Behavioral and Biological Surveillance Study among Injection Drug Users in Bosnia and Herzegovina, 2012: A Respondent-Driven Sampling Survey

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Report prepared by
Valerio Bačak and Zoran Dominković
Infectious Diseases and Related Risk Factors among Injection Drug Users in Bosnia and Herzegovina

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Abbreviations and Acronyms

IDU Injection drug users
NGO Non-governmental organization
RDS Respondent-driven sampling
RDSAT Respondent-driven sampling analysis tool
STI Sexually transmitted infections
UNGASS United Nations General Assembly Special Session on HIV/AIDS
UNDP United Nations Development Programme
HBV Hepatitis B virus
HCV Hepatitis C virus
HIV Human immunodeficiency virus
BiH Bosnia and Herzegovina
FBIH Federation of Bosnia and Herzegovina
RS Republic of Srpska
Executive Summary

The aim of this survey was to continue the systematic monitoring of biological and behavioral factors related to HIV among IDUs in Bosnia and Herzegovina. Like in the previous waves of the survey carried out in 2007 and 2009, RDS was used to reach a probabilistic sample of the IDU population. Banja Luka, Sarajevo, and Zenica participated in all three waves of data collection, while Mostar and Bijeljina were participating for the first time. Data were collected by the local non-governmental organizations with extensive experience in providing harm reduction and HIV prevention services. The sample sizes ranged from 130 in Bijeljina to 260 in Banja Luka. Participants received a primary incentive of 20 BAM for their own participation and 10 BAM for recruiting eligible peers.

HIV prevalence remained very low, not exceeding more than two infections per city. On the other hand, HCV prevalence is relatively high in most cities, with the exception of Zenica and Bijeljina, and has been relatively stable in the last five years. Neither HIV nor HCV testing, however, are very common in the IDU population, especially in Mostar and Bijeljina. An estimated 78% of IDUs in Bijeljina never had an HIV test, and only 8% are estimated to have had an HCV test in the last 12 months.

Awareness and utilization of HIV prevention services increased substantially in Sarajevo, Zenica, and Banja Luka since 2007, but it is at much lower levels in Mostar and Bijeljina. Forty percent of IDUs were aware of an NGO working in HIV prevention in Zenica in 2007, increasing to 55% in 2009 and 74% in 2012. In Bijeljina, in comparison, only two persons reported knowing about organizations working on HIV prevention among IDUs in their city. There is a clear need to scale up prevention in these two cities, while preserving and expanding
the level of contact with IDUs in other cities. Outreach programs can be particularly useful for building initial trust and providing basic information about the availability of services.

There was some reduction in needle sharing since 2007. The proportion of IDUs in Sarajevo, for instance, who used sterile needles and/or syringes the last time they injected increased from estimated 87% in 2009 to 96% in 2012, and a slightly larger change was observed in Zenica, from 78% to 91%. Sharing needles and/or syringes during last injection episode was reported by only 10% of IDUs in Bijeljina and 7% in Mostar, suggesting that risky injecting practices are at relatively low levels in these two cities.

Targeting sexual risk behaviors has to remain a priority in HIV prevention among IDUs in Bosnia and Herzegovina. Unprotected sex was common in all cities, especially with steady sexual partners. Only about a quarter or fewer have used condoms consistently with steady partners in the month preceding the survey. Because many IDUs have steady partners who also inject drugs, the risk of STI transmission through either risky sexual or injecting practices is increased. Injection drug users can also serve as a bridging population by delivering infections to the general population through sexual intercourse.

Many IDUs in the five cities have had extensive contact with the criminal justice system. For instance, 64% in Sarajevo are estimated to have been incarcerated at some point in their life with a half having been in prison three or more times. As importantly, many of the IDUs arrested in the one month preceding the survey have experienced some form of violence or abuse during the arrest. HIV prevention needs to include educating and sensitizing the police about the peculiar health needs and the vulnerabilities of IDUs. Police should be involved in designing programs that would significantly reduce the prevalence of abuse and violence.
Overdose to the point of losing consciousness was commonly reported in most cities. About half of IDUs have ever been overdosed in Sarajevo and Banja Luka. Overdose prevention education needs to be provided to IDUs in Bosnia and Herzegovina, especially through existing harm reduction services and public health organizations. Education should also be targeted at the usual first responders such as the police and physicians.

Unemployment remains widespread among IDUs in Bosnia and Herzegovina, with the highest proportion out of work in Zenica (84%) and Sarajevo (78%). While unemployment in this population reflects the economic opportunities in the larger society, it appears to be substantially higher among IDUs. It is important to take into account that the lack of employment creates material strain for their parents. According to the survey findings, many IDUs live with their parents and depend on them financially. Increasing options for legal earnings should be pursued as part of the broader HIV prevention strategy as it can help IDUs effectively address drug addiction and reduce the levels of harmful health behaviors.
Introduction

Injection drug use is one of the most common means of HIV transmission. Although high quality survey data rarely exist, available data suggest that blood-borne infections, such as HIV and hepatitis C virus, are substantially more prevalent among IDUs than in the general population. In some countries with characteristics similar to Bosnia and Herzegovina, HIV epidemic has been on the rise. The most prominent examples are the HIV outbreak associated with injection drug use in Ukraine and Russia (Cohen, 2010; Kruglov et al., 2007). Ukraine, for instance, has by now the largest HIV prevalence in Europe, estimated at slightly more than 1% in the general population while the UNAIDS estimated that more than a third of IDUs in the Russian Federation live with HIV.

There are a number of reasons why IDUs are a particularly vulnerable group with respect to HIV and other blood-borne and sexually transmitted infections. Similar to other populations most at risk for HIV such as street-based sex workers and men who have sex with men, IDUs engage in a behavior that is severely stigmatized and illegal. For these reasons, their health is vulnerable because they may avoid seeking treatment or prevention services in public institutions such as hospitals or other health care providers. Even when there are harm reduction services targeted at IDUs, they may be reluctant to use them due to fear of stigma and victimization.

In addition to HIV, HCV is the most immediate threat to the health of IDUs both in the developing and the developed countries. By some of the more recent estimates, it is not unusual for HCV prevalence rates to exceed 50% (Aceijas and Rhodes, 2007). Hepatitis C virus infection is also common in Southeastern Europe. A recent RDS survey carried out in Montenegro, for instance, found that HCV prevalence among IDUs increased from 22% to 54% between 2005 and 2008 (Baćak et al., 2013). The situation is similar in another neighboring country, Serbia,
where HCV prevalence among IDUs in Belgrade was estimated at 63% (Judd et al., 2009). The 2009 surveys in Bosnia and Herzegovina found that HCV prevalence reached about half of the IDU population in Sarajevo and Banja Luka.

In those countries, similar to elsewhere, transmission of HCV and HIV is enabled by essentially two levels of risks that IDUs are exposed to - what can be described as proximal and distal factors. The former include behaviors that present an immediate threat to health, such as having unprotected sex and sharing injection equipment. The so-called distal factors complement the more immediate risks by providing the social environment conducive to risk-taking behaviors. These risks include structural barriers such as lack of employment, stigma and discrimination attached to drug addiction, lack of appropriate health care, and severe penal policies aimed at drug injectors (Rhodes and Simic, 2005).

In this survey we continued the surveillance of HIV and related blood borne and sexually transmitted infections among IDUs in Bosnia and Herzegovina. Similar to the surveys carried out in 2007 and 2009, RDS was used to reach a probabilistic sample of IDUs in respective cities. The most important change in this year’s survey is that Banja Luka, Sarajevo, and Zenica were now joined by two cities that so far have not participated in HIV surveillance - Bijeljina and Mostar. In addition to a similar set of indicators measured in previous survey waves in 2007 and 2009, this survey included more detailed measures of experiences with the criminal justice system. In this report, we present the new findings and discuss them in relation to the findings from previous years.
Infectious Diseases and Related Risk Factors among Injection Drug Users in Bosnia and Herzegovina

Following the standards of the World Health Organization, Bosnia and Herzegovina is still considered to be a country with a low-level HIV epidemic. In other words, HIV prevalence has not exceeded 1% in the general population or 5% in any of the most at risk groups, including IDUs, sex workers, and men who have sex with men. Since the first case of HIV was registered in 1986, 196 persons were reported to be HIV-positive and 116 developed AIDS. According to the official records of the Federation of BiH, out of 129 currently registered HIV cases, 15 people were likely infected as a result of injecting drugs. Official records, however, have a limited value for describing the epidemiology of HIV compared to high quality community surveys that reach members of the population who either do not know they are infected or did not seek medical help.

Like in previous years, RDS was used in this survey wave as well. Having a higher quality sample than what would be the case with non-probabilistic methods such as regular snowball or targeted sampling, enables stronger inferences about the HIV-related characteristics of the IDU population as well as about the changes that have occurred in the past five years since the first survey. In addition to yielding a better sample, the expertise and staff for conducting an RDS survey was readily available. A number of researchers who participated in previous surveys, who were central to a successful and timely data collection, were involved in the latest wave of data collection. Since the first wave, on-the-ground implementation of the survey was carried out by three NGOs involved in harm reduction – “Viktorija,” “PROI,” and “Margina.”

Survey measures vary from one wave to another, but the epidemiological core necessary for monitoring HIV and related infections remained mostly the same. Comparison of key
indicators, such as those created and updated by the United Nations General Assembly on HIV/AIDS (UNGASS), is therefore made possible. As for the new measures, in the 2009 survey more focus was placed on initiation into drug injection, along with a number of measures of oral health. In 2012, there are slightly more questions about experiences with the criminal justice system, especially as they pertain to discrimination and policing practices known to be related to risky injecting behaviors. The questionnaires are based on best practices for repeated surveillance studies recommended by the Family Health International (FHI, 2000).

The first RDS survey among IDUs in Bosnia and Herzegovina, conducted in 2007, revealed almost no HIV cases. No cases were detected in Zenica, and only one case was discovered in Sarajevo and Banja Luka. The prevalence was similar in 2009, with still no cases in Zenica, one in Sarajevo, and two in Banja Luka. In the latest survey, HIV prevalence remained very low, similar to the level of prior surveys. In contrast, however, HCV remained a common infection in all surveyed cities. While Zenica had the lowest prevalence of around 20% in all three waves, Sarajevo and Banja Luka had an estimated prevalence rate between 35% and 50%.

The relatively high HCV prevalence reflects a somewhat common practice of sharing injection equipment. There were some changes in reducing this risky behavior between 2007 and 2009. About a third of IDUs in each city reported having shared needles or syringes in the past month preceding the survey in 2007. In 2009, the fraction of the population estimated to have shared injection equipment in Sarajevo remained around a third, while in Zenica and Banja Luka it was slightly reduced to about 20%. Data from the latest survey, however, suggest that injecting with non-sterile equipment remains an important proximate risk factor for transmission of blood borne infections among IDUs in the country, although it has seen a considerable decline.
In brief, it appears that risks related to HIV and HCV infection among IDUs in Bosnia and Herzegovina are lower than they used to be but are still relatively high. Despite the hopeful finding that HIV remains practically non-existent, the prevalence of HCV and persistent risky injecting and sexual practices call for caution. In addition, the larger social factors that may expose IDUs to health-related harms, such as harsh and punitive policing practices, and limited economic opportunities available in the respective cities, add to the further marginalization and vulnerability of IDUs in Bosnia and Herzegovina. After presenting the findings from the 2012 survey, we return to comparing the most recent findings with those from previous survey, examining more closely what changed in the last five years.

Methods

In most countries, injection drug use is an illegal and highly stigmatized activity. The same is the case in Bosnia and Herzegovina, where, despite availability of harm reduction programs, IDUs remain a vulnerable population with respect to infectious diseases. Surveillance programs for populations most at risk for HIV infection encounter unique challenges as to the recruitment of survey participants who are often hidden and hard to reach for research purposes (Magnani et al., 2005). For that reason, alternative sampling techniques have been developed that are more effective at reaching members of these populations. In this study, as in previous years, we used RDS, a method that has proved effective at recruiting IDUs in a number of different settings (Malekinejad et al., 2008).

Technical information about RDS is readily available elsewhere (Heckathorn, 2007; 2002; 1997). The central advantage of RDS compared to convenience-based sampling methods (often used with hidden populations for which there is no sampling frame) is that it yields a
probabilistic sample of the target population. In brief, this is achieved by exploiting the fact that IDUs in a particular locale are socially connected. By tapping into these social networks, and using population members as recruiters, RDS reduces the bias associated with the non-random selection of initial survey participants (called seeds) and accounts for homophily or a tendency of individuals to form social connections with those similar to them. In the following sections, we describe the main characteristics of RDS as it was implemented in the current study.

**Sampling Procedure**

During formative research, researchers associated with participating NGOs identified the initial survey participants or, in RDS terminology, the seeds. Number of seeds varied across the cities, but remained between 5 and 10 in each city\(^1\). A standard part of RDS surveys is the double incentive system in which eligible participants receive a usually monetary incentive for their own participation (primary incentive) and a reduced incentive for recruiting up to three target population members (secondary incentive). In this study, primary incentive was 20 BAM and secondary incentive was set at 10 BAM (approximately 10€ and 5€, respectively). In addition to these incentives, survey participants received recruitment coupons with unique identification numbers to give to their recruits.

In Zenica and Sarajevo, for instance, survey sites were located in a rented apartment, and in Mostar data were collected in the facilities of the Institute of Public Health. Sites were staffed by trained and experienced staff that consisted of screeners, interviewers, coupon managers, counselors, lab technicians, and nurses. Staff participated in a two-day training workshop. Most

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\(^1\) Graphs 1-5 in the appendix show recruitment networks with seeds marked dark red with color progressively fading as participants become more removed from the seed.
already had substantial experience in RDS studies among IDUs, either by working on the 2007 or 2009 surveys or both. Data were collected from early May 2012 until late June/early July (Sarajevo, Zenica, and Mostar) or late July of the same year (Banja Luka and Bijeljina).

Participants were informed that the survey was anonymous and confidential and that at any time they could discontinue their participation. No identifying information was collected from the participants and the informed consent form was signed by the screener following oral consent from the participants. Participants were offered to collect their test results. Positive ethical review of the survey was performed by the ethical committees at the institutes of public health in the Federation of Bosnia and Herzegovina and the Republic of Srpska.

Participants

In order to participate in the survey, all persons who arrived at the survey site had to have a valid recruitment coupon. Furthermore, the person had to be older than 18; had to inject drugs at least once in the past month; had to currently live, work, or study in the city where the study was taking place; and had to be capable of providing informed consent to participate in both the biological and behavioral parts of the survey. Eligibility criteria were examined by the screeners who were trained to assess whether the person had the required characteristics and to probe potential participants if they suspect they are not providing honest answers. As in previous two studies, the screeners themselves were closely familiar with the IDU population, either as having worked in harm reduction programs or being a former IDU.
Survey Measures

A major part of the questionnaire was designed following the guidelines for repeated behavioral surveys in populations at risk of HIV prepared by the Family Health International (2000). The questionnaire also included questions that allowed for the construction of the following UNGASS indicators:

1. Percentage of IDUs that have received an HIV test in the last 12 months and who know their results.
2. Percentage of IDUS who were reached with HIV prevention programs.
3. Percentage of IDUs who both correctly identify ways of preventing the sexual transmission of HIV and who reject major misconceptions about HIV transmission.
4. Percentage of IDUs who have had sexual intercourse before the age of 15.
5. Percentage of IDUs who have had sexual intercourse with more than one partner in the last 12 months.
6. Percentage of IDUs who had more than one partner in the past 12 months reporting the use of a condom during their last sexual intercourse.
7. Percentage of IDUs reporting the use of a condom the last time they had sexual intercourse.
8. Percentage of IDUs reporting the use of sterile injecting equipment the last time they injected.
9. Percentage of IDUs who are HIV infected.
**Statistical Analysis**

Analysis was performed on the weighted and non-weighted data sets. Population-level estimates of demographic and risk-related indicators were calculated with RDSAT\(^2\). This specialized software produces point estimates and associated confidence intervals by adjusting the data for homophily and different probability of recruitment into the survey. The latter is based on participants’ reports of their personal network size consisting of other members of the target population in the city. UNGASS indicators were stratified by age, following the UNAIDS guidelines. Participants with reported network sizes of 50 or more were considered outliers and their network size was adjusted to be 50.

**Results**

In the following sections, we describe the major results from the survey. Less central findings are not described but are available in the appendices. Results are reviewed by cities, focusing on descriptive findings from the 2012 study. Over time comparisons are presented and discussed in the subsequent section. Throughout the Results section we refer to population estimates rather than sample proportions. It is important to note here, however, that population estimates with small sample sizes tend to be unreliable and were therefore presented only tentatively. In that case, sample proportions might be more informative.

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\(^2\) The following settings were used in the analyses: 1-tailed alpha = 0.025; No of re-samples for bootstrap: 25000; Average network Size Estimation: Dual component; Algorithm type: Enhanced Data-Smoothing
Sarajevo

Demographic Characteristics

Similar to the previous surveys and other cities, predominant majority of IDUs in Sarajevo are men (86%). Average age in the sample was 33 years with more than 90% who were 25 or older. Majority were Muslim Bosnians, followed by Roma who constitute an estimated 9% of the IDU population in Sarajevo. High school is the highest level of educational attainment for about two thirds of IDUs. Even though the sample was relatively older, 43% live with their parents. Unemployment level is 78%, with the most common source of income in the last three months, aside from employment, in the form of assistance from the family and theft.

Drug Use History

For many participants, drug use was initiated at an early age, with 16 being the average age at first drug injecting. Slightly over half are estimated to have injected drugs for six years or longer. Similar to previous surveys, the most common drug used when injecting was heroin. Majority of IDUs in Sarajevo are estimated to inject drugs at least once weekly, with about a fourth who inject multiple times a day. A little less than half have ever been overdosed to the point of losing consciousness. Currently, 37% were under some type of treatment against drug addiction. It is estimated that 63% knew of some organization that works on HIV prevention in Sarajevo, out of whom 76% used their services in the 12 months preceding the survey.

Injecting and Needle-Sharing Practices

Only an estimated 8% have used an already used needle and/or syringe the last time they injected drugs. This proportion is higher among younger IDUs, estimated at 22%. About one in
ten have shared injection equipment in the last month, with the most commonly reported reason not having own equipment at the time of injecting. No one reported sharing equipment with someone they did not know at all. Ninety percent have cleaned the used needle and/or syringe the last time they shared injection equipment, water being the most frequently used form of cleaning. An interesting finding is that 23% have injected drugs outside of BiH. With respect to the sources of sterile injecting equipment in the last 12 months, 74% bought it in the pharmacy, 51% acquired it from NGOs that provide needle-exchange services, and 42% received it from an outreach worker. Majority was able to get a new needle and/or syringe when they needed one (76%). During the month preceding the survey, 62% always used new injecting equipment, and 22% used it almost always.

Police and Prison Experience

Contact with the criminal justice system appears common among IDUs in Sarajevo. A little less than half have been arrested in the past month, out of which 45% have reportedly been exposed to some form of abuse or violence. An estimated 64% have ever been imprisoned with half having been imprisoned three or more times. Combining all episodes of imprisonment, majority of IDUs have spent more than a year in prison. Injecting drugs in prison was estimated at 12%.

Sexual Behavior and Condom Use

About a third of IDUs in Sarajevo are estimated to have had sex before the age of 15. Large majority have had sexual intercourse in the last 12 months, during which period 46% had one, 24% had two, and 30% had three or more partners. Thirty percent have used a condom during last sex. Among the 85% who had sex with a steady partner, 34% had partners who were
also injecting drugs. The proportion is similar with casual partners. Out of 44% who had sex with a casual partner, 39% had partners who were IDUs. Condom use prevalence at last sex with a steady partner is lower than condom use with a casual partner, 23% compared to 51%. Similarly, while there were 13% of those who reportedly always used a condom with their steady partners, the proportion increased to 29% for sex with casual partners.

\textit{HIV Knowledge and Testing}

Estimated 13% have had a sexually transmitted infection in their lifetime (e.g. syphilis, gonorrhea). In general, knowledge about the means of transmission and protection from HIV was relatively low with only 18%, however, giving correct answers to all HIV-related questions. When it comes to specific questions, a quarter did not know that HIV can be transmitted by anal sex. Misconceptions seem to be common – slightly more than two thirds did not have a correct answer to the question whether HIV can be transmitted by sharing dishes. Most importantly, however, almost all knew that HIV can be transmitted by sharing injection equipment. About 80% knew where they can get an HIV test. Slightly more than two thirds have tested once or more often and about a half tested in the last 12 months. For those who tested in that period, 35% were required to have an HIV test and almost all informed themselves about the test result. Rates of HCV testing in the last 12 months were lower, estimated at about 50% with large majority knowing the results.

\textit{Infectious Disease Prevalence}

Only one case of HIV was detected in the Sarajevo study, bringing the estimated prevalence at 0.5%. This is similar to HBV that was found among only five participants. No one
was tested positive for syphilis. Prevalence of HCV, on the other hand, was substantially higher, with slightly less than a half who tested positive.

Zenica

Demographic Characteristics

Like in other cities, large majority of IDUs in Zenica were male (90%). Median age was 32 years, with majority of participants older than 25. Sixty percent have completed high school and about a third finished only elementary school. Single is the most frequently reported marital category, followed by a long-term relationship (14%) and married (11%). About half of the IDUs in Zenica lived with their parents and about a fifth lived alone. Unemployment is widespread at 84%, with the main source of income being family (41%) and occasional or temporary work (36%). Majority of the participants were Bosnians. About half have participated in the 2009 survey and about a quarter participated in the 2007 survey wave.

Drug Use History

The average age at first drug injection in Zenica was 16, with most IDUs having had injected drugs for 6 or more years. About two thirds have injected drugs once a week or less often, followed by 27% who injected a few times a week. Last time when they injected drugs, 65% are estimated to have exchanged their used needles and/or syringes for new ones and 29% have disposed of them. Slightly more than a quarter has overdosed to the point of losing consciousness at least once in their lifetime. Twenty-two percent were currently under treatment against drug addiction while 44% were never treated. About three quarters know of organizations
involved with HIV prevention among IDUs in their city, 89% of who used their services in the 12 months preceding the survey.

*Injecting and Needle-Sharing Practices*

Only 6% are estimated to have shared injection equipment during the last injection episode. The proportion remained approximately the same when the question referred to the past one month. The last time they shared needles/syringes, 33% have cleaned it before use, mainly with soap/detergent and cold water. About a quarter are estimated to have injected drugs outside of BiH in the one month preceding the survey. Contact with harm reduction services in Zenica seems to be common. In the last 12 months, 84% have received sterile injection equipment from a needle-exchange center and 75% received them from outreach workers. Almost all were able to get a new, unused needle and/or syringe when they needed one.

*Police and Prison Experience*

In the last one month, slightly more than a half of IDUs in Zenica are estimated to have been arrested. A quarter was arrested for theft or robbery. Of those who were arrested, about a quarter experienced some form of violence or abuse at the hands of police. Thirty-nine percent have ever been imprisoned, majority of whom were incarcerated twice or more often. Combining all the episodes of incarceration in their lifetime, 61% spent more than a year in a prison. One out of ten formerly incarcerated IDUs have injected drugs while in prison.

*Sexual Behavior and Condom Use*
About one in five IDUs in Zenica have had sexual intercourse before the age of 15. A third used a condom during last intercourse. Sixty-nine percent had sex with a steady partner in the 12 months preceding the survey; 35% of those partners also injected drugs. The most commonly reported condom use error/problem was that the condom slipped or remained in the vagina (13%). Condom use at last sex with a steady partner was estimated at 33% while consistent condom use with the same type of partner in the past month was slightly lower (28%). Fifty-five percent had sex with a casual partner in the past 12 months; 37% of those partners were also IDUs. Condom use was more frequent than with steady partners – 40% used condoms at last sex, and 37% used them always in the last 12 months. About one in three IDUs exchanged money, drugs, or something else for sexual services. Only 5% reportedly were diagnosed with and STD in their lifetime.

**HIV Knowledge and Testing**

Large majority had correct answers to the most common questions about the means of transmission and protection of HIV, such as that the person who looks healthy can have HIV, and that HIV can be acquired by anal sex. On the other hand, 32% thought that HIV can be transmitted by using the same cutlery as the one used by an infected person. Twelve percent had correct answers to all the questions related to knowledge of HIV, and having all correct answers was more common among IDUs older than 25. Eighty percent of IDUs in Zenica knew where they can receive an HIV test; 42% tested multiple times and 26% tested once. One out of five tested in the previous 12 months, and for 22% this test was mandatory. Large majority have collected the result of their last test. Hepatitis C testing in the 12 months preceding the survey was estimated at 40%.
Infectious Disease Prevalence

No positive HIV or Syphilis cases were confirmed. Hepatitis C virus prevalence among IDUs in Zenica was estimated at 23% and HBV prevalence was 6%.

Mostar

Demographic Characteristics

The same as in other cities in the current and in the previous waves of the survey, men represent the large majority of IDUs in Mostar. Mean age in the sample of 200 participants was 33 years. Having completed high school was the most common educational level. Sixty-two percent have been single, followed by 15% who are in a steady relationship. Similar to other cities, cohabiting with parents was the modal living arrangement category. Unemployment rate was estimated at 69%. For an estimated half of the IDUs in Mostar, temporary and occasional work was the primary source of income in the last three months. Croats were the most represented, estimated at 43%, followed by 36% of Bosniaks, and 11% of Serbs.

Drug Use History

Mean age at first drug injection in the sample was 16. Majority of IDUs in Mostar are seasoned drug users with injecting careers spanning 6 and more years. In addition to heroin, the drug of choice for practically all participants, amphetamines seemed to have been a relatively commonly injected drug (27%). Majority injected drugs once daily and more often. Sixty-four percent have discarded the needle/syringe which they used for last drug injection, and 19% have
kept them for use at another time. In their lifetime, about a quarter overdosed to the point of losing consciousness. Sixty-one percent have never undertaken treatment against drug addiction. Knowledge of organizations working on HIV prevention among IDUs in Mostar was relatively low, estimated at 33%. About a half of those who heard of these organizations have used their services in the past 12 months.

**Injecting and Needle-Sharing Practices**

Only 7% of IDUs in Mostar have used a non-sterile needle/syringe the last time they injected drugs. The proportion increased to 27% when asked about using non-sterile injection equipment in the past one month. Among those IDUs, lacking appropriate injection equipment was the most commonly reported reason for using already used needle/syringes. Somewhat more than a half cleaned the already used needle/syringe, most often with cold water. Injecting drugs outside of BiH in the past one month was estimated at 16%.

Only 37% of IDUs know about organizations that provide HIV prevention services for the IDU population in their city, out of whom 60% are estimated to have ever used their services. However, it is puzzling that 86% of IDUs have received sterile needles/syringes from a needle exchange center, coordinated by an NGO. This might suggest that some participants did not know that the question refers to these organizations. With the available data, it is not possible to answer this question empirically. Most IDUs in Mostar seemed to be able to access clean injection equipment - about three quarters can get sterile needles/syringes when they need them. Fifty-seven percent have always, reportedly, used new and unused needle/syringe for drug injections during the month preceding the survey.
Police and Prison Experience

Slightly less than a third of IDUs in Mostar has been arrested in the last month, 34% of whom reportedly experienced abuse and violence by the police when being arrested. Thirty-five percent are estimated to have ever been in prison, and majority of them has been imprisoned at least twice. Injecting drugs while in prison was relatively common, estimated at 17%.

Sexual Behavior and Condom Use

Majority of IDUs in Mostar have been younger than 17 at their sexual debut. Condom use at last sex was estimated at 37%. Eighty seven percent had intercourse with steady sexual partners in the past 12 months, out of whom 22% were also IDUs. During last sex with a steady partner, 27% had used a condom, while only 13% used condoms always in the past one month. Sex with casual partners was less common. One in every five IDUs in Mostar had intercourse with a casual partner in the past 12 months. Thirty four percent have used a condom during last sex with that type of partner, and 22% used a condom always in the past 12 months. Seventeen percent have ever received money, drugs or other goods in exchange for sexual services. All have reported that they know where they can buy or get condoms when they need them.

HIV Knowledge and Testing

Only two participants reported ever having been diagnosed with an STI. Knowledge level was relatively high in Mostar, especially with respect to the most basic questions about the means of transmission of and protection from HIV. For instance, 98% knew that HIV can be acquired by unprotected vaginal sex and through sharing injection equipment. The results on the UNGASS composite indicator were less frequently correct – 16% had correct answers to all the questions in the indicator. Knowledge was somewhat lower when questions were asked about
less basic aspect of HIV/AIDS. Fifty nine percent, for instance, correctly responded to the question whether HIV can be transmitted by sharing cutlery. Three quarters knew where they can receive an HIV test in their city. Majority have never had an HIV test (63%), while of those who did have one, 77% tested more than 12 months ago. For estimated 40%, the last HIV test they had was involuntary. Large majority collected their last test result. Only 13% tested for HCV in the last 12 months.

Infectious Disease Prevalence

No HIV cases were detected in Mostar. Hepatitis C prevalence, in contrast, was high with 43% of injection drug users estimated to be infected. Eight participants tested positively for HBV and only one person tested positive for Syphilis.

Bijeljina

Demographic Characteristics

The sample in Bijeljina included 130 participants, out of whom 5 were seeds. About half of the IDUs in Bijeljina are estimated to be younger than 25. Majority completed high school and about one in six have only elementary school education. With respect to relationship status, half were single and slightly more than a quarter were in a steady relationship. As in other cities in this study, majority lived with their parents. Unemployment is estimated at 35%, part time work at 33%, while only 12% had full time jobs. In addition to providing a living space, families are also a financial resource for 43% of the participants. Eighty percent of IDUs in Bijeljina are of Serbian nationality, 11% are Bosnian, and 8% are Roma.
Drug Use History

Age at first injection in Bijeljina was 16 years, with about a half having been injecting drugs for a year or less. Heroin was the drug of choice for all participants. There was also a notable prevalence of non-injecting cocaine and amphetamine use in the last three months (39% and 26%, respectively). During the past one month, 91% are estimated to have injected drugs once weekly or less often. Eighty four percent have disposed of the needle/syringe that they used during their last injection. About one in every six IDUs in Bijeljina overdosed at least once to the point of losing consciousness. Large majority have never been under treatment against drug addiction. Only two persons knew of organizations working in HIV prevention among IDUs in their city.

Injecting and Needle-Sharing Practices

Ten percent of IDUs in Bijeljina are estimated to have used a needle/syringe someone else used the last time they injected drugs, and 15% used it at least once in the past month. The most common reason for sharing was a lack of appropriate personal equipment. Substantial majority have cleaned the needle/syringe the last time they used non-sterile equipment, and water was the typical means of cleaning. In the past one month, majority never cleaned the equipment they shared in the past month. Pharmacies were the most common source of new needles/syringes. When they need one, 70% could get sterile injection equipment.

Police and Prison Experience
Slightly less than a half of IDUs in Bijeljina have been arrested during the past month. During arrest, 43% have been exposed to some form of violence or abuse by the police. About a quarter are estimated to have ever been imprisoned.

Sexual Behavior and Condom Use

Typical age at first sex in Bijeljina was between 15 and 17. Almost all participants had sex in the past 12 months preceding the survey with about a half who had more than three partners. Condom use at last sex was estimated at 35%. Among those who had sex with a steady partner in the past 12 months, about one in three of those partners have also injected drugs. A quarter used a condom during last sex with a steady partner while 18% have reportedly used it always during the past one month. A little less than a half used a condom during last sex with a casual partner and a quarter used it always during sex with the same type of partner in the past 12 months. Twenty nine percent have ever given money, drugs or something else in return for sex. Ten percent have ever been diagnosed with an STI.

HIV Knowledge and Testing

Basic knowledge of HIV was high in Bijeljina, similar to other cities, with large majority that correctly responded to questions on whether HIV can be transmitted by unprotected vaginal or anal sex, and that HIV can be prevented by using sterile injection equipment. While knowledge about less central issues such as using the same toilet with an HIV-positive person is not as high. About a quarter responded correctly to all the UNGASS items. Majority knew where they can have an HIV test while estimated 78% have never had one. Testing was non-
voluntary for eight persons out of those who have had an HIV test in the last 12 months. In the same period, only 8% have tested for HCV.

*Infectious Disease Prevalence*

No one tested positive for HIV in Bijeljina. Hepatitis C virus prevalence was estimated at 12%. Only one person was diagnosed with Syphilis, and none have had antibodies to HBV.

**Banja Luka**

*Demographic Characteristics*

Sample size in Banja Luka was 260 with 8 seeds. Large majority of participants were male and average age was 32. About three quarters completed high school. Most common relationship status was single, followed by a steady relationship. Like in the other cities, majority lived with their parents. Unemployment rate was estimated at 42%, while 19% of IDUs in Banja Luka were employed full time. Family and part time or occasional work was the most common source of income. Eighty two percent were of Serbian nationality, 9% were Croatian, and 5% were Bosnian. About a quarter participated in the 2009 surveillance study and 19% took part in the 2007 study.

*Drug Use History*

Average age at first injection was 16 years. Slightly more than a half had been injecting drugs for six years or longer. Heroin was the most commonly injected drug, reported by almost all participants. About every second IDU in Banja Luka injected drugs multiple times a week or
more often in the past one month preceding the survey. Majority have disposed of the needle and/or syringe that they used for their last injection. Almost a half overdosed to the point of losing consciousness at least once in their lifetime. While only 6% were estimated to be currently on treatment against drug addiction, 23% have had such a treatment once and 34% have been treated multiple times. A half is estimated to know of an organization doing HIV prevention among IDUs in their city, and about a quarter used their services in the past 12 months.

Injecting and Needle-Sharing Practices

Eight percent of IDUs in Banja Luka are estimated to have shared injection equipment the last time they injected, and that percentage increased to 14% when asked about the past month. Not having appropriate equipment was the most commonly reported reason for sharing. The last time they used non-sterile needle/syringe, 88% have cleaned it before use, with hot and cold water being the modal cleaning choice. The most frequent sources of sterile injection equipment in the past 12 months were pharmacies and NGOs that provide needle exchange services. Three quarters reported they could get sterile equipment when they needed it. Sixty seven percent are estimated to have used new, sterile, needles/syringes always during the past month.

Police and Prison Experience

About a quarter of IDUs in Banja Luka have been arrested in the past month, and majority reportedly experienced abuse or violence from the police while being arrested. Forty
percent have been imprisoned at least once in their lifetime. And of those, most were imprisoned multiple times. Injecting drugs while in prison was estimated at 11%.

_Sexual Behavior and Condom Use_

More than a half of IDUs in Banja Luka had at least two sexual partners in the past 12 months preceding the survey. Condom use at last sex was estimated at 28%. About three quarters had sex with a steady partner in the past 12 months. A quarter of those partners were also IDUs. Only 10% used condoms always during sex with a steady partner in the past one month. Of the 43% of IDUs who had sex with a casual sexual partner in the last year, slightly more than a quarter had IDUs among those partners. A little more than a half used a condom during last sex with a casual partner, while only 15% used a condom always in the past 12 months. About one out of five participants had provided money, drugs, or other goods in exchange for sexual services. All reported that they know where they can get condoms. Ten percent were ever diagnosed with an STI.

_HIV Knowledge and Testing_

Basic knowledge of the means of HIV transmission and protection from infection was relatively high, similar to other cities in the study. Large majority of respondents, for instance, were aware that unprotected vaginal and anal sex is a risk factor for HIV. Slightly more than a quarter had correct responses to all the questions that compose the UNGASS knowledge indicator. Three out of four reported knowing where they can get an HIV test, and slightly more than a half have tested at least once. A quarter of those who ever tested, tested in the last 12
months and for a majority testing was voluntary (75%). Large majority were informed about their test results the last time they tested. Fifteen percent had an HCV test in the past 12 months.

**Infectious Disease Prevalence**

Similar to most other cities in the study, no HIV cases were detected among IDUs in Banja Luka, while 35% are estimated to be HCV positive. There were only two HBV and two Syphilis cases.

**Trends in STI Prevalence and Risk Behaviors**

The three waves of this cross-sectional survey include Sarajevo, Banja Luka, and Zenica. The data for Mostar and Bijeljina are only available for 2012. While many key variables were comparable across years, each survey made some changes in the questionnaire either by adding new questions or by slightly altering the content of existing measures. In this section, we focus on a select number of key variables central to HIV. In particular, we descriptively examine the change in indicators on risky sexual and injecting behaviors, HIV testing experiences, HIV-related knowledge, contact with the criminal justice system, and experiences with HIV prevention services in respective cities. It is important to note that these data are cross-sectional since surveys in each year were carried out on a new sample.

**Sarajevo**

One of the notable findings from comparisons across year in Sarajevo is the relatively small decrease in the proportion of those who never tested for HIV, changing from 40% in 2007 to 23% in 2009 and to 35% in 2012. There is therefore still a need to make uptake of HIV
testing more widespread. Since HCV is a serious and a more common health problem among IDUs in all cities, especially in Sarajevo and Banja Luka, HCV testing rates would also need to increase. While the level of basic HIV-related knowledge was relatively high since 2007, knowledge about less common means of HIV transmission is substantially lower. Although this does not need to be very concerning, it might have consequences for the extent of stigmatization toward HIV-positive individuals.

Prevalence of condom use at last sex, one of the main indicators of sexual risk behaviors, remained slightly higher than 30% in 2009 and 2012, while the question was not asked in 2007. There is a clear need to direct prevention efforts on unprotected sex. Large majority of IDUs in Sarajevo reportedly used sterile needles and/or syringes the last time they injected, ranging from estimated 87% in 2009 to 96% in 2012. The proportion of those who did not share injection equipment in the past month preceding the survey remained roughly constant since 2007, varying around 60%. Taking into account the HIV prevention efforts in the last few years, it could have been expected that this proportion would have increased.

Contact with harm reduction services witnessed a notable increase. While estimated 23% knew about an NGO working on HIV prevention among IDUs in their city in 2007, this proportion increased to 55% in 2012. Furthermore, needle exchange services were not mentioned by a single IDU as their main source of injection equipment in 2007 compared to 10% in 2009 and 47% in 2012. The extent of imprisonment did not vary very much. Slightly more than a half of IDUs in Sarajevo have been in prison at some point in their life.

Prevalence of STIs in Sarajevo remained practically constant across all three survey waves. There was only one HIV case in each year, and no Syphilis cases. Prevalence of HBV was a little higher, ranging from 7% in 2007 to 2% in the most recent survey. Hepatitis C virus
was the most prevalent infection, estimated at 46% in 2007, 50% in 2009, and 43% in 2012. While HIV has not become a major public health concern in Sarajevo, the high prevalence of HCV needs to be targeted with increasing rates of HCV testing among IDUs and more efforts at raising awareness about this infection.

**Zenica**

There was a substantial increase in the proportion of IDUs in Zenica who have tested for HIV. While in 2007 75% never had an HIV test, the proportion decreased gradually to 61% in 2009 and eventually to 32% in 2012. It was somewhat surprising that, on the other hand, proportion of HIV tests in the 12 months preceding the survey was much lower in 2012 – 19% compared to 44% in 2009. Similarly, there was a rise, albeit smaller, in the proportion of IDUs who knew where they can receive an HIV test, peaking at 80% in 2012. There was not a comparable increase in HCV testing uptake. About a quarter tested in 2007, increasing to 40% in 2009 and remaining at that level three years later. Testing for HCV needs to be one aspect of harm reduction in Zenica to be targeted with prevention services. Basic knowledge of HIV, similarly to other cities, was high.

Using sterile injection equipment during last injection episode was measured in 2009 and 2012, increasing from 78% to 91%. Proportion of IDUs in Zenica who did not share injection equipment in the last month before the survey did not see a similarly consistent increase, varying between 60-70%. Prevalence of condom use at last sex in Zenica increased slightly, from 27% in 2009 to 33% in 2012, similar to consistent condom use with steady partners. While the focus in HIV prevention among IDUs needs to be on risky injecting practices, unprotected sex has to remain a high priority.
Imprisonment rate in 2007 was substantially lower than in subsequent years when it reached about 40%. Contact with the criminal justice system, especially if it is motivated by harsh policing practices related to drug use, may have serious negative consequences for reducing risk behaviors.

One of the most important findings, that reflect governmental and non-governmental efforts in HIV prevention in BiH in the last five years, was the extent of contact with prevention services. Forty percent of IDUs were aware of an NGO working in HIV prevention in Zenica in 2007, compared to 55% in 2009 and 74% in 2012. Similar to Sarajevo, no one reported NGOs as main sources of injection equipment in 2007. In 2009 the proportion increased to 24%, eventually reaching 84% of IDUs in the city in 2012.

No HIV cases were detected in 2007 and 2009, and only one case was detected in 2012. Situation was similar with Syphilis where a single case was discovered only in 2007. There was some oscillation in HBV that peaked at 19% in 2009, to decrease to 6% in the last survey. Prevalence of HCV was considerably smaller than in other cities, in all three survey waves. It varied slightly around 20% each year. These findings suggest that HIV and to a large extent HCV have been effectively contained in Zenica.

**Banja Luka**

In Banja Luka, similar to Zenica and Sarajevo, the proportion of IDUs who never tested for HIV has been on the decline since 2007. Compared to 61% who never tested in the first survey wave, the proportion in 2012 was 45%. Since this is still a relatively large number of IDUs, and larger than what was found in the other cities, HIV testing would need to reach more IDUs in Banja Luka. Along similar lines, proportion of IDUs who knew where they can have an HIV test increased, peaking at 75% in 2012, compared to estimated 47% five years earlier. The
extent of HCV testing remained the same between 2007 and 2009, at 35%. The proportion in 2012 was substantially smaller, but that was most likely because the question was asked for the last 12 months instead of ever.

Prevalence of condom use at last sex decreased since 2009, from 42 to 28%. Likewise, consistent condom use with steady partners was the lowest in 2012, estimated at 11%. Similar to what was the case in Sarajevo and Zenica, sexual risk practices need to be additionally targeted to ensure infections, including HIV, are not channeled through intercourse. Majority are estimated to have used sterile injection equipment at their last injection in both 2009 and 2012 when this question was asked. The proportion of sterile equipment users increased in the five year period from 74% to 89%. There was a spike in the proportion of IDUs in Banja Luka who did not share injection equipment in the one month preceding the survey. Compared to 27% in 2007 proportions in 2009 and 2012 were 79% and 67%, respectively.

Imprisonment was estimated at less than half of the IDU population in Banja Luka in all three years, with the highest rate in 2012 (40%). This proportion largely corresponds to other cities and suggests an extensive contact of IDUs in BiH with the criminal justice system. Finally, with respect to the effectiveness of HIV prevention efforts, there was a substantial rise in the proportion of IDUs who use harm reduction services. While no one reported an NGO as their main source of injection equipment in 2007, and only 4% in 2009, the proportion eventually reached 27% in 2012. A need remains, however, to reach more IDUs and make sterile needles and syringes easily and freely available. This is especially important in the light of the finding that 80% used pharmacies as their main source of equipment in both 2007 and 2012.

Similar to other cities, HIV prevalence was very low. No HIV case was discovered in 2012, with only one case found in 2007 and two cases in 2009. Hepatitis C virus, in contrast, was
very common among IDUs in Banja Luka, at comparable levels to Sarajevo. Prevalence did, however, decline to 35% in 2012 from 43% in 2007 and 51% in 2009. No Syphilis cases were detected in 2007 while two cases were found in each subsequent wave of data collection.

Policy and Research Implications

Findings from this study suggest that while there has been some improvement in cities that participated since 2007, the findings show that more work needs to be done to protect the health of IDUs in Bosnia and Herzegovina. In particular, in Mostar and Bijeljina, two cities that participated in the study for the first time, some of the key risk indicators such as familiarity and use of harm reduction services, appear to be exceptionally low. In this section, we discuss some of the key findings and policy implications. In the previous section we focused on Sarajevo, Zenica, and Banja Luka, while in this section most of the attention is devoted to Mostar and Bijeljina.

Although there is substantial variation, in most cities unemployment among IDUs in 2012 seemed to be widespread. The highest unemployment estimates come from Zenica and Sarajevo, where 84% and 78% of IDUs were out of work. Banja Luka is in the middle with 69%, followed in decreasing order by Banja Luka (42%) and Bijeljina (35%). These findings are not surprising considering the economic outlook of the wider society. Even though the unemployment rates reflect the vitality of local labor markets, efforts need to be made to make IDUs more economically independent. This is especially important in the light of the result that many IDUs lived with and depend financially on their parents, placing material strain on entire households and families.

Increasing the options for legal earnings among IDUs is a promising resource for HIV prevention (Richardson, Sherman, and Kerr 2011). Employment has been associated with
abstinence from drug use, especially when it is tied to abstinence reinforcement (Silverman et al., 2007). In addition, studies showed that unemployment among IDUs can be tied to a range of negative outcomes, including HIV incidence (e.g. Niccolai et al., 2011; Sanchez et al., 2006). Efforts should be made at designing programs that would enhance the employability of IDUs and decrease the institutional barriers they may face when looking for legal work.

Drug overdose is one of the leading causes of death among IDUs in Europe (EMCDDA, 2011). Overdose to the point of losing consciousness was common in the study, with about a half of the IDUs that overdosed in Sarajevo and Banja Luka. Prevention efforts and training for proper response should be reinforced in the five cities, especially through existing harm reduction services such as needle-exchange programs. Overdose prevention education should be targeted at IDUs during vulnerable periods such as dropping out of treatment, but also at the first responders such as the police and physicians. In addition, screening patients with drug abuse problems for risks of overdose and educating them about recognizing and responding to overdose is also important (Beletsky, Rich, and Walley, 2012).

Like in the 2007 and 2009 studies, the criminal justice system remains an important aspect in the lives of IDUs in Bosnia and Herzegovina. Arrest and imprisonment, often accompanied by abuse at the hands of police, are still common in Banja Luka, Sarajevo, and Zenica, but are also part of the everyday life of IDUs in Mostar and Bijeljina. Reducing harsh policing practices is important for a number of reasons with respect to HIV prevention. Fear of police may make IDUs less reluctant to use public institutions such as hospitals and public health organizations and make them more difficult to reach for prevention purposes (Maher and Dixon, 1999). It is also important to note that, in some cities, injecting drugs during imprisonment was reported by relatively high proportions of IDUs, estimated at 17% in Mostar and 29% in
Bijeljina. These findings suggest that harm reduction services in prisons and jails are essential resources for protecting the health of IDUs, especially against HIV and HCV.

In Mostar and Bijeljina, the two cities that participated in the HIV surveillance survey for the first time, knowledge of and use of prevention services were low. This stands in stark contrast to Sarajevo, Zenica, and Banja Luka, where there was a notable improvement in raising the awareness of and access to HIV prevention services in the past five years. While in Sarajevo, for instance, an estimated 63% of IDUs were aware of organizations that work on HIV prevention, the same question was answered affirmatively by 33% in Mostar and only two persons in Bijeljina. According to the survey findings, it is clear that scaling up of those services needs to be one of the goals in the next period of HIV prevention in Bosnia and Herzegovina. Reaching out to IDUs could prove fruitful in initially making them aware of the resources available in their cities to receive free sterile injection equipment, condoms, and other assistance.

Reaching out to IDUs also applies to HIV testing that was found to be infrequent in the two cities, with 78% in Bijeljina and 63% of IDUs in Mostar who never tested for HIV. Scaling up HIV prevention services in Mostar and Bijeljina and making them known and easily accessible should contribute to increasing the rates of testing. Findings from Sarajevo, Zenica, and Banja Luka suggest that testing uptake can be substantially improved in a relatively short period. Building trust with the IDU community is essential in this process, in addition to raising the awareness of the health risks associated with injection drug use. Furthermore, a number of studies have demonstrated that community outreach can be effective in changing both injecting and sexual risk behaviors (Coyle, Needle, and Normand, 1998).

Although there is less risk of transmitting sexual and blood borne infections through intercourse compared to needle-sharing, sexual risk behavior needs to remain the priority of HIV
prevention among IDUs in Bosnia and Herzegovina. The rate of condom use, the most effective protection from STIs, remains low in all cities. Condom use is especially low with steady sexual partners, with only about a quarter or less who used condoms consistently with steady partners in the one month preceding the survey. The rates are only slightly higher with regard to condom use at last sex. Sex with steady partners needs to be targeted by especially tailored prevention programs to increase condom use. Unprotected sex can serve as a source of infection for both IDUs themselves (as their partners often also inject drugs), but also their partners. It is now widely recognized that IDUs can indirectly serve as a bridging population for transporting infectious diseases to the general population by means of sexual intercourse. Interventions aimed at reducing unprotected sex, if designed appropriately, can be very effective (Semaan et al., 2002).

Finally, HCV prevalence remained stable and relatively high in most cities, while HIV was kept at a minimum, not exceeding more than two positive cases in any of the cities. There was some variation in HCV rates across cities. Compared to 43% in Mostar and Sarajevo, a very small proportion of IDUs in Bijeljina were diagnosed with HCV, estimated at 12%. High rates of HCV, however, were not accompanied by high rates of testing. Only 13% of IDUs in Mostar, for instance, have tested for HCV in the past 12 months. Efforts should be made to scale up HCV prevention and increase testing uptake among IDUs.

**Conclusion**

There has been noteworthy progress in HIV prevention among IDUs in Bosnia and Herzegovina since 2007. Most prominently, contact with and utilization of harm reduction services in all three cities that participated in the survey in the last five years increased considerably. As importantly, there was no HIV outbreak, while HCV prevalence remained
relatively constant. The progress made in reducing risky injecting practices, however, was not always paralleled with the reduction in risky sexual behaviors. Condom use at last sex, which is one of the most reliable indicators of sexual risk taking, largely remained the same since 2007, and was lower in 2012 in one city than five years before. Targeting sexual practices needs to take on a more important role in HIV prevention. Contact with and abuse from the criminal justice system remained common among IDUs in Zenica, Sarajevo, and Banja Luka. Changing the harsh policing practices toward IDUs should become a more central concern for public health. Finally, interventions that aim to reduce risk behaviors and enhance the well being of IDUs in Bosnia and Herzegovina should start to be systematically implemented and rigorously evaluated. In addition, HIV surveillance should be continued with high quality studies.

References


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Appendices

Table 1: Distribution of risk-related indicators in Sarajevo, 2012
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