existing polarization of certain indicators and receive more statistically reliable indicator by increasing the sample.

Thus, as a result of calculations made on the basis of statistical indicators and survey data, a number of estimates of each of the groups most-at-risk for HIV infection at the level of cities of regional significance were obtained.

**Data validation.** The next step was the conduction of validation of the obtained sets of local estimates at the city level. In general, the validation procedure included careful consideration of estimates obtained for each of the indicators. As validation criteria of the estimate assumptions were used as to what local estimates are calculated for a particular indicator should not be less than the annual rate of coverage with prevention programs according to the Global Fund projects and the project “Scaling-Up the National Response to HIV/AIDS through Information and Services” (SUNRISE))<sup>26</sup>. Moreover, attention was drawn to the fact that variation of the level of obtained local estimates should largely correspond to the general epidemiological situation in the country, i.e., in regions where there is unfavorable epidemiological situation, the size of groups most-at-risk for HIV

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<sup>26</sup> Source of statistics – «SyrEx» database, reporting of subgrantees by the results of activity during 2011.



infection may greatly exceed the size of groups in more safe areas. Validation of the initial estimates was conducted at the meeting of the interdepartmental working group on monitoring and evaluation (M & E), which consists of experts who are interested in combating the spread of HIV in Ukraine, including government agencies and NGOs.

The most adequate estimation results selected by validation results and approved by the collective decision helped to define the most probabilistic estimated range at the city level. Key position to determine the final estimate of the group size in the city was a zone of intersection of the maximum number of individual estimates, which were based on different indicators. However, expert evaluation remained to be the final criterion for choosing a particular estimated range for each of the target groups.

**Approach to the extrapolation of estimates to the regional level.** In the situation, when the sample obtained in the city is not representative for the region on the whole, the question occurs on the possibility of extrapolating the results obtained from the level of a regional center to the level of the region as a whole and to the country level. There is no doubt that the procedure of extrapolation from local level to regional level involves the use of a certain factor. At meetings of the Interagency Working Group on M & E approaches to the formation and use of extrapolation factors were agreed. For each of the key groups the specific procedure of extrapolation was determined that takes into account the peculiarity of dissemination of risky behavior practices among general population of the country. Relevant sections of this report contain further description of the procedure of extrapolation of estimates of each group to the regional level.

**Approval of regional and national estimates.** In order to increase the responsibility of the state sector in the approval and use of data obtained, estimates of the size of groups most-at-risk for HIV infection in Ukraine have been reviewed and approved by the Coordination Council on tuberculosis and HIV/AIDS prevention at the Council of Ministers of the Autonomous Republic of Crimea, Kyiv and Sevastopol city administrations.

National size of groups most-at-risk for HIV infection was obtained by summing regional estimates approved at the regional level.

## KEY RESULTS OF THE ESTIMATION OF THE SIZE OF GROUPS MOST-AT-RISK FOR HIV INFECTION IN UKRAINE IN 2012

This chapter presents key results of the estimation of the size of groups most-at-risk for HIV infection (IDU, FSW and MSM) in Ukraine that were obtained in the course of the study conducted in 2012.

As part of the study, a number of estimation procedures of the size of injecting drug users, female sex workers and men who have sex with men were conducted at the level of certain cities using the coefficient method. The estimates based on the results of calculations have passed the procedures of validation and expert evaluation at the meetings of interagency working group on monitoring and evaluation (M&E), which consists of experts representing all stakeholders in combating the spread of HIV/AIDS in Ukraine (governmental institutions and non-governmental organizations). The procedure of extrapolation of local estimates (calculated for certain cities) to the level of urban population of an appropriate region of the country was jointly approved. The obtained estimates of the size of IDU, FSW and MSM at local and regional levels were submitted for consideration and approval to the national and regional councils on tuberculosis and HIV/AIDS prevention. Therefore, estimates of the size of groups most-at-risk for HIV infection were received at local, regional and national levels of *urban population* of the country. Table 3 presents estimates of the size of groups most-at-risk for HIV infection that have been approved and recommended for widespread use. Most regions approved estimates that fall within the range recommended by the researchers. For those regions that did not agree with the calculated estimates and did not provide arguments for the received data, the researchers recommended using estimates received in the result of this survey (see comments to table 2).

**Table 3. Regional estimates of the size of groups most-at-risk for HIV infection approved and recommended for widespread use**

Region	Decision <sup>27</sup>	Approved estimated size of IDU		Approved estimated size of FSW		Approved estimated size of MSM	
		At the regional level	At the city level (regional centre)	At the regional level	At the city level (regional centre)	At the regional level	At the city level (regional centre)
AR of Crimea	of 28.03.2012	15 000	6 000	5 500	1 700	6 000	1 800
Volyn	№ 1 of 26.03.2012	5 500	3 300	1 100	500	2 300	900
Vinnitsia	of 26.06.2012	4 500	2 500	1 000	1 000	4 200	2 700
Dnipropetrovsk	№ 1 of 17.04.2012	35 050	10 300	6 400	2 300	17 600	6 300
Donetsk	№ 1 of 30.05.2012	42 000	9 200	9 300	3 100	31 000	7 500
Zhytomyr	of 17.05.2012	5 000	2 100	700	700	2 400	1 000
Zakarpattia	№ 2 of 08.05.2012	500*	300*	500	500	1 500	1 000
Zaporizhzhia	№ 1 of 26.03.2012	11 700	6 600	2 500	2 300	5 600	3 100
Ivano-Frankivsk	№ 1 of 29.03.2012	5 300	3 200	2 000	1 100	3 000	1 200
Kyiv	of 16.05.2012	8 700	-	2900	-	3 000	-

<sup>27</sup> Approved at the meeting of the Coordination Council on tuberculosis and HIV/AIDS prevention.

Kirovograd	№ 01-27/114/4 of 24.04.2012	12 500	4 500	6 300	2 700	500*	200*
Lugansk	№ 1 of 10.04.2012	15 000	5 400	1 300	1 300	2 500*	1 000*
Lviv	№ 2 of 21.06.2012	11 000	5 500	1 600	1 600	10 100	4 900
Mykolaiv	of 28.04.2012	10 300	6 400	3 700	3 400	2 000*	2 000
Odesa	№ 1 of 29.03.2012	20 000*	10 000*	7 000	5 000	8 000*	5 000
Poltava	№ 4 of 15.06.2012	8 100	2 900	2 766	990	3 900	1 300
Rivne	№ 1 of 22.05.2012	4 000	2 400	800	800	2 000	1 100
Sumy	of 4.04.2012	5 800	4 100	1 200	1 200	3 600	1 300
Ternopil	№ 2 of 29.03.2012	1 400	1 000	300	300	2 100	1 000
Kharkiv	№ 1 of 27.03.2012	15 300	9 300	4 500	4 500	15 600	10 400
Kherson	№ 1 of 28.03.2012	7 200	3 500	1 200	1 200	2 300*	1 600
Khmelnyskyi	№ 3 of 27.03.2012	5 000	2 250	800	800	2 500	900
Cherkasy	№ 1 of 26.03.2012	13 300	5 500	1 900	1 900	2 600	1 100
Chernivtsi	of 18.04.2012	4 700	3 700	800	700	1 300	900
Chernigiv	№ 2 of 28.05.2012	5 850	3 050	1 050	1 050	1 850	800
City of Kyiv	of 28.03.2012	31 300	31 300	10 700		36 300	36 300
City of Sevastopol	№ 20 of 27.04.2012	6 000	6 000	2 000	2 000	2 000	2 000
Total		310 000		79816		175750	

\*Despite the fact that the figures presented in the table were approved at the regional level, the researchers recommend using estimates received in the result of this survey: the estimated number of IDU in Uzhgorod – 1500 IDU, in Zakarpattia region – 1900; the estimated number of IDU in Odesa city – 20000 IDU, in Odesa region – 31400 IDU; the estimated number of MSM in Kirovograd city – 900 MSM, in Kirovograd region – 2300 MSM; the estimated number of MSM in Lugansk city – 2900 MSM, in Lugansk region – 13600 MSM; the estimated number of MSM in Mykolaiv region – 3200 MSM; the estimated number of MSM in Odesa city – 9600 MSM, in Odesa region – 15400 MSM; the estimated number of MSM in Kherson region – 3500 MSM.

The results of the estimation of the size of groups most-at-risk for HIV infection obtained within this survey at regional level provide an opportunity to estimate the nationwide size of these groups. National estimates based on the figures approved in the regions are presented below, although in some regions researchers recommended using figures different from the approved ones (see comments to table 3).

**Table 4. Total number of the approved regional estimates of the size of groups most-at-risk for HIV infection (approximated to 1000)**

<b>IDU</b>	<b>FSW</b>	<b>MSM</b>
310 000	80 000	176 000

## **DESCRIPTION OF THE PROCEDURES OF ESTIMATING THE SIZE OF GROUPS MOST-AT-RISK FOR HIV INFECTION IN 2012**

### **The procedure of estimating the size of injecting drug users (IDU)**

In this survey, results obtained during IDU interviewing within regular sociological bio-behavioural survey conducted in 2011 “Monitoring the behavior and HIV infection prevalence among injecting drug users as a component of second generation surveillance” were used to calculate the estimated size of injecting drug users through the coefficient method. The fact of using injecting drugs within the last 30 days preceding the survey was determined as the inclusion criterion for the sampling within this survey as in previous years.

Generally, 14 sets of local estimates of the size of IDU were calculated based on different statistical and quantitative indicators at the level of certain cities of Ukraine:

- remaining under the dispensary supervision due to intravenous drug use;
- coverage with medical services at the state drug treatment in-patient clinics during 2010;;
- coverage with medical services at the state drug out-patient treatment clinics during first half of 2011;
- coverage with medical services at the state drug in-patient treatment clinics during first half of 2011;
- coverage of HIV-infected IDU with antiretroviral therapy (as of July, 1<sup>st</sup>, 2011);
- coverage of HIV-infected IDU with antiretroviral therapy (as of October, 1<sup>st</sup>, 2011);
- coverage of group’s representatives with substitution maintenance therapy (SMT);
- coverage with prevention services within the NGO network – indicator “distribution of syringes”;
- coverage with prevention services within the NGO network – indicator “unique object”;
- coverage with prevention services within the NGO network – use of HIV rapid tests within the NGO network;
- participation in monitoring surveys among IDU in 2007;
- participation in monitoring surveys among IDU in 2008;
- participation in monitoring surveys among IDU in 2010.

As a result of critical consideration of all the indicated estimates, members of the interagency working group on monitoring and evaluation (M&E) of the efficiency of follow-up measures against HIV/AIDS recognized only 5 out of 14 proposed estimates of the size of IDU as the appropriate ones for using in the triangulation procedure. They are further described in details.

### **Calculation of local estimates of IDU based on the indicators of hospitalization to state drug treatment in-patient clinics**

It should be noted that nowadays the statistics of hospitalization to drug treatment clinics does not separate the group of injecting drug users out of the total number of drug users. However, the use of the indicator of drug users’ hospitalization for calculation of the general number of IDU is based on the assumption that the main group that requires in-patient treatment is injecting drug users as such practices have the most drastic consequences. This assumption was confirmed during the study «Verification of the Medical Drug Registration Data in Ukraine»<sup>28</sup>, which has found that 98% of

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<sup>28</sup> Results of the survey “Verification of the Medical Drug Registration Data in Ukraine”, conducted by the Ukrainian Institute on Public Health Policy with the financial support of the World Health Organization Office in Ukraine and the ICF “International HIV/AIDS Alliance in Ukraine”. The survey was conducted in December, 2008 – January, 2009 in Dnipropetrovsk, Donetsk, Kyiv, Lviv, Mykolaiv, Odesa, Poltava and Kherson. The more detailed information on the

persons registered and hospitalized due to the drug addiction, are the users of opiates, stimulants or combinations of several drugs. It should be also noted that the hospitalization indicator has been also twice used to estimate the size of the IDU group in the course of similar studies (in 2005 and 2009), while the estimation results with the use of hospitalization indicators in some cases were very similar to those received via other methods and to experts' estimates<sup>29</sup>.

The following output data were used when calculating the estimated size of IDU based on the hospitalization indicator:

**Statistical indicator:** «Composition of people in a drug treatment in-patient clinic (number)». Annual reporting form N11 «Report on morbidity of individuals with mental and behavioural disorders due to psychoactive substance use». Reporting period – 2010, absolute numbers.

**Respondents' answers to questions from the questionnaire:** «Have you been under in-patient treatment at the state drug treatment clinic in 2010?» (answer «yes»). As far as the statistical reporting concerns only those people that received treatment not anonymously, the following question was also asked: «Have you anonymously been under treatment at the state drug treatment in-patient clinic in 2010?» (answer «no»), which was used as the filtering one.

The procedure of determining the local estimates by the hospitalization indicator of IDU was as follows:

- 1) Statistical information on the number of IDU who had received treatment at state drug treatment in-patient clinics of the regional centre during 2010 was obtained<sup>30</sup>;
- 2) According to IDU interviewing results, the share of IDU who reported having been not anonymously treated at state drug treatment in-patient clinics during 2010 in each of the surveyed cities was calculated. This share was further used as the coefficient.
- 3) Estimates of the size of IDU were calculated at the city level, according to interviewing results in which it became possible to define the significant coefficient (see Table 5).

**Table 5. Calculation of local estimates of the size of IDU based on the indicator of hospitalization to drug treatment in-patient clinics within 2010**

City <sup>31</sup>	Hospitalized to drug treatment in-patient clinics, people	Coefficient (share of IDU who were not anonymously treated at drug treatment in-patient clinics)	Local estimate of the general size of IDU, people
	A	B	C = A / B
	Health statistics	Interviewing results	Estimated size
Simferopol	579	0,022	26 318
Lutsk	194	0,059	3 288
Zaporizhzhia	971	0,080	12 138
Bila Tserkva	13	0,070	186
Lugansk	1 248	0,042	29 714

procedure and results of this survey was given in the Analytical report based on the results of the sociological survey "Estimation of the size of groups most-at-risk for HIV Infection in Ukraine" as of 2009.

<sup>29</sup> Analytical reports based on the results of the sociological survey "Estimation of the size of groups most-at-risk for HIV Infection in Ukraine" as of 2005 and 2009.

<sup>30</sup> Statistical data on the hospitalization have been provided by the Ukrainian Medical and Monitoring Centre on Alcohol and Drugs of the MoH of Ukraine.

<sup>31</sup> Indicators obtained in Vinnytsia, Dnipropetrovsk, Donetsk, Zhytomyr, Uzhgorod, Ivano-Frankivsk, Kirovograd, Odesa, Poltava, Sumy, Kharkiv, Chernivtsi, Chernigiv, Kyiv were not used to calculate local estimates of the size of the group because of having too much possibility of statistical error.

Lviv	245	0,028	8 750
Mykolaiv	293	0,041	7 146
Rivne	27	0,027	1 000
Ternopil	110	0,060	1 833
Kherson	33	0,015	2 200
Khmelnyskyi	83	0,055	1 509
Cherkasy	418	0,065	6 431

### Calculation of local estimates based on the indicators of participation in the substitution maintenance therapy programme

The following output data were used when calculating the estimated size of IDU based on the indicator of involvement in SMT programmes:

Statistical indicator: number of patients who have ever received substitution maintenance therapy (SMT) since the beginning of the programme implementation in Ukraine till August, 1<sup>st</sup>, 2011. Absolute numbers.

Respondents' answers to questions from the questionnaire: «Have you ever received methadone tablets or buprenorphine during the substitution maintenance therapy (SMT) programme?» (answer «Yes»).

The procedure of determining the local estimates by the indicator of IDU's coverage with substitution maintenance therapy was as follows:

- 1) Statistical information on the number of IDU who have ever received substitution maintenance therapy within programme implementation in each of the cities was obtained<sup>32</sup>;
- 2) According to IDU interviewing results, the share of IDU who reported having received methadone tablets or buprenorphine during the substitution maintenance therapy (SMT) programme in each of the surveyed cities was calculated. This share was further used as the coefficient.
- 3) Estimates of the size of IDU were calculated at the city level, according to interviewing results in which it became possible to define the significant coefficient (see Table 6).

**Table 6. Calculation of local estimates of the size of IDU based on the indicators of getting substitution maintenance therapy**

City <sup>33</sup>	Received SMT, people	Coefficient (share of IDU who received SMT)	Local estimate of the general size of IDU, people
	<i>A</i>	<i>B</i>	$C = A / B$
	Health statistics	Interviewing results	Estimated size
Simferopol	297	0,025	11 880
Vynnytsia	242	0,052	4 654
Lutsk	154	0,250	616
Dnipropetrovsk	319	0,023	13 870

<sup>32</sup> Statistical data have been provided by the Ukrainian Institute on Public Health Policy.

<sup>33</sup> Estimates for the following cities were not calculated: Bia Tserkva (SMT programme is not realized in the city), Lviv (only 26 IDU have been covered within the programme, unreliable indicator according to the survey results), and Sumy (unreliable indicator according to the survey results).

Donetsk	324	0,034	9 529
Zhytomyr	118	0,106	1 113
Uzhgorod	79	0,031	2 548
Zaporizhzhia	98	0,035	2 800
Ivano-Frankivsk	92	0,386	238
Kirovograd	132	0,048	2 750
Lugansk	172	0,049	3 510
Mykolaiv	1 040	0,079	13 165
Odesa	470	0,023	20 435
Poltava	320	0,151	2 119
Rivne	85	0,046	1 848
Ternopil	211	0,296	713
Kharkiv	30	0,039	769
Kherson	319	0,064	4 984
Khmelnyskyi	81	0,074	1 095
Cherkasy	127	0,059	2 153
Chernivtsi	100	0,088	1 136
Chernigiv	41	0,068	603
Kyiv	899	0,037	24 297

### **Calculations of local estimates based on the indicators of IDU's coverage with prevention programmes (indicators of unique object)**

The following output data were used when calculating the estimated size of IDU based on the indicator of coverage with prevention programmes:

Statistical indicator: number of IDU who received a unique client's code according to the reports of subgrantees of Global Fund projects and the project "Scaling-Up the National Response to HIV/AIDS through Information and Services" (SUNRISE)), reporting period – January – September, 2011, absolute numbers.

Respondents' answers to questions from the questionnaire: «Are you a client of any non-governmental organization working with injecting drug users (have a card or a personal code)?», «Have you received from this NGO representative such a card?» (answer "Yes"). A client's card with the unique code (start to be used in 2011) was demonstrated to the respondent.

The procedure of determining the local estimates by the indicator of IDU's registration by the unique code was as follows:

- 1) Statistical information on the number of IDU who have received a unique client's card in each of the regional centres was obtained<sup>34</sup>;
- 2) According to IDU interviewing results, the share of IDU who reported having received clients' cards with the unique code in 2011 in each of the surveyed cities was calculated.
- 3) Estimates of the size of IDU were calculated at the city level, according to interviewing results in which it became possible to define the significant coefficient (see Table 7).

<sup>34</sup> Statistical data were provided by the ICF "International HIV/AIDS Alliance in Ukraine".



**Table 7. Calculation of local estimates of the size of IDU group based on the indicators of registration at organizations that provide HIV prevention services to most vulnerable populations**

City <sup>35</sup>	Registered / reregistered, oci6	Coefficient (share of IDU who were registered at NGO according to the new accounting system)	Local estimate of the general size of IDU, people
	A	B	C= A / B
	Statistics of prevention programmes	Interviewing results	Estimated size
Simferopol	1 159	0,459	2 525
Vinnytsia	788	0,062	12 710
Lutsk	421	0,627	671
Dnipropetrovsk	1 077	0,033	32 636
Donetsk	2 397	0,269	8 911
Zhytomyr	580	0,314	1 847
Uzhgorod	93	0,058	1 603
Zaporizhzhia	553	0,227	2 436
Bila Tserkva	188	0,307	612
Lugansk	1 190	0,123	9 675
Lviv	539	0,047	11 468
Mykolaiv	2 530	0,167	15 150
Poltava	504	0,228	2 211
Rivne	325	0,037	8 784
Sumy	1 107	0,732	1 512
Ternopil	234	0,295	793
Kharkiv	1 041	0,028	37 179
Kherson	1 068	0,308	3 468
Chernivtsi	482	0,742	650
Chernigiv	167	0,262	637
Kyiv	6 529	0,285	22 909

### **Calculations of local estimates based on the indicators of using HIV rapid tests within the realization of prevention programmes**

Due to the fact that at the moment of this survey conduction the system of registration of unique clients of NGOs that provide prevention services and help have not yet been implemented, it was not possible to estimate how many IDU got the opportunity to be tested for HIV using rapid tests within the reporting period. However, there is information available on the total number of rapid tests, which were conducted among IDU. Therefore, the procedure of calculation of estimates of the size of IDU based on the indicators of distribution of HIV rapid tests is slightly different from the procedure of calculation of other estimates.

The following output data were used when calculating the estimated size of IDU based on the indicator of using HIV rapid tests:

<sup>35</sup> New cards have been not distributed at the moment of IDU interviewing in Ivano-Frankivsk, Odesa, Khmelnytskyi, Cherkasy.

**Statistical indicator:** number of rapid tests realized among IDU by NGOs that conduct prevention activities in the framework of program activities according to the reports of subgrantees of Global Fund projects and the project “Scaling-Up the National Response to HIV/AIDS through Information and Services” (SUNRISE)», reporting period – since the beginning of 2011 till the end of the survey, absolute numbers.

**Respondents’ answers to questions from the questionnaire:** «Have you been HIV-tested with the help of rapid tests in a non-governmental organization in 2011?» (answer “Yes”); «How many times have you been HIV-tested with the help of rapid tests in a non-governmental organization in 2011?».

The procedure of determining the local estimates by the indicators of using HIV rapid tests distributed by NGOs that conduct prevention activities was as follows:

- 1) Statistical information on the number of rapid tests used by IDU in each of the cities was obtained<sup>36</sup>;
- 2) According to IDU interviewing results, the size of IDU sampling was determined and general number of rapid tests used by survey participants in each of the surveyed cities was calculated.
- 3) The ratio of the size of IDU and the number of used HIV rapid tests was used as the coefficient;
- 4) Estimates of the size of IDU at the city level were calculated (see Table 8).

**Table 8. Calculation of local estimates of the size of IDU based on the indicators of using HIV rapid tests distributed by NGOs that conduct prevention activities**

City	Registered / reregistered, items	Number of IDU who answered the question on testing	General number of tests undertaken by the interviewed IDU	Local estimate of the general size of IDU, people
	A	B	C	$D = A * B / C$
	Statistics of prevention programmes	Sampling	Interviewing results	Estimated size
Simferopol	1 025	495	143	3 546
Vinnitsia	430	350	92	1 634
Lutsk	320	352	72	1 564
Dnipropetrovsk	733	497	85	4 284
Donetsk	1 021	501	111	4 608
Zhytomyr	187	348	95	686
Uzhgorod	182	200	19	1 916
Zaporizhzhia	319	200	37	1 724
Ivano-Frankivsk	57	250	93	153
Bila Tserkva	287	299	48	1 788
Kirovograd	91	349	68	468
Lugansk	971	251	136	1 791
Lviv	479	250	12	9 979
Mykolaiv	1 235	498	140	4 389
Odesa	3 595	486	85	20 548
Poltava	753	349	92	2 861

<sup>36</sup> Statistical data have been provided by ICF “International HIV/AIDS Alliance in Ukraine”.

Rivne	343	349	45	2 662
Sumy	660	350	196	1 179
Ternopil	213	195	60	694
Kharkiv	474	349	31	5 342
Kherson	1 411	350	86	5 741
Khmelnyskyi	666	350	58	4 019
Cherkasy	1 461	351	186	2 760
Chernivtsi	752	200	205	732
Chernigiv	302	347	43	2 434
Kyiv	4 532	506	147	15 596

### Calculations of local estimates based on the indicators of participation in previous monitoring surveys

The following output data were used when calculating the estimated size of IDU based on the indicator of participation in previous monitoring surveys:

Statistical indicator: sample size of IDUs who were interviewed within monitoring survey conducted in 2009 in each of the surveyed cities in 2009. Absolute numbers.

Respondents' answers to questions from the questionnaire: «Have you participated in similar surveys in this city (when you were asked questions on injecting drugs), when you were tested and received such coupons (show the coupons)) within the last years? If yes, what was the year: 2007, 2008, 2009?» (answer «Yes, in 2009»).

The procedure of determining the local estimates by the indicators of IDU participation in the monitoring survey conducted in 2009 was as follows:

- 1) Statistical information on the number of IDU who were interviewed in 2009 in each of the surveyed cities was obtained<sup>37</sup>;
- 2) According to IDU interviewing results, the share of IDU remembered having participated in similar survey among IDU in 2009 in each of the surveyed cities was calculated.
- 3) For each local coefficient indicator the probability of statistical error at a significance level of 5% was calculated. Point estimates of the size of IDU in the cities were calculated by using local coefficients that were statistically significantly different from 0 (see Table 9).

**Table 9. Calculation of local estimates of the size of IDU group based on the indicators of participation in the monitoring survey conducted in 2009**

City	Sampling size in 2009, people	Coefficient (share of IDU who remembered having been HIV tested in 2009)	Local estimate of the general size of IDU, people
	A	B	C= A / B
	Quantitative information of the monitoring survey	Interviewing results	Estimated size
Simferopol	252	0,627	402
Vinnitsia	250	0,089	2 809
Dnipropetrovsk	249	0,009	27 667

<sup>37</sup> Data have been provided by ICF "International HIV/AIDS Alliance in Ukraine".

Zhytomyr	249	0,417	597
Uzhgorod	100	0,068	1 471
Zaporizhzhia	249	0,099	2 515
Ivano-Frankivsk	250	0,077	3 247
Mykolaiv	250	0,094	2 660
Rivne	254	0,167	1 521
Ternopil	101	0,028	3 607
Cherkasy	249	0,068	3 662
Chernivtsi	101	0,027	3 741
Chernigiv	250	0,020	12 500
Kyiv	407	0,013	31 308

Formation of estimated ranges, validation and extrapolation of estimates to the regional level Taking into account all of the above-mentioned local estimates and using triangulation techniques and expert evaluation, the most likely estimated range of the number of IDU at the local level was identified for each of the cities (see Table 10). Estimates obtained based on the indicators of hospitalization, receiving SMT and coverage with prevention programmes were used as main sources for forming of the estimated range. Estimates obtained based on the indicators of using HIV rapid tests and participation in the survey in 2009 were used as auxiliary when there was not enough of selected estimates to form a range.

Extrapolation factor was used to extrapolate estimates from local to regional level that had been calculated according to the formula:

$$\left( \frac{N^R}{N^C} + \frac{A^R}{A^C} \right) / 2, \text{ where}$$

$N^R$  – size of general urban population of the region aged 15-59 years;

$N^C$  – size of the population of a central city of regional importance aged 15-59 years;

$A^R$  – Number of drug addicts remaining under the dispensary supervision due to drug use in the region;

$A^C$  - Number of drug addicts remaining under the dispensary supervision due to drug use in the central city of the region<sup>38</sup>.

This average figure provided an opportunity to consider the assumptions about the specific character of the ratio of IDU in the central city and in other cities of the region. On the one hand, to take into account that in small towns the concentration of IDU is less than in big cities. On the other hand, to consider the fact that IDU who live in small towns, have less access to drug treatment services and, therefore, they are less likely to get under the dispensary supervision.

Extrapolation factor was used to minimal, maximal and average points of local estimated ranges and the estimated range of the size of IDU at the level of the urban population of the region was calculated.

**Table 10. Results of the estimation of the size of IDU at local level and their extrapolation to regional level**

City	Estimates of the size of IDU at local	Extrapolati on factor	Region (AR of Crimea / Region /	Estimates of the size of IDU at regional
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<sup>38</sup> Detailed calculations of extrapolation factors for each region are given in Annex

	level (approximated to 100), people		(k)	City)	level (approximated to 100), people	
	MIN <sub>L</sub>	MAX <sub>L</sub>			MIN <sub>R</sub> = MIN <sub>R</sub> * k	MAX <sub>R</sub> = MAX <sub>R</sub> * k
Simferopol	3500	7 600	3,11	AR of Crimea	10900	23600
Vinnitsia	1600	2 800	2,13	Vinnitsia	3400	6000
Lutsk	1600	3 300	2,14	Volyn	3400	7100
Dnipropetrovsk	10 300	13 900	3,4	Dnipropetrovsk	35050	47300
Donetsk	8900	9 500	4,5	Donetsk	40100	42800
Zhytomyr	1800	2 100	2,75	Zhytomyr	5000	5800
Uzhgorod	1500	1 600	1,25	Zakarpattia	1900	2000
Zaporizhzhia	6600	8 500	1,71	Zaporizhzhia	11300	14600
Ivano-Frankivsk	1600	3 200	2,22	Ivano-Frankivsk	3600	7100
Bila Tserkva	1800	1 800	4,84	Kyiv	8700	8700
Kirovograd	2800	5 100	2,59	Kirovograd	7300	13200
Lugansk	3500	7 300	3,62	Lugansk	12700	26400
Lviv	4800	7 400	2,09	Lviv	10000	15500
Mykolaiv	7100	10100	1,5	Mykolaiv	10700	15200
Odesa	20400	20 500	1,54	Odesa	31400	31600
Poltava	2100	2 900	2,79	Poltava	5900	8100
Rivne	1800	2 700	1,78	Rivne	3200	4800
Sumy	1500	2000	2,88	Sumy	4300	5800
Ternopil	800	1 800	1,71	Ternopil	1400	3100
Kharkiv	5300	9 300	1,65	Kharkiv	8700	15300
Kherson	3500	5 000	2,07	Kherson	7200	10400
Khmelnyskyi	1700	2 800	2,21	Khmelnyskyi	3800	6200
Cherkasy	5500	6 400	2,41	Cherkasy	13300	15400
Chernivtsi	2000	3 700	1,45	Chernivtsi	2900	5400
Chernigiv	2400	3 700	1,92	Chernigiv	4600	7100
Kyiv	24300	31 300	1	City of Kyiv	24300	31 300
Sevastopol <sup>39</sup>	3700	8 000	1	City of Sevastopol	3700	8 000

The estimated ranges of the size of IDU calculated in such a way at the regional level were submitted for consideration and approval to regional councils on HIV/AIDS and other socially dangerous diseases. Most regions agreed to the proposed estimated range of the size of IDU and approved estimation within its limits. The approved estimates are given in the chapter “Key results of the estimation of the size of groups most-at-risk for HIV infection in Ukraine in 2012” of this report. Comments on the use of estimates are given in the table with the approved data for those regions that did not agree with the recommended estimates and did not provide arguments in favor of lowering the estimated size of IDU.

<sup>39</sup> For calculation of the estimates for the city of Sevastopol were used statistics on the level of Sevastopol and sociological data at the level of Simferopol. The reason of such approach is absence of sociological data for IDU in Sevastopol in 2011.

## Recommendations on the calculation of the estimated size of IDU at a local level

The above-mentioned estimates of injecting drug users characterize the size at the level of region or regional centre. However, the necessity occurs in the programme goals to operate with the size of IDU at the level of a separate district of the region. This section presents algorithm for calculating the estimated size of IDU at a local level.

Calculation of the estimated size of IDU is conducted for each district and for each city of regional subordination which provide financing for health care institutions from municipal budget. If health care institutions in a city of regional subordination are financed from the district budget, the city and the district that provides financing are being considered together.

### Data used:

1. Approved estimated size of IDU at the level of region and regional centre (Simferopol for AR of Crimea)

*Data source:* estimated size of IDU approved at the meetings of regional councils on TB and HIV/AIDS

2. Size of urban population with a breakdown: regional centre (Simferopol for AR of Crimea), districts and cities of regional/republican subordination.

*Data source:* State Statistics Service of Ukraine.

3. Data on the coverage with medical services at drug treatment in-patient clinic.

*Data source:* «Composition of people in a drug treatment in-patient clinic (number)». Reporting form N11 «Report on morbidity of individuals with mental and behavioural disorders due to psychoactive substance use». Government body «Centre for Health Statistics of the Ministry of Health of Ukraine».

### Symbols used for calculations:

**N** – approved estimated size of IDU at the regional level; **N<sub>oc</sub>** – approved estimated size of IDU at the level of regional centre (Simferopol for AR of Crimea); **N<sub>1,2...</sub>** – estimated size of IDU at the level of a certain city/district.

**NM<sub>1,2...</sub>** - estimation of the size of IDU at the level of a certain city/district, calculated through the coefficient method based on the data of urban population of this city/district.

**NN<sub>1,2...</sub>** - estimation of the size of IDU at the level of a certain city/district, calculated through the coefficient method based on the indicator of coverage with medical services of drug treatment in-patient clinics.

**A** – size of urban population of the region; **A<sub>oc</sub>** – size of urban population of a regional centre (Simferopol for AR of Crimea); **A<sub>1,2...</sub>** – size of urban population of a certain city/district.

**B** – level of regional population's coverage with medical services of drug treatment in-patient clinics; **B<sub>oc</sub>** – level of regional centre population's coverage with medical services of drug treatment in-patient clinics (Simferopol for AR of Crimea); **B<sub>1,2...</sub>** – level of coverage with medical services of drug treatment in-patient clinics at the level of a certain city/district.

### CALCULATION ALGORITHM:

1. **Make a list of districts and those cities of regional subordination that provide financing for health care institutions from local budgets.**

2. Calculate the estimated size of IDU for each city/district through the coefficient method based on the size of urban population (NM<sub>1,2...</sub>).

Coefficient calculation  $k_m$

$$k_m = \frac{(N - N_{oc})}{A - A_{oc}}$$

$$NM_{1,2...} = k_m * A_{1,2...}$$

N – approved estimated size of IDU at the regional level;  
 N<sub>oc</sub> – approved estimated size of IDU at the level of a regional centre (Simferopol for AR of Crimea);  
 A – size of urban population of the region;  
 A<sub>oc</sub> – size of urban population of a regional centre (Simferopol for AR of Crimea);  
 A<sub>1,2...</sub> – size of urban population of a certain city/district.

3. Calculate the estimated size of IDU for every city/district through the coefficient method based on the indicator of coverage with medical services of drug treatment in-patient clinics (NN<sub>1,2...</sub>)

Coefficient calculation  $k_n$

$$K_n = \frac{(N - N_{oc})}{B - B_{oc}}$$

$$NN_{1,2...} = k_n * B_{1,2...}$$

N - approved estimated size of IDU at the regional level;  
 N<sub>oc</sub> – approved estimated size of IDU at the level of a regional centre (Simferopol for AR of Crimea);  
 B – level of regional population’s coverage with medical services of drug treatment in-patient clinics;  
 B<sub>oc</sub> – level of regional centre population’s coverage with medical services of drug treatment in-patient clinics (Simferopol for AR of Crimea);  
 B<sub>1,2...</sub> – level of coverage with medical services of drug treatment in-patient clinics at the level of a certain city/district.

4. Calculation of the estimated size of IDU at the local level for every city/district (N<sub>1,2...</sub>)

$$N_{1,2...} = \frac{NN_{1,2...} + NM_{1,2...}}{2}$$

NM<sub>1,2...</sub> - estimation of the size of IDU at the level of a certain city/district, calculated through the coefficient method based on the data of urban population of this city/district.  
 NN<sub>1,2...</sub> - estimation of the size of IDU at the level of a certain city/district, calculated through the coefficient method based on the indicator of coverage with medical services of drug treatment in-patient clinics.

## EXAMPLE OF CALCULATION

### Output data:

**Approved estimated size of IDU at the level of:**

region N = 5000

regional centre Noc = 3300

**Size of urban population:**

In the region = A = 104000

In the regional centre A<sub>oc</sub> = 42000

In the district «1» A<sub>1</sub> = 35000;

In the district «2» A<sub>2</sub> = 27000

**Level of coverage with medical services of drug treatment in-patient clinics:**In the region  $B = 140$ In the regional centre  $B_{oc} = 60$ In the district «1»  $B_1 = 50$ In the district «2»  $B_2 = 30$ 

1. **Make a list of districts and those cities of regional subordination that provide financing for health care institutions from local budgets.**

«1»

«2»

2. **Calculate the estimated size of IDU for each city/district through the coefficient method based on the size of urban population ( $NM_{1,2...}$ ).**

$$\text{Coefficient calculation } k_m = \frac{(N-N_{oc})}{A-A_{oc}} = \frac{5000-3300}{104000-42000} = 0,02742$$

$$NM_{1,2...} = k_m * A_{1,2...}$$

$$NM_1 = k_m * A_1 = 0,02742 * 35000 = \mathbf{960 IDU}$$

$$NM_2 = k_m * A_2 = 0,02742 * 27000 = \mathbf{740 IDU}$$

3. **Calculate the estimated size of IDU for every city/district through the coefficient method based on the indicator of coverage with medical services of drug treatment in-patient clinics ( $NN_{1,2...}$ )**

$$\text{Coefficient calculation } k_n = \frac{(N-N_{oc})}{B-B_{oc}} = \frac{5000-3300}{140-60} = 21,25$$

$$NN_{1,2...} = k_n * B_{1,2...}$$

$$NN_1 = k_n * B_1 = 21,25 * 50 = \mathbf{1062,5 IDU}$$

$$NN_2 = k_n * B_2 = 21,25 * 30 = \mathbf{637,5 IDU}$$

4. **Calculate the estimated size of IDU at the local level for every city/district ( $N_{1,2...}$ )**

$$N_{1,2...} = (NN_{1,2...} + NM_{1,2...})/2$$

$$N_1 = (NN_1 + NM_1)/2 = (960 + 1062,5)/2 = \mathbf{1011 IDU \text{ in the district «1»}$$

$$N_2 = (NN_2 + NM_2)/2 = (740 + 637,5)/2 = \mathbf{689 IDU \text{ in the district «2»}$$



## **Procedure of estimating the size of female sex workers (FSW)**

In this survey, results obtained during FSW interviewing within regular sociological bio-behavioural survey conducted in 2011 “Monitoring the behavior and HIV infection prevalence among female sex workers as a component of second generation surveillance” were used to calculate the estimated size of female sex workers through the coefficient method. The fact of having commercial sexual partners within the last 6 months (180 days) preceding the survey was determined as the inclusion criterion for the sampling within this survey.

Generally, 5 local estimates of the size of FSW were calculated based on different statistical and quantitative indicators:

- Coverage with prevention services within the NGO network – indicator “distribution of condoms”;
- Coverage with prevention services within the NGO network – indicator “unique object”;
- Coverage with prevention services within the NGO network – use of HIV rapid tests within the NGO network;
- Participation in monitoring survey among IDU in 2008;
- Participation in monitoring survey among IDU in 2009.

Unfortunately, the received calculations significantly contradicted each other and other validation characteristics, so they could not have been used for estimation. Therefore, estimation of the size was calculated based on:

- The indicator of dual problematics that was further used as the most likely estimated range of the size of FSW at the local level.

## **Calculations of local estimates based on the indicators of distribution of cases of “dual problematics” (IDU-FSW, FSW-IDU)**

The following output data were used when calculating the estimated size of FSW based on the indicators of “dual problematics”:

Quantitative indicator: estimated range of the size of IDU at the local level

Respondents’ answers to questions from the questionnaire for IDU: «How many commercial partners (people you received money from for providing sex services) you have had out of all your sexual partners within the last 3 months (90 days)?» (indicated having such partners).

Respondents’ answers to questions from the questionnaire for FSW: « Could you say, please, which of the drugs listed below you have used, and which ones you have injected within the last 30 days? (indicated injecting of any drugs)»

The procedure of determining the local estimates by the indicators of dual problematics among FSW was as follows:

- 1) Local estimates of the size of female IDU were calculated based on the most likely estimated range of the size of IDU at the local level (27% of the general size of IDU).
- 2) According to IDU interviewing results, the share of female FSW who indicated having commercial sexual partners within a certain period preceding the survey was calculated. Generally, this share made up 8,61% out of all interviewed female IDU.
- 3) Local estimates of the size of female IDU who provide commercial sexual services were calculated y.
- 4) According to FSW interviewing results, the share of FSW who indicated using injecting drugs within the last month (30 days) preceding the survey was calculated. Generally, this share made up 6,77% out of all interviewed FSW.

5) Local estimates of the size of FSW were calculated (see Table 11).

Generally, the procedure of calculation of the local estimate of the size of FSW based on the indicators of dual problematics could be expressed by the following formula:

$$\frac{M^L \times 0.27 \times 0.0861}{0.0677}, \text{ where } M^L - \text{local estimate of the size of IDU.}$$

**Table 11. Calculation of local estimates of the size of FSW based on the indicators of dual problematics (drug use and provision of paid sex services)**

City	Local estimated range of the size of IDU, people	Local estimated range of the size of female IDU, people	Local estimated range of the size of IDU-FSW, people	Local estimated range of the size of FSW, people
	A	B = A * 0.27	C = B * 0.0861	D = C / 0.0677
Simferopol	3 500 — 7 600	945 — 2 052	81 — 177	1 202 — 2 610
Vinnnytsia	1 600 — 2 800	432 — 756	37 — 65	549 — 961
Lutsk	1 600 — 3 300	432 — 891	37 — 77	549 — 1 133
Dnipropetrovsk	10 300 — 13 900	2 781 — 3 753	239 — 323	3 537 — 4 773
Donetsk	8 900 — 9 500	2 403 — 2 565	207 — 221	3 056 — 3 262
Zhytomyr	1 800 — 2 100	486 — 567	42 — 49	618 — 721
Uzhgorod	1 500 — 1 600	405 — 432	35 — 37	515 — 549
Zaporizhzhia	6 600 — 8 500	1 782 — 2 295	153 — 198	2 266 — 2 919
Ivano-Frankivsk	1 600 — 3 200	432 — 864	37 — 74	549 — 1 099
Bila Tserkva (Kyivska oblast)	1 800 — 1 800	486 — 486	42 — 42	618 — 618
Kirovograd	2 800 — 5 100	756 — 1 377	65 — 119	961 — 1 751
Lugansk	3 500 — 7 300	945 — 1 971	81 — 170	1 202 — 2 507
Lviv	4 800 — 7 400	1 296 — 1 998	112 — 172	1 648 — 2 541
Mykolaiv	7 100 — 10 100	1 917 — 2 727	165 — 235	2 438 — 3 468
Odesa	20 400 — 20 500	5 508 — 5 535	474 — 477	7 005 — 7 039
Poltava	2 100 — 2 900	567 — 783	49 — 67	721 — 996
Rivne	1 800 — 2 700	486 — 729	42 — 63	618 — 927
Sumy	1 500 — 2 000	405 — 540	35 — 46	515 — 687
Ternopil	800 — 1 800	216 — 486	19 — 42	275 — 618
Kharkiv	5 300 — 9 300	1 431 — 2 511	123 — 216	1 820 — 3 193
Kherson	3 500 — 5 000	945 — 1 350	81 — 116	1 202 — 1 717
Khmelnyskyi	1 700 — 2 800	459 — 756	40 — 65	584 — 961
Cherkasy	5 500 — 6 400	1 485 — 1 728	128 — 149	1 889 — 2 198
Chernivtsi	2 000 — 3 700	540 — 999	46 — 86	687 — 1 271
Chernigiv	2 400 — 3 700	648 — 999	56 — 86	824 — 1 271
Kyiv	24 300 — 31 300	6 561 — 8 451	565 — 728	8 344 — 10 748
Sevastopol	3 700 — 8 000	999 — 2 160	86 — 186	1 271 — 2 747

## Formation of estimated ranges of FSW, validation and extrapolation of estimates to the regional level

Local estimates of the size of FSW (minimum and maximum) calculated based on the indicators of dual problematics formed their own estimated ranges to which extrapolation procedures were further used.

As an extrapolation factor the indicator of the ratio of urban female population of the region to female population of the regional center aged 15-59 years was used. Extrapolation factor was applied not to all local estimates, because provision of commercial sex services is a common practice mostly in big cities and resort areas. Enriching of local estimates to the regional level was made only for certain regions:

- AR of Crimea (including Sevastopol and surrounding areas), Mykolayiv, Odesa region - since these regions are resort and tourist areas, and therefore the demand for commercial sexual services has greatly contributed to significant increase of FSW concentration in most settlements;
- Dnipropetrovsk region - due to the fact that in this region the population of large cities is much higher as compared to other regions.

It was decided that for the rest of the regions estimate of the size of FSW can be recommended to be calculated at the level of central city of the region.

**Table 12. Results of the estimation of the size of FSW at local level and their extrapolation to regional level**

City	Estimates of the size of FSW at local level (approximated to 100), people		Extrapolation factor (k)	Region (AR of Crimea / Region / City)	Estimates of the size of FSW at regional level (approximated to 100), people	
	MIN <sub>L</sub>	MAX <sub>L</sub>			MIN <sub>R</sub> = MIN <sub>R</sub> * k	MAX <sub>R</sub> = MAX <sub>R</sub> * k
Simferopol	1200	2 600	3,58	AR of Crimea	4 300	9 300
Vinnitsia	500	1 000	-	Vinnitsia	500	1 000
Lutsk	500	1 100	-	Volyn	500	1 100
Dnipropetrovsk	2 300	4 800	2,77	Dnipropetrovsk	6 400	13 300
Donetsk	3 100	3 300	-	Donetsk	3 100	3 300
Zhytomyr	600	700	-	Zhytomyr	600	700
Uzhgorod	500	500	-	Zakarpattia	500	500
Zaporizhzhia	2300	2 800	-	Zaporizhzhia	2300	2 800
Ivano-Frankivsk	500	1 100	-	Ivano-Frankivsk	500	1 100
Bila Tserkva	618	618	4,8	Kyiv oblast	2900	2900
Kirovograd	1000	1 800	-	Kirovograd	1000	1 800
Lugansk	1200	2 500	-	Lugansk	1200	2 500
Lviv	1600	2 500	-	Lviv	1600	2 500
Mykolaiv	1500	2 400	1,59	Mykolaiv	2 400	3 800

Odesa	4500	7 000	1,59	Odesa	7 200	11 100
Poltava	1000	1 000	-	Poltava	1000	1 000
Rivne	600	900	-	Rivne	600	900
Sumy	1200	1 400	-	Sumy	1200	1 400
Ternopil	300	600	-	Ternopil	300	600
Kharkiv	1800	3 200	-	Kharkiv	1800	3 200
Kherson	1200	1 700	-	Kherson	1200	1 700
Khmelnyskyi	600	1 000	-	Khmelnyskyi	600	1 000
Cherkasy	1900	2 200	-	Cherkasy	1900	2 200
Chernivtsi	700	1 300	-	Chernivtsi	700	1 300
Chernigiv	800	1 300	-	Chernigiv	800	1 300
Kyiv	8300	10 700	-	City of Kyiv	8300	10 700
Sevastopol	1300	2 700	1,05	City of Sevastopol	1 400	2 800

It should be noted that calculations of the size of FSW in Ukraine have been conducting since 2005. In 2005 the size of this group made up 180 thousand people representing 1,2% of female population of Ukraine aged 15–49 years or 1,6% of urban female population of Ukraine (see Table 1). In the course of time methodology of calculating the size of the hidden groups improved and methods used in 2009 gave us an opportunity to estimate the size of FSW in Ukraine at the level of 70 thousand people representing 0,5% and 0,6% correspondingly of female population of the country and urban female population aged 15-49 years. Estimates of the size of FSW received in 2011 remained to be almost the same as in 2009 and their share makes up 0,4% of general female population of the country, 0,6% of urban female population and 1,3% of female population of regional centres (see Table 13).

According to the surveys, the size of FSW out of the general population in Eastern Europe varies from 0,4 to 1,4%, in Western Europe – from 0,1 to 1,4%. FSW out of female population in Russian Federation makes up from 0,1 to 1,5%<sup>40</sup>.

According to the results of the survey among general population of Ukraine aged 15-49, conducted to the order of the ICF “International HIV/AIDS Alliance in Ukraine” by the “Socioconsulting” in 2011, the share of women who indicated having received payment for sexual services within the last 12 months makes up 0,6%. 1,3% find it difficult to answer this question. Thus, percentage of women who have provided commercial sexual services within the last 12 months can make up from 0,7% to 2,2%.

**Table 2. Size of FSW and their share in the female population of Ukraine, 2005-2011**

	Female population of Ukraine aged 15-59 years			Estimated size of FSW, 2005-2011, thousand people	% of FSW out of female population		
	Rural and urban areas, thousand people	Urban areas, thousand people	Population of regional centres, thousand people <sup>41</sup>		Rural and urban areas, %	Urban areas, %	Population of regional centres, %
As of 1.01.2006	15 642	11 261	5 179	180	1,2	1,6	3,5
As of	15 547	11 171	5 179	70	0,5	0,6	1,4

<sup>40</sup> Estimates of the number of female sex workers in different regions of the world. J Vandepitte, R Lyster, G Dallabetta, F Crabbé, M Alary, and A Buvé//Sex Transm Infect. 2006 June; 82(Suppl 3): iii18–iii25. doi: [10.1136/sti.2006.020081](https://doi.org/10.1136/sti.2006.020081)

<sup>41</sup> Size of female population of regional centres as of 01.01.2012 used for all years.

1.01.2010							
As of 1.01.2012	15 238	10 914	5 179	66*	0,4	0,6	1,3
As of 1.01.2012	15 238	10 914	5 179	80**	0,6	0,8	1,7

\*National estimates based on total number of regional estimates recommended by researches.

\*\* National estimates based on total number of approved on regional level estimates.

Thus, the estimated ranges of the size of FSW calculated and validated in such a way at the regional level were submitted for consideration and approval to regional councils on HIV/AIDS and other socially dangerous diseases. The proposed concept of extrapolation was significantly changed for some regions according to the decision of regional Coordination Councils on Tuberculosis and HIV/AIDS Prevention, as local experts did not agree with the hypothesis of the members of interagency working group on monitoring and evaluation on the presence of female sex workers mainly in regional centres of certain regions, provided arguments in favor of the presence of FSW in other settlements of the region and used extrapolation coefficient based on the ratio between female population of regional centre aged 15-59 and urban female population of the region. Calculated extrapolation factors are given in the Annexes.

The amount of the approved regional estimates of the size of FSW is higher than the amount of recommended regional estimates – 80 000 FSW. It means that the share of FSW among female population of Ukraine aged 15-59 years does not exceed percentages approved by other surveys and is not significantly higher among female population of regional centres making up 0,6% of the general female population, 0,8% in urban female population and 1,7% in the population of regional centres (see Table 13). The approved estimates are given in the chapter “Key results of the estimation of the size of groups most-at-risk for HIV infection in Ukraine in 2012” of this report.

## Procedure of estimating the size of men who have sex with men (MSM)

Estimation of the size of men who have sex with men remains to be one of the most difficult and controversial issues. On the one hand, in the former Soviet Union this risk group is much stigmatized and therefore hidden. On the other hand, despite the behavior of other risk groups, homosexual practices do not pose criminal threat; therefore they do not become subject of attention of any supervision agencies. There is still very few information on the size of MSM. It should be noted that according to the UNAIDS recommendations, the size of MSM in Eastern Europe should be assessed in 2-5% of the whole male population aged 15-49. In 2008 the size of MSM was assessed as 1,3% of the whole male population aged 15-49 as part of a similar study on estimating the size of groups most-at-risk for HIV infection. The estimate was based on the results of interviewing of general population<sup>42</sup> and was accepted with the proviso of being probably significantly underestimated even taking into account the high level of homophobia among the population.

In this survey, results obtained during MSM interviewing within sociological bio-behavioural survey conducted in 2011 “Monitoring the behavior and HIV infection prevalence among men who have sex with men as a component of second generation surveillance” were used to calculate the estimated size of men who have sex with men through the coefficient method. The survey was conducted among men who proved having sexual contact with another man within 6 months preceding the survey.

Generally, 9 sets of local estimates of the size of MSM were calculated based on different statistical and quantitative indicators:

- Coverage with prevention services within the NGO network – indicator “distribution of condoms”;
- Coverage with prevention services within the NGO network – indicator “unique object”;
- Coverage with prevention services within the NGO network – use of HIV rapid tests within the NGO network;
- Usage of Internet sites of mamba family in order to find male sex partners (love.gay.ru, facelink.ru, love.mail.ru);
- Usage of an Internet sites qguys.ru in order to find male sex partners;
- Usage of an Internet site bluesystem.ru in order to find male sex partners;
- Usage of an Internet site loveplanet.ru in order to find male sex partners;
- Participation in monitoring survey among IDU in 2007;
- Participation in monitoring survey among IDU in 2009.

Unfortunately, the received calculations contradicted each other and other validation characteristics, so they could not have been used for estimation. As a result, members of the interagency working group on monitoring and evaluation of the efficiency of follow-up measures against HIV/AIDS recognized only 2 out of 9 proposed sets of estimates of the size of MSM at the city level as the appropriate ones for using in the triangulation procedure. They include usage of Internet sites qguys.ru and loveplanet.ru in order to find sexual male partners, which are further described in details.

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<sup>42</sup> Соціологічне опитування молоді 14–24 років у межах проекту «Моніторинг поведінки молоді як компонент епідагляду другого покоління» та опитування дорослого населення 25–49 років «Ставлення та поведінкові орієнтації дорослого населення до проблеми ВІЛ/СНІДу та до людей, які живуть з ВІЛ/СНІДом» проведені в 2004 році. Вибіркові сукупності багатоступеневі, територіально-поселенські, стратифіковані, репрезентативні для населення за ознаками: тип поселення, стать, вік, область. Виконавці – ДІРСМ та УІСД за фінансової підтримки МБФ «Міжнародний Альянс з ВІЛ/СНІД в Україні» в рамках реалізації програми «Подолання епідемії ВІЛ/СНІД в Україні», підтриманої Глобальним фондом для боротьби зі СНІДом, туберкульозом та малярією. З метою аналізу було підготовлено об'єднаний масив для вікової групи 15–49 років з відповідними коефіцієнтами зважування для забезпечення репрезентативності даних для визначеної вікової групи.

### Calculations of local estimates based on the indicators of using Internet dating sites

The following output data were used when calculating the estimated size of MSM based on the indicator of using Internet dating sites:

Statistical indicator: number of registered users of an appropriate site structured by city and age (those MSM who have “profiles” or “forms”).

Respondents’ answers to questions from the questionnaire: «On which Internet sites do you have profiles (personal pages)?» (indicated «qguys.ru» or «loveplanet.ru»).

Two possible ways of calculating estimates on the base of the chosen data were considered. The first one – to apply their own coefficient for each city which corresponds to the answers of the respondents interviewed in this city. The second one – to apply a single common coefficient determined on the base of all interviewed MSM. The second approach was decided to be used, since the increase of the sample on the base of which the coefficient was calculated gave an opportunity to reduce the impact of a number of outstanding and unpredictable factors: city size, Internet access in this city, situation with services aimed at MSM, different policies of different dating sites on the positioning and target groups, the youngest and the oldest age of the users etc. The correlation coefficient between the size of MSM calculated in the corresponding city and population of this city became an argument when choosing a method of coefficients’ use (individual for a city or average at dating sites)<sup>43</sup>.

Therefore, the procedure of determination of local estimates based on the indicators of using Internet dating sites was as follows:

- 1) Data on the size of MSM using Internet sites «qguys.ru» and «loveplanet.ru» in each of the surveyed cities were obtained;
- 2) According to the survey, percentage of MSM who indicated having profiles on sites «qguys.ru» or «loveplanet.ru» was defined. Generally, 30,1% of all the interviewed MSM indicated having personal pages at «qguys.ru» and 12,37% - at «loveplanet.ru».
- 3) Local estimates of MSM were calculated based on the number of users of the surveyed sites in each of the city and general indicator of their popularity among MSM (see table14).

**Table 34. Calculation of local estimates of the size of MSM based on the indicators of using Internet dating sites**

City	Number of profiles of MSM at the site qguys.ru, people	Local estimate of the general size of MSM (qguys.ru), people	Number of profiles of MSM at the site loveplanet.ru, people	Local estimate of the general size of MSM (loveplanet.ru), people
	A1	$B1 = A1 / 0,301$	A2	$B2 = A2 / 0,1237$
	Statistical information	Estimated size	Statistical information	Estimated size
Simferopol	892	2 963	437	3 524
Vinnitsia	511	1 698	337	2 718
Lutsk	284	944	171	1 379
Dnipropetrovsk	1 899	6 309	1 053	8 492
Donetsk	2 244	7 455	1 103	8 895
Kryvyi Rig	624	2 073	409	3 298
Zhytomyr	305	1 013	159	1 282

<sup>43</sup> Statistical information on age and sex distribution of the Ukrainian population as of 1.01.2010 according to the State Statistics Service of Ukraine

Uzhgorod	368	1 223	97	782
Zaporizhzhia	923	3 066	528	4 258
Ivano-Frankivsk	359	1 193	203	1 637
Kirovograd	265	880	156	1 258
Lugansk	877	2 914	505	4 073
Lviv	1 480	4 917	599	4 831
Mykolaiv	589	1 957	402	3 242
Odesa	3 126	10 385	1 195	9 637
Poltava	378	1 256	249	2 008
Rivne	264	877	167	1 347
Sumy	382	1 269	218	1 758
Ternopil	289	960	151	1 218
Kharkiv	3 118	10 359	1 342	10 823
Kherson	473	1 571	256	2 065
Khmelnyskyi	280	930	185	1 492
Cherkasy	342	1 136	214	1 726
Chernivtsi	376	1 249	-	-
Chernigiv	-	--	-	--
Kyiv	16 244	36 259	3 285	34 579
Sevastopol	744	2 472	374	3 016

#### Formation of estimated ranges of MSM, validation and extrapolation of estimates to the regional level

Local estimates of the size of MSM calculated based on the indicators of using Internet dating sites formed their own estimated ranges to which extrapolation procedures were further used.

As an extrapolation factor the indicator of the ratio of male population of the region to male population of the regional center aged 15-59 years was used. Argumentation for the use of extrapolation factor defined purely based on statistical data of the population to all local estimates without exception is caused by an assumption that the specific share of MSM in the male population does not have significant differences in different regions. A suggestion as to a lower concentration of MSM in small towns can be rather explained by the fact that a higher level of MSM stigmatization is observed there than in large cities.

**Table 4. Results of the estimation of the size of MSM at local level and their extrapolation to regional level**

City <sup>44</sup>	Estimates of the size of MSM at local level (approximated to 100), people		Extrapolation factor (k)	Region (AR of Crimea / Region / City)	Estimates of the size of MSM at regional level (approximated to 100), people	
	MIN <sub>L</sub>	MAX <sub>L</sub>			MIN <sub>R</sub> = MIN <sub>R</sub> * k	MAX <sub>R</sub> =

<sup>44</sup> Estimates of the size for Bila Tserkva and Chernigiv were defined on the analogy to the estimate, which was calculated according to the available indicators for Kriviy Rig, because Bila Tserkva and Chernigiv as well as Kriviy Rig are cities located near megalopolises. Отже, для них було здійснено зворотню процедуру оцінювання, а визначені оцінки відповідають чисельності приблизно 0,3%-0,5% від загального чоловічого населення цих міст віком від 15 до 59 років.



						MAX <sub>R</sub> * k
Simferopol	3 000	3 500	3,8	AR of Crimea	11 400	13 300
Vinnitsia	1 700	2 700	2,1	Vinnitsia	3 600	5 700
Lutsk	900	1 400	2,6	Volyn	2 300	3 600
Dnipropetrovsk	6 300	8 500	2,8	Dnipropetrovsk	17 600	23 800
Donetsk	7 500	8 900	4,2	Donetsk	31 000	37 400
Zhytomyr	1 000	1 300	2,6	Zhytomyr	2 600	3 400
Uzhgorod	800	1 200	1,4	Zakarpattia	1 100	1 700
Zaporizhzhia	3 100	4 300	1,8	Zaporizhzhia	5 600	7 700
Ivano-Frankivsk	1 200	1 600	2,5	Ivano-Frankivsk	3 000	4 000
Bila Tserkva	600	1 000	5	Kyiv	3 000	5 000
Kirovograd	900	1 300	2,6	Kirovograd	2 300	3 400
Lugansk	2 900	4 100	4,7	Lugansk	13 600	19 300
Lviv	4 800	4 900	2,1	Lviv	10 100	10 300
Mykolaiv	2 000	3 200	1,6	Mykolaiv	3 200	5 100
Odesa	9 600	10 400	1,6	Odesa	15 400	16 600
Poltava	1 300	2 000	3	Poltava	3 900	6 000
Rivne	900	1 300	2,2	Rivne	2 000	2 900
Sumy	1 300	1 800	2,8	Sumy	3 600	5 000
Ternopil	1 000	1 200	2,1	Ternopil	2 100	2 500
Kharkiv	10 400	10 800	1,5	Kharkiv	15 600	16 200
Kherson	1 600	2 100	2,2	Kherson	3 500	4 600
Khmelnitskyi	900	1 500	2,8	Khmelnitskyi	2 500	4 200
Cherkasy	1 100	1 700	2,4	Cherkasy	2 600	4 100
Chernivtsi	600	1 200	1,5	Chernivtsi	900	1 800
Chernigiv	600	1 000	2,3	Chernigiv	1 400	2 300
Kyiv	34 600	36 300	1	City of Kyiv	34 600	36 300
Sevastopol	1 600	2 500	1	City of Sevastopol	1 600	2 500

Calculations of the size of MSM in Ukraine have been conducting since 2005. In 2005 the size of this group ranged from 303 thousand persons representing 2,5% of male population of Ukraine or 3,6% of urban male population of Ukraine aged 15–49 years. In 2009 in the absence of reliable methods the size of MSM was estimated at the level of 95 thousand people or 1,3% of general male population aged 15–49. In the course of time methodology of calculating the size of the hidden groups improved and methods used in 2012 gave us an opportunity to estimate the size of MSM in Ukraine at the level of 225 thousand people representing 1,7% of urban male population aged 15-59 years.

Taking into account the experience of similar studies in Ukraine, UNAIDS recommendations for countries of Eastern Europe on determination of the size of MSM in the range from 2 to 5% of male population of the country and experts' opinions, it could be predicted that estimates of the size of MSM received within this survey are more adequate than the previous ones.

The estimated ranges of the size of MSM calculated in such a way at the regional level were submitted for consideration and approval to regional councils on HIV/AIDS and other socially dangerous diseases. Most regions agreed to the proposed estimated range of the size of MSM and approved estimation within its limits.

The amount of the approved regional estimates of the size of MSM is lower than the amount of recommended regional estimates – 176 000 MSM. It means that the share of MSM among male population of Ukraine aged 15-59 years makes out 1,2%. Taking into consideration the UNAIDS

recommendations on the percentage of MSM among general population, researchers believe that national estimates of the size of MSM based on the amount approved in the regions are underestimated. The approved estimates are given in the chapter “Key results of the estimation of the size of groups most-at-risk for HIV infection in Ukraine in 2012” of this report. Comments on the use of estimates are given in the table with the approved data for those regions that did not agree with the recommended estimates and did not provide arguments in favor of lowering the estimated size of MSM.

## USED AND RECOMMENDED LITERATURE

LAW OF UKRAINE «On the Approval of the National Programme for HIV Infection Prevention, Treatment and Care of the HIV-Positive People and People Living with AIDS for 2009-2013» of the 19<sup>th</sup> of February, 2009 N 026-VI

REGULATION of 13<sup>th</sup> of September, 2010 N 1808-p “On the Approval of the Concept on Public Policy on Combating Drug Abuse, Illicit Trafficking of Narcotic Drugs, Psychotropic Substances and Precursors for 2011-2015”

Methodological guidelines on conducting researches to monitor the national HIV epidemic response. / O. M. Balakirieva, M.Y. Varban, G.V. Dovbakh [et al.], ICF «International HIV/AIDS Alliance in Ukraine». – K.: 2008.

Creation of the NGO network working with female sex workers in Ukraine / Balakirieva O.M., Andrushchak L.I., Varban M.Y. – K.: Ukrainian Institute for Social Research, 2000. – P.82.

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Estimation of the size of groups most-at-risk for HIV infection in Ukraine / Balakirieva O.M., Gusak L.M., Dovbakh G.V., Lavrenov O.O., Paniotto V.I., Petrenko T.V., Pogorila N.B., Saliuk T.O., Sydiak S.V., Khutkyi D.O., Shamota T.S. – Kyiv: ICF “International HIV/AIDS Alliance in Ukraine”. – 2006.

Analytical report based on the results of the sociological survey “Estimation of the size of groups most-at-risk for HIV infection in Ukraine” as of 2009 / Berleva G.O., Dumchev K.V., Kobysycha Y.V., Paniotto V.I., Petrenko T.V., Saliuk T.O., Shvab I.A. – Kyiv: ICF “International HIV/AIDS Alliance in Ukraine”. – 2010.

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## ANNEXES

## ДОДАТКИ

## Annex 1. IDU estimation coefficient factor calculation

Oblast/region	City	Number of people with mental disorders due to intravenous drug use.			<i>Number of urban population 15-59 (as of 1.01.2010)</i>			Averaged extrapolation factor
		Oblast/region	City	extrapolation factor	Oblast/region	City	extrapolation factor	
AR Crimea	Simferopol	2629	1036	2,5	807,7	220,3	3,7	<b>3,1</b>
Vinnitsia	Vinnitsia	963	449	2,1	546,9	258,6	2,1	<b>2,1</b>
Lutsk	Lutsk	1458	806	1,8	360	145,5	2,5	<b>2,2</b>
Dnipropetrovsk	Dnipropetrovsk	7818	1948	4,0	1854,6	666,9	2,8	<b>3,4</b>
Donetsk	Donetsk	8789	1789	4,9	2651	648	4,1	<b>4,5</b>
Zhytomyr	Zhytomyr	836	291	2,9	494,6	189	2,6	<b>2,8</b>
Uzhgorod	Uzhgorod	167	145	1,2	305,5	227,7	1,3	<b>1,3</b>
Zaporizhzhia	Zaporizhzhia	5349	3246	1,6	926,6	523,3	1,8	<b>1,7</b>
Ivano-Frankivsk	Ivano-Frankivsk	585	306	1,9	402,4	158,8	2,5	<b>2,2</b>
Kyiv	Bila Tserkva	1157	244	4,7	715,1	145,1	4,9	<b>4,8</b>
Kirovograd	Kirovograd	2465	956	2,6	409,3	158,2	2,6	<b>2,6</b>
Lugansk	Lugansk	4471	1644	2,7	1332,7	295,7	4,5	<b>3,6</b>
Lviv	Lviv	1006	479	2,1	1030,5	494,3	2,1	<b>2,1</b>
Mykolaiv	Mykolaiv	2247	1612	1,4	538,1	336,5	1,6	<b>1,5</b>
Odesa	Odesa	6003	3997	1,5	1059,4	670,4	1,6	<b>1,6</b>
Poltava	Poltava	1734	669	2,6	601,8	201,6	3,0	<b>2,8</b>
Rivne	Rivne	1013	706	1,4	378,4	177,3	2,1	<b>1,8</b>
Sumy	Sumy	1005	340	3,0	533	191,3	2,8	<b>2,9</b>
Ternopil	Ternopil	531	402	1,3	324,3	154,4	2,1	<b>1,7</b>
Kharkiv	Kharkiv	1942	1081	1,8	1496,4	996,4	1,5	<b>1,7</b>
Kherson	Kherson	2203	1128	2,0	440,4	201,2	2,2	<b>2,1</b>
Khmelnyskyi	Khmelnyskyi	1823	1075	1,7	497,8	183,9	2,7	<b>2,2</b>
Cherkasy	Cherkasy	1765	748	2,4	484,8	198,1	2,4	<b>2,4</b>

Chernivtsi	Chernivtsi	679	478	1,4	258,1	174,7	1,5	<b>1,5</b>
Chernigiv	Chernigiv	1788	1155	1,5	462,6	202,7	2,3	<b>1,9</b>
City of Kyiv Kyiv	Kyiv	8902	8902	1,0	1907,1	1907,1	1,0	<b>1,0</b>
City of Sevastopol	Sevastopol	1136	1136	1	234,3	223	1,1	<b>1</b>
<b>Ukraine</b>		<b>70464</b>			<b>21053,4</b>			

**Annex 2. FSW and MSM estimation coefficient factor calculation**

	<i>Number of oblast/region urban population 15-59, (as of 1.01.2010), thousand people</i>				<i>Number of city (oblast center) urban population 15-59, (as of 1.01.2010), thousand people</i>			<b>FSW estimates extrapolation factor</b>	<b>MSM estimates extrapolation factor</b>
	<i>Male and Female</i>	<i>Male</i>	<i>Female</i>		<i>Male and Female</i>	<i>Male</i>	<i>Female</i>		
<b>Oblast/region</b>				<b>City</b>					
AR Crimea	807,7	378,2	429,6	Simferopol	220,3	100,4	119,9	<b>3,6</b>	3,8
Vinnitsia	546,9	257,4	289,5	Vinnitsia	258,6	120	138,6	<b>2,1</b>	2,1
Luts'k	360	169,2	190,9	Luts'k	145,5	66,2	79,3	<b>2,4</b>	2,6
Dnipropetrovsk	1854,6	881,3	973,2	Dnipropetrovsk	666,9	315,8	351,1	<b>2,9</b>	2,8
Donetsk	2651	1260,9	1390,1	Donetsk	648	298,4	349,6	<b>4,0</b>	4,2
Zhytomyr	494,6	236,4	258,2	Zhytomyr	189	89,7	99,4	<b>2,6</b>	2,6
Uzhgorod	305,5	146,6	158,9	Uzhgorod	227,7	106,4	121,3	<b>1,3</b>	1,4
Zaporizhzhia	926,6	438,3	488,3	Zaporizhzhia	523,3	247,1	276,2	<b>1,8</b>	1,8
Ivano-Frankivsk	402,4	193,6	208,8	Ivano-Frankivsk	158,8	76	82,8	<b>2,5</b>	2,5
Kyiv	715,1	342,4	372,7	Bila Tserkva	1907,1	901	1006,1	<b>4,8</b>	5
Kirovograd	409,3	192,3	216,9	Kirovograd	158,2	73,8	84,5	<b>2,6</b>	2,6
Lugansk	1332,7	638,9	693,8	Lugansk	295,7	136	159,7	<b>4,3</b>	4,7
Lviv	1030,5	500,5	530	Lviv	494,3	238,8	255,5	<b>2,1</b>	2,1
Mykolaiv	538,1	254,3	283,8	Mykolaiv	336,5	157,8	178,8	<b>1,6</b>	1,6
Odesa	1059,4	512,8	546,7	Odesa	670,4	326	344,4	<b>1,6</b>	1,6
Poltava	601,8	285,4	316,4	Poltava	201,6	95,7	105,9	<b>2,3</b>	3
Rivne	378,4	177,6	200,8	Rivne	177,3	82	95,3	<b>2,1</b>	2,2
Sumy	533	249,5	283,5	Sumy	191,3	88,3	103,1	<b>2,7</b>	2,8
Ternopil	324,3	153,6	170,7	Ternopil	154,4	71,9	82,4	<b>2,1</b>	2,1
Kharkiv	1496,4	715,7	780,7	Kharkiv	996,4	476,6	519,8	<b>1,5</b>	1,5

Kherson	<i>440,4</i>	<i>208,5</i>	<i>232</i>	Kherson	<i>201,2</i>	<i>94,1</i>	<i>107,1</i>	<b>2,2</b>	2,2
Khmelnyskyi	<i>497,8</i>	<i>236,4</i>	<i>261,4</i>	Khmelnyskyi	<i>183,9</i>	<i>85,9</i>	<i>98</i>	<b>2,7</b>	2,8
Cherkasy	<i>484,8</i>	<i>227,5</i>	<i>257,3</i>	Cherkasy	<i>198,1</i>	<i>93,2</i>	<i>104,9</i>	<b>2,5</b>	2,4
Chernivtsi	<i>258,1</i>	<i>122</i>	<i>136,2</i>	Chernivtsi	<i>174,7</i>	<i>81,4</i>	<i>93,3</i>	<b>1,5</b>	1,5
Chernigiv	<i>462,6</i>	<i>220,2</i>	<i>242,4</i>	Chernigiv	<i>202,7</i>	<i>97</i>	<i>105,7</i>	<b>2,3</b>	2,3
City of Kyiv	<i>1907,1</i>	<i>901</i>	<i>1006,1</i>	Kyiv	<i>1907,1</i>	<i>901</i>	<i>1006,1</i>	<b>1,0</b>	1,0
City of Sevastopol	<i>234,3</i>	<i>112,5</i>	<i>121,9</i>	Sevastopol	<i>223</i>	<i>107</i>	<i>115,9</i>	<b>1,1</b>	1,1