



STI prevalence and knowledge, attitudes, behavior and perception of STIs among professional defence forces

Study report

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Tallinn 2014

This study was funded by the United States Department of Defense under the Defense HIV/AIDS Prevention Program (DHAPP) to the University of South Carolina, Department of Medicine, and the National Institute for Health Development, Estonia, through National HIV/AIDS Strategy for 2006–2015.

The authors are grateful to all involved health units of Estonian Defense Forces and all participants.

Our special thanks to: Julia Vinckler, Dr Kersti Lea, Dr Oleg Novikov and Dr Anu Mill from EDF Headquarters, Dr Heli Vasar from Naval Base, Ingrid Milvaste and Kristiina Nööp from Viru Infantry Battalion, dr Margus Pärnamäe from Scouts Battalion, all participating EDF IT-specialists and nurses, Virge Jürjenson and Jaak Jänes from Quattromed HTI Laboratories, and Natalia Gluškova and Iveta Tomera from National Institute for Health Development, Estonia.

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ABBREVIATIONS

Ab	antibody
Ag	antigen
EDF	Estonian Defence Forces
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
KABP	Knowledge, Attitude, Behaviour, & Perception
NIHD	National Institute for Health Development
STI	Sexually Transmitted Infection

EXECUTIVE SUMMARY

Background: Previous research on military personnel has been mixed in the findings pertaining to risk behavior engagement. These risk behaviors include alcohol and other drug use as well as sexual risk behaviors. Globally, alcohol and other drug prevention programmes are emerging in militaries, indicating that the culture of the military is one where drug use, especially alcohol is widespread.

If alcohol use is high among military personnel, it is possible that this leads to increased risky sexual behavior that could increase the acquisition and transmission of sexually transmitted infections (STIs). Given this assumption, many militaries conduct entry testing and periodic testing among personnel for specific disease, such as HIV, HCV, and others.

Purpose: This project was designed to determine the prevalence of STIs including HIV among the professional defence forces and to measure the occurrence of risk behaviors.

Findings: 186 people participated in the study (86.6% male, mean age 30 years), comprising 7.3% of the total professional defence forces at the time of the study. This project identified four cases of Chlamydia, and no cases of gonorrhoea, trichomoniasis, Hepatitis C, Hepatitis B or HIV. Only one person had ever injected drugs. The findings indicate that professional defence forces in Estonia have an occurrence of STI, including HIV, and drug use equal to or lower than the same age cohorts in general population.

Conclusion: The prevalence of STIs in this sample was less than the non-military, general population. While the rates were lower, this was a voluntary study, therefore, people who suspected they may have a chronic infectious disease or STI might have opted to not participate. Additionally, due to the small sample we can only report on this sample as there may be distinct differences compared to the remainder of the military forces.

Given these findings, considerations, and study limitations, the Estonian Defense Forces and the Ministry of Defense should develop a policy tailored to the expression of infections found here which is also in alignment with similar militaries who deploy international peace keepers. An example of this would be testing at entry, prior to deployment, and once a year. Additionally, policies should be developed that would bar discrimination against any service member and ensure equitable treatment.

INTRODUCTION

Previous research on military personnel has been mixed in the findings pertaining to risk behavior engagement. These risk behaviors include alcohol and other drug use as well as sexual risk behaviors. Globally, alcohol and other drug prevention programmes are emerging in militaries, indicating that the culture of the military is one where drug use, especially alcohol is widespread.

If alcohol use is high among military personnel, it is possible that this leads to increased risky sexual behavior that could increase the acquisition and transmission of sexually transmitted infections (STIs). Given this assumption, many militaries conduct entry testing and periodic testing among personnel for specific disease, such as HIV, HCV, and others.

In Estonia there have been no special studies on HIV-prevalence among general population or professional defence forces. Prevalence data has been collected from risk groups like injecting drug users, commercial sex workers or men who have sex with men, and also military conscripts [6]. Data on knowledge and risk behaviours among Estonian youth aged 10–29 has been collected in youth studies conducted by National Institute for Health Development (NIHD) [7–10]. Limited data is available on HIV knowledge and testing among general population aged 16–64 [11–14].

The primary objective of this study was to determine the STI (including HIV, HCV and HBV markers) prevalence among professional defence forces. There is no routine STI or HIV testing in the defence forces (Government Order No 282). These findings will provide input to the Ministry of Defence and Estonian Defence Forces (EDF) for planning respective testing among defence forces in the future. Another goal of the study was to estimate the risk-behaviours, attitudes and knowledge related to STIs among defence forces. This information would provide input for EDF for planning respective education and prevention strategy.

STUDY METHODOLOGY

A cross sectional study using convenience sampling among professional defence forces was conducted. Participation in this study was voluntary and anonymous. Eligibility criteria included age at least 18 years old and able to provide informed consent.

A minimum of 385 participants were planned to be recruited. The number of people to be recruited (including in each site) was planned to be proportional to the total number of military personnel in these sites.

Participants were planned to be recruited in three military bases in three cities (Paldiski, Võru and Tapa). In choosing the study sites the following issues were taken into consideration: 1) number of military personnel in each base; 2) presence of medical unit, work load of the personnel of the medical unit, and transportation issues of

biological samples. Due to Norwalk-virus outbreak in Kuperjanov Infantry Battalion in Võru in March 2013, their participation was cancelled and Naval Base in Tallinn was included as the third site.

Data and biological sample collection took place during March 20–September 30, 2013.

Ethical Board Review

This study was reviewed and approved by the Tallinn Medical Research Ethics Committee (decision number 157, from February 14, 2013) and the University of South Carolina Institutional Review Board.

Study personnel

Participants were recruited and study procedures were conducted by the medical personnel of each military base medical unit, under the supervision of NIHD. Personnel received training before the data collection started on study methodology, securing informed consent, and privacy and confidentiality of the participants.

Study procedures

1. Recruitment. Information about the study was distributed orally and in a written form (leaflets in Estonian and Russian as well as messages in intranet). People who consented to participate, were provided with informed consent (these were available in both Estonian and Russian) and described the study aims and methods. Study personnel answered the questions. Recruitment and biological sample collection took place during the regular working hours of the medical units.
2. In order to ensure unique participation, all participants received a participant code (consisted of the first letter of the study site and serial number, for example T001, T002, etc for Tapa, V001, V002, etc for Võru). The code was used to identify and match the questionnaire, urine and blood samples.
3. Knowledge, Attitude, Behaviour, & Perception (KABP) assessment. After determining eligibility and obtaining consent, the participants completed a self-guided KABP questionnaire which was available in both Estonian and Russian (Appendix 2). The KABP used in this project was a modified version of the assessment administered to conscripts in 2012 [6]. The modified version for this project contained 34 questions and required approximately 20 minutes to complete. The KABP contained questions on sexual behaviours, drug use, HIV and STI testing, attitudes and knowledge about HIV.
4. Biological sample collection and testing. Study nurses instructed participants on how to collect urine (from men, 5 ml)/vaginal swab (from women) and when to come back to give blood and return the samples. Participants were given laboratory supplies to collect urine/vaginal swab and a small reminder card which included participant number and instructions for specimen collection, as well as time and date for coming

back to give blood. From every participant 10 ml of venous blood was collected. HBV, HCV and HIV tests used blood while gonorrhoea, Chlamydia and trichomoniasis were urine/vaginal swab based tests. Biological samples were analysed in Quattromed HTI Laboratories using the following methods to identify infection markers:

- HIV antibodies + antigen (HIV 1,2 Ab+Ag) – chemoluminescence
- HCV antibodies (HCV Ab) – chemoluminescence
- HBV antigen (HBsAg) – chemoluminescence
- Chlamydia (C trachomatis DNA) – PCR
- Gonorrhoea (N gonorrhoea DNA) – nested PCR
- Trichomoniasis (T vaginalis DNA) – PCR

HIV, HCV and HBV test were screening tests, for confirming the diagnosis additional test were required, which were organized through the EDF medical services.

5. Ordering the tests and reporting the results. Tests were ordered and results reported back to the medical units by web-based system. In case the participants were interested, they were able to receive the results of the tests based on their unique participation code. Receiving test results was voluntary. In case the test results for Chlamydia, gonorrhoea, or trichomoniasis were positive, participants were offered treatment by the military medical services. In case the test results for HIV, hepatitis B virus, or hepatitis C virus were positive, participants were offered additional testing, because in the study only screening tests were used and the final diagnosis had to be confirmed. Considering the aims of the study we did not collect any information on how many participants returned for their test results.

Data entry and management

Double data entry of the KABP into Microsoft Excel was conducted at the NIHD. These two files were imported into STATA for comparison. Discrepancies were resolved by referring to the source documentation. In the case that the source documentation was not clear, a determination was be made by the Principal Investigators on this project with documentation on the method of data clarification.

Data were analysed using STATA 10.0. Descriptive statistics (mean, median, percentages) were used to characterize participants.

RESULTS

Participants

Alltogether 186 people participated in the study (Table 1). This is 17.7% of all professional defence forces in these bases and 7.3% of the total professional military (n=2,564) at the time of the study.

Table 1. Number and percentage of participants by military base (study sites)

	Study participants		Total number of professional defence forces	
	Number	Percentage among all study participants	Number	Percentage who participated in the study
Naval Base, Tallinn	9	4.8	193	4.7
Scouts Battalion, Paldiski	106	57.0	673	15.8
Viru Infantry Battalion, Tapa, Lääne-Virumaa	71	38.2	185	38.4
Total	186	100.0	1,051	17.7

Socio-demographic and behavioural data

13.4% of the participants were female (n=25) and 86.6% male (n=161). The mean age of the participants was 29.5 years (median 26.5 years, range 19–60 years). 89.7% were Estonians (n=166), 8.1% were Russians (n=15) and 2.2% were other nationalities (n=4; Lithuanian, German, Finnish, and Ukrainian).

Data on socio-demographics, risk behaviours and HIV/STI symptoms and testing by gender is presented in Table 2.

Table 2. Socio-demographic and behavioural data

	Male (n=161)		Female (n=25)		
	Number	%	Number	%	
Socio-demographic data					
Age (mean, median, range)	28 (median 26, range 19–56)		40 (median 38, range 22–60)		
Ethnicity					
	Estonian	149	93.1	17	68.0
	Other	11	6.9	8	32.0
Education					
	Primary	7	4.4	0	0.0
	Secondary or secondary vocational	117	72.7	13	52.0
	Higher (including masters or doctoral degree)	37	22.9	12	48.0
Sexual behaviour					
Ever had sex (YES)	156	96.7	23	92.0	
Sex in last 12 months (YES)	148	94.9	22	95.7	
Number of sexual partners in the last 12 months (among those who have had sex in the last 12 months)	1.3 (median 1, range 1–4)		2.1 (median 2, range 1–12)		
Alcohol use before the last sexual intercourse	69	44.2	7	65.2	
Illegal drug use before the last sexual intercourse	1	0.6	0	0.0	
Sex with a person of the same gender (ever)	1	0.7	0	0.0	
Sexual orientation					
	Heterosexual	159	100.0	23	95.8
	Homosexual	0	0.0	0	0.0
	Bisexual	0	0.0	1	4.2
STIs and HIV					
Suspicion of an STI in the last 12 months (YES)	28	17.4	0	0.0	
HIV testing ever	57	35.4	13	52.0	

Table 2. Continued

	Male		Female	
	Number	%	Number	%
Result of the last HIV test (among those ever tested)				
Negative	56	98.3	13	100.0
Positive	0	0.0	0	0.0
Did not receive the result	1	1.7	0	0.0
Injection drug use				
Ever injected drugs (YES)	1	0.6	0	0.0
Ever shared injecting equipment	0	0.0		
Other blood borne infections risk factors				
Tattooing or piercing by a non-professional	27	16.8	5	20.0
Blood-transfusion before 1994	3	1.9	1	4.0

HIV knowledge and attitudes

HIV related knowledge and attitudes were assessed with 12 statements and questions. Results are presented in the Appendix 1 (Table 1). The majority of the participants had positive attitudes towards condom use, correct knowledge of HIV transmission and accepting attitudes towards people with HIV.

Test results

Blood and urine/vaginal samples were suitable for testing from all participants. Test results are presented in Table 3. Only four case of Chlamydia were diagnosed, all of them among men who had been sexually active in the last 12 months (prevalence rate among sexually active men 2.4%) and all among people younger than 30-years of age (two 23-year olds, one 24-year old and one 26-year old). One of them had had one sexual partner and three had had two sexual partners in the last 12 months. Only one of the four had had any suspicion in the last 12 months that they might have had an STI.

Table 3. Results of the tests

	Negative		Positive		Positives among those sexually active in the last 12 months	
	N	%	N	%	N	%
HIV Ag+Ab	186	100.0	0	0	0	0
HCV Ab	186	100.0	0	0	0	0
HBsAg	186	100.0	0	0	0	0
Gonorrhoea	186	100.0	0	0	0	0
Trichomoniasis	186	100.0	0	0	0	0
Chlamydia	182	97.8	4	2.2	4	2.4

DISCUSSION AND CONCLUSIONS

The current study focused on the prevalence of HIV and other STIs among professional defence forces as well as their behaviours, attitudes and knowledge related to STIs. It was the first study of this kind in Estonia and one of the first in the region. The study was conducted to provide baseline data to the military and defense policy makers to aid development of testing and education policy.

The study included 186 people from three military bases (comprising 7.3% of the total professional defence forces at the time of the study). As we used convenience sampling the results of this study cannot be generalized to all military personnel in Estonia. The initial sample size was planned to be 385, but there was limited interest in participation and the study was concluded in late September 2013 (after almost seven months of recruitment).

The results of the study show that in general the knowledge professional defence forces have of HIV-transmission is very good. Vast majority has positive attitudes towards condom use and people living with HIV. HIV testing and illegal drug use rates were comparable to the same age groups in general population [7–14].

The prevalence of infections in our study was as expected and comparable to the other countries. Thus newly diagnosed HIV-cases among 15 to 24 year olds in Estonia have decreased year after year [15]. Considering that only one person in our study had ever injected drugs, the finding that HIV, HCV and HBV prevalence was 0% was not surprising. Chlamydia is the most common bacterial STI in Europe, prevalence rates as high as 5–10% have been described among sexually active youth [16].

The limitations of our study are convenience sampling and recruitment in only a few military bases. We were not able to use random sampling because we wanted to ensure the confidentiality of the defence forces. Answering questions related to sexual behavior and illegal drug use may have been prone to recall and desirability bias. It was not

possible to collect the very first morning urine from all participants, and this may have influenced the sensitivity of the PCR methodology. We did not collect and compare data on the urine sample collection time.

Given these findings, considerations, and study limitations, the Estonian Defense Forces and the Ministry of Defense should develop a policy tailored to the expression of infections found here which is also in alignment with similar militaries who deploy international peace keepers. An example of this would be testing at entry, prior to deployment, and every two years. Additionally, policies should be developed that would bar discrimination against any service member and ensure equitable treatment.

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APPENDICES

Appendix 1. Knowledge, attitudes and perceptions related to HIV (D1)

	Totally agree		Most likely agree		Most likely disagree		Totally disagree		Do not know	
	N	%	N	%	N	%	N	%	N	%
A HIV and AIDS is the problem only for drug-users	1	0.5	23	12.4	48	25.8	111	59.7	3	1.6
B Can it be that the healthy looking person is HIV-infected?	120	64.5	54	29.0	6	3.2	2	1.1	4	2.2
C Maximum pleasure during the sexual intercourse is more important than using the condom	5	2.7	25	13.4	73	39.3	75	40.3	8	4.3
D If the person is HIV infected his life loses its meaning	5	2.7	27	14.5	65	35.0	72	38.7	17	9.1
E I'd rather stop the relations with my mate, friend, if I find out that he/she is HIV-infected	3	1.6	11	5.9	48	25.8	103	55.4	21	11.3
F One can get HIV-infection by hugging an HIV-infected person	1	0.5	4	2.2	21	11.3	157	84.4	3	1.6
G HIV/AIDS are problems related only with	2	1.1	3	1.6	29	15.6	147	79.0	5	2.7

gays										
H I'd rather agree to work in one team with HIV-infected person	41	22.2	79	42.7	31	16.8	8	4.3	26	14.0
I HIV is not so common in Estonia that I should use a condom in every casual sexual relationship	6	3.3	8	4.3	43	23.2	120	64.9	8	4.3
J One can get HIV-infection by eating from the same plate with an HIV-infected person	2	1.1	21	11.3	68	36.8	63	34.0	31	16.8
K HIV-infected teacher can continue working at school	44	23.8	65	35.1	25	13.5	18	9.7	33	17.9
L One can get HIV-infection by using the same toilet with HIV-infected person	2	1.1	19	10.2	61	40.0	69	37.3	34	18.4

Appendix 2. Questionnaires

English Questionnaire

**UNIVERSITY OF SOUTH CAROLINA AND ESTONIAN NATIONAL INSTITUTE FOR
HEALTH DEVELOPMENT
Health study 2013**

Dear respondent!

Filling in this form is voluntary. It will not take much time to answer the questions and the questions are not difficult.

You should outline the number of the correct answer (it is placed before or after the answer) or write an answer in the separate space.

EXAMPLE 1

Mark your sex. 0 female **1** male

EXAMPLE 2

Many questions in the form are given in the tables. In such case mark the correct answer for each line of the table separately. (Questions are also followed by the remark "Mark the correct answer in each line")

What is your current social status? *Mark the right answer in each line*

	Yes	No
A Employed, age worker	1	2
B Student	1	2
C Unemployed	1	2

Please also follow the attached instructions!

The questionnaire is anonymous; nobody will know your name!

All your answers are very important for us!

PART A

- A1 How old are you (in full years)**
..... Years
- A2 What is your gender?**
0 female
1 male
- A3 What is your nationality?**
0 Estonian
1 Russian
2 Other (*write*).....
- A4 What is your highest level of education? Mark one most suitable answer.**
0 Primary
1 Secondary
2 Secondary vocational
3 Bachelor's degree
4 Master's or PhD

PART B

- B1 Have you ever had sex (anal, oral or vaginal)?**
0 No→ *if you have chosen this answer please go to question B7*
1 Yes
- B2 Have you had sex (vaginal or anal) during the last 12 months...**
0 No→ *if you have chosen this answer please go to question B4*
1 Yes
- B3 How many different sexual partners have you had during the last 12 months?**
..... sexual partners
- B4 Did you use alcohol before the last sexual intercourse (for example beer, wine, vodka)?**
0 No
1 Yes
2 Don't remember
- B5 Did you use illegal drugs before the last sexual intercourse (for example amphetamine, cocaine, ecstasy)?**
0 No
1 Yes
2 Don't remember

B6 Have you ever had the sexual relations with a partner of the same sex as you?

- 0 No
- 1 Yes
- 2 Don't remember

B7 What is your sexual orientation?

- 0 Heterosexual
- 1 Bisexual
- 2 Homosexual
- 3 Not specified

PART C

C1 Did you have any suspicion in the last 12 months that you might have a sexually transmitted disease?

- 0 No → *if you have chosen this answer please go to question C3*
- 1 Yes

C2 What actions did you take if during the last 12 months you had suspicions that you might have a sexually transmitted disease? Mark several answers if necessary

- 0 I did not do anything
- 1 I visited a specialist doctor
- 2 I visited family doctor
- 3 I asked for medication in pharmacy shop
- 4 I took the medication which I had at home by myself
- 5 I talked about my concerns with my sexual partner
- 6 I stopped sexual relations with my partner during this period
- 7 I started using the condom while having sex
- 8 Did something else (*please specify*).....

C3 Have you ever had an HIV-test?

- 0 no, never → *if you have chosen this answer please go to question C6*
- 1 yes, during the last year
- 2 yes, more than 1 but less than 2 years ago
- 3 yes, more than 2 years ago
- 4 Do not know / Don't remember

C4 Where were you HIV-tested for the last time?

- 0 AIDS counseling centre (anonymous cabinet)
- 1 Youth counseling center
- 2 At the family physician
- 3 At the doctor-specialist's
- 4 Blood centre
- 5 Other
- 6 Don't remember

- C5 What was the result of your last HIV test?**
 0 Negative (not infected with HIV)
 1 Positive (infected with HIV)
 2 I did not receive test results
- C6 Have you ever injected drugs?**
 0 No →*if you have chosen this answer please go to question C10*
 1 Yes
- C7 When was the last time you injected drugs?**
 0 Less than 6 months ago
 1 More than 6 but less than 1 year ago
 2 1–3 years ago
 3 more than 3 years ago
 4 Do not remember
- C8 Have you ever shared injecting equipment/needles?**
 0 No *if you have chosen this answer please go to question C10*
 1 Yes
 2 I do not know/I do not remember *if you have chosen this answer please go to question C10*
- C9 When was the last time you shared injecting equipment/needles?**
 0 Less than 6 months ago
 1 More than 6 but less than 1 year ago
 2 1–3 years ago
 3 more than 3 years ago
 4 Do not remember
- C10 Have you had a piercing/tattoo from a non-licensed professional?**
 0 No
 1 Yes
 2 I do not know/I do not remember
- C11 Have you had blood transfusion before 1994?**
 0 No
 1 Yes
 2 I do not know/I do not remember

PART D

D1 Do you agree with the following statements? Mark the right answer in each line.

	Totally agree	Most likely agree	Most likely disagree	Totally disagree	Hard to say
A HIV and AIDS is the problem only for drug-users	1	2	3	4	5
B Can it be that the healthy looking person is HIV-infected?	1	2	3	4	5
C Maximum pleasure during the sexual intercourse is more important than using the condom	1	2	3	4	5
D If the person is HIV infected his life loses its meaning	1	2	3	4	5
E I'd rather stop the relations with my mate, friend, if I find out that he/she is HIV-infected	1	2	3	4	5
F One can get HIV-infection by hugging an HIV-infected person	1	2	3	4	5
G HIV/AIDS are problems related only with gays	1	2	3	4	5
H I'd rather agree to work in one team with HIV-infected person	1	2	3	4	5
I HIV is not so common in Estonia that I should use a condom in every casual sexual relationship	1	2	3	4	5
J One can get HIV-infection by eating from the same plate with an HIV-infected person	1	2	3	4	5
K HIV-infected teacher can continue working at school	1	2	3	4	5
L One can get HIV-infection by using the same toilet with HIV-infected person	1	2	3	4	5

If you wish to add some comment concerning the questionnaire, you can write it here!

.....

THANK YOU FOR FILLING IN THIS FORM! YOUR ANSWERS ARE REALLY HELPFUL!