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Institut za javno zdravstvo Republike Srpske
Public Health Institute of Republic Srpska

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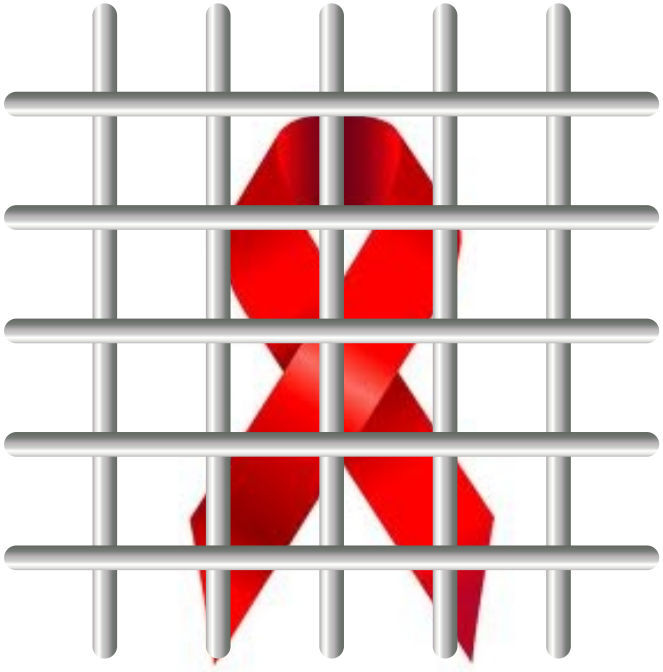
RESEARCH ON RISK BEHAVIOR OF PRISON INMATES IN RELATION TO HIV/SPI

BOSNIA AND HERZEGOVINA, 2011



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UNDP

Mostar, Sarajevo, Banja Luka, 2012

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Foreword

Study on prevalence of HIV and other sexually or blood-borne infections is a first comprehensive, coordinated research among persons serving a prison sentence in Bosnia and Herzegovina (B&H) and represents an important contribution to the significance of conducting supervision over marginalised groups exposed to an increased risk of HIV, hepatitis B and C viral infection and syphilis, At the same time, it represents a contribution to complementary programmes of „damage reduction" – condom programme, syringe exchange programme, methadone substitution programme, etc, all contributing to monitoring blood-borne diseases among populations exposed to an increased risk.

Prison inmate population shows a high incidence of risky behaviour, especially in terms of injected drugs misuse, and are therefore more exposed to a higher risk of blood-borne infections. For example, fact that HCV infection is especially present among younger prison inmates anticipates health issues even in the next 10 to 20 years.

This is a first study about prevalence of risk and protective behaviours, i.e. levels of sensitivity to HIV and other sexually transmitted infections among the population serving a prison sentence, and considering it includes more than one prison, it gives the possibility of estimating the effect on out-of-prison environment, i.e. general population.

Experiences from a high number of countries show that it is possible to prevent transmission of HIV, HCV, HBV and other blood-borne diseases among prison inmates by creating specific prevention, education and information programmes in prison structures, based on similar studies.

We hope this publication will successfully present the profile of risk and protective behaviours of persons serving a prison sentence and demonstrate that conditions for improvement of care for population exposed to a higher risk of HIV/AIDS and other blood-borne and sexually transmitted diseases can be achieved even in a prison surrounding, aiding a better control and prevention of a 'bridge" towards general population.

We hereby thank all associates, institutions and non-governmental organisations who supported and participated in this study.

We especially thank those serving a prison sentence who willingly accepted to participate in this study, the staff at corrective institutions where this research was carried out, and also to members of research teams.

We express our thanks in particular to the Global Fund to Fight AIDS, tuberculosis and malaria, and UNDP, who financed this research.

Research Team

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Abbreviations

AIDS	Acquired immune deficiency syndrome
B&H	Bosnia and Herzegovina
FB&H	Federation of Bosnia and Herzegovina
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HIV	Human immunodeficiency virus
IDU	Intravenous drug users
NGO	Non-governmental organization
RS	Republic of Srpska
SPS	Serving a prison sentence
STI	Sexually transmitted infections
VCAT	Voluntary, Counselling and Testing

1. INTRODUCTION

1.1 HIV/AIDS IN BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina is a country with a low incidence of HIV epidemic, but general circumstances in the country (poor socio-economic conditions, high unemployment, insufficient education of population especially on the topic of HIV and sexually transmitted diseases transmission, a rise in use of narcotics, rise in crime, prostitution, human trafficking, migrations, stigma, discrimination, lack of knowledge about hard-to-reach population exposed to an increased risk) all present a potential danger of spread of HIV in the coming period.

By introduction of second generation monitoring, activities on prevention and control of HIV/AIDS are directed to sub-population groups - whose risk behaviour can contribute to further spread of infection – a „bridge“ towards general population.

1.2. HIV AND OTHER BLOOD-BORNE AND SEXUALLY TRANSMITTED INFECTIONS IN PRISONS

Numerous research in the world confirm that prison inmates present one population group especially exposed to the risk of HIV and other blood-borne, or sexually transmitted infections due to a high level of risk behaviour in prisons. Experiences from a high number of countries show that it is possible to prevent transmission of HIV among prison inmates by creating specific prevention, education and information programmes in prison structures, based on similar studies.

There are 15 prison facilities in Bosnia and Herzegovina where approximately 2,600 individuals are serving a prison sentence. On the territory of Federation of Bosnia and Herzegovina exists one closed-type correctional facility, four semi-open correctional facilities and three branches of semi-open correctional facilities. Total capacity counts 1,052 for convicted and 361 beds for persons serving a detention measure.

On the territory of Republic of Srpska there are two closed-type correctional facilities, one semi-open correctional facility and three district prisons. Total capacity adds up to 770 spaces for convicted and 285 spaces for persons serving a measure of detention. In Brcko District, there are no facilities where prison sentences are served. All prison sentences are directed to correctional facilities in the two entities. (2007)

At the end of 2007 there were 2,668 persons serving a prison sentence on the territory of Bosnia and Herzegovina, of whom 2,179 were adults.

In Federation of Bosnia and Herzegovina, prison sentence was served by 1,332 adults, while in Republic of Srpska this number totalled 847.

Approximate rate of prisoners per /100.000 inhabitants is 69. In European Union, the rate of national prison population ranges from 66 to 285 prisoners per 100.000 inhabitants. Member states from

Central and Eastern Europe register a higher average rate. Among sentenced persons in majority of EU countries, those sentenced for use of narcotics make 10-30% of prison population.

In majority of states, rates of HIV, hepatitis B and C infections among sentenced prisoners are significantly higher than those among general population due to risk behaviours before and during imprisonment. Although those serving a sentence may have been infected prior to coming to prison, undoubtedly there exists a risk for them to get infected in prison through unsafe sexual activity (including sexual intercourse between persons of same sex), rape, unsafe tattooing, blood exchange rituals, exchange of injection equipment and other sharp instruments. Due to a high level of mobility between the prison and community, HIV/AIDS and other sexually transmitted diseases do not remain within the prison.

HIV

Human immunodeficiency virus (HIV) cannot survive nor can it reproduce itself outside a living host, but is transmitted from person to person via unprotected (heterosexual or homosexual) intercourse, through contact of damaged skin or mucosa with body fluids (i.e. blood, sperm), through use of infected needles, including sharing of such between intravenous drug users, by means of transfusion of infected blood or its components, and transplantation. Risk for HIV transmission through a sexual intercourse is lower that with majority of other sexually transmitted forms. Regardless, presence of other sexually transmitted diseases, (ulcerations for example) may ease transmission of HIV.

HBV

Hepatitis B virus (HBV) is a blood-borne pathogen, transmitted through percutaneous and permucuous (e.g. sexual intercourse) way, through exposure to infected blood or body fluids (sperm or saliva). HBV circulates in blood at high titter, and at lower titter in other body fluids (e.g. sperm, vaginal secretion or saliva) and is around 100 times more infectious than HIV and 10 times more infectious than HCV.

Majority of persons with a chronic HBV infection are asymptomatic, and one third has no signs of liver disease, despite a high level of replication in hepacotytes. Rate of progression into a chronic stage, cirrhosis and hepatocelullar cancer varies in line with age at which HBV infection was acquired, HBeAg status, co-infection with HDV, HIV, HCV, and alcohol consumption.

HCV

Hepatitis C virus (HCV) is a pathogen transmitted by blood, most effectively by direct percutaneous exposure to infected blood. Among the newly infected with HCV, only 20-30% have symptoms of acute hepatitis. Chronic infection develops among 75-85% infected persons who acquired the infection at an older age (over 45 years), and among 50-60% of persons infected at younger age.

Majority of persons with a chronic HCV infection do not have any symptoms, and close to 30% have no signs of liver disease. Risk of progression of HCV infection into cirrhosis varies depending on age at which infection was acquired (at a rate of 5% among persons infected at a young age, and 10-20% among those infected at older age). Clinical progression of the illness is also speeded-up by alcohol consumption, chronic co-infection with HBV, and is more frequent among males. Co-infection with

HIV increases HCV viremia, the rate of progression into fibrosis and cirrhosis, and mortality associated with liver disease. Cancer occurs in 1-5% of persons with chronic hepatitis C.

1.3. TRANSMISSION THROUGH INJECTION

Sharing of drug injection syringes is also an effective way of transmission of blood-borne infections. Despite efforts to prevent bringing of drugs into prisons, intravenous drug use in prisons is a frequent occurrence that represents a high risk for transmission of blood-borne infections. Since it is much harder to bring in illegally needles and syringes for drug injection to prison (smuggling), than it is to smuggle drugs, prisoners exchange drug injection equipment among themselves. Transmission is caused by blood contamination, since parts of blood may remain inside the syringe and get injected to another user.

Prevention is based on hindrance of transmission caused by contaminated syringes. At population level, adopting a pragmatic policy for risk reduction creates most acceptable conditions for transmission prevention. If such policy does not exist, institutions may promote the safe practice of injection by intervention, from health education to a programme of exchange of used needles and syringes. High concentration of hepatitis B and C viruses in blood, and their ability to live outside the body, makes them more infectious than HIV. To prevent infection with hepatitis B and C viruses, intravenous drug users should avoid sharing any part of their drug injection equipment, including syringes, cotton pads, water and steamers.

1.3.1. TATTOOING, PIERCING

Although tattooing is prohibited in prisons, it is still a frequent occurrence in numerous countries. Tattooing is usually conducted in unclean conditions, using pens and needles. Non-sterilised tattooing equipment may serve as an effective means of blood borne infections transmission. Tattooing is associated with a risk of HIV, hepatitis B and C, and tetanus infection.

Piercing is also present in many prisons. Parts of the body most subject to piercing are ear shell and lobule, eyebrow, lip, nose, tongue, nipple, navel and genitals.

1.4. SEXUALLY TRANSMITTED INFECTIONS

Prison population infected with sexually transmitted diseases may expect an increase in the number of HIV infections: sexually transmitted diseases that impair the integrity of skin and may make mucous membranes bleed easily, increasing the contagiousness and sensibility to HIV. Sexually transmitted diseases are an important predictor of HIV since they show a presence of behaviours associated with HIV transmission. Best way of prevention of sexually transmitted diseases is full avoidance of sexual relations, but it is not realistic to expect such behaviour, as majority of inmates are at a sexually active age, which is why some of them may be subject to different forms of sexual abuse. Still, prisoners can be encouraged to learn how to prevent sexually transmitted diseases and recognise general symptoms of STDs, and how to seek medical care as soon as they notice any kind of symptoms.

SYPHILIS

Without treatment, syphilis determinant, Treponema pallidum, remains in the body throughout the whole life, leading to heavy damage, nervous system disorders and death. Syphilis is transmitted through an unprotected vaginal, anal and oral intercourse, by kissing, and from mother to the fetus during pregnancy. It is most infectious at its earliest stage – secretion released from ulcus durum is very contagious.

HEALTH IN PRISONS

Health services in prisons, where they exist, are mainly outside the health system, usually with insufficient capacity, characterised by lack of staff and other resources. Effective policies of HIV and STI prevention within prisons are often hampered by denial of existence of factors that aid their spread (access to drugs, sexual activities, lack of protection). Drug users and persons living with HIV in prison are often a stigmatised group exposed to social isolation, abuse and breach of human rights on behalf of both parties - inmates and prison staff.

Prison staff is, also, in danger of HIV infection and other blood-borne infections through exposure to blood and body fluids (accidental injury through contaminated equipment).

Lack of HIV/AIDS/STI prevention programmes in prisons endangers not only the health of inmates and prison staff, but also the health of a wider community.

2. STUDY AIM

GENERAL RESEARCH AIM

To estimate current conditions in relation to HIV and other STIs in prisons in B&H, to enable us to develop and implement comprehensive, fact-based programmes of prevention and treatment of HIV and other STDs (representing a contribution to maintaining the low prevalence of HIV status for the country).

SPECIFIC RESEARCH AIMS:

- To estimate HIV/STI prevalence among prison population;
- To determine the size of self-disclosed risk behaviour among persons serving a prison sentence prior and during the current prison time, and to identify risk factors that could be associated with transmission of HIV and other STIs;
- To examine association between risk behaviour and HIV/STI prevalence among persons serving a prison sentence;
- To estimate the level of knowledge, attitudes, behaviour and practices in relation to HIV/STIs among persons serving a prison sentence;

- To determine accessibility to promotional preventive services, information, education and communication about HIV/STIs in prisons;
- To secure a base for continuous monitoring and evaluation of results of intervention programmes.

3. METHODOLOGY AND RESPONDENTS

3.1. SAMPLE

This research was conducted as a cross-sectional study of a randomly selected sample of 620 persons serving a prison sentence in B&H, by surveying respondents with a standardised questionnaire and blood sampling for HIV and other STI (hepatitis B and C, syphilis) laboratory testing.

Participation criteria: persons serving a prison sentence longer than 2 months, present on the day of research.

Elimination criteria: persons serving a prison sentence shorter than 2 months, in solitary confinement, those who are rarely in contact with other inmates and those who were judged by prison staff to present a high hazard to the assessor. Selected respondents (upon obtaining an informed consent) were surveyed (self-administration of questionnaire in a group), with blood sample for laboratory testing taken after the survey.

3.2. TIME AND LOCATION OF SURVEY

Research was conducted in the period between 15.08. and 26.08.2011. at 4 selected prison facilities in FB&H, and in period between 17.8. and 2.9.2011. in 6 prison facilities in RS. Research covers 620 respondents (421 in FB&H and 199 in RS). Assessment team, in co-operation with prison service, prepared the research facility prior to research – list of persons serving a prison sentence, divided into smaller groups (to enable questionnaire deployment in groups).

3.3. RESEARCH INSTRUMENTS

Survey was conducted via a standardised questionnaire deployed by specially educated NGO members who already implement HIV and STI prevention activities in prisons, and who have prior to assessment itself completed training during a one-day workshop. Questionnaire paper was coded, with the same code accompanying the blood sample (5ml) taken by a vacuum tube method immediately after the questionnaire following an informed consent. Coded sample with the accompanying laboratory order was officially delivered to a selected laboratory. Testing was completed using the new generation ELISA tests and results were handed over to the research team monitoring coordinator who delivered them to each respondent individually in a sealed, coded envelope, via their prison coordinator with an explanation of the findings and recommendation for possible further check-ups if needed.

4. ENDORSMENT OF THE ETHICS COMMITTEE

Respecting the principles of the Helsinki declaration and its amendments, adherence to ethical practices within the research were ensured by obtaining an informed consent of respondents to participate in the research, and data protection of participants from the sample studied through no use of personal data. Prior to conducting this research, an endorsement for the research was obtained from the Ethical Committee of FB&H. In Republic of Srpska, approval for research was obtained from the Ministry of Health and Social Welfare of Republic of Srpska as the Ethics Committee within the Institute for Public Health was not set-up at the time of research. Endorsements obtained are a confirmation that that dignity and right to privacy protection of each respondent are respected, and that their data will be used only and solely for planning and administration of public health protection.

5. STATISTICAL ANALYSIS OF DATA AND FINAL REPORT

After logical processing of completed questionnaires and data entry into a Microsoft Access 2000 database, SPSS software for Windows (version 15.00, SPSS INC, Chicago, Illinois, USA) was used for statistical analysis.

Descriptive statistics method was used in data processing. Data was shown as a frequency and percentage for category variables, median and range for ordinal, and for continuous variables – depending on distribution of data – the mid value and standard deviation.

For difference testing χ^2 test was used, with level of probability of $p<0,05$ being taken as statistically significant.

Research results are presented in chapters:

- General information (including response rate, sociodemographic characteristics), history of prison sentences (current and previous),
- prevalence of HIV and other STIs,
- prevalence of intravenous drug users, their characteristics,
- disclosed sexual activities and behaviour of respondents,
- analysis of contributing factors that increase the risk of exposure to HIV, HGV, HBV and syphilis infections.

6. RESULTS

Research was conducted as a prevalent study among persons serving a prison sentence in 10 prison facilities around B&H, four in Federation of B&H (Zenica, Sarajevo, Mostar and Tuzla) and six in Republic of Srpska (Banja Luka, Trebinje, Doboj, Istočno Sarajevo, Bijeljina and Foča)

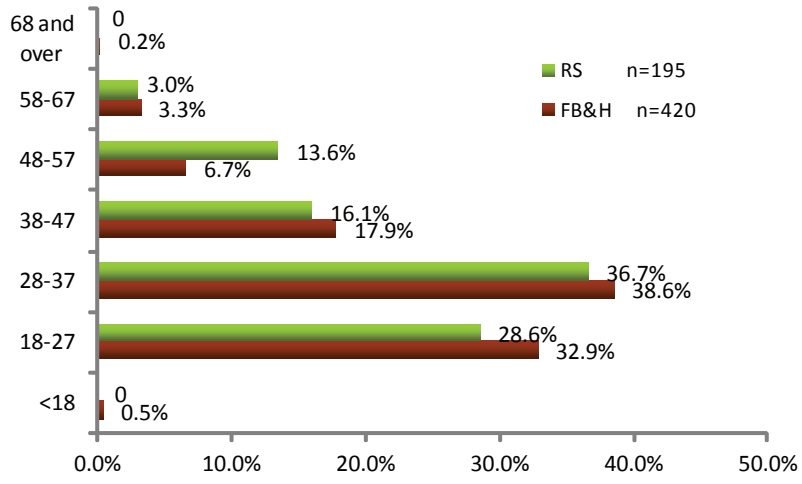
Research covers 620 respondents representing a satisfactory response rate of 84% (out of 740 planned responses). Out of total number of respondents, 54,7% are serving their sentence in a closed type prison.

A total of 620 respondents participated in the survey consisting of answering a questionnaire with 31 questions, and 595 of them accepted to give blood samples for HIV, HCV, HBV and syphilis testing (588).

6.1. SOCIODEMOGRAPHIC DATA

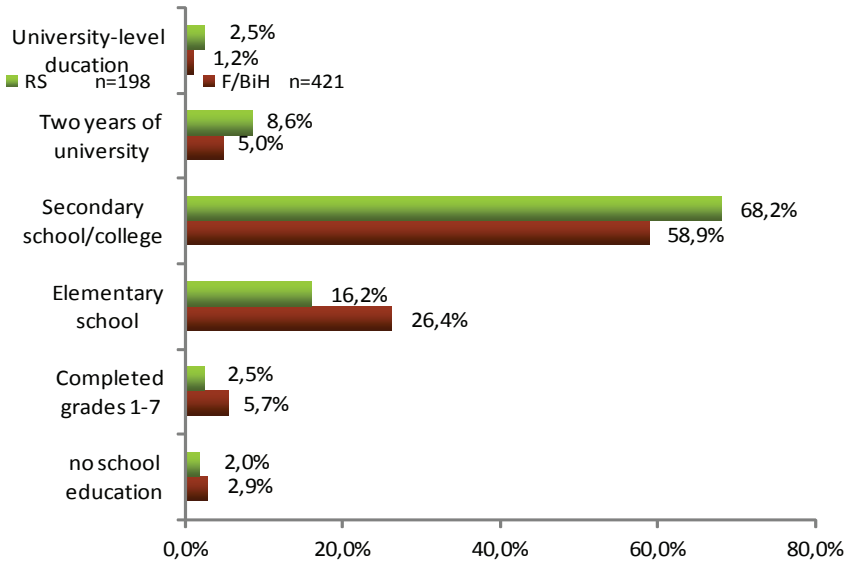
Over 97% of respondents are citizens of B&H, with 93,7% of respondents being men. Average age of a respondent is 34 years (standard deviation 10,639), in a range from 17 to 71 years of age. Largest number of respondents (38%) belong to the 28-37 age group. In the total sample there were 254 (40,9%) of respondents at the age of 30 or younger (40,7% of respondents under 30 being male, and 48,7% females younger than 30).

Graph 1: Respondents (total sample) by age groups



Higher share (61,9%) are respondents with completed secondary school, while 2,6% have no school education (slightly fewer in RS at 2,0%, with a generally slightly better education profile among respondents in the RS subsample).

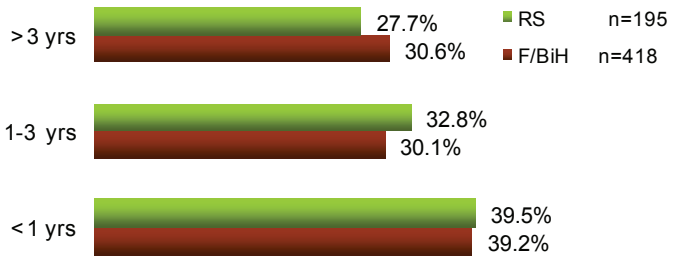
Graph 2: Respondents structure (total sample) by level of education



More than half of respondents (50,6%) were unemployed prior to coming to prison. Almost a half of respondents - 46,4% are in a marriage/or marriage union, whilst 39% of respondents are single.

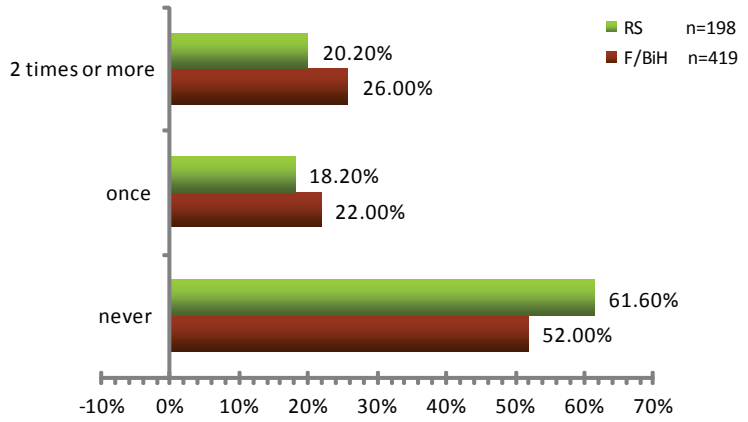
By length of current sentence they are serving, largest share in the total study sample are respondents sentenced to 3 to 5 years of prison, on average 5 years and 4 months (range from 2 months to 32 years).

Graph 3: Respondents structure (total sample) by length of sentence



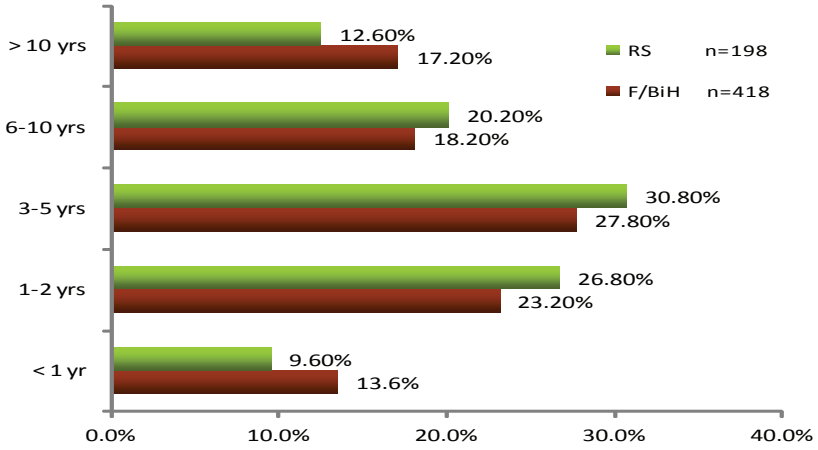
Largest share in the sample (39,3%) are respondents that have not yet served one year of their sentence, while a third is in prison longer than three years.

Graph 4: Respondents structure by frequency of imprisonment



For more than half of respondents (55,1%) this is their first prison sentence, while 24,1% of them have been imprisoned 2 and more times. A higher percentage of respondents in RS subsample are in prison for the first time.

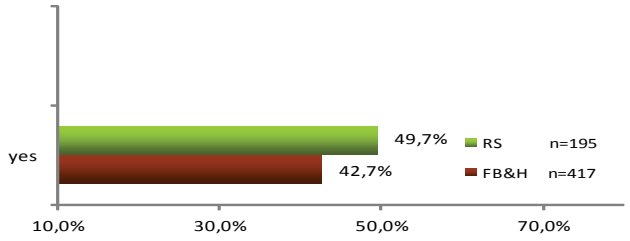
Graph 5: Sample structure by length of sentence served by respondents



Largest part of the studied sample are respondents sentenced to between 3 and 5 years in prison. In FB&H subsample, inmates with shortest sentence (<1 year) and longest sentence (>10 years of imprisonment) are most represented.

Over 55% of respondents started their prison sentence without receiving any education or information about HIV/AIDS prior to coming to prison.

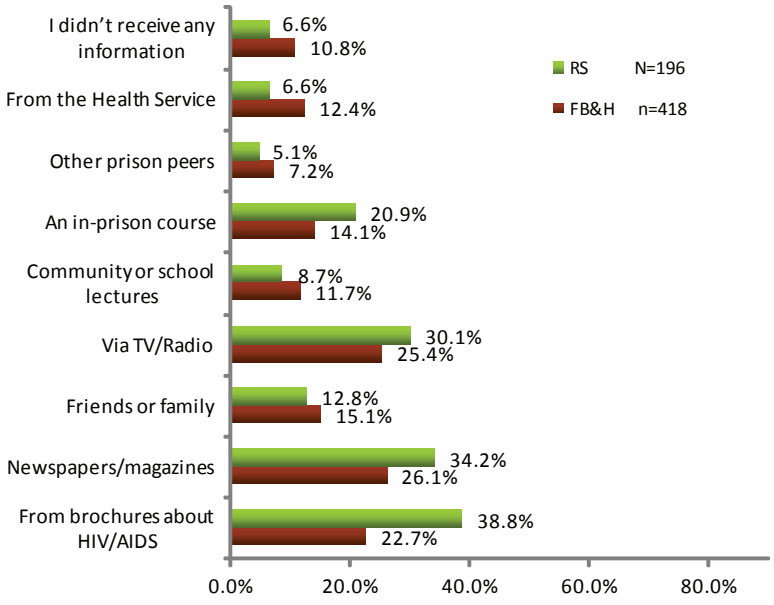
Graph 6: Information received by respondents about HIV/AIDS prior to coming to prison



Respondents in the RS subsample have at a higher percentage received education, and are better informed about HIV/AIDS prior to coming to prison.

By their personal judgement, 41% of total number of respondents know little about HIV/AIDS-u (especially those in the FB&H subsample – 43,8%), while largest percentage of respondents (43%) in the RS subsample believe they know enough about HIV/AIDS.

Graph 7: Most frequent sources of information about HIV/AIDS, total sample



Respondents cite newspapers, printed media and TV and radio as most frequent sources they received information about HIV/AIDS from. Respondents from RS subsample in largest part quote printed sources of information about HIV/AIDS (brochures, newspapers), while for subsample in FB&H sources are newspapers, followed by TV/radio. Ten percent of total sample quote not receiving information about HIV/AIDS at all.

6.2. KNOWLEDGE, ATTITUDES AND BEHAVIOUR RELATED TO HIV/AIDS

Answers to questions about knowledge are grouped in three parts: general knowledge about HIV/AIDS, knowledge about ways of transmission and knowledge about HIV infection prevention.

6.2.1. KNOWLEDGE ABOUT HIV/AIDS, WAYS OF TRANSMISSION AND PREVENTION

Table 1: Structure of respondents with correct answer to claims about HIV/AIDS

DO YOU AGREE WITH THE FOLLOWING?	B&H		FB&H		RS	
AIDS is caused by HIV	n=607	%	n=413	%	n=194	%
yes	382	62,9	235	56,9	147	75,8
All people carrying HIV have AIDS	n=609	%	n=416	%	n=193	%
yes	277	45,5	178	42,8	99	51,3
All homosexuals have HIV/AIDS	n=605	%	n=413	%	n=192	%
yes	353	58,3	220	53,3	133	69,3
A person that looks healthy could be infected with HIV	n=610	%	n=414	%	n=196	%
yes	447	73,3	291	70,3	156	79,6
Persons infected with HIV are more prone to different diseases	n=605	%	n=413	%	n=192	%
yes	412	68,1	266	64,4	146	76,0

Percentage of correct answers to certain questions about HIV/AIDS comes to between 45,5% to 73,3%. Lowest number of respondents (227) know that not all people living with HIV have AIDS (45,5%) (respondents from RS subsample show a somewhat better knowledge on all questions).

Table 2: Knowledge about ways of transmission of HIV infection

HOW CAN ONE CONTRACT AN HIV INFECTION?	B&H		FB&H		RS	
Vaginal sexual intercourse without a condom	n=618	%	n=421	%	n=197	%
yes	520	84,1	342	81,2	178	90,4
Anal sex intercourse without condom	n=613	%	n=416	%	n=197	%
yes	452	73,7	284	68,3	168	85,3
Oral sex	n=601	%	n=408	%	n=193	%
yes	316	52,6	210	51,5	106	54,9
Mosquito bite	n=595	%	n=403	%	n=192	%
no	236	39,7	141	35,0	95	49,5
By sharing dining cutlery	n=598	%	n=408	%	n=190	%
no	264	44,1	163	40,0	101	53,2
By using a common toilet	n=595	%	n=408	%	n=187	%
no	276	46,4	176	43,1	100	53,5
By sharing drug injection equipment	n=612	%	n=417	%	n=195	%
yes	503	82,2	332	79,6	171	87,7
Through handshaking with a person infected with HIV	n=601	%	n=408	%	n=193	%
no	376	62,6	239	58,6	137	71,0
From an infected mother to a child during pregnancy or childbirth	n=603	%	n=409	%	n=194	%
yes	379	62,9	240	58,7	139	71,6
By sharing common equipment for tattooing/ piercing	n=616	%	n=418	%	n=198	%
yes	499	81,0	331	79,2	168	84,8
By using a shared shaving blade, toothbrush and similar	n=614	%	n=416	%	n=198	%
yes	442	72,0	284	68,3	158	79,8

Percentage of correct answers to the question of ways of transmission of HIV infection ranges from 39,7% (those who know that HIV is not transmitted by a mosquito bite) to 84,1% (those who know that HIV can be contracted through an unprotected vaginal sexual intercourse with a person who is HIV infected). In this group of questions also, respondents from RS subsample show a better knowledge of ways of HIV transmission.

Smallest percentage of respondents (9,4%) are aware that HIV transmission cannot be prevented only by HIV counselling and testing (Table 3).

Table 3: Knowledge about ways of HIV transmission

IN YOUR OPINION, HIV SPREAD CAN BE PREVENTED BY:	B&H		FB&H		RS	
Abstinence from sexual intercourse	n=608	%	n=414	%	n=194	%
yes	363	59,7	241	58,2	122	62,9
By being faithful to one, HIV negative partner	n=604	%	n=411	%	n=193	%
yes	328	54,3	205	49,9	123	63,7
By correctly using the condom during every sexual intercourse	n=617	%	n=418	%	n=199	%
yes	493	79,9	322	77,0	171	85,9
Through HIV counselling and testing	n=609	%	n=414	%	n=195	%
no	57	9,4	42	10,1	15	7,7
By using disposable tattooing equipment	n=611	%	n=415	%	n=196	%
yes	420	68,7	271	65,3	149	76,0
By using disposable equipment for drugs injection	n=597	%	n=408	%	n=189	%
yes	409	68,5	268	65,7	141	74,6

Almost 80% of respondents answered correctly that HIV transmission can be prevented by proper use of condom during every sexual intercourse. In this group of questions also, respondents from RS subsample answered a higher percentage of questions correctly. Out of the total number of respondents, smallest number (9,4%) know that HIV transmission cannot be prevented by HIV counselling and testing on its own, which is possibly a consequence of lack of understanding of the question since HIV counselling and testing can contribute to knowledge that needs to be transformed into reduction of risk behaviour.

6.2.2. KNOWLEDGE ABOUT WAYS OF TRANSMISSION IN RELATION TO PRISON CATEGORY

Out of 345 respondents from closed-type prisons, 23 of them (6,7%) answered correctly to all 11 questions about ways of HIV transmission, and out of 275 respondents from semi-open prisons, 14 of them (5,1%) answered correctly to all 11 questions.

Table 4: Knowledge about ways of HIV transmission in relation to prison type

QUESTIONS ABOUT WAYS OF HIV TRANSMISSION	PRISON TYPE				χ^2 test	df	P
	SEMI-OPEN		CLOSED				
	n=275	%	n=345	%			
All questions answered correctly	14	5,0	23	6,7	0,677	1	0,411
Not all questions answered correctly	261	94,9	322	93,3			

Respondents from closed-type prisons have in higher percentage (without statistical significance, p>0,05) correctly answered to questions about ways of HIV infection transmission, compared to those from semi-open prisons.

Table 5: Knowledge about HIV/AIDS in relation to sex and prison type

DO YOU AGREE WITH THE FOLLOWING?	% CORRECT ANSWERS			
	SEX		PRISON TYPE	
	M	F	SEMI-OPENED	CLOSED
AIDS is caused by HIV	63,1	59,45	67,6	59,2
All people carrying HIV have AIDS	45,3	47,3	48,8	42,8
All homosexuals have HIV/AIDS	58,2	60,5	63,1	54,6
A person that looks healthy could be infected with HIV	72,9	78,9	75,2	71,7
Persons infected with HIV are more prone to different diseases	68,0	69,2	72,0	65,0

Female respondents have, compared to male respondents, given a higher percentage of correct answers to 4 out of 5 questions about HIV/AIDS. Looking by prison type, persons serving a sentence in semi-open prisons give a higher percentage of correct answers to every question about HIV/AIDS compared to those in closed-type prisons.

Table 6: Knowledge about ways of HIV transmission, by sex and prison type

HOW CAN ONE CONTRACT HIV INFECTION?	% OF CORRECT ANSWERS			
	SEX		PRISON TYPE	
	M	F	SEMI-OPENED	CLOSED
Vaginal sexual intercourse without a condom	83,4	94,8	85,8	82,7
Anal sex intercourse without a condom	73,9	71,0	70,0	76,6
Oral sex	52,6	51,3	51,3	53,3
Mosquito bite	39,2	45,7	40,1	39,2
By sharing dining cutlery	43,8	48,5	44,2	44,0
By using a common toilet	46,1	50,0	46,9	45,9
Consuming drugs using shared equipment	82,4	79,4	82,6	81,8
Through handshaking with a person infected with HIV	62,7	60,0	66,5	59,5
From an infected mother to a child during pregnancy or childbirth	62,4	69,2	66,5	60,0
By sharing common equipment for tattooing/ piercing	81,4	74,3	81,9	80,2
By using a shared shaving blade, toothbrush and similar	71,8	73,6	74,0	70,3

Respondents in higher percentage quote correctly that one can be infected with HIV through unprotected sexual intercourse, exchange of injection equipment, tattooing. Smallest percentage of respondents know that HIV is not transmitted by a mosquito bite.

Table 7: Knowledge about prevention of HIV transmission, by sex, by prison type

HOW CAN HIV INFECTION TRANSMISSION BE PREVENTED?	% OF CORRECT ANSWERS			
	SEX		PRISON TYPE	
	M	F	SEMI-OPENED	CLOSED
Abstinence from sexual intercourse	59,8	57,4	62,5	57,4
By being faithful to one, HIV negative partner	54,4	52,6	58,4	51,0
By correctly using the condom during every sexual intercourse	80,1	76,9	82,7	77,6
Through HIV counselling and testing	9,6	5,2	8,9	9,6
By avoiding use of shared tattooing equipment	69,0	64,1	71,0	66,9
By using disposable equipment for drugs injection	68,6	66,6	70,7	66,7

Compared to male respondents, women serving a prison sentence showed lesser knowledge on the topic of ways HIV transmission can be prevented. Respondents serving a sentence in semi-open prisons give a higher percentage of correct answers on ways HIV transmission can be prevented, when compared to inmates in closed-type prisons.

6.2.3. KNOWLEDGE, ATTITUDE AND BEHAVIOUR OF RESPONDENTS IN RELATION TO HIV/AIDS, PER LENGTH OF SENTENCE SERVED

ANOVA

When it comes to level of knowledge, respondents differ significantly depending on the length of time spent serving a prison sentence in the last 10 years (F=4,143; p=0,016). Respondents who spent from 2 months to a year, had a significantly lower level of knowledge compared to those who spent three or more years in prison (Poshoc Scheffe test, p=0,021).

Table 8: Knowledge, attitude and behaviour in relation to HIV/AIDS per length of prison sentence

VARIABLE	THEORETICAL SCORE RANGE	M±SD SCORE BY LENGTH OF SENTENCE			F	p
		2-12 months	1-3 years	> 3 years		
Knowledge	0-22	12,33±5,84*	13,62±5,62	13,94±4,92	4,143	0,016
Attitude	0-4	2,16±1,47	2,27±1,45	2,35±1,43	0,885	0,413
Behaviour	0-23	18,26±2,47	17,98±2,36	17,60±2,76	2,704	0,068

There is no significant difference in knowledge, attitudes and behaviour in relation to HIV/AIDS depending on time spent in prison (p>0,05).

6.2.4. RESPONDENTS' ATTITUDES IN RELATION TO PERSONS LIVING WITH HIV

Percentage of negative answers to given questions represents a reflection of discriminatory attitude of respondents towards a person living with HIV.

Table 9: Respondents' answers about attitude towards HIV positive persons

IF YOU KNEW SOMEONE WHO IS INFECTED WITH HIV, WOULD YOU ACCEPT TO:	B&H		FB&H		RS	
Eat with them	n=611	%	n=416	%	n=195	%
yes	242	39,6	156	37,5	86	44,1
Socialize with him/her	n=612	%	n=416	%	n=196	%
yes	311	50,8	203	48,8	108	55,1
Share a prison cell with them	n=608	%	n=414	%	n=194	%
yes	225	37,0	144	34,8	81	41,8
Offer them support	n=612	%	n=417	%	n=195	%
yes	439	71,7	286	68,6	153	78,5

A little over a third of respondents would accept having a meal or sharing a cell with a person infected with HIV (these percentages are somewhat higher among respondents from the RS subsample).

Out of 605 respondents that answered to this question, 90 (14,9%) gave a negative answer to all four response options (subsample FB&H 17,4%; subsample RS 9,4).

On the scale of attitude towards a person infected with HIV, inmates from semi-open prisons had a score of 2,40±1,43 in a range of 0 to 4 points, while respondents from closed-type prisons had a score of 2,14±1,46 points, resulting in a significantly more positive, more open attitude from respondents in semi-open prisons towards people living with HIV. (Student t-test=2,145: p=0,032)

6.3. RISK BEHAVIOUR PRIOR TO COMING TO PRISON

SEXUAL BEHAVIOUR

Out of 612 respondents, 82,4% of them quote having practiced sexual intercourse without a condom. Same-sex sexual intercourse is reported by 4,2% of them (FB&H subsample 5,5%, RS 1,5%). Out of 442 respondents who reported a sexual intercourse with a random partner, 86,4% did not use a condom at the time.

Paying for a sexual favour is reported by 22% of respondents, while 7,3% of them quote having received treatment for „an STI".

DRUG USE

Out of 617 respondents who answered the question about taking drugs, 231 (37,4%) of them have used drugs prior to coming to prison. (FB&H, 41,8%, RS, 28,3%). Out of the total number of respondents, 107 of them (17,4% of total sample) have used drugs by injection (FB&H, 18,4% and RS, 15,2%).

Table 10: Share of respondents who have prior to coming to prison used drugs intravenously

PERSONS SERVING A PRISON SENTENCE WHO HAVE USED INTRAVENOUS DRUGS PRIOR TO COMING TO PRISON	B&H		FB&H		RS	
	n=616	%	n=418	%	n=198	%
yes	107	17,4	77	18,4	30	15,2
Persons serving a prison sentence who have exchanged drug injection equipment prior to coming to prison	n=107	%	n=77	%	n=30	%
yes	62	57,9	43	55,8	19	63,3

Out of 107 respondents who were intravenous drug users prior to coming to prison, 60 (57,9%) of them report having an experience of exchanging used injection equipment (FB&H, 55,8%; RS, 63,3%).

Average age of first drug injection among respondents is 21 years of age, (standard deviation 5,423), range from 12 to 38 years.

Table 11: Age (in years) of first drug consumption among respondents in the researched sample, by sex

VARIABLES	C±Q* BY SEX		Mann-Whitney U	P
	MALE	FEMALE		
Age at first drug consumption	20,00±7,0	17,50±8,0	230,500	0,310

** C±Q* =median± quartile range*

There was no significant difference between males and females in terms of their age at first drug taking by injection. Out of 229 respondents who quoted using any kind of drugs, 15,7% have received methadone as part of a programme at the time of starting their prison sentence. Out of 107 respondents who quote having already taken drugs intravenously at the time of starting their sentence, 27,1% (29) have participated in methadone programme.

Table 12: Use of injected drugs prior to coming to prison, by prison type

PRIOR TO COMING TO PRISON, HAVE YOU INJECTED YOURSELF WITH DRUGS OF ANY KIND	PRISON TYPE		Total
	SEMI-OPEN (%)	CLOSED(%)	
YES	47 (17,3%)	60 (17,4%)	107 (17,4%)
NO	218 (80,1 %)	277 (80,5%)	495 (80,4%)
No answer	7 (2,6%)	7 (2,0%)	14 (2,3%)
Total	272 (100,0%)	344 (100,0%)	616 (100,0%)

There is no statistically significant difference in frequency of intravenous drug users by type of prison (χ^2 test=0,199; df=2; p=0,905), pointing to a fact that experience of drug use by injection is almost equally present among respondents from both prison types. This piece of data directly reflects the presence of intravenous drug use in the community regardless of the criminal background, and echoes a need for creation of programmes for “damage reduction” in prisons.

6.4. RISK BEHAVIOUR IN PRISON

SEXUAL BEHAVIOUR

Out of 617 respondents, 1,6% of them quote being a victim of sexual abuse (5 male and 1 female), 10% of physical abuse, and 19,4% of psychological abuse (n=614). Having a wilful sexual intercourse with an inmate was reported by 1,9% of respondents.

Table 13: Indicators of risk sexual behaviour, by type of prison

WHILE SERVING YOUR SENTENCE IN THIS PRISON, HAVE YOU WILLFULLY HAD SEXUAL INTERCOURSE WITH OTHER PRISONERS?	PRISON TYPE				χ^2 test	df	P
	SEMI-OPEN		CLOSED PRISON				
	n=273	%	n=345	%			
yes	5	1,8	7	2,0	1,886	2	0,393
no	265	97,1	329	95,4			
Would not like to answer	3	1,1	9	2,6			
While serving your sentence in prison, have you been a victim of sexual abuse?							
yes	4	1,5	6	1,7	0,513	2	0,774
no	266	97	333	96,			
Would not like to answer	3	1,1	9	2,6			

In the section estimating the sexual behaviour of persons serving a prison sentence, 61% of respondents believe that sexual intercourse is not practiced among inmates, 32% believe sex is practiced by a smaller, and 6% by a larger number of inmates, whilst 69,5% of respondents claim no-one uses a condom during anal sexual intercourse.

Risk of getting infected by HCV and HBV while serving a prison sentence is judged as being high by more than a third of respondents, with a little under a third regard risk for HIV infection as being high.

Answering a question on accessibility to confidential HIV counselling and testing, 65,2% of respondents from the total sample answered positively to having access to both. Remaining four questions regarding specific forms of protection, were answered with 40,5% of respondents having access to condoms, and 22,6% to lubricants. Sterile needles and syringes were accessible only to 3,3% of respondents.

DRUG USE

Out of total number of respondents (620), 69 of them 11% consumed drugs during their time in the current prison (FB&H 12,9%, RS 7,0%). From 68 that quoted to have taken drugs of some kind, 16,2% of them injected themselves (FB&H 7/54; RS 4/14). Within the total number of intravenous drug users who are serving a prison sentence (107), 9 of them (8,4%) of them continued taking drugs intravenously in prison, out of whom four use injection equipment used by someone else (Table 14).

Table 14: Respondents who injected drugs whilst serving in current prison, and at the same time used equipment previously used by someone else

PERSONS WITH EXPERIENCE OF USING DRUGS WHO CONTINUED USING DRUGS INTRAVENUOSLY IN THIS PRISON	B&H		FB&H		RS	
	n=107	%	n=77	%	n=30	%
yes	9	8,4	7	9,1	2	6,7
IDUs WHO EXCHANGE DRUG INJECTION EQUIPMENT WHILST SERVING A SENTENCE	n=9	%	n=7	%	n=2	%
yes	4	44,4	3	42,9	1	50,0

Having a first drugs injection experience in prison is reported by 3,7% of respondents out of the total number of respondents who reported taking drugs intravenously (FB&H, 5,2%; RS,0%). Statistically significant higher number of respondents with experience in taking drugs by injection did not have their first injection in prison (χ^2 test=174,075; df=2; P<0,001), indicating that inmates starting a prison sentence arrive mostly with experience of intravenous drug use, presenting an additional risk of exposure to HIV/STIs in prison environment.

In relation to prison type, out of 6 respondents who answered to practice exchanging injection equipment during intravenous drug use, five are from closed-type prisons.

Table 15: Structure of respondents by experience of equipment exchange, by prison type

EXCHANGE OF DRUG INJECTION EQUIPMENT	PRISON TYPE				χ^2 test	df	P
	SEMI-OPEN PRISON		CLOSED				
	n=47	%	n=60	%			
yes	26	55,3	36	60,0	0,246	2	0,884
no	20	42,5	23	38,3			
Would not like to answer	1	2,1	1	1,6			

There is no statistically significant difference among respondents with experience in exchange of drug injection equipment in terms of type of prison (p> 0,05).

TATTOOING AND PRISON

Out of 618 respondents, over 50% of them have a tattoo (46,3% prior to coming to prison and 11,2% in prison), whilst 11,1% had a piercing prior to coming to prison, and 1,1% had it done in prison.

Of total respondents, 57,5% have a tattoo, with 12,2% reporting having it done with equipment that was already used.

11% report having their tattoo done in prison, of whom 25% used previously used equipment.

Respondents in closed-type prisons had tattoos more frequently, and done in prison, compared to respondents from semi-open type of prisons (χ^2 test=21,922; df=2; p<0,001).

6.5. TESTING FOR HIV/STIs

Out of all respondents in the studied sample (617), 40,2% claim to have ever tested for HIV, and out of 616 respondents, 137 (22,2%) have tested in the last 12 months. Out of total number of respondents (617), 18,1% tested in the last 12 months and know their test results.

Among those who claim to have tested in the last 12 months (answered by 124 respondents), 90% know their test results.

Table 16: Structure of respondents tested for HIV in the last 12 months, by type of prison

HAVE YOU TESTED FOR HIV IN THE LAST 12 MONTHS	PRISON TYPE				χ^2	df	P
	SEMI-OPENED		CLOSED				
	n=272	%	n=345	%			
yes	57	21,0	80	23,2	0,439	1	0,508
no	215	79,0	265	76,8			

Respondents in closed-type prisons have tested in a somewhat higher percentage in the last 12 months (without a statistically significant difference in relation to semi-open prisons, p<0,05).

TEST RESULTS

Of 616 respondents, 595 were – after an informed consent - tested for HIV (out of which 7 were tested with a quick test since they declined to give a blood sample from a vein), whilst 588 were tested for hepatitis B and C viral infections and syphilis. No one taking the test was anti HIV positive, whilst HCV infection was detected on 14,3% of the tested, HBV on 1,5%, and syphilis among 0,5% of tested individuals.

Table 17: Frequency of HCV infection among respondents, by sex

HCV - testing	M		F		χ^2 test	df	P
	n=549	%	n=39	%			
Positive	80	14,5	4	10,2	0,554	1	0,457
Negative	469	85,4	35	89,8			

HCV infection is registered at a higher percentage among male respondents in comparison to females, but without a statistical significance (p>0,05).

Table 18: HCV infection and time spent in prison – all respondents included n=584

HOW LONG HAVE YOU BEEN IN PRISON ALREADY	HCV test result		Total
	Positive	Negative	
2 months to 1 year	41	185	226
%	50,0	36,9	38,7
1-3 years	27	156	183
%	32,9	31,1	31,3
More than 3 years	14	161	175
%	17,1	32,1	30,0
Total	82	502	584

Calculated from a total number of respondents, those with HCV infection have served in prison for a shorter time compared to respondents without an HCV infection (there is a statistical significance χ^2 test=8,517; df=2; P=0,014) which could be explained by previous service in prison and the experience of intravenous drug use.

Table 19: HCV infection and time spent in prison – includes only respondents who have not been imprisoned until now (n=328)

HOW LONG HAVE YOU BEEN IN PRISON ALREADY	HCV test result		Total
	Positive	Negative	
2 months to 1 year %	15 53,6	113 37,7	128 39,0
1-3 years %	8 28,6	93 31,0	101 30,8
More than 3 years %	5 17,9	94 31,3	99 30,2
Total	28	300	328

In the sample of respondents serving their first prison sentence, among those with HCV infection, larger number were those who served their prison sentence for a shorter period of time (without a statistically significant difference in HCV infection presence dependent on length of time spent in prison (χ^2 test=3,250; df=2; P=0,197), an occurrence that could be explained by a fact that inmates arrive to serve a prison sentence already infected with HCV - experience of intravenous drug use).

HCV positive respondents – intravenous drug users were serving a significantly shorter sentence compared to HCV negative persons, pointing to the fact that HCV infection is acquired prior to arriving to serve a prison sentence or shortly after arrival.

Table 20: Frequency of HCV, HBV and syphilis among respondents, by type of prison

VARIABLES	PRISON TYPE				χ^2 test	df	P
	SEMI-OPEN		CLOSED				
HCV - testing	n=262	%	n=326	%			
positive	36	13,6	48	14,7	0,115	1	0,735
HBV- testing	n=262		n=326				
positive	4	1,5	5	1,5	0,000	1	0,994
Syphilis - testing	n=261		n=326				
positive	1	0,4	2	0,6	0,151	1	0,693

Somewhat higher HCV infection percentage was detected in closed-type prisons in comparison to semi-open type, but without statistical significance ($p<0,05$).

Multivariate logistic regression analysis shows that intravenous drug use is one of the most significant predictors of HCV infection among persons serving a prison sentence.

Table 21. Predictors for HCV infection

Questions	Sig.	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
How old are you	0,215	1,027	0,984	1,072
Length of total service in prison	0,033	1,625	1,039	2,542
Prior to coming to prison, have you ever had a sexual intercourse with your STABLE partner without a condom	0,675	0,849	0,395	1,824
Prior to coming to prison, have you had sexual intercourse with someone of same sax	0,033	3,575	1,105	11,563
Prior to coming to prison, have you ever had sexual intercourse with a random partner/ someone who is not your stable or partner in marriage	0,671	0,818	0,324	2,064
Prior to coming to prison, have you ever had sexual intercourse with a RANDOM partner without using a condom	0,831	1,107	,436	2,811
Prior to coming to prison, have you ever injected yourself with drugs of any kind	0,000	19,699	6,857	56,587
Was your first drug injection consumed in prison?	0,109	2,185	,841	5,678
Do you have a tattoo?	0,003	0,415	0,232	0,742
Do you have a piercings?	0,037	3,144	1,073	9,213
While serving your sentence in this prison, have you been a victim of sexual abuse	0,004	26,975	2,820	258,065
While serving your sentence in this prison, have you forced someone to a sexual intercourse	0,135	0,086	0,003	2,142
While serving your sentence in this prison have you wilfully had sexual intercourse with other prisoners	0,035	0,123	0,018	0,864
While serving your sentence in this prison have you taken drugs (of any kind)	0,105	2,287	0,841	6,223
While serving your sentence in this prison, have you taken drugs intravenously	0,729	1,387	0,218	8,831
While serving your sentence in this prison, have you used drug injection kit used by someone beforehand	0,806	1,315	0,148	11,652
While serving your sentence in this prison, have you used tattoo equipment used by someone beforehand	0,529	1,396	0,494	3,945
Constant	0,001	0,000		

Upon exclusion of variables with significant mutual correlation from the predictive model, the following HCV infection predictors have occurred as significant: intravenous drug use prior to prison, time spent in prison in the last 10 years, sexual intercourse with a person of same sex prior to coming to prison, presence of tattoo or piercing, victim of sexual abuse, wilful sexual intercourse with other inmates (Negelkerke R^2=0,534) (Table 21).

Table 22: Possible predictors of HBV infection

Question	Sig.	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
How old are you	,203	,957	,895	1,024
Length of total service in prison	,898	,942	,375	2,366
Prior to coming to prison, have you ever had a sexual intercourse with your STABLE partner without a condom	,372	,505	,113	2,261
Prior to coming to prison, have you had sexual intercourse with someone of same sax	,679	,512	,022	12,188
Prior to coming to prison, have you ever had sexual intercourse with a random partner/ someone who is not your stable or partner in marriage	,117	6,839	,617	75,787
Prior to coming to prison, have you ever had sexual intercourse with a RANDOM partner without using a condom	,334	,462	,097	2,207
Prior to coming to prison, have you ever injected yourself with drugs of any kind	,325	7,077	,143	349,440
Was your first drug injection consumed in prison?	,507	,283	,007	11,775
Do you have a tattoo?	,824	,875	,269	2,843
Do you have a piercings?	,944	,925	,105	8,157
While serving your sentence in this prison, have you been a victim of sexual abuse	,909	1,397	,005	420,315
While serving your sentence in this prison, have you forced someone to a sexual intercourse	,788	3,075	,001	10919,491
While serving your sentence in this prison have you wilfully had sexual intercourse with other prisoners	,974	1,098	,004	310,685
While serving your sentence in this prison have you taken drugs (of any kind)	,356	,259	,015	4,563
While serving your sentence in this prison, have you taken drugs intravenously	,760	,405	,001	135,525
While serving your sentence in this prison, have you used drug injection kit used by someone beforehand	,969	,893	,003	286,578
While serving your sentence in this prison, have you used tattoo equipment used by someone beforehand	,523	2,087	,219	19,908
Constant	,395	1340,886		

After excluding variables with significant mutual correlation from the predictive model, possible HBV infection predictors did not appear significant (Negelkerke R^2=0,088) (Table 20).

6.6. INDICATORS

Indicator	B&H	FB&H	RS	Predictor description
HIV prevalence	0,0	0,0	0,0	Numerator: Number of HIV positive persons serving a prison sentence Denominator: Number of persons serving a prison sentence who have been tested
HBV prevalence	1,5	2,0	0,6	Numerator: Number of HBV positive persons SPS Denominator: Number of persons SPS who have been tested
HCV prevalence	14,3	15,9	10,7	Numerator: Number of HCV positive persons SPS Denominator: Number of persons SPS who have been tested
Syphilis prevalence	0,5	0,0	1,7	Numerator: Number of persons SPS positive to syphilis Denominator: Number of persons SPS who have been tested
% of inmates who have used any type of drugs prior to coming to prison	37,4	41,8	28,3	Numerator: Number of persons SPS who have used any type of drugs prior to coming to prison Denominator: Number of persons SPS who participated in the research
% of inmates who have used intravenous drugs prior to coming to prison	17,4	18,4	15,2	Numerator: Number of SPS who have used intravenous drugs prior to coming to prison Denominator: Number of persons SPS who participated in the research
% of injection drug users who have engaged in injection equipment sharing prior to coming to prison	57,9	55,8	63,3	Numerator: Number of injection drug users who have engaged in injection equipment sharing prior to coming to prison Denominator: Number of injection drug users serving a prison sentence
% of SPSs who have injected themselves with drugs in this prison	8,4	9,1	6,7	Numerator: Number of SPSs who have injected themselves with drugs in this prison Denominator: Number of injection drug users serving a prison sentence
% of SPSs who use intravenous drugs and in doing so engage in injection equipment sharing	44,4	42,9	50,0	Numerator: Number of SPSs who used intravenous drugs and in doing so engaged in injection equipment sharing Denominator: Number of persons SPS and IDUs who used injection drugs in this prison

% of persons who have taken drugs intravenously for the first time in prison, out of total number of IDUs	3,7	5,2	0,0	Numerator: Number of persons SPS who have taken drugs intravenously for the first time in this prison Denominator: Number of injection drug users serving a prison sentence
% of persons SPS who have taken drugs (of any kind) while serving their sentence in this prison	11,0	12,9	7,0	Numerator. Number of persons SPS who have taken drugs (of any kind) while serving their sentence Denominator: Number of persons SPS who participated in research
% of persons who have injected themselves with drugs, as a share of those who took drugs of any kind	16,2	13,0	28,6	Numerator: Number of persons SPS who have injected themselves with drugs in this prison Denominator: Number of persons SPS who used drugs of any kind in this prison
% of persons SPS who had a tattoo done in prison	19,4	21,8	13,8	Numerator: Number of persons SPS who had a tattoo done in prison Denominator: Number of persons SPS who have ever had a tattoo done
% of persons SPS who used tattoo equipment previously used by someone else while having their tattoo done in prison	24,6	25,5	21,4	Numerator: Number of persons SPS who used tattoo equipment previously used by someone else while having their tattoo done in prison Denominator: Number of persons SPS who have ever had a tattoo done in prison
% of persons serving a prison sentence who have been a victim of sexual abuse in prison (total sample)	1,6	2,1	0,5	Numerator: Number of persons of both sexes, serving a prison sentence, who have been a victim of sexual abuse in prison Denominator: Number of persons of both sexes SPS who participated in the research
% of persons SPS who have been a victim of sexual abuse in prison (men only)	1,6	2,0	0,5	Numerator: Number of male persons SPS who have been a victim of sexual abuse in prison Denominator: Number of male persons SPS who participated in the research
% of persons SPS who had wilfully engaged in sexual intercourse with other persons serving a prison sentence (men only)	1,7	2,0	1,1	Numerator: Number of male persons SPS who had wilfully engaged in sexual intercourse with other persons of same sex SPS Denominator: Number of male persons SPS who participated in the research

% of persons SPS who have engaged in a sexual intercourse with a RANDOM partner (male or female) prior to coming to prison	73,0	71,4	76,4	Numerator: Number of persons SPS who have engaged in a sexual intercourse with a RANDOM partner (male or female) prior to coming to prison Denominator: Number of persons SPS who participated in the research
% of persons who have engaged in a sexual intercourse with a random partner (male or female) without a condom	86,4	87,5	84,4	Numerator: Number of persons who have engaged in a sexual intercourse with a random partner (male or female) without a condom Denominator: Number of persons who have engaged in a sexual intercourse with a random partner (male or female) without a condom prior to coming to prison
% of persons SPS who have engaged in sexual intercourse with a STABLE partner (male or female) without using a condom	82,4	80,3	86,7	Numerator: Number of persons SPS who have engaged in sexual intercourse with a STABLE partner (male or female) without using a condom prior to coming to prison Denominator: Number of persons SPS who participated in the research
% of persons SPS who have correctly answered to all questions about ways of HIV transmission	3,2	3,3	3,1	Numerator: Number of persons SPS who have correctly answered to all questions about ways of HIV transmission Denominator: Number of persons SPS who participated in the research
% of persons SPS who have correctly answered to all questions on prevention of spread of HIV	31,0	28,1	37,3	Numerator: Number of persons SPS who have correctly answered to all questions on prevention of spread of HIV (q15-1 to q15-6) Denominator: Number of persons SPS who participated in the research
% of persons SPS who have a discriminatory attitude towards persons infected with HIV	14,9	17,4	9,4	Numerator: Number of persons SPS who answered NO to all questions about discrimination (q16-1 to q16-4) Denominator: Number of persons SPS who participated in the research
% of persons SPS who have tested for HIV in the last 12 months	22,2	24,1	18,3	Numerator: Number of persons SPS who have tested for HIV in the last 12 months Denominator: Number of persons SPS who participated in the research

7. DISCUSSION

Prisons are places of an expectedly higher prevalence of blood-borne and sexually transmitted infections (BBSTDI) compared to the general community, for two main reasons: first, many persons serving a prison sentence are former or current intravenous drug users, and in that way may have a higher frequency of BBSTDI, especially HCV. Second reason being lack of , or insufficient preventive measures (clean needles and syringes, access to free condoms) in majority of prisons, combined with extreme social conditions, altogether causing additional possibility for transmission of BBSTDIs in prison.

Frequency of BBSDTIs, injection drug use among prisoners, combined with drug injection and tattooing equipment sharing, abuse and other forms of risk behaviours make prison a high risk environment for transmission of those infections. As a result, this contributes to the epidemiological profile of those infections even in the out-of-prison environment, upon return from serving a prison sentence.

This research was conducted as a prevalence study among persons serving a prison sentence in ten prisons, four in Federation of B&H (FB&H, with 421 respondents) and six in Republic of Srpska (RS, with 199 respondents). Consequently, 620 respondents took part in the research (581 male and 39 female). They have, after an informed consent, completed a questionnaire about risk factors, and tested at a high response rate (over 95%) for HIV, HCV, HBV and syphilis.

Average age of a respondent is 34 years, with highest part in the age group 28 and 39 years. Majority (62%) have completed secondary school, whilst 2,6% have had no school education. For more than half of respondents, this is their first prison sentence, and more than a third of them are in prison for less than a year. More than a fifth are „returnees“, who have been to prison two or more times.

Results of the study show lower level of knowledge about HIV/AIDS, ways of HIV transmission prevention, and especially poor knowledge about ways of transmission. This is in line with their self-assessment of knowledge about HIV/AIDS, and also in-line with the fact that more than half of them arrived to prison without any prior education or information about HIV/AIDS.

Even so, women serving a prison sentence show a better overall knowledge about HIV/AIDS in this research, yet not also about ways of its prevention. Relative to prison type, somewhat better knowledge about HIV ways of transmission is shown among respondents from closed-type prisons.

Results of the study have shown that respondents who spent a shorter time in prison have significantly lower level of knowledge than those who have been serving their sentence longer, indicating insufficient information and education of the younger population in particular. Most accepted sources of information, channels of communication by results of this research are printed sources – newspapers, brochures, TV/radio.

Insufficient knowledge about HIV/AIDS, ways of transmission and ways of prevention may be explained by the learning from this research showing that a fifth of respondents show a discriminatory attitude to persons living with HIV. On this subject, respondents from semi-open prisons have had a significantly

more positive attitude towards persons living with HIV. Fear of being differently treated due to possible HIV seropositivity represents a serious barrier to undertaking testing. We have achieved a high response rate in this research (84%) something that can be associated to gradual strengthening of HIV prevention programme in prisons, and to a better, but still insufficient co-operation with health institutions and NGOs. According to data gathered, VCAT services (Voluntary, Confidential Advice and Testing) is accessible to 65% of respondents, condoms to 40,5% (somewhat lower percentage in RS subsample, 34%), sterile needles and syringes to 3,3% of respondents (somewhat lower in RS subsample, 2,5%).

Behaviour of persons serving a prison sentence prior to entering a prison in large part determines their exposure to the risk of HIV and other blood-borne infections in prison environment. Results of the study show over 86% of respondents did not use a condom during sexual intercourse with a random partner (male or female), 4,2% of them had experienced same-sex sexual intercourse.

More than a third of respondents have used some kind of a drug prior to their time in prison, and every sixth has experienced taking drugs by injecting themselves, without a difference dependent on prison type. Out of 107 who have used drugs intravenously, 58% of them exchanged injection equipment whilst doing so.

Average age of first drug injection consumption is 21 years, without a significant difference by sex.

Out of the total number of intravenous drug users, 4% used drugs for the first time in prison, meaning that , from a statistical point of view a significantly higher number of respondents start their prison sentence already having an IDU status. Some of them stop injecting drugs upon arrival to prison, however, some continue doing so and results of this research show 8,4% of IDUs use drugs in prison whilst serving their prison sentence, out of whom 44,4% exchange equipment, with no statistically significant difference dependent on prison type. Drug injection in prison is a particularly important risk factor in relation to danger of HIV and other blood-borne diseases, especially if exchange of used equipment is present. A higher prevalence of HCV infection in prisons, when compared to general population, is registered mainly among intravenous drug users (IDUs) who form 17,4% of all respondents, therefore making intravenous drug injection the highest risk factor for HCV, usually maintaining high share of IDUs in prisons. Namely, IDU status is determined through self-registration, and respondents may not have the tendency to „admit“ a history of IDU in fear of possible consequences/additional sentence in prison. Despite these limitations, it can be concluded that blood-borne infections are present among persons serving a prison sentence, and that activities on prevention should be aimed at this prison sub-population. HBV infection in this research was registered among 1,5% of respondents and was not connected with IDUs, which may tell us that HBV infection is not so concentrated among this prison sub-population.

Frequent tattooing with exchanged equipment (over 50% of respondents have a tattoo, every eighth tattooed inmate has had their tattoo done in prison, and in 25% of cases sterile equipment was not used) warns us of a low awareness about the risk of tattooing in a prison environment.

Sexual activities can be regarded as less significant factor for transmission of HIV and other blood-borne diseases in prison, however, being aware that sex happens in prisons also, calls for an assessment of this risk too considering the data about risk sexual behaviour prior to coming to prison.

Reliable data about the frequency of sexual activity in prisons is hard to gather in this type of research since sexual relations, apart from permitted marriage/out-of-marriage visits, are against prison rules, and are therefore reported less frequently to avoid inconvenience and in fear of being labelled as gay (considering majority of inmates practising same-sex sexual relations do not identify themselves as homosexuals).

Out of the total number of male respondents (578) who have replied to this question, 10 of them (1,7%) quote having wilful sexual intercourse with other inmates, 1,6% were a victim of sexual abuse. Through indirect questions judging sexual behaviour of other inmates, 6% of respondents claim higher number of inmates have had wilful sexual intercourse with other inmates, whilst 70% believe none of the inmates use a condom during anal sexual intercourse.

Every fifth respondent believes risk of contracting HIV during their time in prison is high, same stands for HCV and HBV (every third respondent). Awareness of HIV infection risk is not succeeded by a HIV testing habit, resulting in 40% of respondents having taken the test at any point, and only 22% in the last 12 months.

Testing can have a direct benefit for the inmates, but may also pose a risk of stigmatisation. Research conducted in this way, although anonymous, still informed all respondents about their individual result, and those with a positive result could refer to the prison health service for further steps. In this way, prison can also offer a special surrounding for advancement in care of persons serving a prison sentence and prevention of HIV/STI bridge towards general population.

8. CONCLUSIONS AND PROPOSAL OF MEASURES

Prison institutions, being a high risk environment for occurrence and spread of blood-borne and sexually transmitted infections require implementation of comprehensive preventive measures, continuous monitoring of scope of risk and protective behaviour of persons serving a prison sentence. At the same time, workability and value of comprehensive screenings for blood-borne and sexually transmitted infections in prisons should be evaluated – whether to be offered to all or only those with a history of IDU considering this research shows intravenous drug use, especially combined with equipment sharing, is the strongest risk factor for HCV and usually reflects a higher presence of IDUs in prisons.

Other risk factors – tattooing with exchanged equipment, risky sexual intercourse, abuse, insufficient knowledge and information about HIV/AIDS, ways of transmission, ways of protection and emphasised stigma, all require a set of comprehensive measures:

-*IEC(information, education, communication)* – are an essential prerequisite for implementation of HIV/STD preventative measures in prisons. Persons serving a prison sentence should also be informed about those measures through structurised educational programmes, acceptable communication channels, adjusted to the education level of prison (who, themselves, should take part in creation of such materials, with „peer educators“ possibly taking a key role).

Advice and testing (VCAT) is significant at least for two reasons – as a part of HIV preventive programmes and support to change in behaviour, i.e. early detection and admittance to treatment. Data from this research show that VCAT services are partly accessible, occasionally and such should be available routinely or per request, but not as compulsory or as an instrument for segregation of seropositive individuals.

It is therefore necessary to increase the accessibility to VCAT services as part of the comprehensive HIV/STI programmes whose aim is to raise risk awareness, improve access to health care, treatment and support, reduction of stigma and discrimination and protection of confidential medical information whereby all forms of imposing must be avoided.

IEC is not sufficient as a response to HIV/STIs in prisons without accompanying condom programmes – widely available free condoms, needle exchange programme, opiate substitute programme, etc. Though needle and syringe exchange (and even opiate substitute programmes) are all controversial questions that would evoke resistance from prison staff.

Conducting regular survey programmes on a random sample of persons serving a prison sentence is important because it enables monitoring of seroprevalence trends of blood-borne and sexually transmitted infections, risk and protective behaviours among the prison population calling for further strengthening of co-operation between the governmental and non-governmental sector.

9. LITERATURE

Dolan K et al. Availability and risk behavior in prison in New South Wales, Sydney, Australia. Sydney, National Drug and Alcohol Research Centre, 1994:14.

Gaughwin MD et al. HIV prevalence and risk behaviours for HIV transmission in South Australian prison. AIDS, 1991, 5:845–51.

WHO/UNODC/UNAIDS. Interventions to address HIV in prisons: Comprehensive review (Evidence for Action Technical Paper) Geneva: World Health Organization; 2007.

Reindollar RW. Hepatitis C and the correctional population. American Journal of Medicine. 1999;107(6B):100S–103S.

Estebanez P. Prevalence and risk factors for HIV infection among inmates. IV International Conference on AIDS, 1988; Stockholm, Sweden. Abstract no 4202

Health Canada - Public Health Agency of Canada. Hepatitis C Virus Transmission in the Prison/Inmate Population. Canada Communicable Disease Report. 2004;30(16):141–148.

Hughes RA, Huby M. Life in prison: Perspectives of drug injectors. Deviant Behavior. 2000;21(5):451–479.

Chu S, Peddle K. Under the skin: A people's case for prison needle and syringe programs. Toronto: Canadian HIV/AIDS Legal Network; 2010.

Elwood Martin R, Gold F, Murphy W, Remple V, Berkowitz J. Drug use and risk of bloodborne infections: A survey of female prisoners in British Columbia. Canadian Journal of Public Health. 2005;96(2):97–101.

Frost L, Tchertkov V. Prisoner risk taking in the Russian Federation. AIDS Education and Prevention. 2002;14(Suppl B):7–23.

Godinho J. Reversing the Tide: Priorities for HIV/AIDS Prevention in Central Asia. >Washington: The World Bank; 2005.

Pearson M. Voluntary screening for hepatitis C in a Canadian federal penitentiary for men. Canadian Communicable Disease Report. 1995;21(14):F4–F5.

Butler T, Milner L. The 2001 inmate health survey. Sydney: NSW Corrections Health Service; 2001.

Calzavara LM, Ramuscak N, Burchell AN. Prevalence and predictors of HIV and hepatitis C in Ontario jails and detention centres. Final report. HIV Social, Behavioural, and Epidemiological Studies Unit, Faculty of Medicine, University of Toronto; 2005.

Jürgens R, Betteridge B. Prisoners who inject drugs: public health and human rights imperatives. Health & Human Rights. 2005;8(2):47–74.

World Health Organization. WHO Guidelines on HIV Infection and AIDS in Prisons. Geneva: WHO; 1993.

UNODC & WHO. Policy Brief: HIV Testing and counselling in prisons and other closed settings. Vienna & Geneva: UNODC & WHO; 2009.

WHO/UNODC/UNAIDS. Interventions to address HIV in prisons: Prevention of sexual transmission. Geneva: World Health Organization; 2007.

WHO/UNODC/UNAIDS. Interventions to address HIV in prisons: Needle and syringe programmes and decontamination strategies. Geneva: World Health Organization; 2007.

WHO. Effectiveness of Sterile Needle and Syringe Programming in Reducing HIV/AIDS among Injecting Drug Users. Geneva: WHO; 2004.

WHO/UNODC/UNAIDS. Interventions to Address HIV in Prisons: Drug Dependence Treatments. Geneva: World Health Organization; 2007.

UNODC. HIV/AIDS in Prisons. A Toolkit for Policy Makers, Prison Managers and Prison Staff. Vienna: UNODC; 2008.

Hughes RA. Illicit drug and injecting equipment markets inside English prisons: a qualitative study. Journal of Offender Rehabilitation. 2003;37(3/4):47–64.

Centers for Disease Control and Prevention. Antiretroviral postexposure prophylaxis after sexual, injection-drug use, or other nonoccupational exposure to HIV in the United States. MMWR. 2005;54(RR02):1–20.

WHO/UNODC/UNAIDS. Interventions to Address HIV in Prisons: HIV Care, Treatment and Support. Geneva: World Health Organization; 2007.

World Health Organization. Statement from the Consultation on Prevention and Control of AIDS in Prisons, Global Programme on AIDS. Geneva: WHO; 1987.

C Paul, S Das Gupta, S Sharma et al, Awareness, perception and risk behaviours of drug users in the prisons. Abstract WeOrE1323, XVth International AIDS Conference, Barcelona 2002

Laporte J, Bolinni P, Management of HIV/AIDS related problems: Situation in European prisons. Programme and Abstracts of XII World AIDS Conference, Geneva. Abstract 44193