Population Size Estimation of People Who Inject Drugs in Selected High Priority Countries: Review of Current Knowledge
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Preface and Acknowledgments

This report investigates the methodologies used to obtain current population size estimates of people who inject drugs (PWID) in China, India, Philippines, Myanmar, Tajikistan, Kyrgyzstan, Uzbekistan, Kazakhstan, Belarus, and Libya.

In this synthesis report, current population size estimates are presented, with evaluations of accuracy, based on the type of methodology used. Recommendations are made to build data capture or infrastructure that will allow for the most appropriate methodology to update estimates of the country’s PWID population, if necessary.

We hope that this review will be useful in prioritizing and allocating resources to gain a better understanding of the PWID population size and the mobilization of resources to change the dynamics of the epidemic in the respective countries.

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List of Abbreviations

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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AIDS</td>
<td>Acquired immunodeficiency syndrome</td>
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<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<td>HRI</td>
<td>Harm Reduction International</td>
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<td>IBBS</td>
<td>Integrated Biological and Behavioral Surveillance</td>
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<td>PWID</td>
<td>People who inject drugs</td>
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<td>RDS</td>
<td>Respondent-driven sampling</td>
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<td>UNODC</td>
<td>United Nations Office of Drugs and Crime</td>
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Executive Summary

This document summarizes the state of knowledge of the injecting drug use population sizes in 10 priority developing or transitioning countries (Belarus, China, India, Kazakhstan, Kyrgyzstan, Libya, Myanmar, Philippines, Tajikistan, and Uzbekistan). Estimates of the size of PWID are critical as they are needed to understand the magnitude of the drug use epidemic, allocate adequate resources, design and implement programs, monitor the coverage and impact of programs, and advocate for better policies and programs.

Information was gathered from peer-reviewed and grey literature for information related to size of the PWID populations in these countries, as well as key staff from relevant international organizations (USAID, CDC, UNAIDS, UNODC) and implementing organizations (International HIV/AIDS Alliance, FHI360). Additionally, for the four Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan), UNODC convened a stakeholder meeting with representation from government (including Ministry of Health and drug control agencies) and NGOs implementing PWID size estimation data collection in June 2014. The meeting entailed gathering information on current size estimation activities from country representatives and developing concrete recommendations for next steps in each country.

Overall, with the exception of India, these countries lack the infrastructure and resources for routine and timely data capture and analysis to inform policy and programs adequately. On the other end of the spectrum from India is Libya, where there has been a recent surge in HIV in PWID and there has been virtually no information on the size estimates of PWID. In such a case, there is an immediate need for population size estimation. While size estimates for many of the priority countries could be found in the literature, generally, the methodologies were not well-specified, which brings into question the accuracy of these estimates. In some cases, estimates were based on Delphi method of expert self-reporting or only one method of estimation had been used, which reduces the robustness of the estimates. Basic needs for data and estimation include sub-national and national estimates and breakdown of population estimates by age and sex.

Country-specific recommendations are made on next steps to improve estimates, and include recommendations to standardized estimates for comparisons across countries and to ensure that multiple estimates from multiple methods are used to determine a range for the estimate. Where possible, recommendations for data collection build on existing infrastructure. First, we recommend using routine or sentinel surveillance data registers from multiple PWID services, where possible and relevant, as a cheaper and faster way to get rough estimates of PWID population sizes. Second, we recommend incorporating PWID population size estimation data collection into existing or planned integrated biological-behavioral surveillance (IBBS) surveys as a low-cost opportunity to derive multiple size estimates. This method is considered low-cost because it only requires adding a few questions into the survey and/or adding unique object distributions. Third, in countries where there is no IBBS or where incorporating size estimation with the next IBBS is not feasible, we recommend conducting a simplified respondent-driven sampling (RDS)-based survey, which incorporates various size estimation methods. Though assessments of feasibility and cost-effectiveness of this method might be needed, this simplified survey would forego the normal lengthy behavioral survey and sero-testing, which would greatly reduce the time and expense needed to implement the survey. In addition, some global health organizations have been conducting frequent behavioral tracking surveys (similar to a simplified IBBS survey), and size estimation components can be added into these surveys if planned ahead of time. We also advocate for incorporating size estimation exercises into national surveys where appropriate (e.g., AIDS Indicator Survey, Demographic and Health Survey; Expenditure Survey). This would provide more data in a cost-saving way for triangulation and strengthening the estimates.
Background and Objectives

Worldwide, according to UNODC World Drug Report, the 2013 estimate for the size of the people who inject drugs (PWID) population is 14 million people between the ages of 15 to 64.\(^1\) This is down from 15.9 million in 2008 which may reflect improved availability of more reliable data as well as changes in injecting behavior.\(^1\)

Globally, PWID are disproportionately affected by HIV, with HIV prevalence in this population being significantly higher than the prevalence in the general population. For example, the 2012 estimates of global new infections for Eastern Europe and Central Asia indicate that HIV infection among PWID and their sexual partners accounted for 40% of new HIV cases; in the Philippines, 36% of new infections were attributed to PWID.\(^2\)\(^3\) As a consequence, PWID are a population of interest in HIV prevention, in assessing local and global populations at risk, and in informing prevention and treatment efforts going forward. To date, data on the size of the PWID population in many countries, including countries where HIV prevalence is high or growing, are scarce or inaccurate.

The drug-using population is a difficult population to assess. Their illegal and stigmatized behaviors make estimates from surveys of general populations inaccurate, and increase bias in many data sources. Reliable estimates of the size of PWID populations are critical to understanding the magnitude of the drug use epidemic, allocating adequate resources, designing and implementing programs, monitoring the impact of programs, and advocating for better policies and programs for PWID. Population size estimates are also critical to projection and estimation of HIV infections, and HIV infections averted under certain intervention programs, through mathematical modeling. Finally, size estimates are an important part of strategic information as accurate estimates are needed to set appropriate program targets and assess the adequacy of program coverage.

Some countries have initiated the recommended Comprehensive Package of HIV services (WHO/UNODC/UNAIDS), which includes interventions among PWID. These interventions require knowledge of sizes for planning purposes, and places where the intervention activities should target. Different methods have different advantages and limitations and each method might be more relevant for certain settings and purposes, which will be described in the next chapter. In addition, without more robust estimates of the PWID population, it would be challenging to determine the coverage and impact of the current programs targeting this population. Size estimations are also needed by some countries to justify initiating PWID interventions in countries where current resources are inadequate.

This document summarizes population estimates for PWID in ten priority countries selected by The World Bank and UNODC, and outlines methods used for estimation. Recommendations for additional data collection and analytical methods are provided by country.
Overview of Key Methods Used for Estimating the Size of PWID Populations

There is no gold standard method for estimating the size of PWID populations and choosing a method depends on several factors, including cost and time, what the data will be used for, what data are already available, and the legal environment. Selection of methodologies should be informed by formative research in the local contexts where size estimations are required. In this section, we present some of the most common methods that have been used to estimate the size of key populations, including PWID. We aim to provide a brief description of select methodologies, data requirements, and advantages and limitations for each of these methods. Details for some of these methods can be found in the UNAIDS and WHO Guidelines on Estimating the Size of Populations Most at Risk to HIV. A summary table of the methods discussed in this section are presented in Appendix I.

CENSUS AND ENUMERATION METHODS
Censuses are efforts to count all members of a target population. For PWID, however, it is not possible to count all PWID within population households, and a census of PWID would likely need to be venue-based. Venues where PWID congregate are identified by individuals familiar with the local context at all “hotspots” (i.e., congregation venues, injection sites, etc.) and identified areas are mapped. These identified venues are then accessed and PWID are then counted. Reported numbers may serve as the lowest number in the estimate range, as members of these groups can remain hidden. This method is preferred for sub-locations or small geographical areas. Together with location coordinates collected from mapping, these data are useful for targeted intervention programs.

Enumeration is similar to census, but instead of counting every individual at every site or hotspot, a sample of sites are chosen from a sample frame or list of venues, and only individuals within those chosen venues are counted. Final numbers are then inflated to reflect the estimate of all sites (in the selected region or location). For example, from a list of hotspots in a district, select and visit one third of the hotspots to get an average number of PWID in these selected hotspots. Then multiply by 3 to get an estimate of PWID in the whole district. Enumeration method is used when it is only possible or feasible to reach a fraction of the target populations due to time, budget, or access constraints.

CAPTURE-RECAPTURE METHOD
The capture-recapture method derives a population size estimate using two different population counts within a defined area. In the first count (capture), PWID are counted and “tagged” with a unique object so they may recall easily that they were counted. A second count (recapture) is conducted after a minimal time period, for instance, 1-2 weeks. A mathematical formula is then used to estimate of total population size \[\text{Estimated Size} = \frac{\text{number in first capture} \times \text{number in second capture}}{\text{number in both captures}}\].

The key steps in capture-recapture are below:

- teams visit and map all hotspots
- enumerators count all PWID in each hotspot and distribute some card/ gift (something unique and easy to identify) “tag”
- enumerators re-visit the same sites one or two weeks later and count of all PWID and ask whether they received the token/card/gift (count both previously tagged and untagged)

Capture-recapture assumes:
• No major migration between the two captures (a closed population).
• It is possible to identify and match individuals in the two captures.
• Every member has an equal chance of being included in either count.
• The two samples are independent from each other, meaning that the probability of identification in the second count is not biased based on their identification in the second count.
• The sample size for each capture needs to be large enough to be precise.

These assumptions may pose challenges during implementation. For example, PWID may move rapidly between locations, or police may conduct raids in PWID hotspots between counts. This, of course, may affect the probability of being re-captured. In addition, the estimate is only reliable when the number of matched individuals in the two captures is large enough. However, this method is easy to implement and has been used successfully in many countries to estimate the size of PWID and other stigmatized and/or criminalized populations.

**MAPPING AND INTERVIEWS OF KEY INFORMANTS**

This method was developed by researchers with the University of Manitoba, and has been implemented successfully in several countries in Asia and sub-Saharan Africa. It includes a geographic mapping of key locations where target populations congregate. Preliminary steps of the geographic mapping involve developing or acquiring maps of the targeted area, segmentation of the target area into smaller geographic zones to facilitate field work data collection. After the mapping step, interviews with primary and secondary key informants are conducted to verify the list of hotspots, estimate number of target population at each hotspot, and identify peak time and date at each location for the next step. At the second step, enumerators visit each hotspot at the peak time and date, and interview primary key informants to get an estimate of minimum and maximum number of target population. Average, minimum, and maximum numbers are then calculated.

Similar to capture-recapture, this method may likely miss segments of the target populations that do not congregate or spend much time in venues. In addition, it relies on informant estimates rather than actual counts of target population at the spots identified, which may lead to biases in the estimates. A key advantage of this approach is that it is easy to implement and the results tend to be informative for program implementation. The mapping data can be used in HIV programming for a variety of purposes, including planning, outreach activities, peer-education activities, and setting up services to meet the needs of the target population.

**SERVICES MULTIPLIER**

This method requires at least two aggregate data sources. The first data source is obtained from a program that provides services to PWID. The other is the proportion of PWID receiving services from that particular program obtained through a population-based survey. As an example, Source 1 might be the number of PWID captured in opioid substitution programs. Source 2 might be the prevalence of PWID who enroll in opioid substitution programs, discovered through a survey based on probability-based sampling. For example, if 100 people are registered in an opioid substitution program, and a representative sample of PWID show a 20% enrolling at the same opioid substitution program, the estimate would be:

\[
100 \times \frac{100}{2} = 5,000 \text{ PWID}
\]

The underlying assumptions for this method are:

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* The survey should be ideally conducted among PWID using probability-based sampling to reduce biases.
• The first data source should be complete—in our example, the enumerated population must include the count of all PWID in the opioid substitution program.
• The second data sources should be derived from a representative sample.
• The two data sources must define PWID in the same way.
• The definition and the timeframe for the first data source should be the same as the definition and the time frame in the second data source. For example, if the program data counts PWID seeking services for a full year of 2012, then survey should ask participants if they seek services at that program during the full year of 2012.
• Both data sources must be independent.

This method can be advantageous as researchers can make use of a wide range of available data sources if they are available. Program data can be obtained at relatively low cost; while second source of data (multiplier) can be incorporated in current or up-coming surveys. In addition, several service multipliers (more than two) can be used on the same survey to strengthen the estimates (e.g., producing a median estimate and range). The choice of service multipliers is determined by the availability and quality of the unduplicated count available in each location during the formative phase of the project.

**UNIQUE OBJECT MULTIPLIER**
This method uses 2 different data sources and the formula to estimate the size is similar to the capture recapture method.

First multiplier: 1 week before the survey, peer educators from community outreach projects distribute simple object to people they identify as PWID. Each person receives only 1 object, and will be asked to keep the object (not to distribute the object to their peer). The goal will be to distribute as many of the unique objects as possible.

The second multiplier: will be enumerated during a survey (ideally RDS survey) among PWID in the same catchment areas where objects were distributed. The RDS survey will ask each participant the following questions:

  o Have you received this object in the past 1 week (or applicable time period)?
  o From whom did you receive it (if they have received a watch from someone other than a peer educator, they will be eliminated from the multiplier).
  o Where did you receive it? (To verify the object was received in the catchments area).

The unique object identifier method is advantageous in that it is controlled by the survey team and may reduce potential bias. This method is favored when combining with a probability sampling survey (for example with an RDS survey).

**WISDOM OF THE CROWD**
Wisdom of the crowd (WOTC) is based on the assumption that, when asked to estimate the number of members in a population of interest, the average response of a surveyed population approximates the actual number in the population of interest. This method relies on the knowledge of members of the target population. For example, in an IBSS survey among PWID, survey participants were asked to estimate the average number of PWID in a particular location. The median of the responses is considered the size of the PWID population for that particular location. While the most desirable use for WOTC is within a population-based surveillance survey, it is also sometimes may be used among venue-based or non-probability samples (such as with key informants).
DELPHI METHOD
In Delphi methodology, an estimate is generated by systematically soliciting, sharing and collectively reviewing selected expert knowledge on the size of a target population (i.e. PWID in this case). Often, this process involves a series of expert-panel meetings where these experts are asked to estimate how many PWID are in a particular location. Each estimate or opinion undergoes a series of reviews by the other experts. Authors are encouraged to reconsider their estimates in light of feedback.

The accuracy and quality of Delphi estimates may vary widely. This is dependent on the availability (or lack of) data sources. Often the Delphi method is employed when systematic size estimation data is currently lacking, and thus based on limited information.

NETWORK SCALE-UP (NSUM)
Network scale-up estimates are generated by asking a sample of the general population about people known to them – their “network” – and how many engage in the behavior of interest, in this case, injection drug use. The below information must be collected:

1. The average network size (person they know/acquaintance) of the survey participants.
2. In their personal network, the percent of people they know who inject drugs.
3. Size of the general population for a particular geographical location where you want to estimate PWID size.

For example, if the average network size from a survey is 50, and the average percentage of PWID they know in the networks is 0.1%, then the estimated size of PWID in City A with a total population of 500,000 will be: (0.1 x 500,000) / 50 = 1000.

This method can be incorporated into ongoing national household surveys such as the Demographic and Health Surveys or AIDS indicator surveys. Advantages include that it generates an estimate from a sample of the general population rather than the target population. This is particularly important because individuals are more comfortable reporting sensitive behaviors of others than their own. The limitations are that in certain places, PWID might not associate with the general population, and thus are not known as PWID to the survey respondents. In addition, estimating network sizes can be challenging. Additionally, since the prevalence of injection drug is often low among the general population, this method requires a large sample size in order to capture PWID.

GENERAL POPULATION SURVEY
This method is similar to the network scale up method that uses general population surveys. However, instead of asking drug injecting behavior of people in a participant’s personal network, it asks participants about their own drug injecting behavior. This method is easy to use and social-desirability bias can be reduced by using computer assisted personal interview or online surveys. Some PWID, however, may not be easily reached through traditional household sampling methods employed by these surveys.

NATIONAL LEVEL POPULATION SIZE ESTIMATES
Often size estimates of key populations are produced for major urban or other specific areas of a country. While helpful in local planning or estimate adjustments, these estimates and the prevalence they generate cannot in themselves provide data-supported estimates for a whole country. Using statistical methods to extrapolate population size from areas where estimation has been performed to areas where it has not is one approach to constructing country-wide estimates. However, careful review and understanding of the regional differences in drug-using characteristics is important so that programmatic decisions can be adjusted accordingly. For example, in some countries there may be a high prevalence of
PWID in rural communities, or in border areas, or along drug trafficking routes but very low prevalence in other areas. The quality of national PWID population size estimates can be highly dependent on the quality of each regional or local estimate. For this reason, review of the method used to have a sense of data quality and credibility is important in every national estimation effort. Caution should also be taken if only urban estimates exist, as applying urban population prevalence to other areas could overestimate the size of the PWID population.
Reported Estimates and Methodologies

Current sub-national and national estimates, along with their estimation methodologies, as available, are shown in Appendix 2. The information was gathered through literature review (published and grey) and communications with various local and international stakeholders (i.e., regional representatives of USAID, CDC, UNAIDS, and UNODC as well as some implementing organizations such as International HIV/AIDS Alliance and FHI360). Additionally, for the four Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan), UNODC convened a stakeholder meeting with representation from government (including Ministry of Health and drug control agencies)\(^b\) and NGOs implementing PWID size estimation data collection in June 2014. The meeting entailed gathering information on current size estimation activities from country representatives and developing concrete recommendations for next steps in each country.

With the major exception of India, a large part of these estimates are based on two comprehensive systematic literature reviews (Aceijas, 2004 and Mathers, 2008) summarizing global drug injection prevalence by country. These papers utilize a vast number of grey and research literature, and thus provide a broader regional understanding of sizes and the estimation methods. Many estimates are reported with insufficient details about methodology, preventing further evaluation of the data quality. Some estimates show wide variation between analogous populations that raise questions about the accuracy of estimates, and warrant further investigations. Many estimates are old and provide no information on demographics or subpopulations. Because most of these estimates are not part of routine data reporting, they provide little information on trends.

RECOMMENDATIONS FOR COUNTRY PWID ESTIMATES

In addition to country-specific data review, synthesis, and recommendations, some overarching principles for estimating the size of PWID populations are recommended below:

- **Capacity building** is needed on assessing the quality of existing population size estimates in countries and conducting data collection to obtain population size estimates, especially at the local or regional levels.

- **Multiple methods** of population size estimates should be obtained to triangulate estimates and obtain a median of the estimates. The use of multiple methods strengthens confidence in estimates, provides upper and lower plausibility bounds, and reduces the likelihood that biases from any single method will substantially alter results.

- **Integration of methods** into planned national or regional IBBS activities is encouraged to maximize efficiencies in cost and resource use. Since the regular use of IBBS is increasing in many countries, incorporating population size estimation activities as part of the IBBS (e.g., various multiplier methods, unique object identifiers, and WOTC) represents an opportunity to establish regular updates in PWID population size estimates.

- For countries that do not conduct regular IBBS or if the PWID population size estimates are desired sooner than the next round of IBBS, we recommend a variation of this protocol (a **simplified RDS-based survey**). This would produce (a) PWID population-based size estimates and (b) be reliable/comparable if replicated in future IBBS surveys using RDS recruitment. To adapt the protocol, the behavioral survey and the HIV testing procedures are eliminated from the IBBS. The formative assessment and recruitment of participants using RDS would remain the same. Some cost savings (compared to a full

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\(^b\) Government representatives from Uzbekistan were not present at the stakeholders meeting in Astana, Kazakhstan.
IBBS using RDS) would be achieved by eliminating medical supplies and serotesting and hiring of less staff, but the implementation time may be similar to a full IBBS. Instead of the lengthy behavioral survey, participants would be administered a brief questionnaire (approximately 10 questions) that includes screening questions, demographics, peer network size, and population size estimation-related questions. The following population size estimation methodologies may be incorporated into the simplified RDS-based survey: various multiplier methods, unique object identifiers, and WOTC.

- In most countries, there may be existing data sources (such as drug treatment data, arrests, and registries, perhaps even from sentinel surveillance sites) on drug use. These should be considered when using service multiplier method or for capture-recapture method. Formative assessment should be conducted to ensure that these sources are complete and accurate.

- PWID size estimation activities should try to disaggregate by sex and age where possible. Females who inject drugs have not been well-assessed in these countries, and more concrete data is needed. This information is crucial as evidence shows that compared to men who inject drugs, women who inject drugs have typically higher rates of HIV, higher levels of risky injecting and sexual behaviors, higher mortality rates, and faster progression to drug dependence. Without sex-disaggregated data, it is difficult to ascertain whether there are sufficient services for women who inject drugs and if there are disparities in access to services.

**LIMITATIONS IN THE ASSESSMENT OF COUNTRY PWID ESTIMATES**

The review of country-level PWID population size estimates presented several challenges. Primary barriers in gathering data for this assessment included the paucity of published estimates, lack of availability of translated reports, delays in communication responses from in-country officials, and lack of final dissemination or government approvals to publish draft estimates. Many countries, notably in Central Asia, have actually conducted recent PWID size estimation activities, but reports had not been completed, translated, or disseminated. Therefore, it was difficult to systematically assess the quality of timely or current PWID size estimation activities and methods.

A standard systematic review would have (a) yielded only outdated information, (b) been difficult to replicate given the need for several personal communications and independent translations of unofficial presentations, and/or (c) not reflected several current ongoing activities or identified timely relevant needs. Also, the size estimations were often not described or described inadequately in a number of papers and documents. Thus, we were not able to grade or score the quality of estimates in a number of countries due to lack of available details.

Another limitation is the lack of estimates disaggregated by sex or other important mediating factors such as age, urban residence, or incarceration/residence in institutional settings.
Country-Specific Recommendations

Details of the review of the ten countries are provided in the Appendix. Tables include sources and methodologies used and the limitations and strengths of the methods. We provide our interpretation and recommendations below.

Belarus

**Overview of the HIV epidemic**
Belarus has a concentrated HIV epidemic with an average prevalence of 0.1%. Among PWID, the prevalence is 17.1%. Regional HIV prevalence varies, exceeding 40% among PWID in Svetlogorsk. High PWID prevalence are also found in Mogilev, Minsk, and Gomel Regions (Personal communications with International HIV/AIDS Alliance, Ukraine). Female PWID are highly involved in commercial sex. Harm reduction activities including opioid substitution programs are provided across the whole country.

**Review of the estimation data**
The estimates of PWID population in Belarus range from approximately 50,000 to 76,000 nationally. The officially reported estimate to UNAIDS is 75,000 in 2012. A reported registry count from 2005 was only 6,308. The registry or registries on which this estimate was based were not specified in the reference. One reference that details the methodology used for estimation was conducted in 2008 and was based on using capture-recapture with two different national level registries. The first registry was the Narcological Register as of the beginning of 2008, and the second register consisted of HIV positive persons who were identified to be drug users by the Department for HIV/AIDS Prevention of the National Centre for Hygiene, Epidemiology and Public Health as of January 2008. This yielded a national estimate of 76,281 (69,200 – 83,400). The estimation based on two data sources alone is likely subject to bias, especially due to the likely correlation between the two sources (i.e., being in one data source would influence that same person being captured in the other data source). In addition, both data are not representative of the PWID population.

A more recent estimate (2009) that was reported with some level of detail of the methodology was based on triangulation of multiple methods including service multiplier incorporated into a sentinel surveillance survey with PWID and the NSUM. The sentinel sites for PWID included 17 cities in Belarus. The service multiplier method used multiple services data as the multiplier (narcological service, law enforcement agency, hospital admissions for overdose in the last six months, and anonymous counseling centers for drug users), which increases the robustness of the population size estimate. National estimates obtained from the multiplier and NSUM were triangulated, resulting in an estimate of 45,247 (lower bound) and 65,246 (upper bound). Results from each of the different methodologies were not provided.

An RDS-based IBBS survey for PWID was implemented in 2013 in Minsk, Soligorsk, Gomel, Svetlogorsk, Pinsk, and Polotsk. Population size estimation was not incorporated into the survey but the survey included questions related to registration at narcological and psychiatric clinics and number of overdose cases. In addition, a client tracking database of a harm reduction program
provides the number of clients at local and national levels. These data sources have untapped potential for providing additional estimates.

**Recommendations**

It will be important to convene a stakeholder meeting in Belarus that includes government officials and drug control agency as well as relevant implementers. The stakeholder meeting will be important for understanding what size estimation exercise have been done, what data are available, and how useful the data are. Furthermore, it will also be worth determining if PWID population sizes can be estimated using the data collected in the 2013 IBBS (i.e., via service multiplier) given that questions related to registration at various service points were included in this survey. There is also a need for technical assistance on publishing the existing size estimation data through a writing support..

**China**

**Overview of the HIV epidemic**

China has a concentrated HIV epidemic with an estimated prevalence of 0.1% among the general population of adults aged 15-49.\(^1\) HIV prevalence is much higher among key populations including MSM, FSWs, and PWID.\(^1^8\) Regionally, the HIV prevalence is markedly higher in southwest and northwest China, especially in the provinces Yunnan, Sichuan, Guangxi, Guizhou, Guangdong, and Xinjiang.\(^1^9\)

Among PWID, the HIV prevalence is estimated at 6.3% (2012).\(^2^0\) China has diverse populations of PWID and their risks also vary significantly across regions and sub-groups. Injection drug use is estimated to be highest near drug trafficking routes (i.e. border towns and ports) and in some major cities.\(^2^1\)

**Review of the estimation data**

National estimates of the size of the PWID population range from 1 million to 2.35 million; with the highest numbers of PWID estimated to be in Yunnan, Guangxi, Henan, Xinjiang, Guangdong provinces (>50,000 PWID per province). Provinces which include estimates ranging from 10,000 to <50,000 PWID include Sichuan, Guizhou, Hunan, Chongqing, Zhejiang, Hubei, Anhui, and Jiangsu.\(^1,1^4,1^5,2^1-2^8\) China conducts regular size estimations of PWID, in which they use a combination of methods including service multipliers and others. PWID data in law enforcement registers have been used as a benchmark to estimate the size of PWID. Multiple data sources have been used to strengthen the estimates. Overall, the size estimate of PWID in China is fairly robust because there is a national process and they use multiple methods in many cities.

**Recommendations**

As China is a large and diverse country, we suggest the estimation efforts should continue to focus on regional levels, especially where the drug use are reportedly high. The regional estimates ensure its relevancy as well as directly inform programming and policies in each region. To supplement current efforts where relevant and possible, RDS-based surveys should incorporate size estimation components.

**India**

**Overview of the HIV epidemic**

India has a concentrated HIV epidemic with an estimated prevalence of 0.27% in 2011.\(^2^9\) The
epidemic is concentrated among sex workers, men who have sex with men, and PWID. The HIV prevalence also varies across different states. In particular, the North Eastern States have typically had much higher HIV prevalence compared to other areas and is largely driven by PWID. Other parts of the countries, which were previously perceived as having low prevalence, are experiencing increasing prevalence rates of infection; these include Punjab, Chandigarh, Delhi, Mumbai, Kerala, Odisha, Madhya Pradesh, Uttar Pradesh and Bihar. The estimated prevalence of HIV among PWID in India has remained stable around 7% since 2007.

**Review of the estimation data**

Estimates on the size of the PWID in India are very much up to date as well as comprehensive. The latest national estimate of PWID stands at 177,000 as reported in National AIDS Control Organization 2012-2013 Annual Report. This estimate is based on the state level epidemiological profiling project in 25 states (India has 28 states and one capital region). These estimates are based on mapping and supplemented by information obtained regularly through the Targeted Interventions Program partners, whose program staff has regular contacts with PWID. Information on mapping and updating through the Targeted Interventions were not specified. However, one of the positive features of the epidemiological profiling is that data is obtained directly at the district level as opposed to extrapolating to the district level from a few local hotspots. It is unknown whether there was any inflation factor used to account for non-venue based PWID. This estimate is consistent with the estimate of 164,820 reported by Mathers (2008).

The latest round of IBBS for PWID was conducted for May – July 2014, with another round likely in 2017/18. The 2014 IBBS did not incorporate a component of size estimation; the reason is unknown. The next round of IBBS for PWID will not include a national size estimation exercise. However, they will select a few districts in certain states where there is substantial PWID population, and within these districts, they will validate all hotspots based on information provided by the Targeted Intervention partners and from the wisdom of the crowd method with PWID and gatekeepers at each hotspot.

**Recommendations**

India currently has multiple existing estimation data on the size of PWID. However, the methods are heavily dependent on mapping of hotspots. This might underestimate the actual size of PWID population because hidden segments of the population are likely missed from the mapping. In the future round of PWID IBBS (2017/2018), NACO should consider obtaining population size estimates via additional methods to validate current estimates. The round of IBBS should incorporate multiplier methods and WOTC). Obtaining service multipliers should be feasible given the availability of PWID registries maintained by the Targeted Intervention programs. Size estimates from this service multiplier method could be triangulated with the size estimates obtained from the state-level epidemiological profiling project to provide a plausible range for the national estimate. This would provide additional estimates while being cost-saving.

**Kazakhstan**

**Overview of the HIV epidemic**

Kazakhstan has a concentrated epidemic with an estimated HIV prevalence of 0.2% in 2011. The HIV prevalence is much higher among key populations, especially PWID, which is estimated at 4.8%.
The epidemic is considered to be driven by PWID and the transmission has been bridged into the general population through heterosexual contacts with female partners of PWID.

Review of the estimation data
Several national estimates of PWID population has been conducted in Kazakhstan, ranging from 100,000 to 200,000. Kazakhstan has a relatively extensive set of epi-behavioral data (Personal communications, UNAIDS). Areas covered by survey and sentinel surveillance include over 20 sites. The periodicity of epi-behavioral data collection, including PWID size estimations, is regulated by the government and implemented by governmental organizations, based on the decree approved back in 2005. Prior to 2013, the PWID size estimations were carried out on biannual basis at regional level by making use of mainly multiplier and capture-recapture methods. The last estimation was done in 2013, and the last published estimate is from the 2010/11 estimation exercise. The national figure is obtained by summing up the regional level data. The limitations is that many documents have not been transcribed and widely disseminated, and do not describe detailed estimation methods.

Kazakhstan has developed national guidelines for estimating the size of most-at-risk population size estimation, which will be used starting from 2014. Methods previously utilized and currently considered for PWID size estimation are service multipliers, capture-recapture using record databases, and NSUM. In fact, the multipliers are already incorporated in the 2014 IBBS, which uses RDS-survey, sentinel survey, and service multipliers available from prevention and treatment programs. Some regions, where independent databases using similar anonymous unique identifiers are in place, will apply a capture-recapture method based on matching identifiers in the databases. NSUM was piloted by UNAIDS in 2012 in two regions of Kazakhstan (Almaty city and Almaty region) although the unadjusted estimates were found to be too low due to reporting bias and other factors. Results were not published or used internally, and further modifications for use of NSUM in the future are under consideration (Personal communications with UNAIDS country office).

Recommendations
Given the extensive size estimation activities currently on-going, we do not recommend additional data collection in Kazakhstan. Size estimates for multiple sites/cities were reported in 2011, making it unlikely that other priority sites have not been addressed. Additionally, size estimation using multiplier methods were incorporated into the implementation of the 2014 IBBS. Continued efforts to incorporate size estimation methods into ongoing planned IBBS activities are encouraged.

At the same time, the implementers of the IBBS and sentinel surveys in Kazakhstan have identified gaps in their resources for analysis, interpretation, and dissemination of the 2014 and 2011 IBBS size estimation data. Based on the Astana Meeting (June 2014), the stakeholders in Kazakhstan have requested support for and endorsed the following recommendations:

1. Support a national seminar in late 2014 to achieve following objectives:
   a. Build the capacity of regional staff in Kazakhstan:
      i. Training to implement higher-quality size estimation methods
      ii. Discuss and assess the quality of data previously and currently collected
2. Provide technical assistance to produce publications on size estimation data, including:
   a. Technical writing support and expertise, including possible workshop to produce papers, including peer-reviewed journal articles
   b. Translation and editing services to facilitate wider publication dissemination of existing and future reports
3. Provide technical support as needed to review population size estimation questionnaires and data collection tools for upcoming and future size estimation assessments
4. Provide technical support to review and advise on analysis and interpretation of results as needed, including training and support to implement statistical software related to size estimation methodologies, such as the RDS Analysis Tool (RDSAT).

Kyrgyzstan

Overview of the HIV epidemic
Kyrgyzstan has a concentrated HIV epidemic with an estimated prevalence of 0.3% in 2012. Key populations, including PWID suffer a much higher HIV burden. PWID has a prevalence of 14.6 (estimated in 2013).2

Review of the estimation data
The first PWID population estimate was conducted in 2006 by UONDC and the reported number was 25,000. This estimation exercise utilized a population-based nomination/multiplier method, at the national level. Other estimates which are much higher seem to be based primarily on expert opinion and not primary data sources.

There are several recent estimates. In 2011, a study was conducted with technical support from UNAIDS and the Central Asia Drug Abuse Programme (CADAP). It used multiplier/nomination methods integrated within the 2011 IBBS. The most recent round of IBBS was conducted in 2013 where some multipliers were integrated, but PWID were not assessed in this round. In parallel, however, a PWID size estimation exercise was carried out in 2013 through a project funded by GFATM with UNAIDS technical support. Eight service multiplier and a modified capture-recapture method were used to produce PWID size estimates in eight locations throughout the country. A combined report of the results from the 2011 and 2013 data collections is in progress, but results have not been officially released. The next IBBS is scheduled for 2015, and the protocol will be modified to account for the results and lessons learned from the 2013 size estimation.

Recommendations
Since the 2011 and 2013 size estimation data has not been released, we recommend providing the necessary support to assist in finalization of the report, as well as support translation and dissemination to a broader audience.

However, given that there is a plan to include a size estimation study in to the 2015 IBBS, we recommend expert reviews of this study to ensure that multiple relevant methods for size estimation will be incorporated to yield best estimate possible.

In addition, the stakeholders in Kazakhstan have requested support and endorsed the following recommendations:

1. Support a national seminar in late 2014 to achieve following objectives:
   a. Build the capacity of regional staff in Kyrgyzstan:
      i. Training within the seminar to implement higher-quality size estimation methods
      ii. Discuss and assess the quality of data previously/currently collected
   2. Provide technical assistance to produce publications on size estimation data, including:

\[d\] Nomination method starts with a small and accessible subgroup of the target population who are then asked to refer others in the same target population. Those referred individuals are asked to refer others and so forth. This method, however, is not recommended for population size estimations due to selection biases.
a. Technical writing support and expertise, including possible workshop to produce papers, including peer-reviewed journal articles
b. Translation and editing services to facilitate wider publication dissemination of existing and future reports

3. Provide technical support as needed to review population size questionnaires and data collection tools for upcoming and future assessments
4. Provide technical support to review and advise analysis and interpretation of results as needed, including additional capacity-building trainings as needed and requested.

Libya

Overview of the HIV epidemic
Limited information is available on the HIV situation in Libya. UNAIDS estimated HIV prevalence in Libya at 0.13% (2005). The epidemic is concentrated among PWID, with injection drug use accounting for as much as 90% of all new infections in 2010. A range of post-conflict conditions have added and exacerbated risk factors in HIV transmission overall, including a lack of antiretroviral drugs, disrupted infection control and blood safety systems, and a rise in sexual and gender-based violence.

Among PWID, HIV prevalence estimates range from 15% to 32%. In Mathers 2008, the estimate of HIV prevalence among registered PWID was cited at 22%. There is a more recent (2013) estimate of HIV prevalence among PWID in Tripoli; it was estimated at 87.1% (95% confidence interval: 81.5-91.9). This estimate is from an IBBSS using RDS with a sample size of 294.

Review of the estimation data
Years of civil unrest have hindered any estimation of injection drug use in Libya; from the research literature, reliable national estimates for Libya do not exist. Some limited national estimates show a wide range: from 1,685 (from registry data, representing only a verified lower bound) to 7,206 (adjusted estimate from Mathers 2008, 2011). All estimates are derived from narcological registry data, which is likely an underestimate of the true number of PWID. There was no information on how the data was obtained for the narcological registry. IBBS has been conducted in Libya but no population size estimation was incorporated in it. There is currently no PWID population size estimation activities planned.

Recommendations
There is an urgent need to estimate the population size of PWID for Libya. However, this may depend on the current political situation and security issues in Libya. Methods chosen for size estimation in Libya should be determined based on formative research and experience from other countries. We recommend the use of multiple methods, and where relevant, incorporate size estimation in probability surveys, including IBBS. WOTC, unique objective multipliers, and network scale up methods can be incorporated into probability surveys. It may also be worth exploring the use of the multiplier method with the 2013 IBBS that was conducted in Tripoli. This would require reviewing the questionnaire to see if any specific service use questions were asked (with a timeframe) and investigating the quality of the respective service registry.

Myanmar

Overview of the HIV epidemic
Myanmar has a concentrated HIV epidemic with an estimated prevalence of 0.5% (in 2011). Key populations such as female sex workers, MSM, and PWID have a much higher reported prevalence.
Among PWID, the estimated prevalence is 18.0%, and concentrated in the regions that cultivate opium or near drug trafficking routes.

**Review of the estimation data**

National estimates range from 60,000 to 195,000, and a consensus meeting of in-country stakeholders agreed to an estimated number of 75,000 PWID as the national estimate. This number of 75,000 was arrived at from the estimate of 0.5% of the male population 15-49 years of age being PWID. No justification for the use of 0.5% was provided. There are a number of harm reduction programs currently operated by the government, UNODC and Burnet Institute Centre for Harm Reduction that would potentially provide services data for size estimation purposes. UNAIDS/CDC/WHO is currently providing technical assistance to the National AIDS Program for the current IBBS (data collection completed May 2014), which includes size estimation activities using the service multiplier and unique object multiplier methods. (Personal communications, UNAIDS/Myanmar). The IBBS for PWID was conducted in a total of 16 sites: Lashio, Naung Mon, Nampoung, Muse, Kukkhai, Nam Pha Kar, Myitkyina, Waimo, Ay Myint Tha, Bamaw, Mandalay (Aung Myae Thar Zan, Pyi Gyi Tha Gon), Yangon (Thin Gangyun, Kyimyndaing), Kalay, and Tamu, that would give regional estimates as well as a credible benchmark to result in a new national estimate.

**Recommendations**

Progress is being made in that population size estimations of PWID using sound methodology have been incorporated in the current round of the IBBS in 16 sites. National estimate based on this survey would have to carefully consider the regional differences. The profile of these 16 sites are somewhat unique in that they represent two major urban centers (Yangon and Mandalay) or sites in high opium growing states (Kachin and Shan) and their estimated sizes may not be applicable to other parts of Myanmar which are not urban centers or in opium growing states. Some formative assessment should be conducted to determine if additional data on PWID population size should be obtained from other sites in Myanmar (the north and the south). It may also be worthwhile exploring the need for conducting capacity building workshops in PSE implementation, data analysis and interpretation, and technical writing.

**Philippines**

**Overview of the HIV epidemic**

Although the Philippines has a relatively low HIV prevalence (0.036% in 2011), the HIV epidemic has changed drastically in the past five years with an exponential increase in newly reported HIV cases. Similar to other concentrated epidemics, key populations including PWID also suffer a higher burden of HIV compared to the general population. HIV prevalence among PWID was less than one percent prior to 2010. However, as of 2012, the estimated HIV prevalence among PWID was as high as 13.6% nationally. The 2011 Integrated HIV Bio-Behavioral Surveillance Survey (IHBSS) in the province of Cebu indicated a much higher prevalence (53.8%).

**Review of the estimation data**

The National Epidemiology Center/Department of Health (NEC-DOH) has recognized the need for PWID size estimation and has conducted numerous size estimation exercises since 2011. Population size estimations of key populations are systematically determined every two years by NEC-DOH, with technical assistance from various agencies including WHO. (Personal communications, Ricardo Mateo MD, FHI360, Philippines)
The latest national estimate was 16,578 PWID (2011).\textsuperscript{42} PWID is a priority population for HIV prevention in 70 selected areas/cities. These areas were selected based on data from the IHBSS, rapid assessment of HIV vulnerability in 2010 and 2011, and the estimated number of key populations in each of the area for 2011. There are a total of 122 cities in the Philippines. In the 70 priority cities together, the estimated number of PWID was reported to be 8,111, and the rest of the country was estimated to be 8,467, yielding a total estimate of 16,578 nationally. However, the methodology for this is not specified.

A previous reported estimate is from the 2009 consensus meeting, which took into account the Dangerous Drug Board’s survey which reported that 2-4\% of the general population use illegal drugs, and of these, 0.089\% were PWID.\textsuperscript{46} The consensus meeting also took into account estimated figures from three cities (Cebu City, General Santos City, and Zamboanga City) with identified PWID networks (methodology not specified). This consensus meeting reported a figure of 12,705-21,567 PWID nationally.

The latest IHBSS survey was conducted by NEC-DOH in 2013 in Cebu and Mandaue with technical assistance from WHO.\textsuperscript{47} They survey incorporated population size estimation using multiple methods: i) unique object distribution implemented one week prior to the PWID IHBSS data collection; ii) service multiplier using service data from the Social Hygiene Clinics; and iii) services multipliers using data from the Cebu City and Mandaue City prison/jail. The results will be available in September 2014. (Personal communications, NEC-DOH)

Policy changes to legalize syringe exchange could provide improved multipliers for benchmark-multiplier methods in the Philippines. Comprehensive harm reduction interventions, including needle and syringe programs, are planned to be implemented in Barangay Kamagayan in Cebu City as part of the Big Cities Project.\textsuperscript{48} (Personal communications, Sutayut Osornprasop, World Bank/Thailand)

**Recommendations**

The Philippines appear to have a national process in place to estimate the size of PWID. The methodology seems to be robust with the use of multiple size estimation methodologies. The upcoming comprehensive harm reduction interventions that will be initiated should ensure that service data is of high quality and that it can be used for the service multiplier method (i.e., ensure that duplicate clients can be identified). We recommend these continuous size estimation efforts and that estimated figures, detailed methods, and lessons learned from the 2013 and 2014 size estimation to be shared broadly with national and international stakeholders. There might be the need for technical assistance in using multiple service data when they become available and to help publish size estimation data.

**Tajikistan**

**Overview of the HIV epidemic**

Tajikistan has a concentrated HIV epidemic with a national estimated prevalence of 0.3\% (2012).\textsuperscript{20} Female sex workers and PWID and their sexual partners suffer a much higher prevalence. The prevalence among PWID is 13.5\% (2012).\textsuperscript{20} Injecting drug use among men has largely driven the HIV epidemic in Tajikistan and heterosexual transmission to the sex partners of male PWID is also

\textsuperscript{4} This project is supported by the Asian Development Bank and World Bank under Department of Health guidance and leadership. This is being implemented jointly by the Population Services International (PSI) and the Philippine NGO Council on Population Health and Welfare Inc.
common. Recent routine surveillance data showed an increase in the proportion of newly registered HIV cases due to heterosexual transmission (57.5%); of which more than half was women.

**Review of estimation data**

Few size estimation studies are available and the estimates range from 15,000 to 50,000. Most of these estimates come from in-country expert opinion only—possibly extrapolated from drug registry data. The estimate of 25,000 of PWID that comes from the 2009 AIDS Project Management Group study is widely used using multiplier methods. The most recent estimates are from 2013, when a USAID project conducted a situational analysis and estimated the PWID size by making use of existing program data and expert opinion in assigning a multiplier coefficient to each area. It resulted in a national estimate of 26,500 PWID. (Personal communications, UNAIDS/Tajikistan).

The last IBBS was done in 2011, and a new round of RDS-based IBBS is planned for late 2014. In the current version of the 2014 IBBS protocol that was approved in 2013, the PWID size estimation component is not integrated. However, the data collection tool includes questions on overdose, narcological or police registration, TB registry and opioid substitution treatment registration. In addition, there is a separate small survey (supported by UNAIDS) using RDS methodology being concurrently implemented for the purposes of population size estimation using multiplier methods.

**Recommendations**

Since size estimation of PWID using multiplier methods is currently being implemented, we did not recommend further size estimation to be implemented at this point. However, we recommend investigating the potential of using services data as well as data from the 2014 IBBS to produce more data to strengthen the national estimate.

Based on the Astana Meeting (June 2014), the implementers and supporters of the size estimations in Tajikistan have requested support and endorsed the following recommendations:

1. Support a national seminar in late 2014 to achieve following objectives:
   a. Review the draft results of the 2014 RDS survey size estimation
   b. Build the capacity of regional staff in Kyrgyzstan:
      i. Training to implement higher-quality size estimation methods
      ii. Training in interpretation and utilization of data and results
   c. Session focusing on identifying needs and linking services to utilization of 2014 results
   d. Session on monitoring of service quality
2. Provide technical assistance to produce publications on size estimation data, including:
   a. Technical writing training.
   b. Translation and editing services to facilitate wider publication dissemination of existing and future reports.
   c. Training on dissemination of results.

**Uzbekistan**

**Overview of the HIV epidemic**

Uzbekistan has a concentrated HIV epidemic with the national estimated prevalence of 0.1% (2012). Similar to other countries in the Central Asian Region, the HIV epidemic is particularly concentrated in PWID with an HIV prevalence of 7.3% (2013). Transmission between PWID and their female partners is also considered be a driver of the HIV epidemic in the country.
**Review of the estimation data**

National PWID estimates range from 79,300 to over 100,000.\textsuperscript{14, 49-51} Most of these estimates come from in-country expert opinion only—possibly extrapolated from prevalence estimates and drug registry data. The first government-led PWID size estimation exercise was carried out in 2011 with technical support from UNAIDS and the Central Asia Drug Action Programme (CADAP) by making use of multiplier/nomination method integrated within the 2011 IBBS. (Personal communications, UNAIDS). Draft results are not available for dissemination outside of the country. The results from these size estimations are also not currently accepted and adopted by Uzbekistan government officials. Based on the lessons learned from the 2011 round, the 2013 IBBS data collection tool was adjusted accordingly. The data collection has been completed, but the analysis has not yet performed.

**Recommendations**

It is difficult to make feasible recommendations to support current and future recommendations for PWID size estimation in Uzbekistan, given that recent estimates are likely to remain unpublished. It is also noted that implementation of UN- or outside-funded assessments is not easily approved in Uzbekistan; thus complementary PWID population size research may not be feasible. If possible, the first and logical next step towards moving PWID size estimation—both past estimates and future—in Uzbekistan is to organize a national stakeholders meeting on size estimation to review what has been done and what would be the relevant next steps for sharing the findings and lessons learned. This consultation would have to be held in Uzbekistan, ensure key government representation, and be based on a strategic agenda.

**REGIONAL DYNAMICS**

Seven of the ten priority countries share borders. Therefore, regional coordination in size estimation efforts may be key to understanding the impact of drug trafficking routes on PWID population estimates. Regional studies could also help inform HIV prevention and harm reduction activities in the region. Furthermore, regional estimates would also facilitate the standardization of several recommended approaches in population size estimation, including using multiple methods, incorporating size estimation into probability-type surveys, or using multiple existing service or drug registry data.
Conclusion

Table 2 below summarizes the key recommendations and next steps for the population size estimation of PWID in the ten priority countries. A number of the priority countries have conducted population size estimation exercises using multiple methods and incorporating it into the IBBS surveys. It is important to note that there is no gold standard method for population size estimation of PWID and therefore multiple methods are recommended. Where feasible, size estimation should be conducted to triangulate the data and strengthen the estimates. Given many of these ten countries are rolling out IBBS or other probability-based surveys, efforts should ensure that there is enough local capacity in population size estimation incorporated within these surveys. This would potentially produce more credible data and at the same time can be cost-saving.

Although several of these countries have conducted population size estimates of PWID, there is still a need for technical assistance in analysis, reporting and publications of these data. Regardless of the fact that size estimation has been done in these countries, this review has faced critical challenges in gathering size estimation data from these countries. In addition, much of the recommendations generated by in-country stakeholders in the Central Asian countries indicate the need for capacity building workshops in implementation, analysis and disseminations of size estimation exercises.

Lastly, we emphasize the importance of convening country-level stakeholder meetings as was conducted in Astana for the four Central Asian countries for this project. The stakeholder meetings were crucial in evaluating the quality of the existing estimates and assessing the need for future size estimation needs as well as technical assistance needs. We recommend that national level stakeholder meetings be conducted in the remaining countries.

Table 2. Summary of recommendations and next steps in the ten priority countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Recommendation/Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus</td>
<td>Size estimation may not be immediately required because current estimates have incorporated multiple methods. Stakeholder meeting should be convened to determine if there is a need for technical assistance for producing publication on size estimation data such as through technical writing workshop and translation and editing services to facilitate wider publication dissemination of existing reports.</td>
</tr>
<tr>
<td>China</td>
<td>Given that there is already an existing national process for PWID population size estimations, it may be very difficult to obtain buy-in from the government to conduct any externally-funded assessments. We, however, recommend a more rigorous assessment in coordination with China officials of any gaps in regional estimates for high drug use provinces, and to support future activities if needed. Sizes of PWID can be changed overtime and thus efforts to continue the estimation is needed.</td>
</tr>
<tr>
<td>India</td>
<td>Given there is national estimate effort using mapping and key informant interviews, we don’t recommend more immediate estimation exercise. But given there are periodic IBBS being conducted among PWID in India, we recommend to have size estimation to be incorporated in these survey to save money as well as to provide data for triangulation and to enhance the quality of the estimates. This is particularly important as most of the estimates in India are done through mapping, potentially resulting in underestimates of PWID.</td>
</tr>
<tr>
<td>Country</td>
<td>Recommendation</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>No immediate size estimation efforts recommended. However, we recommend having workshops to build local capacity on multiple method use, and data analysis and dissemination.</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>No immediate size estimation efforts recommended. However, we recommend having workshops to build local capacity on multiple method use, and data analysis and dissemination.</td>
</tr>
<tr>
<td>Libya</td>
<td>Population size estimation is needed due to lack of data. Methods chosen for size estimation in Libya should be determined based on formative research and experience from other countries. We recommend the use of multiple methods.</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Efforts to calculate national estimate should take into account regional variance. In addition, formative assessment should be considered in non-opium growing areas to determine if additional PWID size estimations is needed. It may also be worthwhile exploring the need for conducting capacity building workshops in PSE implementation, data analysis and interpretation, and writing.</td>
</tr>
<tr>
<td>Philippines</td>
<td>No population size estimation recommended; estimate based on multiple indirect estimation methods will be released in September 2014. Reach out to national stakeholders to determine if any technical assistance is required for the analysis, reporting and publications.</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>No immediate size estimation efforts recommended. However, we recommend having workshops to build local capacity on multiple method use, and data analysis and dissemination.</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>Political issues currently inhibit the publishing of previous size estimation results. Implementation of outside-funded assessments is also not easily approved in Uzbekistan, and not recommended at this time. If possible, a national meeting is proposed to review recent results, and work with government officials to identify critical concerns about the data and plan a size estimation agenda for the near future.</td>
</tr>
</tbody>
</table>
### APPENDIX I

**SIZE ESTIMATION METHODS WITH LIMITATIONS, ADVANTAGES AND CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Method</th>
<th>Key attributes</th>
<th>Limitations</th>
<th>Budget and resource issues</th>
</tr>
</thead>
</table>
| **Enumeration and Census**    | • Census is a real count, not an estimate; thus straightforward to calculate  
• Easily understood by policy makers since no special statistics are required  
• Census produces creditable lower limit  
• Provide useful information for programming or outreach activities                                                                 | • Require direct interaction that might not perform well if population is geographically dispersed or hidden  
• Care must be taken to avoid risk for participants; community guides are needed for access  
• Enumeration requires a reliable sample frame of venues  
• Method will overestimate if population is mobile and double counted; underestimate if populations are well-hidden                                                                 | • Census is time-consuming and cost-prohibitive if not part of ongoing data collection  
• Enumeration requires fewer resources and is less expensive to conduct than census                                                                                                                                  |
| **Capture-Recapture**         | • Quick and relatively easy  
• Does not require much data  
• Does not require statistical expertise  
• Capture-recapture with mapping can be useful to programming                                                                 | • It is difficult in practice to not violate some assumptions of this method, especially in ensuring (a) the probability of selection is the same in both counts, and (b) that members of the population have an equal chance of selection  
• Require direct interaction with PWID, which may not be feasible in hostile environments                                                                 | • Can be conducted within a shorter time frame relative to other survey-related methods, possibly reducing costs |
| **Services Multiplier**       | • Quick and relative easy  
• Uses existing data  
• Multiple data sources can be used to strengthen the estimates  
• May be integrated into an existing or ongoing survey                                                                 | • The two data sources must be independent  
• The two data sources must define the population in the same way  
• Quality service data may not exist, or be difficult to access or interpret                                                                 | • Usually low-cost, especially if added to existing survey activities                                                                                     |
| **Unique object multiplier**  | • Easy to integrate when combining with a probability sampling survey like RDS                                                                                                                                  | • It may be difficult to distribute the objects to target population in drug use settings  
• Data collection needs to be finished in a short timeframe to prevent migration                                                                 | • Can be low cost, especially if added to existing survey activities  
• Depends on the cost/type of object being distributed                                                                                                               |
| **Mapping and interviews of key informants** | • Cheaper than the traditional capture recapture method  
• Useful for program planning  
• Easy to implement                                                                                                                                                                   | • May miss hidden segments of the population, especially those who spend little time at venues  
• Estimates can have a wide minimum and maximum range                                                                                                                        | • Requires field-based data collection  
• Costs dependent on number of locations targeted for enumeration                                                                                                               |
| **WOTC**                      | • Leverages existing surveys targeting PWID, such as IBBS surveys  
• Does not require direct interaction or counting of PWID                                                                                                                                  | • Difficult to verify the validity of the estimate  
• Estimates often have wide reported ranges                                                                                                                                             | • Low cost if built into existing surveys                                                                                                                                    |
| **Delphi**                    | • Does not require raw data capture or direct interaction with PWID  
• Expert opinion-based                                                                                                                                                                         | • Vulnerable to political influences  
• Difficult to verify the validity of the estimate  
• Estimates often have wide confident intervals                                                                                                                                 | • Low cost                                                                                                                                                                      |
<table>
<thead>
<tr>
<th>NSUM</th>
<th>General population survey</th>
</tr>
</thead>
</table>
| • May be used in countries with minimal or no data  
• Social-desirability bias is minimized by asking indirect questions  
• Methodology still under development  
• Average personal network size can be difficult to estimate  
• PWID may not associate with members of general population  
• Respondents may be unaware of someone in his/her personal network injects drugs  
• Respondents may not admit knowing PWID  
• Cost of integration into existing surveys can be minimal |
| • Leverages existing surveys  
• Social-desirability bias is minimized by asking indirect questions  
• Leverages existing surveys among the general population  
• Straightforward to analyze and explain  
• Bias can be reduced by using computer assisted personal interviews  
• Requires a large sample size in order to capture PWID in the population  
• Respondents may not report stigmatized and criminalized behaviors  
• Some PWID may not be reached by household sampling methods employed by large surveys of general populations  
• Cost of integration into existing surveys can be minimal |
## APPENDIX II  ESTIMATES AND METHODOLOGIES BY COUNTRY

### Belarus

<table>
<thead>
<tr>
<th>City/Region/Year</th>
<th>Male/Female/both</th>
<th>Age</th>
<th>Estimation method(s)</th>
<th>PWID size estimate (range) [% of 2012 population]</th>
<th>Source</th>
<th>Limitations/biases; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National/2008</td>
<td>Both</td>
<td>N/A</td>
<td>From 2004 estimates, adjusted</td>
<td>76,500 [0.8]</td>
<td><a href="http://www.idurefgroup.unsw.edu.au/country-data-and-maps/Belarus">http://www.idurefgroup.unsw.edu.au/country-data-and-maps/Belarus</a></td>
<td>Underlying data (Vinitskaya) may be biased, and adjustment methodology insufficient to capture trends</td>
</tr>
<tr>
<td>National/2008</td>
<td>Both</td>
<td>N/A</td>
<td>simplified ‘capture-recapture’ method: 1) Narco registry** 2) Dept for HIV/AIDS Prevention National Centre Registry</td>
<td>76,281 (69,200 – 83,400) [0.8]</td>
<td>European Monitoring Centre for Drugs and Drug Addiction (2009). Drug abuse and illicit drug trafficking in the Republic of Belarus in 2007. ** (cites Vinitskaya, 2008)</td>
<td>The two data sources may be interdependent. Estimate may also be biased by age as the likelihood of capture in both sources increases with age. Narco registry has multiple sources and biases may be hard to quantify.</td>
</tr>
<tr>
<td>National/2004</td>
<td>Both</td>
<td>N/A</td>
<td>Literature review with midpoint of findings as estimate</td>
<td>46,000 (41,000 - 51,000) [0.5]</td>
<td>Aceijas (2004)</td>
<td>No details on data or study methodologies</td>
</tr>
<tr>
<td>National/2005</td>
<td>Both</td>
<td>N/A</td>
<td>Registry data</td>
<td>6,308 [0.1]</td>
<td>Mathers B et al (2008)</td>
<td>Registry data largely underestimates PWID populations; likelihood of capture may increase with age.</td>
</tr>
</tbody>
</table>

*Prevalence of HIV among PWID - 17.0*

2012 country population (Age 15-65): 9,625,888

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** From EMCDDA: “The Neurological Register (NR) consists of a Dispensary Narcological Register and a Prevention Narcological Register. The Dispensary Narcological Register includes persons diagnosed with an addiction according to ICD-10 criteria. The Prevention Narcological Register includes non-addicted patients who are suspected of using drugs (i.e., urine tested positive in strip tests). Reasons for including a person on the NR may be the result of an individual’s visit to a doctor; by a request from relatives, police, medical institutions, employers, educational institutions or military service commissions; or the result of inspections for juvenile offenders. All persons who test positive for drug use through a urinalysis, including those conducted at police stations, are then subject by law to observation and regular examination for drug addiction.”

*** From report: “The methodology of research based on a complex approach with the use of different sources of information on drug use in the country, results of behavioural researches among IDUs and results of questioning of different groups of population. During the estimate of the number of IDUs a statistical method of frequency coefficients, triangulation and verification of received data were used. The quantitative estimate of IDUs over the country was fulfilled by summation of estimated figures in all regions and Minsk City.”
<table>
<thead>
<tr>
<th>City/Region/ Year</th>
<th>Male/ Female /both</th>
<th>Age</th>
<th>Estimation method(s)</th>
<th>PWID size estimate (range) [% of 2012 population]</th>
<th>Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National / 2009</td>
<td>Both</td>
<td>N/A</td>
<td>Not given</td>
<td>1.93 million (midpoint) (1.31-2.54 million) [0.19]</td>
<td>World Drug Report, 2014: UNAIDS estimate via CDC China</td>
<td></td>
</tr>
<tr>
<td>National / 2010</td>
<td>80% M 20% F</td>
<td>N/A</td>
<td>Grey and white lit review; Country focal expert responses to a survey instrument</td>
<td>2.35 million (1.8–2.9 million) [0.23]</td>
<td>Needle RH, Zhao L (2010)</td>
<td>Delphi, secondary report</td>
</tr>
<tr>
<td>National / 2008</td>
<td>Both</td>
<td>N/A</td>
<td>Lit review</td>
<td>1,928,200 (.356-3.5 million) [0.19]</td>
<td>Aceijas (2004)</td>
<td>No study methodologies, lit review. Not statistical.</td>
</tr>
<tr>
<td>National / 2007</td>
<td>Both</td>
<td>N/A</td>
<td>Mass screenings by Public Security Bureau; Undocumented based on known HIV prevalence rates among P not registered with the PSB, collected from sentinel surveillance data and from Methadone programs operating in 22 provinces, adjusted by comparing known rates from data on groups participating in Methadone clinics.</td>
<td>1.5–3.0 million [0.30]</td>
<td>Wang L et al. (2009)</td>
<td>Workbook Methods to get population size not adequately specified.</td>
</tr>
<tr>
<td>National/ 2005</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect methods</td>
<td>2.35 (1.8-2.9 million) [0.23]</td>
<td>Mathers, B et al (2008).</td>
<td>Lit review not direct</td>
</tr>
<tr>
<td>National / 2005</td>
<td>Both</td>
<td>N/A</td>
<td>Sum of Public Security Bureau prefecture listings of the numbers of drug users were combined with information from detoxification/treatment centers on the proportion of injectors among drug users and local surveys of registration completeness to derive the estimated number of drug injectors.</td>
<td>1.8–2.9 million [&lt;0.29]</td>
<td>Lu F, et al. (2006)</td>
<td>Workbook. Using estimates from security and detox. Circular – Detox follows arrest.</td>
</tr>
<tr>
<td>National / 2004</td>
<td>Both</td>
<td>N/A</td>
<td>Not disclosed</td>
<td>&gt;3 million [0.30]</td>
<td>Summary Country Profile for HIV/AIDS Treatment Scale-Up. UNODC. (2005)</td>
<td>No provenance</td>
</tr>
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<td>-----------------------------------------------</td>
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</tbody>
</table>

**Regional**

<table>
<thead>
<tr>
<th>Location</th>
<th>Method</th>
<th>Data</th>
<th>Source</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urumqi, Xinjiang, Peoples’ Republic of China 2011-</td>
<td>Benchmark/ multiplier study. (68.2% of 10,481) and the maximum number was 13,640 (68.2% of 20,000).</td>
<td>7,148</td>
<td>Ni et al, (2012)</td>
<td>From a public security estimate. Provenance unknown</td>
</tr>
<tr>
<td>Ruili City; Luxi City; Longchuan Cty; Yingjing Cty Liaghe Cty / (2008)</td>
<td>7 sentinel sites, 16 community-based surveys, 15 studies</td>
<td>RC 1650 (1,500–1,800); Lx C 3,450 (3,000–3,900); Lng Cn 4,600 (4,000–5,200); YC 4,400 (4,100–4,700); Li Cty 550 (500–600)</td>
<td>Jia Y et al (2008) (same study as above)</td>
<td>Workbook. Unclear how they got estimates as workbook requires estimates to be imputed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City/ Region/ Year</th>
<th>Male/ Female /both</th>
<th>Age</th>
<th>Estimation method(s)</th>
<th>PWID size estimate (range) [% of 2012 population]</th>
<th>Source</th>
<th>Limitations/ biases; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National / 2007-09</td>
<td>Both</td>
<td>N/A</td>
<td>Mapping conducted in 2007-09 and validated yearly through Targeted Intervention program</td>
<td>177,000 [0.02]</td>
<td>National Aids Control Organization– Annual Report 2012-2013</td>
<td>Details of how the mapping was conducted is minimal. Mapping is conducted as part of the District HIV/AIDS Epidemiological Profile project, which is a systematic compilation of available data from various sources (surveillance, program). It is possible that this estimate may be an underestimate as mapping likely only captures PWID found in hotspots. However, this is likely to be minimal since a large proportion of PWID in India are street-based (as opposed to home-based). Additionally, these state- and district- level counts of PWID are validated every year as part of the Targeted Intervention program, whose program staff have regular contacts with PWID (both street- and home- based PWID).</td>
</tr>
<tr>
<td>National / 2008</td>
<td>Both</td>
<td>N/A</td>
<td>Adapted from Mathers 2008: prevalence * population from 2008</td>
<td>172,000 (111,000-233,000) [0.03]</td>
<td><a href="http://www.idurefgroup.unsw.edu.au/country-data-and-maps/India#idu">http://www.idurefgroup.unsw.edu.au/country-data-and-maps/India#idu</a> Mathers, 2008</td>
<td></td>
</tr>
<tr>
<td>National / 2006</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect methods</td>
<td>164,820 (106,518-223,121) [0.02]</td>
<td>Mathers, B et al (2008).</td>
<td>No details on what indirect method was used but indirect methods are preferred over other methods so this estimate is deemed to be fairly strong.</td>
</tr>
<tr>
<td>National / 2006</td>
<td>Male/ Female</td>
<td>N/A</td>
<td>Not included</td>
<td>Male 96,463 - 189,729 Female 10,055 - 33,392 [&lt;0.02]</td>
<td>National Aids Control Program 2006-2011</td>
<td>Study methodologies not specified</td>
</tr>
<tr>
<td>National / 2004 statistics from 1998-2003</td>
<td>Both</td>
<td>N/A</td>
<td>Lit review</td>
<td>1,294,000 (563,000-2,025,000) [0.16]</td>
<td>Aceijas (2004)</td>
<td>No study methodologies</td>
</tr>
</tbody>
</table>

Prevalence of HIV among PWID – 7.1*

2012 country population (Age 15-64): 808,440,644
<table>
<thead>
<tr>
<th>Study Area</th>
<th>Methodology</th>
<th>Counts of PWID are available for 25 states, including at the district level</th>
<th>Epidemiological profiling of HIV/AIDS situation at District and Sub-district levels using Data Triangulation Project (NACO 2013)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 states/2013</td>
<td>Both N/A Mapping exercise conducted 2007-2009</td>
<td>Counts of PWID are available for 25 states, including at the district level</td>
<td>Epidemiological profiling of HIV/AIDS situation at District and Sub-district levels using Data Triangulation Project (NACO 2013)</td>
<td>Very comprehensive systematic compilation of program and surveillance data; counts are available for 25 out of the 28 Indian states and 1 Capital region. This may underestimate population size; mapping likely only capture PWID found in hotspots. However, this is likely to be minimal since a large proportion of PWID in India are street-based (as opposed to home-based). Additionally, these state- and district- level counts of PWID are validated every year as part of the Targeted Intervention program, whose program staff have regular contacts with PWID (both street- and home- based PWID).</td>
</tr>
<tr>
<td>2 states (Maharashtra [MH] and Nagaland [NG]) /2008</td>
<td>Mapping from Avahan Program compared to cap-recap (CR) (unique object and recapture through pop-based survey using RDS recruitment)</td>
<td>Churachandpur (MH): 2,500 (program estimate); 1,493 (CR) Phek (NG): 1,800 (program estimate); 2,439 (CR) Wokha (NG): 4,800 (program estimate); 2,941 (CR)</td>
<td>Vadivoo 2008</td>
<td>Multiple methods were used; 2 of 3 program estimates fall within 95% CI of estimate through CR; Program-based estimates are regularly updated by program staff who have regular contact with PWID</td>
</tr>
<tr>
<td>5 cities (Imphal, Chennai, Mumbai, Calcutta, Delhi) /2000</td>
<td>Stakeholder report of estimates and observations at hotspots to check estimates</td>
<td>Imphal (9,000-1,2000); Chennai (15,000-20,000); Mumbai (38,000); Calcutta (10,000-15,000); Delhi (25,000-30,000)</td>
<td>Dorabjee and Samson 2000 Delphi method but reported estimates were cross-checked through observations at hotspots. More than 10 years old.</td>
<td></td>
</tr>
<tr>
<td>New Delhi and Mumbai 1998-2003</td>
<td>Both N/A Lit review</td>
<td>New Delhi (35,000) and Mumbai (38,000)</td>
<td>C Aceijas, 2004 No study methodologies</td>
<td></td>
</tr>
<tr>
<td>Imphal West, Imphal East, Thoubal Churachandpur Bishenpur District</td>
<td>Both N/A Service multiplier method</td>
<td>Imphal West, 7,353 (95% CI: 6,759-8,123); Imphal East, 5,806 (95% CI: 5,635-6,054); Thoubal 3,816 (95% CI: 3,571-4,139); Churachandpur 2615 (95% CI:2,528-</td>
<td>Medhi et al. 2012</td>
<td>Delphi method but reported estimates were cross-checked through observations at hotspots. More than 10 years old.</td>
</tr>
<tr>
<td>Region</td>
<td>Gender</td>
<td>Age</td>
<td>Method</td>
<td>Estimation</td>
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<tr>
<th>City/Region/ Year</th>
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<th>Age</th>
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<th>Source</th>
<th>Limitations/biases; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National/ 2011</td>
<td>Both</td>
<td>N/A</td>
<td>Multiple methods: Quasi capture-recapture based on several lists of names from different registers; nomination (based on information from key informants), and multiplier from RDS-based IBBS. Final estimates were discussed with experts and the report presents averaged estimates; Aggregates from 16 regional estimates.</td>
<td>123,640 [1.12]</td>
<td>Ganina et al., Review of the HIV Epidemiologic Situation and Results of the Integrated Bio-Behavioral Surveys in the Republic of Kazakhstan 2010-2011, Republican AIDS Center, Almaty, Kazakhstan, 2012. <a href="http://www.rcaids.kz/files/000000185.pdf">http://www.rcaids.kz/files/000000185.pdf</a></td>
<td>Methodology is explained vaguely in the report. However, information from the Republican AIDS Center shows that eight service multipliers were utilized.</td>
</tr>
<tr>
<td>National / statistics from 2011</td>
<td>Both</td>
<td>N/A</td>
<td>Sentinel snowball method; 3 methods: Multiple analysis, multiplication and nomination) and focus groups</td>
<td>100,000 [0.91] 124,400 [1.13] Separate estimates</td>
<td><a href="http://www.emcdda.europa.eu/publications/country-overviews/kz">http://www.emcdda.europa.eu/publications/country-overviews/kz</a></td>
<td>Methodology not well documented, in this source. Original description of methods not locatable. These data appear to be a root source for other expert estimates ranging from 100,000 to 125,000</td>
</tr>
<tr>
<td>National / 2010</td>
<td>Both</td>
<td>N/A</td>
<td>UNODC national project Officers</td>
<td>186,000 [1.68]</td>
<td>Accessibility of HIV Prevention, Treatment and Care Services for People who use Drugs and incarcerated people in Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan UNODC</td>
<td>Details not available. This source seems to make inferences based on previous prevalence estimates from EMCDDA, possibly updated.</td>
</tr>
<tr>
<td>Country</td>
<td>Type</td>
<td>Methodology</td>
<td>PWID Estimates (2008)</td>
<td>Source and Notes</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>National / 2008</td>
<td>Both</td>
<td>Indirect methods: Estimated number of PWID (for 2008) derived from prevalence estimate to the 2008 15-64 year old population from Mathers</td>
<td>102,500 [0.93]</td>
<td>IDU reference Group website <a href="http://www.idurefgroup.unsw.edu.au/regional-data-and-maps/Central_Asia">http://www.idurefgroup.unsw.edu.au/regional-data-and-maps/Central_Asia</a> This estimate is derived from the population prevalence provided by Mathers et al. Not based on any direct observation or data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National/ 2006</td>
<td>Both</td>
<td>Indirect methods</td>
<td>100,000 [0.91]</td>
<td>Mathers B, et al. (2008). No direct methods seem to be utilized. Possible that some documents with direct methods were utilized in lit review, but not specified. Experts consulted on final estimates. Likely a Delphi estimate not based on strong source data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National/ 2004</td>
<td>Both</td>
<td>Lit review</td>
<td>174,000 (97,000-250,000) [1.58]</td>
<td>Aceijas 2004 No study methodologies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*UNAIDS 2013.*
<table>
<thead>
<tr>
<th>City/Region/Year</th>
<th>Male/Female/both</th>
<th>Age</th>
<th>Estimation method(s)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>National/2013</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect</td>
<td>Pending</td>
<td>Communication with AIDS Republican Centre, Ministry of Health, Kyrgyzstan; UNAIDS communication</td>
<td>Multiplier methods, Global Fund-supported size estimation (independent of IBBS). RDS used for sampling/survey data which were triangulated with service multipliers.</td>
</tr>
<tr>
<td>National/2011</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect</td>
<td>Pending</td>
<td>AIDS Republican Centre, Ministry of Health, Kyrgyzstan; UNAIDS communication</td>
<td>Multiplier method integrated within the 2011 IBBS round.</td>
</tr>
<tr>
<td>National/2006</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect</td>
<td>25,000 [0.70]</td>
<td>Mathers B, et al 2008</td>
<td>Original source likely to be UNODC estimation study (EMCDDA 2006).</td>
</tr>
</tbody>
</table>
| National/2006    | Both             | N/A | "In 2006, the UNODC estimation study using the multiplication (nominative) method, the number of problem drug users (PDU) in Kyrgyzstan was estimated at 26 000, of whom 25 000 were intravenous drug users (IDU)."
<table>
<thead>
<tr>
<th>National / statistics from 1998-2003</th>
<th>Both</th>
<th>N/A</th>
<th>Lit review</th>
<th>21,000 (19,000 – 23,000) [0.58]</th>
<th>Aceijas 2004</th>
<th>No direct methods seem to be utilized. Possible that some documents with direct methods were utilized in lit review, but not specified. Experts consulted on final estimates. Likely a Delphi estimate not based on good data.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>City/ Region /Year</th>
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<th>PWID size estimate (range)</th>
<th>Source</th>
<th>Limitations/biases; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National / 2010</td>
<td>Both</td>
<td>All</td>
<td>Adapted from Mathers</td>
<td>7,206 (4,633-9,779) [0.18]</td>
<td>Laith J. 2008</td>
<td>No details on adjustment from registry data.</td>
</tr>
<tr>
<td>National / 2004</td>
<td>Both</td>
<td>All</td>
<td>Lit review</td>
<td>7,000 (5,000-10,000) [0.17]</td>
<td>Aceijas 2004</td>
<td>No details on study methodologies</td>
</tr>
</tbody>
</table>

* Mirzoyan 2013. The HIV prevalence is only for Tripoli.
<table>
<thead>
<tr>
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<th>Source</th>
<th>Limitations/ biases; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National / 2010</td>
<td>Male</td>
<td>15-49</td>
<td>Estimated percentage of adult male population and consensus</td>
<td>75,000 [0.50]</td>
<td>National AIDS Programme (Strategic Information and M&amp;E Working Group): HIV Estimates and Projections Asian Epidemiological Model, Myanmar 2010-2015</td>
<td>Based solely on calculation of PWID being 0.5% of the male population aged 15-49 years and agreed upon by in-country stakeholders; it was not based on enumeration or other indirect methods of estimation.</td>
</tr>
<tr>
<td>National / 2004</td>
<td>Both</td>
<td>N/A</td>
<td>Lit review</td>
<td>195,000 (90,000, 300,000) [0.53]</td>
<td>Aceijas 2004</td>
<td>No study methodologies</td>
</tr>
<tr>
<td>National / 2007</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect estimates from registered drug users.</td>
<td>75,000 (60,000–90,000) [0.20]</td>
<td>Mathers B et al (2008).</td>
<td>Methodology not described. Much of the HIV and PWID research uses this estimate as a base.</td>
</tr>
<tr>
<td>National / 2009</td>
<td>Both</td>
<td>N/A</td>
<td>Author’s personal communication with WHO Country Office and National AIDS Programme Staff.</td>
<td>60,000–90,000 [0.24]</td>
<td>Sharma M 2009</td>
<td>Not based on systematic methodologies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City/Region/Year</th>
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</tr>
</thead>
<tbody>
<tr>
<td>National/2009</td>
<td>90% males; 10% females</td>
<td>N/A</td>
<td>Based on national consensus meeting which took into account the Dangerous Drug Board’s survey indicating that 2-4% of general population use illegal drugs, and 0.89% of them were PWID. This rate was applied to all but three sites (Cebu City, General Santos City, and Zamboanga City), where identified networks of PWID were estimated (method not specified). In these three cities, the reported figures from the identified networks were used instead of the percentage of 0.03% of the general population being PWID.</td>
<td>12,705-21,567 [0.030-0.04]</td>
<td>Philippine National AIDS Council/Philippine Estimates of the Most At-Risk Population and People Living with HIV (2011)</td>
<td>No indirect estimations are available for the nation. This is based on 0.03%-0.04% of the adult male population (15-49 years) being PWID with the exception of the 3 cities which had reported networks of PWID that were higher than the estimated 0.03-0.04% of the general population being PWID.</td>
</tr>
<tr>
<td>National/2004</td>
<td>Both</td>
<td>N/A</td>
<td>Lit review</td>
<td>17,000 (10,000-24,000) [0.028]</td>
<td>Aceijas 2004</td>
<td>No study methodologies reported</td>
</tr>
<tr>
<td>Regional</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cebu City, Santos City, Zamboanga/2011</td>
<td>Both</td>
<td>N/A</td>
<td>Not reported. It only states that they “identified networks of IDUs”.</td>
<td>Cebu City estimated 2,027; PWID in the city, 627 in General Santos City; 1,190 in Zamboanga City.</td>
<td>Philippine National AIDS Council/Philippine Estimates of the Most At-Risk Population and People Living with HIV (2011)</td>
<td>Methodology not reported.</td>
</tr>
<tr>
<td>Pasay, Quezon, Baguio, Angeles, Cebu, Iloilo, Cagayande</td>
<td>Both</td>
<td>N/A</td>
<td>Data from 10 sentinel sites; no method given.</td>
<td>7,239-14,478 [0.012-0.024]</td>
<td>2007 HIV Estimates in the Philippines. Unpublished, Cited by Philippines Country Profile in Evidence to Action website Aidsdatahub.org;</td>
<td>Appears to aggregated count.</td>
</tr>
</tbody>
</table>
Oro, Davao, General Santos, Zamboanga / 2007

<table>
<thead>
<tr>
<th>City/Region/Year</th>
<th>Male/Female/both</th>
<th>Age</th>
<th>Estimation method(s)</th>
<th>PWID size estimate (range)</th>
<th>Source</th>
<th>Limitations/biases; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National/2013</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect</td>
<td>26,500</td>
<td>Analysis of the situation and resources to implement a comprehensive package of services for injecting drug users in the Republic of Tajikistan, 2013 (in Russian) (Анализ ситуации и ресурсов для внедрения комплексного пакета услуг для ПИН в Республике Таджикистан, 2013)</td>
<td>No direct methods seem to be utilized. Multiplication of benchmarks by the assigned coefficient in each area. The coefficient was assigned based on expert opinion from 1.5 for areas with good coverage to 5 for areas with low coverage.</td>
</tr>
<tr>
<td>National/2009</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect</td>
<td>25,000 (20,000-30,000)[0.51]</td>
<td>Study of high-risk groups and the capacity of local organizations in the preparation and execution of programs to prevent HIV / AIDS among PWID, CSWs and their clients in Tajikistan (personal communication, Republican Centre on AIDS Prevention and Control, Ministry of Health and Social Protection, Republic of Tajikistan).</td>
<td>Multiplier methods were used, but have not been able to locate detailed documentation. Implemented by the AIDS Project Management Group in 2009.</td>
</tr>
<tr>
<td>National/statistics from 1998-2003</td>
<td>Both</td>
<td>N/A</td>
<td>Lit review</td>
<td>53,000 (43,000-62,000) [1.09]</td>
<td>Aceijas 2004</td>
<td>No direct methods seem to be utilized. Possible that some documents with direct methods were utilized in lit review, but not specified. Experts consulted on final estimates. Likely a Delphi estimate not based on strong source data.</td>
</tr>
<tr>
<td>National/2006</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect methods</td>
<td>17,000 (no range given) [0.35]</td>
<td>Mathers 2008</td>
<td>No direct methods seem to be utilized. Possible that some documents with direct methods were utilized in lit review, but not specified. Experts consulted on final estimates. Likely a Delphi estimate not based on strong source data.</td>
</tr>
<tr>
<td>Source Region</td>
<td>Data Scope</td>
<td>Survey Type</td>
<td>Result</td>
<td>Notes</td>
<td></td>
<td></td>
</tr>
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<td>-------------------</td>
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</tr>
<tr>
<td>National / 2008</td>
<td>Both</td>
<td>Mapping</td>
<td>34,000 [0.70]</td>
<td>Accessibility of HIV Prevention, Treatment and Care Services for People who use Drugs and incarcerated people in Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan UNODC; Cites: UNAIDS, Tajikistan, country progress report (January 2008).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* UNAIDS 2012.
### Uzbekistan

**Prevalence of HIV among PWID – 7.3***

<table>
<thead>
<tr>
<th>City/ Region/ Year</th>
<th>Male/ Female /both</th>
<th>Age</th>
<th>Estimation method(s)</th>
<th>PWID size estimate (range) [proportion of 2012 population]</th>
<th>Source</th>
<th>Limitations/biases Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National/2011, 2013</td>
<td>Both</td>
<td>N/A</td>
<td>Indirect</td>
<td>Pending</td>
<td>UNAIDS communication</td>
<td>Multiplier method integrated within the 2011 and 2013 IBBS rounds.</td>
</tr>
<tr>
<td>National / statistics from 1998-2003</td>
<td>Both</td>
<td>N/A</td>
<td>Lit review</td>
<td>87,000 (52,000-122,000) [0.45]</td>
<td>Aceijas 2004</td>
<td>No direct methods seem to be utilized. Possible that some documents with direct methods were utilized in lit review, but not specified. Experts consulted on final estimates. Likely a Delphi estimate not based on good data</td>
</tr>
<tr>
<td>National / 2009</td>
<td>Both</td>
<td>N/A</td>
<td>0.5% population prevalence based on snowball assessment. Size estimate derived using this prevalence and total population.</td>
<td>80,000 (2006) [0.42]</td>
<td>EMCDDA <a href="http://www.emcdda.europa.eu/publications/country-overviews/uz">http://www.emcdda.europa.eu/publications/country-overviews/uz</a></td>
<td>From source: “Such a large estimated number of injecting drug users raises doubts among narcological specialists and requires specification and confirmation by means of the scientific performance of epidemiological surveys.”</td>
</tr>
<tr>
<td>National/ 2001</td>
<td>Both</td>
<td>N/A</td>
<td>Unknown</td>
<td>&gt;100,000 (&gt;0.53)</td>
<td>United Nations Office on Drugs and Crime, via Summary Country Profile for HIV/AIDS Treatment Scale-Up.</td>
<td>Source data not found.</td>
</tr>
</tbody>
</table>

* UNAIDS 2013.

**2012 Country Population (Age 15-64 years): 19,042,221**
APPENDIX II REVIEW OF SELECT LITERATURE ON SIZE ESTIMATION STUDIES

References

34. UNODC and Canadian HIV/AIDS Legal Network. *Accessibility of HIV Prevention, Treatment and Care Services for People who use Drugs and Incarcerated People in Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan; Legislative and Policy Analysis and Recommendations for Reform 2010.*


42. National Epidemiology Center, Department of Health (Philippines). *Philippine Priority Areas for HIV Intervention (PAHI) 2012.*


44. UNAIDS. *HIV in Asia and the Pacific 2013.*


47. Department of Health, National Epidemiology Center, Philippines. Brief report: 2013 Integrated HIV Behavioral and Serologic Surveillance: Males who have Sex with Males (MSM) and Male Injecting Drug Users (IDU), Manila, Philippines; 2013.


49. UNODC Regional Office for Central Asia. *Illicit Drug Trends in Central Asia: UNODC Regional Office for Central Asia; 2008.*
