



REGIONAL OFFICE FOR

World Health Organization

Europe

By: Kristi Rüütel
Aire Trummal
Maris Salekešin
Cyril Pervilhac

HIV Epidemic in Estonia: Analysis of Strategic Information

Case Study



Tervise Arengu Instituut
National Institute for Health Development



sotsiaals
ministeerium



REGIONAL OFFICE FOR

**World Health
Organization**

Europe

HIV Epidemic in Estonia: Analysis of Strategic Information

Case Study

**By: Kristi Rüütel, Aire Trummal,
Maris Salekešin, Cyril Pervilhac**



Tervise Arengu Instituut
National Institute for Health Development



sotsiaal
ministeerium

This publication describes an in-depth retrospective secondary data analysis, using triangulation principles, that was conducted to analyse the course of the HIV/AIDS epidemic in Estonia, describe the interventions implemented and provide guidance and input for priority setting. The researchers also highlighted main data gaps and made recommendations to improve surveillance and interventions. The exercise showed that: HIV transmission is slowly but steadily decreasing in Estonia, injecting drug use remains the most important transmission route and the HIV epidemic continues to affect vulnerable populations (particularly injecting drug users (IDUs) and their sexual partners) more.

Other findings include the following. Many HIV/AIDS interventions were significantly scaled up in Estonia over the last decade, and the decline in newly diagnosed HIV cases among young people indicates that prevention efforts are affecting this group's behaviour and are having a positive impact on the epidemic. Further scale-up and quality improvement of harm-reduction services are important to prevent infection in IDUs. The authors recommend scaling up HIV testing in all settings, improving post-test counselling, developing more active partner counselling and contact-tracing services, more active referral systems to infectious disease services, support for adherence to treatment and intervention monitoring. As behaviour-change interventions for people living with HIV are very limited in Estonia, counselling on sexual behaviour and drug use and access to services for sexual health and sexually transmitted infections should be improved.

Keywords

HIV INFECTIONS – epidemiology
ACQUIRED IMMUNODEFICIENCY SYNDROME – epidemiology
ACQUIRED IMMUNODEFICIENCY SYNDROME – statistics
ESTONIA

ISBN 978 92 890 0257 8

Address requests about publications of the WHO Regional Office for Europe to:

Publications
WHO Regional Office for Europe
Scherfigsvej 8
DK-2100 Copenhagen Ø, Denmark

Alternatively, complete an online request form for documentation, health information, or for permission to quote or translate, on the Regional Office web site (<http://www.euro.who.int/pubrequest>).

© World Health Organization 2011

All rights reserved. The Regional Office for Europe of the World Health Organization welcomes requests for permission to reproduce or translate its publications, in part or in full.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either express or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use. The views expressed by authors, editors, or expert groups do not necessarily represent the decisions or the stated policy of the World Health Organization.

Contents

	<i>Page</i>
Tables and figures	iv
Acknowledgements.....	vi
Acronyms.....	vii
Executive summary	viii
1. Introduction	1
2. Background.....	3
3. General HIV epidemiological situation	9
4. HIV testing.....	17
5. Women and HIV.....	22
6. Youth and the general population.....	28
7. STIs.....	38
8. IDUs	41
9. Prisoners.....	52
10. HIV and TB	60
11. PLHIV	68
12. MSM	75
13. Sex workers	82
14. General discussion and conclusions.....	93
Annex. Data sources.....	98
References.....	103

Tables and figures

Tables

Table 1. Newly diagnosed HIV cases and cases diagnosed in ACCs	6
Table 2. Pregnant women tested for HIV, births and abortions, 1988–2009	23
Table 3. Reproductive factors, HIV and drug use among different age groups of women, 2007.26	
Table 4. Distribution of the population aged 15–49 by age group and gender, 2010	28
Table 5. Size and prevalence of the IDU population, 2004	41
Table 7. SEP client sociodemographic and drug use data, 2003–2009.....	43
Table 8. IDUs' sexual and injecting risk behaviour, RDS studies 2005, 2007, 2009, 2010	45
Table 9. Prevalence of HIV and other infections among IDUs (%), RDS studies, 2005, 2007, 2009, 2010	46
Table 11. Contact with SEP services, RDS studies, 2005, 2007, 2009, 2010.....	48
Table 12. SEP services in Estonia, 2003–2010.....	49
Table 13. Patients on OST at the end of year, 2004–2010.....	49
Table 14. HIV tests and new cases among prisoners, 2000–2009	55
Table 15. TB cases among prisoners, 2000–2010.....	61
Table 16. Treatment outcomes of HIV-infected TB patients, 2004–2010.....	63
Table 17. Babies born to HIV-infected women and vertical transmission rates, 1987–2010.....	72
Table 18. HIV prevalence among MSM	79
Table 19. Injecting drug use prevalence among samples of female sex workers	84
Table 20. Diagnoses and visits of new and repeat clients, Elulootus Health Centre, 2005–2009	89

Figures

Fig. 1. Newly diagnosed HIV cases by gender, 1988–2010	10
Fig. 2. Newly diagnosed HIV cases among 15–49-year-olds by gender per 100 000, 2000–2010	10
Fig. 3. Newly diagnosed HIV cases per 100 000 by region, 2000–2010.....	11
Fig. 4. Registered new HIV cases by age groups among men, 2000–2010	12
Fig. 5. Registered new HIV cases by age groups among women, 2000–2010	12
Fig. 6. New HIV cases by age group, excluding Tallinn and Ida-Virumaa county, 2000–2010 ..	13
Fig. 7. Newly diagnosed HIV cases in ACCs by mode of transmission, 2001–2010.....	14
Fig. 8. HIV tests performed and number of people tested, 1987–2010	18
Fig. 9. HIV-infected pregnant women by age group, 2000–2007.....	24
Fig. 10. HIV prevalence among pregnant women by age group, 2000–2007 (%).....	24
Fig. 11. HIV prevalence among pregnant women in selected regions, 2000–2007 (%).....	25
Fig. 12. 16–64-year-olds correctly answering questions on HIV transmission, by age group (%), 2008.....	29
Fig. 13. Percentage of those aged 14–18 who have had sex, by age, 2007 and 2010.....	30
Fig. 14. 15–54-year-olds with more than one sexual partner in the past 12 months (% of all those who have had intercourse), 2006.....	30
Fig. 15. 15–54-year-olds using condoms during first intercourse, by age group (% of all those who had had intercourse), 2006	31
Fig. 16. 14–29-year-olds using condoms during first intercourse by age group (% of all those who had had intercourse), various years	31

Fig. 17. 19–29-year-olds with casual partners who always used a condom in the past 12 months, by gender (%), various years.....	32
Fig. 18. Condom use with casual partners in the past 12 months by 14–18-year-olds (%), 2010	32
Fig. 19. Condom use with casual partners in the past 12 months by 19–29-year-olds (%), 2010	33
Fig. 20. Condom use with casual partners by 16–54-year-olds in the past 12 months, by age group (%), 2008.....	33
Fig. 21. Indicators related to using and carrying condoms among 19–29-year-olds with casual partners in the past 12 months, by gender (%), 2010.....	34
Fig. 22. STIs; cases per 100 000 population, 1991–2009	39
Fig. 23. First-time SEP visitors aged 25 and over in two regions (%), 2003–2009.....	44
Fig. 24. SEP visitors using a condom with all partners during the past 4 weeks (%), 2003–2009	46
Fig. 25. SEP visitors not sharing syringes/needles with others during the past 4 weeks (%), 2003–2009	48
Fig. 26. Length of prison sentences (%), 2007.....	53
Fig. 27. Frequency of condom use among those having sex in prison in the past 12 months (%), 2008.....	54
Fig. 28. IDUs who had injected drugs in prison (%), 2007.....	54
Fig. 29. Newly registered HIV cases in prisons, by age group (%), 2007–2009	56
Fig. 30. TB notification rate, incidence per 100 000 population and HIV-infected TB cases by year, 1989–2010.....	61
Fig. 31. Actual and modelled new TB diagnoses per year, 1985–2015.....	64
Fig. 32. PLHIV on ART, 1995–2010.....	69
Fig. 33. Modelled need for first-line ART, compared to observed ART provision and linear projection of the most recent provision trend.....	70
Fig. 34. HIV-related deaths per year, modelled versus registered, 1993–2008	71
Fig. 35. AIDS cases and deaths (ICD-10 codes B20–B24), 1987–2010	72
Fig. 36. MSM having sex with women (%), 2010	76
Fig. 37. MSM correctly identifying true statements on HIV and STI transmission (%), 2010	76
Fig. 38. Condom use with various partners in the past six months (%), 2007.....	77
Fig. 39. MSM who did not always use a condom with various partners in the past 12 months (%), 2010.....	78
Fig. 40. Means of client contact among visitors to the Elulootus Health Centre in the past four weeks (%), 2009.....	83
Fig. 41. Mean age of visitors to the Elulootus Health Centre (%), 2004–2007	83
Fig. 42. Repeat SEP visitors receiving payment for sex in the past four weeks, by gender (%) ..	84
Fig. 43. Answers to the questions on methods of avoiding STIs (%), 2005–2006	85
Fig. 44. Frequency of condom use with a client by type of intercourse (%), 2005–2006	86
Fig. 45. Condom use in vaginal and oral sex in the past four weeks, by means of contact (%), 2005–2006.....	86
Fig. 46. Elulootus Health Centre visitors always using a condom with clients in the past four weeks (%), 2004–2007.....	87
Fig. 47. Number of sex workers' clients in the past seven days (%), 2005–2006	87
Fig. 48. Time since last HIV test (%), 2005–2006.....	88
Fig. 49. Time since last STI test (%), 2005–2006.....	89

Acknowledgements

We would like to express our sincere gratitude to the following people without whose comments, suggestions, and feedback this report would not have been possible: Aare Raudsepp (the Estonian Anti-AIDS Association), Aljona Kurbatova (National Institute for Health Development, Estonia), Anneli Uusküla (University of Tartu, Estonia), Annemarie Stengaard (WHO Regional Office for Europe), Christian Gunneberg (WHO headquarters), George Schmid (United States Centers for Disease Control), Heli Paluste (Ministry of Social Affairs, Estonia), Helvi Tarien (National Institute for Health Development, Estonia), Igor Sobolev, Iveta Tomera (National Institute for Health Development, Estonia), Jarno Habicht (WHO Country Office, Republic of Moldova), Jevgenia Epštein (Health Board, Estonia), Kai Kliiman (National Institute for Health Development, Estonia), Kai Part (Estonian Sexual Health Association), Kai Zilmer (West Tallinn Central Hospital, Estonia), Kristiina Kahur (Estonian Health Insurance Fund), Kristina Joost (Convictus Estonia), Lali Khotenashvili (WHO Regional Office for Europe), Lisa Johnston, Margit Kuus (National Institute for Health Development, Estonia), Merike Rätsep (National Institute for Health Development, Estonia), Nelli Kalikova (AIDS Education and Support Centre), Pille Teder (Ministry of Justice, Estonia), Rait Kuuse (Ministry of Justice, Estonia), Riin Kullaste (North Estonia Medical Centre), Ryuichi Komatsu (Global Fund to Fight HIV, Tuberculosis and Malaria), Taavi Lai (Ministry of Social Affairs, Estonia), Triin Habicht (Estonian Health Insurance Fund), Ulrich Laukamm-Josten (WHO Regional Office for Europe), Ulrich Marcus (Robert Koch Institute, Germany), Valentina Ustina (West Tallinn Central Hospital, Estonia).

Special thanks to Ave Talu (National Institute for Health Development, Estonia), Jesus Maria Garcia Calleja (WHO headquarters), Merilin Mäesalu (Ministry of Social Affairs, Estonia) and Katri Abel-Ollo, Liilia Lõhmus, Merily Murd, and Piret Viiklepp (National Institute for Health Development, Estonia).

We would also like to thank Kristiina Kahur from the Estonian Health Insurance Fund who helped us with data regarding health services for people with HIV and Gleb Denissov from the National Institute for Health Development for help with data on mortality.

The report was prepared with a financial contribution received through the biennial collaborative agreement 2010/2011 between the WHO Regional Office for Europe and the Ministry of Social Affairs of the Republic of Estonia to support overall health system development, including response to communicable diseases and chronic conditions such as HIV/AIDS. The national team benefited from capacity-building in the Andria Stampar School of Public Health in Zagreb, Croatia (WHO Collaboration Centre for Capacity Building in HIV/AIDS Surveillance) in February 2010 to initiate the national coordination and strategic data analysis. The current report is guided by the *HIV triangulation resource guide* launched by WHO, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the Global Fund to Fight AIDS, Tuberculosis and Malaria.

Kristi Rüütel, Aire Trummal, Maris Salekešin, Cyril Pervilhac

Acronyms

ACC	AIDS counselling centre
ART	antiretroviral therapy
ARV	antiretroviral
cART	combined antiretroviral therapy
CD4	cluster of differentiation 4 (T-cell coreceptor)
DOTS	directly observed treatment short course
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EHIF	Estonian Health Insurance Fund
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
EMIS	European Man-for-Man Internet Sex Survey
EU	European Union
GFATM	Global Fund to Fight HIV, Tuberculosis and Malaria
HBsAG	hepatitis B surface antigen
HBV	hepatitis B virus
HCV	hepatitis C virus
HTC	HIV testing and counselling
ICD-10	International Statistical Classification of Diseases and Related Health Problems, tenth revision
IDU	injecting drug user
IGRA	interferon gamma release assay
LTBI	latent tuberculosis infection
MDR-TB	multidrug-resistant tuberculosis
MSM	men who have sex with men
MTCT	mother-to-child transmission
NGO	nongovernmental organization
NIHD	National Institute for Health Development
NHRL	National HIV Reference Laboratory
OST	opioid substitution therapy
PCR	polymerase chain reaction
PITC	provider-initiated HIV testing and counselling
PLHIV	people living with HIV
PMTCT	prevention of mother-to-child transmission of HIV
RDS	respondent-driven sampling
SEP	syringe exchange programme
STI	sexually transmitted infection
TB	tuberculosis
TST	tuberculosis skin test
UNAIDS	Joint United Nations Programme on HIV/AIDS
XDR-TB	extensively drug-resistant tuberculosis

Executive summary

There are various sources of data on HIV in Estonia and over the years many studies have been implemented as well. The current in-depth retrospective secondary data analysis, using triangulation principles, seeks to better use the existing data for policy and decision-making. It aims to analyse the course of the epidemic, give feedback on implemented interventions and provide guidance and input for priority setting. For the purpose of this triangulation exercise all available sources of data relevant to the Estonian HIV epidemic were used. The team's goal was to answer the following key questions.

- Is HIV transmission decreasing, increasing or stable?
- What are the main transmission routes and have there been any changes over the years?
- Are vulnerable populations – e.g. injecting drug users (IDUs) and their sexual partners – more affected by HIV or is it also spreading more in the general population, too?

In addition to HIV trends, the report also covers aspects of risk behaviours, knowledge and interventions in the general population and vulnerable populations (IDUs, men who have sex with men (MSM), sex workers), and health and psychosocial support services for people living with HIV (PLHIV), including in prisons. Based on the analysis we also highlight main data gaps and provide recommendations to improve surveillance and interventions.

The key results of the triangulation exercise are as follows.

- Current evidence based on available data of newly diagnosed HIV cases and prevalence rates among vulnerable populations (especially IDUs) shows that HIV transmission is slowly but steadily decreasing on the national level.
- The number of cases related to injecting-drug behaviour (sharing injecting equipment and sex) still exceeds the number of cases of heterosexual transmission among the general non-injecting population. There is no proof of any major HIV epidemic among other risk groups, for example MSM. In the last five years, the HIV prevalence rate among IDUs has been stable but very high. Incidence among new IDUs who have been injecting for less than three years has decreased.
- The HIV epidemic continues to affect vulnerable populations (IDUs and their sexual partners) more than others. Sexual risk behaviours among the general population have somewhat decreased over the last ten years, as have sexually transmitted infections' (STI) rates. If these trends continue and the IDU epidemic is further controlled, there is reason for optimism that it will not develop into a generalized epidemic.

Additional findings include the following.

- There has been a major scale-up of many HIV/AIDS interventions in the last decade, for example, syringe exchange programmes (SEPs), HIV testing and counselling (HTC) and antiretroviral (ARV) treatment. The decline in newly diagnosed HIV cases among both men and women in the 15–19 and 20–24 age groups (as a proxy for new infections or incidence) is evidence that prevention efforts are having an effect on young people's behaviour (especially IDU-related) and are having a positive impact on the epidemic.
- The most efficient way to prevent HIV transmission from IDUs to their sexual partners and the general population is to prevent HIV infections among IDUs themselves. Thus, further

scale-up and quality improvement of harm reduction services (according to the needs of different geographical regions and subgroups of IDUs) are important.

- Considering the high rates of late diagnosis, treatment delay and low coverage of antiretroviral treatment (ART), we recommend scaling up HIV testing in all settings (health care and community based), improving post-test counselling, developing more active partner counselling and contact tracing services, more active referral systems to infectious disease services, support for adherence to treatment and intervention monitoring. In this process special attention should be paid to vulnerable populations.
- Behaviour change interventions (“positive prevention”) for PLHIV are very limited in Estonia, therefore counselling on sexual and drug use behaviour and access to sexual health and STI services for PLHIV should be improved.

1. Introduction

1.1 Rationale for the triangulation case study in Estonia

The political and socioeconomic situations in Estonia have changed widely in the last two decades, as have the structure and delivery of health services. The country's HIV epidemic has also changed, from a few cases per year in the 1990s (mostly heterosexual and homosexual transmission) to a concentrated epidemic among IDUs with very high HIV prevalence rates.

HIV prevention and care activities, including harm reduction, have been considerably scaled up in the last decade thanks to the massive efforts of many national and international partners from both governmental and nongovernmental sectors. The first multisectoral national strategy for HIV prevention was adopted by government order in December 2005 for 2006–2015 (previous national programmes are introduced in Chapter 2). The face of the epidemic has somewhat changed since then and constant re-evaluation of the priorities and intervention coverage is required. The current exercise was undertaken to analyse the situation and future needs in order to provide feedback on the adequacy of the interventions implemented so far and to provide input for the priority setting and goals of the next action plan (2013–2015).

With such a massive epidemic among IDUs, the potential for the spread of HIV from IDUs to the general population is clearly a concern, and we will look at local and international evidence to analyse this possibility. In our analyses we implement data triangulation principles. The report does not cover much about financing or resource needs, which could be a subject for the next exercise. We also do not go deeply into the details of services/interventions and their quality.

1.2 What is triangulation?

Triangulation can be broadly defined as the synthesis and integration of data from multiple sources through collection, examination, comparison and interpretation. One goal of triangulation is the collective use of existing data for policy implementation and programmatic improvement (1).

By first collecting and then comparing multiple datasets, triangulation helps to counteract threats to the validity of each data source. This approach has been applied in diverse fields of social science to strengthen conclusions about observations and to reduce the risk of false interpretations by drawing upon multiple independent sources of information. Triangulation includes not only the comparison of different data sources but also the use of different data-gathering techniques and methods to investigate the same phenomenon (1).

Triangulation should be distinguished from meta-analysis, which combines rigorous scientific data of similar quality and design to conduct statistical analyses. In contrast, triangulation seeks to make use of data from diverse sources and study designs, and incorporates judgments, findings and interpretations on each data source's limitations. It is intended to be used by researchers, policy-makers, ministries of health, national AIDS commissions and programme managers (1).

National health information systems tend to collect subnational programmatic and surveillance data in separate databases housed in different locations from other relevant information such as research data, national census data and other special studies. Likewise, national surveys generally result in datasets that are analysed independently, in isolation from other information. Integration of datasets in different data management or analytical formats is difficult. In most instances, imperfect overlapping of the wording of variables precludes direct comparison or combining of data and reduces the power of subsequent statistical analyses. At the other end of the spectrum, scientific research is often focused on specific questions, with a slow turnaround time for the release of results, and has limited external validity. Triangulation presents one strategy for using diverse datasets to develop timely recommendations for policy implementation and programme improvement to guide decision-making (1).

1.3 Outline and objectives of the case study

Our main objective was to describe and analyse the HIV epidemic in Estonia (including its trends and co-infections among the general population and vulnerable populations) and to answer the following questions.

- Is HIV transmission decreasing, increasing or stable?
- What are the main transmission routes, and have there been any changes over the years?
- Are vulnerable populations – e.g. IDUs and their sexual partners – more affected by HIV or is it also spreading more in the general population, too?

In addition this case study describes:

- services and interventions targeting the general population and vulnerable populations (IDU, MSM, sex workers, prisoners), providing suggestions for activities and targets;
- services and interventions for PLHIV (including treatment of co-infections), providing suggestions for improving provision and access; and
- existing data sources, analysing their strengths, weaknesses and gaps, providing general recommendations for improving surveillance.

Furthermore, the case study can be used:

- to facilitate discussions among national experts on the HIV situation and the required response in Estonia, supported by the data; and
- as input for writing the action plan of the National HIV and AIDS strategy for 2013–2015.

The report starts with the general overview of HIV prevention, care and surveillance, followed by specific thematic chapters organized with a general rationale for the chapter, a description of the existing data, a discussion and conclusions and recommendations. The report ends with the general discussion and conclusions. In the annex we describe the main data sources we used and the responsibilities of different institutions in HIV surveillance.

2. Background

2.1 General information about Estonia

Estonia is situated in the Baltic region in northern Europe. It is bordered to the north by the Gulf of Finland, to the west by the Baltic Sea, to the south by Latvia, and to the east by Lake Peipsi and the Russian Federation. Estonia gained its independence in 1918. The country became part of the USSR at the beginning of the Second World War, and its independence was restored on 20 August 1991. Estonia became a European Union Member State on 1 May 2004.

The territory of Estonia covers 45 227 km² and the population is 1.34 million. The official language is Estonian, which is a Finno-Ugric language closely related to Finnish. Estonia is divided into 15 counties. The capital and largest city is Tallinn, with a population of 400 000 (528 000 with surrounding Harju county). The next most populous counties are Ida-Virumaa (in the north-east) with 168 000 and Tartumaa (in the south-east) with 150 000.

2.2 General overview of HIV prevention and care in Estonia

Activities addressing HIV prevention and care in Estonia started more than 20 years ago. At the end of the 1980s, biological surveillance of HIV infection started and the first anonymous AIDS counselling centres were opened. On the basis of the prevention strategy developed by the Estonian association Anti AIDS, the first National Programme for AIDS Prevention was in effect in 1992–1996; the second national programme, the National Action Plan for Prevention of HIV/AIDS and other Sexually Transmitted Diseases, in 1997–2001; and the third national programme was adopted for 2002–2006. These programmes were financed from the state budget and coordinated by the Ministry of Social Affairs.

In 2003–2007 Estonia received considerable resources (US\$ 10.25 million) from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) to scale up HIV prevention activities and provide for the increasing need for ARV treatment for PLHIV. The primary recipient was the National Institute for Health Development (NIHD). GFATM resources enabled considerable expansion of interventions among young people, vulnerable populations and PLHIV, as well as development of surveillance and evaluation systems for the respective activities.

In light of the growing HIV epidemic, a clear need emerged for a new strategy that would better involve other governmental organizations, the private sector and civil society. In 2005, the national HIV and AIDS strategy for 2006–2015 was developed, together with an action plan for 2006–2009. In 2009, a new action plan was developed for 2010–2012. The strategy also created a high-level, multisectoral HIV and AIDS committee as an advisory body for its central coordination of the implementation, including representatives of all the relevant ministries (Social Affairs, Education and Research, Justice, Defence and Interior), municipalities and counties, Parliament (the Social Committee), the office of the Prime Minister, four thematic working groups, PLHIV and the youth organizations' union.

The committee meets at least twice a year to discuss and approve an action plan and annual report. The four thematic working groups (prevention, harm reduction, treatment and care, monitoring and evaluation) are open to all specialists and organizations operating in the field of HIV, both governmental and nongovernmental. Most of the working groups review the strategy action plans (for longer periods) and present their proposals to the committee, which reviews the

proposals of the working groups and approves the national action plan and the government adopts the document. The Ministry of Social Affairs serves as the secretariat to the committee. Each implementing ministry develops its own annual action plan with a precise budget (based on the strategy action plan) which is presented to the committee for approval. Besides the strategy working groups there is a separate HIV and tuberculosis (TB) working group (with the primary aim of coordinating collaborative actions) and a special committee for the procurement of ARV drugs.

The financing of HIV prevention, treatment and care has increased considerably in the last decade. For example, the contribution from the state budget and Estonian Health Insurance Fund (EHIF) to national strategy implementation was 161 million kroon (~ €10.3 million) in 2007, 196 million kroon (~ €12.5 million) in 2008, 186 million kroon (~ €11.9 million) in 2009 and 193 million kroon (~ €12.3 million) in 2010.¹ In addition to the state budget, financing of implementation has been received from the EHIF, gambling tax and other local funds and from foreign donors (Open Estonian Foundation, GFATM, foreign embassies, Family Health International, the European Commission, the WHO Regional Office for Europe, the Nordic Council of Ministers, the Baltic States Body for Cooperation, and others). For a more detailed overview of financing of HIV and TB interventions, see Politi & Tõrvand (2).

2.3 National HIV and AIDS strategy for 2006–2015

The general goal of the National HIV and AIDS strategy for 2006–2015 is to achieve a constant decline in the newly diagnosed HIV cases in Estonia. The priorities of the strategy include harm reduction for IDUs, prevention work for young people (with a focus on at-risk youth) and HIV-related health and social support services for PLHIV.

The strategic objectives set by the National Strategy are:

1. a decline in the number of IDUs and a constant decline in the spread of HIV among them;
2. a constant decline in the incidence of HIV among young people (those 15–29 years old);
3. no increase in the spread of HIV infection among sex workers and a decline in the spread of STIs;
4. greater population knowledge of the means of HIV transmission and greater skills to assess infection risks, with a decline in negative attitudes towards PLHIV;
5. no spread of HIV infection in penal institutions;
6. a decline in vertical HIV transmission;
7. no increase in the spread of HIV infection among MSM;
8. declining STI spread in the population;
9. no HIV transmission in the course of vocational work;
10. greater availability of HIV testing and counselling;
11. ensured safety of transfused donor blood and transplanted organs and tissues;
12. improved quality of life for PLHIV;

¹ Ministry of Social Affairs statistics; for the earlier years there are no readily available data.

13. expanded evidence-based planning in the field of HIV;
14. more professional staff members and increased competence in the field of HIV prevention;
and
15. more specialist services on the basis of an agreed service description.

2.4 General description of HIV surveillance and monitoring

Surveillance is used to identify changes in the nature or extent of health problems and the effectiveness of public health interventions. Health problems monitored by surveillance include both chronic and acute diseases, injuries, disabilities, environmental and occupational health hazards, reproductive health and health risk behaviours (3). Surveillance methods can be divided into four general categories: passive, active, sentinel and special systems. In general, passive and active systems are based on conditions reportable to the health jurisdiction. The term “passive” refers to the idea that health authorities take no action while waiting for report forms to be submitted (4). Sentinel systems and special systems are usually designed to obtain information not generally available to health departments.

In Estonia, HIV case data are collected through a passive surveillance system, the most common form of surveillance, relying on standardized reporting forms from state or local health departments. The completed forms are returned to the health department when cases of disease are detected.

Historically, passive surveillance of newly diagnosed HIV was laboratory-based and carried out by the National HIV Reference Laboratory (NHRL) at the West Tallinn Central Hospital, and was mostly paper-based. The NHRL reported cumulative numbers of newly diagnosed cases (disaggregated by gender, age and region of diagnosis on the county level) to the Health Board (until 2010 the Health Protection Inspectorate). Since the implementation of the new communicable diseases information system in October 2009, doctors who diagnose infections and laboratories are required to report directly to the Health Board, either through a web-based system, or on paper. HIV is the only infection for which web-based reporting is mandatory.

Until the end of 2008 anonymously diagnosed HIV cases were also included in national reporting, which may have caused some double reporting. From 2000–2008 approximately 30% of new cases were diagnosed anonymously in AIDS counselling centres (ACCs) (5). Since January 2009 no preliminarily positive cases without personal data are confirmed or included in the total number of HIV cases (see also Chapter 3). The amount of double reporting before 2009 is difficult to estimate. Table 1 presents data from ACCs on how many people diagnosed with HIV infection reported having been previously tested positive. There are no data on how many people diagnosed with HIV infection in the general health care system had been tested positive before (for example in ACCs).

Other key institutions responsible for data collection include the NHRL (HIV testing), the NIHD (HIV surveillance among vulnerable populations, monitoring its National Strategy activities, national TB and mortality registries, etc.), the EHIF and Ministry of Social Affairs (health services for PLHIV), and the Ministry of Justice (HIV prevention and care in prisons). For a more detailed description of databases and sources see the annex.

Table 1. Newly diagnosed HIV cases and cases diagnosed in ACCs

Year	Total newly diagnosed HIV cases	HIV cases diagnosed in ACCs	People reporting prior positive testing (among those testing positive in ACCs)	
			No.	% (out of ACC cases)
2004	743	238	39	16.4
2005	621	182	12	6.6
2006	668	246	97	39.4
2007	633	243	35	14.4
2008	545	189	22	11.6
2009	411	217	ND	ND
2010	372	153	ND	ND

ND = no data.

Source: Programmatic data from AIDS counselling centres (5); Health Board (6).

Since 2003, the NHID has developed a data collection system for regular studies measuring risk behaviours and HIV prevalence in different target groups and monitoring the efficiency of implemented activities. The studies that are part of the surveillance system include:

- knowledge, attitudes and behaviour of 10–18- and 19–29-year-old youth all over Estonia (random sample in layers), conducted in 2003, 2005, 2007 and 2010 (7–10);
- prevalence of infections and risk behaviours among IDUs in Tallinn and north-east Estonia (respondent-driven sampling), conducted in 2005 and 2007 (Tallinn, Kohtla-Järve), 2009 (Tallinn) and 2010 (Narva), mostly in close cooperation with the University of Tartu (11–14);
- knowledge, drug use and sexual behaviour of convicts (random sample of sections in all prisons), conducted in 2004, 2006, 2008 (15–17) and 2011;
- knowledge, attitudes and behaviour of MSM (convenience sample of men visiting gay-oriented web sites), conducted in 2004, 2005, 2007 and 2010 (18–21), with a respondent-driven sample (RDS) study for measuring HIV prevalence among MSM in 2007 (22);
- prevalence of infections and risk behaviours among female sex workers in Tallinn (respondent-driven sampling, snowball sample), conducted in 2005–2006 (23) and 2011;
- quality of life and discrimination of PLHIV who visit infectious diseases specialists (convenience sample of PLHIV in three hospitals), conducted in 2005 and 2008 (24,25); and
- knowledge of the general population ages 16–64 (random sample); since 2004, a few HIV-related questions are part of a biannual general health behaviour study (26–29).

Additionally, the following data have been collected (using short questionnaires) from the clients of different services financed by NIHD:

- demographics, knowledge and behaviour of new and multiple visitors of syringe exchange sites in Tallinn and north-east Estonia (all new clients, quota sample of multiple clients once a year), continuously conducted since 2003 (30–36); and

- demographics and behaviour of people visiting different testing centres: ACCs since 2004 (5,37), sex worker STI testing 2004–2007, and from 2009 (38–42), STI testing for IDUs and their sex partners since 2006 (43).

2.5 Estonian health care system and financing

2.5.1 Health service providers

Primary care services are provided to everyone insured by EHIF through family physicians, including those not residing in Estonia. There are 18 hospitals in Estonia, offering both inpatient and outpatient services (specialist services). There are also many smaller providers of mostly outpatient services in some fields. A referral from the family physician is required to visit a medical specialist. No referral is needed to visit a psychiatrist, gynaecologist, dermatovenerologist, ophthalmologist, dentist, pulmonologist (for TB treatment), infectious disease specialist (for HIV/AIDS treatment) or in case of trauma. Health care is largely publicly financed.

2.5.2 Health service financing

2.5.2.1 EHIF

The core purchaser of health care services is the EHIF, which purchases most care for insured people (94% of total population), except ambulance service. The EHIF operates under the Ministry of Social Affairs, but as an independent legal entity under public law. Its main duties are: entry into contracts with health care providers for payment for the provision of care, payment for health services subject to reimbursement, payment for pharmaceuticals included in the discount distribution list and payment of benefits for temporary incapacity for work and other cash benefits. The EHIF negotiates yearly contracts with health service providers. The contracts are legally binding documents and specify the minimum volume of health services by specialties, the total amount of obligations, maximum waiting times, etc. Contract performance is monitored by the EHIF regional departments (2).

The EHIF pools funds transferred from the Taxation Agency (earmarked payroll social tax). Estonian health insurance is a social insurance, relying on the principle of solidarity: the EHIF covers the cost of health services required in case of illness regardless of the amount of social tax paid by the person concerned. The vast majority of the population, including children and the elderly, are covered by the compulsory health insurance scheme. As of 31 December 2010, the EHIF had 1 256 240 insured people registered. Uninsured people, who represent about 6% of the population, consist mainly of low-income men who either are long-term unemployed or work in the informal sector. The government is responsible for funding emergency care for them. Emergency care for those not covered by health insurance is paid for out of earmarked funds in the state budget, on the basis of a contract between the Minister of Social Affairs and the EHIF.

The state budget also covers ambulance services, and strategic administration is done by the Health Board, a specialized agency of the Ministry of Social Affairs dealing with health care providers.

Insured people include the following (44):

- those working in Estonia on employment contracts
- those registered with the Estonian Unemployment Insurance Fund

- conscripts
- those receiving social allowance
- pregnant women
- those under 19 years old
- those receiving an Estonian state pension
- students who are permanent residents
- some other small specific groups.

Certain disease prevention and health promotion activities (e.g. breast and cervical cancer screening programmes) are also financed from EHIF funds. Disease prevention is carried out by health care providers under their contracts, which define the target population, minimum levels of service and the total budget for each programme. For health promotion, the EHIF has defined priority areas, taking into account the cost and the burden of diseases (currently including cardiovascular diseases, cancer and mental health).

Private health insurance in Estonia is very limited; there is only one commercial insurer, which entered the market in 2002 (2).

2.5.2.2 Ministry of Social Affairs

The Ministry pools funds from the state budget to finance emergency services for the uninsured (allocated through the EHIF), ambulance services (allocated through the Health Board) and public health programmes managed by the NIHD, though some functions (purchasing medicines, vaccines) are exercised by Ministry departments (2).

2.5.2.3 Ministry of Justice

The Ministry of Justice receives funds from the state budget to provide health care in prisons.

2.5.2.4 Local municipalities

Local municipalities have no clear responsibility to cover health care expenditures and therefore financing practices vary widely. Municipalities mainly spend on care for the uninsured (in addition to nationally covered emergency care), transport to health care facilities, public health programmes' and offsetting out-of-pocket payments. Some municipalities cover some costs of family physician services, but in-kind contributions for family physicians are quite common (for example, working space). In the capital area special allocations have been made for infectious diseases. In addition, municipalities owning hospitals contribute to their financing (2).

3. General HIV epidemiological situation

This chapter focuses on general HIV infection trends and seeks answers to the three main questions of this triangulation exercise (see p. 2).

3.1 Results

3.1.2 The early years

The first HIV case in Estonia was registered in 1988. At the end of 1999, a total of 96 HIV cases had been reported (6); 46 (48%) of them were homosexual or bisexual men and 31 (32%) were presumed to have been infected heterosexually. Only four individuals were likely to have become infected through injecting drug use. Forty-three individuals (45%) were presumed to have been infected outside of Estonia, whereas thirty-eight (40%) were likely to have become infected in Estonia. According to national estimates the real number of HIV-infected individuals at the end of 1990s was estimated as no higher than 1.5–3 times the number of known cases (45). However, the fact that some HIV infections remained undiagnosed was illustrated by the data that approximately 10% of newly diagnosed HIV cases had advanced immunodeficiency at presentation (45). The available data (1987–1999) on the transmission categories of HIV testing identified groups at risk, including STI patients, sailors and the sexual contacts of PLHIV (46). The year 2000 brought dramatic changes: 357 new HIV cases were reported during its last four months (92% of them in Ida-Virumaa county (the north-east) and 6% in Tallinn) and an additional 1474 cases during 2001 (60% in the north-east and 36% in Tallinn) (6). The cumulative data, including the information recorded on HIV testing and clinical records, suggest that injecting drug use was a factor in nearly 90% of the new HIV cases reported in 2000 (5,46).

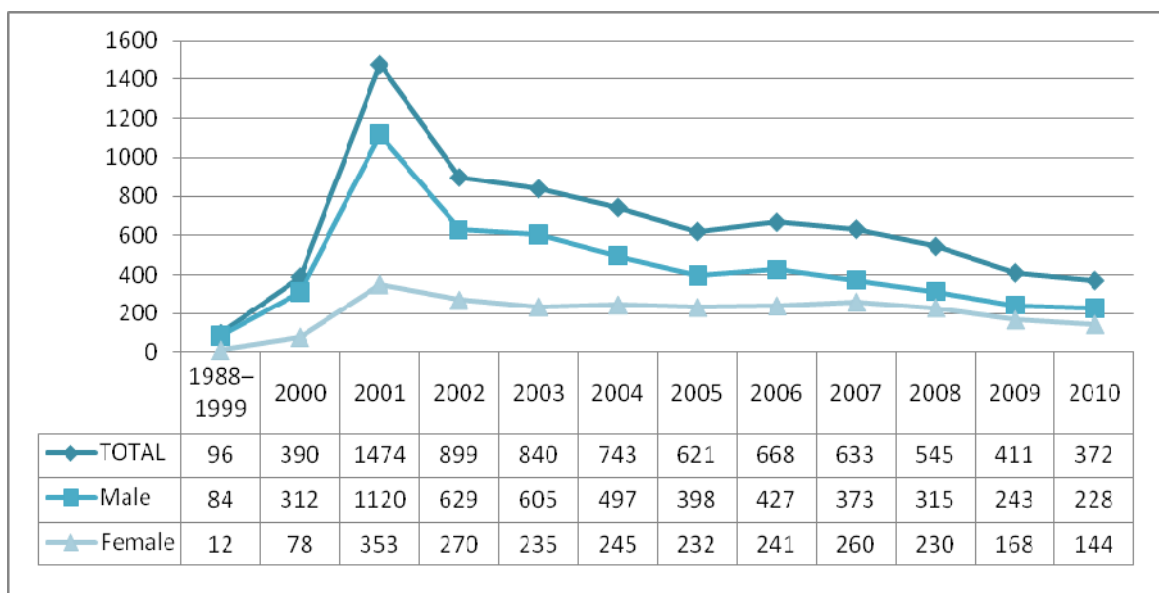
3.1.2 The concentrated epidemic

After the autumn of 2000, the number of newly diagnosed HIV cases started increasing sharply; there were 390 in 2000 and 1474 in 2001. Starting from 2002, the number of newly registered cases has decreased; in 2010, 372 new cases were registered (Fig. 1). All in all, by the end of 2010, 7692 HIV cases had been reported (5224 males and 2466 females) (6). Although anonymous reporting stopped at the end of 2008, there has been no sharper decline in the number of newly diagnosed cases (as might have been expected if there had been major double reporting over the years). This, together with the fact that late diagnosis is common (see Chapter 11), supports the assumption that double reporting accounts for less than 30% of the total number of cases (see Chapter 2). On the other hand, there may have been a real increase in the number of newly diagnosed cases in recent years. Unfortunately, no systematic data are collected on CD4 (cluster of differentiation 4) counts of the newly diagnosed people (or any other measures to estimate the percentage of late diagnosis), so it is not possible to differentiate between old and very recent cases that are newly reported.

The rates of newly diagnosed HIV cases per 100 000 population among 15–49-year-olds have decreased steadily, especially among males (Fig. 2). A rough HIV prevalence estimation among the 15–49 population in 2010 was 1.6%, based on cumulative HIV cases from 2000–2010 and population size, not taking into account the number of deaths of PLHIV or the number of those who moved out of this age group (6,47). The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that the number of PLHIV in Estonia could be 9900 (8000–12 000) and the respective adult (15–49 years old) prevalence rate could be 1.2% (1.0–1.5%) (48). Another

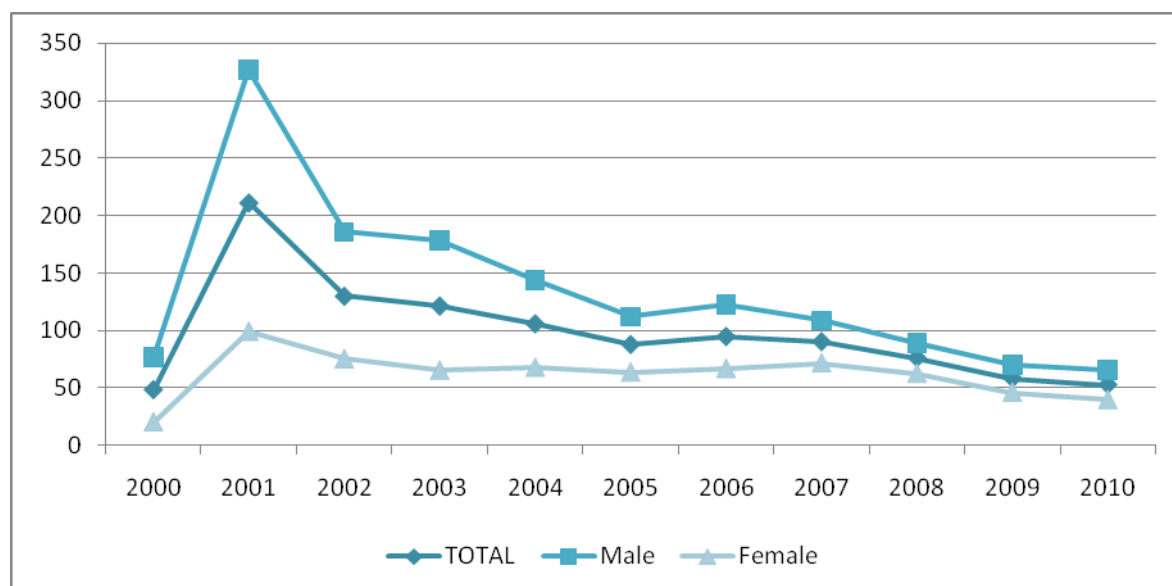
modelling exercise estimated that the total number of PLHIV in Estonia was approximately 11 000 in 2008, based on studies conducted among IDUs and other risk groups (49).

Fig. 1. Newly diagnosed HIV cases by gender, 1988–2010



Source: Health Board (6).

Fig. 2. Newly diagnosed HIV cases among 15–49-year-olds by gender per 100 000, 2000–2010



Source: Health Board (6); Statistics Estonia (47).

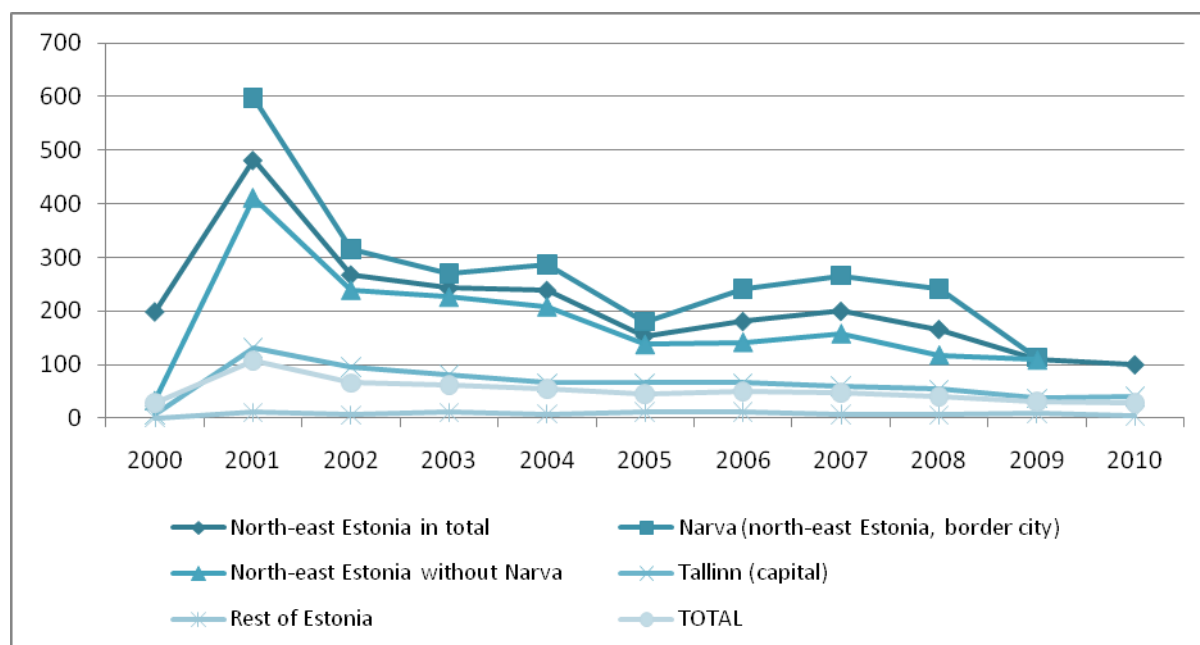
3.1.3 Regional data

In 2000, the majority of newly diagnosed HIV cases (92%) were registered in the north-east. The percentage of HIV cases diagnosed in Harju county (Tallinn and surrounding area) increased considerably in 2001–2002. Since then the epidemic has been located in these two regions. In

2010, 45% of all new cases (n=168) were diagnosed in the north-east and 44% (n=165) in Tallinn (100 and 41 cases per 100 000 population respectively). The rate of newly diagnosed cases in other regions of the country has remained lower than 12 per 100 000 throughout the years (5 in 2010) (6).

Fig. 3 illustrates a consistent and large decrease in the rates of newly diagnosed HIV cases between 2001 and 2005 (of 68% in the north-east, 70% in Narva, 50% in Tallinn), and an overall decrease between 2001 and 2010 (79% in the north-east, 69% in Tallinn) (6).

Fig. 3. Newly diagnosed HIV cases per 100 000 by region, 2000–2010



Source: Health Board (6); Statistics Estonia (47).

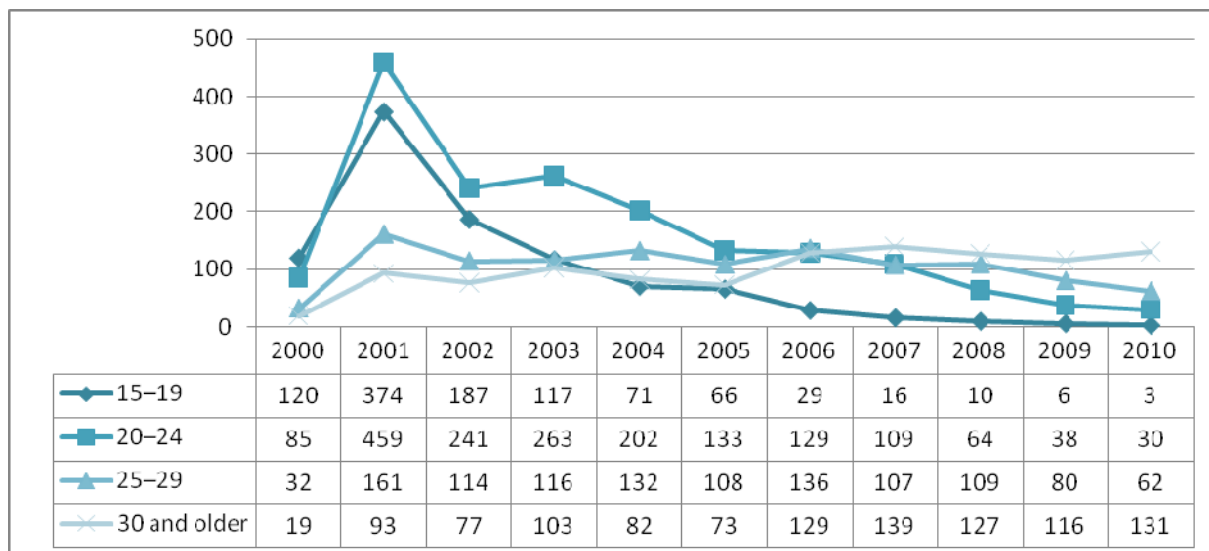
3.1.4 Gender and age distribution of newly diagnosed HIV cases

Almost 70% of all HIV cases in 2000–2010 were diagnosed among men. The percentage of men was especially high in 2000–2001, but in recent years the percentage of women has increased in all age groups due to the decrease in the absolute number of men being infected (Fig. 4). Women accounted for 20% of all new cases registered in 2000, and 40% in 2007–2009. In absolute figures, the number of new cases among women was quite stable in 2002–2008 and decreased in 2009 and 2010 (Fig. 5). More detailed gender analysis is presented in Chapter 5.

In general, the percentage of newly diagnosed HIV patients older than 29 is increasing, but the absolute numbers were quite stable in 2006–2010. During the beginning of the epidemic spread of HIV (2000–2001), 78% of all new cases were diagnosed among the group aged 15–24 (n=1402). In 2002–2009 the number and percentage of cases in this group decreased greatly (tenfold among men and threefold among women). This age group accounted for 28% (n=275) of new HIV cases in 2008–2009, and 21% (n=78) in 2010. The decrease was seen in both men and women aged 15–19, but among men only in those aged 20–24. In 2006–2007, there was a small increase of the number of new cases among people over 30, and the trend stabilized in 2008–2009. The number of new cases among men aged 15–19 and 20–24 has decreased so much

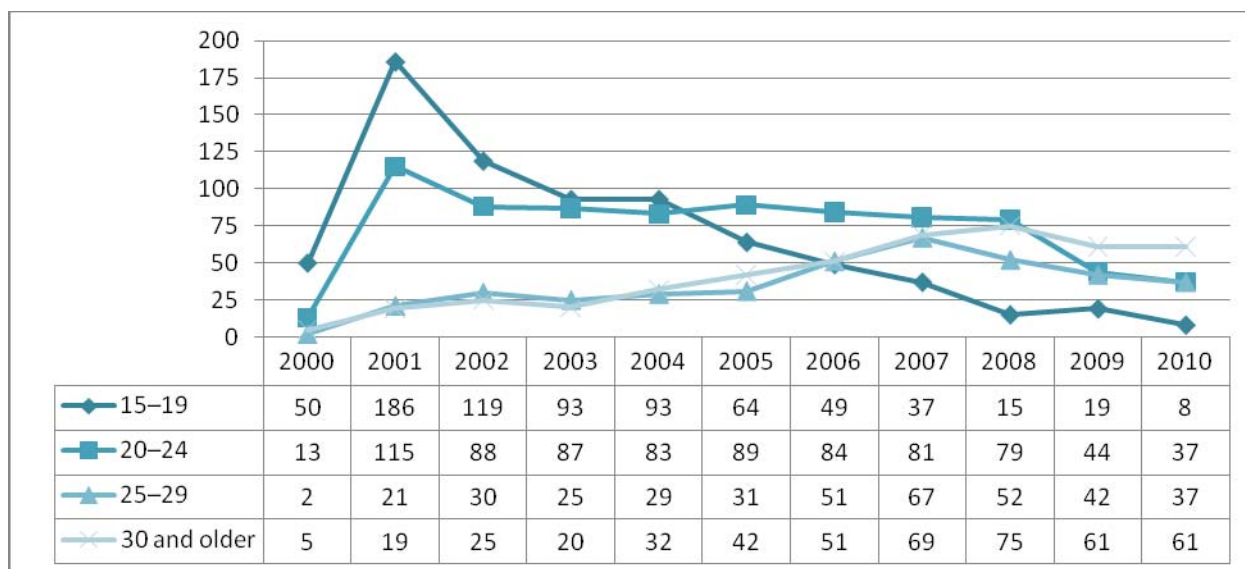
that, in last two years, there have been more new cases among men aged 25–29 and 30 and older than in the younger groups (Fig. 4 and 5).

Fig. 4. Registered new HIV cases by age groups among men, 2000–2010



Source: Health Board (6); Statistics Estonia (47).

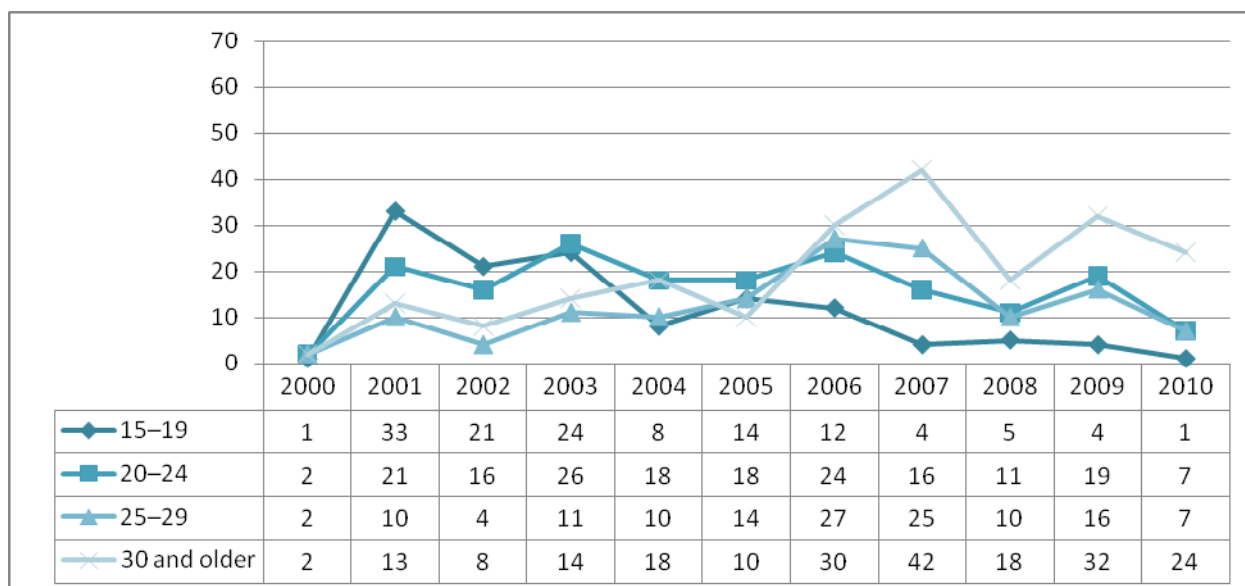
Fig. 5. Registered new HIV cases by age groups among women, 2000–2010



Source: Health Board (6); Statistics Estonia (47).

The trends according to age and gender have been similar in two regions. From 2000 to 2009 in Tallinn and Ida-Virumaa county, there were large decreases of new cases among men and the groups aged 15–19 and 20–24 and a stable situation among women, as well as a small increase among older people in 2006–2007. No clear trends are evident for the rest of the country. The number of new cases per year has been around 20 among women and 21–69 among men during the last five years.

Fig. 6. New HIV cases by age group, excluding Tallinn and Ida-Virumaa county, 2000–2010



Source: Health Board (6).

3.1.5 Transmission routes

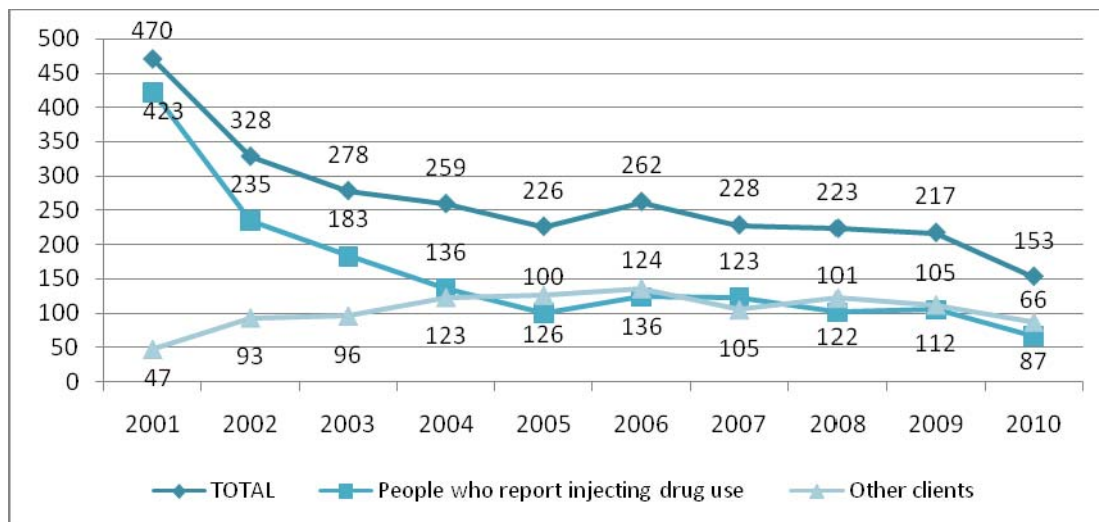
Data on transmission routes are limited and based mostly on data from ACCs and expert opinions. One third of all HIV cases have been registered in ACCs. In 1988–1999, HIV infection spread mainly through sexual transmission (both homosexual and heterosexual). Since 2000, the main transmission route has been the sharing of contaminated injecting equipment, although there have been some indications of possible increases in the share of sexual transmission. In ACCs, IDUs accounted for 90% of new HIV cases in 2001, 66% in 2003, 54% in 2007 and 48% in 2009 (5). During this period, the absolute numbers of diagnosed HIV infections among clients who did not report injecting drug use did not increase; their increased share of the total relates to the decrease in absolute numbers of IDUs diagnosed with HIV (Fig. 7). Cases among MSM diagnosed in ACCs have been few: five in 2007, one in 2008 and seven in 2009 (see Chapter 12). Vertical transmission has been consistently low, at 0.5% of all newly diagnosed cases in 1988–2010 (1.5% in 2008, 0.7% in 2009 and 0.5% in 2010) (6) (see Chapter 11).

3.1.6 ACC transmission route data, 2004–2009

This section analyses data on newly diagnosed HIV cases from ACCs (eight centres all around Estonia) for 2004–2009 in more detail (such data were not collected for 2001–2003). The distribution among age groups follows the same trends as that for all cases: the percentage of cases in women older than 24 years of age has increased, although the absolute numbers are small and the increase was not major. Similar trends can be observed among men.

The percentage of men among the newly diagnosed HIV cases reporting injecting drug use in last 12 months decreased from 78% in 2004 to 49% in 2008, most significantly in the group aged 15–24 (from 85% to 53%). The percentage of those reporting injecting drug use was stable among 25–29-year-olds, increased among 30–34-year-olds and decreased among those older than 34. Among those younger than 20 and older than 29, the absolute numbers of cases per year are rather small (50 and 30 cases per year, respectively in 2008–2009).

Fig. 7. Newly diagnosed HIV cases in ACCs by mode of transmission, 2001–2010



Source: Programmatic data from AIDS counselling centres (5).

The percentage of women among the newly diagnosed HIV cases reporting injecting drug use in last 12 months decreased from 54% in 2004 to 31% in 2008, most significantly in the group aged 15–24. Among women 30 years and older, the percentage reporting IDU in last 12 months increased somewhat, but the absolute numbers were very small (4 cases in 2007, 5 cases in 2008) (5).

3.1.7 Blood donors

The prevention of transmission of viral infections through blood components is achieved in two ways:

- the recruitment and selection of blood donors aim to exclude individuals with risk factors for infectious diseases transmitted by transfusion; and
- donations undergo systematic screening tests to remove infected donations and donors.

Screening of blood donors for HIV started in 1987 and is required by law (the Communicable Disease Prevention and Control Act). All three blood donation centres use the polymerase chain reaction (PCR) method to screen blood for HIV. Initially, pooled PCR is used for 10 specimens and, if positive, all ten specimens are tested separately with PCR. In the largest centre, around 20 000 people donate approximately 30 000 units of blood annually (the Blood Donation Centre of North Estonia Medical Centre Foundation, unpublished data). Blood donation in Estonia is voluntary and unpaid. Those who donate blood get a cup of coffee or juice and biscuits during the extraction and a small package of food afterwards.

In 1987–1999, six new cases of HIV were diagnosed among donors (less than 0.01% of donors). Altogether 113 newly diagnosed cases of HIV were detected among blood donors in 1987–2010 (1.4% of newly diagnosed cases); 68% were male and 72% younger than 30; 59% were from the north-east, 31% from Tallinn and Harju county and 10% from other regions. The largest number of new HIV cases among blood donors was found in 2002: 26 people (0.07% of all blood donors, 85% male and 69% from the north-east). Since 2004, around 10 new HIV cases have been diagnosed annually: around 0.02% of all donors, 53% from the north-east (Blood Donation Centre of North Estonia Medical Centre Foundation, unpublished data). Thus, among a similar

population in the same sites giving blood in 1997–2010, HIV prevalence in this population has remained low and stable.

3.2 Discussion

In the 1990s the number of cases of HIV infection initially remained very low, in spite of the rapidly and substantially increasing STI rates (syphilis in particular) (see Chapter 7). The HIV epidemic began to develop only after it spread to IDUs. Following a peak in 2001, the number of newly diagnosed cases has been steadily decreasing in both epidemic regions, Tallinn and the north-east, which still bear the highest burden of new infections. No major increase in the number of new cases has been detected in the rest of the country. The percentage and absolute numbers of newly diagnosed HIV cases decreased over time among both men and women in the groups aged 15–19 and 20–24. This can be taken as a proxy for new infections or incidence, and lead to the conclusion that prevention efforts targeting drug use and sexual behaviour are affecting young people and, ultimately, the epidemic.

The majority of IDUs in Estonia are men (see Chapter 8) and two thirds of all new HIV cases have been diagnosed among men. The natural course of an HIV epidemic, in which young men become infected by unsafe drug injection would, in the worst case, lead to an equal number of women, as sexual partners of IDUs, becoming heterosexually infected. As sexual transmission of HIV is much slower, however, these infections occur over a longer period than those among IDUs. This is supported by the data from various sources (studies among IDUs, ACC data) suggesting that the absolute number of newly diagnosed cases that can be attributed to injecting drug use behaviour is decreasing, along with the percentage of IDUs among all newly diagnosed cases.

Evidence on sexual transmission independent of injecting drug behaviour is limited and based only on ACC data. For example, in ACCs, more than 80% of newly diagnosed HIV patients older than 35 do not report such behaviour. At the same time, the absolute numbers of these cases are low and have not increased over time. Unfortunately, there is no systematic data collection on co-infections (for example, with hepatitis C) and sexual partners of newly diagnosed HIV cases; thus, we cannot rule out that the people reporting heterosexual transmission have actually injected drugs or had high risk sexual partners (e.g. IDUs).

In recent years the decline in the number of new cases has been slower, especially considering that cases have not been reported anonymously since 2009. Given that late diagnosis may be high (see Chapter 11), that the epidemic peaked in 2000–2003 and that a high percentage of infected people are unaware of their status (see Chapter 4), it is possible that a considerable percentage of newly diagnosed cases were infected several years ago and are only now accessing health services. As the total number of PLHIV in Estonia was already estimated to be around 11 000 in 2008, there is little chance that the main aim of the National Strategy – fewer than 20 new cases per 100 000 population (approximately 270 cases per year) – will be achieved by 2015. In any case, the burden of HIV on health care will only increase in the next decade.

3.3 Conclusions

- Data on newly diagnosed HIV cases show that HIV transmission is decreasing at the national level, although two regions (Tallinn and the north-east) show a high number of newly diagnosed cases (albeit with decreasing trends).
- Overall, the data support the conclusion that the number of cases among IDUs still exceeds that of the general population.
- The data do not support any generalization of the epidemic, but suggest that infections mostly occur among IDUs and their sexual partners.

3.3.1 Data gaps

- Only limited data are available on transmission routes and risk behaviours (including those of the sex partners) of newly diagnosed HIV cases.

4. HIV testing

Global policy affirms the need for increased access to HTC to address the global HIV pandemic (50–52). HIV testing is an integral component of prevention and care strategies worldwide. Testing is important for individuals to avail themselves of medical care if they are found to be HIV positive (53). By combining personalized counselling with knowledge of one's HIV status, HTC is believed to motivate people to change their behaviour to prevent the transmission of the virus (53–55). In recent years much discussion in scientific literature and the public health community has focused on different approaches to offering HIV testing, including promotion of provider-initiated HIV testing and counselling (PITC) in health-care institutions and HTC outside traditional health care setting.

This chapter focuses on HIV testing services and trends in order to analyse the coverage with testing and also provide direction for optimizing HTC in health care system and for vulnerable populations.

4.1 Results

4.1.1 *General background of HIV testing*

HIV testing started in Estonia in 1987. Every person living in Estonia has the right to HTC. Any doctor (both family doctors and specialists) can recommend HIV testing based on clinical indications, risk assessment or patient requests. At the moment there are no general guidelines for PITC; every professional society has its own. The groups for whom HIV testing is recommended include pregnant women, prisoners and people with TB, STIs, hepatitis, occupational exposure or a history of injecting drugs or engaging in risky sexual behaviour (including having sex partners who have had multiple sex partners). The only groups for whom HIV screening is mandatory are blood and organ donors.

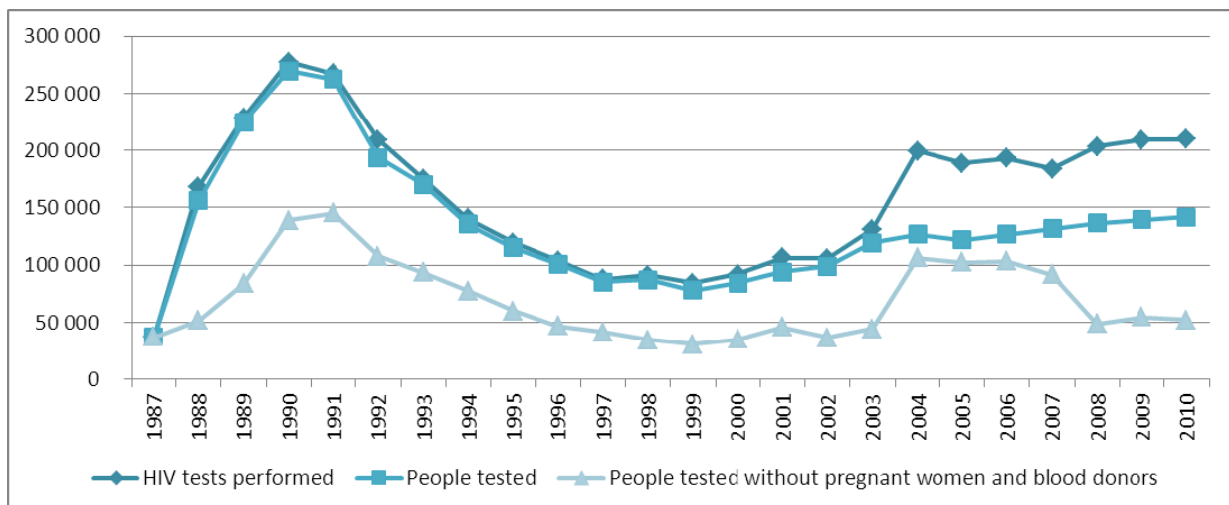
HIV testing is provided only in health care institutions (including family medicine centres and prison health services). Non-medical personnel are not allowed to perform HIV testing, but they can be involved in counselling. Blood drawing and rapid testing can be performed only by medical personnel: nurses, midwives, laboratory specialists or doctors. HIV testing is confidential and oral informed consent is sufficient. Tests are performed by primary laboratories in larger institutions all across the country (n=33). Health care providers without their own laboratories send blood samples to the nearest qualified laboratory. All preliminary positive samples are sent on to the NHRL in Tallinn, which conducts confirmatory testing. The most common methods used are the ELISA method (fourth generation in most laboratories) for screening and immunoblot for confirmation. Donated blood is screened by PCR. Babies born to HIV-infected mothers are also screened with PCR. Laboratory-based testing results (including confirmatory testing) are normally available within three business days. Rapid tests are used very seldom in general health care institutions; they are available in Tallinn ACCs.

HTC is free of charge for patients with health insurance by family physicians or specialists when there is an indication for testing. For people who are not insured there are other free testing options. Those aged 19–24 years can take an HIV test at youth counselling centres, and there is a network of ACCs in eight cities where anyone 16 and over can have free, anonymous HIV, hepatitis B and C counselling and testing. All prisoners are offered HTC upon their arrival in prison (refusal rate is less than 1%). Testing is offered again after one year in prison or if there are indications of infection. In total 4944 HIV tests were made in prisons in 2009 and 4380 in

2010. The number of tests per year in prisons has been between 4000 and 5000 for the last 5 years. HIV testing in general health care system is financed by the EHIF, at youth counselling centres by the EHIF and NIHD (National Strategy funds), in ACCs by NIHD (National Strategy funds) and in prisons by the Ministry of Justice. Partner notification can be done either by the patient or doctor and it is voluntary. There are no data on partner notification practices and trends.

Fig. 8 presents the overall number of HIV tests performed and number of people tested (with and without blood donors and pregnant women). Historically the testing rates were high in the late 1980s and early 1990s, when HIV testing was performed routinely for many population groups. Testing decreased in the second half of the 1990s (probably partly because of the reforms in health care system and structure). Data suggest that HIV testing has increased since the end of the 1990s, from 31 000 tested (22 per 1000) in 1999 to 52 000 in 2010 (39 per 1000), excluding blood donors and pregnant women. The sharp increase in the number of people tested from 2003–2008 most likely reflects an artefact of reporting (i.e. double counting when a person has been tested several times a year) (see the comments in Chapter 5). There are no data on how many of those tested were citizens of other countries not permanently living in Estonia, but the number is estimated to be rather low. No data are available on how many Estonian citizens have been tested abroad.

Fig. 8. HIV tests performed and number of people tested, 1987–2010



Source: Health Board (6); Statistics Estonia (47); Ustina (56).

4.1.2 Testing in vulnerable populations

4.1.2.1 IDUs

Besides testing in the general health care system, there are a few other testing options for IDUs: ACCs, STI services for IDUs in the north-east (Narva and Kohtla-Järve), and some substitution treatment centres that also offer testing. SEPs do not offer routine HIV testing but in Tallinn local ACCs provide HIV testing a couple of hours per week. Future plans include availability of HIV testing (including rapid testing) in all ACCs and SEPs. According to a respondent-driven sampling study in 2007 (n=350 in Tallinn and 350 in Kohtla-Järve), high numbers of IDUs had been tested for HIV at least once, 85% in Tallinn and 76% in Kohtla-Järve. In the same sample 57% in Tallinn and 37% in Kohtla-Järve had tested for HIV in last 12 months before the study.

In Tallinn 55% were HIV-positive and self-reported HIV prevalence was 35%. In Kohtla-Järve the respective percentages were 70% and 47% (12).

Among a convenience sample of SEP visitors in one site in Tallinn (n=407), 77% had been tested for HIV. No statistically significant differences by gender, ethnicity or education were found. People who had a longer injecting history (up to 2 years: 52%, more than 2 years: 79%), had ever been in prison (89% versus 67%) or had good knowledge of HIV transmission (correct knowledge: 80%, incorrect knowledge: 52%) were more likely to have had an HIV test. Imprisonment and HIV knowledge remained independent predictors of testing in multivariable analysis, too (57). Among SEP clients, 81% of repeat visitors in 2010 had been tested for HIV (36) (see also Chapter 8). Especially high rates of testing are reported by those IDUs who have been in prison. This conforms to data from the Ministry of Justice, which confirms high rates of testing among prisoners. The highest rates of testing are reported by those who are already in contact with certain health services (for example substitution treatment).

Barriers to testing have been addressed in two projects. In an HIV rapid testing pilot programme in 2008, participants in one SEP in Tallinn (n=200) cited the following reasons for not having testing earlier: no time (21%), have not had an opportunity (14%); have not thought about it (13%); afraid that name will be reported (5%); and afraid of the results (5%) (58). In a study among HIV-infected people who reported injecting drug use (n=52), participants thought that people avoided testing out of fear of social consequences (79%), fear of finding out they may have a serious disease (73%) and not being aware of HIV risks (60%) as the main reasons why people may not be tested. Only a few cited poor knowledge of testing places (10%) and nobody thought that financial constraints prevented testing. These results revealed that HIV-infected IDUs consider the knowledge of testing sites to be high among their peers. The financial issues were also not considered major barriers. Lack of testing was thought to be more related to personal barriers (low risk perception, fear of consequences) (59).

4.1.2.2 MSM

In an HIV rapid testing pilot programme in 2008, 79 MSM in Tallinn were interviewed on HIV testing practices. More than two thirds of the participants (n=52, 68%) had previously been tested for HIV. Uptake of previous HIV testing did not show statistically significant differences by ethnicity, level of education, monthly income or sexual orientation (homosexual versus bisexual). Of the 25 participants who had not been tested previously, 12 reported that they had not considered it necessary to be tested, 7 reported not having had an opportunity and 7 stated that they had had no time for it (60).

Half of the MSM who participated in the Internet study in 2007 (sample size: 361) had been tested for HIV, 27% of them during prior twelve months (20). The percentage of people who had been tested for HIV was stable during three study rounds (2004, 2005 and 2007) (18–20). In the European MSM Internet Survey 2010 (EMIS) (sample size: 612), 60% of respondents said that they had been tested for HIV, 32% in the past twelve months (21).

4.1.2.3 Sex workers

Among 227 sex workers studied in Tallinn in 2005–2006, 66% had ever tested for HIV. The lowest percentage who had ever tested was found among those over 34 years old (44%). The respective percentages among those under 25 and those aged 25–34 were 69% and 78%. Of the women surveyed, 57% had tested for HIV within the past year (23).

4.2 Discussion

There has been an increasing trend in the number of people tested (and the number of tests made) since the early 2000s. At the same time, despite the increasing and relatively high coverage, many people engaging in high-risk behaviour do not access HIV testing services. For example, approximately 20% of IDUs report no lifetime HIV testing and more than one third of HIV-infected IDUs are not aware of their status (11,12). Barriers to HIV testing in Estonia have not been studied in detail. Limited data suggest that low risk perception and fear of social consequences may contribute to the low testing rates among vulnerable populations (58,59).

The services linked to testing are considered to be key determinants of utilization. After all, whether testing leads to treatment and promotes prevention depends on the extent to which fears of testing are overcome, adverse consequences of disclosure are avoided and patients are referred to appropriate treatment and prevention services. Fear of social consequences could potentially contribute to the lack of testing, especially in the context of injecting drug use. Because of these worries, individuals often do not execute their plan to take HIV tests (61). To minimize the potential for social harm (intimate partner violence, abandonment, job loss), WHO recommends that testing and counselling involve informed consent, confidentiality, post-test counselling and appropriate referrals (51,55). The absence of programmes and policies to support clinician education and training on HIV testing and to reduce HIV-related stigma and discrimination are also barriers to expanded testing (61).

International organizations encourage greater efforts to scale up access to and uptake of HTC services tailored to different settings, populations and client needs in light of the local epidemiological situation (50,51). Increased access to HTC in non-clinical settings can reduce HIV incidence through earlier detection of new cases and faster linkage to medical care, thereby reducing the potential for continued transmission. Individuals with more immediate access to testing services are more likely to engage in testing. Commonly identified reasons for decreased acceptance of HTC include venous blood draws in a clinical setting, the waiting time for test results and the need to return to obtain the results (62,63). Considering the identified barriers and known facilitating factors for HTC acceptance, HIV rapid testing is a method that could significantly increase the availability of HTC (64).

In general, HIV testing in Estonia should be scaled up. Universal HIV testing of people accessing health services across Estonia may be neither cost-effective nor most efficient in reducing the number of people still unaware of their infection. The groups at highest risk of HIV infection are often disenfranchised and stigmatized, and as a result may not access health care services or disclose their risk behaviour when they do (50). Data from studies among IDUs suggest that this is the case in Estonia. Special targeted interventions for vulnerable populations (such as IDUs and sex workers) should be developed to reach them with HIV testing and referrals to health services. In health care settings, indicator-disease and risk-assessment based HIV testing are recommendable. Tallinn and the north-east deserve special consideration. Taking into account the higher IDU prevalence in these regions and higher estimated HIV prevalence among adults, routine HIV testing for all 18–49-year-olds accessing health care could be implemented. Before expanding HIV testing, consideration should be given to whether individuals diagnosed as HIV positive can be provided timely access to care (65).

A prerequisite for any successful HIV testing strategy is good-quality information (50). Besides surveillance studies among vulnerable populations, routine data collection on HIV testing and people tested should be strengthened.

4.3 Conclusions

- There has been an increase in the total number of people being tested in Estonia per year, but access to HIV testing for vulnerable groups should be increased by involving community-based organizations (such as SEPs) and offering routine testing in all substitution treatment centres.
- More vigorous HIV testing among 18–49-year-olds accessing health care in Tallinn and the north-east is needed. In other parts of Estonia risk-assessment-based HIV testing among that group is needed.
- Since many people testing positive do not reach the health care system afterwards, post-test counselling and referral to health care and support services should be improved.
- Partner notification and contact tracing systems need to be established to target those at greatest risk of HIV infection.
- Monitoring and evaluation of HIV testing services should be improved.

4.3.1 Data gaps

- Limited data are available on HIV testing (who is tested, in what setting, differentiation of the number of people tested, identification of the newly tested), and on testing barriers, perceptions and beliefs among the general population and vulnerable populations.
- There are no data on practices and trends in partner notification.

5. Women and HIV

This chapter focuses on trends among women, including HIV infection in pregnancy. It analyses whether the HIV epidemic in Estonia is still concentrated among high-risk groups (especially IDUs and their sexual partners) or if there is an independent heterosexual transmission among the general population. Vertical transmission is discussed in Chapter 11.

5.1 Results

5.1.1 Childbirth and abortion trends in Estonia

The mean age of women giving birth in Estonia increased from 25.5 years in 1992 to 28.5 years in 2008. The mean age of mothers at their first birth increased from 22.7 to 25.6 years over the same period. The birth rate among 15–19-year-old women decreased from 50.5 per 1000 in 1992 to 22.9 in 2008 (respectively 588 and 277 births). The mean age of abortion patients has been stable since 1996, at around 28.1–28.6 years. Around 60% of abortion patients since 1996 have been in the group aged 20–34 and 4–6% are younger than 17 years. The abortion rate among women aged 15–19 decreased from 49.2 per 1000 in 1996 to 27 in 2008 (727 cases in 1996 and 382 cases in 2008). The percentage of women giving birth without a prior visit to a gynaecologist decreased from 7% in 1992 to 2% in 2008, and those without a visit to any doctor decreased from 3% to 1% (66).

5.1.2 HIV testing among pregnant women

In Estonia free universal antenatal infection screening for HIV, hepatitis B and congenital syphilis infections is recommended for the benefit of the mother and in order to reduce vertical transmission of infections. A 2003 law also recommends offering rapid HIV testing during labour for women who have presented with unknown HIV status. Countrywide data on HIV testing among pregnant women, including those who opt for abortion have been available since 1988 (see Table 2). HIV testing among pregnant women decreased in the middle of 1990s, and started to increase again after 2000.

Based on the system developed by the NHRL, HIV tests for pregnant women can be found in two categories, for pregnancy and abortion (see also Annex 1). HIV testing coverage among pregnant women is higher than among those opting for abortion. Because HIV testing is recommended to all pregnant women (twice during pregnancy) and to all those who have health insurance from the moment they register their pregnancy, their testing costs are covered by EHIF. In contrast, HIV testing is not routinely recommended to women who opt for abortion. Sometimes women may not yet know, during the first visits to an obstetrician, whether they will opt for abortion and therefore they may be tested for HIV and not coded under abortion. For example, in 2006 more than 32 000 tested women were registered as pregnant, yet the total number of births was less than 16 000 in both 2005 and 2006. There appears to be a major discrepancy (especially since 2004) between the total number of pregnant women tested and total number of pregnancies, which cannot be explained solely by the time between pregnancy and birth (for example, registering of pregnancy in 2008, but giving birth in 2009). Most pregnant women are tested twice during pregnancy, so another reason for the discrepancy could be double counting, as laboratories are not always able to avoid double counting and to differentiate between people and tests.

Table 2. Pregnant women tested for HIV, births and abortions, 1988–2010

Year	Births*	Pregnant women tested (category 109)	Abortions**	Abortion patients tested (category 107)	Pregnancies (births and abortions)	Pregnancies tested (categories 107 and 109)	HIV-positive pregnant women (total/newly diagnosed with HIV)	HIV rate per 10 000 pregnancies
1988	ND***	25 606	ND	ND	ND	ND	ND	ND
1989	ND	63 847	ND	ND	ND	ND	ND	ND
1990	ND	59 594	ND	ND	ND	ND	ND	ND
1991	ND	61 965	ND	ND	ND	ND	ND	ND
1992	18 031	43 025	28 403	ND	ND	ND	ND	ND
1993	15 107	16 745	25 587	2 990	40 694	19 735	ND	ND
1994	14 025	6 401	22 450	1 524	36 475	7 925	ND	ND
1995	13 340	6 619	20 518	1 406	33 858	8 025	ND	ND
1996	13 109	5 859	19 464	1 789	32 573	7 648	ND	ND
1997	12 491	4 339	19 157	1 658	31 648	5 997	ND	ND
1998	12 072	5 020	18 424	1 667	30 496	6 687	ND	ND
1999	12 333	7 501	17 027	1 419	29 360	8 920	ND	ND
2000	12 983	11 809	15 340	1 427	28 323	13 236	13/6	4.6
2001	12 539	16 533	14 055	1 293	26 594	17 826	52/29	19.5
2002	12 890	19 374	13 158	1 788	26 048	21 162	74/44	28.4
2003	12 932	22 581	13 021	2 328	25 953	24 909	119/60	45.9
2004	13 868	28 298	12 641	2 451	26 509	30 749	127/58	47.9
2005	14 230	29 708	11 849	2 433	26 079	32 141	133/61	51.0
2006	14 731	32 213	11 647	2 941	26 378	35 154	126/45	47.8
2007	15 651	34 515	11 144	2 535	26 795	37 050	131/52	48.9
2008	15 837	32 383	10 719	788	26 556	33 171	ND/41	ND
2009	ND	32 570	ND	ND	ND	32 570	ND/41	ND
2010	ND	30 558	ND	ND	ND	30 558	ND/30	ND

Source: Health Board (6); Ustina (56).

* Includes stillbirths. ** Includes both legal and illegal abortions. *** No data.

5.1.3 HIV-infected pregnant women

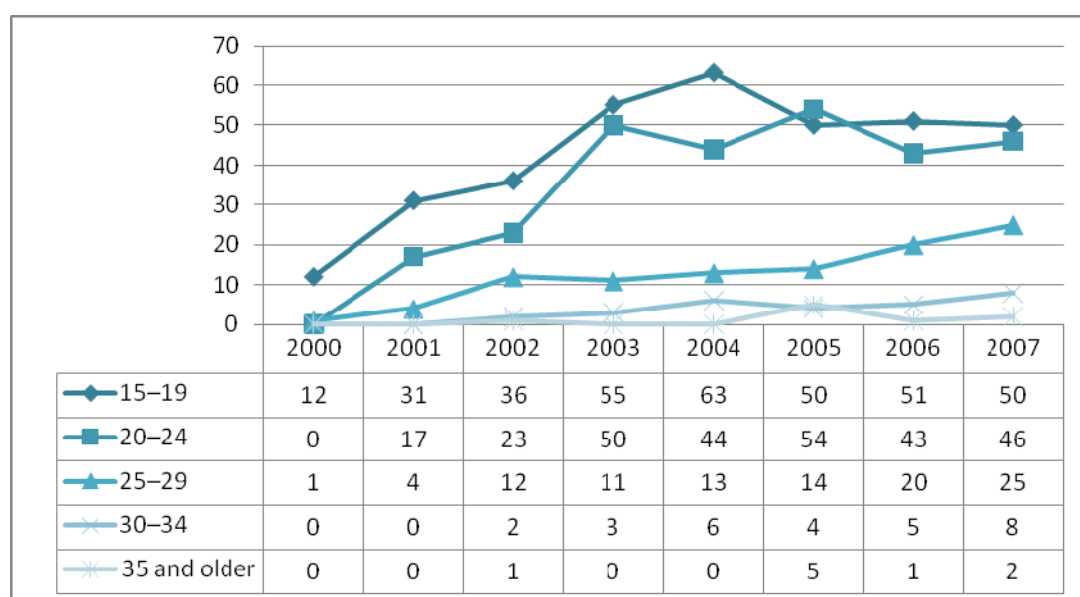
Data in Table 2 reveal that the number of newly diagnosed HIV cases found among pregnant women peaked in 2003–2005 and has decreased a little ever since, in particular among 15–24-year-olds. Data on the total number of HIV-infected pregnant women are available until the end of 2007. The numbers started to increase in 2001 and were relatively stable in 2004–2007.

Fig. 9 and 10 present data on all HIV-infected pregnant women by age group. The large majority (around 80%) have been aged 15–24, with a large percentage among those aged 15–19. HIV

prevalence rates are the highest among those under 20 years old. Data on HIV transmission routes among these women are not systematically collected.

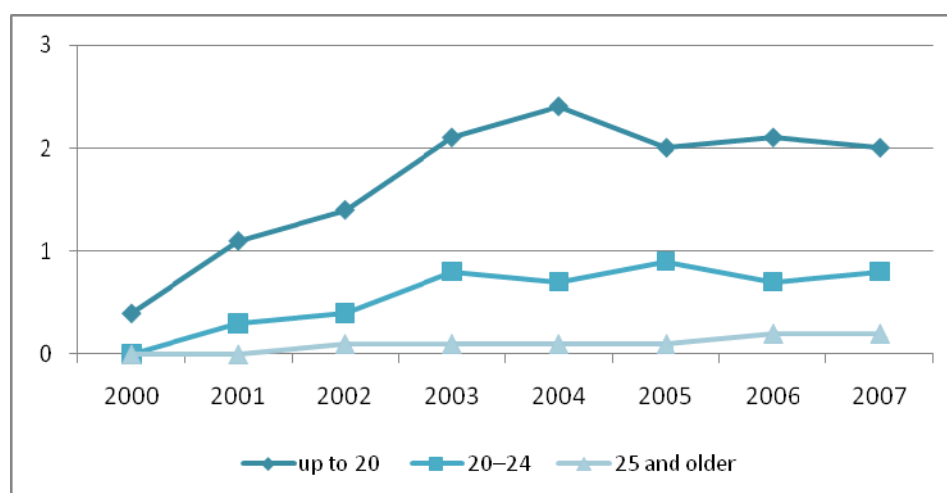
Fig. 11 presents HIV prevalence among pregnant women in Estonia on average, and in Tallinn and the north-east. These two subregions (which have the largest numbers of IDUs) have the highest number of HIV-infected pregnant women and the highest HIV prevalence rates in this group. In other regions only a few HIV-infected pregnant women have been diagnosed over the years (31 cases in 1988–2007, mostly in Lääne-Virumaa and Tartu). For the country as a whole there appears to have been an encouraging stabilizing trend since 2003–2007. The prevalence rate in the north-east has been stable but high: around 2% for 2003–2007.

Fig. 9. HIV-infected pregnant women by age group, 2000–2007



Source: Ustina (56).

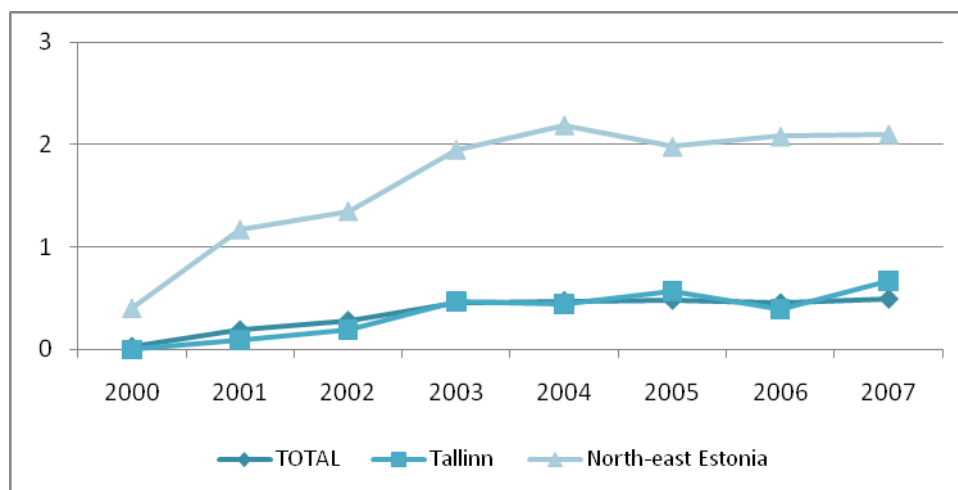
Fig. 10. HIV prevalence among pregnant women by age group, 2000–2007 (%)



Source: Statistics Estonia (47); Ustina (56).

Table 3 includes data on the age distribution of women in different groups in 2007 (we have the largest number of different data sources available for this year). HIV-infected pregnant women are largely concentrated in the younger groups (less than 24 years of age), compared to the general age distribution of women giving birth and having abortions. Newly diagnosed HIV cases among women peak at ages 20–24.

Fig. 11. HIV prevalence among pregnant women in selected regions, 2000–2007 (%)



Source: Statistics Estonia (47); Ustina (56).

According to the 2007 RDS study of IDUs at least 18 years old, female IDUs (overall and those with HIV) are mainly in the groups aged 20–24 and 25–29 (12). The same applies for the new HIV cases registered in 2007 in ACCs among women who reported injecting drug use in the previous 12 months (in ACCs the minimum testing age is 16). ACC data available for other years follow the same general trend. Thus, the age distribution of HIV-infected women, including pregnant women, matches that of female IDUs.

5.2 Discussion

The mean age of women giving birth has increased and the birth rate among 15–19-year-olds decreased substantially from 1992 to 2008. The data also reveal that the mean age of women having an abortion has been stable since 1996. The data indicate that the follow-up of pregnancies (e.g. testing and deliveries) has improved since 1992 (66). Other favourable changes include the adoption of the policy recommending HIV testing for all pregnant women.

Serious questions remain about the completeness of data on pregnant women tested for HIV, so it is not possible accurately to estimate the HIV testing rates among them (either among those who opt for abortion or those who decide to give birth). However, the testing rate seems to be much higher among women who give birth than those who abort, so it is likely that HIV infection remains undiagnosed in some pregnant women. Our data indicate increasing HIV prevalence among pregnant women, and the rate is especially high in the north-east, where 2.1% of pregnant women had HIV in 2006–2007. This number could be even higher, because the total number of pregnancies was used as a denominator, but not all pregnant women were tested for HIV (especially among those opting for abortion). After 2007, no data are available on the total number of HIV-infected pregnant women, but only on the number of women who were

diagnosed during pregnancy, which has made it impossible to follow the prevalence trends for the last three years.

Table 3. Reproductive health, HIV and drug use among women by age group, 2007

Measures	Age groups (years)									
	15–19		20–24		25–29		30–34		≥35	
	No.	%	No.	%	No.	%	No.	%	No.	%
Births (registry)	1168	7.5	3710	23.7	4901	31.3	3691	23.6	2181	14.0
Abortions (registry)	1295	15.0	2146	24.1	1906	21.4	1627	18.3	1926	22.0
Pregnant women with HIV(NHRL)	50	38.2	46	35.1	25	19.1	8	6.1	2	1.5
New HIV cases among women (6)	37	14.6	81	31.9	67	26.4	29	11.4	40	15.7
Female IDUs (12)	13	12.4	42	40.0	33	31.4	8	7.6	9	8.6
Female IDUs with HIV (12)	5	13.9	13	36.1	12	33.3	3	8.3	3	8.3
New HIV cases in women reporting:										
• injecting drug use in previous 12 months (5)	4	11.4	17	48.6	10	28.6	2	5.7	2	5.7
• no injecting drug use in previous 12 months (5)	10	14.7	23	33.8	17	25.0	7	10.3	11	16.2
• injecting drug use as possible transmission route (5)	2	6.25	16	50.0	10	31.3	2	6.25	2	6.25
New HIV cases among women who report other transmission routes (5)	12	15.6	25	32.5	20	25.9	9	11.7	11	14.3

Source: Programmatic data from ACCs (5); Health Board (6); Lõhmus & Trummal (12).

HIV prevalence has reached more than 1% among pregnant women in at least one region, which is above the cut-off value used to categorize a concentrated and generalized HIV epidemic (67). The main question now is whether HIV-infected pregnant women in Estonia represent the general heterosexual population or IDUs and their sexual partners. Unfortunately, the HIV transmission routes and injecting-drug-use status of HIV-infected pregnant women are not known (data not collected on national or regional levels). What can be said, based on the available data, is that HIV-infected pregnant women are in younger age groups than the general population of pregnant women, and their age group distribution matches that of female IDUs,

thus supporting the assumption that a considerable percentage of HIV-infected pregnant women have injected drugs or are from other marginalized groups (high-risk youth, sexual partners of IDUs).

5.3 Conclusions

- HIV prevalence among pregnant women in Estonia has remained stable and below 1% in most regions, except the north-east, where it was around 2% in 2003–2007.
- Data support the assumption that a considerable percentage of HIV-infected women and pregnant women have injected drugs or are from other marginalized groups. These trends confirm that vulnerable populations continue to be more affected by HIV.
- Even though most HIV-infected women have been IDUs, there is a clear warning sign about possible spread to the sexual partners of IDUs as a potential bridging population between them and the general population (considering the high HIV prevalence in general and high numbers of IDUs in the two subregions). This stresses the importance of activities to prevent the sexual spread of HIV, especially targeting vulnerable groups and younger people (up to 29 years old).

5.3.1 Data gaps

- There is no countrywide system to collect comprehensive data on pregnant women with HIV (including data on transmission routes, time when HIV was diagnosed, coverage of ARV treatment, etc.).
- Data collection on HIV testing among pregnant women (including those who opt for abortion) should be improved.
- After 2007 no data are available on the total number of pregnant women with HIV, but only on cases diagnosed during pregnancy.

6. Youth and the general population

Young people are at the centre of the global HIV and AIDS pandemic. More than half of all STIs and HIV cases occur among people aged 15–24. Adolescents who start having sex early are more likely to have high-risk or multiple partners, and are less likely to use condoms (68,69). Too, more than half of all HIV cases in Estonia have been diagnosed in the group aged 15–24.

The group aged 15–49 years is considered the most reproductively active. Accessing the general population creates an environment for more targeted HIV prevention measures to promote behavioural change and stigma reduction (67,70).

This chapter considers the trends in sexual risk behaviour among youth and the general population and the factors influencing them. It also discusses whether the level of risk behaviour could trigger and sustain independent sexual transmission of HIV in the general population.

6.1 Results

6.1.1 Population

According to data from Statistics Estonia, the population was 1.34 million as of January 2010: 46% men and 54% women. The group aged 15–49 comprises nearly half of the population (Table 4). Nearly one third (30%) live in Tallinn and 13% in Ida-Virumaa county; Estonians form 69% of the population, Russians 26% and other nationalities 5% (47).

Table 4. Distribution of the population aged 15–49 by age group and gender, 2010

Gender	Age group (years)							Total
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
Men	41 748	54 479	51 585	46 883	45 927	41 901	44 085	326 608
Women	39 699	52 184	50 443	46 211	46 959	44 951	49 288	329 735
Total	81 447	106 663	102 028	93 094	92 886	86 852	93 373	656 343
% of the total population	6.1	8.0	7.6	6.9	6.9	6.5	7.0	49.0

Source: Statistics Estonia (47).

6.1.2 HIV-related knowledge

According to the study *HIV-related knowledge, attitudes and behaviour among Estonian youth*² young people are knowledgeable about HIV transmission. In 2010, 54% of 14–15-year-old and 77% of 16–18-year-old students answered all four questions on HIV transmission correctly;³ the corresponding figure for the groups aged 19–24 and 25–29 was 86%. The percentage of people answering single questions correctly is around 90% or more. The level of knowledge stayed the same during three study rounds in 2005, 2007 and 2010 (10). The students proved less aware that only using condoms can protect one from contracting STIs and that interrupted sexual

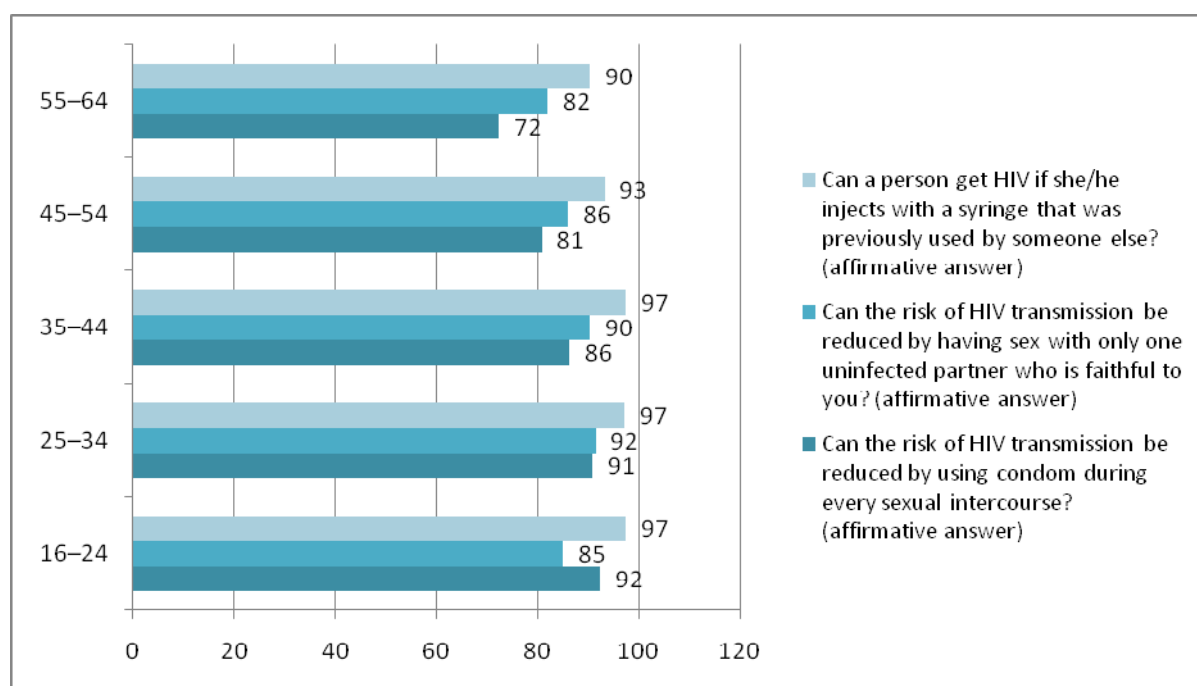
² Random sample, 2010 sample size: 14–18: 1921, 19–29: 1348.

³ Related to always using a condom, one uninfected and faithful partner, injecting with a syringe that has been used before and whether a healthy looking person can have HIV.

intercourse, intrauterine devices and oral contraceptives are not methods for avoiding infections. Only 15% of 14–15-year-olds and 47% of 16–18-year-olds answered all four statements correctly in the 2010 study. The results for the groups aged 19–24 and 25–29 were 72% and 85%, respectively (10).

According to a 2008 population study (random sample of 3004) a high level of HIV transmission knowledge can be also found among older people (28) (see Fig. 12).

Fig. 12. 16–64-year-olds correctly answering questions on HIV transmission, by age group (%), 2008



Source: Tekkel, Veideman & Rahu (28).

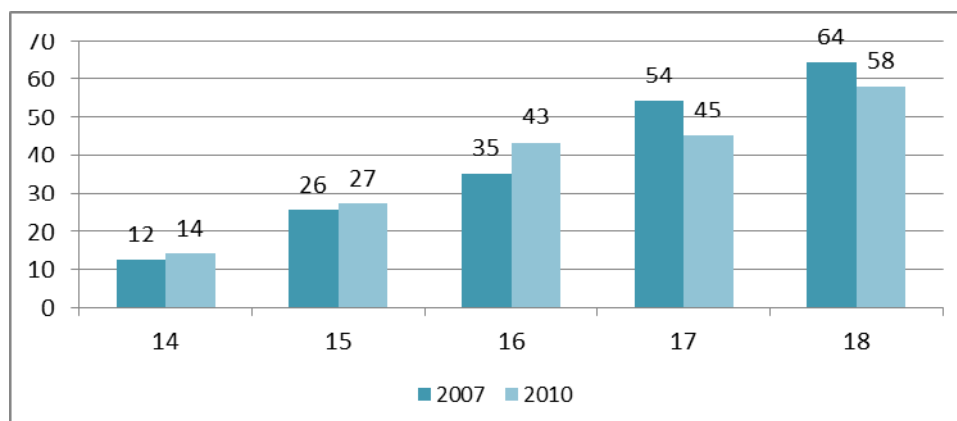
6.1.3 Sexual behaviour

6.1.3.1 Sexual debut and sex partners

The data from the 2007 and 2010 youth studies show that, among those aged 14–18, the number of young people who have had sexual intercourse increases rapidly with age (Fig. 13) (9,10). In 2010, 84% of the group aged 19–24 and 97% of those aged 25–29 had had sexual intercourse. Among the groups aged 16–18, 19–24 and 25–29, one tenth had become sexually active before age 15. These data have not changed significantly in four study rounds (10). Young men have their first sexual intercourse earlier than young women: the mean age is 14.5 for boys and 15.0 for girls aged 14–18, although more girls (66%) than boys (48%) have had sex by the age of 18 (10).

Younger generations start their sexual lives earlier than older generations, especially women. Study data from 2006 (random sample, sample size: 3506 in the group aged 15–54) show that 22% of men and 6% of women aged 50–54 had their first sexual intercourse before 18. Among 20–24-year-olds, the figures were 33% and 34%, respectively (71).

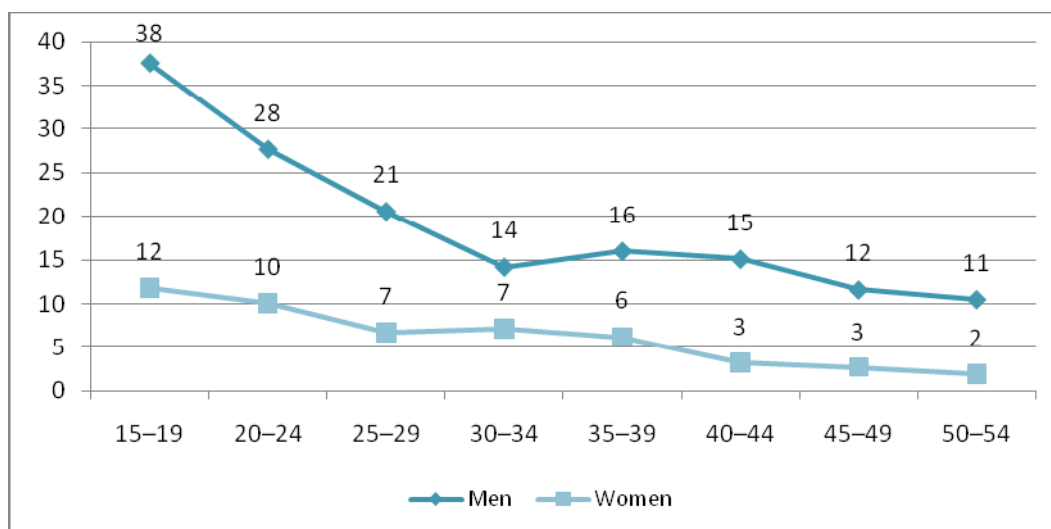
Fig. 13. Percentage of those aged 14–18 who have had sex, by age, 2007 and 2010



Source: Lõhmus & Trummal (9); Trummal, Glušková & Murd (10).

According to the 2010 study, 40% of sexually active 14–18-year-old students had had more than one sexual partner in the past 12 months. The percentages were 31% in the group aged 19–24 and 20% in those aged 25–29. More than one third (36%) of 14–18-year-old students had casual partners during the last year, as had 28% of 19–24-year-olds and 16% of 25–29-year-olds. Significant numbers of sexually active youth had a regular partner as well as casual partners: 16% of those aged 14–18, 15% of those aged 19–24 and 9% of those aged 25–29 (10). Fig. 14 shows the percentage of people who had had more than one sexual partner during last year; this percentage was higher among younger people and men (71).

Fig. 14. 15–54-year-olds with more than one sexual partner in the past 12 months (% of all those who have had intercourse), 2006



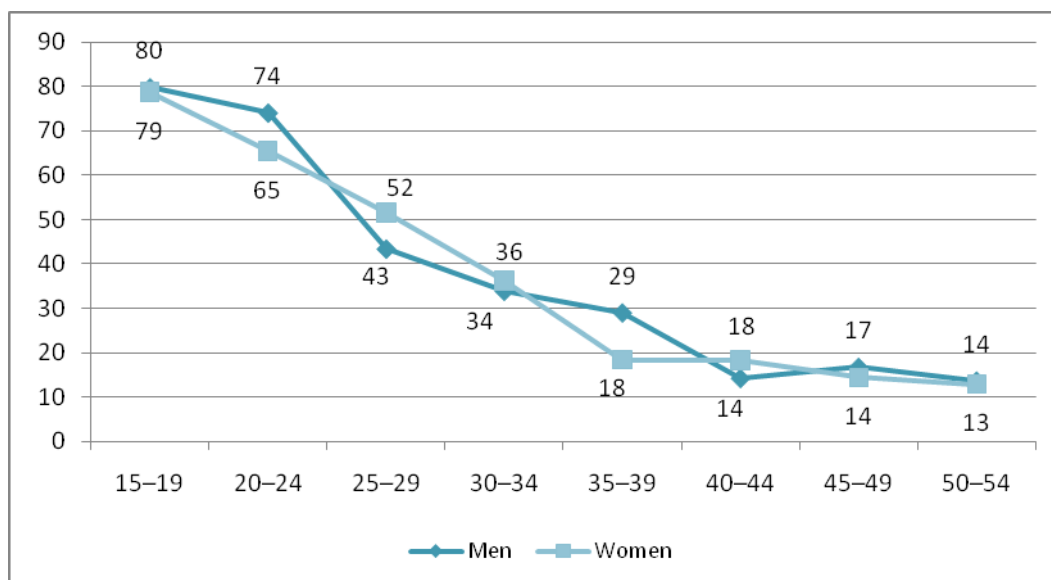
Source: Matsi & Oja (71).

6.1.3.2 Condom use

Similar percentages of men and women used condoms during their first sexual intercourse; the younger the respondents, the higher the percentage of condoms users: e.g. a third of the group aged 30–34 and three quarters of the group aged 15–19 (Fig. 15) (71). Data from the study of young people aged 14–18 and 19–29 show that the percentage of youth who used a condom during their sexual debut constantly increased (Fig. 16) (10). This change occurred among both

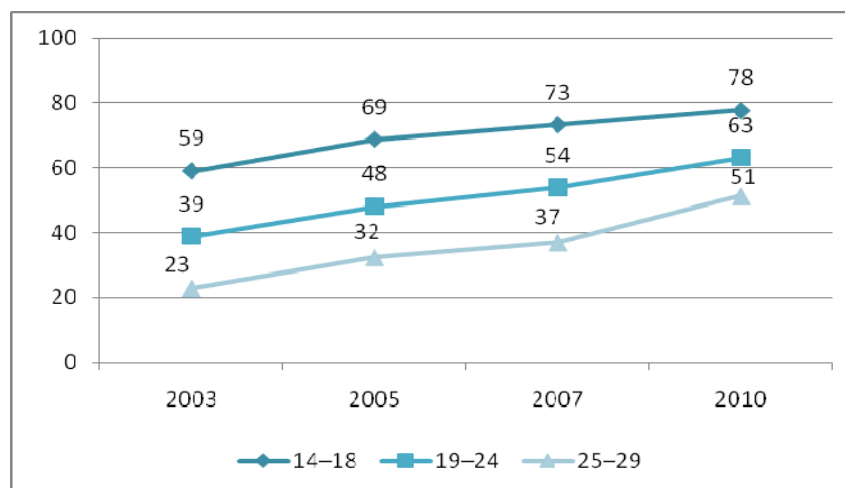
men and women, and the level of condom use during first sexual intercourse does not differ according to gender.

Fig. 15. 15–54-year-olds using condoms during first intercourse, by age group
(% of all those who had had intercourse), 2006



Source: Matsi & Oja (71).

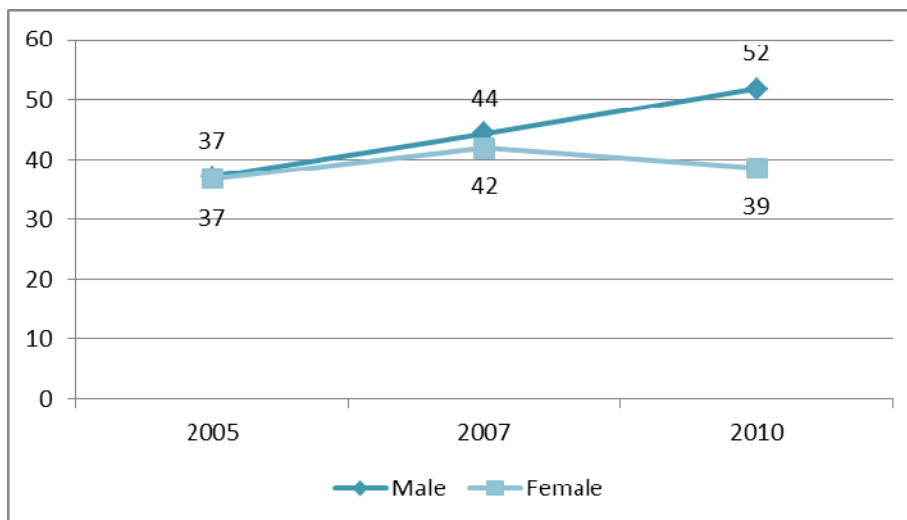
Fig. 16. 14–29-year-olds using condoms during first intercourse by age group
(% of all those who had had intercourse), various years



Source: data from Lõhmus, Trummal & Harro (7); Lõhmus & Trummal (8,9); Trummal, Glušková & Murd (10).

In the 2010 study, 62% of 14–18-year-olds and 48% of 19–29-year-olds who had casual partners during the prior year had always used condoms with them. The percentage among the latter group increased over three study rounds, owing to more condom use by men; the data for women did not change significantly (Fig. 17) (10).

Fig. 17. 19–29-year-olds with casual partners who always used a condom in the past 12 months, by gender (%), various years

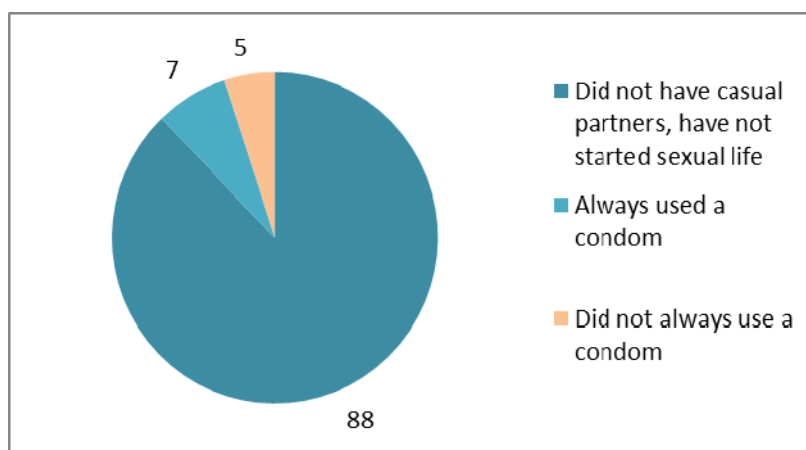


Source: data from Lõhmus & Trummal (8,9); Trummal, Glušková & Murd (10).

Fig. 18 and 19 present the percentage of youth who put themselves at risk of HIV or STIs in the previous year by not always using a condom in casual relationships. Since men have more partners, this percentage is highest among 19–29-year-old men (women: 4%; men: 14%). The 2010 study data on 14–18 and 19–29-year-olds showed the following.

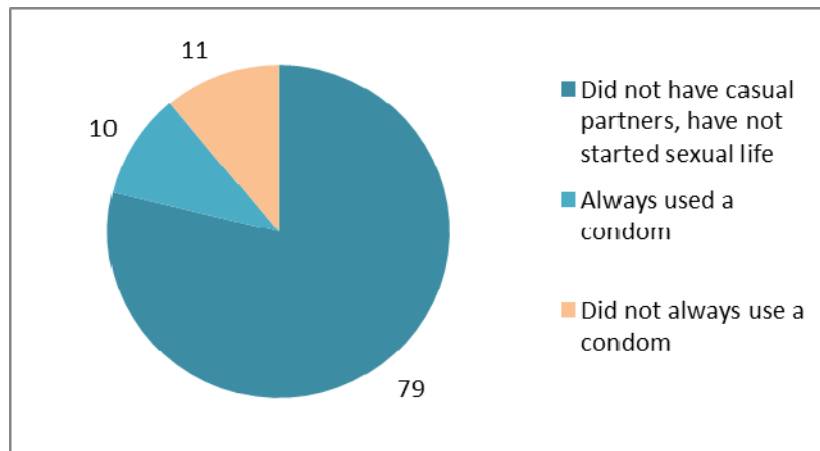
- The percentage of youth carrying condoms with them is higher among those who had more than one sexual partner and casual partners during the previous year.
- In the group aged 19–29, those who carry condoms also use them more often during casual sex. This had been true of both age groups in the 2007 study.
- Young people who used condoms during their first sexual intercourse also used them much more in casual relationships.
- A higher level of condom use with casual partners is not related to better knowledge of HIV transmission and methods for avoiding STIs (10).

Fig. 18. Condom use with casual partners in the past 12 months by 14–18-year-olds (%), 2010



Source: Trummal, Glušková & Murd (10).

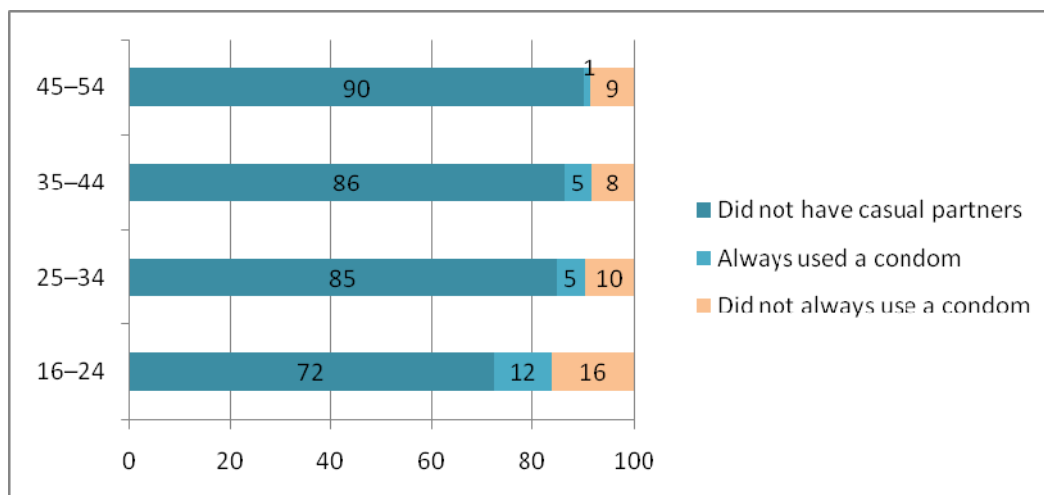
Fig. 19. Condom use with casual partners in the past 12 months
by 19–29-year-olds (%), 2010



Source: Trummal, Glušková & Murd (10).

The study of the general population also investigated condom use with casual partners (28). Most of the people questioned had not had a casual partner in the past twelve months: in 2008, 72% in the 16–24 group 85–90% of the older groups. There is less constant condom use in casual relationships in the older age groups: 42% of 16–24-year-olds, 38% of 25–34-year-olds, 36% of 35–44-year-olds and 12% of 45–55-year-olds. The figure for 35–44-year-olds had increased from 15% in 2004. The data of the whole sample (including those who did not have casual partners) show that one tenth of the people in the groups aged 25–34, 35–44 and 45–54 had put themselves at risk of infection during the year prior to the study by not always using a condom with casual partners. One sixth of 16–24-year-olds had run that risk (Fig. 20).

Fig. 20. Condom use with casual partners by 16–54-year-olds in the past 12 months,
by age group (%), 2008

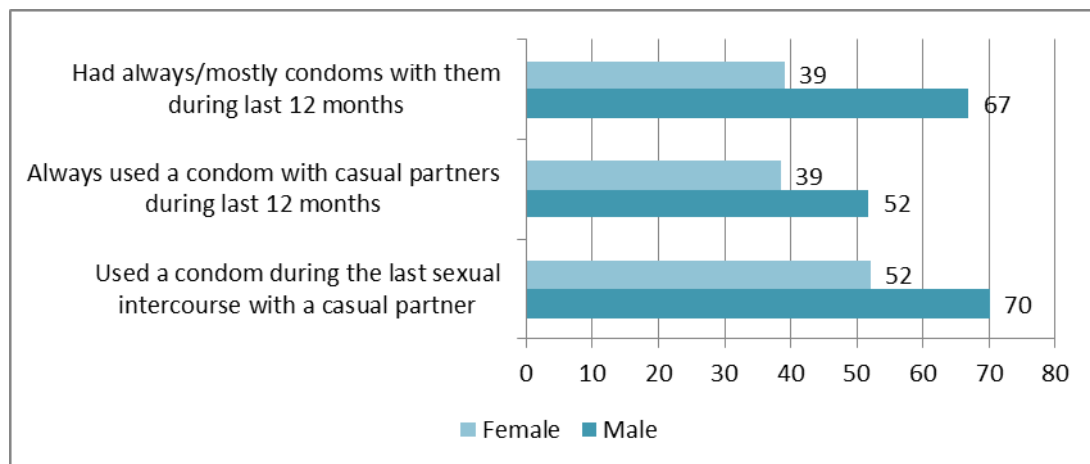


Source: Tekkel, Veideman & Rahu (28).

More young women than men have positive attitudes towards condom use. At the same time there are many more men who carry condoms with them and more men use condoms in regular and casual relationships in the 14–18 and 19–29 groups. Larger differences are found in the group aged 19–29 (Fig. 21). In qualitative focus group interviews (sample size: 76), 16–24-year-olds said that young women are more careful and start the conversation about using condoms.

Nonetheless, it is mostly men who have condoms and it is also considered to be their business to do so. It was explained that young men have the aim of having sex when going out in the evening and therefore prepare, whereas women do not assume that the evening will end in intercourse. Embarrassment about buying condoms was also mentioned by women as a reason (72).

Fig. 21. Indicators related to using and carrying condoms among 19–29-year-olds with casual partners in the past 12 months, by gender (%), 2010



Source: Trummal, Glušková & Murd (10).

6.1.4 Prevention activities

Up until the early 1990s there was no sexuality education in Estonian school programmes. The first national education curriculum for elementary and secondary school that contained mandatory sexuality education elements came into force in 1996. The curriculum was updated in 2002 and a third version is being implemented in 2011. In the school programme, sexuality education is part of human studies and is integrated with other topics. The topic of human reproduction is also addressed in biology. In the 2002 curriculum, human studies was offered at the second (35 lessons in the fifth and 35 lessons in the sixth grade) and third levels (35 lessons in the seventh grade), but not in higher grades (14–18-year-olds). Compared to the 1996 curriculum, fewer lessons were offered in 2002. The exact number of compulsory sexuality education lessons has not been defined and that gives teachers the opportunity freely to decide how many lessons they dedicate to this subject. The list of compulsory topics in each course ensures that sexuality education has to be discussed at least minimally. It is not possible to define the exact extent of sexuality education elements since those are integrated in all human studies courses. In 2011 the number of sexuality education lessons will increase and the topics will be more precisely defined for each grade. Human studies can be taught by teachers with various professional backgrounds: human studies (the specialty has existed since 1996) or biology and by other teachers with appropriate qualifications. Training for human studies teachers started in 1996 (73,74). New teacher guidelines were introduced in 2005 and 545 teachers were trained over the next five years. There is no sexuality education textbook for students (75).

Several studies indicate that the younger the age group, the higher the percentage who deem school sexuality education to be sufficient. In a 2000 study, fewer than half of those born in 1967–1971 said that the information given at school was sufficient. Among those born in 1977–1983 that percentage was about three fourths (76). In a study conducted in 2004–2005 among

women, more than half (53%) of 18–24-year-olds, 19% of 25–34-year-olds and 7% of 35–44-year-olds claimed that discussions of sex-related topics at school were sufficient (77). A 2010 cost-effectiveness analysis report stated that the evidence suggests that the sexuality education programme in Estonian schools is potentially highly effective and cost-effective (74).

The other prevention measures for youth have mainly focused on raising awareness and developing attitudes through training, peer education activities and media campaigns. Several NGOs have been involved in peer education and lectures in schools since the 1990s. The number of young people receiving HIV-related education from specialists outside the school system increased significantly under the Estonian GFATM programme (2004–2007) in which lectures were given in schools (grades 5–12), vocational schools, welfare institutions and to conscripts. About 88 500 people were educated during the four-year programme, mainly in Harjumaa and Ida-Virumaa counties.

The services of youth counselling centres of the Estonian Sexual Health Association are available in 18 sites around the country. The first clinics were opened in 1993. The centres offer individual sexual and reproductive health counselling and HIV/STI testing for those up to 24 years of age. Since 2007 testing has been free of charge, even for young people without health insurance. Since 2002 the number of visits per year has constantly increased: 20 980 in 2002, 26 070 in 2005 and 33 640 in 2009. A large majority of the clients are young women, and men have constituted 4–5% of the clientele during the past eight years. Youth counselling centres also give lectures on sexual and reproductive health.

In 2006 the Healthy Estonia Foundation was established, to offer an opportunity for employers to carry out training events and information campaigns on HIV in the workplace. The organization aims to involve the private sector as an active partner and attempts to draw funding for the prevention work from companies themselves. By autumn 2010 it had trained about 7000 people in more than 100 organizations all around Estonia. A coalition called Companies against HIV was created in 2007.

The first prevention campaigns related to HIV and its transmission were organized in 1992–1993. In the past five years one or two media campaigns have been organized annually. The spring campaigns have mostly concentrated on condom use and been targeted at young people, while the autumn campaigns have addressed such topics as HIV testing, attitudes towards PLHIV, mother-to-child transmission.

6.2 Discussion

Younger people become sexually active earlier (especially women), have more sexual partners and casual partners (especially men), but also use condoms more than older people. The level of consistent condom use during casual sex is not high among youth (or the general population), but the percentage of young people who used condoms during their first sexual intercourse has constantly increased over the past seven years. Positive changes have also started to occur related to condom use with casual partners. If those trends continue, it may be possible to avoid a big increase in heterosexual HIV transmission in the general population.

The level of knowledge on HIV transmission among youth is rather high; consistent condom use with casual partners is not related to knowledge, but rather to condom use during the first sexual intercourse and having them on hand. The importance of preparations – such as obtaining and

carrying condoms or discussing safe sex – rather than knowledge or beliefs, as predictors of condom use has been demonstrated in many studies in different countries (78–81). Besides giving information on changes during puberty, sexual health and infections, sexuality education should therefore also deal with developing skills for negotiating and preparing for safe sex.

In a 2003 qualitative focus group study, the main educational concerns were that the subject of HIV is addressed randomly and unsystematically, there are not enough lessons in human studies, teacher competence needs improving, there are not enough updated educational materials (82). According to a 2010 youth study, drug use and puberty are discussed more during school lessons than HIV and STIs (10). Other studies show that the younger the students, the better the assessment they give of their sexuality education. Human studies teachers have been trained according to a new programme for several years and the new school curriculum in 2011 aims to include more sexuality education lessons. Hopefully those efforts will help to provide more systematic and continuous sexuality education across different school levels in Estonia.

According to study data young men have more casual partners than young women, but a much higher percentage of men carry condoms with them and more of them use condoms in regular and casual relationships. In the past five years, consistent condom use has increased among 19–29-year-old men, but stayed the same among women. Studies in other countries show that men tend to have better condom use self-efficacy and women are more vulnerable to the influence of their partners (83,84). At the same time youth counselling centre statistics show that young men use services related to reproductive health and STI testing much less frequently than young women. More information is needed on how gender norms and practices affect sexual behaviour and uptake of services. Prevention campaigns should also address the issue of gender inequalities and sexual norms that hinder the condom use.

Young adults and the general population can be reached with more targeted interventions through workplaces, universities and vocational schools. Companies and other institutions can do things faster and more effectively than public information campaigns. A comprehensive workplace programme would include creation of company policies on HIV-related issues and their dissemination to employees, information on preventing transmission, places to seek further information and services and promotion of condoms (85). Involving parents in sexuality education is also an issue that has not got much attention and could be targeted through schools and workplaces.

6.3 Conclusions

- Younger generations are more accustomed to condom use than older generations and positive changes in condom-use trends among youth have started to show. Efforts should be made to understand what influences that positive trend and to continue the implementation of interventions that have had a good result for youth.
- Study results show that consistent condom use is related to other behaviours like carrying condoms and using them during the first sexual intercourse. Prevention messages should be targeted towards motivating youth (including young men) to prepare for and negotiate safer sex.
- More young women than men have positive attitudes towards condom use and also raise the issue during sexual contact, but most of them do not have condoms with them and rely on men to do so. More attention should be paid to the vulnerability of young women. There

is a need to understand what hinders women in preparing for safe sex and how to motivate them to purchase and carry condoms.

- Continuous efforts should be made in favour of systematic and high quality sexuality education at different school levels.
- Activating the private sector for workplace HIV prevention activities is a relatively new measure and should be continued and expanded, since the workplace has an opportunity for direct involvement of the general population in changing attitudes and behaviours.

6.3.1 Data gaps

- Regular HIV-related studies are conducted among 10–18-year-olds and 19–29-year-olds. Only minimal information is available on older age groups.
- Qualitative study information is needed for better understanding how gender norms affect condom use and service uptake.
- It is hard to understand and measure the outcome of sexuality education in the school curriculum. The number of compulsory lessons has not been defined and, along with the way issues are covered, varies a lot among schools.

7. STIs

STIs are known to have a direct effect on HIV transmission, especially those with genital ulceration such as syphilis and genital herpes. STIs are unique in the infectious disease world as they are completely dependent on behavioural factors for transmission (except for mother-to-child transmission). Worldwide, STI incidence is highest in adolescents and young adults (86). This chapter focuses on STI trends and services in Estonia. We do not aim to provide a comprehensive overview of all STIs, but rather discuss them as markers of sexual risk behaviours and facilitators of HIV transmission.

7.1 Results

7.1.1 Diagnosis and treatment

STIs are mostly diagnosed and managed by gynaecologists, dermatovenerologists and family physicians. Services are free of charge for all who are covered by health insurance. There are also several private and anonymous pay-for-service clinics for STIs (mostly in larger cities). Youth up to age 24 can get services at youth counselling centres. There is one special centre for STI diagnosis and treatment for sex workers in Tallinn and two for IDUs and their sexual partners in the north-east (these services are free of charge for all, independent of health insurance).

7.1.2 Reporting

In Estonia infectious disease surveillance is based on mandatory universal notification to the Health Board (see Chapter 1). The nationally notifiable STIs include syphilis, gonorrhoea (since 1930s), sexually transmitted chlamydia (since 1992) and anogenital herpes (since 1991). Trichomoniasis has not been notifiable since 2004. Estonia has traditionally managed STIs on an etiological basis (laboratory-based diagnosis). Accordingly, each reported case of STI should be verified by laboratory testing; however, information from the laboratories was not reported and is not linked to clinical data for surveillance purposes (87). Reporting policies and procedures were stable for the several decades (88). A major change took place in late 2009, when a new web-based information system on communicable diseases. Besides paper-based reporting, doctors can now report through this web-based system (see Chapter 2).

7.1.3 General trends

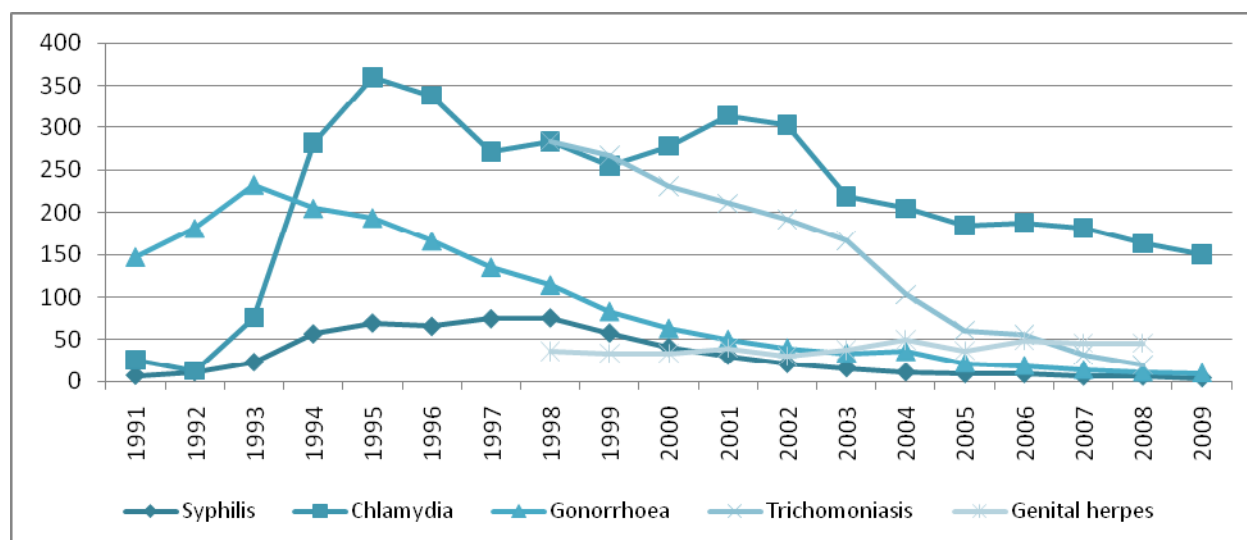
The incidence rates of reportable STIs have decreased in the past 10 years (Fig. 22).

Syphilis incidence increased between 1990 and 1998 from 3 to 76 cases per 100 000 population, and has decreased steadily since the turn of the century. In 2009 the incidence rate per 100 000 population was 4 (5 for men and 4 for women). A decline has been observed in all major regions and age groups. In recent years the highest incidence among women has been in 25–29 and 35–39 age groups (23 cases per 100 000 for both in 2008) and among men in the 35–39 group (22 cases per 100 000 in 2008) (6).

The prevalence of gonorrhoea almost doubled between 1990 and 1993, from 128 to 233 per 100 000. In the last decade, incidence rate decreased both among male and females in all age groups and in all major regions in Estonia. In 2009 the incidence rate was 10 per 100 000 (9 for

men and 10 for women). In 2008, the highest incidence rates for both men and women were observed in the group aged 25–29 (34 and 60 cases per 100 000 population, respectively) (6).

Fig. 22. STIs; cases per 100 000 population, 1991–2009



Source: Health Board (6).

7.1.4 Vulnerable populations

In the 2007 RDS study in Tallinn (sample size: 350), 2% of participants reported having had syphilis, 5% gonorrhoea, 2% genital herpes and 4% chlamydia. In Kohtla-Järve (sample size: 350) the respective figures were 1%, 2%, 0.3% and 0 (12). Out of 72 MSM men participating in a pilot programme of rapid HIV testing in 2008, 6 (8%) reported having had an STI in the 12 months prior to the survey (58). In the EMIS study, less than half of participating MSM (43%, sample size: 612) had ever had a test for STIs and 21% had been tested for STIs in the past year. Of the sample, 2% had had syphilis (that is 5% of those ever tested) and 9% gonorrhoea or chlamydia (that is 18–19% of MSM ever tested for STIs) (21). The number of diagnosed STI cases among sex workers visiting a special clinic in Tallinn in 2005–2009 decreased, while the number of visits increased (38–42). About a tenth of the female sex workers participating in a 2005–2006 study had never been tested for STIs and 71% had been tested within the past year (see Chapter 13) (23). No data are available on STI rates or testing among PLHIV.

7.2 Discussion

The rates of syphilis and gonorrhoea have been decreasing in Estonia since the end of the 1990s. Syphilis epidemiology often reflects broader social trends (86,89). The radical social changes of the early 1990s were accompanied by an increase in syphilis and other STIs. In the past decade, the economy has been more stable, with declining unemployment and a higher standard of living (47). In the same period, syphilis and other STI incidence rates have declined in all age groups and regions. Considering the decline in sexual risk behaviours and improved access to health services over the last decade, it is plausible that the observed decline in the infection rates reflects a real decrease and is not just due to underreporting. However, all STI surveillance systems underestimate the true situation since not all infections are reported and many patients

with STIs are asymptomatic and do not seek care. Furthermore, because of the continuing perceived social stigma associated with STIs, many patients may not seek care at all (90). We do not know the quality of case reporting in Estonia, especially from private clinics, and thus cannot estimate how much of the decrease in incident rates is due to underreporting.

Although routine passive surveillance systems provide comparatively robust surveillance data, they do not provide sufficient information on risk factors to target STI control and prevention programmes appropriately (91). STI surveillance should provide relevant, accurate and timely data to inform control and prevention initiatives. Effective systems should be able to detect changes in incidence in those with the greatest risk of infection, such as MSM, adolescents, women of child-bearing age and people who suffer multiple episodes of STIs, so that targeted intervention strategies can be developed (91). In Estonia little is known about the incidence/prevalence of STIs among the major HIV risk groups, MSM, IDUs and sex workers. STI trends among PLHIV are unknown, and there are no data on partner notification practices and trends.

7.3 Conclusions

- Since STIs are markers of sexual risk behaviour, and being infected has a role in facilitating HIV transmission, future steps should include active STI surveillance among HIV risk groups and PLHIV.
- The control of STIs requires easy access to sexual health services that can provide advice, screening and treatment. These services should be expanded for HIV risk groups and PLHIV. Interventions to promote sexual health should be strengthened and expanded to better meet the needs of those at high risk of acquiring STIs, including HIV.

7.3.1 Data gaps

- STI trends and risk factors among HIV vulnerable populations and PLHIV are not known.
- There are no data on partner notification practices.

8. IDUs

IDUs have been recognized as the main population at risk for HIV in Estonia since early 2000. This chapter looks at HIV trends among them, and harm reduction services.

8.1 Results

8.1.1 Population

The use of illicit drugs (including injecting drugs) has grown rapidly in Estonia in the past 15 years, as confirmed by several studies. According to the surveys of the European School Survey Project on Alcohol and Other Drugs, 8% of 15–16-year-old students in 1995 had experience with some illicit drug. This figure had risen to 16% in 1999 and 30% in 2007. Around 1% of 15–16-year-olds have ever injected drugs: 0.2% in 1995, 0.7% in 1999, 1.3% in 2003, and 0.5% in 2007 (92,93). According to a 2010 study of young adults, 47% of 19–24-year-olds and 39% of 25–29-year-olds have used drugs at some point; 1% of the former and 3% of the latter have injected drugs (10).

Comparing the 2003 and 2008 population surveys shows that the percentage of people who have tried drugs at some time increased (from 15 to 21% among 15–64-year-olds). The lifetime prevalence of drug use has increased in both the older and younger age groups, but is considerably larger in the latter. The increase was particularly significant in the group aged 25–34, 36% of whom have tried some illicit drug at least once (up from 16% in 2003) (94).

Injecting drug use started to increase during the 1990s (46). The first reports describing an outbreak and the size of the IDU population came from field reports and expert opinions. They describe about 10 000–15 000 IDUs in the country (N. Kalikova, personal communication). It is believed that the early phase and intensive growth of the IDU epidemic occurred during the second half of the 1990s (95). In 2005, it was estimated (using capture-recapture method on three different national databases) that there were 13 801 (95%, confidence interval (CI): 8132–34 443) IDUs in Estonia, with a prevalence of 2.4% among 15–44-year-olds (95). IDU prevalence is mostly confined to two (out of 15) counties – Harjumaa including Tallinn and Ida-Virumaa (north-east). More detailed data is presented in Table 5. A new survey for prevalence estimation was planned for 2011.

Table 5. Size and prevalence of the IDU population, 2004

Area	Size of IDU population (95% CI)	Prevalence of injecting drug use (95% CI)
Whole country	13 801 (8 178–34 732)	2.4% (1.4–6.0%)
Male	12 387 (7 119–30 600)	4.3% (2.5–10.6%)
Female	1 414 (1 059–4 132)	0.5% (0.4–1.4%)
Harjumaa county	9 963 (5 904–25 075)	4.3% (2.5–10.7%)
Ida-Virumaa county	2 501 (1 482–6 295)	3.5% (2.0–8.7%)
Rest of Estonia	1 199 (689–2 962)	0.4% (0.3–1.1%)

Source: Uusküla et al. (95).

According to the cross-sectional RDS studies conducted in 2005, 2007 and 2009, most participating IDUs in Tallinn and Kohtla-Järve were Russian-speaking men under 30 years old (Table 6) (11–13). The percentage of IDUs older than 30 has increased over the years. The mean duration of injecting drugs in Tallinn increased from 6 years in 2005 to 10 years in 2009. The main drug injected in Tallinn has been fentanyl and in Kohtla-Järve, poppy liquid. Besides opiates, amphetamines are being injected and a high percentage of IDUs report injecting more than one type of drug (polydrug use) (Table 6). Similarly to the cross-sectional studies presented in Table 6, a majority of the first-time visitors to SEPs in both regions have been men (Table 7) (30–36). The percentage of first-time visitors aged 25 years and older has increased steadily in Tallinn, while increasing from 2003 to 2007 and then decreasing in 2009 in Ida-Virumaa county (Fig. 23). The increases in the five-year period may be explained by the large increases in services during that period on the one hand (see section 8.1.4) or by the increase of clients and needs for those services on the other hand. Data for repeat visitors are available only for those who match first-time visitors by age and gender and is not therefore presented.

Table 6. IDU sociodemographic and drug use data, RDS studies 2005, 2007, 2009, 2010

IDU characteristic	Tallinn			Kohtla-Järve, 2007 (n=349)	Narva, 2010 (n=351)
	2005 (n=350)	2007 (n=350)	2009 (n=331)		
Age group (%)					
≤ 19 years	20.0	7.4	4.8	4.0	2.6
20–24 years	36.6	31.2	28.1	27.5	16.2
25–29 years	27.7	35.7	34.1	44.1	31.6
≥ 30 years	15.7	25.7	33.0	24.4	49.6
Median age (years)	24	26	28	27	29
Male (%)	83.1	84.0	82.2	85.7	75.5
Russian speaking (%)	80.0	81.7	85.2	93.1	92.3
Temporary or regular job in last 4 weeks (%)	46.6	53.5	33.0	45.0	33.3 ^a
Health insurance (%)	47.1	42.9	46.0	45.6	69.8
Less than 10 years of formal education (%)	55.4	53.2	49.2	57.3	45.8
Median duration of injecting drug use (years)	6	8	10	9	11
Injecting period ≤2 year (%)	13.4	10.9	ND	5.4	10.9
Main drug injected in last 4 weeks (%)	Fentanyl (75.8)	Fentanyl (71.1)	Fentanyl (55.0)	Poppy liquid (57.6)	Amphetamine (64.1)
Polydrug use in last 4 weeks (%)	52.0	29.1	39.9	45.0	29.9

^a Last 6 months.

ND = no data.

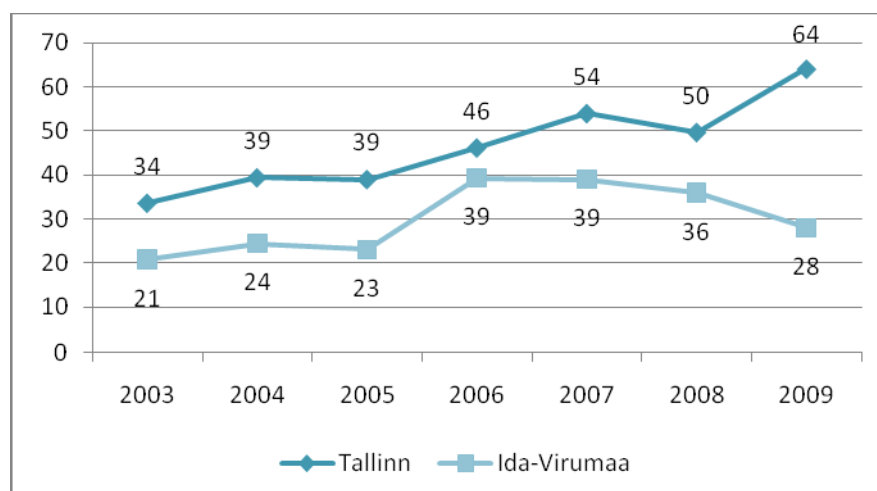
Source: Uusküla A et al. (11); Lõhmus L et al. (12); HIV transmission data (13).

Table 7. SEP client sociodemographic and drug use data, 2003–2009

Characteristic	2003		2004		2005		2006		2007		2008		2009	
	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east
First-time visitors														
Age group (%)														
≤ 19 years	24.4	24.0	20.5	25.2	28.8	22.3	19.1	20.2	13.3	19.5	24.2	24.2	10.5	27.2
20–24 years	42.0	55.2	40.1	50.3	32.2	54.7	34.7	40.6	32.7	41.4	26.1	39.8	25.4	44.8
≥ 25 years	33.6	20.8	39.4	24.4	39.0	23.0	46.2	39.3	54.0	39.0	49.7	36.0	64.1	28.0
Mean age (years)	23.2	22.2	24.0	22.4	23.7	22.2	24.6	24.0	26.0	24.0	24.7	23.6	27.5	22.7
Male (%)	75.9	82.9	78.5	83.1	79.2	75.6	77.1	80.2	77.2	78.7	75.9	79.7	76.9	74.3
Russian speaking (%)	86.5	93.0	83.6	91.2	84.0	89.4	86.1	90.2	86.0	90.8	84.7	90.2	81.6	92.1
Not employed or studying (%)	52.0	54.5	54.2	54.5	45.2	54.7	47.7	44.9	48.5	46.7	50.5	45.1	67.4	56.0
Duration of injecting drug use (%)														
≤1 year	29.8	33.5	25.7	30.7	34.9	45.0	29.1	32.3	24.5	31.0	30.0	41.1	25.5	45.7
2–4 years	38.2	48.6	35.8	46.0	33.6	37.1	34.9	39.5	27.2	40.6	31.0	39.1	19.8	38.7
5–10 years	27.5	16.3	31.2	21.3	23.7	17.4	29.1	22.3	34.4	22.5	28.2	15.8	36.0	12.9
≥10 years	4.5	1.7	7.3	2.1	7.8	0.5	6.9	6.0	13.9	6.0	10.8	4.0	18.8	2.7
Repeat visitors														
Not employed or studying (%)	54.8	51.1	59.6	51.3	43.8	56.3	44.1	56.9	56.2	50.7	44.6	53.9	68.9	60.9
Polydrug use (%)	25.0	35.0	31.6	46.3	32.7	39.8	28.9	39.7	23.2	45.1	10.8	49.8	19.0	44.8

Source: Lõhmus & Trummal (30–33); Murd & Trummal (34–36).

Fig. 23. First-time SEP visitors aged 25 and over in two regions (%), 2003–2009



Source: Lõhmus, Trummal (30–33); Murd, Trummal (34–35).

8.1.2 HIV-related risk behaviours

All IDUs who participated in cross-sectional studies in 2005, 2007 and 2009 reported high levels of injection and sexual risk behaviours: shared syringes and unprotected intercourse (Table 8). Besides syringes, sharing of other injecting paraphernalia was also reported. No major decrease in risk behaviours can be observed from the data. Programmatic data from SEPs are available for 2003–2009 (Table 10). All first-time visitors fill out a short questionnaire and repeat visitors are questioned once a year. Data suggest that first-time visitors engage in sexual risk behaviours more often than repeat visitors of the same gender and age, but the percentage of new visitors who always use a condom has decreased in recent years (Fig. 24). First-time visitors in the north-east report less risky sexual behaviours than those in Tallinn (Table 10). Sharing syringes has decreased among both first-time and repeat visitors (Fig. 25) in both Tallinn and the north-east, more so in the latter. The percentage of daily injectors among those visiting SEPs multiple times increased by 15–20% from 2003–2009 in both regions. Moreover, the percentage of repeat visitors reporting injecting several times a day also rose (with yearly fluctuations).

8.1.3 HIV and other infections

A study among a convenience sample of 159 IDUs visiting Tallinn SEPs found a 56% prevalence of HIV in 2003–2004 (96). Based on the 2005, 2007 and 2009 RDS studies in Tallinn, the high HIV prevalence among IDUs remained stable (11–13). Prevalence rates among men and women were not statistically different in 2005 and 2007, and increased with the duration of injecting drug use (11,12). In 2004–2008 the age of HIV-infected IDUs diagnosed in ACCs increased. In 2004, 73% of HIV-positive IDUs were in the 15–24 age group; in 2008 it was 36%. Of all IDUs visiting ACCs, 68% were 15–24 in 2004 and 45% in 2008. The same tendency is not seen among other clients (5,37). HIV infection has been found to be substantial among the newer injectors (three years or less) in Tallinn: it was 50% in 2003–2004 and 34% in 2005, putting the estimated HIV incidence at 31 and 21 per 100 person-years, respectively (97). In 2007 HIV incidence among new injectors in Tallinn was 8 per 100 person-years (98). The prevalence of hepatitis C virus (HCV) among IDUs is even higher (Table 9). In SEPs no data on HIV and HCV prevalence are routinely collected.

Table 8. IDUs' sexual and injecting risk behaviour, RDS studies 2005, 2007, 2009, 2010

Characteristic	2005 Tallinn (n=350)	2007		2009 Tallinn (n=331)	2010 Narva (n=351)
		Tallinn (n=350)	Kohtla -Järve (n=350)		
Sexual behaviour					
Median number of sex partners (last 12 months)	2	1	1	1	1
More than one sexual partner in last 12 months (%)	51.9	44.5	36.4	39.6	43.3
Protected intercourse, last 4 weeks (always) (%)	48.6	41.7	59.6	37.3	21.7 ^a 45.8 ^b
Injecting behaviour					
In last 4 weeks					
Injected every day (%)	38.0	60.2	34.2	36.9	21.7
Sharing of used syringes (%) ^c	54.3	35.4	16.6	29.0	15.9
Sharing of used syringes (%)	32.2	25.1	7.4	22.4	11.1
Front/back loading (%)	34.3	21.1	4.3	14.4	10.8
Sharing container (%)	28.0	23.7	9.5	16.9	13.4
Sharing cooker (%)	ND	17.1	7.4	13.8	12.5
Sharing filter/cotton (%)	14.3	9.4	4.6	9.2	9.1
Sharing of needles when injected for the first time (%)	ND	18.6	35.0	10.3	12.5

^a Permanent partner.

^b Casual partner.

^c In last 6 months.

Source: Uusküla et al. (11); Lõhmus L et al. (12); HIV transmission data (13); HIV and risk behaviour (14).

8.1.4 Services

8.1.4.1 SEPs

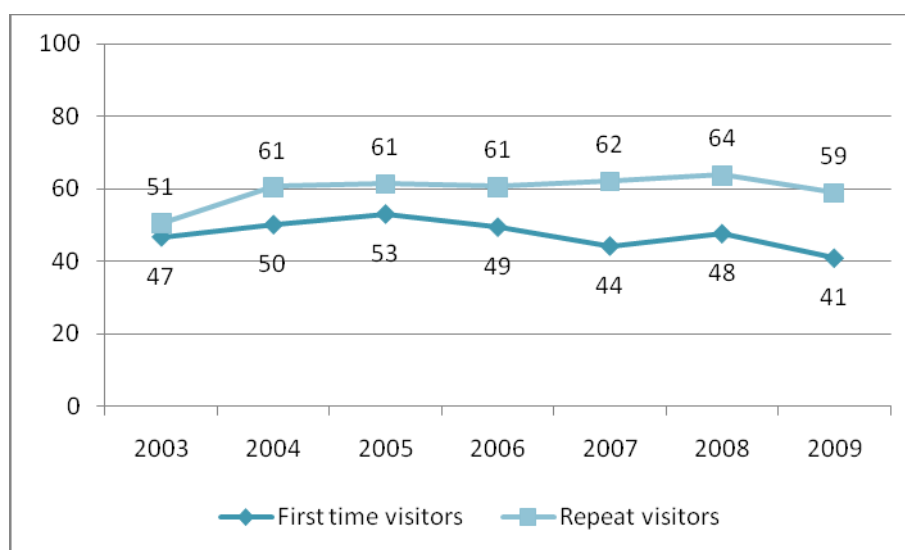
The first SEPs in Estonia were established in 1997. In 2001 the service was expanded to Narva, Sillamäe, Kohtla-Järve, Ahtme, Jõhvi and Kiviõli (in the north-east). In 2006 three low-threshold centres for IDUs were established in Tallinn, Kohtla-Järve and Paide (central Estonia). Syringe-exchange coverage greatly increased during the GFATM programme, 2004–2007. Estonia has promoted a comprehensive package of interventions among IDUs (99) and attempted to set and reach ambitious targets (60% coverage) (100). The number of SEPs increased from 13 in 2002 to

36 in 2010 (in 17 cities/settlements, 13 stationary and 23 field-work points). Services are provided mostly in the Tallinn and its surrounding areas and in the north-east (Ida- and Lääne-Virumaa counties). In cross-sectional studies, a high percentage of IDUs report having visited SEPs or being in contact with outreach work (Table 11). In 2009, about 7300 clients visited syringe-exchange points. In total, SEPs were visited 173 000 times in 2010 and 2.40 million syringes and more than 584 000 condoms were distributed. Table 12 shows that the number of syringes distributed has increased over the years in total and in two major regions, Tallinn and Ida-Virumaa county. Data reveal that more than two thirds of the syringes have been distributed in Ida-Virumaa, and about one third in Tallinn and only 0.5% elsewhere (110).

8.4.1.2 Substitution treatment

In addition to syringe exchange, opioid substitution treatment (OST) is provided for IDUs. OST was first started in 2004. Table 13 presents the number of patients on OST at the end of years in the period 2004–2010, in the centres financed from the state budget. As of the end of 2010, the number of clients on OST was 632. The total number of substitution treatment slots financed under the National Strategy was 715 at the end of 2010 (101).

Fig. 24. SEP visitors using a condom with all partners during the past 4 weeks (%), 2003–2009



Source: Lõhmus, Trummal (30–33); Murd, Trummal (34–35).

Table 9. Prevalence of HIV and other infections among IDUs (%), RDS studies, 2005, 2007, 2009, 2010

Characteristic	2005 Tallinn (n=350)	2007		2009 Tallinn (n=331)	2010 Narva (n=351)
		Tallinn (n=350)	Kohtla-Järve (n=350)		
HIV-antibody positive	54.2	55.1	69.9	50.5	52.6
HCV-antibody positive	ND	94.3	82.8	ND	75.8
Hepatitis B surface antigen (HBsAg) positive	ND	4.9	1.7	ND	5.7
Syphilis (RPR-positive)	ND	9.4	8.3	ND	ND

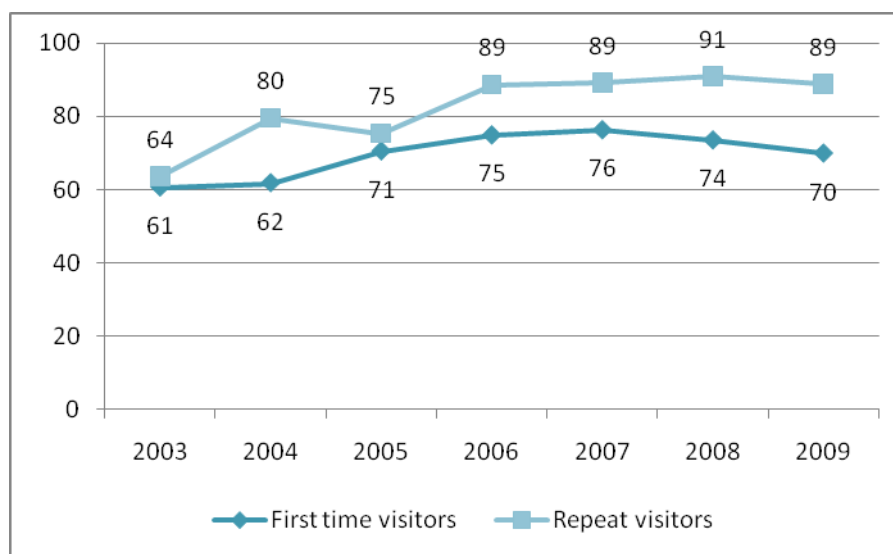
Source: Uusküla et al. (11); Lõhmus L et al. (12); HIV transmission data (13).

Table 10. SEP client sexual and injecting risk behaviour, 2003–2009 (%)

Characteristic		2003		2004		2005		2006		2007		2008		2009	
		Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east	Tallinn	North-east
Protected intercourse, last 4 weeks															
First time visitors		44.9	47.6	41.7	61.6	48.9	57.7	45.1	50.9	40.2	45.7	54.2	42.8	43.1	39.2
Repeat visitors		41.5	51.9	39.6	68.1	47.9	70.3	54.5	64.5	50.3	70.0	44.9	74.8	39.4	71.1
Number of sex partners, last 4 weeks															
First-time visitors	0	15.8	16.6	22.4	16.2	19.0	20.9	29.5	16.6	29.2	14.1	29.4	15.9	26.5	14.6
	1	46.4	44.4	44.9	47.5	43.8	46.7	41.2	49.4	48.7	47.5	48.1	54.3	45.0	53.9
	≥ 2	37.7	39.0	32.7	36.3	37.2	32.4	29.3	34.0	22.1	38.4	22.5	29.8	28.5	31.6
Repeat visitors	0	28.9	18.6	21.7	15.7	24.0	3.5	16.1	8.4	26.1	10.3	15.0	5.5	24.3	10.2
	1	37.8	53.8	48.1	48.1	47.9	55.5	50.3	52.9	47.9	48.1	55.1	41.9	50.0	41.0
	≥ 2	33.3	27.7	30.2	36.2	28.1	41.0	33.5	38.7	26.1	41.6	29.9	52.6	25.7	48.8
Sharing used syringes, last 4 weeks															
First time visitors		43.3	37.3	46.3	26.5	41.2	15.9	38.0	19.6	33.5	19.5	43.3	19.3	44.4	20.5
Repeat visitors		35.6	36.4	34.6	15.0	44.8	9.7	16.8	7.6	20.0	4.3	20.1	2.4	24.3	2.9
Injected every day, last 4 weeks (repeat visitors)		44.4	37.3	52.5	48.2	53.3	61.9	54.4	52.3	57.9	53.5	52.7	62.9	57.9	58.5
Injected several times a day (repeat visitors)		37.8	22.9	32.7	27.8	35.9	27.9	38.8	14.8	44.5	26.3	37.2	41.8	38.2	32.8

Source: Lõhmus, Trummal (30–33); Murd, Trummal (34–36).

Fig. 25. SEP visitors not sharing syringes/needles with others during the past 4 weeks (%), 2003–2009



Source: Lõhmus, Trummal (30–33); Murd, Trummal (34–35).

Table 11. Contact with SEP services, RDS studies, 2005, 2007, 2009, 2010

Characteristic	2005, Tallinn (n=350)	2007		2009, Tallinn (n=331)	2010, Narva (n=351)
		Tallinn (n=350)	Kohtla- Järve (n=350)		
Any SEP contact (%)	81.1	81.7	78.8	82.7	70.1
Main place to obtain syringes (%)	Pharmacy (54.9)	SEP (51.1)	SEP (61.0)	SEP (62.0)	Pharmacy (44.4)

Source: Uusküla et al. (11); Lõhmus L et al. (12); HIV transmission data (13).

8.2 Discussion

Data suggest high IDU prevalence in Estonia, especially in Tallinn and the north-east. Considering that, according to the available data, the age and injecting period of IDUs is increasing, the population seems to have stabilized. A new study on the size and prevalence of the IDU population from 2005–2009 should shed more light on this issue. HIV prevalence among IDUs is very high, but seems to have stabilized. Incidence among new injectors in Tallinn has decreased from 31 per 100 person-years in 2003–2004 to 8 per 100 (97,98). The prevalence of other blood-borne infection markers, especially hepatitis C, is even higher. This is not surprising, because data from various sources suggest that most IDUs have shared syringes at least once. Previous research has shown that HIV can spread extremely rapidly among IDUs, with seroprevalence rates increasing from less than 10% to 40% or higher within a period of 1–2 years (102). Prevalence rates as high as 75% have been described in Asian countries and 60% in western countries (103). Evidence also suggests that, once HIV prevalence among IDUs reaches

a level of about 10–20%, HIV epidemics can become self-perpetuating, with even modest levels of risk behaviour leading to substantial infection rates (104,105).

Table 12. SEP services in Estonia, 2003–2010

Numbers	2003	2004	2005	2006	2007	2008	2009	2010
First-time visitors								
Tallinn	1035	1611	1183	845	566	1297	1 031	1571
Ida-Virumaa	1431	1653	1393	1795	2419	2695	2150	1052
Elsewhere	–	–	–	–	–	96	212	169
Total	2466	3264	2576	2640	2985	4088	3393	2792
Visits								
Tallinn	2341	18 316	30 863	53 525	63 324	64 622	63 333	54 505
Ida-Virumaa	21 307	38 729	49 826	98 879	130 179	104 515	115 011	125 351
Elsewhere	–	–	–	–	–	8725	11 145	6865
Total	23 648	57 045	80 689	152 404	193 503	170 624	179 226	186 721
Syringes distributed								
Tallinn	18 010	129 093	230 409	452 242	600 021	734 954	774 782	798 087
								1 592
Ida-Virumaa	265 153	390 660	635 043	1 163 028	1 404 905	1 293 497	1 495 788	989
Elsewhere	–	–	–	965	1025	4924	6939	12 404
								2 403
Total	283 163	519 753	865 452	1 616 235	2 005 951	2 033 375	2 277 509	480
Condoms distributed								
Tallinn	16 427	76 004	83 975	139 836	158 164	156 735	131 162	106 590
Ida-Virumaa	135 444	231 429	301 415	396 665	573 245	527 999	503 062	425 699
Elsewhere	–	–	–	663	21 548	70 140	64 947	52 709
Total	151 871	307 433	385 390	537 164	752 957	754 874	699 171	584 998

Source: Syringe exchange programme data (110).

Table 13. Patients on OST at the end of year, 2004–2010

Clients	2004	2005	2006	2007	2008	2009	2010
At the end of year	ND	ND	ND	673	649	660	632
Per year	128	399	602	1030	1008	1012	950

Source: Opioid substitution treatment programme data (101).

Besides syringes and needles, IDUs also report sharing other injecting paraphernalia. It has been clearly demonstrated that sharing of drug preparation equipment can be an important route of

HIV and HCV transmission. Hagan and colleagues found that 54% of new HCV infections among those who did not share syringes were attributable to sharing of preparation equipment (106). Programmes to reduce HIV and HCV transmission among IDUs will need to focus on preventing the sharing of paraphernalia, as well needles and syringes. Information distribution and counselling are essential and other clean injecting equipment (so called “safer-injecting-kits”) should also be distributed wherever possible.

In general, injecting risk behaviour among IDUs has somewhat decreased, especially in the north-east, demonstrating the effectiveness of targeted and scaled-up SEPs in specific locations. More than three fourths of IDUs in Tallinn and the north-east report having visited an SEP or been in contact with outreach work. More than half of IDUs report SEPs as their main source of clean syringes. Data show that approximately twice as many syringes (more per IDU per year) are distributed in Ida-Virumaa county than in Tallinn, raising the question of whether SEP coverage is lower in Tallinn than in the north-east. SEP data also show that there are more people who inject daily or more than once a day in Tallinn than in Ida-Virumaa county. Also, the general increase in the percentage of IDUs who inject daily or more than once a day should be taken into account in planning syringe-exchange services. Outside of epidemic areas, harm-reduction services are provided only in Lääne-Virumaa and Järvamaa (with a modest number of visitors and syringes distributed). Yet there are also reports of injecting drug use in other regions (i.e. Tartu). Analysis of situation and needs for intervention in other regions can be recommended.

Buying syringes from pharmacies is quite common among IDUs: a 2007 RDS study showed that 72% of IDUs in Tallinn and 53% in Kohtla-Järve had obtained syringes from pharmacies in the previous month (12). These could be considered additional sites for syringe exchange and counselling in the future, wherever injecting drug use and HIV are serious problems. Involvement of pharmacies is quite common in the developed world and has proved a useful alternative to specialized SEPs and low-threshold centres (107–109).

As mentioned, the main injection drug is fentanyl in Tallinn, and poppy liquid in Ida-Virumaa county. This could also be related to injection frequency. Fentanyl-injectors’ behaviour has been found to be more risky than that of others. Fentanyl injectors appear to be at a more “advanced” stage of their injection careers: their duration of injecting drug use is longer and injection frequency higher. They also report higher levels of risk behaviour: receptive sharing during the previous four weeks, and sharing of a needle or syringe with a sexual partner or a person known to be HIV positive (111).

Data from first-time visitors to SEPs show that the percentage of those who report having injected for less than one year increased considerably in 2003–2009. Considering that the absolute number of IDUs of short duration is not increasing as rapidly as five years ago, this means that SEPs are effective in reaching new injectors. At the same time, there is a need to launch specific interventions to engage IDUs of shorter duration, who may have more motivation to accept treatment and other services. Moreover, first-time SEP visitors also report higher levels of risky injection behaviour than repeat visitors. We therefore suggest launching interventions targeting first-time visitors, to reduce their injecting and sexual risk behaviours.

Analysis has shown that HIV-positive IDUs who are aware of their serostatus report more injection risk behaviours (such as receptive sharing, sharing with a known HIV-positive person and with sexual partners) than their HIV-positive counterparts who are not aware of their serostatus or HIV-negative IDUs (112).

Data show that more than half of IDUs are young adults (aged 20–29), sexually active, have several sexual partners, commonly participate in sexual risk behaviour; these characteristics did not change during the years covered by the study. At the same time, the number of condoms distributed has decreased in recent years and there are no specific sexual health counselling or services. Given the high prevalence of HIV in the IDU population, interventions are needed to reduce the risk of transmission from IDUs to non-injecting sexual partners. Little is known about IDUs' sexual partners and they are an especially hard-to-reach group. Considering that an important percentage of IDUs engage in unprotected sex, HIV transmission to sexual partners is a reality. At the moment no specific programmes target this group.

The percentage of unwanted pregnancies has been found to be several times higher among opioid-dependent women than among women in the general population. Interventions are sorely needed to address the extremely high rate of unintended pregnancy among such women. Drug-treatment and harm-reduction programmes are likely to be an important setting for such interventions (113,114).

8.3 Conclusions

- HIV prevalence among IDUs is high, but has stabilized, and HIV incidence among new injectors has decreased.
- Injecting risk behaviours of IDUs have decreased. There is a need to develop more focused interventions to target IDUs with shorter injection duration, polydrug users and those who are already HIV infected.
- Sexual risk behaviours of IDUs have not decreased significantly. Sexual behaviour counselling and services are needed, including special services for female IDUs, and IDUs' sexual partners.
- The coverage of harm-reduction services has increased considerably and large percentage of IDUs are in contact with syringe exchange. There is a need to increase the geographical coverage outside Tallinn and the north-east and the number of distributed syringes in Tallinn, as well as pursuing the ambitious targets set for these programmes.

8.3.1 Data gaps

- Very limited data are available on IDUs' sexual partners.
- More information is needed on IDU prevalence and characteristics in regions outside Tallinn and the north-east.
- The only data available on repeat SEP visitors are for those who match the first-time visitors by age and gender (questioning of the repeat visitors is done using a quota sample). Additional information is needed on all repeat visitors.

9. Prisoners

The rates of HIV infection among prisoners in many countries are significantly higher than those in the general population. While most of the prisoners living with HIV contract their infection outside prison, the risk of being infected in prison, in particular through sharing of contaminated injecting equipment and unprotected sex, is great. Studies from around the world show that many prisoners have a history of problems with drug use and that drug use, including injecting drug use, occurs in prison. Outbreaks of HIV infection have occurred in a number of prison systems, demonstrating how rapidly it can spread unless effective action is taken to prevent transmission (115). In Europe HIV prevalence among prisoners is primarily related to the sharing of injecting equipment inside and outside prisons (116).

This chapter tries to answer the question as to how much behaviour that can lead to HIV transmission is found in prisons.

9.1 Results

9.1.1 Population

The number of prisoners was up to 4800 in the early 1990s, and 4352 in 2003. The recent decline resulted from increased numbers released on parole and the decreased number entering the prison system. The number of people convicted and held in custody as of December 2010 was 3420. The number of prisons decreased from nine in 2003 to five: Tallinn, Tartu, Murru, Viru and Harku (Harku is the women's prison). This is a result of extensive reforms, changing from the dormitory prisons of the past to modern cell prisons. The first cell prison opened in 2002 in Tartu; the similar Viru Prison was completed in 2008 and the new Tallinn Prison is under construction (117).

In 2010, 1% of prisoners had life sentences; 1% were minors and 6%, women. According to the last published prison system yearbook, in 2007, 23% of the convicts were 24 years old or younger, 21% were 25–29, 32% were 30–39, 15% were 40–49 and 9% were 50 or older. Half of the prisoners (51%) were Russians; 42% Estonians and 7% other nationalities. Two thirds (69%) of prisoners were unemployed before imprisonment. Most (56%) were convicted for violent crimes (mostly murders or abductions), 21% for crimes against property and 13% for drug-related crimes. Most people receive sentences of up to five years (117) (Fig. 26).

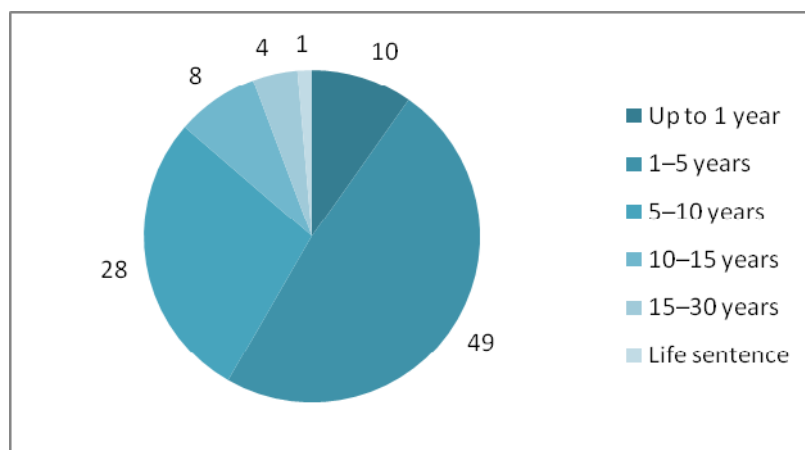
9.1.2 Overlap with IDU population

According to Ministry of Justice data, there were 877 drug users in prisons in 2010: 26% of the prison population. This number includes injecting and other drug users. The most common reason for incarceration of drug users is crimes against property (118).

More than half (58%) of respondents to a 2008 study of convicts in all five prisons (sample size: 750, random sample of prison sections) had used drugs at some time and 28% had done so during imprisonment. Most who had used drugs in prison did so by smoking and more than half (55%) had injected drugs. Fourteen per cent of all convicts had injected drugs in prison. About one quarter (27%: 6% of all convicts) who had used drugs in prison had done so also in the previous four weeks, a decline from the 43% (8% of the total) in the 2006 study. Injecting in the past month was calculated according to several questions asked about sharing different injecting equipment. In total, about one fifth of the convicts who had injected during imprisonment had

done so in the past four weeks, about 3% of all convicts (17). (The survey question on injecting drugs during imprisonment needs improvement.) Alcohol consumption in prisons also declined from 2006 to 2008.

Fig. 26. Length of prison sentences (%), 2007



Source: *Prison system yearbook* (117).

In the 2007 RDS study of IDUs, 49% of drug users in Tallinn and 38% in Kohtla-Järve said that they had been in prison, most more than once. Of these, 38% in Tallinn and 58% in Kohtla-Järve had injected drugs during their most recent imprisonment (12).

9.2 Knowledge

The level of knowledge of HIV transmission and methods for avoiding STIs has increased among prisoners. In 2008, 67% of respondents answered all four questions on HIV transmission correctly (more than 80% answered each separate question correctly) and 38% gave correct answers on all four methods for avoiding STIs. In 2006, the corresponding figures were 56% and 32%, respectively (17).

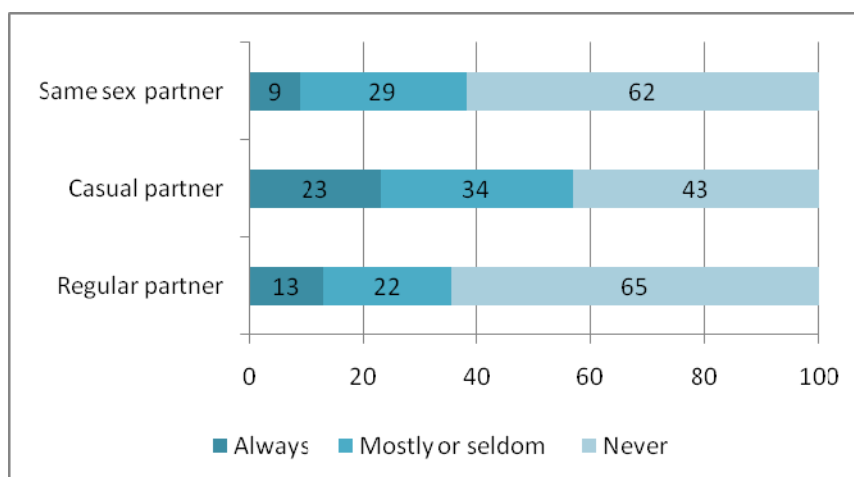
9.3 Behaviour

9.3.1 Sexual behaviour

About one quarter (27%) of the convicts questioned in 2008 had had sexual intercourse during imprisonment and 23% had done so in the past 12 months in prison. Most (79%) had one partner and 83% had sex during long-term visits. Of those who had had sex in prison in the past year, 20% said that they had intercourse with a partner of the same sex and 39% with a casual partner. Half of those who had casual partners also stated that they had same-sex partners. Long-term visits are allowed for married couples and cohabiting partners. It can be assumed that some proportion of the casual partners indicated were of the same sex as the respondents. The percentage of convicts who had casual or same-sex partners had significantly decreased since 2006, when 54% had casual partners and 41% same-sex partners. Among all prisoners (including those who had not had sex in the previous year), 18% had sex with a regular partner, 9% with a casual partner and 5% with a same-sex partner (17).

About one tenth of those who had same-sex partners and one fourth of those who had casual partners always used a condom (Fig. 27). In total, 82% of prisoners who had casual or same-sex partners had not always used a condom (8% of all convicts).

Fig. 27. Frequency of condom use among those having sex in prison in the past 12 months (%), 2008

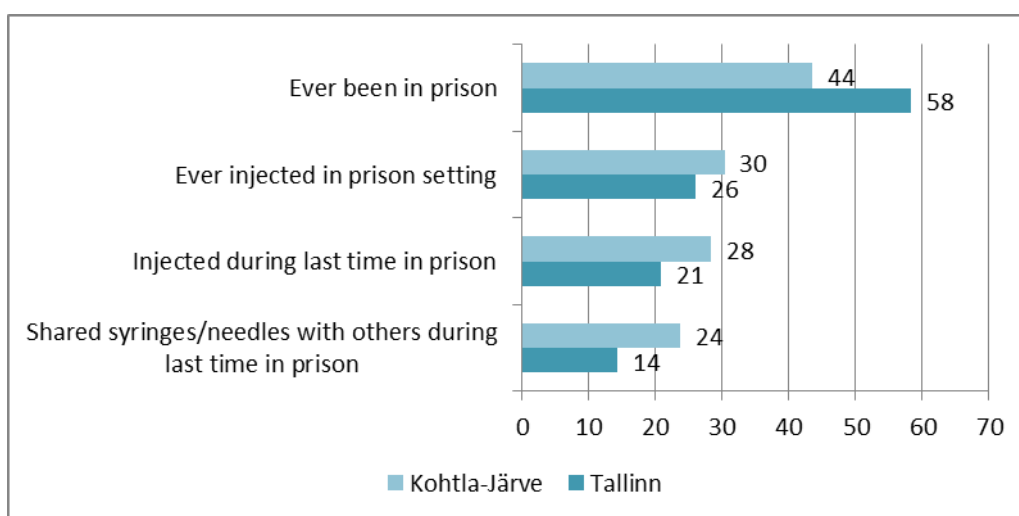


Source: Lõhmus & Trummal (17).

9.3.2 Drug use

According to a 2007 study of IDUs who had been in prison, more than a third in Tallinn and more than a half in Kohtla-Järve had injected drugs during their last prison term. Most had also shared syringes or needles: 69% in Tallinn and 84% in Kohtla-Järve (12). Fig. 28 gives the percentage of IDUs who have been in prison and injected during imprisonment from the whole sample questioned.

Fig. 28. IDUs who had injected drugs in prison (%), 2007



Source: Lõhmus et al. (12).

In the 2008 study, about 3% of convicts said they had injected drugs in prison in the past month (calculated according to different questions on injecting equipment). More than half (2% of all convicts) shared some injecting equipment with others (17).

9.3.3 Tattooing and piercing

Some information on tattooing and body piercing is available from two studies. In a 2006 study of 593 convicts in three prisons, half stated they had had a tattoo done in prison and 4% had a piercing. Also, 16% had shared a razor blade with other prisoners and 4% had shared a toothbrush (119).

In the 2008 study, 10% of convicts said they had been tattooed in prison during the last 12 months, a decrease from 19% in 2006. Most of those who had been tattooed (86%) said that disinfectants were used in the process; 10% said that disinfectants were not used and 4% did not know (17). No information was sought on the level of sharing and reuse of equipment for breaking the skin during tattooing and piercing.

9.4 HIV prevalence

About 13–15% of the prison population has HIV; the percentage varies over the years. The first new HIV case in prison (that is, a prisoner who had not known about being infected) was registered in May 2000. Changes in the number of new cases in prison per year have generally followed those in the overall trend in the country: a big increase in 2001 and a decline thereafter. The number of new cases has remained stable during the past three years. By the end of 2010, the cumulative number of new HIV cases found among entering prisoners was 1652: 22% of cases in the country. Around 2% of all tests made in prisons are positive (Table 14). Testing is offered upon entering the prison, after a year and as indicated. The age distribution of new cases during the past three years is given in Fig. 29.

Table 14. HIV tests and new cases among prisoners, 2000–2009

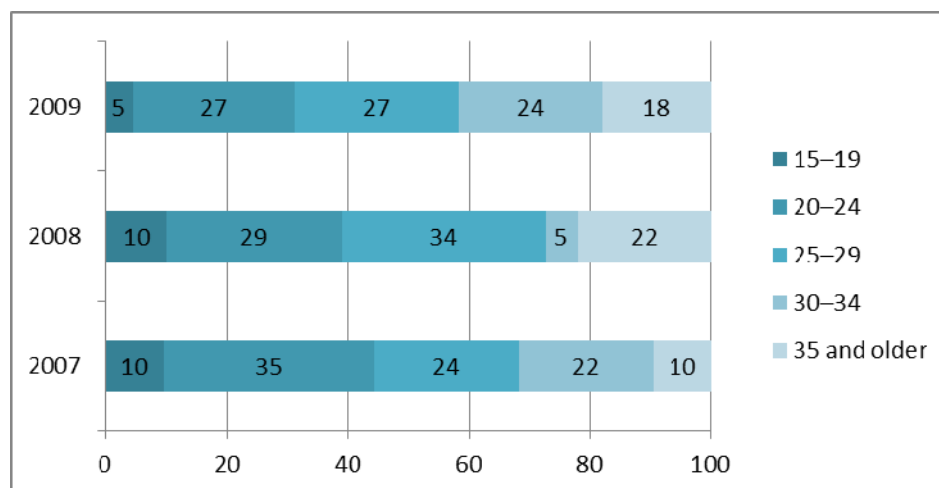
Year	No. of tests	New HIV cases		
		No.	% of tests made	% of all new cases in Estonia
2000	1034	80	7.7	20.5
2001	2568	420	16.4	28.5
2002	1923	243	12.6	27.0
2003	5009	266	5.3	31.7
2004	4717	163	3.5	21.9
2005	4819	121	2.5	19.5
2006	4530	107	2.4	16.0
2007	3982	63	1.6	10.0
2008	4160	60	1.4	11.0
2009	4944	68	1.4	16.5

Source: Health Board (6); Ustina (56).

It is not known how many of the people testing positive in prisons are IDUs. According to Ministry of Justice data, seven cases of HIV transmission in prisons have been detected, and they were related to sharing injecting equipment. The most recent case of HIV transmission in prison

was registered in 2007. The 2007 study of IDUs in Tallinn and Kohtla-Järve, found no correlation between having been in prison and being HIV positive (12).

Fig. 29. Newly registered HIV cases in prisons, by age group (%), 2007–2009



Source: Health Board (6).

In 2010, 37 cases of HCV and 10 cases of acute or chronic hepatitis B virus (HBV) were diagnosed in prisons. According to Ministry of Justice information, no hepatitis transmission was detected in prisons in 2010. A 2006 study in three prisons (Murru, Viljandi and Harku) found a high prevalence of hepatitis: the hepatitis C antibody prevalence among 590 prisoners was 45%, hepatitis B was at 39%, and HBsAg was 3%. Nearly three quarters of those who had hepatitis C did not know they were infected. Having injected drugs and been tattooed inside prison were associated with the presence of HCV antibodies. Two thirds (68%) of the HCV-infected prisoners had injected drugs during their lives: 39% of the total sample (119).

9.5 Services

The Ministry of Justice is responsible for health care and social services in penal institutions. Each prison has its own medical department and the Tallinn Prison Hospital provides inpatient medical care. All convicts and detainees have access to voluntary counselling and testing upon their arrival in prison and the refusal rate is less than 1%. Testing is offered again after one year or if there are indications. In total, 4380 HIV tests were done in prisons in 2010. The number of tests per year has been 4000–5000 for the last five years. Education related to HIV, sexual behaviour and drug use has been offered to prison staff and prisoners for years.

People with HIV have access to health monitoring by an infection specialist and treatment if necessary. ARV treatment was given to 39 people (7% of the HIV-infected prison population) in 2006 and 230 (47% of the HIV-infected) in 2010. The NGO Convictus Estonia established the first support group for PLHIV in prisons at the end of 2002. Support services for PLHIV and drug users are offered in all prisons. Until 2009 prisoners with sentences longer than seven months were vaccinated against hepatitis B. Since 2009, prisoners belonging to risk groups have been vaccinated. Prisoners undergo examination for TB upon arrival and treatment is ensured for everyone who needs it (see Chapter 10).

Methadone treatment in prisons started in 2008, when it was provided to 2 people, and by 2009 12 people had methadone withdrawal or substitution treatment. In 2010, 59 people had withdrawal treatment and 64 had substitution treatment. Methadone is offered to people who were being treated before being convicted. Offering methadone treatment in detention centres started in 2010 (under the Ministry of the Interior). Departments for drug use rehabilitation have been founded in three prisons – Tartu (174 places), Viru (40 places) and Harku (8 places) (under the Ministry of Justice).

Condoms are available under certain conditions: in long-term appointment rooms, when requested from the medical department and in the prison shop. During the GFATM programme period (2004–2007), staff of Convictus Estonia and Tallinn Prison distributed free condoms; 10 000–13 000 condoms were distributed per year for two years, decreasing to about 700 condoms in 2009 (report of the National HIV and AIDS strategy, 2009). According to the prison study, 69% of convicts were aware that free condoms were available in prison in 2006, but only 45% by 2008. Although 20% of convicts had said that they needed condoms in the past year, nearly three quarters (72%) had not received any. In 2006 that percentage was 52% (17).

9.6 Discussion

More a tenth of prisoners have HIV, and high hepatitis C prevalence was found among prisoners studied in 2006. One fourth of the prison population are drug users (all types of drugs included) and some IDUs continue injecting in prison. Still, only a few cases of HIV transmission in a prison have been detected over the years in Estonia.

Study data show that alcohol and drug consumption in prisons has decreased and there are fewer sexual contacts among prisoners (when comparing 2006 and 2008 data). These positive tendencies are related to penal-system reforms and changing to prison cells, which allow less communication and more control than dormitories. There have also been massive investments in infrastructure and provision of medical services (120). Prisoners' level of correct knowledge of HIV transmission and testing has also increased. The last study was made in 2008 (when Viru Prison had just opened) and more changes may have occurred; a new study was planned for autumn 2011.

In the 2008 study, every seventh convict said that he/she had injected drugs during imprisonment at some time. Two per cent of convicts had shared some kind of injecting equipment with others during the last month. While active IDUs comprise a small percentage of about 3400 prisoners, this means that about one hundred people are potential sharers of injecting equipment (the concentration varies from prison to prison). Although IDUs are less likely to inject while in prison, those who do are more likely to share injecting equipment and with a greater number of people. Syringes may be hidden in commonly accessible locations where prisoners can use them as necessary, or owned by one prisoner and rented to others for a fee or used exclusively by one prisoner again and again over a period of months. Sometimes the equipment used is homemade, with syringe substitutes fashioned out of available materials. Groups of syringe users will contain both HIV-positive and HIV-negative people. There are obvious risk differences among these groups for infection through contaminated equipment, and prevention messages should be adjusted accordingly (116,118).

Syringe exchange – as an HIV-prevention strategy for those who are not motivated or able to stop using drugs during imprisonment – is not provided in Estonia. According to the Ministry of

Justice, that is because no HIV transmission in prisons has been detected; an effective HIV testing system has been established; control and security systems have been improved; personnel have been trained and Tartu Prison specializes in the rehabilitation of drug users. During recent years, methadone treatment has been made available to prisoners who were being treated before imprisonment.

Tattooing among prisoners is a common practice in many countries (118). In 2008 every tenth convict in Estonia had been tattooed in prison during the last year, down from the 2006 percentage. Because tattooing involves breaking the skin, it poses a risk of transmission of blood-borne infections through the sharing and reuse of equipment such as needles and ink, which come into contact with large amounts of blood during the process. Tattooing is prohibited by prison authorities in many countries (including Estonia). It is therefore an activity that takes place secretly, often in unhygienic environments, using homemade equipment and ink, and as quickly as possible. These factors increase the risk of negative health consequences (118). No study data are available on the sharing and reuse of equipment for breaking the skin during tattooing and piercing in Estonian prisons, so the level of risk involved is not known.

Another aspect of risk is sexual behaviour. Given the stigma associated with homosexual relationships, levels of sexual activity among prisoners are difficult to estimate as these (whether consensual or not) generally occur in secrecy, and risk behaviour studies within prisons may underestimate the true amount of sexual activity (118). According to Estonian study data from 2008, every fourth prisoner had sex during imprisonment in the prior year (including long-term meetings with spouses or cohabiting partners) and every twentieth admitted to having intercourse with a partner of the same sex. A large majority of those people had not always used a condom. One in thirteen convicts risked infection through unprotected sexual intercourse with a casual or same-sex partner during the year. The percentage of convicts who had casual or same-sex partners decreased from 2006 to 2008, but the availability of condoms substantially decreased at the same time.

According to the Ministry of Justice, a majority of sexual contact between men in prisons is coerced, has other motives than sexual pleasure (demonstrating dominance, power and hierarchy) and is not necessarily related to sexual orientation. It is therefore argued that there is no need to make condoms more accessible. At the same time, a 2008 study data showed that prisoners see the need for condoms: a fifth said that they had needed condoms during past year and three quarters of them did not get any. Today, free condoms are available in long-term appointment rooms and from the prison medical department.

A 2006 UNAIDS policy brief stated that, in long-term all-male environments, such as prisons or boarding schools, sex between men can be common regardless of sexual identity and may be coerced. MSM may be subject to violence, discrimination and social exclusion. These negative consequences can make sexually active male prisoners more vulnerable to HIV and STIs by deterring them from accessing condoms for fear of identifying themselves as sexually active (118). It is therefore suggested that condoms should be made easily and discreetly accessible so that prisoners can pick them up without having to ask or be seen by others. Along with condoms, water-based lubricant should be provided, since it reduces the probability of condom breakage and rectal tearing (115). Promotion of consistent and proper condom use should also be a component of prevention work (70).

9.7 Conclusions

- Important prison-system reforms have taken place in recent years in Estonia, and more health care services are available, e.g. increased HIV testing and the introduction of methadone treatment. Positive changes in prisoners' behaviour (decreased alcohol and drug use, increased knowledge) have followed.
- The most recent data (from 2008) show that about 2% of prisoners are in danger of being infected by sharing injecting equipment with others, in a situation where more than a tenth of the prison population has HIV.
- Transmission of infections through sexual contact may occur since study data (from 2008) show that a significant number of convicts have same-sex partners, most intercourse is unprotected and condoms are not easily accessible. At the same time study, data also show that sexual contact among prisoners has decreased.

9.7.1 Data gaps

- There are no official data on the percentage of IDUs among HIV-infected prisoners.
- Official statistics are needed on how many prisoners who were tested upon entering are retested later during imprisonment. The medical departments of prisons collect such data.
- No study data are available on sharing and reuse of equipment for breaking the skin during tattooing and piercing. These would need to be included in the 2011 prison study, and the questions on injecting drugs need revision.

10. HIV and TB

This chapter focuses on TB trends and screening and treatment coverage for PLHIV as well as IDUs in general. In eastern Europe there are independent epidemics of TB and HIV and a large majority of TB patients developed their disease without HIV-related immunosuppression. Among PLHIV, the risk of acquiring TB is higher where the TB prevalence is high (121). Studies of different populations indicate that the risk of developing active TB is considerably higher among those who are also co-infected with HIV (122). This is mainly the result of reactivation of latent TB infection (LTBI). HIV-infected people who are also infected with *Mycobacterium tuberculosis* have a 5–10% per year risk of developing TB disease (122).

Illegal drug use has become a risk factor for TB as a result of the overlap of epidemiological and social factors associated with both. The spread of HIV infection has amplified the spread of TB among drug users (123). Drug users are also exposed to other serious infectious diseases that may complicate or help facilitate TB transmission. Hepatitis B and C and STIs may also play a role (124). The overall incidence rate of active TB disease in drug users has been calculated at 1–2 cases per 100 person-years (124). Data on the outcome of treatment for HIV-positive and -negative TB patients show lower treatment success rates, higher death rates and higher default rates among HIV-positive patients (125).

10.1 Results

10.1.1 Background

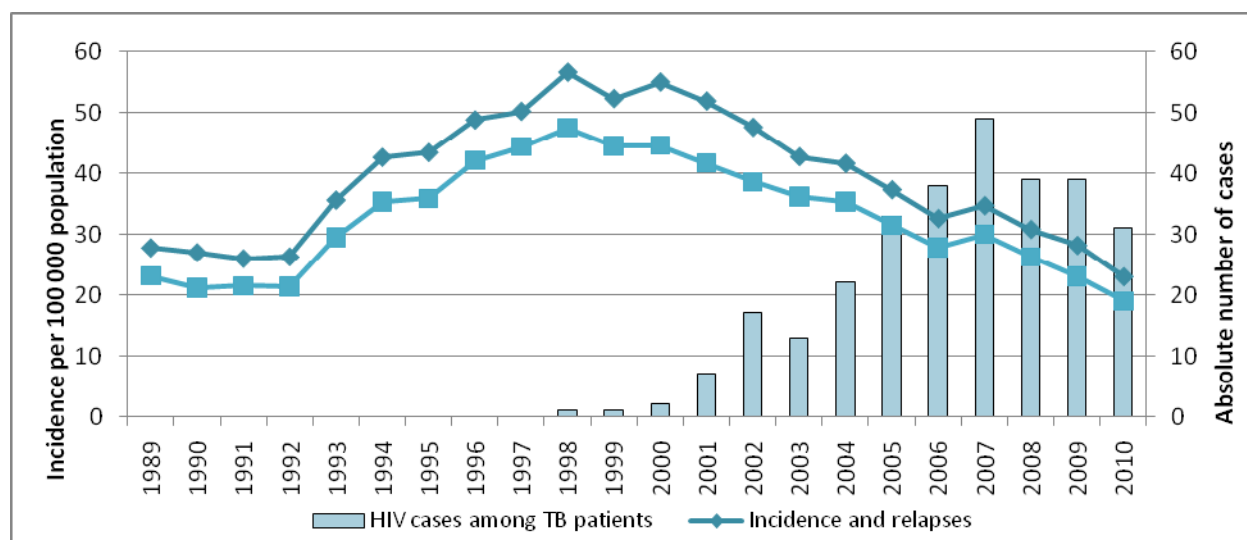
The incidence of TB started to increase in the 1990s, rising rapidly from 21 per 100 000 in 1992 to 48 in 1998. Since 1999, incidence has decreased to 26 per 100 000 in 2008 (354 new cases) and 25 per 100 000 in 2009 (328 new cases) (Fig. 30). In recent years the notification rate has been highest in the north-east (37 per 100 000 in 2009). Over a quarter of all TB cases in Estonia are resistant to at least one drug. The percentage of MDR-TB cases among all TB cases is quite high and has risen in recent years – from 11% in 2006 to 17% in 2009. Almost 10% of MDR-TB cases are extensively drug resistant (XDR-TB). In 2001–2009, there were 94 cases of XDR-TB (among both new cases and relapses), 6 in 2008 (4 new cases and 2 relapses) and 1 in 2009 (relapse). The mean age of TB patients was 48.9 years in 2008, 47.7 in 2009 and 47.8 in 2010. The proportion of TB patients who are male was 72% in 2008, 70% in 2009 and 72% in 2010 (126).

TB rates have been higher in prison than in the general population. Thus, the TB notification rate (new cases and relapses) was 774 per 100 000 prisoners in 2007, 301 in 2008 and 770 in 2009 (at the end of the year). The corresponding rates for the general population were 35, 31 and 28 cases per 100 000, respectively. If the cases diagnosed during imprisonment (and those diagnosed upon entry, who were already ill) are omitted, the TB notification rate was 54 per 100 000 prisoners in 2008. As mentioned, the number of prisoners has considerably decreased (see Chapter 10) and continues to change, so it is difficult to provide proper rates because of the changing denominator. TB screening is mandatory for all prisoners. In 2009, 7% of all TB cases were diagnosed in prisons (30 cases out of 410), most of them at entry, and 6 out of 39 HIV-infected TB patients (15%) were diagnosed at entry. Table 15 gives more detailed data.

There are no population-wide data on the prevalence of LTBI in Estonia. Prophylactic treatment is not provided universally because of high rates of primary resistance to isoniazide and other first-line TB drugs. The need for such treatment is decided case by case. BCG vaccination is part

of the required immunization schedule and is usually performed during the first three days after birth. There is no revaccination programme.

Fig. 30. TB notification rate, incidence per 100 000 population and HIV-infected TB cases by year, 1989–2010



Source: Lai et al. (49.)

Table 15. TB cases among prisoners, 2000–2010

Year	TB cases diagnosed in prisons		Cases diagnosed during imprisonment (out of total)	
	Total (new plus relapses)	Number with HIV	No.	%
2000	37	0	23	62.2
2001	34	4	11	32.4
2002	22	1	6	27.3
2003	28	0	14	50.0
2004	41	3	18	43.9
2005	24	7	15	62.5
2006	18	5	7	38.9
2007	30	6	10	33.3
2008	11	2	2	18.2
2009	28	8	6	21.4
2010	15	6	2	13.3

Source: *Tuberculosis in Estonia 2008–2009* (126).

Directly observed treatment, short-course (DOTS) has been implemented in Estonia since 2000 and the coverage is 100%. Health services related to TB diagnostics and treatment are financed

from the EHIF and state budget (National TB Control Programme, operated by NIHD) and are free of charge for all patients, including those who do not have health insurance. Pulmonologists see patients suspected of having TB in outpatient settings in 11 cities. There are no pulmonologist services in Valgamaa and Hiiumaa counties. In the north-east there are outpatient services in Narva and Kohtla-Järve. Family physician's referral is not needed if a person suspects he or she has TB. For TB treatment (inpatient services) there are hospitals in Tallinn, Tartu, Narva, Kohtla-Järve and Viljandi. The latter also has a special department for involuntary treatment. DOTS is provided mostly in collaboration with county pulmonologists and family physicians, in a programme coordinated by the National TB Control Programme and financed from the state budget.

In 2008, the treatment success rate at 12 months was 64%, lower than the average of European Union (EU)/(European Economic Area) EEA countries, because of the high percentage of MDR cases whose treatment generally lasted longer (up to 36 months) and the high default rate (9% of all patients). In 2009, the TB death rate was 4 per 100 000 for males and 2 per 100 000 for females. In prison the cure rate is up to 100% for those who finish DOTS while incarcerated. In some cases DOTS is disrupted after release from prison, especially among those who do not have a permanent residence and/or are not on probation. For example, in 2009, 30 patients started treatment in prison (24 new, 4 relapses, 2 after default); 14 were cured in prison; 2 are still under treatment and 14 continued treatment after release (8 cured, 4 defaulted, 2 still under treatment) (126).

10.1.2 TB among PLHIV

The number of HIV-infected TB patients increased from 1 case in 1997 to 31 cases in 2010. Throughout these years a total of 292 HIV-infected TB cases have been diagnosed (both new cases and relapses). The percentage of HIV-positive patients among all TB cases increased from 7% in 2005 to 10% in 2010 (Fig. 30). MDR-TB prevalence among HIV-infected TB cases is higher than among other TB cases (22% in 2007), compared to 13% among all new TB cases and 29% among all relapses (National TB Registry). The mean age of HIV-infected TB patients was 32.4 years in 2008, 33.7 in 2009 and 35.5 in 2010. Males comprised 78% of HIV-TB patients in 2008, 75% in 2009 and 87% in 2010 (126).

In a 2005 cross-sectional study of 450 PLHIV in outpatient care (54% men, mean age: 25.8 years) in the three largest infectious disease hospitals, 10 had previously had TB (data from clinical records); 4 of them self-reported injecting drug use as the possible HIV transmission mode, 3 were older than 29 and 8 were male (24). In the 2008 follow-up study in the same hospitals (n=450), 15 reported having had TB, of whom 10 reported having injected drugs, 10 were male and 10 were older than 29 years (25).

TB diagnosis and treatment for PLHIV are provided on similar bases as treatment for all other patients. Treatment outcomes of HIV-infected TB patients are presented in Table 16. PLHIV are recommended for TB screening (chest X-ray) once a year, in case of symptoms indicating TB or contact with known TB cases. No data are routinely collected on screening coverage of PLHIV for TB. Based EHIF data, a total of 2115 PLHIV had at least one chest X-ray in 2007–2009 (average age 30.7 years, range: 0–81; 12% did not have health insurance). The total number of X-rays performed on PLHIV in this period was 6043. Stratification of data based on the reason for the X-ray (prophylactic or diagnostic) is not possible.

All TB patients are routinely offered HIV testing (opt-out approach, recommendations of the professional society of pulmonologists) (127). HIV tests are often done early in the diagnostic

process, even before the TB diagnosis is confirmed. Data from the TB Registry reveal high coverage of HIV testing for TB patients: for 90% of the patients the HIV test result was known from 2007–2009 (126).

Table 16. Treatment outcomes of HIV-infected TB patients, 2004–2010

Year	TB-HIV cases (new and relapses)		Died before treatment or treated less than 1 month		Started treatment		Cured		Failure		Default		Died		Died of TB	
	No.	No.	%	No. (died from TB)	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2004	22	4	18.2	1	18	81.8	11	61.1	0	0.0	5	27.8	2	11.1	1	
2005	33	5	15.2	2	27	81.8	20	74.1	0	0.0	5	18.5	2	7.4	2	
2006	39	8	21.1	2	31	81.6	20	64.5	1	3.2	4	12.9	6	19.4	6	
2007	47	9	19.1	8	38	80.9	25	65.8	1	2.6	7	18.4	2	5.3	2	
2008	37	8	21.6	6	29	78.4	25	86.2	1	3.4	1	3.4	2	6.9	2	
2009	36	6	16.7	2	30	83.3	22	73.3	0	0.0	2	6.6	2	6.6	2	
2010	31	6	19.4	2	15	80.6	ND	ND	ND	ND	2	6.7	ND	ND	ND	

ND = no data.

Source: *Tuberculosis in Estonia 2008–2009* (126).

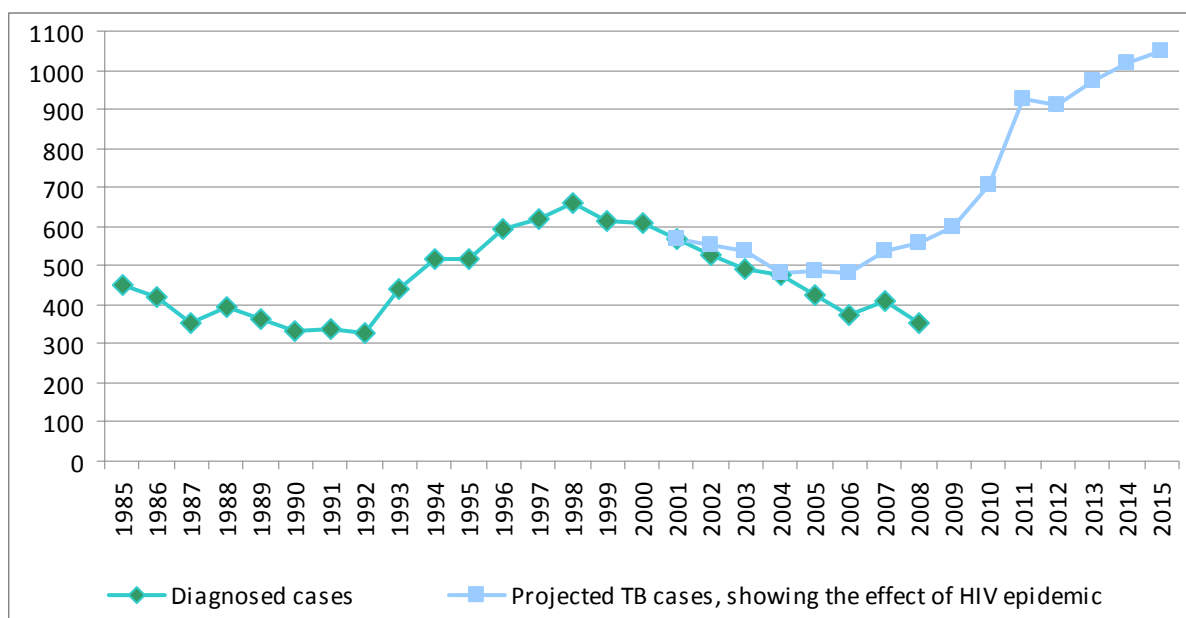
Modelling of the HIV epidemic estimated its effect on TB incidence in coming years (49). One of the possible future scenarios is presented in Fig. 31, a calculation based on the historical HIV model, TB cases diagnosed in 1987–2007, ART coverage, the estimated size of the population with LTBI and the percentage of HIV co-infection among TB cases, assuming a six-year lag between increased HIV incidence and increased TB incidence. According to this model, HIV began to affect the number of new TB cases in 2004; there may be as many as 130–150 undetected new TB cases each year and the total number of annual TB cases could reach 1000 in 2015 due to the spread of TB among PLHIV.

10.1.3 IDUs and TB

Data on TB patients reporting injecting drug use are limited; in 2009 the number was 30 (7% of all TB cases) and the number of HIV-TB cases reporting injecting drug use was 24 (67% of all HIV infected TB cases) (National TB Registry). In a 2008 study, 68% of IDUs recruited from a Tallinn SEP thought that TB could be contracted during sexual intercourse; 71%, from drinking from the same glass; 57%, through water and food; 60% did not know that TB diagnostics and treatment are free of charge for everybody and 42% did not know where to go if they suspected that they had TB. More than 95% knew that condoms protect against HIV, that sharing syringes can transmit HIV and that HIV-infected people can look healthy. No correlations were found among TB- and HIV-related knowledge scores. TB transmission

knowledge was higher among those who had been in prison and among those who visited SEPs more frequently (in the last four weeks prior to the study). TB treatment adherence knowledge was higher among those who had received ARV treatment (57).

Fig. 31. Actual and modelled new TB diagnoses per year, 1985–2015



Source: Lai et al. (49).

A few studies have tried to estimate LTBI prevalence and other TB-related issues among IDUs. In the 2007 RDS study, LTBI prevalence (based on *M. tuberculosis*-specific interferon-gamma release assay – IGRA) was 10.1% in Tallinn and 4.8% in Kohtla-Järve. The factors independently associated with *M. tuberculosis*-specific interferon-gamma positivity were age (≥ 30 years), nationality (Estonian) and having been diagnosed with TB in the past (128). In a study among IDUs on substitution treatment (n=112) 8% of participants were IGRA positive. 16% had positive Mantoux tuberculin skin test (TST) (≥ 5 mm); 35% of them were also IGRA positive (129).

10.2 Discussion

10.2.1 TB trends

In general, the TB situation is improving, following similarly downward trends for HIV, but there is still a major problem with high rates of MDR- and XDR-TB. The risk groups for HIV and TB do not show considerable overlap: in general, PLHIV and IDUs are younger (< 35 years of age) than TB patients (≥ 40). Modelling shows that the number of HIV-infected TB cases should be several times higher than the actually diagnosed cases. We do not consider major underdiagnosis of TB cases as the possible reason for this discrepancy. This is supported by the low numbers of TB cases among PLHIV under care, of cases reported by IDUs, of cases diagnosed post-mortem (12 in 2009, 3% of new and relapse cases; 4 of them had TB-HIV, 3 of whom were known IDUs, according to the National TB Registry). Increasing coverage of ART in recent years may also contribute somewhat to the low TB rate among PLHIV. Nevertheless, there is some indication that ART coverage may be lower among HIV-infected IDUs than others

(adjusted to the time since HIV diagnosis – see Chapter 11) (129) and thus this group may be particularly at risk of developing active TB disease. In addition, LTBI prevalence among IDUs appears to be quite low, and this may also contribute to the low number of TB cases. Our data come only from a few cross-sectional studies; we have no population-wide estimates of LTBI prevalence, so the results should be cautiously interpreted. In any case, the measured TST-positivity of 16% in one study and 7–8% of IGRA-positivity in two studies are at the lower end compared to reports from other countries (130–136).

10.2.2 Management and care

DOTS coverage in Estonia is excellent. Coverage with TB screening services among HIV-infected under care appears to be good, but may be problematic for those not in contact with health services. IDUs (with or without HIV) may face special problems. A rising problem is the long-term treatment of MDR-TB patients, who may be smear-positive for a long time. There is a need for hospice services.

As mentioned in Chapter 9, diagnosis, treatment and care for TB in prisons are free of charge for everyone. Every prisoner is screened for TB upon entry. DOTS coverage is 100%. The cure rate in prison among those who complete treatment there is 100%. In some cases, DOTS is disrupted after release from prison. To ensure a maximum cure rate, a follow-up system should be developed and collaboration between prison and civil health services improved.

10.2.3 Special issues related to injecting drug use

An increase in TB among relatively young people, such as IDUs, who often have active social lives, may have serious public health consequences and lead to the spread of TB infection. Those with or at risk of HIV infection should therefore be closely monitored for TB and TB infection, even in a country where TB prevalence is low (137). IDUs constitute a high-risk group for whom screening, prevention of infection, diagnosis and treatment may pose particular challenges. TB services capable of engaging them (whether they are in or out of drug treatment programmes) have the potential to disrupt a significant chain of rapid TB transmission (123). Drug treatment programmes can provide a strategic setting for screening and directly observed preventive therapy and for referring IDUs to needed health care, especially for TB and antiretroviral therapies (138,139). A WHO-supported expert mission to strengthen TB surveillance among IDUs in Estonia identified several issues in SEPs that must be addressed, including low knowledge of TB among personnel, lack of system/guidelines for screening and referral of clients to TB services and problems with infection control (140).

Historically, HIV, TB and drug-treatment services in Estonia have been developed as vertical structures. Related health services are often provided by different institutions in different locations. International guidance often supports the idea of one-stop treatment, or integration and co-location of HIV/AIDS, TB and drug treatment services. Data suggest that such integration would expand services for each of these problems, increase detection of TB and HIV, improve adherence, increase drug-treatment uptake, decrease the likelihood of adverse drug events and improve the effectiveness of prevention interventions (141). On the other hand, an often quoted disadvantage of such integration is the potential for nosocomial spread of TB in areas where patients with active TB (awaiting the confirmation of diagnosis) and highly susceptible HIV-infected patients interact, such as waiting rooms. In addition, where resources are limited, services cannot be co-located when it would require major reconstruction or new construction of premises. In such cases, other measures can be taken to increase uptake and coverage of services.

Efficient collaboration between different service providers is crucial. In programmes that use additional outreach techniques, such as assistance with transportation, incentives and food vouchers, very high levels of adherence have been achieved in very hard-to-reach populations, such as people who are homeless, have severe mental illness and/or actively abuse drugs (142). In the pilot study among OST patients (143), all participants were randomly assigned into either a passive referral group (who were instructed to schedule an appointment with TB doctor themselves) or an active referral group (for whom appointments were made, reminders given and transportation provided). The TB clinic was then attended by 44% of participants (49 out of 112), 17 (30%) from the passive group and 32 (57%) from the active group. These results showed the need to implement a more active referral system for TB services for OST patients and demonstrated that TB screening can be provided with relatively small additional resources (doctors' and nurses' time, incentives, transportation, X-ray costs).

Our results also reveal that TB-related knowledge among IDUs is low. Given the absence of TB education for the general population in recent years, these findings likely reflect a population-wide lack of TB-related knowledge. On the other hand, IDUs tend to have excellent knowledge of HIV-related issues. Harm-reduction services have focused on educating them on these issues. It is high time also to pay attention to TB. It is encouraging, however, that people already in contact with certain services (infectious disease treatment, SEPs, prison) have better knowledge, and these institutions should be further supported to provide TB-related information and counselling to their clients.

Finally, a study by Atun et al. (144) estimated the impact of different policy scenarios on cumulative HIV/AIDS, TB and HIV-associated TB deaths over 20 years. According to their model, effective MDR-TB and HIV control could reduce cumulative TB deaths by 54%, cumulative MDR-TB deaths fifteenfold and cumulative HIV-associated TB deaths by half. Effective MDR-TB control, without effective harm-reduction programmes, would only reduce TB deaths by 22%. Even if MDR-TB control were poor, but harm-reduction programmes successful, cumulative TB deaths could be reduced by 34%, MDR-TB by 14% and HIV-associated TB by 56%. Even with good control programmes for drug-resistant TB, neglecting harm reduction and MDR-TB control would result in 50% more TB-related deaths than if both are effectively addressed. Effective harm-reduction programmes (which reduce the spread of HIV) reduce cumulative deaths from TB more substantively than effective MDR-TB control. Thus, harm reduction among IDUs is crucial to containing the HIV and TB epidemics.

10.3 Conclusions

As the epidemic is still concentrated, the following are key points related to TB and HIV co-infection.

- Overall TB incidence is decreasing (following the HIV trend a few years later) and HIV prevalence among new TB cases has remained stable in recent years.
- IDUs (especially those co-infected with HIV) are a new risk group for TB, so there is a need for a more vigorous approach to providing them with TB screening services. Drug treatment and SEPs can be strategic partners, so additional personnel training and funding should be provided.
- Knowledge of TB and related services should be increased among PLHIV and vulnerable groups.

In addition, the following support is needed.

- PLHIV who are not in care do not benefit from the services. Community-based organizations working with PLHIV and vulnerable groups should be trained to counsel and refer their clients to necessary health services.
- There is a need for a sustainable system to support a continuum of care for TB patients released from prison and not on probation, and those who need long-term MDR-TB treatment (e.g. hospices).

10.3.1 Data gaps

- Service monitoring should be improved; for example, no data are routinely collected to assess PLHIV and IDU screening coverage.
- No data are available on LTBI prevalence in the general population.

11. PLHIV

This chapter focuses on health services for PLHIV, trends in mother-to-child transmission (MTCT) and the prevention of vertical transmission of HIV.

The use of ART has significantly improved the survival rate of PLHIV in developed countries, which in turn is increasing the pool of people capable of transmitting the virus, which could accelerate the pace of the epidemic in many regions (145). At the same time people in treatment whose viral load is suppressed are less infectious to their sexual partners. Thus, HIV treatment is considered important from both the health and prevention points of view.

Preventing MTCT is also an integral part of HIV prevention, treatment and care. In the absence of preventive interventions, an infant born to and breastfed by an HIV-positive woman has a one-in-three chance of contracting HIV. Appropriate interventions – timely antiretroviral treatment, appropriate mode of delivery and safe alternatives to breastfeeding – can reduce MTCT to nearly zero. The Dublin Declaration committed the European Region to eliminating MTCT – defined as reducing transmission to less than 2% – by 2010. Western Europe is close to achieving the goals of virtual elimination of MTCT of HIV among infants. The challenge is to extend this success throughout eastern Europe and central Asia, where increasing HIV infection among young women is reported in a context of health and social systems weakened as a result of socioeconomic and political transition (146).

11.1 Results

11.1.1 Health care services

Health services related to HIV infection, including combined antiretroviral treatment (cART), are provided in specialized departments of both inpatient and outpatient infectious disease services, including HIV. TB and STI services are provided by separate specialists (pulmonologists and dermatovenerologists, respectively). Infectious diseases departments are part of the general, central and regional hospitals located in Tallinn, Narva, Kohtla-Järve, Pärnu and Tartu. Services are also available in all prisons through contracts with local hospitals.

Patients testing positive for HIV are referred to an infectious diseases doctor for health monitoring, treatment, counselling and contact tracing. No official referral is required (as opposed to the other specialists, for which a family physician's referral is necessary). HIV-related services are free of charge for all patients. Financing comes via the Ministry of Social Affairs (cART for all and services for the uninsured), the Ministry of Justice (cART and services for prisoners) and the EHIF (services for those with health insurance).

Drugs are procured and purchased by the Ministry of Social Affairs and distributed to the infectious diseases departments by Health Board. Patients on cART usually have to visit the hospital once a month to get a month's supply of ARV drugs. Patients who are not yet on cART usually visit the hospital once or twice a year for regular medical check-ups. The Estonian Society for Infectious Diseases has developed guidelines for HIV patient management and antiretroviral treatment monitoring.

11.1.1.1 Psychosocial support and behaviour change

Psychological support for people with HIV and their loved ones is provided by support and self-help groups (organized by PLHIV themselves and supported through the National HIV Strategy).

At the end of 2010, there were 13 support groups (organized by 6 organizations) with 396 members. There were 3676 consultations of PLHIV and their associates in 2010 (147). The first support group for PLHIV in prisons was established at the end of 2002. Now support groups are organized in all prisons. Behaviour change interventions (positive prevention) take place in support groups, infectious diseases departments and SEPs. No data are available on the outcomes of these interventions or on the sexual behaviour of PLHIV in general. Some data from RDS studies indicate that IDUs aware of their HIV infection tend to take more risks in sexual relationships and drug use than their non-infected counterparts and the HIV-infected IDUs who are not aware of their status (112).

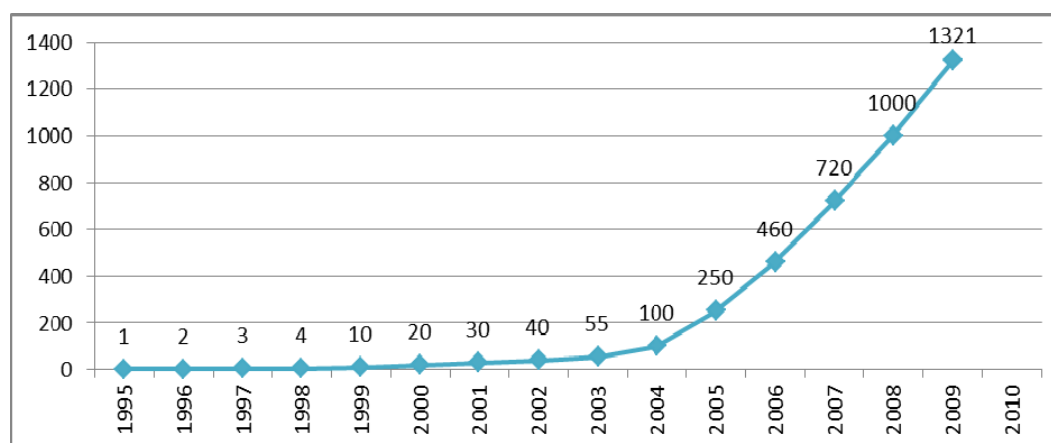
Adherence counselling is provided in all infectious diseases departments. In spring 2010, a pilot programme to support ARV adherence among IDUs was launched in the West Tallinn Central Hospital Infectious Diseases Clinic. ARV drugs and methadone are provided daily in a directly observed method in infectious diseases outpatient department. A case-management system is also under development (with support from the National HIV Strategy) in the West Tallinn Central Hospital Infectious Diseases Clinic, Ida-Viru Central Hospital and Narva Hospital. Through case-management counselling on social issues, support for adherence and referrals to other social services are provided. Extra staff for these tasks include social workers and nurses.

11.1.1.2 ART

The number of people receiving cART has been growing steadily (Fig. 32): 39 PLHIV in prison received cART in 2006 (7% of incarcerated PLHIV), 109 did so in 2007 (18%) and 195 in late 2009 (41%). Over the years, several estimates have been made of the number of people in need of ARV treatment. Fig. 33 shows the actual numbers of people on cART, findings from the most recent modelling exercise (49), and goals of the National Strategy. The gap between people in needing treatment and those receiving it is significant: 1000 people were in treatment in 2008, and the number in need was 3000. If the trend from 2004–2008 continues, the model shows that between 2010 and 2015 the gap will be closing, with more equitable access to cART.

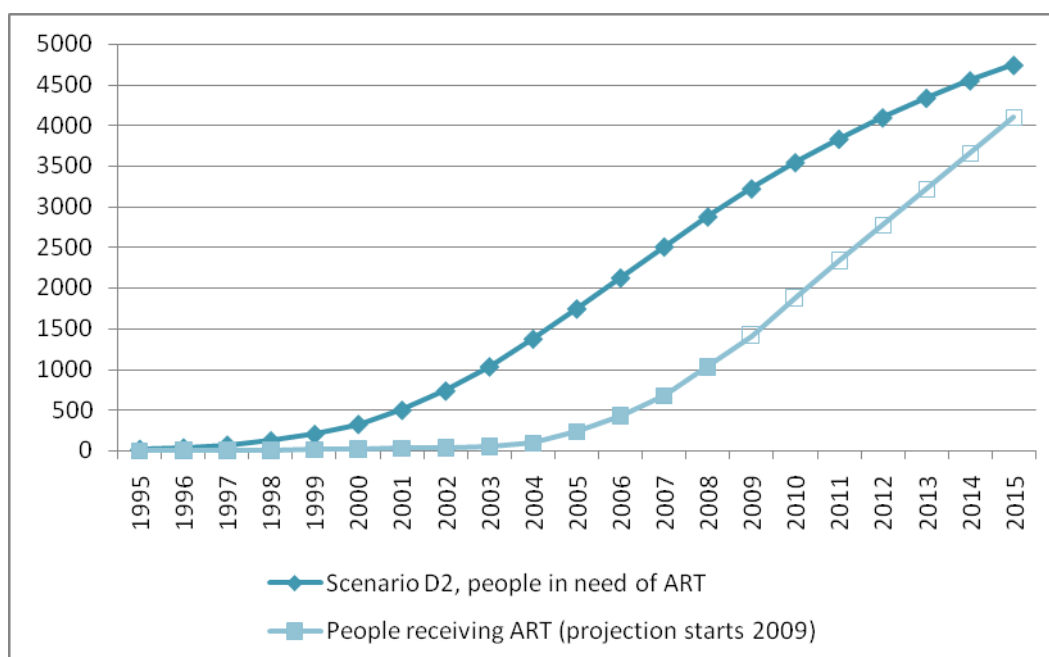
There is no central data collection on rates of discontinuation, adherence to cART or viral resistance among all PLHIV in treatment, though there are resistance data for those starting treatment.

Fig. 32. PLHIV on ART, 1995–2010



Source: Health Board (6); Ustina (56).

Fig. 33. Modelled need for first-line ART, compared to observed ART provision and linear projection of the most recent provision trend



Source: Lai et al. (49).

There is no central data collection on the present/life-time status of injecting drug use and possible route of HIV transmission of those on cART. Data from surveys indicate that the percentage of HIV-infected IDUs on cART is low. Thus, among 2007 IDU RDS study participants, 13.2% in Tallinn and 25.8% in Kohtla-Järve had been on cART during the previous six months (of those who reported being HIV-infected) (12). Among SEP visitors in Tallinn 20.9% of those who reported having HIV had been on cART during the previous six months (57).

11.1.1.3 Hepatitis B and C

Diagnosis and treatment for hepatitis are provided by infectious disease doctors and gastroenterologists. The services are free of charge for all PLHIV with health insurance. Hepatitis B vaccination has been on the recommended immunization list since 2004 (all children are vaccinated with a three-dose series in the first 6 months of life). In prisons hepatitis B testing is recommended to all prisoners, and those testing negative are offered hepatitis B vaccination (free of charge). According to a 2008 study of 450 PLHIV, 48% in outpatient care in Tallinn and 9% in Ida-Virumaa county had had hepatitis B, and 72% and 55% had had hepatitis C (data from medical records), respectively. The rates of both HCV and HBV were higher among PLHIV reporting injecting drug use during the last month (25).

11.1.1.4 STIs

There are no specific STI testing services for PLHIV. Services for the general population are free of charge for those with health insurance. STI services are free of charge for all prisoners. There are no data on STI rates among PLHIV.

11.1.2 AIDS and death

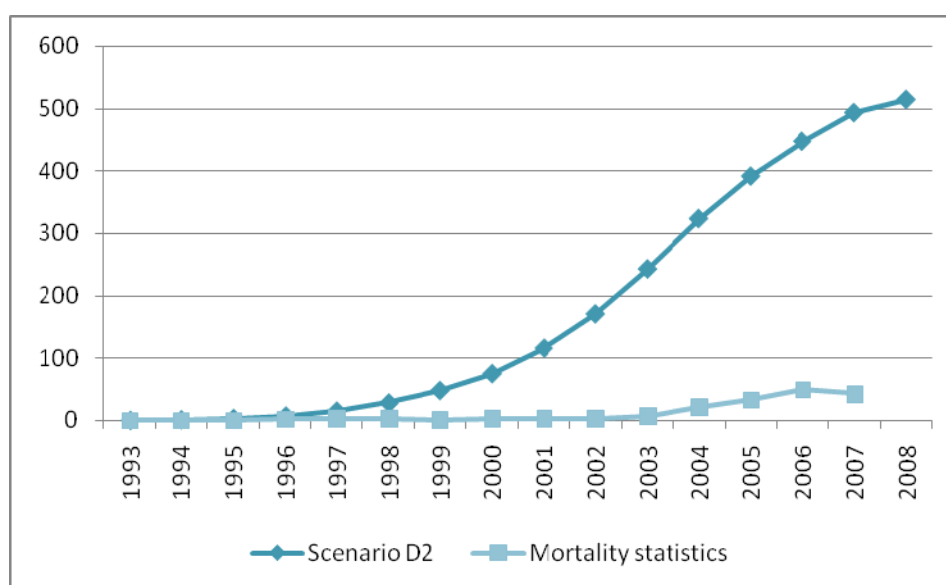
The first AIDS case (International Statistical Classification of Diseases and Related Health

Problems, tenth revision (ICD-10) codes B20–B24) was diagnosed in 1992. In Estonia, 61 people (5 per 100 000) were diagnosed with AIDS in 2008, 38 (3 per 100 000) in 2009 and 25 (2 per 100 000) in 2010. The total number of people diagnosed by the end of 2010 was 315. TB is the main AIDS-defining disease in Estonia (see Chapter 10). In 2001–2007, 44% of AIDS cases were diagnosed within 12 months of HIV diagnosis (Zilmer K, personal communication).

Data on mortality in PLHIV are contradictory and probably underestimate the real situation. Thus, the number of people who died because of AIDS was 263 by the end of 2009 (Statistics Estonia). According to the death registry, 12 PLHIV died from other causes (age range: 26–53) in 2000–2009. According to the NHRL, of 179 PLHIV who died in 1987–2007, 57 died due to AIDS, 15 were AIDS patients who died from other causes and 107 died from other causes (56).

Fig. 34 presents findings from the most recent modelling exercise on the number of people who have died because of HIV-infection-related causes (49). The modelling takes into account the real coverage of cART until 2008. Fig. 35 presents the absolute number of AIDS cases (ICD codes B20–B24) and deaths, according to Statistics Estonia, in 1987–2009.

Fig. 34. HIV-related deaths per year, modelled versus registered, 1993–2008

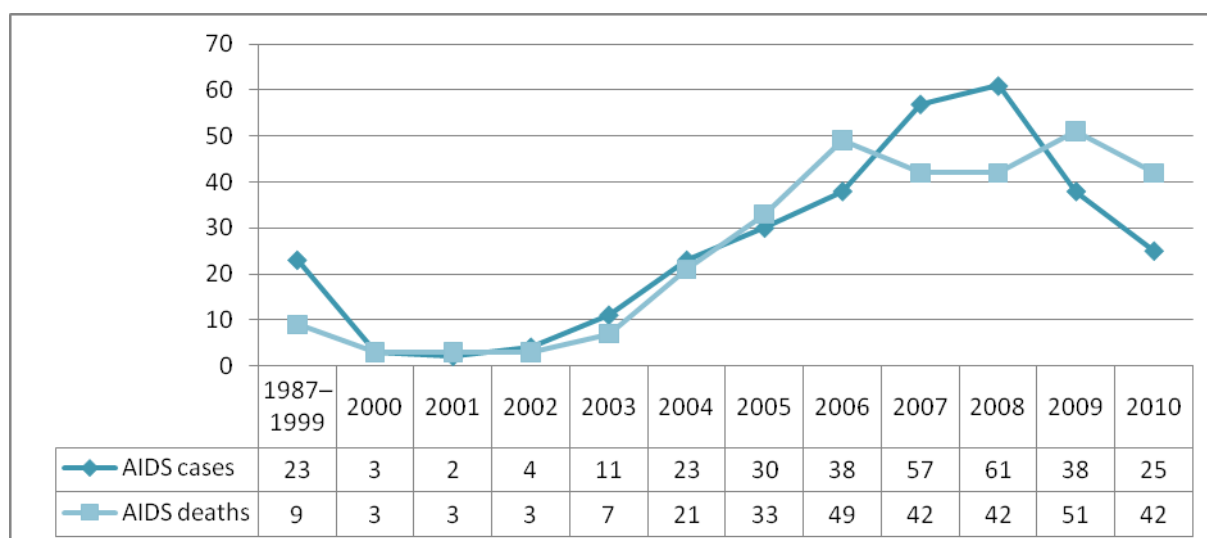


Source: Lai et al. (49).

11.1.3 Vertical transmission

The first known birth from an HIV-infected mother took place in 2000. A total of 40 cases resulting from MTCT have been diagnosed since 2000. In 2000–2007, 467 HIV-infected women gave birth and 25 cases of vertical transmission were registered, an overall vertical transmission rate of 5.4% (no data available for 2008–2010). Vertical transmission accounted for 0.5% of all newly diagnosed cases in 1988–2010 (1.5% in 2008, 0.7% in 2009, 0.5% in 2010) (6), i.e. representing a decrease in vertical transmission over time (Table 17).

Fig. 35. AIDS cases and deaths (ICD-10 codes B20–B24), 1987–2010



Source: Health Board (6); Statistics Estonia (47).

Table 17. Babies born to HIV-infected women and vertical transmission rates, 1987–2010

Year	HIV-infected pregnant women	Babies born to HIV-infected women	HIV-positive babies	
			No.	%
1987–1999	ND	0	0	0
2000	13	3	0	0
2001	52	20	3	15.0
2002	74	16	2	12.5
2003	119	62	3	4.8
2004	127	82	7	8.5
2005	133	88	4	4.5
2006	126	105	4	3.8
2007	131	91	2	2.2
2008	ND	ND	8	–
2009	ND	ND	3	–
2010	ND	ND	2	–

ND = no data.

Source: Health Board (6); Ustina (56).

11.2 Discussion

So far, the numbers of officially registered AIDS cases and AIDS-related deaths remain very low despite the low overall ART coverage. On the other hand, a modelling exercise suggests that in 2007 alone there were about 500 HIV-related deaths in the country (49). HIV infection as a supplementary cause of death or co-infection is obviously underreported to the death registry. The validity of death data from different sources is low, so it is not possible to estimate how

many HIV-infected people have died from causes other than AIDS. Low registration by itself does not fully explain the major differences in the registered versus modelled death rates. Another factor could be PLHIV have a longer actual survival time than the model default of 10 years (49). In addition, there could be some double reporting of cases before 2008, when anonymously diagnosed cases were included in the official number of newly diagnosed HIV cases. It is not possible to estimate how much these various factors influence the real outcome.

The number of people on ART has increased slowly but steadily over the years, but a large number still await treatment. Reasons for this may include that people do not turn to infectious disease doctors immediately after HIV diagnosis, are diagnosed late or refuse to start treatment (K Zilmer, personal communication). Another reason could be a relatively higher threshold for receiving HIV-related health services; people have to navigate the health system and may not be motivated to seek treatment and care.

Our findings suggest that coverage of IDUs by ART and HIV-related health services may be disproportionately low in general. Lack of health insurance, the need to pay fees, difficulties in negotiating the health care system and other problems may all be barriers to access. A comprehensive approach that includes drug-abuse treatment, HIV testing, treatment of infections and care holds the greatest promise for screening, treating and curing IDUs with HCV and TB infections because this would ultimately reduce the spread of the diseases in the population (141,148,149).

In general, IDUs are often wary of traditional medical settings, preferring to use emergency rooms intermittently and only when sick. Stigma, fear and multiple co-morbidities may contribute to this reluctance, resulting in delayed entry into care and treatment (148). Research on stigma and discrimination in Estonia shows that up to 28% of PLHIV in outpatient care have heard negative and/or stigmatizing comments from health care workers in the previous 12 months. Many PLHIV prefer not to reveal their status, so only 36% of those in care have told their family physicians about their status (25).

The United States Public Health Service and the Infectious Diseases Society of America have recommended incorporating prevention counselling into the routine medical care of HIV-infected patients to reduce risk-taking behaviours associated with HIV transmission, as well as routine screening for STIs (150). The percentage of unwanted pregnancies among opioid-dependent women has been found to be several times higher than among general population in Estonia. Interventions are sorely needed to address the extremely high rate of unintended pregnancy among such women. Drug treatment programmes are likely to be an important setting for such interventions (113,114). The country has no special approach to sexual health promotion and STI treatment and prevention for PLHIV. Considering that the majority of PLHIV are of reproductive age, there is a need for counselling (on preventing unwanted pregnancies, STIs and HIV transmission to sexual partners) and improved access to STI services for those lacking health insurance.

HIV vertical transmission rates have remained below 10%, and have declined since 2004. Thus, the programmes to prevent MTCT can be considered successful. Still, considering the high numbers of young HIV-infected women (who are IDUs or otherwise marginalized) more attention should be paid to vulnerable populations and missed opportunities for further reducing the MTCT rate.

11.3 Conclusions

Based on the findings and discussion, the following are needed.

- Considering the high rates of late diagnosis, treatment delay and low ART coverage, we recommend scaling up HIV testing in all settings (health care and community based), developing more active partner counselling and contact tracing services, more active referral systems to infectious disease services, support for adherence to treatment and intervention monitoring. In this process special attention should be paid to vulnerable populations. One solution could be implementation of “one-stop shop” principles, especially for vulnerable groups such as IDUs.
- Behaviour change interventions (positive prevention) for PLHIV are very limited in Estonia, so counselling on sexual and drug-use behaviour and access to sexual health and STI services for PLHIV should be improved.
- Hepatitis B vaccination is recommended for those PLHIV who have not been vaccinated, and HCV treatment for those who do not have health insurance.

11.3.1 Data gaps

- Little is known about sexual and drug-use behaviours of PLHIV.
- Service monitoring should be improved (ART outcomes, drug resistance, general follow-up of HIV patients).

12. MSM

The term MSM refers to men who see themselves as homosexual or bisexual, as well as those who consider themselves heterosexual or having some other sexual identity, but occasionally have sex with men. In this population group, a major risk factor is the failure to use a condom during anal sex with a non-regular partner of unknown HIV serostatus. Some MSM are married or also have sex with women. If infected, they can transmit HIV to their female partners (151,152).

One third of new HIV cases in western Europe in 2004–2008 were registered among MSM. Since the late 1990s, numbers of newly diagnosed HIV infections in MSM have increased in most western European countries. They have also increased in eastern Europe, although very low numbers of such infections have been officially registered (0.4% of all cases) (153,154).

This chapter examines the trends in sexual risk behaviour among MSM and the extent of homosexual transmission of HIV in Estonia.

12.1 Results

12.1.1 Population

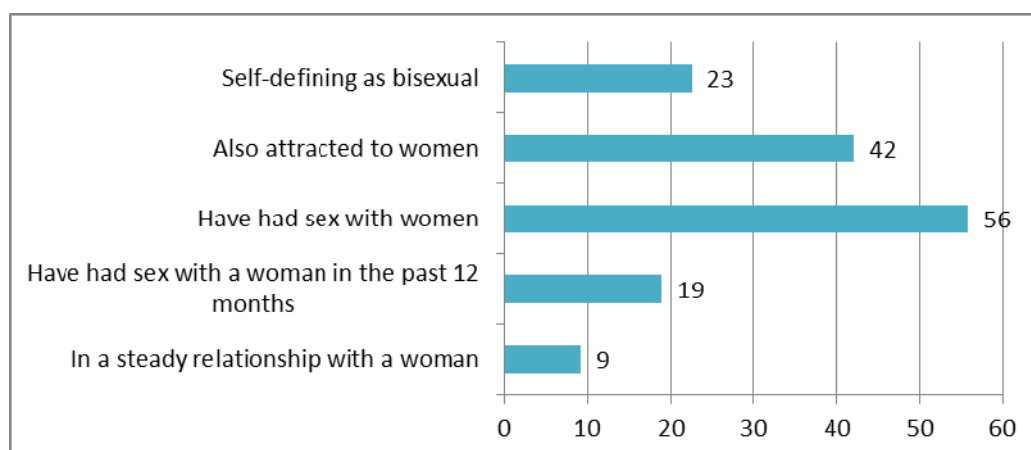
General population studies in Estonia have not sought information for calculating the size of the MSM population. The youth study conducted in 2010 included a question on having had sexual intercourse with a same-sex partner, with 5% of the sexually active 14–18-year-olds and 2% of 19–29-year-old men responding affirmatively (9). In 2007 the question was asked about the previous 12 months, with 1% of both groups saying they had had intercourse with a same-sex partner during that period (10). Studies of various countries show different results on homosexuality and bisexuality, depending on whether questions address having sex with a same-sex partner ever, during the last 5 years or the last 12 months; self-identified sexuality; etc. Various data sources suggest that about 2–4% of the sexually active male population is predominantly homosexual (155–157).

In 2005 and 2007 studies via gay-oriented web sites, one quarter of the MSM questioned (sample size: 232 in 2005, 361 in 2007) said that they were bisexual and about one quarter had also had sex with women in the past six months (19,20). In the EMIS survey (sample size: 612), a similar percentage defined themselves as bisexual; more than half of participants had had sex with a woman and 42% said that they were also attracted to women (Fig. 36). More than half (58%) were attracted only to men (21).

Data from several studies provide information for assessing the overlap between MSM and IDUs: whether MSM had injected drugs during previous four weeks (18). In the EMIS survey, 2% of MSM stated that they had injected drugs (21). In the 2008 HIV rapid testing pilot study (where MSM were tested in gay-oriented bars and an information centre), 5 (6%) of the 79 bisexual or homosexual male participants had injected drugs in the past 12 months, and 4 of them participated in the study at the syringe exchange site (58). In the 2007 IDU study (sample size: 350 in both towns, RDS method), 2% of the male participants (n=290) in Tallinn said they were homosexual or bisexual; nobody made such a statement in the sample of Kohtla-Järve (12).

Chapter 13 has information about overlap with the sex-worker population.

Fig. 36. MSM having sex with women (%), 2010

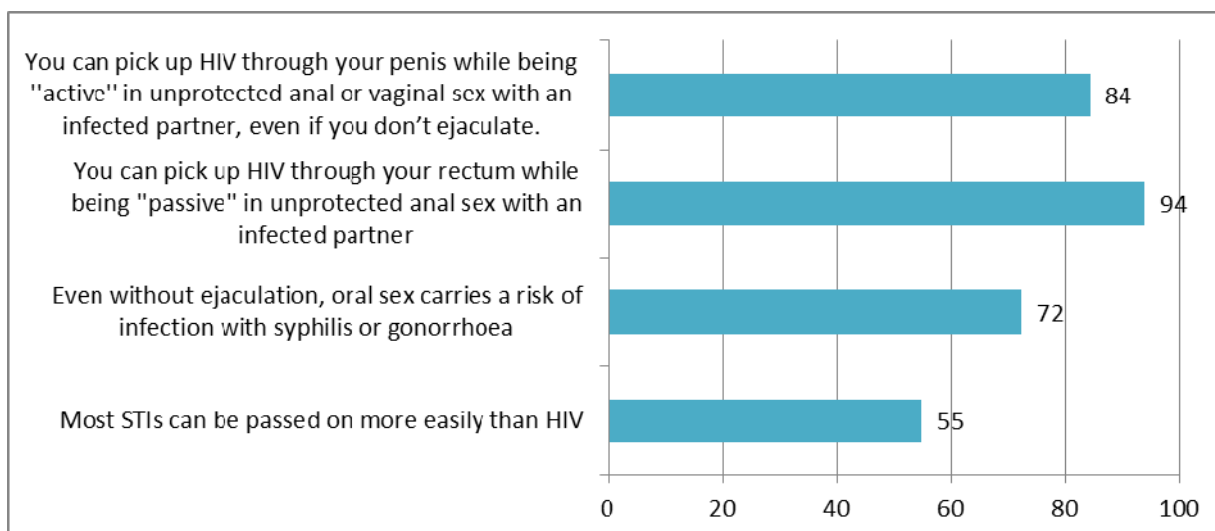


Source: EMIS (21).

12.1.2 Knowledge

More than three quarters (79%) of MSM questioned online in 2007 answered all four questions on HIV transmission correctly;⁴ the data did not differ from the 2005 study (20). In the EMIS survey in 2010, over 80% of MSM were aware that HIV can be transmitted through receptive and insertive anal sex. Fewer men knew about STI transmission (see Fig. 37) (21).

Fig. 37. MSM correctly identifying true statements on HIV and STI transmission (%), 2010



Source: EMIS (21)

12.1.3 Sexual behaviour

12.1.3.1 Sex partners

Of MSM questioned in 2010 (21):

⁴ Related to always using a condom, one uninfected and faithful partner, injecting with a syringe that has been used before and whether a healthy-looking person can have HIV.

- 65% had sex with a steady male partner during last 12 months; 41% of them had more than one steady partner and 92% of them had anal intercourse with the steady partner;
- 76% had sex with a non-steady male partner during the last 12 months; 64% of them had more than 2 non-steady partners and 38% had at least 5 partners; and 82% of them had anal intercourse with the non-steady partner.

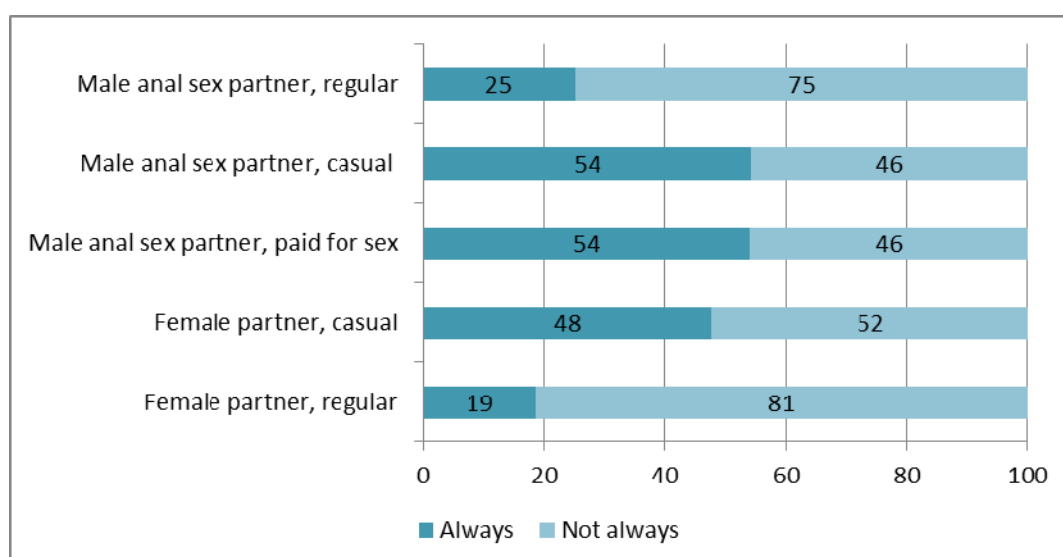
MSM in the group aged 35–44 had more non-regular partners than the group aged 15–24. Of those who had non-regular partners, 54% of 15–24-year-olds and 73% of the 35–44-year-olds had had more than 2 non-steady partners during the previous year, as had 65% of the groups aged 25–34 and 45 and older.

As mentioned, a significant percentage of MSM surveyed online also had female sex partners. In the 2010 study, about one quarter defined themselves as bisexual, one fifth had had sex with a woman during the past year (32% of them with more than one) and 42% were also attracted to women (21). In 2007, 21% had also had female sex partners in the past six months; 62% had had one partner; 24%, 2–3 partners; and 15%, at least 4. Of those having sex with women, 87% had regular female partners, 51%, casual female partners, and 24% had paid for sex with a female partner (20).

12.1.3.2 Condom use

About half of those who had casual male or female partners or paid for anal male sex in the past six months had not always used a condom (Fig. 38) (20). Of the total sample of 361 MSM, 25% had risked getting HIV or STIs during past six months by not always using a condom with casual partners. The level of condom use with different partners did not change across the online studies in 2004, 2005 and 2007 (18–20).

Fig. 38. Condom use with various partners in the past six months (%), 2007

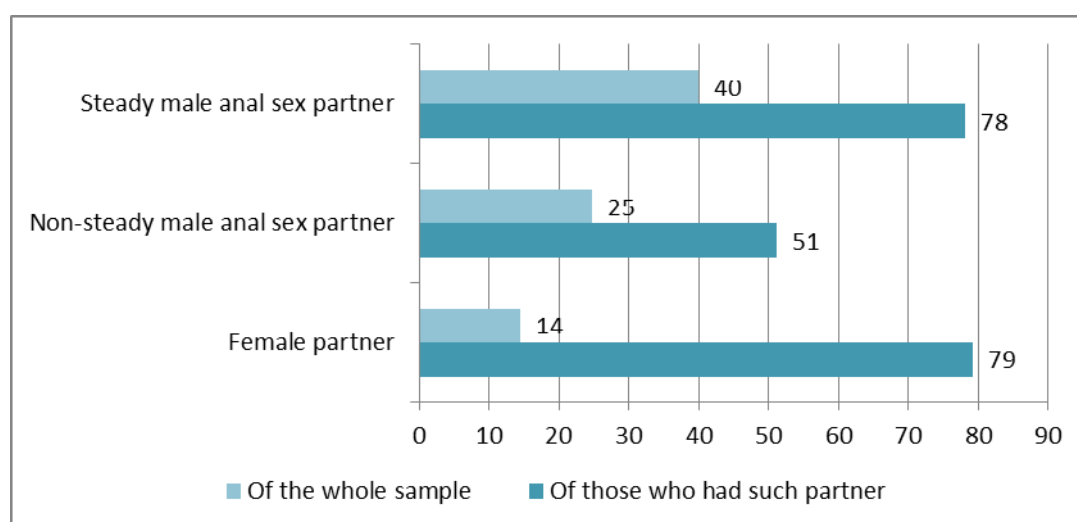


Source: Lõhmus & Trummal (20).

Fig. 39 shows the percentage of MSM in the 2010 survey who had not always used a condom during sexual intercourse with steady and non-steady male partners and female partners in the previous year. From the whole sample of 612 MSM, 25% put themselves at risk of HIV or STIs during unprotected intercourse with a non-steady male partner. Half of them did not use a

condom with several non-steady partners. Condom use with non-steady partners does not differ significantly among age groups. Seven per cent of the sample had sex with a steady male partner as well as a female partner. More than half (53%: 4% of the entire sample) had not always used a condom with either gender. Nearly a tenth (9%) of MSM had sex with a non-steady male partner, as well as a female partner, in the past year, and 47% (4% of the whole sample) had not always used a condom with either gender.

Fig. 39. MSM who did not always use a condom with various partners in the past 12 months (%), 2010



Source: EMIS (21).

Nearly half (47%) of EMIS respondents had had anal sex with a male partner outside Estonia with a man not living in Estonia, 25% of them during the past 12 months. Germany, Finland, France, Latvia and the United Kingdom were the most frequently mentioned locations. The last time they had sex in another country, 62% had had anal intercourse and 30% of them (4% of the whole sample) did not use a condom.

12.1.4 HIV prevalence

There are no data on what percentage of the registered PLHIV in Estonia represent MSM, IDUs or sex workers. It has been assumed that most of the cases registered before 2000 were among MSM. Four different data sources give some information on HIV transmission in this subpopulation, and they suggest the prevalence can be around 2–3% (Table 18). In ACCs (where everyone tested fills out a questionnaire), 8% of MSM were found to be HIV positive in 2009; but in this case those who are tested are mostly people concerned that they might be infected. Of all male visitors who filled the questionnaire, 9% said that they had had sex with a same-sex partner during the past 12 months.⁵

Of the MSM who tested positive in ACCs in 2009, 2 of the 7 had injected drugs, as had 1 of the 11 who said they were HIV infected in the 2010 EMIS study (5,21). In the EMIS study, none

⁵ In 2009 a new questionnaire for the ACCs was pilot-tested and clients started to fill out the questionnaire themselves. Before that, it had been filled in by the counsellor and fewer men said that they were homosexual or bisexual (3–5% in 2005–2008), probably leading to some underestimation of the number of MSM clients. In 2005–2008, 1–6% of homosexual and bisexual men per year were diagnosed as HIV positive (n=1–6).

was ever diagnosed with hepatitis C and one or two had been diagnosed with syphilis, gonorrhoea or chlamydia. None had been paid for sex with a man during the past 12 months. Five of the nine HIV-infected MSM answering the question had been diagnosed before 2000, and four, between 2003 and 2008.

Table 18. HIV prevalence among MSM

Study	MSM sample size	HIV prevalence	
		No.	%
EMIS study 2010, of the whole sample <i>self-reported prevalence</i>	605	11	1.8
EMIS study 2010, of the MSM who ever received HIV test result <i>self-reported prevalence</i>	364	11	3.0
Rapid testing piloting, 2008	79	1	1.3
RDS study, 2007	59	1	1.7
ACCs, 2009	92	7	7.6

Sources: ACC data (5); EMIS (21); Trummal, Johnston & Lõhmus (22); Rüütel & Parker (58).

Another source of data is a 2008 study among PLHIV who visited infection specialists in Tallinn, Narva and Kohtla-Järve hospitals (sample size: 450). Of the male respondents, 4% (n=9) said that they were homosexual or bisexual; 7% (n=16) stated that they did not identify their sexual orientation, and 8% of the whole sample did not respond to this question (25). It can be assumed that large portion of the respondents who answered “have not identified myself” or did not respond to the question were also MSM. Six of the nine homosexuals or bisexuals stated that they had regularly injected drugs at some point. Four of the MSM had been diagnosed with HIV three to five years previously, and five more than five years previously.

In the 2007 Tallinn IDU study, 5 men out of 290 said that they were homosexual or bisexual; 1 of them had HIV (12).

Exactly half of the MSM who participated in the 2007 online study had been tested for HIV, the same as in the 2004 and 2005 surveys (18–20). In the 2010 EMIS, 60% of the respondents said that they had been tested for HIV; 32% had been tested in the past 12 months. Less than half (43%) had ever been tested for STIs, and 21% had been tested in the past year; 2% of the sample had had syphilis (5% of those who had been tested) and 9% had had gonorrhoea or chlamydia (18–19% of those tested for STIs); 1% (n=8) had been diagnosed with hepatitis C and 2 had injected drugs (21). Nearly one tenth (8%) of the 79 homosexual and bisexual men who were contacted during the study for piloting HIV rapid testing in 2008 had had an STI in the past year (58).

12.1.5 Prevention activities

Before the GFATM programme (2004–2007) started in Estonia, few information materials on safe sex for MSM had been produced; one gay sauna (opened in 2001) distributed condoms and an information centre for sexual minorities existed in Tallinn in 1995–1996. During the GFATM programme, a gay and lesbian information centre was opened in 2004 in the capital, and condoms, lubricants and information materials were distributed in all gay-oriented bars, clubs

and saunas. In total, 458 600 condoms were distributed during the programme. The information centre was closed and the free distribution of condoms stopped in 2009, as a result of budget cuts and too little interest in the centre. Testing of MSM takes place in the general health care system or ACCs; there is no separate testing service for this target group.

Of MSM questioned in the 2010 EMIS, 70% said they had seen or heard information about HIV or STIs specifically for MSM during the past 12 months, including information sources outside Estonia (21).

12.2 Discussion

According to the data from different sources, HIV prevalence among MSM in Estonia is probably around 2–3%. At the same time, one should consider that studies may be underrepresentative of HIV-infected people. Nearly half of homosexual and bisexual men have never been tested for HIV and this has not changed much throughout the various online surveys. Even fewer men have been tested for STIs.

The level of consistent condom use with non-regular partners has not changed in the period of various online studies. About half of the MSM with non-steady partners do not always use a condom during anal sex. Every fourth one of the MSM surveyed in 2010 had put himself at risk of HIV or STIs during casual male anal sex in the past year, half of them with more than one non-steady partner. That is a favourable context for transmission of infections.

About 2% of men participating in studies have ever injected drugs, similar to the general population. Two per cent of 19–29 year olds in the 2010 population survey said they had injected drugs (10). Most of the small numbers of HIV-infected MSM studied have never injected drugs. According to those data, MSM in Estonia do not seem to be at significant risk of contracting HIV by injecting drugs with non-sterile equipment. At the same time, one should consider that Internet studies underrepresent people with lower social status and limited access to electronic means of communication and information.

In addition, Estonian MSM have sex in other countries. According to the last study, one in four did so in the past year and a third of them did not use a condom the last time they had anal sex outside Estonia with a foreigner. Respondents mentioned western European countries with higher HIV prevalence among MSM more frequently among places where the most recent sex outside Estonia had taken place. Studies of other countries have identified the vulnerability of travellers to unsafe sex, and mass tourism is a major factor in the international transmission of HIV (158–160). Findings from across industrialized countries confirm an increasing connectivity within the global MSM community, which is decreasingly defined by geographical boundaries and, in the era of the Internet and easier foreign travel, increasingly linked by shared interests and social and sexual networks. This was demonstrated in the nearly simultaneous outbreaks of syphilis and lymphogranuloma venereum among MSM in Europe and the United States in 2003–2004 (161,162). Further, attention should be paid to making MSM aware of the risks of unsafe sex abroad, to help prevent HIV/STI transmission to the Estonian MSM community from countries with higher prevalence.

Interventions targeting MSM have been fragmented and, for the last two years, there have not been any national-level activities. There is a lack of MSM-friendly STI testing services (including anal swabs to detect rectal infections). At the same time, the level of risk behaviour

among MSM needs attention. According to UNAIDS, in case of a low-level epidemic among MSM, the essential package of services should be ensured and advertised, at least in major urban areas (70). A minimum set of interventions for that target group should include safe access to information and education about HIV and STIs, condoms, water-based lubricants, HIV testing and counselling and STI services (163).

Information for MSM given out so far has centred on male-to-male sex. Data show that many MSM also have sex with women. Every fifth respondent to the 2010 EMIS had had sex with a female partner during the past year. One in ten had had non-steady male partners and female partners and half of them had not always used a condom with partners of either sex. EMIS also appears to show that fewer bisexuals than homosexuals are tested. More than half of men who identified themselves as bisexuals had never been tested for HIV or STIs (59% for both), while the figure for homosexuals were 30% and 48%, respectively (21). Targeted messages should address men with partners of both sexes. Information is needed to understand the factors hindering service use by bisexuals, which may be related to hiding their sexual orientation and being afraid of discrimination. According to WHO, every country should conduct formative research focusing on the impact of stigma and discrimination on MSM. Understanding the barriers MSM face in their sexual and social lives will be a key to identifying what works to control HIV and STI transmission in different settings (163).

12.3 Conclusions

- There is no evidence of high HIV prevalence among the MSM population in Estonia. Overlap with the IDU population is probably small.
- Half of MSM do not always use a condom during casual anal sex, and that level is not changing according to the available study data. This can lead to increased transmission of STIs and HIV in that subpopulation.
- A significant percentage of MSM have unprotected sex in countries outside Estonia, which can increase HIV transmission at home.
- Since a significant percentage of MSM have female partners, an HIV/STI transmission bridge can form between this subpopulation and the general population if HIV starts to spread more rapidly among MSM.
- This information warrants discussion of HIV/STI prevention strategies, as no interventions targeted at MSM were included in the activities of the National HIV Strategy in recent years.

12.3.1 Data gaps

- Studies on MSM have been conducted several times, starting from 2004. Today only biased samples are available (mostly MSM using gay-oriented web sites) and the effort to use RDS in this target group has not worked.
- Since HIV/STI prevalence cannot be measured in online studies (which have worked well for behavioural data collection) and only self-reported data can be secured, there is no good information on the real prevalence of HIV/STIs among MSM.
- Qualitative information would be needed to understand the barriers that MSM face in their sexual lives and in service use.

13. Sex workers

Sex work is the provision of sexual services for money or items of monetary value, such as drugs. Sex workers may be male, female or transgendered, and the boundaries of the work are vague, ranging from erotic displays without physical contact with the client to high-risk unprotected sexual intercourse with numerous clients. Sex work can be classified as either formal (organized) or informal (not organized). Generally, formal sex work is establishment based and managers or pimps act as clearly defined authorities and intermediaries between the worker and the client. Most sex workers do not define themselves as such and consider it a temporary activity. This variability results in a spectrum of implications for public health and health service provision (164–166).

A high rate of partner change suggests that sex workers are more vulnerable to infection and, if infected, may be more likely to transmit disease than people with fewer partners (166). Through the exchange of sex for drugs or its use to support drug habits, the two pathways of HIV transmission are linked (165).

This chapter discusses HIV prevalence and risk behaviours among sex workers, links between them and the general population, overlap between sex workers and IDUs and MSM, and the risk of increasing sexual transmission of HIV through sex work.

13.1 Results

13.1.1 Population

According to the Estonian Penal Code, it is criminal to mediate prostitution (including renting a room for prostitution or contributing in other ways), to influence a minor (under 18) to commence in prostitution or otherwise assist prostitution involving minors. Taking money for sex or to buy sex is not punishable.

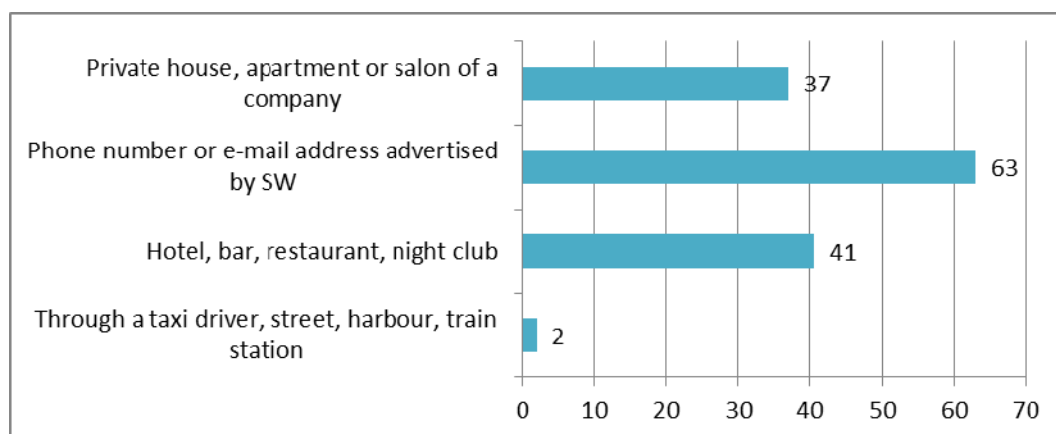
No study has been done to estimate the size of the sex-worker population in Estonia. According to expert opinion from the Elulootus Health Centre and the NGO Lifeline, the number of sex workers has decreased during recent years and could be about 1500: half of the number estimated in 2006. This decrease is explained by the economic recession (fewer tourists and clients, need to reduce prices) and police efforts to close brothels. Few big brothels remain in Tallinn. Instead of working in big brothels, many sex workers seek clients through online advertising and in newspapers. They tend to be organized in small groups in rented flats where they meet the clients. Others find clients in hotels, nightclubs and bars. According to outreach specialists, this group is especially hard to reach since they do not openly present themselves as sex workers. Recognizable street sex work is only found in one place in North Tallinn, where around twenty women – many of them IDUs – solicit clients (167).

Visitors at the Elulootus Health Centre testing site in Tallinn fill out a questionnaire each time they come for testing (915 questionnaires in 2009) (42). Most of the sex workers coming to Elulootus find their clients through advertising phone numbers and e-mail addresses on their own (Fig. 40).

Sex workers are older than some years ago and, according to experts, the number of minors selling sex has decreased substantially (167). The age distribution of new visitors to the Health Centre in 2009 (n=184) was 0.4% aged 19, 55% aged 20–29; 41% aged 30–39 and 4% aged 40

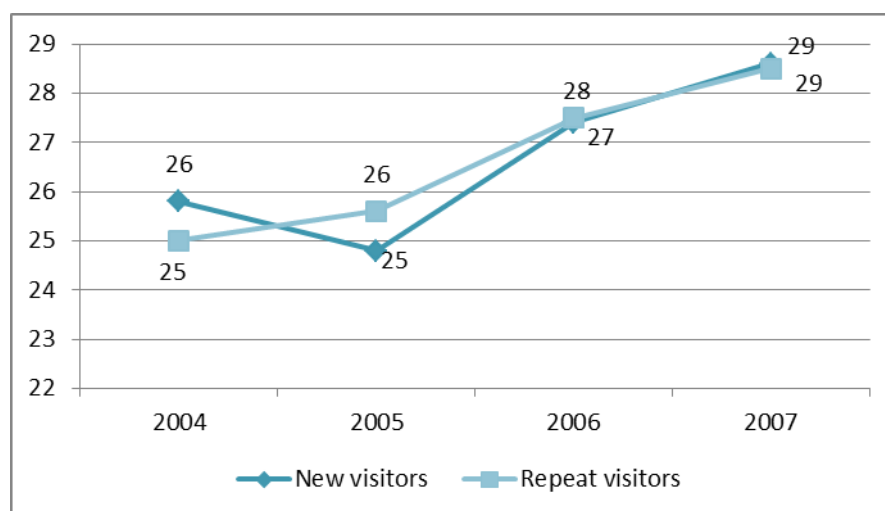
and older (the oldest being 45). The corresponding figures for 2006 (in, n=130) were: 7%, 62%, 29% and 3%, respectively. The increase of the mean age from 2004 to 2007 is given in Fig. 41 (visitors to the Elulootus Health Centre were not questioned in 2008). Most sex workers are Russian speakers. According to a study conducted in 2005–2006 and Health Centre data, about a tenth are Estonians.

Fig. 40. Means of client contact among visitors to the Elulootus Health Centre in the past four weeks (%), 2009



Source: Programmatic data from STI services (42).

Fig. 41. Mean age of visitors to the Elulootus Health Centre (%), 2004–2007



Source: Programmatic data from STI services (42).

Twenty-eight per cent of Elulootus Health Centre visitors in 2009 did not live in Tallinn. They were mainly from Ida-Virumaa county (22%) and other parts of country. Nine per cent lived mainly abroad. Sex workers who live in the north-east work mainly in Tallinn or abroad (167). This information was also corroborated through Elulootus outreach to people selling sex to truck drivers in the Russian border town of Narva in 2008. Elulootus managed to find and establish contact with 27 sex workers during three outreach rounds, 63% (n=17) of whom reported that they sell sex mostly in the capital or abroad and that soliciting truck drivers in Narva was an occasional activity (168).

13.1.1.1 Overlap with the IDU population

Around one tenth of the female sex workers studied (Elulootus visitors and sex worker study 2005–2006) reported injecting drug use (Table 19) (23).

Table 19. Injecting drug use prevalence among samples of female sex workers

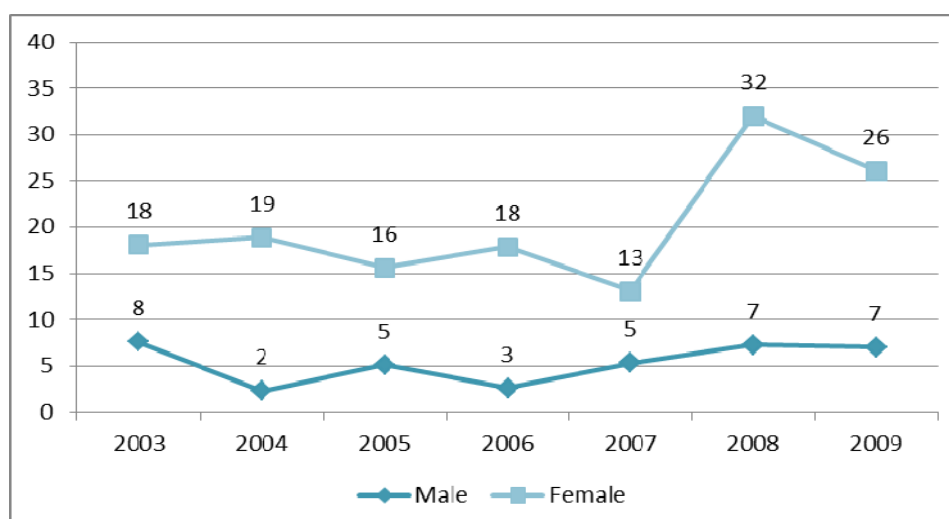
Study	Sex worker sample size	Prevalence	
		No.	%
New visitors to the Elulootus Health Centre 2009, injecting drug use during lifetime	174	19	10.9
Study in Tallinn 2005–2006, injecting drug use in last 4 weeks	227	15	6.6

Source: Programmatic data from STI services (42); Trummal, Fischer & Raudne (23).

Other data come from IDU studies. In 2009, one quarter of the repeat female clients of SEPs (sample size: 89) said that they had received money, drugs or goods in exchange for sex during the past four weeks (35). That percentage was higher in north-east Estonia (38%) than in Tallinn (11%), and increased significantly in 2008 (Fig. 42). In the 2007 RDS study, 11% of 56 female IDUs in Tallinn and 16% of 49 in Kohtla-Järve said that they had received money for sex at some time in their lives, a majority of them also in the past 6 months (data for the two towns do not differ significantly). In a 2010 RDS study of IDUs in Narva, 18% of 85 female respondents said that they had received payment for sex, more than one third of them in the past month. Many of those IDUs are not in contact with organizations dealing with sex workers and do not consider themselves to be such workers.

Some sex work can be also found among male IDUs. In the past three years, 5–7% of the repeat male SEP clients (sample size: about 300) had received payment for sex in the past month (Fig. 41). In the 2007 RDS study, fewer than 1% of male IDUs in Tallinn (n=294) and Kohtla-Järve (n=299) said they had received payment for sex during their lives. In the 2010 Narva study, 3% of male IDUs (n=266) had ever received payment for sex.

Fig. 42. Repeat SEP visitors receiving payment for sex in the past four weeks, by gender (%)



Source: Lõhmus & Trummal (30–33); Murd & Trummal (34–35).

13.1.1.2 Overlap with the MSM population

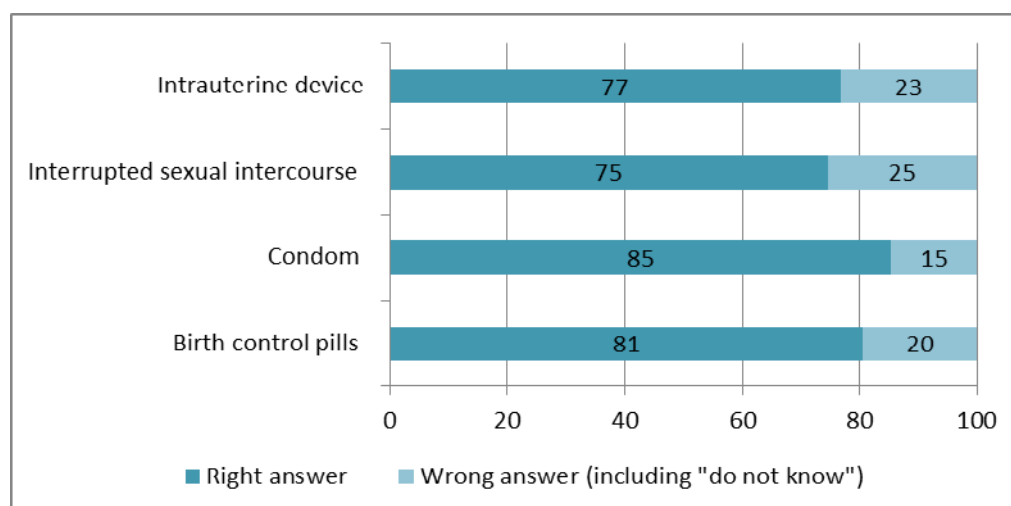
A small amount of male prostitution can be found in Estonia, but has not been separately studied. The 2007 online survey of MSM showed that 14% of 361 respondents had paid for sex in the past six months (20). They were not whether they paid for sex in Estonia or abroad. The 2010 survey of 612 MSM showed that 7% had paid for male sex in the past 12 months in Estonia and 7% (n=38) said that they had been paid (21).

In addition to offering STI/HIV testing services for female sex workers, the Elulootus Health Centre has some male visitors: men made 1.5% (n=13) of the visits in 2009. As mentioned, in 2009 7% (n=21) of the repeat male clients of SEPs indicated that they had received payment for sex during past four weeks. It is not known whether the male visitors/clients had offered sex to men or to women (42).

13.1.2 Knowledge

A 2005–2006 study of 227 female sex workers in Tallinn asked about knowledge of HIV transmission and methods for avoiding STIs. About one fourth did not know that interrupted sexual intercourse or an intrauterine device does not protect from STIs (Fig. 43). Nearly half (46%) answered all four questions correctly and knew that only using a condom is a method for avoiding STIs; 96% knew that the risk of HIV transmission can be reduced by using condom during every sexual intercourse, 98% knew that it is possible to get HIV when injecting with a syringe previously used by someone else and 86% knew that a healthy-looking person can have HIV. Eighty-three per cent correctly answered all three questions related to HIV transmission (23).

Fig. 43. Answers to the questions on methods of avoiding STIs (%), 2005–2006



Source: Trummal, Fischer & Raudne (23).

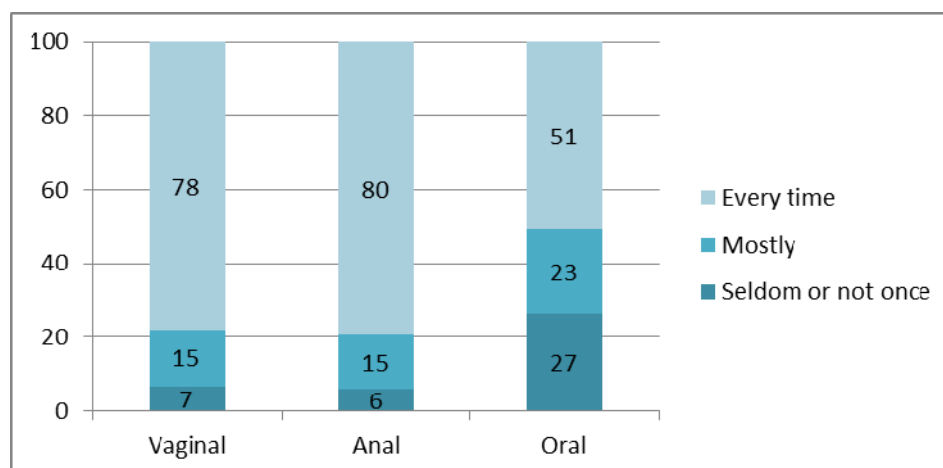
13.1.3 Behaviour

13.1.3.1 Condom use with clients

In the 2005–2006 study, nearly 80% of the sample of female sex workers in Tallinn said that they had used a condom every time when having anal or vaginal sex with a client in the past four weeks. The level of consistent condom use during oral sex was smaller (Fig. 44). About half of the women (48%) used a condom every time during vaginal, anal and oral sex. The percentage

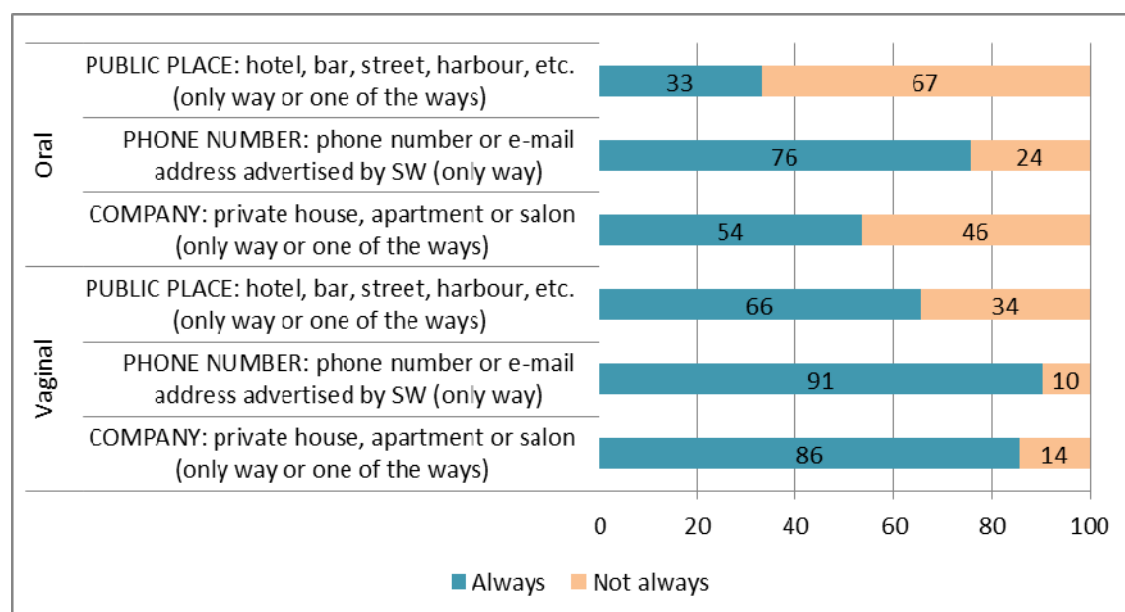
who always used a condom for vaginal or oral sex was smaller among those who contacted their clients in public places (Fig. 45) (23).

Fig. 44. Frequency of condom use with a client by type of intercourse (%), 2005–2006



Source: Trummal, Fischer & Raudne (23).

Fig. 45. Condom use in vaginal and oral sex in the past four weeks, by means of contact (%), 2005–2006

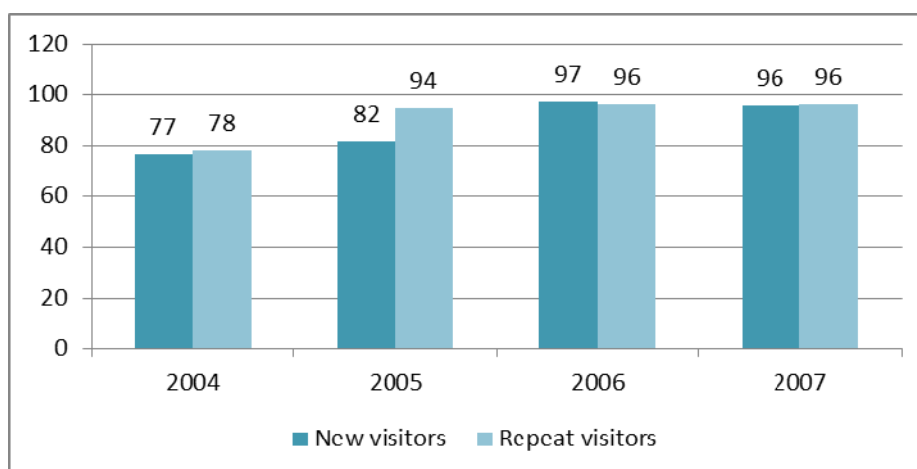


Source: Trummal, Fischer & Raudne (23).

Among new visitors to the Elulootus Health Centre in 2009 (n=184), 98% had used a condom during the last sexual intercourse with a client (42). The visitors were also questioned (different questionnaire) from 2004 to 2007 and the level of condom use had also been very high then (Fig. 46) (38–41).

Among SEP repeat visitors in 2009 (n=401), the level of condom use during the last sex was higher among those who had received payment for sex in the past four weeks than among other visitors: 91% and 75%, respectively. When comparing consistent condom use over the past month the difference is not statistically important (73% and 60%) (35).

Fig. 46. Elulootus Health Centre visitors always using a condom with clients in the past four weeks (%), 2004–2007



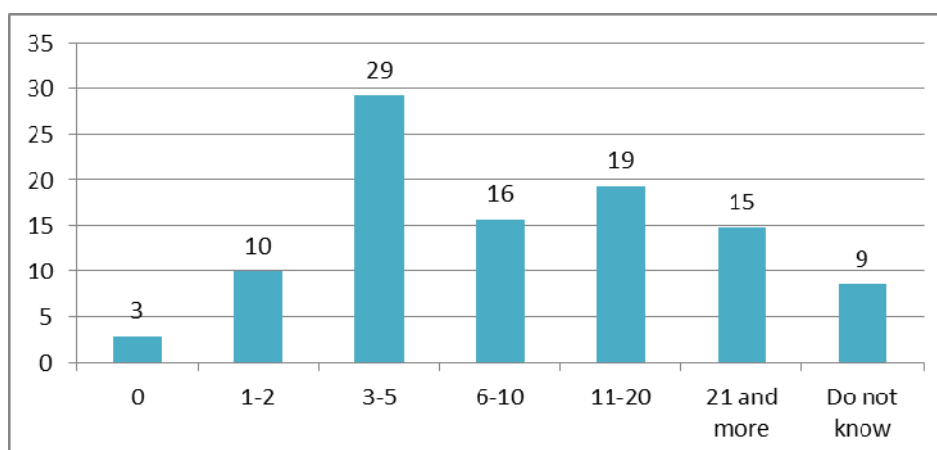
Source: Lõhmus & Trummal (38–41).

13.1.3.2 Sex partners

There is no good overview on the percentage of sexually active men or women who pay for sex in Estonia, and their habits of condom use with sex workers. The 2007 youth study provides data on 19–29-year-olds, 3% (n=48) of whom said they had paid for sex in the past 12 months – 5% of men and 1% of women. Eighty-one per cent of those always used a condom (9). In the 2010 youth study, 4% (n=18) of men in that group aged 19–29, and none of the women in the sample, had paid for sex in the past year (sample size: 1348) (10). Of ACC visitors in 2009, 11% of the males and 1% of the females said that they had paid for sex in the past year (sample size: 2434). In 2004–2009, that percentage varied between 2% and 16% among men (5). Men who pay for sex are probably more likely to visit ACCs than those who do not.

Fig. 47 presents the number of clients that the sex workers participating in the 2005–2006 study had had in the previous seven days. Half of the women had had more than 5 clients and a third had had more than 10. The level of constant condom use was higher among women who had more clients – 72% of those who had up to 10 clients and 93% of those who had more than 10 had always used a condom during vaginal intercourse in the last month. Most sex workers (71%) said that they had had Estonian clients in the past 4 months: 66% mentioned Russians, 55% Finns, and 23% Swedes or Englishmen. Smaller percentages mentioned other nationalities (23).

Fig. 47. Number of sex workers' clients in the past seven days (%), 2005–2006



Source: Trummal, Fischer & Raudne (23).

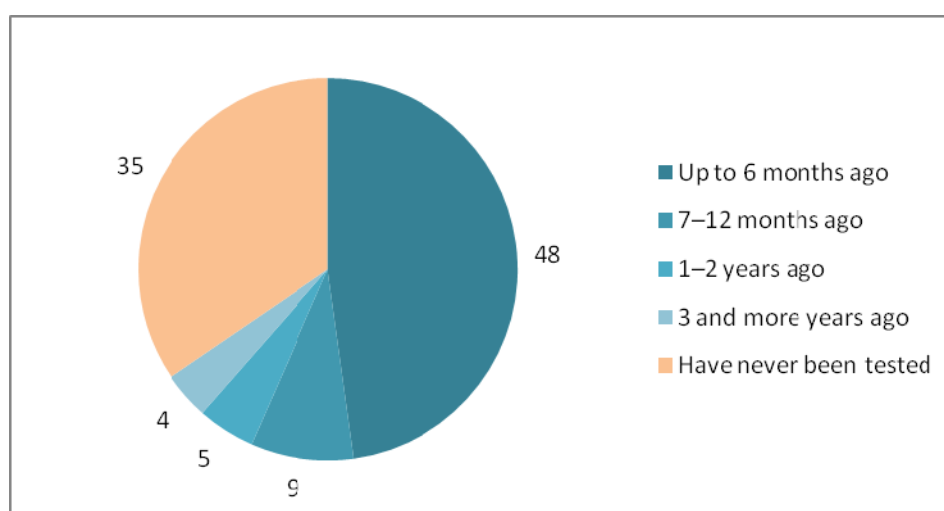
It is not known whether sex workers' clients who inject drugs are mostly IDUs or people from the general population. A little information on IDU clients is available from two studies. In the 2010 RDS study of IDUs in Narva (sample size: 351), 22 people (6%: 18% of women and 3% of men) mentioned ever having received payment for sex, 8 of them in the past 4 weeks. Two mentioned that IDUs were among their clients in the past month. All eight cited local inhabitants as clients and three mentioned truck drivers. Less than one fifth (17%) of male IDUs participating in this study said that they had ever paid for sex (and 1 woman) (14). Of 153 male IDU respondents in the 2008 HIV rapid testing piloting study, 16% said they had paid for sex in the past 12 months (58).

Significant numbers of sex workers also have partners who do not pay for sex. In the 2005–2006 study, 47% of the women had had such partners in the past month and 16% lived with a partner. Among sex workers who had non-paying partners, 27% had more than 1 such partner and 29% had casual partners. One fifth of the women who had regular non-paying partners and one third of those who had casual non-paying partners had used condoms inconsistently with both their partners and clients (23).

13.1.4 HIV prevalence

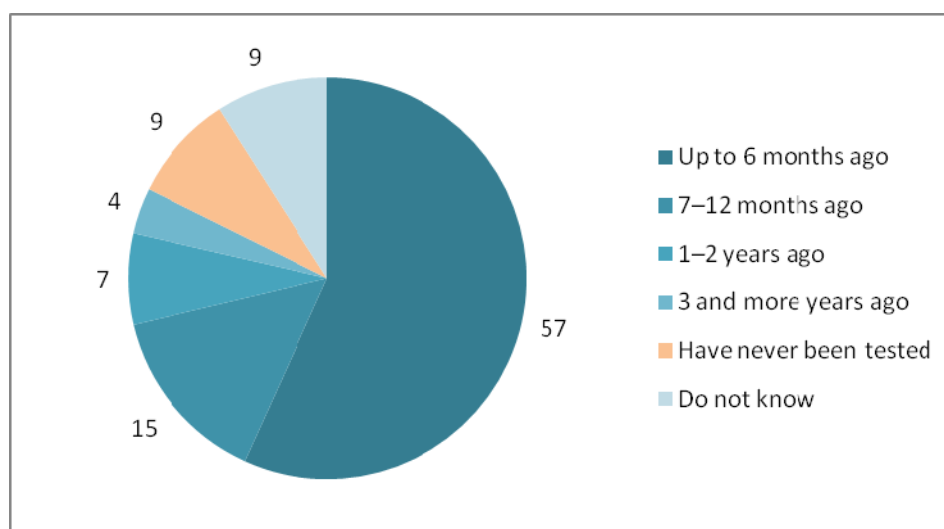
Some data about possible HIV prevalence among sex workers are available from two studies and statistics of the testing services. HIV and HCV prevalence in the 2005–2006 snowball sample of Tallinn sex workers was 8%, with 3% having both infections (23). Of 16 HIV-infected women, 3 had known about their status before. HIV prevalence was smaller among older sex workers; the infection rates were: 10% of those 24 and younger, 9% of those aged 25–34 and 2% of those aged 35 and older. There were no differences by type of sex work. Every third sex worker had never been tested for HIV and 9% had never been tested for STIs (Fig. 48 and 49).

Fig. 48. Time since last HIV test (%), 2005–2006



Source: Trummal, Fischer & Raudne (23).

Fig. 49. Time since last STI test (%), 2005–2006



Source: Trummal, Fischer & Raudne (23).

The Open Estonian Institute conducted a study of a convenience sample of 408 sex workers around the country in 2005, mainly focusing on prostitution and women's needs. It also contained a question on self-reported HIV-status; 51% of the women had had an HIV test and 20% of them said their last test had been positive (a tenth of the whole sample) (169).

At Elulootus Health Centre, a few HIV cases are found per year, along with more STI cases. Table 25 shows data on all visits: new and repeat clients. Fewer gonorrhoea and chlamydia cases have been found in the past two years. In 2009, 40% of the first-time clients were positive for some kind of STI (74 out of 184). One per cent of new clients in 2005–2008 and zero in 2009 were HIV infected. One should note that the sample is biased towards people who come to the centre, since they already suspect they have STIs.

Table 20. Diagnoses and visits of new and repeat clients, Elulootus Health Centre, 2005–2009

STIs and visits	2005	2006	2007	2008	2009
Syphilis	4	8	6	3	3
Gonorrhoea	40	40	25	13	0
Chlamydia	77	84	74	35	42
Trichomoniasis	29	44	80	90	65
HIV	3	6	4	3	0
Total number of visits	851	979	1199	1412	1304
Number of new visitors	236	468	418	250	184

Source: Programmatic data from STI services (42).

In the 2005–2006 study, HIV-positive status was associated with injecting drugs, as 23% of the sex workers who had injected in the past month (n=15) and 7% of those who had not turned out to be HIV-infected (170). As mentioned, the 2007 IDU study showed 11% of the female

respondents in Tallinn and 16% in Kohtla-Järve having received money for sex; in absolute numbers that is 14 women, and 10 of them had HIV.

One per cent (n=21) of people questioned in ACCs in 2009 said they had received payment for sex in the past year. Three of them (14%) had HIV and all three had injected drugs at some point in their lives (5).

Seven per cent of MSM (n=38) questioned in the 2010 EMIS study had received payment for sex in the past year, none of whom said he had HIV (21).

13.1.5 Prevention activities

Separate services for sex workers are available in Tallinn, where the Elulootus Health Centre has offered HIV and STI testing, treatment for STIs, thematic counselling, safe sex supplies and information materials since 1994. The number of new clients decreased after peaking in 2006–2007, but the total number of visits increased (see Table 20).

The NGO Lifeline's ATOLL counselling centre in Tallinn opened at the end of 2005. Its objective is to help women involved in prostitution find different jobs, but they also provide consultations on STI/HIV and safe sex and distribute condoms, lubricants and information materials. The number of new clients per year has been 70–93 for the past three years and total consultations increased from 382 in 2007 to 747 in 2009.

13.2 Discussion

Today, people involved in sex work are older than about four or five years ago and, according to expert opinion, more of them act independently. Most of this population can be found in the capital and those living in other parts of Estonia mostly come to Tallinn for sex work. There is reason to assume that the sex worker population is rather small, but its size has not been measured in the capital and the sex work scene has not been mapped in towns such as Pärnu (a popular tourist destination in summer) and Tartu (the second largest city in Estonia).

Sex workers do not transmit HIV infection inside their own subpopulation (as do MSM and IDUs), but are infected from contact with other subpopulations, such as IDUs or their sex partners from the general population. Every fourth female IDU visiting SEPs in Tallinn and Ida-Virumaa county reported being paid for sex. In 2008–2009 that percentage was higher than in earlier years. HIV prevalence can be very high among such women. More than half of female IDUs who participated in the 2007 RDS study in Tallinn and Kohtla-Järve had HIV. Most IDUs who are paid for sex are not in contact with the services for sex workers, but with those for IDUs. Harm-reduction interventions should pay attention to the sexual transmission of HIV and issues related to sex work while interventions aimed at sex workers should integrate harm-reduction components to reduce the risks of drug use (171).

The extent of overlap between sex workers and MSM may be greater than assumed, since 7% (n=38) of the 2010 EMIS respondents said they had received payment for male sex in the past year. More information is needed on that group.

Evidence shows that keeping HIV levels low among sex workers slows the spread of the epidemic (70). In the only study measuring HIV prevalence in female sex workers in 2005–2006,

8% were infected. Although the sample was not representative, that is a rather worrisome result, considering that a prevalence of 5% means a concentrated epidemic in a subpopulation. One tenth of sex workers were never tested for HIV. The prevalence among studied sex workers was associated with injecting drugs, indicating that HIV transmission can be related mainly to the overlap with the IDU population, but the total number of IDUs (n=15) and HIV-infected women (n=16) in the sample was too small to justify such conclusions. Data from two studies show that nearly one fifth of male IDUs pay for sex, so some sex work may be going on inside the IDU population and some women who inject and are paid for sex may not have sexual contact with men from the general population.

Sex workers seem to have quite good knowledge about HIV transmission. The level of condom use with clients is very high among sex worker visitors to the STI/HIV testing site in Tallinn, but less protected sex was found among the snowball sample in 2005–2006. Every fifth sex worker in that study had not always used a condom. More risk behaviour was found among sex workers who were meeting clients in public places. Injecting drug use and violence during sex work were also more prevalent among those women. A greater percentage of them said they did not have the chance to go to gynaecologist or get STI testing (23). The health and safety of sex workers depend to a considerable degree on the context and location of their transactions and the intensity of the work. Sex work on the streets, in clubs and bars, and involving drugs is considered high-risk. The overlap of sex work and injecting drug use makes it more difficult to negotiate safer sex. Needles are sometimes shared between sex workers and clients who pay for their services with drugs (164,171). In sum, sex workers involved in injecting drug use and those who find clients in public places need the most attention and are probably the least covered by relevant services.

An important percentage of sex workers' clients are locals and large percentage of sex workers also have sexual partners who do not pay for sex (about half in the 2005–2006 study). Those two groups form a bridge between sex workers and the general population, but they can also transmit infections to sex workers. For example, a nine-year prospective study in London concluded that sex workers are at increased risk of STIs primarily through non-commercial sexual partnerships (172). Not much is known about the characteristics of the clients and other sex partners of sex workers in Estonia. ACC data do not show important differences in HIV prevalence between those visitors who had had sex with sex workers in the past year and those who had not.

Since the sex worker population is small and concentrated in Tallinn, one should first consider how to target it in the framework of existing services, such as the ACCs in seven different towns and SEPs in Tallinn and Ida-Virumaa county, rather than opening new, special service points for sex workers in other regions.

13.3 Conclusions

- Every fifth sex worker studied in 2005–2006 had not always used condoms with clients. A significant number also had non-commercial sex partners, and some failed to use condoms with either type of partner. If HIV prevalence among sex workers increases, that may increase the sexual transmission of the infection to the general population.
- More sexual risk behaviour and injecting drug use has been found among sex workers who contact clients in public places. A significant overlap between the IDU and sex worker

populations can be seen from different data sources. Prevention activities should be concentrated on this high-risk context of sex work.

13.3.1 Data gaps

- There are no representative data or data on trends over time for sex workers' HIV prevalence and risk behaviour. A new study of female sex workers in Tallinn was planned for spring–summer 2011.
- The number of sex workers going to ACCs for HIV testing is probably underreported, and some sex workers do not reveal that they receive payment for sex. Only a few visit ACCs, according to questionnaire data.
- Minimal information is available on sex workers' clients and there is no knowledge on how the clients of different types of sex workers differ.
- Some data have been collected on sex workers in eastern Estonia, but no information is available on Pärnu and Tartu, larger cities where some sex work must be taking place.
- The size of the sex worker population has not been measured.

14. General discussion and conclusions

A major HIV epidemic among IDUs in Estonia started more than a decade ago and now the potential for its spread to the general population is clearly a concern. To provide feedback on the interventions implemented so far and to provide guidance and input for priority setting, the current exercise was undertaken using the principles of data triangulation.

Our main aim was to describe and analyse the HIV epidemic (including the trends in HIV and co-infections among the general population and vulnerable populations), and answer the following questions.

- Is HIV transmission decreasing, increasing or stable?
- What are the main transmission routes, and have there been any changes over the years?
- Is HIV transmission concentrated in vulnerable populations (such as IDUs and their sexual partners) or is it spreading more to the general population as well?

14.1 Decreasing, increasing or stable HIV transmission?

Current evidence, based on available data on newly diagnosed HIV cases, shows that at the national level HIV transmission is slowly but steadily decreasing, even though two regions (Tallinn and the north-east) continuously show high rates of new cases (yet with decreasing trends as well, especially among IDUs).

The percentage of newly diagnosed HIV patients is increasing among older age groups and the people who do not report drug-injecting behaviour. The absolute number of cases in older age groups increased in 2006–2007, but stabilized after that. Thus, the higher percentage is due to the decline in cases in younger groups. At the same time the percentage of people reporting injecting drug use is lower in older age groups, especially those over 35, and has remained stable. One reason for some increase in age could be greater spread of HIV among older groups; another could be the increase in the age of IDUs. The same cohort may be growing older: in the 2005 Tallinn RDS study the percentage of IDUs under 25 years old was 56%; in 2007 it was 35%. HIV prevalence among IDUs is very high, but the spread of the infection has stabilized and incidence is decreasing.

14.2 Main transmission routes?

In the 1990s, HIV spread mostly through sexual relationships, and the absolute number of newly diagnosed cases and rates per 100 000 population were very small (a total of 96 cases diagnosed in 1988–1999). The major epidemic was detected in 2000 among IDUs, with close to 90% of all newly diagnosed cases found among this vulnerable population in 2000–2001. Unfortunately, there has been no systematic data collection on HIV transmission routes among all newly diagnosed HIV cases during the last decade.

Data from various sources suggest that, following a rapid increase in HIV prevalence among IDUs, the absolute number of newly diagnosed cases that can be attributed to drug-injecting behaviour is decreasing. Prevalence among IDUs was already very high a few years ago (up to 70% in the north-east), as were rates of HIV testing and knowledge of HIV status, while self-

reported risk behaviours decreased. Thus, it is plausible that the number of IDU-related HIV cases is decreasing.

The data from recent years also support the assumption that the number of cases related to drug-injecting behaviour still exceeds the number of cases among the non-injecting population. The absolute number of newly diagnosed cases among men is decreasing, but is rather stable among women. Even though the IDU status of these women is not generally known, a comparison of data from different sources supports the assumption that a considerable percentage of HIV-infected women have injected drugs or are from other marginalized groups (high-risk youth, sexual partners of IDUs).

There is no proof of any major epidemic among other risk groups, such as MSM. More HIV infection may be present among sex workers, but there are no good prevalence data and this problem can be assumed to be related mainly to the overlap with the IDU population, since a considerable number of female IDUs are paid for sex.

14.3 HIV transmission: concentrated in vulnerable populations or spreading to the general population?

In generalized epidemics, HIV is firmly established in the general population. This means that, although subpopulations at high risk may continue to contribute disproportionately to the spread of HIV, sexual networking in the general population is sufficient to sustain an epidemic independent of subpopulations at higher risk (67). Our data do not indicate a generalization of the epidemic, but that new infections continue to occur mostly among IDUs and their sexual partners.

14.4 Could an epidemic among IDUs trigger a generalized epidemic in the general population?

Sexual transmission provides the potential for HIV to spread from IDUs to their non-injecting, regular, casual or commercial-sex partners (the “first wave”) and further to the general population (173). Our limited data show that first-wave transmission may already be occurring: most IDUs in Estonia are young adults who have several sexual partners and their rates of condom use are rather low. Gaps in data remain, however: no data are available on the sexual partners of IDUs or the IDU status of the partners of newly diagnosed HIV cases who do not report injecting drugs. The spread of HIV beyond the first wave, from non-injecting sexual partners of IDUs to other non-injectors, is difficult to assess and predict. Previous research indicates that HIV epidemics among IDUs can spread to the general population and contribute to generalized epidemics. Whether this happens, however, appears to be determined more by the sexual behaviour of the general population than by the risk behaviour of IDUs (173).

In the mid-1990s, when STI rates were considerably higher and sexual risk behaviours more common, sexual transmission among the general population was feared. There is no proof that this has happened, even though the number of sexually active PLHIV who could contribute to the spread has increased considerably over the last decade. Sexual risk behaviour among the general population is still common, but some positive changes have occurred, especially among younger generations during the past decade (more condom use during first intercourse and casual sex, decreasing rates of STIs). If these trends continue and the drug-injecting epidemic is further controlled, there is reason to be optimistic that the epidemic will not become generalized. The

rate of less than 12 cases per 100 000 in other regions of Estonia (where IDU prevalence is low) since 2000 supports the conclusion that the epidemic is still confined among IDUs and their non-injecting partners – the first-wave population – and that the sexual behaviour and networking of the general population have been unable to sustain (or increase) the spread of HIV independently.

Our data are naturally limited. For example, we still know little about the rate of partner change and concurrency, or the frequency of unprotected sex, especially among people aged over 29 years. These are considered some of the most important determinants of the sexual spread of HIV. Another important variable is the transmission probability per sex act (173), which is correlated to the viral load and co-infections (especially ulcerative STIs). Viral load can be suppressed by timely and effective cART. Our data show that, despite the progress in cART provision, a major gap remains between the number of people in treatment and the estimated number who need it. A modelling exercise concluded that this gap probably poses the greatest danger of HIV spread to the general population (49). Substantial scaling up of ART coverage is therefore important not only to improve the quality of life of PLHIV but also to contain the further spread of the epidemic.

14.5 Priorities for the future

14.5.1 IDUs and their sexual partners

Previous research (both national and international) has concluded that harm reduction among IDUs is crucial to containing the HIV and TB epidemics, (49,97,144). Harm-reduction programmes (syringe exchange and OST) have been considerably scaled up in Estonia in the past decade, yet there are opportunities for further action and quality improvement. The potential for the spread of HIV from IDUs to the general population is clearly a concern, but is not the only reason for the urgent need to address HIV among IDUs. This intersection of HIV and injecting drug use is also important because the sexual partners and newborn children of IDUs are at risk of HIV infection. Such first-wave transmission serves as a continuing source of HIV infection for the general population. The most efficient way to prevent such transmission is to prevent it at the source, among IDUs (173). That IDUs are a disadvantaged, hard-to-reach group makes it all the more imperative that the problem be tackled directly as a health and social issue. Routine services are not likely to reach IDUs and special programmes are needed to provide this vulnerable population with the same level of prevention and care services as other groups (148,173).

Considering the importance of preventing HIV and co-infections among IDUs, we recommend evaluating the coverage of the services in Tallinn, increasing the geographical coverage of SEPs outside of Tallinn and the north-east, providing more vigorous sexual-behaviour counselling and services (including special services for female IDUs and sex partners of IDUs) and developing more focused interventions to target IDUs with more specific needs (those with shorter injection duration, polydrug users and those who already have HIV). Interventions need to be informed by the expectations and needs of IDUs.

14.5.2 HIV testing and counselling

In Estonia, the number of people tested (and the number of tests) has increased since the turn of the century. Nonetheless, many people engaging in high-risk behaviour do not access HIV testing services. Testing is important so that people can avail themselves of medical care if they

are found to be HIV positive. By combining personalized counselling with knowledge of one's HIV status, HTC is also believed to motivate people to change their behaviour to prevent transmission (53–55). Thus, we recommend scaling up HIV testing in all settings (health care and community based), improving post-test counselling and developing more active partner-counselling and contact-tracing services.

14.5.3 Health services for PLHIV and IDUs

As discussed earlier, cART is one of the keys for reducing HIV transmission, as well as improving the quality of life of PLHIV. Considering the high percentage of late diagnoses, treatment delays and low cART coverage, interventions need to be developed to provide timely HIV testing, referrals to infectious diseases services and support for adherence. Involvement of community-based organizations working with vulnerable populations and integration of services (cART, OST, TB and co-infection management) should be supported. Positive prevention programmes are very limited in Estonia, so behaviour-change counselling for PLHIV and access to STI services should be improved.

14.6 Recommendations for improving surveillance and evaluation

Based on the analysis, we highlight the following data gaps that limited our interpretations of data and support of findings, and provide recommendations to further strengthen surveillance and evaluation.

14.6.1 Surveillance of infections and risk behaviours

14.6.1.1 First priorities

- Data on possible transmission routes and risk behaviour of newly diagnosed HIV cases (including those in the penal system) is limited, despite the new communicable diseases database, which provides an opportunity to collect such data. To improve collection, data updating once someone enrolls in infectious diseases clinics for follow-up and report training for doctors should be considered.
- There is no countrywide system for collecting comprehensive data on pregnant women with HIV; only data on newly diagnosed cases are available. Such a central data collection system has to be developed, if possible using existing databases (such as data from e-health).

14.6.1.2 Other issues

- There is no information on HIV-trends and risk behaviour of IDUs' sexual partners.
- PLHIV's STI trends and sexual and drug use behaviour are not known.
- Regular HIV-related studies are conducted among youth, but only minimal information is available on older age groups in the general population.
- Qualitative study information is needed to understand how the gender norms of sexuality affect young people's condom use and service uptake.
- STI risk factors among the general population and populations vulnerable to HIV are not known.

- Very limited information is available on the population size and risk behaviour of IDUs, MSM and sex workers in other regions besides Tallinn and the north-east.
- Limited data are available on HIV prevalence among MSM and sex workers.
- Qualitative information is needed to understand the barriers that MSM face in their sexual and social lives and use of services.
- Minimal information is available on sex workers' clients.
- There are no data on LTBI prevalence in the general population.

14.6.2 Monitoring of health services

- Monitoring of health services for PLHIV is limited. For example, no data are collected routinely and centrally to assess PLHIV and IDU screening for TB, CD4 count and viral load at the start of treatment, adherence to treatment or viral resistance. No information is available on the demographics of PLHIV in care.
- Data on HIV testing are limited and their quality is decreasing; for example, it is often not possible to differentiate the number of people tested from the number of tests. There are also limited data on HIV-testing barriers, perceptions and beliefs in the general population and vulnerable populations.
- No data are available on practices and trends in partner notification.

Annex. Data sources

A.1 Institutions

A.1.1 Estonian Health Board (until 31 December 2009 Health Protection Inspectorate)

The Health Board is responsible for passive surveillance of communicable diseases, including HIV. Historically, the surveillance of newly diagnosed HIV cases in Estonia was laboratory-based and carried out by the NHRL (see below) which reported to the Health Board (data disaggregated by gender, age, region of diagnosis). Since the launch of a new communicable diseases information system in October 2009, both doctors (who diagnose the infection) and laboratories are required to report directly to the Health Board. Reporting can be done through a web-based system (www.nakis.ee) but paper-based reporting is still possible. Reporting through the web-based system is only mandatory for HIV/AIDS.

The Health Board collects and aggregates monthly data on ARV usage from the hospitals. The data include the total number of people in each treatment regimen in each hospital, including pregnant women, as well as the percentage of drug-resistant cases among those who start treatment.

A.1.2 National HIV Reference Laboratory (NHRL)

HIV serological surveillance is performed by 33 primary diagnostic laboratories, in all the larger medical institutions. Positive samples are sent to the NHRL, located in West Tallinn Central Hospital. All samples sent for HIV testing have to be categorized and coded. Coding categories include transmission mode, the type of institution doing the testing and the reason for the test. There are a total of 14 categories, and a testee could belong to overlapping categories (e.g. an IDU tested in an anonymous facility). For each sample, the NHRL assigns a primary code for inclusion in its HIV database, which contains data on all HIV cases in Estonia, with personal identifiers if they exist. About 30% of the tests cannot be associated with any individual, as they stem from anonymous testing in ACCs. The NHRL also collects data from all primary diagnostic laboratories on the number of HIV tests performed and the number of people tested. These data are cumulative and anonymous.

A.1.3 National Institute for Health Development (NIHD)

The NIHD is an independent national research and development agency under the jurisdiction of the Ministry of Social Affairs. It is responsible for implementing the national public health strategies, including the national HIV Prevention Strategy, the National Drug Abuse Prevention Strategy and the National TB Prevention Programme. It is also responsible for the active serological and behavioural surveillance of HIV in key populations (IDUs, sex workers, MSM) and behavioural surveillance of general population. Finally, it is active in monitoring and evaluating national public health strategies, and collecting and disseminating information on HIV-related topics.

A.1.4 Estonian Health Insurance Fund (EHIF)

EHIF handles compulsory health insurance in Estonia (see Chapter 2). EHIF contracts with health care providers for different types of health services. It has a database of everyone who has ever received any kind of health services, including general information such as gender and date

of birth, as well as information about disorders, diseases and services received. These data are sent to EHIF by health care providers electronically.

A.1.5 Ministry of Justice

The Ministry of Justice provides health services – including HIV testing, treatment and care as well as TB diagnostics and treatment – in prisons and other penal institutions. The Ministry collects data on the number of newly diagnosed HIV cases in prison, the cumulative number of incarcerated PLHIV and the number of people under its jurisdiction who receive ARV or TB treatment.

A.1.6 Ministry of Social Affairs

The Ministry of Social Affairs is responsible for procuring ARV drugs and funding HIV-specific health services for PLHIV who are uninsured. It is responsible for monitoring these services as well as for the overall budgeting of the National Strategy.

A.1.7 Statistics Estonia

Statistics Estonia is a government agency under the Ministry of Finance, tasked with providing public institutions, business, researchers, international organizations and private individuals with reliable, objective information on economic, demographic, social and environmental situations and trends in Estonia. With regard to HIV, its primary data of interest are official mortality and population statistics.

A.2 Registries

A.2.1 National Tuberculosis Registry (of NIHD)

The National Tuberculosis Registry has been collecting data on individual TB cases and treatment from doctors and mycobacteriology laboratories via a compulsory notification system for the last 20 years.

A.2.2 Estonian Causes of Death Registry (of NIHD)

The Estonian Causes of Death Registry has been operating since January 2008. Its aim is to collect data on causes of all deaths registered on Estonian territory and in Estonian foreign missions. The data is gathered using death cards and perinatal death cards, from all health care institutions (filled in by doctors or forensic medicine specialists).

A.2.3 Medical Birth and Abortion Registry (of NIHD)

The Estonian Medical Birth Registry has been operating since 1992. The objective of the Registry is to measure fertility by gathering data from all hospitals rendering obstetric services on birth cards for every live or still birth (live or stillbirth) in Estonian territory. The Estonian Abortion Registry (EAR) started in 1994, to undertake the continuous and systematic collection of information about abortions in Estonian health care institutions. Since 1996, national abortion statistics has been based on EAR data, gathered from all of the health care institutions (including private doctors) who have performed abortions or provided medical care to women who have had an abortion on abortion cards.

A.3 Overview of studies

Theme and focus	Year	Sample size (n)	Study site	Sampling method	Measurements	Reference
HIV-related knowledge and behaviour among MSM visiting gay-oriented Internet sites (IS)	2004	312	2–3 Estonian gay-oriented web sites	Convenience sample	Electronically self-administered structured questionnaire	18
	2005	232				19
	2007	361				20
The European MSM Internet Sex Survey 2010 (EMIS)	2010	612	Estonian and international gay-oriented web sites	Convenience sample	Electronically self-administered structured questionnaire	21
HIV prevalence and risk behaviours among MSM in Tallinn and Harjumaa: pilot study using respondent-driven sampling	2007	59	Tallinn, sexual health clinic	Respondent-driven sampling	Self-administered structured questionnaire; venous blood sample collection for syphilis, anti-HIV antibodies detection	22
Assessment for representative sampling among female sex workers in Tallinn	2009	28	Tallinn	Qualitative study, clients of services for sex workers	Semi-structured interviews	167
HIV-prevalence and risk behaviour among female sex workers in Tallinn	2005–2006	227	Tallinn	Respondent-driven sampling, snowball	Interviewer administered structured questionnaire; saliva sample for HIV and HCV antibodies testing	24
Prostitution in Estonia: overview of the situation of women involved in prostitution	2005	408	Various towns	Convenience sample	Self-administered structured questionnaire	169
Questioning of the clients of STI services for sex workers	2009	915	Community-based STI services in Tallinn (one site)	All clients attending STI services	Self-administered structured questionnaire	42
HIV-related knowledge, attitudes and behaviour among Estonian youth (HKABEY), 10–18 years old	2003	4066	Questioning in schools, whole country	Random sample in 18 layers (age, region, language and settlement type of the school)	Self-administered structured questionnaire	7
	2005	4861				8
	2007	2265				9
	2010	3618				10
HIV-related knowledge, attitudes and behaviour among Estonian youth (HKABEY), 19–29 years old	2003	2433	Questionnaire sent by mail, whole country	Random sample in 6 layers (age, region)	Self-administered structured questionnaire	7
	2005	3015				8
	2007	2026				9
	2010	1348				10
Estonian Health Interview Survey 2006, 15–84 years old	2006	6434	Home visit, whole country	Systemized random sample in 30 layers	Interviewer-administered structured questionnaire	71
Health Behaviour among Estonian Adult Population	2004	3074	Questionnaire sent by mail, whole country	Random sample	Self-administered structured questionnaire	26
	2006	2867				27

Theme and focus	Year	Sample size (n)	Study site	Sampling method	Measurements	Reference
(HBEAP), 16–64 years old	2008	3004				28
HIV and risk behaviour among injecting drug users in two cities (Tallinn and Kohtla-Järve)	2005	Tallinn (350), Kohtla-Järve (100)	Community-based SEPs in Tallinn and Kohtla-Järve (one each)	Respondent-driven sampling; seeds were recruited from among the clients of SEPs	Interviewer-administered structured questionnaire; biological sample (dried blood spot) collection for anti-HIV antibodies detection	11
HIV and other infections and related risk behaviours among injecting drug users in Tallinn and Kohtla-Järve	2007	Tallinn (350), Kohtla-Järve (350)			Interviewer-administered questionnaire; biological sample (venous blood) collection for anti-HIV and anti-HCV antibodies, HBsAg detection	12
HIV transmission among drug users in Tallinn, Estonia	2009	353	Tallinn, community-based SEP (one site)	Respondent-driven sampling; seeds were recruited from among the clients of SEPs	Interviewer administered questionnaire; biological sample (venous blood) collection for anti-HIV antibodies detection	13
HIV transmission among drug users in Narva, Estonia	2010	350	Narva, community-based SEP (one site)	Respondent-driven sampling; seeds were recruited from among the clients of SEPs	Interviewer administered questionnaire; biological sample (venous blood) collection for anti-HIV antibodies detection	14
Programmatic data from SEPs	2004	1810 first time and 397 repeat visitors	Syringe exchange sites of 2 organizations in Tallinn and 2 organizations in Ida-Virumaa	New clients – all clients coming to syringe exchange; repeat visitors – quota sample based on age and sex.	Self-administered structured questionnaire	30
	2005	1218 first time and 396 repeat visitors				31
	2006	1665 first time and 401 repeat visitors				32
	2007	1511 first time and 399 repeat visitors				33
	2008	1118 first time and 402 repeat visitors				34
	2009	1111 first time and 401 multiple clients				35
HIV/AIDS and drug related knowledge, attitudes and behaviour among prisoners (HDKABP)	2006	807	All 7 prisons	Random sample of prison sections	Self-administered structured questionnaire	16
	2008	750	All 5 prisons			17

Theme and focus	Year	Sample size (n)	Study site	Sampling method	Measurements	Reference
Piloting HIV rapid testing	2008	791	Different testing and community sites in Tallinn (n=6)	Convenience sample	Self-administered structured questionnaire, fingertip rapid test	58
Programmatic data from AIDS Counselling Centres	2007	6077	7 testing sites (6 towns)	All clients attending ACCs across Estonia	Interviewer-administered structured questionnaire	5
	2008	5982	6 testing sites (5 towns)			37
	2009	2434	6 testing sites (5 towns)		Self-administered structured questionnaire	5
Quality of life and stigma and discrimination related to HIV among people with HIV under care in infectious diseases departments	2005	451	Infectious diseases out-patient departments in Tallinn, Narva, and Kohtla-Järve	Convenience sampling among PLHIV under care (who attended out-patient department during the study-enrolment)	Self-administered structured questionnaire (by participant); standardized form for collecting clinical data from medical records (by medical doctor)	24
Quality of life and stigma and discrimination related to HIV among people with HIV under care in infectious diseases departments	2008	450				25
Prevalence of latent TB and TB among methadone substitution treatment patients	2007	112	Community-based methadone substitution treatment centre in Jõhvi (one site)	Convenience sampling among consecutive clients	Self-administered structured questionnaire; standardized form for collecting clinical data from medical records; venous blood collection for HIV and latent TB testing, Mantoux test	129
TB related knowledge and TB screening among injecting drug users in SEPs	2007–2008	403	Community-based SEP in Tallinn (one site)	Convenience sampling among SEP visitors	Self-administered structured questionnaire	57

References

1. *HIV triangulation resource guide: synthesis of results from multiple data sources for evaluation and decision-making*. Geneva, World Health Organization, 2009 (http://data.unaids.org/pub/Manual/2009/20090915_hiv_trianguation_resource_guide_en.pdf, accessed 2 September 2010).
2. Politi C, Tõrvand T. *Financing HIV/AIDS and tuberculosis interventions in Estonia*. Copenhagen, WHO Regional Office for Europe, 2007 (http://www.euro.who.int/__data/assets/pdf_file/0010/78904/E90770.pdf, accessed 4 April 2011).
3. Buehler JW. Surveillance. In: Rothman KJ et al., eds. *Modern epidemiology*. Philadelphia, Lippincott Williams & Wilkins, 2008:459–480.
4. *Program operations guidelines for STD prevention. Surveillance and data management*. Atlanta, Centers for Disease Control and Prevention, 2007 (<http://www.cdc.gov/std/program/surveillance/4-PGsurveillance.htm>, accessed 13 May 2011).
5. *Programmatic data from AIDS counselling centres, 2004–2010*. Tallinn, National Institute for Health Development, 2011.
6. Terviseamet [Health Board] [web site]. Tallinn, Health Board, 2011 (<http://www.terviseamet.ee/nakkushaigused/nakkushaigustesse-haigestumine/hiv-ja-aids.html>, accessed 29 April 2011).
7. Lõhmus L, Trummal A, Harro M. *HIV/AIDS-related knowledge, attitudes and behaviour of young people in Estonia: study report 2003*. Tallinn, National Institute for Health Development, 2003 (http://www.tai.ee/failid/Raport_engl_youth_survey_pdf.pdf, accessed 13 December 2010).
8. Lõhmus L, Trummal A. *HIV/AIDS-i teematikaga seotud teadmised, hoiakud ja käitumine Eesti noorte hulgas [HIV/AIDS-related knowledge, attitudes and behaviour of young people in Estonia]*. Tallinn, National Institute for Health Development, 2005 (http://www.tai.ee/failid/_le_eestiline_noortuurimus_2005.pdf, accessed 13 December 2010).
9. Lõhmus L, Trummal A. *HIV/AIDS-i teematikaga seotud teadmised, hoiakud ja käitumine Eesti noorte hulgas. Uurimusraport 2007 [HIV/AIDS-related knowledge, attitudes and behaviour of young people in Estonia. Study report 2007]*. Tallinn, National Institute for Health Development, 2007 (http://www2.tai.ee/teated/GF/HIV_noortuurimus_2007.pdf, accessed 13 December 2010).
10. Trummal A, Glušková N, Murd M. *HIV/AIDS-i teematikaga seotud teadmised, hoiakud ja käitumine Eesti noorte hulgas. Uurimusraport 2010 [HIV/AIDS-related knowledge, attitudes and behaviour of young people in Estonia: study report 2010]*. Tallinn, National Institute for Health Development, 2011.
11. Uusküla A et al. *HIV levimuse ja riskikäitumise uuring Eesti kahe linna (Tallinna ja Kohtla-Järve) süstivate narkomaanide seas [HIV and risk behaviour among injecting drug users in two cities (Tallinn and Kohtla-Järve) in Estonia]*. Tallinn, National Institute for Health Development, 2005

- (http://www.tai.ee/failid/S_stivate_narkomaanide_HIV_levimuse_uurimus_2005.pdf, accessed 8 December 2010)
12. Lõhmus L et al. HIV-nakkuse ja teiste infektsioonide ning riskikäitumise levimus Tallinna ja Kohtla-Järve süstivate narkomaanide seas [*HIV and other infections and related risk behaviours among injecting drug users in Tallinn and Kohtla-Järve: study report 2007*]. Tallinn, National Institute for Health Development, 2008 (http://www2.tai.ee/TAI/SN_RDS_uurimuse_raport_2007_17.12.2008.pdf, accessed 8 December 2010).
 13. *HIV transmission among drug users in Tallinn, Estonia*. Tartu University and National Institute for Health Development, 2009, unpublished data.
 14. *HIV and risk behaviour among injecting drug users in Narva, Estonia*. National Institute for Health Development, 2010, unpublished data.
 15. Lõhmus L. *HIV/AIDS-i ja narkomaaniaga seotud teadmised, hoiakud ja käitumine süüdimõistetute hulgas* [*Knowledge, attitudes, and behaviour related to HIV/AIDS and illicit drug use among Estonian inmates: study report 2004*]. Tallinn, National Institute for Health Development, 2004 (http://www2.tai.ee/uuringud/Syuidimoist_HIV_narko_uurimus_2004.pdf, accessed 8 December 2010).
 16. Lõhmus L, Trummal A. *HIV/AIDS-i ja narkomaaniaga seotud teadmised, hoiakud ja käitumine süüdimõistetute hulgas* [*HIV/AIDS and drug related knowledge, attitudes and behaviour among prisoners: study report 2006*]. Tallinn, National Institute for Health Development, 2006 (http://www.tai.ee/failid/S__dim_ist._raport_07.12.2006.pdf, accessed 8 December 2010).
 17. Lõhmus L, Trummal A. *HIV/AIDS-i ja narkomaaniaga seotud teadmised, hoiakud ja käitumine süüdimõistetute hulgas* [*HIV/AIDS and drug related knowledge, attitudes and behaviour among prisoners: study report 2008*]. Tallinn, National Institute for Health Development, 2009 (http://www.tai.ee/failid/SM_uurimuse_raport_2008_netiti.pdf, accessed 8 December 2010).
 18. Lõhmus L, Trummal A. *HIV/AIDS-iga seotud teadmised ja käitumine gay-internetilehekülgi külastavate meeste seas* [*Knowledge and risk behaviours related to HIV-infection among men visiting gay-related web sites: study report 2004*]. Tallinn, National Institute for Health Development, 2004 (http://www.tai.ee/failid/_MSM_netikusitus.pdf, accessed 8 December 2010).
 19. Lõhmus L, Trummal A. *HIV/AIDS-iga seotud teadmised ja käitumine gay-internetilehekülgi külastavate MSM-ide seas* [*Knowledge and risk behaviours related to HIV-infection among MSM visiting gay-related web sites: study report 2005*]. Tallinn, National Institute for Health Development, 2006 (http://www.tai.ee/failid/MSM_netik_s.raport_10.02.2006.pdf, accessed 8 December 2010).
 20. Lõhmus L, Trummal A. *HIV/AIDS-iga seotud teadmised ja käitumine gay-internetilehekülgi külastavate MSMide seas* [*Knowledge and risk behaviours related to HIV-infection among MSM visiting gay-related web sites: study report 2007*]. Tallinn, National Institute for Health Development, 2008 (http://www2.tai.ee/uuringud/MSM_internetiuurimus_2007.pdf, accessed 8 December 2010).

21. *The European Man-for-Man Internet Sex Survey 2010*. London, Sigma Research, 2010 (http://www.rki.de/cln_151/nn_1621192/EN/Content/Prevention/EMIS/Publications/EMIS_2010_CommunityReport1_English,templateId=raw,property=publicationFile.pdf/EMIS_2010_CommunityReport1_English.pdf, accessed 17 May 2011).
22. Trummal A, Johnston LG, Lõhmus L. *HIV prevalence and risk behaviours among men having sex with men in Tallinn: pilot study using respondent driven sampling*. Tallinn, National Institute for Health Development, 2007 (http://www2.tai.ee/teated/GF/Meestega_seksivate_meeste_uurimus_2007.pdf, accessed 15 March 2011).
23. Trummal A, Fischer K, Raudne R. *HIV-nakkuse levimus ning riskikäitumine prostitutsiooni kaasatud naiste hulgas Tallinnas [HIV prevalence and risk taking behaviour among female sex workers in Tallinn]*. Tallinn, National Institute for Health Development, 2006 (http://www.tai.ee/failid/PK_HIV_uurimuse_raport_12.2006_1_parandatud.pdf, accessed 29 April 2011).
24. Rüütel K, Loit HM. *Infektsionisti külastavate HIVi nakatunute elukvaliteet ning HIV-nakkusega seotud stigma ja diskrimineerimine Eestis [Quality of life and stigma and discrimination related to HIV among people with HIV under care in infectious diseases departments: study report 2005]*. Tallinn, National Institute for Health Development, 2006 (http://www.tai.ee/failid/HIV_pos_uurimuse_raport_20.07.2006.pdf, accessed December 8, 2010).
25. Lõhmus L et al. *Infektsionisti külastavate HIVi nakatunute elukvaliteet ning HIV-nakkusega seotud stigma ja diskrimineerimine Eestis [Quality of life and stigma and discrimination related to HIV among people with HIV under care in infectious diseases departments: study report 2008]*. Tallinn, National Institute for Health Development, 2009 (http://www.tai.ee/failid/HIV_pos_uurimuse_raport_netti_09.2009.pdf, accessed 8 December 2010).
26. National Institute for Health Development. *Health Behavior among Estonian Adult Population, 2004*. Tallinn, National Institute for Health Development, 2005 (http://www.tai.ee/failid/TKU2004_kogumik.pdf, accessed 15 March, 2011).
27. Tekkel M, Veideman T, Rahu M. *Health Behavior among Estonian Adult Population, 2006*. Tallinn, National Institute for Health Development, 2007 (<http://www2.tai.ee/uuringud/TKU2006.pdf>, accessed 15 March 2011).
28. Tekkel M, Veideman T, Rahu M. *Health Behavior among Estonian Adult Population, 2008*. Tallinn, National Institute for Health Development, 2009 (<http://www2.tai.ee/TAI/TKU2008.pdf>, accessed 15 March 2011).
29. Tekkel M, Veideman T. *Health Behavior among Estonian Adult Population, 2010*. Tallinn, National Institute for Health Development, 2010 (http://www.tai.ee/failid/TKU_2010.pdf, accessed 15 March 2011).
30. Lõhmus L, Trummal A. *Süstlavahetuspunktide külastajate HIV/AIDS-iga seotud riskikäitumine ja teadmised [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in Estonia, short report 2004]*. Tallinn, NIHD, 2005 (<http://www.tai.ee/failid/sustlavahetus.pdf>, accessed 27 April 2011).
31. Lõhmus L, Trummal A. *Süstlavahetusteenuse külastajate HIV/AIDS-iga seotud riskikäitumine ja teadmised. Esma- ja korduvklieentide võrdlev analüüs 2005 [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in*

- Estonia: comparison between first-time visitors and regular clients 2005*]. Tallinn, NIHD, 2006 (http://www.tai.ee/failid/SVP_esma__ja_korduvk_1._NETTI_12.01.2006.pdf, accessed 29 April 2011).
32. Lõhmus L, Trummal A. *Süstlavahetusteenuse külastajate HIV/AIDS-iga seotud isikikäitumine ja teadmised. Esma-ja korduvklientide võrdlev analüüs 2006* [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in Estonia: comparison between first-time visitors and regular clients 2006]. Tallinn, NIHD, 2007 (http://www2.tai.ee/teated/GF/Systlavahetuse_kylastajad_2006.pdf, accessed 29 April 2011).
 33. Lõhmus L, Trummal A. *Süstlavahetusteenuse külastajate HIV/AIDS-iga seotud isikikäitumine ja teadmised. Esma-ja korduvklientide võrdlev analüüs 2007* [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in Estonia: comparison between first-time visitors and regular clients 2007]. Tallinn, NIHD, 2008 (http://www2.tai.ee/uuringud/SVP_klientide_uurimus_2007_LYHI.pdf, accessed 29 April 2011).
 34. Murd M, Trummal A. *Süstlavahetusteenuse külastajate HIV/AIDS-iga seotud isikikäitumine ja teadmised. Esma-ja korduvklientide võrdlev analüüs 2008* [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in Estonia: comparison between first-time visitors and regular clients 2008]. Tallinn, NIHD, 2009 (http://www2.tai.ee/TAI/SVP_raport_2008_netti.pdf, accessed 29 April 2011).
 35. Murd M, Trummal A. *Süstlavahetusteenuse külastajate HIV/AIDS-iga seotud isikikäitumine ja teadmised. Esma-ja korduvklientide võrdlev analüüs 2009* [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in Estonia: comparison between first-time visitors and regular clients 2009]. Tallinn, NIHD, 2010 (http://www.tai.ee/failid/SVP_raport_2009_netti.pdf, accessed 29 April 2011).
 36. Murd M, Trummal A. *Süstlavahetusteenuse külastajate HIV/AIDS-iga seotud isikikäitumine ja teadmised. Esma-ja korduvklientide võrdlev analüüs 2010* [Knowledge and behaviour related to HIV/AIDS among IDUs visiting syringe exchange programmes in Estonia: comparison between first-time visitors and regular clients 2010]. Tallinn, NIHD, 2011 (http://www.tai.ee/failid/Systlavahetusteenuse_kylastajate_hiviga_seotud_riskikaitumine_ja_teadmised.pdf, accessed 29 April 2011).
 37. Murd M, Trummal A. *AIDS counselling centre clients, 2008*. Tallinn, NIHD, 2009 (http://www.tai.ee/failid/ANK_kliendid_2008.pdf, accessed 29 April 2011).
 38. Lõhmus L, Trummal A. *Prostitutsiooni kaasatute meditsiiniteenuste külastajate HIV/AIDS-iga seotud riskikäitumine ja teadmised* [Knowledge and behaviour related to HIV/AIDS among commercial sex workers visiting health services, 2004]. Tallinn, NIHD, 2005 (http://www.tai.ee/failid/prostitutsiooni_kaatatud_18.03.20052.pdf, accessed 29 April 2011).
 39. Lõhmus L, Trummal A. *Prostitutsiooni kaasatute meditsiiniteenuste külastajate HIV/AIDS-iga seotud riskikäitumine ja teadmised* [Knowledge and behaviour related to HIV/AIDS among commercial sex workers visiting health services. Comparison between first-time visitors and regular clients, 2005]. Tallinn, NIHD, 2005 (http://www.tai.ee/failid/PK_esma__ja_korduvk_laliste_raport_24.01.2006.pdf, accessed 29 April 2011).
 40. Lõhmus L, Trummal A. *Prostitutsiooni kaasatute meditsiiniteenuste külastajate HIV/AIDS-iga seotud riskikäitumine ja teadmised* [Knowledge and behaviour related to

- HIV/AIDS among commercial sex workers visiting health services. Comparison between first-time visitors and regular clients, 2006*. Tallinn, NIHD, 2006 (http://www2.tai.ee/teated/GF/Med.teenused_prost.kaasatud_2006.pdf, accessed 29 April 2011).
41. Lõhmus L, Trummal A. *Prostitutsiooni kaasatute meditsiiniteenuste külastajate HIV/AIDS-iga seotud riskikäitumine ja teadmised* [Knowledge and risk behaviour related to HIV among commercial sex workers visiting health services. Comparison between first-time visitors and regular clients, 2007]. Tallinn, NIHD, 2008 (http://www2.tai.ee/teated/GF/Med.teenust_kylastavate_PK_kysitus_2007.pdf, accessed 29 April 2011).
 42. *Programmatic data from STI services for commercial sex workers, 2004–2010*. Tallinn, National Institute for Health Development, 2011.
 43. *Programmatic data from STI services for injecting drug users, 2006–2010*. Tallinn, National Institute for Health Development, 2011.
 44. *Health insurance*. Tallinn, Estonian Health Insurance Fund, 2011 (<http://www.haigekassa.ee/eng/health-insurance>, accessed 29 April 2011).
 45. Ustina V et al. Epidemiology of HIV in Estonia. *AIDS Research and Human Retroviruses*, 2001, 17:81–85.
 46. Uusküla A et al. The role of injection drug use in the emergence of human immunodeficiency virus infection in Estonia. *International Journal of Infectious Diseases*, 2002, 6:23–27.
 47. Statistics Estonia [web site]. Tallinn, Statistics Estonia, 2009 (<http://www.stat.ee>, accessed 29 April 2011).
 48. *HIV and AIDS estimates, Estonia*. Geneva, Joint United Nations Programme on HIV/AIDS, 2009 (<http://www.unaids.org/en/regionscountries/countries/estonia/>, accessed 12 May 2011).
 49. Lai T et al. *Modelling Estonia's concentrated HIV epidemic. A case study*. Copenhagen, WHO Regional Office for Europe, 2009. (<http://ee.euro.who.int/E93235.pdf>, accessed 29 April 2011).
 50. *HIV testing: increasing uptake and effectiveness in the European Union*. Stockholm, European Centre for Disease Prevention and Control, 2010. (http://ecdc.europa.eu/en/healthtopics/spotlight/spotlight_aids/Pages/index.aspx, accessed 29 April 2011).
 51. *Scaling up HIV testing and counselling in the WHO European Region as an essential component of efforts to achieve universal access to HIV prevention, treatment, care and support. Policy Framework*. Copenhagen, WHO Regional Office for Europe, 2010 (http://www.euro.who.int/__data/assets/pdf_file/0007/85489/E93715.pdf, accessed 29 April 2011).
 52. *Guidelines for testing HIV, viral hepatitis and other infections in injecting drug users*. Lisbon, European Monitoring Centre for Drugs and Drug Addiction, 2010 (<http://www.emcdda.europa.eu/publications/manuals/testing-guidelines>, accessed 29 April 2011).
 53. Lauby JL et al. Decisional balance, perceived risk and HIV testing practices. *AIDS and Behavior*, 2006, 10:83–92.

54. Higgins DL et al. Evidence for the effects of HIV antibody counselling and testing on risk behaviors. *The Journal of the American Medical Association*, 1991, 7:2419–2429.
55. Denison JA et al. HIV voluntary counselling and testing and behavioral risk reduction in developing countries: A meta-analysis, 1990–2005. *AIDS and Behavior*, 2008, 12:363–373.
56. Ustina V. *HIV infection in Estonia in 1987–2004. Overview of surveillance data*. Tallinn, West-Tallinn Central Hospital, 2005.
57. Rüütel K, Loit HM. *TB related knowledge and TB screening among injecting drug users in syringe exchange programmes: study report 2008*. Tallinn, National Institute for Health Development, 2008.
58. Rüütel K, Parker RD. *Piloting HIV rapid testing: study report 2008*. Tallinn, National Institute for Health Development, 2008.
59. Rüütel K, Barros H, Deblonde J. What are the perceived barriers to HIV testing among injecting drug users – short report from Estonia and Portugal. *Conference HIV in European Region – unity and diversity, Tallinn, 25–27 May 2011*.
60. Tripathi A, Rüütel K, Parker RD. HIV risk behaviour knowledge, substance use and unprotected sex in men who have sex with men in Tallinn, Estonia. *Euro Surveillance*, 2009, 14(48):pii=19429.
61. Makhlof Obermeyer C, Osborn M. The utilization of testing and counselling for HIV: A review of the social and behavioral evidence. *American Journal of Public Health*, 2007, 97:1762–1774.
62. Franco-Paredes C, Tellez I, del Rio C. Rapid HIV testing: A review of the literature and implications for the clinician. *Current HIV/AIDS Reports*, 2006, 3:159–165.
63. Vermund SH, Wilson CM. Barriers to HIV testing – where next? *The Lancet*, 2002, 360:1186–1187.
64. Bowles KE et al. Implementing rapid HIV testing in outreach and community settings: results from an advancing HIV prevention demonstration project conducted in seven U.S. Cities. *Public Health Reports*, 2008, 123:(Suppl. 3)78–85.
65. *HIV screening and access to care: Exploring barriers and facilitators to expanded HIV testing*. Committee on HIV Screening and Access to Care; Institute of Medicine, National Academy of Sciences, 2010.
66. Estonian Medical Birth and Abortion Registry [web site]. Tallinn, National Institute for Health Development, 2011 (<http://www.tai.ee/?id=2369>, accessed 15 March 2011).
67. *Second generation surveillance for HIV*. Geneva, World Health Organization, 2000 (http://www.who.int/hiv/pub/surveillance/en/cds_edc_2000_5.pdf, accessed 8 December 2010).
68. *Sexually transmitted infections. Breaking the cycle of transmission*. New York, United Nations Population Fund, 2004 (<http://www.unfpa.org/publications/detail.cfm?ID=215>, accessed 8 December 2010).
69. *Young people and HIV/AIDS. Opportunity in Crisis*. New York, United Nations Children's Fund, 2002 (http://data.unaids.org/topics/young-people/youngpeoplehivaids_en.pdf, accessed 29 April 2011).

70. *Practical guidelines for intensifying HIV prevention. Towards universal access.* Geneva, Joint United Nations Programme on HIV/AIDS, 2007
(http://data.unaids.org/pub/Manual/2007/20070306_prevention_guidelines_towards_universal_access_en.pdf, accessed 29 April 2011).
71. Matsi A, Oja L. *Estonian Health Interview Survey 2006. Tables.* Tallinn, National Institute for Health Development, 2009.
72. Trummal A. *Factors influencing the use of condoms among youth aged 16–24 years: analysis of focus groups interviews.* Tallinn, National Institute for Health Development, 2009.
73. Part K. Sexual education in Estonia. In: Poolamets O et al., eds. *Sexuality in Estonia. History. Developments.* Tallinn, Tänapäev, 2006:57–66.
74. Kivela J, Ketting E, Baltussen R. *Cost and cost-effectiveness analyses of school-based sexuality education programmes in six countries.* Paris, UNESCO, Radboud University Nijmegen Medical Center, 2011.
75. Part K. Overview of sexual education in newly independent Estonia. *Seminar on cost analyses of school-based sexuality education in Estonia, Tartu, 5 November 2010.*
76. Haavio-Mannila E, Kontula O. *Seksin trendit meillä ja naapureissa [Sexual trends in Finland and neighbouring countries].* Helsinki, Werner Söderström Osakeyhtiö, 2001.
77. Part K et al. *Estonian women's health: sexual and reproductive health, health behaviour, attitudes and use of health care services. Survey report.* Tartu, University of Tartu, 2007.
78. Bryan A et al. Tests of the mediational role of preparatory safer sexual behavior in the context of the theory of planned behavior. *Health Psychology*, 2002, 21:71–80.
79. Empelen van P, Kok G. Action-specific cognitions of planned and preparatory behaviors of condom use among Dutch adolescents. *Archives of Sexual Behavior*, 2008, 37: 626–640.
80. Sheeran P et al, Abraham C, Orbell S. Psychosocial correlates of heterosexual condom use: A meta-analysis. *Psychological Bulletin*, 125:90–132.
81. Štulhofer A et al. HIV/AIDS-related knowledge, attitudes and sexual behaviors as predictors of condom use among young adults in Croatia. *International Family Planning Perspectives*, 2007, 33:58–65.
82. Kull M. *Seksuaalkasvatust ja HIV/AIDS-i teematika käsitlemine koolides: probleemid ja võimalikud lahendused [Sexual education and HIV/AIDS in school curriculums: problems and possible solutions].* Tallinn, Eesti Tervisekasvatuse Keskus, 2003.
83. Calazans G et al. Factors associated with condom use among youth aged 15–24 years in Brazil in 2003. *AIDS*, 2005, 19:S42–S50.
84. Farmer MA, Meston CM. Predictors of condom use self-efficacy in an ethnically diverse university sample. *Archives of Sexual Behavior*, 2006, 35:313–326.
85. Rau B. *Workplace HIV/AIDS programmes. An action guide for managers.* Durham, North Carolina, Family Health International, 2004.
86. Zenilman JM. Sexually transmitted diseases. In: Nelson KE, Williams CM, eds. *Infectious diseases epidemiology. Theory and practice.* London, Jones and Bartlett Publishers, 2007:963–1020.

87. Naaber P et al. Laboratory diagnosis of sexually transmitted infections in Estonia in 2001–2002: Shortcomings with impact on diagnostic quality and surveillance. *Sexually Transmitted Diseases*, 2005, 32:759–764.
88. Uusküla A et al. The prevalence of chlamydial infection in Estonia: a population-based survey. *International Journal of STDs and AIDS*, 2008, 7:455–458.
89. Uusküla A, Nygård JF, Kibur-Nygård M. Syphilis as a social disease: experience from the post-communist transition period in Estonia. *International Journal of STDs and AIDS*, 2004, 10:662–668.
90. Uusküla A et al. Sexually transmitted infections in Estonia – syndromic management of urethritis in a European country? *International Journal of STDs and AIDS*, 2001, 8:493–498.
91. Hughes G, Paine T, Thomas D. Surveillance of sexually transmitted infections in England and Wales. *Euro Surveillance*, 2001, 5:pii=208.
92. Hibell B et al. *The ESPAD report 2003: alcohol and other drug use among students in 35 European countries*. Stockholm, Swedish Council for Information on Alcohol and Other Drugs, 2004 (http://www2.tai.ee/uuringud/Narkomaania/espac_2003_rahvusvaheline.pdf, accessed 29 April 2011).
93. Allaste A. *Schoolchildren and drugs: use of legal and illegal drugs by 15–16 year old students in Estonia*. Tallinn, Tallinn University, 2008 (<http://www2.tai.ee/uuringud/Narkomaania/ESPAD2007pdf.pdf>, accessed 29 April 2011).
94. Talu A et al. *Report about the drug situation in Estonia in 2009 (Based on data from 2008)*. Tallinn, National Institute for health Development, 2009.
95. Uusküla et al. Estimating injection drug use prevalence using statewide administrative data sources: Estonia, 2004. *Addiction Research and Theory*, 2007, 4:411–424.
96. Uusküla A et al. High prevalence of blood-borne virus infections and high-risk behaviour among injecting drug users in Tallinn, Estonia. *International Journal of STDs and AIDS*, 2007, 18:41–46.
97. Uusküla A et al. High-prevalence and high-estimated incidence of HIV infection among new injecting drug users in Estonia: need for large scale prevention programmes. *Journal of Public Health*, 2008, 30:119–125.
98. Uusküla A et al. Outcomes of large-scale syringe exchange in Tallinn, Estonia. *XVIII International AIDS Conference, Vienna, 18–23 July 2010*.
99. WHO, UNODC, UNAIDS *technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users*. Geneva, World Health Organization, 2009 (http://www.who.int/hiv/pub/idu/idu_target_setting_guide.pdf, accessed 29 April 2011).
100. Donoghoe M et al. Setting targets for universal access to HIV prevention, treatment and care for injecting drug users (IDUs): Towards consensus and improved guidance. *International Journal of Drug Policy*, 2008, 19S:S5–S14.
101. *Programmatic data from substitution treatment centers, 2004–2010*. Tallinn, National Institute for Health Development, 2011.
102. Des Jarlais DC. Preventing HIV infection among injecting drug users: intuitive and counter-intuitive findings. *Applied and Preventive Psychology*, 1999, 8:63–70.

103. Des Jarlais DC et al. HIV-1 infection among intravenous drug users in Manhattan, New York City, from 1977 through 1987. *Journal of American Medical Association*, 1989, 261:1008–1012.
104. Des Jarlais DC et al. HIV incidence among injection drug users in New York City, 1992–1997: evidence for a declining epidemic. *American Journal of Public Health*, 2000, 90:352–359.
105. Holmberg SD. The estimated prevalence and incidence of HIV in 96 large US metropolitan areas. *American Journal of Public Health*, 1996, 86:642–654.
106. Hagan H et al. Sharing of drug preparation equipment as a risk factor for hepatitis C virus. *American Journal of Public Health*, 2001, 91:42–46.
107. Thein HH et al. Injecting behaviour of injecting drug users at needle and syringe programmes and pharmacies in Australia. *International Journal of Drug Policy*, 2003, 14:425–430.
108. Matheson C, Bond CM, Pitcairn J. Community pharmacy services for drug misusers in Scotland: what difference does 5 years make? *Addiction*, 2002, 97:1405–1411.
109. Strang J, Sheridan J, Barber N. Prescribing injectable and oral methadone to opiate addicts: results from the 1995 national postal survey of community pharmacies in England and Wales. *BMJ*, 1996, 313:270–272.
110. *Programmatic data from syringe exchange programmes, 2003–2010*. Tallinn, National Institute for Health Development, 2011.
111. Talu A et al. HIV infection and risk behaviour of primary fentanyl and amphetamine injectors in Tallinn, Estonia: Implications for intervention. *International Journal of Drug Policy*, 2010, 21:56–63.
112. Abel-Ollo K et al. Knowledge of HIV serostatus and risk behaviour among injecting drug users in Estonia. *AIDS Care*, 2009, 21:851–857.
113. Heil SH et. Unintended pregnancy in opioid-abusing women. *Journal of Substance Abuse Treatment*, 2010, in press.
114. Selwyn PA et al. Knowledge of HIV antibody status and decisions to continue or terminate pregnancy among intravenous drug users. *Journal of American Medical Association*, 1989, 261:3567–3571.
115. *Effectiveness of interventions to address HIV in prisons*. Geneva, World Health Organization, 2007 (http://www.who.int/hiv/idu/OMS_E4Acomprehensive_WEB.pdf, accessed 8 December 2010).
116. Stöver H et al. Final report on prevention, treatment, and harm reduction services in prison, on reintegration services on release from prison and methods to monitor/analyse drug use among prisoners. 2008
117. Estonian prison system and probation supervision yearbook, 2007. Tallinn, Ministry of Justice, 2008 (http://www.vangla.ee/orb.aw/class=file/action=preview/id=35787/Vanglate_aastaraamat_2007.pdf, accessed 29 April 2011).
118. Stöver H, Thane K. *Towards a continuum of care in the EU criminal justice system. A survey of prisoners' needs in four countries (Estonia, Hungary, Lithuania, Poland)*. Odenburg, Germany, University of Oldenburg, 2011.

119. Faber M et al. *Survey on infectious diseases and related risk behaviour among Estonian prisoners and on knowledge, attitudes and behaviour of Estonian prison staff towards infectious diseases and drugs*. Berlin, Robert Koch Institute, NIHD, WIAD, 2009.
120. *Evaluation of fighting HIV/AIDS in Estonia*. Copenhagen, WHO Regional Office for Europe, 2008 (http://ee.euro.who.int/E91264_Evaluation_of_fighting_HIV_AIDS_in_Estonia.pdf, accessed 29 April 2011).
121. *HIV/AIDS treatment and care. Clinical protocols for the WHO European Region. Management of tuberculosis and HIV coinfection*. Copenhagen, WHO Regional Office for Europe, 2006 (http://www.euro.who.int/___data/assets/pdf_file/0004/78124/E90840_Chapter_4.pdf, accessed 8 December 2010).
122. Selwyn PA et al. A prospective study of the risk of tuberculosis among intravenous drug users with human immunodeficiency virus infection. *New England Journal of Medicine*, 1989, 320:545–550.
123. Perlman DC et al. Tuberculosis in drug users. *Clinical Infectious Diseases*, 1995, 21:1253–1264.
124. Hwang LY et al. Latent tuberculosis infections in hard-to-reach drug using population – detection, prevention and control. *Tuberculosis*, 2009, S1:S41–S45.
125. *Global tuberculosis control: surveillance, planning, financing*. Geneva, World Health Organization, 2008 (http://www.who.int/tb/publications/global_report/2008/pdf/fullreport.pdf, accessed 8 December 2010).
126. *Tuberkuloosihagistumus Eestis 2008–2009 [Tuberculosis in Estonia 2008–2009]*. Tallinn, National Institute for Health Development, 2010.
127. Vink K. *Guidelines for diagnosis, treatment and follow-up of tuberculosis*. Tartu, Tartu University Clinic, 2004 (http://www.tai.ee/failid/TB_ravijuhis.pdf, accessed 8 December 2010).
128. Rüütel K et al. Prevalence of latent tuberculosis and risk factors among injecting drug users in Estonia and Latvia. *5th European Conference on Clinical and Social Research on AIDS and Drugs*, Vilnius, 28–30 April 2009.
129. Rüütel K et al. *Prevalence of latent tuberculosis and tuberculosis among methadone substitution treatment patients: study report 2007*. Tallinn, National Institute for Health Development, 2008.
130. Garfein RS et al. Latent tuberculosis among persons at risk for infection with HIV, Tijuana, Mexico. *Emerging Infectious Diseases* 2010. Epub ahead of print.
131. Lifson AR et al. Skin test anergy among injection drug users recruited from community settings. *Journal of Drug Issues*, 1998, 28:891–904.
132. MacGregor RR, Dunbar D, Graziani AL. Tuberculin reactions among attendees at a methadone clinic: Relation to infection with the human immunodeficiency virus. *Clinical Infectious Diseases*, 1994, 6:1100–1104.
133. Perlman DC et al. Tuberculosis screening at a syringe exchange program. *American Journal of Public Health*, 1997, 87:862–863.
134. Portu JJ et al. Tuberculin skin testing in intravenous drug users: differences between HIV-seropositive and HIV-seronegative subjects. *Addiction Biology*, 2002, 7:235–241.

135. Quaglio G et al. Prevalence of tuberculosis infection and comparison of multiple-puncture liquid tuberculin test and Mantoux test among drug users. *Scandinavian Journal of Infectious Diseases*, 2002, 34:574–576.
136. Rusen DI, Yuan L, Millson ME. Prevalence of *Mycobacterium tuberculosis* infection among injection drug users in Toronto. *Journal of Canadian Medical Association*, 1999, 160:799–802.
137. Van Deutekom H et al. The HIV epidemic and its effect on the tuberculosis situation in the Netherlands. *Tubercle and Lung Disease*, 1993, 74:159–162.
138. Durante AJ, Selwyn PA, O'Connor PG. Risk factors for and knowledge of *Mycobacterium tuberculosis* infection among drug users in substance abuse treatment. *Addiction*, 1998, 93:1393–401.
139. Estrada AL. Epidemiology of HIV/AIDS, hepatitis B, hepatitis C, and tuberculosis among minority injection drug users. *Public Health Reports*, 2002, S126–S134.
140. Salovaara, K. Report from the WHO supported expert mission to strengthen TB surveillance among injecting drug users 16.9–17.9 2009 in Tallinn, Estonia.
141. Sylla L et al. Integration and co-location of HIV/AIDS, tuberculosis and drug treatment services. *International Journal of Drug Policy*, 2007, 18:306–312.
142. El Sadr W, Medard F, Barthaud V. Directly observed therapy for tuberculosis: The Harlem Hospital experience, 1993. *American Journal of Public Health*, 1996, 86:1146–1149.
143. Rüütel K, Uusküla A, Loit HM. Pilot program for tuberculosis control among methadone substitution treatment patients in Estonia. *XVII International AIDS Conference, Mexico City, 3–8 August 2008*.
144. Atun RA et al. Impact of joined-up HIV harm reduction and multidrug resistant tuberculosis control programmes in Estonia: System dynamics simulation model. *Health Policy*, 2007, 81:207–217.
145. Vellozzi C et al. The study to understand the natural history of HIV and AIDS in the era of effective therapy (SUN Study). *American Journal of Epidemiology*, 2009, 169:642–652.
146. *Progress on implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia*. Copenhagen, WHO Regional Office for Europe, 2008.
147. *Programmatic data from support groups for people living with HIV, 2010*. Tallinn, National Institute for Health Development, 2011.
148. Friedland G. Infectious disease comorbidities adversely affecting substance users with HIV: Hepatitis C and tuberculosis. *Journal of Acquired Immune Deficiency Syndromes*, 2010, 55:S37–S42.
149. *Policy guidelines for collaborative TB and HIV services for injecting and other drug users: An integrated approach*. Copenhagen, WHO Regional Office for Europe, 2008 (http://whqlibdoc.who.int/publications/2008/9789241596930_eng.pdf, accessed 8 December 2010).
150. Incorporating HIV prevention into the Medical care of persons living with HIV. Recommendations of CDC, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. *MMWR Recomm Rep*, 2003, 52:1–24.

151. *HIV/AIDS among men who have sex with men: fact sheet*. Atlanta, Centers for DiseaseControl and Prevention (CDC), 2006 (http://www.aidspreventionlausa.net/images/pdf_factsheet/MenWhoHaveSexwithMen.pdf, accessed 29 April 2011).
152. *HIV and sex between men. UNAIDS Policy Brief*. Joint United Nations Program on HIV/AIDS, Geneva, 2006 (http://data.unaids.org/pub/BriefingNote/2006/20060801_policy_brief_msm_en.pdf, accessed 29 April 2011)
153. *HIV/AIDS surveillance in Europe 2008*. European Center for Disease Prevention and Control, World Health Organization, 2009.
154. Marcus U et al. HIV incidence increasing in MSM in Germany: factors influencing infection dynamics. *Euro Surveillance*, 2006, 11(9):pii=645.
155. Diamond M. Homosexuality and bisexuality in different populations. *Journal Archives of Sexual Behavior*, 1993, 4:291–310.
156. Purcell C et al. Calculating HIV and syphilis rates for risk groups: estimating the national population size of men who have sex with men. *National STD Prevention Conference, Atlanta, 8–10 March 2010*.
157. Smith TW. American sexual behavior: Trends, socio-demographic differences, and risk behavior. NORC, Digital Library, GSS Topical Report No. 25, 1998.
158. Hamlyn E, Peer A, Easterbook P. Sexual health and HIV in travellers and expatriates. *Occupational Medicine*, 2007, 57:313–321.
159. Herold ES, Van Kerkwijk C. AIDS and sex tourism. *Journal of the International AIDS Society*, 1992, 4:8.
160. Carter S et al. The sexual behaviour of international travellers at two Glasgow GUM clinics. *International Journal of STD and AIDS*, 1997, 8:336–338.
161. Fenton KA, Imrie J. Increasing rates of sexually transmitted diseases in homosexual men in Western Europe and the United States: why? *Infectious Disease Clinics of North America*, 2005, 19:311–331.
162. Holstein I, Fenton AK, Ison C. European network for surveillance of STIs (ESSTI) establishes working groups on lymphogranuloma venereum and HIV/STI prevention among MSM. *Euro Surveillance*, 2004, 25:pii=2490.
163. *Prevention and treatment of HIV and other sexually transmitted infections among men who have sex with men and transgender populations*. Geneva, World Health Organization, 2009 (http://www.msmaia.org/tl_files/resources/OMS%20MSM_DF.pdf, accessed 29 April 2011).
164. Harcourt C, Donovan B. The many faces of sex work. *Sexually Transmitted Infections*, 2005, 81:201–206.
165. *HIV and sexually transmitted infection prevention among sex workers in Eastern Europe and Central Asia. UNAIDS best practice collection*. Joint United Nations Program on HIV/AIDS, Geneva, 2006 (http://data.unaids.org/publications/IRC-pub07/jc1212-hivpreveasterneurcentrasia_en.pdf, accessed 29 April 2011).
166. Day S, Ward H. sex workers and the control of sexually transmitted disease. *Genitourinary Medicine*, 1997, 73:161–168.

167. Johnston L, Trummal A. *Assessment for representative sampling among female sex workers in Tallinn, Estonia*. Tallinn, National Institute for Health Development, 2010 (http://www.tai.ee/failid/Report_on_Sampling_FSWs_in_Tallinn_01.2010.pdf, accessed 29 April 2011).
168. *Bordernet activity report of Estonia of the project "Practice-oriented further development and implementation on HIV-AIDS and STI-s prevention, diagnostic and therapy in Europe."* Tallinn, AIDS Information and Support Centre, 2008.
169. Pettai I, Kase H, Proos I. *Prostitution in Estonia: overview of the situation of women involved in prostitution, results of a sociological survey*. Tallinn, Estonian Institute for Open Society Research, 2006 (http://www.tai.ee/failid/Prostitution_in_Estonia._ingl.pdf, accessed 15 December 2010).
170. Uusküla A et al. A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. *Sexually Transmitted Infections*, 2008, 843, 189–191.
171. Tanguay, P. *Injecting drug use and sex work. Paying attention to the needs of female drug users in Asia*. Amsterdam, Royal Tropical Institute, 2006 (http://www.kit.nl/net/KIT_Publicaties_output/ShowFile2.aspx?e=1029, accessed 15 December 2010).
172. Ward H, Day S, Weber J. Risky business: health and safety in the sex industry over a 9-year period. *Sexually Transmitted Infections*, 1999, 75:340–343.
173. Archibald CP et al. HIV among injecting drug users and spread to the general population: putting the cart before the horse. *International Journal of Drug Policy*, 2003, 14:75–78.

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

Member States

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
The former Yugoslav
Republic of Macedonia
Turkey
Turkmenistan
Ukraine
United Kingdom
Uzbekistan



9 789289 002578

**ISBN
978 92 890 0257 8
Original: English**

**World Health Organization
Regional Office for Europe**

Scherfigsvej 8, DK-2100 Copenhagen Ø, Denmark

Tel.: +45 39 17 17 17. Fax: +45 39 17 18 18. E-mail: contact@euro.who.int

Web site: www.euro.who.int