

HIV IN EUROPE HIV IN EUROPE HIV IN EUROPE HIV IN EUROPE HIV IN EUROPE HIV IN EUROPE HIV IN EUROPE

# **THE SPREAD OF HIV IN EUROPE**

## **HIDDEN EPIDEMICS AND OTHER BARRIERS TO UNIVERSAL ACCESS TO PREVENTION, TREATMENT AND CARE**

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FACULTY OF MEDICINE  
LUND UNIVERSITY

# **The spread of HIV in Europe**

## **Hidden epidemics and other barriers to universal access to prevention, treatment and care**

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**LUND**  
UNIVERSITY

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Bodily fluids are politically important.  
—*Peter Baldwin, Disease and democracy* (1)

Isolated teams of scientists in research centers in America and Europe risked their reputations and often their jobs to pioneer early research on AIDS.  
—*Randy Shilts, And the band played on* (2)

Modern epidemiology is oriented to explaining and quantifying the bobbing of corks on the surface of waters, while largely disregarding the stronger undercurrents that determine where the cluster of corks ends up along the shorelines of risk.  
—*Anthony McMichael, “The health of persons, populations, and planets”* (3)



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## List of abbreviations

AIDS	acquired immune deficiency syndrome
CD4 cell	cluster of differentiation antigen 4 cell
ECDC	European Centre for Disease Prevention and Control
EU	European Union
GDP	gross domestic product
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GNP+	The Global Network of People living with HIV/AIDS
G8	Group of Eight
HAART	highly active antiretroviral treatment
HBcAg	hepatitis B core antigen
HBsAg	hepatitis B surface antigen
HBSC	Health Behaviour in School-aged Children (survey)
HBV	hepatitis B virus
HCV	hepatitis C virus
HDI	Human Development Index
HIV	human immunodeficiency virus
IDU	injecting drug user
MSM	men who have sex with men
MTCT	mother-to-child transmission (of HIV)
NGO	nongovernmental organisation
OR	odds ratio
OST	opioid substitution therapy
PLHIV	people living with HIV
STI	sexually transmitted infection
TB	tuberculosis
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNODC	United Nations Office on Drugs and Crime
USSR	Union of Soviet Socialist Republics
WHO	World Health Organization

## List of original publications

This doctoral dissertation is based on the following six papers, which will be referred to in the text by their Roman numerals.

- I. Lazarus JV, Himedan HM, Østergaard LR, Liljestrand J. HIV/AIDS knowledge among Somali and Sudanese immigrants in Denmark. *Scandinavian Journal of Public Health*, 2006;34(1):92–99.
- II. Donoghoe MC, Bollerup A, Lazarus JV, Nielsen S, Matic S. Access to highly active antiretroviral therapy for injecting drug users in the European Region, 2002–2004. *International Journal of Drug Policy*, 2007;18(4):271–280.
- III. Lazarus JV, Shete P, Eramova I, Merkinaite S, Matic S. HIV/hepatitis coinfection in eastern Europe, and new pan-European approaches to hepatitis prevention and management. *International Journal of Drug Policy*, 2007;18(5):426–432.
- IV. Lazarus JV, Olsen M, Ditiu L, Matic S. TB/HIV coinfection: policy and epidemiology in 25 countries in the European region. *HIV Medicine*. Accepted
- V. Lazarus JV, Liljestrand J, Rasch V. Midwifery at the crossroads in Estonia: attitudes of midwives and other key stakeholders. *Acta Obstetricia et Gynecologica Scandinavica*, 2005;84(4):339–348.
- VI. Lazarus JV, Moghaddassi M, Godeau E, Ross J, Vignes C, Östergren PO, Liljestrand J. A multilevel analysis of condom use among adolescents in Europe. *Submitted*.



## **Abstract**

### **Introduction**

An estimated 2.4 [1.8–3.2] million people in the WHO European Region now live with HIV, and none of the Region's 53 countries have been spared. The epidemic is spreading most rapidly in western Europe among migrants and men who have sex with men, and in eastern Europe among male injecting drug users – and increasingly their sexual partners. This doctoral research investigates several aspects of HIV epidemiology and treatment in the European Region that inform the global commitment to provide universal access to HIV prevention, treatment, care and support services. Concretely, it aims to:

- assess two migrant populations' knowledge of and attitudes towards HIV/AIDS (Paper I), and evaluate the equity of injecting drug users' access to HIV treatment in the Region (Paper II);
- track the Region's two principal HIV coinfections, hepatitis C (Paper III) and tuberculosis (Paper IV);
- analyse the effect of health care reforms on potential HIV health care providers in Estonia, the country with the highest HIV prevalence in the European Union (Paper V); and
- measure the impact of individual and societal factors on condom use in young people across the Region (Paper VI).

### **Methods**

The methods utilised included logistic regression, semi-structured interviews and a nominal group technique (I, V), multi-country data collection, descriptive epidemiology and policy analysis (II, III, IV) and multilevel analysis (VI).

### **Results**

The six papers illuminate a range of equity, policy, knowledge and health systems issues.

- Paper I found that in the migrant populations studied, general knowledge about HIV/AIDS, and condom use specifically, particularly among women, was especially deficient.
- Paper II showed that for injecting drug users, access to antiretroviral treatment was inequitable, particularly in eastern Europe.
- Paper III revealed that, in countries where the HIV epidemic is driven by injecting drug use, coinfection with hepatitis C ranges from 10% to 80%. It noted that, overall, access to hepatitis treatment is still very limited in Europe due to poor surveillance, high costs and countries' failure to recognise hepatitis as a critical health issue.
- Among TB patients tested in 25 countries, Paper IV found that 3.3% were HIV-positive. The male-to-female ratio of the coinfecting group was 2.7:1, with the largest percentage of coinfections being reported in people aged 25–34 (48%). Though recommended TB/HIV policies have been implemented in many European countries, the paper emphasised that what is needed most is strengthened coordination between TB and HIV programmes.
- In Estonia, Paper V showed that the health sector reforms of the 1990s did not take advantage of its many midwives to address the major HIV epidemic that was emerging.
- Paper VI demonstrated correlations between a variety of individual and contextual variables – such as alcohol use, predominant national religion and socioeconomic indicators – and young Europeans' condom use.

### **Conclusions**

In Europe, where HIV/AIDS is often a high priority and the means to combat it are widely available, transmission patterns remain misunderstood and the epidemiology has many gaps. That there still exist “hidden” epidemics, hidden HIV issues and inequitable responses in the European Region today reflects, in part, the status of the groups most at risk and the poor state of surveillance – of HIV, AIDS and their comorbidities such as hepatitis and tuberculosis. This, in turn, impedes effective prevention, treatment, care and support efforts. Research that exposes such blind spots – whether in epidemiology, policy or implementation – can identify key challenges in responding to this epidemic and suggest concrete ways to address them.

## Abstract (Russian)

### Введение

По оценочным данным, около 2,4 [1,8–3,2] млн. человек в Европейском регионе ВОЗ инфицированы ВИЧ, и ни одна из 53 стран региона не избежала эпидемии. В Западной Европе эпидемия распространяется, в основном, за счет мигрантов и мужчин, практикующих секс с мужчинами, в то время как в Восточной Европе движущей силой эпидемии являются потребители инъекционных наркотиков, и, все больше в процесс распространения ВИЧ вовлекаются их сексуальные партнеры. Настоящая работа исследует некоторые аспекты эпидемиологии и лечения ВИЧ-инфекции в Европейском регионе, которые лежат в основе глобальной инициативы обеспечения универсальной доступности услуг по профилактике, лечению и уходу при ВИЧ-инфекции. В частности, задачами работы являются:

- определение уровня знаний и отношения к проблеме ВИЧ/СПИДа двух групп мигрантов (научная статья I), и оценка равенства доступности лечения ВИЧ-инфекции для потребителей инъекционных наркотиков (ПИН) в Регионе (научная статья II);
- изучение двух основных ко-инфекций ВИЧ в Регионе: гепатит С (научная статья III) и туберкулез (научная статья IV);
- анализ влияния реформ системы здравоохранения на потенциальные возможности медицинских работников в Эстонии, страны с самой высокой распространенностью ВИЧ-инфекции в Европейском союзе (научная статья V);
- оценка воздействия индивидуальных и социальных факторов на использование презервативов молодыми людьми в Европейском регионе (научная статья VI).

### Методы

Были использованы: метод логической регрессии, полуструктурированное интервью и методика номинальных групп (I, V), сбор данных по разным странам, описательная эпидемиология, анализ политики страны (II, III, IV), и многоуровневый анализ (VI).

### Результаты

Представленные шесть докладов разъясняют ряд вопросов связанных с равенством доступности услуг, политикой, знаниями и системами здравоохранения

- Из научной статьи I следует, что в изученных группах мигрантов общие знания о ВИЧ/СПИДе и использовании презервативов, особенно среди женщин были крайне низкими.
- Научная статья II свидетельствует о наличии неравенства в доступности лечения ВИЧ-инфекции для ПИН, особенно в странах восточной Европы.
- Из научной статьи III следует, что в тех странах, где движущей силой эпидемии ВИЧ являются ПИН, уровень ко-инфекции ВИЧ и гепатита С составляет от 10 до 80%. В целом, из-за недостаточного эпидемиологического надзора, высокой стоимости препаратов для лечения и отсутствия признания странами парентеральных гепатитов одной из ключевых проблем здравоохранения, доступность лечения х гепатитов в Европе все еще довольно ограничена.
- Научная статья IV свидетельствует о том, что из протестированных на ВИЧ пациентов с туберкулезом в 25 странах Европы, 3.3% были ВИЧ-позитивными. Соотношение мужчин и женщин в группе с ко-инфекцией составило 2.7:1. Самый высокий уровень ко-инфекции (48%) был зарегистрирован в возрастной группе 25-34 года. Хотя рекомендованные стратегии по ко-инфекции ВИЧ с туберкулезом были внедрены во многих Европейских странах, наиболее важным и необходимым является усиление координации между программами по ВИЧ-инфекции и туберкулезу.
- Научная статья V показал, что реформа системы здравоохранения 1990-ых в Эстонии не воспользовалась преимуществом своего многочисленного штата акушерских сестер, чтобы противостоять значительно растущей ВИЧ-эпидемии.
- Научная статья VI демонстрирует, что на использование презервативов молодыми людьми в Европе влияют различные индивидуальные, ситуационные (употребление алкоголя, преобладающая религия) и социально-экономические факторы.

## **Заключение**

В Европе, где борьба с ВИЧ/СПИДом зачастую является приоритетом, и где выделяются огромные средства на борьбу с ней, закономерности передачи все еще понимаются не всегда правильно, а в эпидемиологическом плане существует много пробелов. Сегодня существование в Европейском Регионе “скрытых” эпидемий, скрытых проблем, связанных с ВИЧ, и несоответствующее реагирование частично отражает недостаточность системы эпидемиологического надзора за ВИЧ-инфекцией, СПИДом и сочетанными инфекциями с ВИЧ, такими как гепатиты и туберкулез. Это, в свою очередь, препятствует эффективному предоставлению услуг по профилактике, лечению, уходу и поддержке. Исследования, выявляющие пробелы (будь то в области эпидемиологии, политики или внедрения), могут помочь в определении главных проблем в противостоянии эпидемии и подсказать конкретные пути для их решения.

## Preface

That HIV/AIDS would transform the fabric of life for tens of millions of people around the world was unthinkable when I was growing up. Yet even in Europe, where HIV/AIDS is often a high priority and the financial means to combat it are available, transmission patterns remain widely misunderstood and the epidemiology has many gaps. That is why in many cases it can be described as a hidden epidemic. An estimated 2.36 [1.8–3.2] million people (4) now live with the infection in the WHO European Region, where none of the 53 countries have been spared. And though this figure is low compared to that in the worst-affected area, the southern parts of sub-Saharan Africa, it represents an alarming and unprecedented increase in new cases in just a few years.

In particular, the accelerating spread of HIV in eastern Europe poses one of the region's most critical public health challenges. In the last 10 years, three countries in eastern Europe, including Estonia – now a member of the European Union – have gone from a few reported cases to an estimated prevalence greater than 1% among people aged 15–49. For the vulnerable and the marginalised, the rates are much higher – and rising. Yet authorities across Europe appear to know how HIV is transmitted and which behaviours are associated with transmission. So why does this infection continue to spread?

While the nature of the virus itself – its long incubation period and its shadowy residence in our vital fluids – is partly responsible, much of the problem can be ascribed to government intransigence, public ignorance and the criminalisation of risky behaviours, compounded by poverty, social exclusion, and political and economic turmoil, both at home and abroad. For those who are already infected, the prognosis has improved considerably. Thanks to combination antiretroviral therapy, many HIV-positive residents of the Region can now lead almost normal lives. The WHO/UNAIDS 3 by 5 Initiative – named for its goal of having three million additional people on highly active antiretroviral therapy by the end of 2005 – strove to scale up access to this life-saving treatment. The target for the European Region was to enrol another 100 000 people. While this target was met, the treatment gap in the Region continues to grow because of the growing number of people acquiring HIV and AIDS, especially in eastern Europe.

With the 3 by 5 Initiative over, now is the time to survey the situation and consider how to best move towards the larger goal of universal access to HIV prevention, treatment, care and support. The six articles here seek to contribute to this effort by using evidence-based analysis to illuminate some key aspects of where Europe has been and where it is heading.

Good co-authors are priceless, and I was lucky to work with so many brilliant ones from around the world. Thank you for your contributions to the articles: Annemarie Bollerup, Lucica Ditiu, Martin Donoghoe, Irina Eramova, Emmanuelle Godeau, Himedan M Himedan, Jerker Liljestrand, Srđan Matic, Simona Merkinaite, Mahnaz Moghaddassi, Stine Nielsen, Mette Olsen, Vibeke Rasch, Jim Ross, Priya Shete, Céline Vignes, Per-Olof Östergren and Lise Rosendal Østergaard.

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- Jerker Liljestrand, who initiated this project and taught me that research should lead to action and through the years has led the way. I cannot thank him enough for his dedication to my research, his guidance on how to teach and his support in personal matters.

And for inspiration to close this chapter in my life, little Hannah Liv.

*Jeffrey V. Lazarus*  
Copenhagen, 1 February 2008

## Introduction

Today, more than 25 years after the first cases were registered, HIV is recognised as a global emergency demanding the attention of not just health, but every public sector. Each year it kills millions of people and infects millions more. It has been declared an international security threat (5) and described as a long-wave event with global repercussions (6, 7)). That is why it is high on the public health agenda of many countries and why combating it is one of the eight Millennium Development Goals (8, 9), agreed on by all countries, and a top priority in bilateral and multilateral development aid.

Most of the world's new HIV infections are transmitted sexually. However, within populations, there exist many people who have been infected in other ways, i.e. through nosocomial means, contaminated blood supplies, vertical (mother-to-child) transmission and non-sterile drug injection equipment. Except for vertical transmission, in sub-Saharan Africa, these modes of nonsexual transmission and how to address them have often been under-addressed (10–12). Most countries in the European Region (see Table 1), on the other hand, are making good progress towards eliminating transmission through the first three of these nonsexual routes (13, 14), but transmission by non-sterile needles and syringes remains a major problem in eastern Europe. In western Europe, heterosexual transmission, primarily within migrant populations, has increased. Injecting drug users (IDUs) and migrants are two of the most important marginalised and often “invisible” populations that this dissertation addresses.

Two other problems that Europe faces are first, high levels of HIV coinfection with hepatitis B and C (particularly C); and second, increasing HIV coinfection with tuberculosis (TB). Data on hepatitis infection rates and strategies to address it are sparse. This is especially true for HIV coinfection with hepatitis B and C, which have been described as the most dangerous “silent killers” of our time (15). Because the hepatitis C virus (HCV), like HIV, can cause a latent illness, and because it is about 10 times more infectious than HIV, many of those infected with HCV remain undiagnosed. And owing to the particular efficacy of shared injecting equipment as a transmission route for HCV, it is estimated that after five years of sharing injecting equipment, most IDUs are infected (16). A recent review of the situation in 17 European countries confirmed that this infection pattern was indeed becoming more common (17). Hepatitis B and C can lead to cirrhosis, liver cancer and ultimately, liver failure and death. Now that an increasing number of HIV-positive Europeans are on combination antiretroviral therapy that enables them to live much longer, hepatitis has become one of their major causes of morbidity and mortality.

Among people living with AIDS, TB coinfection is associated with a higher morbidity and mortality; and among people living with TB, HIV coinfection is associated with increased TB transmission to the general population (18). While TB/HIV arose in eastern Europe during a period of rapid health system transition, it has appeared in equal or greater numbers in the well-functioning health care systems of western Europe, such as those in France, Italy, Portugal and Spain. As with HIV/hepatitis, data on TB/HIV are limited, as are national strategies to address it.

Table 1. **Member states of the WHO European Region**

Western Europe	Central Europe	Eastern Europe**
1. Andorra	24. Albania	39. Armenia
2. Austria	25. Bulgaria	40. Azerbaijan
3. Belgium	26. Croatia	41. Belarus
4. Denmark	27. Cyprus	42. Estonia
5. Finland	28. Czech Republic	43. Georgia
6. France	29. Hungary	44. Kazakhstan
7. Germany	30. Malta	45. Kyrgyzstan
8. Greece	31. Montenegro	46. Latvia
9. Iceland	32. Poland	47. Lithuania
10. Ireland	33. Romania	48. Moldova
11. Israel*	34. Serbia	49. Russian Federation
12. Italy	35. Slovakia	50. Tajikistan
13. Lichtenstein	36. Slovenia	51. Turkmenistan
14. Luxembourg	37. The former Yugoslav Republic of Macedonia	52. Ukraine
15. Monaco	38. Turkey	53. Uzbekistan
16. Netherlands		
17. Norway		
18. Portugal		
19. San Marino		
20. Spain		
21. Sweden		
22. Switzerland		
23. United Kingdom		

\* Geographically distinct from the other member states in the Region, Israel is usually grouped with western Europe in WHO statistics.

\*\* Note that eastern Europe is thus defined as the 15 countries of the former USSR.

## ***HIV – an epidemiological overview***

### ***Western Europe***

Following early peaks in newly diagnosed cases of HIV in 1983 (among men who have sex with men (MSM)) and 1987/1988 (among IDUs), the new diagnosis rate in western Europe entered a period of relative decline and stability (19), but in some groups and countries it is once again increasing (20). The declining trend in the annual HIV cases from 2005 to 2006 (see Fig 1) is biased by the fact that Italy and Spain did not report all their cases to the European Centre for the Epidemiological Monitoring of AIDS (EuroHIV) in 2006.<sup>1</sup> In 2005, these two countries had reported 1460 and 952 HIV cases, respectively. Across western Europe the trend in the number of new cases varied from country with no consistent overall pattern from 2005 to 2006. For example, the annual number of HIV cases reported declined in Belgium, France, the Netherlands and Portugal, but increased in Germany and the United Kingdom.

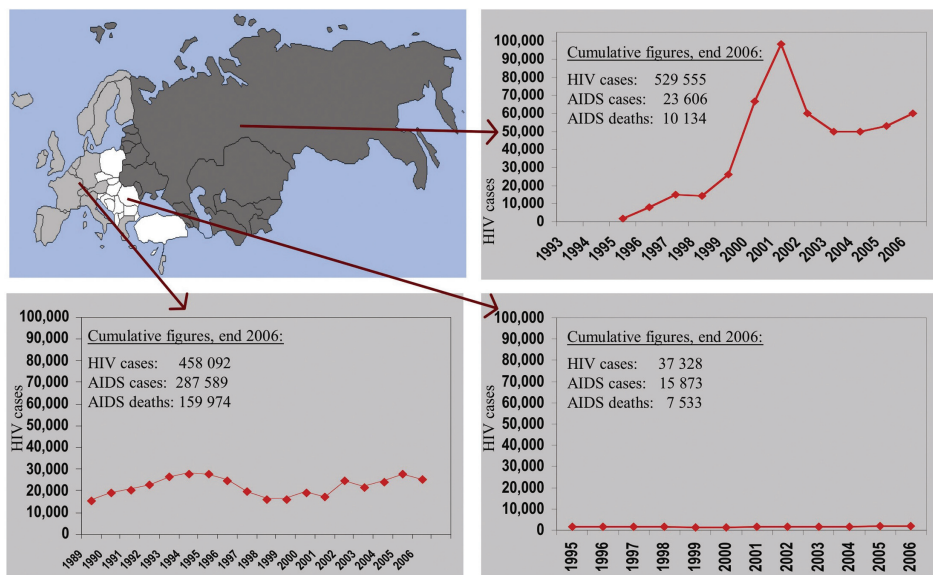
The number of people infected through heterosexual contact increased markedly in 2001 and 2002. However, this rise does not illustrate a spread of HIV into the general population, as most of these cases were diagnosed in individuals migrating from countries with generalised epidemics – mainly countries in sub-Saharan Africa – where the infections were probably

<sup>1</sup> Spain and Italy are the two only countries in Europe without a national HIV reporting system.

acquired (21). Western European countries experiencing such increases included Belgium, Denmark, Germany, Ireland, Sweden, Switzerland and the United Kingdom (21). In addition, the annual number of new cases reported for homosexual and bisexual men in western Europe more than doubled from 2001 to 2006, with 35% of the 2006 cases occurring in the United Kingdom alone.

Following the introduction and widespread use of highly active antiretroviral treatment (HAART) in the countries of this subregion, AIDS cases and AIDS deaths declined sharply in the mid- and late 1990s (22) and continued to fall, albeit with a noticeable levelling off after 1998 (23). Recent increases in AIDS rates in some western European countries raise some important concerns, again, particularly about the vulnerability of migrants.

**Fig 1. Newly reported HIV cases by European subregion, 1989–2006**



**Source:** Adapted from the European Centre for the Epidemiological Monitoring of AIDS, 2007 (13).

### **Central Europe**

The overall rates of both newly diagnosed HIV infections and AIDS in central Europe remain relatively low and unchanged in recent years. Around 37 000 HIV infections were reported in this area as of the end of 2006. Almost two thirds of all cases are in Romania and Poland, two of the biggest countries in this subregion. In 1999–2006, central European countries reported 15 873 cases of AIDS, and in 2002–2006, 7533 AIDS deaths (13). Trends of newly reported HIV cases and AIDS deaths have stabilised over the past decade, while the numbers of reported AIDS cases have declined slowly in the last six years. To date, this part of Europe remains the one least affected by the pandemic. However, high levels of risk behaviour coupled with low levels of HIV knowledge and poorly developed prevention and treatment services in some central European countries create the conditions for potentially devastating HIV/AIDS epidemics (24).



## ***Eastern Europe***

During the transition years that began with the dissolution of the USSR, eastern Europe underwent dramatic social and political changes, often entailing severe economic and social hardships that affected vulnerable populations the most (25). For example, in the Russian Federation, the European Region country with by far the largest number of reported HIV cases, it is estimated that the gross domestic product (GDP) fell by roughly 12% in real terms in 1991 and continued to decline until 1995, while inflation rose to treble digits in the same period (26).

However, the HIV epidemic in eastern Europe was still in its early stages, with very few reported cases of HIV until 1994. This changed in early 1995, when the first major outbreaks of HIV were reported among IDUs in southern Ukraine (27). Most of the people living with HIV (PLHIV) in Europe are now from countries in eastern Europe. Here, overall rates of newly diagnosed HIV infection increased dramatically between 1995 and 2001, mainly among IDUs (24). In many eastern European countries, more than 80% of reported HIV cases are among IDUs. The rates of newly diagnosed HIV cases in Estonia, Latvia, the Russian Federation and Ukraine are among the highest in the world. However, there are serious surveillance issues related to case follow-up and deaths not related to AIDS among PLHIV. It is telling, for instance, especially given the limited availability of HAART there, that the Russian Federation reported cumulative totals through December 2006 of over 369 187 HIV infections, but only about 3253 AIDS cases and 2454 AIDS deaths (13).

In 2002 and 2003, the number of new HIV diagnoses in eastern Europe declined (20), to increase again each year from 2004 to 2006 (see Fig 1), when 59 866 new cases were reported (13). Reported cases greatly underrepresent the number of actual cases (28–30). Two other characteristics of this subregion are important to remember. First, eastern Europe has the highest incidence of TB and multidrug-resistant TB in the European Region – and TB is by far the most common indicative disease for AIDS. Secondly, more than a third of all eastern Europe's PLHIV and more than half of its IDUs living with HIV are estimated to be coinfecting with hepatitis C (31–33).

## ***Addressing risk groups and vulnerable populations***

Recently, the global mantra for HIV prevention and treatment has been to integrate efforts in these fields with existing reproductive health services, such as antenatal care or sexually transmitted infection (STI) clinics. This approach makes good sense in areas with weak health systems where HIV transmission is primarily sexual in nature, e.g. sub-Saharan Africa, where prevention quite appropriately focuses on interventions such as promoting condom use (34, 35). However, in eastern Europe, where the number of reported HIV cases has been increasing more rapidly than in any other region of the world, the situation requires a much different response – one that prioritises those most at risk for HIV infection and not just those traditionally considered most vulnerable to it, such as youth, women and children (see Box 1) (36, 37).

Elsewhere (39), I have examined with two colleagues the nature of HIV transmission in the 15 countries of the former USSR and the implications for HIV prevention efforts there. As part of our effort to promote an evidence-based response to the epidemic, we also addressed the assumptions that in Europe, HIV is primarily transmitted sexually, that the epidemic is “feminised” and that HIV affects young people in particular (40–42) – all of which we have demonstrated to be misconceptions.

Because injecting drug use is so widespread in many countries of eastern Europe, and because it plays such a prominent role in HIV transmission there, effective HIV control requires measures well beyond those aimed at reducing sexual transmission. Such initiatives seek to reduce the harm that drug users bring on themselves from drugs and from the equipment used to administer them. They include most notably opioid substitution therapy (OST) and needle and syringe exchange, which have both been shown to be an essential part of successful HIV prevention and care programmes for IDUs (43–46).

#### Box 1. UNAIDS definitions of vulnerability and risk

**Vulnerability.** “Vulnerability results from a range of factors that reduce the ability of individuals and communities to avoid HIV infection. These may include: (i) personal factors such as the lack of knowledge and skills required to protect oneself and others; (ii) factors pertaining to the quality and coverage of services, such as inaccessibility of services due to distance, cost and other factors[; and] (iii) societal factors such as social and cultural norms, practices, beliefs and laws that stigmatize and disempower certain populations, and act as barriers to essential HIV prevention messages. These factors, alone or in combination, may create or exacerbate individual vulnerability and, as a result, collective vulnerability to HIV.”

**Risk.** “Risk is defined as the probability that a person may acquire HIV infection. Certain behaviours create, enhance and perpetuate risk. Examples include unprotected sex with a partner whose HIV status is unknown[,] multiple

*Source:* UNAIDS, 2007 (38).

While some potential clients for these harm-reduction services may also be in contact with reproductive health care services, e.g. pregnant IDUs, the vast majority will not. Clearly, sexual and reproductive health services should refer clients to such programmes when relevant. But the feasibility of integrating harm-reduction services with other HIV prevention efforts is currently untenable in eastern Europe, given not only the nature of the epidemic there but also the resistance from governmental officials, health care providers and some groups in the general population to harm-reduction programmes throughout much of the region (47–49). This situation is especially unfortunate given IDUs’ unmet reproductive health and HIV prevention and treatment needs as well as the increasing onward spread of HIV from IDUs to their sexual partners (50–52).

At the same time, in western Europe, where 34 336 out of 122 086 (28%) newly diagnosed cases from 2002 to 2006 were among MSM (13), it is inappropriate for HIV prevention strategies to focus primarily on the general population, young people or female sex workers – and the reproductive health services designed for these cohorts. Such services should target their HIV efforts to inter alia migrant groups and STI efforts to the general population.

In a review of recent progress on the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia (53), the chapter on vulnerable and at-risk groups recommended inter alia that every country:

- incorporate into the national HIV policy/strategy comprehensive surveillance systems to identify and support vulnerable populations and risk groups, drawing attention to people who are members of more than one group, such as homosexual migrants;

- audit existing legislation and regulations for obstacles to the development and utilisation of HIV prevention programmes – such as restricting them to people born or officially residing in the country – and remove them; and
- act to counter the stigma experienced by vulnerable populations and risk groups, including what they experience from health care providers (36).

### ***Universal access to prevention, treatment and care***

In signing the Dublin Declaration in February 2004, the countries of the European Region committed themselves to providing universal access to effective, affordable and equitable HIV prevention, treatment and care. Since then, progress in treatment coverage has been substantial (54). The number of patients receiving antiretroviral therapy increased from 282 000 in the middle of 2004 to approximately 435 000 by the end of 2007. However, treatment gaps in many eastern European countries are still immense – and increasing. That is especially true in the two countries with the greatest unmet need, the Russian Federation and Ukraine, where IDUs face major difficulties in obtaining treatment. Yet it is also a problem in western Europe, where many migrant populations do not receive the treatment or prevention services they need (55–56).

In 2005, following the commitment by Group of Eight (G8) members at the summit in Gleneagles and, subsequently, governments at the UN World Summit, the latest and most visionary of the many often-fragmented approaches to the epidemic has been the commitment to provide universal access to HIV prevention, treatment, care and support services by 2010 (57). For coverage to be universal, however, these services cannot just be technically available. They have to be distributed equitably and actually reach the marginalised groups who are most at risk for infection. Otherwise, the effort will only widen prevalence gaps within and between countries and fan the flames of the pandemic, as the people who need these services most are the ones who can do the most to retard – or accelerate – transmission.

This vision of universal access, for Europe as well as Africa, is now firmly planted on the world's health and development agendas, while the current deadline for realizing it, 2010, is much more ambitious than those of the Millennium Development Goals (58). The six papers in this dissertation address several key aspects of achieving universal access in Europe, focusing particularly on priorities in the health system, as established by WHO.

### ***Five strategic directions***

WHO's HIV work for the period 2006–2010 is structured around five strategic directions, each representing a critical area where the health sector must lead if countries are to make progress towards universal access. Within each area, WHO is concentrating its efforts on a limited number of priority health sector interventions. These interventions form the core elements of what is termed the Model Essential Package (59). Each strategic direction and its related priority interventions, adapted to the European context, are described in Box 2. The six studies in this dissertation specifically address Strategic Directions 2 (Paper I), 3 (Papers II, III and IV), 4 (Paper V) and 5 (Paper VI). Together with colleagues, I have recently addressed the first direction, specifically the issue of stigma and discrimination, elsewhere (60–62). Further, work on optimal testing is ongoing, as was attested to at the conference HIV in Europe 2007: Working Together for Optimal Testing and Earlier Care, which I co-chaired (63–65).

**Box 2. Strategic directions for WHO to help national health sectors achieve universal access to HIV prevention, treatment, care and support by 2010**

*Strategic direction 1:* Enable people to know their HIV status.

- Work with countries to develop normative guidance on voluntary and confidential counselling and testing.
- Ensure human rights and reduce the stigma and discrimination experienced by PLHIV.

*Strategic direction 2:* Maximize the health sector's contribution to HIV prevention.

- Promote harm reduction for injecting drug users including needle exchange and opioid substitution therapy in both civilian and prison settings.
- Support evidence-based prevention of sexual transmission of HIV and other STIs including support for the sexual and reproductive health of PLHIV.
- Integrate services for preventing mother-to-child transmission of HIV (MTCT) into perinatal care services and virtually eliminate MTCT and congenital syphilis.
- Prevent HIV transmission in health care settings.
- Assess and develop new prevention technologies and approaches such as vaccines, microbicides and pre-exposure prophylaxis.

*Strategic direction 3:* Accelerate the scale-up of HIV treatment and care.

- Ensure equitable access to HAART.
- Develop and promote comprehensive treatment and care protocols for the European Region.
- Prevent and manage opportunistic infections and comorbidities such as hepatitis B and C.
- Link HIV and TB services.
- Promote care, including palliative care and decent care, that encompasses treatment preparedness.

*Strategic direction 4:* Strengthen and expand health systems.

- Define universal access coverage levels.
- Promote national HIV strategic planning and management in harmony with the UNAIDS Three Ones principles (one agreed-upon framework, one coordination mechanism and one monitoring and evaluation plan).
- Improve procurement and supply management processes.
- Develop and manage human resources through inter alia trainings at the three European knowledge hubs – harm reduction in Vilnius, second-generation surveillance in Zagreb and treatment in Kiev.
- Develop strategies for sustained financing.

*Strategic direction 5:* Invest in strategic information to guide a more effective response.

- Monitor, evaluate and report on progress towards meeting the actions in the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia, including HIV/AIDS and STI surveillance.
- Improve surveillance of HIV drug resistance and side-effects through an annual report and database.
- Conduct operational and other relevant research.

*Source:* Adapted from WHO, 2006 (59).

## **Aims**

This doctoral research seeks to investigate specific HIV trends in the WHO European Region, and to consider how the results obtained can contribute to the goal of universal access to HIV prevention, treatment, care and support services. Concretely, the aims are fourfold:

1. to assess key aspects of two groups showing the Region's greatest recent increase in newly reported HIV cases: migrants (two cohorts' HIV/AIDS knowledge and attitudes) (Paper I) and IDUs (the equity of their access to HIV treatment) (Paper II);
2. to assemble new epidemiological data to track the two principal HIV coinfections in the Region, hepatitis C (Paper III) and tuberculosis (Paper IV), and to review national and international efforts to combat them;
3. to investigate the rapid reduction of a key group of health care providers, midwives, in Estonia, the EU country with the highest prevalence of HIV (Paper V); and
4. to measure the impact of individual and societal variables on condom use in one group commonly thought to be especially vulnerable to HIV: young people (Paper VI).

## **Research design and methods**

The methods employed for the six papers include extensive multi-country data collection, descriptive epidemiology and policy analysis (II, III, IV) and quantitative analysis with a sample size large enough to be statistically significant for the population studied, whether for a single country (I, V) or more than one (VI). Qualitative methods were also used to supplement the quantitative analysis in two papers (I, V).

### ***Setting***

There are six WHO regions covering 193 member states. The WHO European Region is diverse, encompassing 53 countries and stretching from the Atlantic to the Pacific (see Table 1). It includes most of the countries around the Baltic, Mediterranean, Black, Caspian and Aral seas. Its least populous countries, including Andorra, Iceland and Monaco, count their populations in the thousands, while the most populous, the Russian Federation, Germany, Turkey and France do so in tens of millions.

### ***Methodologies***

#### ***Quantitative methods***

Paper II utilised three standardised surveys conducted by WHO Europe, each evaluating a range of indicators relating to HIV/AIDS treatment and care in the member states of the European Region.<sup>2</sup> The surveys were conducted between January 2003 and July 2005, collecting data as of 31 December 2002, 31 June 2004 and 31 December 2004, respectively. The purpose of these surveys was to monitor progress towards achieving universal access to treatment and care for PLHIV, as well as to monitor access of particular groups to essential HIV prevention, treatment and care services. Particular emphasis was placed on IDUs, as IDUs comprise the main group of PLHIV in most eastern European countries and contribute significantly to HIV/AIDS figures in many central and western European countries. Each survey provides point-in-time measurements of progress in treatment scale-up, particularly the level of access for IDUs.

Paper VI focused on the 18 countries and subnational entities in the Region for which there were data on bullying, alcohol use and condom use available from the Health Behaviour in School-aged Children (HBSC) survey. The paper also considered eight national (or subnational) variables (residence, Human Development Index (HDI) rank, GDP per capita rank minus HDI rank, Gini coefficient, Gender-related Development Index, predominant religion and HIV prevalence). Three consecutive multilevel logistic regression models were applied (crude national/subnational and school variance in condom use; gender-adjusted variance; and with all variables adjusted for each other).

Odds ratios (ORs) with corresponding 95% confidence intervals were calculated for all binary variables and p-values for the four continuous variables by using a stepwise logistic regression trend test. The school effect, intra-school correlation (a measure of the degree of similarity among the outcomes from members of the same school), national/subnational effect and intra-national/subnational correlation were reported for all binary variables, as were the

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<sup>2</sup> At the time, before the division of Serbia and Montenegro into two, the Region had 52 members.

variance and standard error. MLwiN Beta version 2.00 and SPSS version 12.0.1 were used to perform the analyses.

### ***Quantitative and qualitative methods***

For Paper I, a 78-item questionnaire divided into five thematic sections was given to 192 purposively selected Sudanese and Somalis of both sexes, aged 18–49, who had lived in Denmark for at least one year. The questionnaire sought to explore the knowledge, attitudes and practices of Somali and Sudanese immigrants to Denmark with respect to HIV/AIDS and condom use. It was administered in Arabic and Somali at four locations around the country, including the capital. The significance of the variables was tested with chi-squared tests and, where frequencies were less than five, Fisher's exact test. The responses were supplemented by 13 semi-structured interviews.

The material and methods of Paper V were diverse, also combining quantitative and qualitative approaches. Data were obtained by sending a pretested 32-question Estonian language questionnaire, based on an agenda developed through semi-structured interviews, to all midwives in Estonia. A nominal group technique, a variation of the Delphi technique, was then employed with 20 key stakeholders to determine the extent of their agreement with the questionnaire's major findings. It was followed by participants' anonymous ranking, on a self-administered written form, their degree of agreement with each of 10 key statements, which were also based on the findings of the midwife questionnaire.

### ***Descriptive epidemiology and policy analysis***

Paper III, drawing on the new WHO European clinical protocols for the management of PLHIV coinfecting with hepatitis B or C (66), reviewed current policies and data on HIV coinfection with HBV/HCV in eastern Europe, and presented stakeholder recommendations for better hepatitis C services.

Paper IV collected and analysed reported cases of TB/HIV from the 25 most affected member states of the WHO European Region. WHO TB or HIV focal points in each country were also asked whether they had implemented health policies covering the collaborative TB/HIV activities recommended by WHO (67), and what its main achievements, obstacles and needs were in addressing TB/HIV coinfection.

### ***Ethical considerations***

For Paper I, written and oral explanations of the study were provided to the informants in Arabic or Somali before they gave oral consent to participate in the study. The explanations emphasised that participation in the study was voluntary, anonymous and confidential. The data for Paper III was originally collected to highlight the situation in Europe for World Hepatitis Awareness Day 2006, which I co-organized at WHO, and to advance the HIV/hepatitis coinfection agenda in Europe. For Paper V, as part of my close collaboration with the Estonian Association of Midwives, I agreed to return to the country to present the study results at the Estonian Association of Perinatology annual conference, which I did in October 2003. For Paper VI, approval to use data from the Health Behaviour in School-aged Children (HBSC) survey was sought from the editorial board and principal investigators and received. The HBSC has a standardised protocol that requires that specially trained personnel, teachers or school nurses administer the questionnaires in classrooms. Questionnaires were distributed during ordinary class hours. Students were informed that participation was voluntary, and that responses would be treated as anonymous.

## Results

The results of the six papers can be loosely grouped into two broad categories, though many of the studies fit into both: inadequate aspects of prevention efforts for vulnerable groups – the first a failure in outreach, the second a need to determine a clearer picture of what is correlated with prevention behaviour (I, VI), and health system failings (II, III, IV, V). Inequity is another major cross-cutting issue, showing up particularly in papers I, II, III, IV.

More detailed results are presented for each paper on the following pages.

### *Inadequate aspects of prevention efforts*

- Knowledge of HIV prevention was significantly lacking among the migrant groups studied in Paper I. Knowledge about condom use was found to be particularly deficient. Most strikingly, one third of the women reported never having seen or heard of a condom, and almost half never having received information about condoms.
- Paper VI looked at the complex interrelationship between preventive behaviour and the environment and correlated a number of individual and contextual variables with young people's condom use, such as alcohol use, predominant national religion and national development and economic indicators.

### *Health system failings*

- IDUs access to HIV treatment was found to be inequitable (Paper II), notably in eastern Europe, where it is particularly difficult for them receive treatment.
- Paper III showed that HIV/hepatitis C coinfection is a major hidden epidemic in the European Region, due in part to low awareness and poor surveillance (Paper III).
- In Europe, where TB is not generalised, both TB and HIV tend to be concentrated in the same high-risk populations, such as IDUs, prisoners, homeless people and migrant populations. Health systems rarely move beyond vertically structured systems in addressing TB, especially, as Paper IV discovered, TB/HIV coinfection.
- A health system that does not capitalise on the abilities of its health care providers can miss crucial opportunities to diagnose, treat and care for PLHIV. In Estonia, Paper V showed that the health sector reforms of the 1990s did not adequately utilise the capacity of its midwives in the middle of a major emerging HIV epidemic.



## HIV and migration (Paper I)

The majority of this study's 192 Somali and Sudanese respondents were married and had lived in Denmark for 1 to 10 years. Women represented 57% of the Somali respondents, but only 17% of the Sudanese respondents. More than half of the Sudanese respondents had completed university, versus only 13% of the Somalis.

The study showed that the majority of the respondents (64.5%) have little knowledge about HIV/AIDS in general, and almost a half (46.3%) have little knowledge about the modes of HIV transmission. Moreover, young people in this study knew strikingly less than those older than 24.

While there is a significant gap in knowledge about HIV/AIDS between Somali women and men ( $p < 0.001$ ), this was not the case with the Sudanese (see Table 2). However, both Sudanese men and women knew significantly more than their Somali counterparts.

Education, sex and nationality were positively associated with knowledge about HIV/AIDS, though length of residence in Denmark was not. Less than half of both men and women scored more than 70% on the knowledge portion of the questionnaire, and the Sudanese respondents knew more than Somali ones. Men had a more negative attitude towards condoms than women, but greater knowledge about them. One third of the women reported never having seen or heard of a condom, and almost half had never received information about condoms. Both sexes preferred receiving such information from the TV or friends instead of family doctors or HIV-positive individuals.

Of the 13 participants who participated in the qualitative component of the study, none reported being afraid of HIV/AIDS; they did not consider condoms relevant; and they would not modify their current behaviour because they believed that they were "not involved in risky behaviour" such as "homosexuality and prostitution". As one participant put it, "The condom is for illegal sexual relations, which are not acceptable to me as a Muslim". None of the participants mentioned risk factors like multiple partners or needle sharing.

Table 2. Level of knowledge about HIV/AIDS, by sex among Sudanese and Somali migrants

Level of knowledge about HIV/AIDS, by sex, among Sudanese					
Level of knowledge	Female		Male		Total (%)
	<i>n</i>	(%)	<i>n</i>	(%)	
High (%)	9	64.29	45	64.29	
Low (%)	5	35.71	25	35.71	
Total (%)	14	100.00	70	100.00	
Did not respond	0		1		
Level of knowledge about HIV/AIDS, by sex, among Somali					
Level of knowledge	Female		Male		Total (%)
	<i>n</i>	(%)	<i>n</i>	(%)	
High (%)	3	4.92	10	21.74	
Low (%)	58	95.08	36	78.26	
Total (%)	61	100.0	46	100.0	

## HIV and injecting drug users (Paper II)

Table 3 presents the data on the number and proportion of IDUs among all reported HIV cases in Europe and compares that with the number and proportion of IDUs receiving HAART at two points in time: December 2002 and December 2004. All figures were adjusted for unknown transmission routes. All three subregions demonstrate inequities in access to treatment for drug injectors at both points in time, with only a relatively small improvement in access between 2002 and 2004. Regional and national comparisons reveal that inequities in IDU access to HAART are worst in eastern European countries.

Only 15 of the 53 countries (29%) were able to provide data on the number of current injectors initiating HAART. These data show great variation in the proportion of IDUs receiving HAART who were currently injecting when they initiated HAART.

There are very few data on the degree to which IDU recipients of HAART also received OST. Only 18 countries were able to provide data on the number of people on HAART who also received OST by December 2004. In 10 of these countries, this number was zero. In the remaining 8 countries, the proportion of IDU HAART recipients ranged from 6% in Latvia to 100% in Malta, where the only IDU receiving HAART was also receiving OST. Relatively high proportions of IDUs on HAART were also on OST in Serbia and Montenegro and in Slovenia.

Table 3. **IDU access to HAART in the WHO European Region, 31 December 2002 and 31 December 2004**

Subregion	Data reporting period (number of reporting countries)	End 2002		End 2004	
		Reported HIV cases, IDUs (% of total reported cases with known transmission routes)*	Reported IDUs on HAART (% of total reported PLHIV with known transmission routes on HAART)	Reported HIV cases, IDUs (% of total reported HIV cases with known transmission routes)*	Reported IDUs on HAART (% of total reported PLHIV with known transmission routes on HAART)
West	a (8)	n/a	n/a	55 705 (36%)	33 329 (38%)
	b (5)	4 698 (9%)	805 (4%)	5 065 (7%)	1 056 (4%)
Centre	a (9)	n/a	n/a	626 (11%)	199 (3%)
	b (5)	519 (39%)	121 (21%)	562 (34%)	180 (22%)
East	a (12)	n/a	n/a	209 913 (83%)	1 044 (24%)
	b (9)	47 867 (73%)	15 (14%)	65 313 (74%)	739 (52%)
Total	a (29)	n/a	n/a	266 244 (64%)	34 572 (35%)
	b (19)	53 106 (45%)	941 (5%)	70 940 (43%)	1 975 (6%)

\* For countries without consistent national HIV case-reporting systems (Austria, Italy, Serbia and Montenegro, and Spain) reported AIDS cases were used. *Data source:* EuroHIV, 2004 (68).

a (n): all countries reporting HAART data at the end of 2004 (number of reporting countries).

b (n): countries reporting HAART data both at the end of 2002 and the end of 2004 (number of reporting countries).

n/a: not applicable.

## HIV/hepatitis coinfection (Paper III)

This study reported on testing availability, treatment cost, and prevention and treatment availability for both hepatitis B and C in the European Region. It also gathered epidemiologic surveillance data for the two diseases from the countries of the former USSR, as shown in Table 4. HBV prevalence rates are estimated to be as high as 10% in the general population of four of these countries and 5% in the Russian Federation, the most populous of the countries studied. While HCV national prevalence data is lacking for most countries, it is estimated to be more than 6% in Georgia and about 2% in the Russian Federation. In the six countries that reported, HCV among PLHIV ranged from 10% to 80%.

Most countries in the European region were found to lack official treatment guidelines for HCV, especially for HCV/HIV coinfection. Where such recommendations do exist, they tend to exclude IDUs from treatment. Treatment of hepatitis C with drugs such as pegylated interferon and ribavirin is not widely available, and where it is, it is extremely costly for the average patient (up to US \$24 000 per patient per full course). Other effective drugs, such as adefovir (for hepatitis B) and tenofovir (for HIV/HBV coinfection), are still not licensed in many countries of the Region, particularly in eastern Europe, in contrast to lamivudine (for HIV/HBV coinfection), which is generally available.

Table 4. **HBV and HCV epidemiological data for eastern Europe\***

Country	HBV prevalence	HBV incidence, 2005 (per 100 000 population)	HCV prevalence	HCV incidence, 2005 (per 100 000 population)	% of PLHIV with HCV coinfection
Armenia	8%	2.7	—	—	67%
Azerbaijan	8%	3.3	—	1.4	—
Belarus	2%	11.2 (acute)	1.4%	60.6 (all types)	76%
Estonia	3%	9.5 (2004)	—	9.4	—
Georgia	2%** <i>or</i> 11%***	7.1	6.7% (2003)	4.1 (acute), 17.9 (chronic)	59%
Kazakhstan	10%	11.7 (2004)	3.1	1.4 (2003)	—
Kyrgyzstan	10%	10.0	—	4.1	80%
Latvia	3%	9.0 (2004)	—	4.8	—
Lithuania	3%	4.1	—	2.0	—
Moldova	10%	9.6	4.9%	3.1	—
Russian Federation	5%	10.4	2.0%	4.5	24%
Ukraine	2–3%	1.2 (2004)	—	—	10%
Uzbekistan	10%	11.4 (2004)	—	—	—

—: either no data are being collected, no surveillance is being done or the data are otherwise unavailable.

\* Tajikistan and Turkmenistan are not included in this analysis due to lack of data.

\*\* hepatitis B surface antigen (HBsAg)

\*\*\* hepatitis B core antigen (HBcAg)

## TB/HIV coinfection (Paper IV)

Twenty of the 25 most affected countries in the European Region reported registering a total of 6925 TB/HIV cases in 2005. Among TB patients, 3.3% of those tested were found to be HIV-positive, up from 2.1% in 2004. The male-to-female ratio of TB/HIV cases was 2.7:1, with the greatest proportion of coinfections among people aged 25–34 (47.8%), followed by those aged 35–44 (25.3%). While recommended TB/HIV policies have been implemented in many of these countries, the greatest remaining unaddressed need was strengthened coordination between TB and HIV programmes.

The reported incidence of TB/HIV in Europe is also increasing. The Region is home to a high level of uncontrolled TB in the general population, including multidrug-resistant TB, and an HIV epidemic that emerged rapidly. There is a potential threat of a major dual epidemic, as the two infections are capable of fuelling each other.

Reported prevalences of TB/HIV coinfection in Europe are still low, though that is partly due to poor case surveillance that does not monitor the overlap between the two infections.

Table 5 shows that, of the countries who responded to the question, 9 (43%) had a national body responsible for coordinating TB/HIV activities, 8 (36%) had a national plan for collaborating TB/HIV activities, 10 (42%) had a national surveillance system to monitor HIV among TB patients, and 13 (57%) had a national estimate of HIV prevalence among TB patients in 2005, ranging from 0.2% in Lithuania to 15.4% in Portugal.

**Table 5. TB/HIV prevalence and mechanisms for collaborating national TB and HIV responses in the 25 most affected countries of the European Region, 2007**

	National estimate for the prevalence of HIV in TB patients, 2005	National body responsible for coordinating TB/HIV activities	National plan for collaborative TB/HIV activities	National surveillance system for the prevalence of HIV in TB patients
Armenia	No	Yes	No	No
Austria	0.7%	No	No	No
Azerbaijan	15%	Yes	Yes	Yes
Belarus	No	No	No	Yes
Belgium	No	—	No	No
Bulgaria	No	Yes	Yes	No
Estonia	No	Yes	Yes	Yes
France	No	—	—	No
Georgia	No	Yes	Yes	No
Italy	Yes	No	No	No
Kazakhstan	0.3%	No	No	No
Kyrgyzstan	Yes	No	No	Yes
Latvia	3.8%	Yes	No	Yes
Lithuania	0.2%	No	Yes	Yes
Moldova	2.4%	No	Yes	Yes
Portugal	15.4%	—	—	Yes
Romania	0.6%	No	No	Yes
Russian Federation	1.6%	Yes	Yes	Yes
Spain	5%	—	—	No

Switzerland	4%	No	No	No
Tajikistan	—	Yes	Piloting	Piloting
Turkey	No	No	No	No
Turkmenistan	—	No	No	—
Ukraine	No	No	No	No
Uzbekistan	No	Yes	Yes	No

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—: No data.

## HIV and human resources (Paper V)

In analysing Estonia's health systems data at a time when the country had Europe's highest rate of reported HIV cases, the rapid reduction in the number of midwives stood out, especially as the decline was much more rapid than the decline in the Estonian fertility rate, was more substantial than in any other European country and the country was restructuring the role of midwives and other health care personnel.

Of the 366 questionnaires sent out to every midwife in Estonia in early 2003, 274 (75%) were completed and returned. The mean age of the responding midwives was 39.8. Forty-nine per cent delivered babies and 56% provided antenatal care, meaning that almost all of them did only one or the other, with just a few doing both or something else completely.

For each variable in Table 6, the first category was defined as the baseline; ORs in the baseline categories were accordingly 1, and other categories were compared to the baseline. The results show that there was no statistically significant association between job satisfaction as a dependent variable and the independent variables of age, nationality, plans to work abroad, interest in more responsibility, or involvement in postpartum care and counselling, as measured by chi-square tests supported by crude and adjusted ORs. There was, however, a significant association between job satisfaction and salary. Further analysis showed that the Russian midwives earned less than their Estonian counterparts; 60% were in the lowest salary category, versus 37% for the ethnic Estonians.

All the ORs were close to the adjusted OR, showing that there was no confounding effect between variables. The significant association between work satisfaction and salary began above EEK 45 000 (€2876), which 21.2% of the respondents earned. The ORs show a positive linear association between job satisfaction and salary.

According to one midwife, salary had not always been associated with satisfaction:

You have to consider that at the beginning of the '90s we had good motivation. We wanted to build up something, start a new Estonia.... At this point the salary wasn't so important because we all had bad situations. We all knew that we had to start and do something, but now, today, salary is important, because what we have seen is that for some people the best is never coming and for others it comes extremely quickly and it doesn't always depend on professional skills.

One participant in the group discussions of the results elaborated, stating, "Most health care professionals are dissatisfied because of the changes in the health care system". Another added, "Most of the midwives like their job [profession], but dissatisfaction is the result of an unclear role and future...".

Table 6. **Crude and adjusted odds ratios (ORs) between job satisfaction and other variables for midwives in Estonia, 2003**

Variable	Satisfied (reference group) vs. non-satisfied	
	Crude OR (95% CI)	Adjusted OR (95% CI)
Age (years)		
≤40	1.00	1.00
>40	1.00 (0.63–1.68)	0.72 (0.39–1.30)

Ethnicity		
Estonian	1.00	1.00
Russian	0.93 (0.51–1.69)	0.98 (0.48–2.00)
Salary (EEK* per year)		
<35 000	1.00	1.00
35 000–45 000	1.75 (0.99–3.09)	1.90 (0.99–3.59)
>45 000	4.66 (2.26–9.64)	4.90 (2.18–11.20)
Planning to work abroad		
No	1.00	1.00
Yes	1.35 (0.57–3.17)	1.20 (0.59–3.90)
Involvement in postpartum care		
No	1.00	1.00
Yes	0.75 (0.29–1.92)	0.99 (0.33–2.95)
Interest in more responsibility		
No	1.00	1.00
Yes	0.78 (0.48–1.29)	0.88 (0.49–1.58)

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\* EEK 100 = €6.40

## Condom use and young people (Paper VI)

Out of 28 306 participants from the reporting 18 European countries or subnational entities, the number of students who had had their sexual debut was 5918 (21%). Almost all (98%) of those who had had their sexual debut were aged 14.5 to 16.5. The study identified school-related factors (intra-school correlation) that explained 7.0% of the total variance in their condom use and national/subnational factors that accounted for another 5.8%.

There was a significant association between condom use and biological sex, alcohol consumption, predominant national religion and national HIV prevalence in the empty model. In the full model, there was in addition significant association between condom use and national Human Development Index ranking, GDP per capita, Gini coefficient and Gender-related Development Index.

Table 7 sets out the factors found to correlate with condom use among sexually active adolescents in the countries studied. For example, where Catholicism did not predominate, there was a significantly greater likelihood of not using a condom. And in countries with “high” HIV exposure (prevalence  $\geq 0.4\%$ ) at the end of 2001 – Estonia, Latvia, Portugal and Spain – there was significantly more condom use among the young people studied than in countries with low exposure. Finally, whether the students lived in western or eastern Europe, and whether or not there was an adequate sexuality education system in place nationally, revealed no significant variation (not shown in table).

**Table 7. Factors associated with condom use in sexually active European adolescents**

	Number who do not use condoms (%)	P-value
<i>Gender*</i>		P $\leq$ 0.000
Boys	706 (22.6)	
Girls	910 (32.6)	
<i>Alcohol*</i>		P $\leq$ 0.025
Low use	1 189 (26.6)	
High use	412 (29.7)	
<i>Bullying behaviour**</i>		P $\leq$ 0.679
No	1 296 (27.2)	
Yes	305 (27.8)	
<i>National religion***</i>		P $\leq$ 0.000
Roman Catholic	721 (23.5)	
Other Christian	895 (31.6)	
<i>National HIV prevalence***</i>		P $\leq$ 0.005
High	188 (23.2)	
Low	1 428 (28.0)	

\* significant in the empty and gender-adjusted models

\*\* significant in the gender-adjusted model

\*\*\* significant in the empty, gender-adjusted and full models



## Discussion

When the HIV epidemic hit western Europe in the early 1980s, central and eastern Europe were almost completely spared. Prevention efforts, including harm reduction and the promotion of consistent condom use, stabilised the epidemic in western Europe in the early 1990s and kept prevalence rates relatively low and incidence rates low but steady. Men who have sex with men continue to be the main risk group there today, along with recent migrants from sub-Saharan Africa and other high-prevalence areas.

In the mid-1990s, after the break-up of the USSR, the number of new HIV cases reported in eastern European countries began to increase exponentially. The epidemic in these countries has been driven primarily by injecting drug use and is rapidly spreading to the sexual partners of IDUs (52). In this part of the WHO European Region, prevention and treatment efforts are still woefully inadequate. Meanwhile in central Europe, the low prevalence and incidence rates remain stable, despite the presence of activities that promote HIV transmission, including sex work and injecting drug use.

This dissertation seeks to approach the HIV epidemic in Europe from a broad variety of perspectives: biomedical, social, cultural, economic and political. The six articles here explore several of the key challenges the Region faces in combating HIV: helping developers of prevention efforts target migrants (I) and young people better (VI); increasing treatment access for IDUs (II); charting the extent of the European epidemic's two most significant coinfections (III, IV); and capitalising on the experience and abilities of midwives (V), as discussed in the following sections.

As noted below and in the articles themselves, several methodological challenges and data limitations arose in the course of the research, and they should be considered carefully before applying or generalising the results.

### **Affected groups**

Papers I and II focused on migrants and IDUs, respectively, because of the increase in newly reported HIV cases in these two groups during the last seven years. However, these trends should not overshadow the fact that in western Europe, men who have sex with men are still the most affected group when measured by reported cases. With incidence rates for MSM still high, particularly in the United Kingdom (69), prevention activities targeting them in western Europe must be renewed, reassessed and revised where appropriate. Meanwhile, MSM transmission in eastern Europe appears to be greatly underreported (70–71). In 2006, for instance, 7410 new MSM cases were reported in western Europe (excluding Italy and Spain) and just 190 in eastern Europe. Yet in the same year, the number of “other/undetermined” cases in eastern Europe was 12 766 out of 35 225 reported cases total (36%), versus 2938 out of 16 167 (18%) in western Europe (13), and the number of such cases that are ascribable to MSM activity is no doubt significant in eastern Europe, given the high level of stigma there (72–73).

Case reporting will always represent only a portion of a country's true incidence, and to be reliable it requires an effective national surveillance system, including well-coordinated reporting of notifiable infections and diseases. Despite our best efforts, Papers III and IV were not able to report data for all indicators in every country studied, as can be seen in Tables 4

and 5 above in Results. The large number of HIV cases in Europe with undetermined transmission routes was a particular problem for Paper II on IDUs, as noted in Table 3. These reporting gaps can often be explained by factors outside the health system, such as stigma, discrimination or fears of prosecution, whether for transmitting HIV, using illicit drugs or even homosexual activity.<sup>3</sup> It is no surprise that countries with repressive drug control laws are less effective in controlling and preventing HIV transmission (75) or in providing HIV treatment to people who use drugs (76). Sex work is another activity that is often criminalised and involves high risk for HIV, particularly when it overlaps with injecting drug use, and one major review of sex work in Europe recently called on HIV researchers to investigate the effects of decriminalising it (77). Not only does criminalisation drive the epidemic underground due to fears of incarceration, but it can also exacerbate the stigma and discrimination experienced by affected groups, whether MSM, IDUs, sex workers or all PLHIV (61, 78, 79).

### ***Migrant populations***

While research has clearly shown that an increasing number of people who test positive for HIV are migrants, particularly in western Europe (21), it was not until late 2007 that the European Union made the health of migrants a political priority. Recognising that the EU was home to some 40 million legal migrants in 2005 (8% of the total population), including migrants moving among the 27 EU member states, the Portuguese Presidency of the EU addressed all aspects of migrant health, particularly HIV. At a conference of national AIDS coordinators in October 2007, preceded by a June meeting of community activists on the same issue (80), experts from every country in the European Region were invited to Lisbon to discuss issues ranging from the health status of migrants to targeted HIV prevention, treatment and care. Participants confirmed that certain migrant populations, primarily from high-prevalence countries, are disproportionately affected by HIV and AIDS, and called on countries “to look for consensus and convergence in their approaches to policies and strategies for prevention, control and treatment” of HIV among migrants (55).

The elevated prevalence of HIV among specific migrant populations is not a new issue. But how to address it while respecting ethical, political and human rights as well as evidence-based public health practice remains unclear (81–83). A recent European seminar on the issue found criminal prosecutions for HIV transmission disproportionately affected migrant communities (84). The authors of a seminal work on health and migration point out that exclusionary principles designed to prevent the importation of communicable diseases are not sufficient and leave mobile populations especially vulnerable to the effects of the infections they may be carrying (85). This observation is clearly true with regard to HIV (13, 86). Nonetheless, many of the 104 countries that still have special regulations for the entry and residence of people with HIV are European (87) – in spite of the fact that every country in the Region has committed to “fight social and legal exclusion, including travel restrictions” (88).

Given this situation, it is surprising that few scientific studies have examined migrant knowledge, attitudes and practices with respect to HIV/AIDS and sexuality in either Denmark

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<sup>3</sup> In the European Region, only Turkmenistan and Uzbekistan still criminalize homosexuality explicitly. For example, Article 120 of the 1994 Uzbek criminal code states that “voluntary sexual intercourse of two male individuals – shall be punished with imprisonment up to three years” (74). However, homosexuality is also implicitly criminalized in many countries, where the general population or law enforcement officials attach a strong stigma to it.

or western Europe as a whole. Paper I focused on Somali immigrants in Denmark, who are the largest group of African immigrants in the country, and Sudanese immigrants. While the latter group is much smaller, the rapidly increasing incidence of HIV in Sudan (89) makes them an important group to study, since in western Europe many migrants who have HIV acquired it in their native country. The results – that the women knew significantly less about the modes of HIV transmission than the men, and that both the Somalis and the Sudanese appeared relatively uninformed about HIV and uninterested in it – suggests that preventing HIV transmission in these groups after they have entered western Europe poses a serious challenge that needs to be addressed.

These groups' HIV knowledge contrasted starkly with the general population's. For example, the vast majority of Danes aged 15–19 know how HIV is transmitted and how they can protect themselves against it, with more than 80% understanding that the safest form of penetrative sex requires a condom. They also attribute their knowledge of sexuality and HIV to primary school (90), unlike the migrant groups studied. Of course, studies on migrant cohorts are not always applicable to migrants in neighbouring countries or even to different migrant groups in the same country. It should also be noted that, as with two recent studies on HIV in Denmark (91, 92), our study did not specifically address same-sex sexual relations among migrants, a topic that should be investigated in future studies.

Many countries are still unsure about how to react to the increase in HIV cases among migrants, though the severity of the problem naturally varies. In a follow-up study to Paper I, we found that the number of cases acquired in Denmark by heterosexual transmission from people from high-prevalence countries had not increased from 1990 to 2005 (93). While this bodes well for Danes, the number could still be lower, and the problem remains a grave one for most of Europe. An alternative approach to reaching migrants is to reach them before they migrate, e.g. by supporting the achievement of the Millennium Development Goal of halting and reversing the spread of HIV by 2015 (8), a key mechanism for addressing HIV in high-prevalence countries – and therefore a necessary measure for reducing HIV in Europe. Future research should also address how entry bans such as HIV-related travel restrictions affect not just prospective migration, but also existing migrants' interactions with the health system in their host country, particularly for undocumented migrants in countries where HIV testing is becoming routine. How much does fear of deportation influence their utilisation of health care services?

### ***Injecting drug users (IDUs)***

In Europe, awareness about the spread of HIV through injecting drug use is high in contrast to other parts of the world. For example, UNAIDS did not seriously acknowledge its contribution to the epidemic in Africa until 2002 (94). Yet interventions to prevent the spread of HIV through contaminated needles and syringes are just as inadequate in many European countries (46, 95), despite a wealth of evidence supporting their efficacy (44, 45). Paper II presents data on the number and proportion of IDUs among all reported HIV cases and compares that with the number and proportion of IDUs receiving HAART at two points in time. In spite of the limited data reported for many countries, and that not all PLHIV are in need of treatment, Paper II revealed that IDUs have inadequate access to treatment, and that the situation is most apparent in eastern Europe. New target setting guidance for IDUs has been developed to compare countries' progress towards universal access to HIV prevention, treatment and care (96). If countries take ownership, as the authors suggest, of what are

sometimes perceived as politically motivated coverage targets, it should help remedy the data deficiencies noted in our study, as will a closer assessment of treatment needs for all PLHIV.

One of the biggest obstacles to effective health policies for IDUs is opposition from the government, the medical profession and prison officials to certain evidence-based interventions, most notably harm-reduction programs such as OST with methadone or buprenorphine. Coverage by these targeted interventions is woefully inadequate in eastern Europe, where the prevailing treatment model is that of abstinence.

The organization of the health care system is particularly problematic for addressing HIV in general and IDUs specifically (97). In eastern Europe, treating injecting drug use is the province of specialised medical doctors known as narcologists. Narcologists, who focus on alcoholism, smoking and drug addiction, rarely, if ever, get involved in HIV work, which is strictly the province of AIDS specialists, who in turn have little contact with venereodermatologists (STI specialists), TB specialists and so on. The prevailing philosophy is that clinical decisions should be based on the training, opinions and instincts of senior physicians, rather than evidence-based medicine (49). (One of many efforts to change this approach is a new HIV clinical protocol from WHO that specifically targets IDUs in Europe (98).)

While reaching IDUs in western European prisons is important, reaching them in eastern European prisons is particularly critical (99, 100) (an aspect not covered in Paper II), as HIV prevalence there is much higher than in the outside population (101) – in no small degree due to the criminalisation of drug injecting – and IDUs face added risks and vulnerabilities in prison, notably high TB levels, coerced sex and other forms of violence.

Another shortcoming of Paper II is that it narrowly focused on treatment issues and did not address the overlap between IDUs and sex workers or coinfections among either group. Interventions to reduce the sexual risk behaviour of drug injectors and their partners are also critically important (52). By the same token, future HIV surveillance efforts should explore whether, in countries with an HIV epidemic driven by injecting drug use, it is possible to detect an epidemic of sexually transmitted HIV at an embryonic stage. In such countries, where it is typically young men who get infected by using contaminated injecting equipment, the natural course of development will inevitably lead to an increasing number of women becoming heterosexually infected. That will not indicate that the epidemic has become generalised; it is merely the natural spread of HIV that is not blocked by condom use or diminished by the treatment of STIs.

However, an independent sexually transmitted HIV epidemic would go beyond the women infected by male IDUs. The first sign of such an independent HIV transmission cycle would therefore be more and more men getting infected with HIV who do not have HCV (a proxy marker for injecting drug use) or HBV (a proxy marker for male-to-male sex), or who claim that they are infected by a woman who does not inject drugs (they may know).

The idea of looking for early signs of an HIV epidemic that shifts transmission modes in this way has not been widely understood or applied, and current surveillance rarely involves the use of proxy markers, or in-depth interviews with men who became infected by an unknown transmission route or claim to have become heterosexually infected. The high proportion of eastern European men with an “unknown transmission” route, discussed above, calls for such measures in order to identify epidemiological changes and enable targeted interventions before the virus establishes itself in new populations.

Closer examination of available data may in fact give us more information than we currently claim to have, and instituting some sentinel sites to look into the transmission routes of male PLHIV may also clarify the situation. Ultimately, the issue of partner management in HIV and STI prevention still needs to be better addressed in Europe – and abroad (102).

### *Young people*

After girls and women, young people in general are often the population targeted most for HIV prevention interventions. In Europe, however, the age group most affected by HIV is *not* young people (see Table 8). Action 8 of the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia, signed 24 February 2004 (53), states that by 2005, at least 90% of European youth (those aged 15 to 24) should have access to relevant HIV information, education and services. As part of the process of monitoring progress on Declaration commitments, WHO and UNAIDS recently reviewed data on young people and HIV from the 53 countries of the European Region. They encountered major problems in both the quality and consistency of data collected. For example, different countries disaggregate their data into different age groups. Each country has different priorities for their young people and does not always disaggregate their data by risk group or target the component risk groups explicitly, such as young MSM, young IDUs or young male sex workers. Although it is accepted that early school-based sexuality education is one important prevention solution, many members of the main youth risk groups do not attend school regularly, if at all, and they suffer from huge gaps in support, information and education where they are most needed (36).

A major goal of sexuality education is to promote safer sex (103), and Paper VI looked at the impact of individual and contextual factors on young Europeans' self-reported condom use. The study found that both alcohol use and national variables like predominant religion, GDP and even HIV prevalence were associated with condom use. The findings should be interpreted with caution, as self-reported condom use is not a reliable indicator of true condom use, which may have been much lower. Nonetheless, the paper raises important issues, as few youth interventions take either the individual or group-level variables it found to be significant into account.

Such “ecological” approaches have in general been slow to influence public health practice in addressing risk behaviours (104). This is in part due to the so-called ecological fallacy, described as a logical fallacy inherent in making causal inference from group data to individual behaviours (105) – a methodological challenge that Paper VI faced. In analysing the predominant national/contextual variables, we did not correlate them directly to individual respondents. This approach means, for example, that although Catholicism may have been the predominant religion in a given country, it is possible that none of the sample population from that country came from Catholic families. Nevertheless, as Sharon Schwartz has noted, one of the common fallacies in thinking about the ecological fallacy is that “individual models are more perfectly specified than ecological-level models” (105). She argues, for example, that ecological studies can avoid certain confounding variables in survey studies, such as recall bias, response bias and “nay-saying”.

Yet researchers and policy-makers often fail to acknowledge the relevance of group-level variables and context, be it local, national or social-historical (3). The prevailing approach has been to help young people cope with risk environments by trying to change their attitudes and behaviours, for instance by promoting abstinence or the use of contraception, treating young

**Table 8. HIV diagnoses by age group in the European Region, 2006 and cumulative**

	Age at diagnosis (years)	New diagnoses*	%	Cumulative diagnoses***	%
<b>Western Europe</b>					
Male	<15	85	1%	2 409	1%
	15–24	1 190	7%	16 769	9%
	25–49	12 462	77%	135 472	76%
	50+	2 308	14%	20 046	11%
	Unknown	122	1%	4 439	2%
	Total	16 167	19%**	179 135	22%**
Female	<15	121	1%	2 095	3%
	15–24	1 165	14%	12 966	17%
	25–49	6 469	75%	54 038	71%
	50+	795	9%	5 075	7%
	Unknown	41	0%	1 868	2%
	Total	8 591	10%**	76 042	9%**
<b>Central Europe</b>					
Male	<15	18	1%	2 343	13%
	15–24	177	13%	3 252	18%
	25–49	872	66%	9 361	51%
	50+	115	9%	1 071	6%
	Unknown	133	10%	2 226	12%
	Total	1 315	2%**	18 253	2%**
Female	<15	17	4%	1 721	23%
	15–24	96	21%	1 923	25%
	25–49	275	60%	2 563	34%
	50+	36	8%	294	4%
	Unknown	36	8%	1 120	15%
	Total	460	1%**	7 621	1%**
<b>Eastern Europe</b>					
Male	<15	252	1%	1 472	0%
	15–24	6 207	18%	138 353	40%
	25–49	27 597	78%	175 365	51%
	50+	1 126	3%	5 352	2%
	Unknown	43	0%	22 505	7%
	Total	35 225	41%**	343 047	43%**
Female	<15	173	1%	941	1%
	15–24	9 834	40%	79 879	50%
	25–49	13 985	57%	65 228	41%
	50+	637	3%	2 680	2%
	Unknown	8	0%	10 586	7%
	Total	24 637	28%**	159 314	20%**
<b>Total European Region****</b>		<b>86 912</b>	<b>100%</b>	<b>806 258</b>	<b>100%</b>

\* No data were reported from Italy or Spain.

\*\* Refers to the proportion (rounded up) among the total number of cases in the European Region.

\*\*\* Cumulative totals from the beginning of reporting through 31 December 2006. Unadjusted for reporting discrepancies in Austria, France, Italy, Spain, Romania, the Russian Federation and Ukraine. The real total figure is 1 024 975.

\*\*\*\* Includes cases with unknown sex.

**Source:** European Centre for the Epidemiological Monitoring of AIDS, unpublished data, 2007.

people like “irresponsible pleasure-seekers” (106, 107). This model fails to adequately address how environmental factors such as religious norms, family values or limited access to condoms also influence attitudes and behaviour, or how certain individual behaviours, such as the use of alcohol or other drugs, may themselves be responses to environmental conditions. Accordingly, the most important steps in preventing HIV and improving the sexual and reproductive health of young Europeans are to address professional and ideological opposition to harm reduction, comprehensive sexuality education and the use of contraception (108–110), and to remove legal barriers requiring parental consent for adolescents to get an HIV test, receive OST or have an abortion (111). Resistance comes from key stakeholders across the Region – including religious leaders, politicians, health care providers (e.g. narcologists), parents and the mass media – who need to understand the evidence base behind such interventions. Another important priority is to ensure up-to-date, accurate information on e.g. contraception use, for otherwise, as Paper VI noted, it is impossible to monitor what is working.

## **Hepatitis**

The decision to address HIV coinfection with hepatitis B and C (III) was based on the very high estimated prevalence levels in Europe and the dearth of hard data on the topic. Even though HIV/hepatitis coinfection rates of 70–90% have been reported among HIV-positive IDUs in some eastern European settings (112), most countries in Europe have not bothered to obtain reliable estimates of hepatitis prevalence. Public awareness is also low, in part because hepatitis often presents no symptoms, and the vast majority of infected people are thus unaware of their status (17). Untreated, HCV causes chronic infection in about 70% of those infected, and in these chronic cases, cirrhosis has been estimated to eventually develop in 10–20% over 20 to 30 years (113). It is already the most common cause of chronic liver disease and the most common reason for liver transplants in some European countries, and morbidity and mortality from hepatitis C are rising and expected to continue rising in the coming decades. Further, progression of liver-related disease is accelerated in individuals coinfecting with HIV and hepatitis C virus (114).

It is useful to contrast the staggering ubiquity of HBV and HCV, with an estimated 350 million cases of chronic hepatitis B and an estimated 130 million of chronic hepatitis C (115), with an estimated 33.2 [30.6–36.1] million individuals living with HIV worldwide (116). In 2006, there were an estimated 2–4 million HIV/HBV coinfections in the world and 4–5 million HIV/HCV coinfections (117). In the context of the HIV epidemic, hepatitis coinfection is a major issue, particularly in Europe, where so many of the cases are due to contaminated needles and syringes. The reverse is not the case; most people with hepatitis in Europe do not have HIV nor the behaviours that lead to HIV transmission. Research on hepatitis, therefore, has multiple constituencies, with the vast majority having no link to HIV. Sharing contaminated drug injection equipment is now the main cause of hepatitis C in Europe since regular blood screening was implemented shortly after the discovery of HCV in 1989. Earlier, the principal causes of hepatitis B and C transmission included transfusion with contaminated blood or blood products; vertical (mother-to-child) transmission at birth; and, particularly for hepatitis B, sexual contact – the latter still a priority issue in Europe.

It should be noted that the estimates gathered in Paper III are unreliable, in part due to the lack of accurate HCV prevalence figures for IDUs (32). For instance, a recent study showed this figure to be very high in the Russian Federation (54–70%) (118), indicating that the figure of

24% for PLHIV with HCV (see Table 4) significantly underestimates the extent of the coinfection there.

The burgeoning hepatitis crisis throughout the European Region is largely due to limited access to prevention measures, diagnostic tests and/or treatment in most of the 53 constituent countries, particularly in eastern Europe. Limited surveillance of hepatitis B and C in these countries' general populations, as well as among their haemodialysis patients and hard-to-reach risk groups such as IDUs and sex workers where hidden hepatitis epidemics might easily lurk, makes it especially difficult to estimate disease burden accurately. In many parts of the Region, the high cost of technology is a particular barrier, limiting access to the serologic and molecular assays that are critical to not only the diagnosis of hepatitis B and C, but also the management and treatment of liver disease.

The aetiology of chronic liver disease in Europe is typically excessive alcohol consumption, viral hepatitis (B and C) or obesity. For western European PLHIV coinfecting with HCV or HBV, the most frequent causes of death are related to liver disease – more often than AIDS-defining infections. This trend, in which hepatic disease as well as cardiovascular disease and pulmonary disease are now rapidly replacing AIDS-defining illnesses as the major cause of death in PLHIV, is well established (119). And in a major cohort study on the death rate from liver-related disease in patients with HIV, it was found that in patients with similar CD4 cell counts, longer exposure to combination antiretroviral therapy was associated with an increased death rate from liver-related disease (120). This trend represents a striking change in the aetiology of HIV-related deaths, which previously were due primarily to opportunistic infections rather than to comorbidities.

Future studies, coupled with better surveillance, are needed to address hepatitis and HIV/hepatitis coinfection throughout the European Region, developing, for example, better estimates of prevalences and undiagnosed cases. Additionally, the burden of treatment costs for individual countries needs to be assessed and ultimately reduced.

### ***Tuberculosis (TB)***

As with HIV/hepatitis coinfection, there are few reliable data on the extent of TB/HIV coinfection or European policies to address it. Paper IV (and a factsheet based on it (121)) provided key background information for a European ministerial forum on TB in October 2007 (122) on one aspect of TB: coinfection with HIV. The declaration of the forum noted that “TB is the most prevalent cause of illness and mortality in people living with HIV/AIDS, and few countries address TB/HIV coinfection in a comprehensive manner.” (123)

And while the declaration called on European ministries of health to “strengthen... collaboration between TB and HIV programmes,” several leading researchers on public health in Europe have lamented the “failure of researchers to acknowledge the importance of the contextual environment in which the [TB] programmes (often vertical and externally supported) are implemented such that lessons are not drawn, mistakes are replicated and sustainability is not assured” (124). While the approach in Paper IV was to examine TB/HIV coinfection by surveying the 25 most-affected countries in Europe in order to glean new data on its extent and health policies that address it, rather than to assess, monitor and evaluate particular programmes as the researchers cited above suggest, we did gather information from each country on its main achievements, obstacles and needs in addressing TB/HIV. Nevertheless, it should be noted that there were substantial reporting gaps and data were often



reported to us by individuals from the same organisations that provide national estimates and which often have vested interests in the data they supply. Moreover, in Table 5 above, two of the countries that reporting having a national estimate for the prevalence of HIV in TB patients, did not release the figure.

Monitoring and evaluation will be needed in addition to new research to assess whether or not the 18 high-priority TB countries in Europe are reaching the six targets set out in Box 3, which are presented in detail in the *Plan to stop TB in 18 high-priority countries of the WHO European Region, 2007–2015 (125)* and other goals described there such as ensuring that 100% of TB patients receive HIV counselling and testing.

**Box 3. TB objectives for high-priority TB countries in the European Region**

- Expand DOTS (directly observed treatment, short course) coverage to 100% of TB patients in eastern Europe;
- Increase case detection rate of new infections to at least 73%;
- Cure at least 85% of detected new infectious TB cases;
- Provide treatment according to internationally recommend guidelines to 100% of multidrug-resistant TB cases;
- Reduce the prevalence of TB (all forms) to 188 cases per 100 000 population;
- Decrease the mortality rate of TB (all forms) to 16 deaths per 100 000 population.

*Source: Plan to stop TB in 18 high-priority countries of the WHO European Region, 2007–2015, 2007 (125).*

The rapid emergence of TB/HIV in eastern Europe calls for health policies that strengthen collaboration between existing TB and HIV control programmes, rather than the development of new programmes, something that has been promoted for years by the TB/HIV Working Group of the Stop TB Partnership, for example (126). The European Framework to Decrease the Burden of TB/HIV (127) sets out the rationale for effective collaboration between national HIV and TB programmes. It identifies five strategic components – political commitment, collaborative prevention, intensified case-finding, coordinated treatment and strengthened surveillance. As Paper IV found, though individual countries have adopted many of WHO’s recommended policies to address TB/HIV, the close collaboration of HIV and TB efforts is an outstanding challenge in most of the Region. Such collaboration in prison settings was not studied.

In addition to the linkages between TB/HIV, imprisonment and poverty, one significant topic that the paper did not address is the link between HIV and multidrug-resistant TB, which may have great epidemiological significance in Europe. The rapid spread of HIV in eastern Europe coupled with a high level of resistant TB poses a special challenge to the TB situation in the European Region. TB patients in some countries of the Region, such as the Baltic states and Russia, are 10 times more likely to have multidrug-resistant strains than TB patients in the rest of the world (128). And the spread of HIV into parts of central Asia and eastern Europe where TB drug resistance is more common makes the prevalence of MDR-TB/HIV coinfection there likely to increase (18).

## Health care providers: midwives

In an interview published in 2000, the WHO European Regional Director stated:

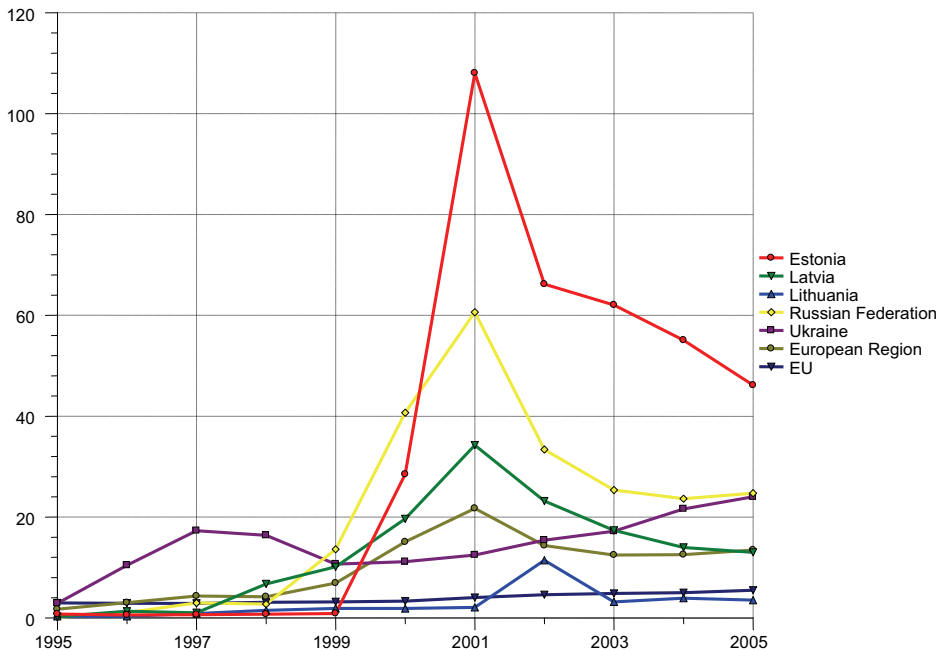
Nurses and midwives are the largest single group of health professionals in Europe. We need to fully utilize [them] if we are to tackle the serious public health challenges of our time such as ageing, AIDS, chronic illness, and care for homeless and migrant populations (129).

Then in August 2002, the six WHO regional advisers on reproductive health held a global meeting in Copenhagen to discuss the effects of health sector reforms on sexual and reproductive health (130). At the meeting, a senior World Bank adviser called on participants to remain vigilant about the impact of such changes, and to gather their own evidence on how reforms may or may not improve both health system performance and reproductive health.

That was the genesis of Paper V, on health sector reforms and reproductive and sexual health in Estonia, specifically with respect to the role of midwives. As a country that was preparing to accede to the EU (which it did in 2004), and the country that had recently experienced the world's highest percentage increase in newly reported cases of HIV (a 124-fold in 1999–2001) (see Fig 2), Estonia was faced with reforming its post-Soviet health care system and preparing to meet EU standards.

In many EU countries, midwives have played an important and sometimes leading role in providing antenatal and postpartum care and other reproductive health services. With its high prevalence of STIs and abortions – four times the EU average – it appeared at first glance that

Fig 2. HIV incidence per 100 000 in the European Region



Source: European health for all database, 2008 (131).

Estonia should be taking more decisive action to stem the decline. Yet instead, the country's 1998 family medicine reform transferred responsibility for antenatal care from obstetrician-gynaecologists and midwives to the new family doctors.

For Paper V, we conducted the first national survey of midwives and a stakeholder analysis of the current national situation that laid special emphasis on the survey results. In-country interviews, a 32-question survey and two stakeholder group discussions were employed to illuminate some of the issues facing this small former Soviet republic. While it did not address HIV specifically – and while the main finding, that job satisfaction was associated with salary, was not adjusted for working hours, working experience or education – the findings remain relevant for the other two Baltic states, other countries facing high HIV incidence rates or reductions in midwifery, EU policy-makers and donor organisations. Like other commemorative efforts to highlight reproductive health challenges, the article was written to coincide with the 10th anniversary of the International Conference on Population and Development, which called for universal access to reproductive health services (110).

The study raised awareness about the decline in the number of midwives in Estonia and their changing and often uncertain role when the findings were presented at a national perinatal conference, and responsibility for antenatal care was later partially restored to midwives, in keeping with similar developments in other EU health systems. Unfortunately, the midwifery trends the paper describes can still be seen elsewhere, such as in Moldova. It highlights the difficulties of reforming the health sector in the countries of the former USSR, particularly in developing a flexible, responsive health system. For instance, despite an Estonian policy shifting responsibility for antenatal primary care back to the midwives, and despite a European Directive permitting trained midwives to carry out most antenatal care roles autonomously, a follow-up study has shown that Estonian midwives themselves do not now all agree on their role, e.g. that they should have responsibility for all aspects of antenatal care (132).

The subsection above on IDUs identified an over-reliance on specialists as one of the failures of the Soviet "Shemasko" health system model. Paper V showed how these autocratic, hierarchical systems failed to stimulate stakeholder initiative in either the health care system or the community at large. Modelling health system dynamics to reflect their complexity and context is a sorely overlooked analytical approach (133). It is not just Estonia and other eastern European countries with high HIV prevalences that could benefit from such an exercise.

As noted, Paper V would have benefited from HIV-specific questions in the survey and follow-up discussions. For example, we could have asked midwives and the other key stakeholders about developing an HIV subspecialisation for midwives that included antenatal care for HIV-positive women and reproductive health counselling for specific HIV risk groups. It would also have been important to determine their interest in working with HIV internationally, and creating, for example, a European HIV midwifery network, similar to the newly established European HIV Nursing Network. Instead of focusing primarily on shifting from specialist systems to family doctor systems, as the World Bank (134), the United States Agency for International Development (USAID) and others do (135), a better, more nuanced approach to drafting health reforms in Estonia and elsewhere would involve midwives and nurses and take their potential into consideration – as all of the countries of the European Region have, in fact, committed themselves to doing (136).

## **Conclusions**

Despite a wealth of knowledge about how to treat and prevent HIV, reported rates of newly diagnosed cases in the European Region continue to rise, while the need for antiretroviral therapy outpaces the increase in treatment. These trends reflect a range of individual and contextual factors (Paper VI), including the situation of the groups most at risk for HIV (Papers I, II); the poor state of surveillance of HIV, AIDS and comorbidities such as hepatitis and tuberculosis, which impedes awareness of the problem's extent and nature (Papers III, IV); and the under-utilisation of particular groups of health care providers resulting from health sector reforms (Paper V). Research addressing these and analogous issues can help identify and demystify the predominant challenges in addressing the HIV pandemic, as well as test hypotheses for remedying the situation. Europe needs more research to shine a light on these and other hidden barriers to universal access.

In reviewing the policy implications of these issues, whether for the countries of eastern Europe in transition or the member states of the EU, it becomes patently clear that democracy and financial resources alone cannot provide a protective bulwark against HIV, even in countries that have recognised the gravity of the situation. Systemic obstacles to HIV prevention and treatment need to be identified and challenged, particularly in countries experiencing the severest epidemics. The key to halting and reversing the pandemic is more and better prevention, treatment and care – and that will require addressing the hidden epidemics and other obstacles identified in these six papers.

### ***Next steps***

The EU is assuming an increasingly pivotal role in halting the spread of HIV in the entire European Region, as demonstrated in 2005 by the establishment of the European Centre for Disease Prevention and Control (ECDC), and by the perspectives and actions articulated in the European Commission's plan for fighting HIV in the EU and neighbouring countries in the next four years (137). It is not only the low-income countries of Africa, Asia and the Americas that require technical assistance from donor organizations. WHO Europe and UNAIDS, together with other multilateral agencies, bilateral agencies and nongovernmental organizations (NGOs), must continue offering technical support to the countries of eastern Europe, not just in combating HIV but also in advancing health system reforms as vertical programming continues to dominate the health sector response there. Typically, there are separate specialised services devoted to HIV, to other STIs, to other infectious diseases and, critically for the many countries there where the epidemic is driven by injecting drug behaviours, to drug and alcohol problems (narcological services). Hidebound attitudes and approaches prevail, and responsibilities are compartmentalized and rigidly demarcated.

But some eastern European countries have made substantial progress, often largely due to civil society efforts, in developing programmes for antiretroviral therapy, condom promotion, OST and needle and syringe exchange, and in coordinating these initiatives via country coordinating mechanisms (as required by the Global Fund to Fight AIDS, Tuberculosis and Malaria), UNAIDS national theme groups, national PLHIV networks, harm-reduction networks and other NGOs. Collaboration with donors and other countries is also on the rise. In May 2007, for example, the first Eastern European and Central Asian AIDS Conference was held, with the participation of scientists, technical experts and civil society activists from across Europe and strong support from the International AIDS Society, the GFATM,

UNAIDS and WHO, not to mention the Government of the Russian Federation. Future conferences in the region should seek to maintain and expand such collaboration by including other governments in the region, for example.

The papers presented in this dissertation also clearly demonstrate that the western European response to HIV continues to be inadequate, especially in dealing with coinfections. These countries also need to address the increase in newly reported HIV cases, particularly among MSM and migrants. Another of the many other urgent issues demanding attention is the approximately 30% of western European PLHIV who are unaware of their HIV status (138) – a number that rises to 50% for the European Region as a whole. Some 300 experts gathered together in November 2007 to wrestle with this issue at the HIV in Europe: Working Together for Optimal Testing and Earlier Care conference (63). Indicator guidance, presented there, on when to test (139) coupled with a better understanding of the obstacles to expanded testing in the European Region should help improve the situation in the next few years.

The following section lays out 10 areas where research promises to improve the effectiveness of the European Region's HIV response.

### ***Research priorities***

In the past, HIV research has often prioritised biomedical solutions such as antiretroviral treatment, pre-exposure prophylaxis, microbicides and vaccines (36, 140). This tendency is evident from reading the funding allocations of major donors, such as the European Commission (141) and most recently the Russian Federation (142). Below, the 10 research priorities, which arose in the course of this dissertation, primarily focus on public health and the social sciences. Some of the issues were articulated in the papers themselves, while others emerged in reflecting on the papers, but they are all informed by one common goal: to make access to HIV prevention, treatment, care and support *universal*. Access to these services is widespread in many parts of the European Region and for many different groups, but making them universal means first, precisely identifying each of the multifarious gaps in coverage, and second, seeking to understand how they arise and how they can be addressed. The largest remaining gaps are generally the result of oversight, simplification, misunderstanding or wilful ignorance: they are Europe's hidden HIV issues, its hidden epidemics and targeting failures. While by no means exhaustive, the following list of priorities seeks to point out some of the most significant gaps in our knowledge and thereby serve as a guide for future research efforts.

New research is crucial to improving our understanding of the European epidemic's dynamics and responding to it more effectively. It needs to include many more behavioural studies and social and political analyses of local and national experiences throughout the Region. As one leading commentator recently expressed it, we worry more about how the virus replicates than about how people acquire it:

While in 25 years scientists have learned more about the human immunodeficiency virus than about any other pathogen, we still lack solid evidence and analysis on what public health measures work and why (143).

In fact, we collectively know more about what reduces HIV incidence than we realise. The six papers in this dissertation represent only a minute part of a growing evidence base that often tells us quite explicitly what works and what does not. A thornier question (and the basis of Priority 3) is why governments, nongovernmental organisations and other HIV actors cannot

or will not implement these proven interventions. After all, the more we neglect difficult-to-reach risk groups, the more we increase the virulence of the epidemic where it is hardest to address.

### **Priority 1. The increasing number of newly reported cases among MSM**

In the European Region, the HIV epidemic has mainly affected the male population, and a first research priority is prompted by the increasing number of newly diagnosed cases among MSM, particularly in western Europe. In that part of the Region, research should investigate the origins of infected MSM. How many MSM are non-nationals and likely to have become infected in their home country or in Europe? How do health care providers interact with non-nationals and do non-nationals fear an HIV diagnosis due to serostatus-related travel restrictions? If MSM are nationals, which interventions are effective in addressing risk behaviours or encouraging testing?

Very little is known about MSM in eastern Europe, and while the number of registered cases for this risk group remain low, it is widely believed to be substantially underreported due to homosexual activities being highly stigmatised and sometimes illegal in the countries there. More research is needed into risk behaviours and HIV prevalence in this population as well as how to implement best practices in countries reporting no or very few MSM cases.

### **Priority 2. HIV/AIDS in prisons**

The second area is HIV prevention in prisons, and again the main target population is male. Fyodor Dostoevsky wrote in the mid-nineteenth century that “the degree of civilization in a society can be judged by entering its prisons.” Current international guidelines now recommend that HIV prevention and care in prison should be equivalent to what is available in the surrounding community (144), or better if that is what is required to achieve equivalent health outcomes (145), and yet basic harm-reduction materials such as condoms and sterile injecting equipment are often unavailable inside in spite of evidence demonstrating their effectiveness (146).

In eastern Europe, research on HIV (and hepatitis) in prisons are especially scanty. National experiences with harm reduction in prisons need to be examined and publicised, including the reasons for any local lack of access to condoms and clean needle and syringes. Prison conditions, including violence against both women and men, is another relevant issue that is under-represented in HIV research.

Knowledge about the availability of HIV treatment in prisons, including HAART, is similarly patchy, and it would be useful to consider whether community health systems would be more effective in providing it than vertically organised prison health systems. Furthermore, since TB rates are also much higher in prison settings, the need to model TB and HIV coinfection rates and drug resistance in the treatment of both is of particular relevance for incarcerated populations. Surveys are also needed of which prisons have TB programmes and whether they are linked to HIV prevention and treatment programmes.

### **Priority 3. Resistance to evidence-based interventions**

Several European countries have rejected evidence-based interventions such as harm reduction (e.g. OST) (36, 49) and school-based comprehensive sexuality education (103), often promoting abstinence instead. These systemic failures need to be better understood. Is opposition due to a poor comprehension of evidence-based medicine, or perhaps to competing professional traditions? Is it linked to anti-Western sentiments, stigma attached to PLHIV and

certain risk groups, religion, culture or is there another agenda at work? One provocative article argues that from a public health perspective, abstinence should be subjected to the same scientific standards as other prevention methods (147). Abstinence is said to be 100% effective if “used” consistently, but how often does it “fail” – and why?

Research should utilise both qualitative and quantitative methods, for instance by assessing the knowledge of health policy-makers, narcologists, infectious disease doctors and other specialists on the principles of evidence-based medicine (148) and asking them to rank interventions in order of utility, followed by interviews to establish the reasons for their rankings. Another factor to scrutinise is international pressure, e.g. how the stance of the United States on harm reduction has affected national drug use programmes, the United Nations Office on Drugs and Crime (UNODC) and other international agencies (149).

#### **Priority 4. Impact of criminalisation**

Intentionally transmitting HIV or exposing another person to it has been criminalised in several countries, but it remains a highly contentious issue (61, 150). Can a person who is unaware of his or her serostatus be found guilty of this crime? Does fear of prosecution drive some PLHIV underground (151)? The issue of culpability is a serious one, especially when exposure has been consensual. A study carried out by the Global Network of People Living with HIV/AIDS (GNP+) showed that for more than 90% of the convictions for HIV transmission, the route of transmission was consensual sexual intercourse (152). From a prevention perspective, is it appropriate or effective to place all the responsibility for preventing transmission on the infected? Does it create a false sense of security in the general population? Does it increase stigmatisation?

#### **Priority 5. Coinfection with hepatitis B or C**

Hepatitis is now recognised as a major global epidemic (153). The fifth research priority therefore addresses HIV coinfection with hepatitis B or C and how to raise awareness about it in the general public and among policy-makers. National surveillance needs to be improved and prevalence estimates need to be made. The primary interventions for hepatitis B and C prevention are very similar to those for HIV prevention among IDUs, including needle and syringe exchange and information about safer injecting techniques and safer sex. But in order to enable better prevention and treatment, many more people need to be tested – something that is not yet happening (17). As HAART works to keep PLHIV alive, hepatitis as a cause of death will increase, and research across Europe should set out to map causes of death that were not due to AIDS.

#### **Priority 6. Injecting drug use, sex work and HIV**

HIV transmission, injecting drug use and sex work have become increasingly intertwined and more research on their linkages is needed. At the same time, both sex workers and IDUs have limited access to harm reduction and sexual health care services (77). Many countries criminalise sex work and drug use, which drives sex workers and IDUs underground, thereby precluding full access to prevention, treatment, care and support services.

To better understand the dynamics of transmission among these two risk groups and the interventions that are most effective in reaching them, more studies are needed to establish STI prevalences, drug use levels, condom utilisation rates and the coverage of harm-reduction services. Further, in countries with an IDU-driven epidemic, studies must investigate the reported mode of transmission when not reported as injecting drug use as one recent study

revealed that pregnant women were often reported as having acquired HIV heterosexually, in spite of having a history of injecting drug use (154).

For sex workers, discrimination and violence (from police, health care providers and clients) also need to be investigated to help establish the conditions needed for a safer environment. Existing research on HIV and sex workers has focused mainly on female sex work, although male sex work has been shown to be much more prevalent than previously recognised (155). The overlap between MSM and sex workers, not to mention migrants, is another issue that is poorly represented in the literature on HIV.

#### **Priority 7. The sexual and reproductive health rights of PLHIV**

One important issue for PLHIV is reproduction – and not only natural reproduction, but medically assisted reproduction that can reduce transmission to the infant and partner (50), most notably through sperm-washing. Since the risk of infecting the female partner or the child with washed sperm is minimal (156, 157), this method has allowed PLHIV to become fathers of seronegative children. Research should investigate why it is not widely promoted. Other research areas related to the rights of PLHIV include their sexual health and well-being, contraception and safe abortion as well as vaccination against hepatitis B or the human papillomavirus, when relevant (50). How to advance such an agenda requires operational research at the country level.

#### **Priority 8. HIV and the spread of other STIs**

In eastern Europe, the HIV epidemic is driven mainly by injecting drug use, and so transmission is not yet facilitated by other (ulcerative) STIs. However, high STI rates there, particularly for syphilis, do indicate that unprotected sex is common in the subregion. In western Europe, HIV rates among MSM are increasing and their other STI levels also show similar trends. For some MSM, prevention strategies have changed from risk avoidance to risk minimisation, relying for example on serosorting and frequent HIV testing, and the consequent decline in regular condom use is likely contributing to the increased spread of STIs. Topics to research include coinfection levels, STI testing patterns past and present, and partner management (primary prevention) in serodiscordant couples.

#### **Priority 9. Mother-to-child transmission: prevention and counselling**

The prevention of MTCT depends on counselling pregnant women and providing access to appropriate treatment. While little is known about the quality and availability of these services in many countries, maternal health trends in some places are worrying. For instance, the number of abortions among HIV-positive women in eastern Europe, particularly the Russian Federation, is much higher than in western Europe.

Research needs to examine who counsels these women – doctors, nurses, midwives or no one? Is the counselling objective, is it “decent” (158) or is it dictated by the availability of treatment or other resources? What are pregnant women actually counselled to do and are social services linked to antenatal care? A 2004 study in Ukraine revealed grave discrimination against HIV-positive women in delivery settings, including cases of health care providers strongly urging them to have abortions (159). And in St. Petersburg, Russia, where HIV among pregnant women is a particular problem, infant abandonment is high (160). More research is needed on these and other country experiences across the European Region.



**Priority 10. A “new” prevention technique: male circumcision**

In 2006, two trials in Africa testing the impact of male circumcision on HIV transmission were stopped due to high efficacy rates of approximately 60% (161, 162), which made it unethical for the researchers to continue the trials with the control groups. While the results have been welcomed by governments, NGOs and the general public, it is unclear how best to address the “complex cultural, human rights, ethical and programmatic issue[s]” of making male circumcision a major HIV prevention method (163). It is evident that male circumcision does not provide complete protection and should only be promoted as one component of a comprehensive prevention strategy (164).

The implications of this intervention have only begun to be clarified. Among the questions that need to be explored are child protection issues and the optimal age at which circumcision should be performed. On the other hand, how should the issue of consent and volition be addressed in cultures that already circumcise minors (165)? Important gender considerations also need to be examined. To date, trials have only shown that male circumcision reduces female-to-male transmission. What is the relevance of male circumcision in European settings, where the primary mode of transmission is not heterosexual? For example, new evidence from a study conducted in the United States among MSM showed that male circumcision was not associated with a significant reduction in HIV transmission (166).

Further, male circumcision may create a false sense of security and undermine existing preventive behaviours and strategies to reduce HIV infection, such as consistent condom use. Considering how poorly condom use has been expanded in many areas, research must address whether the “C” for circumcision may come to replace the “C” for condom use.

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**Papers I–VI**





ORIGINAL ARTICLE

## HIV/AIDS knowledge and condom use among Somali and Sudanese immigrants in Denmark

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### Abstract

**Aims:** This study explores the knowledge, attitudes and practices among Somali and Sudanese immigrants in Denmark with regard to HIV/AIDS and condom use. **Material and methods:** A 78-item questionnaire, divided into five thematic sections, was given to 192 purposively selected Sudanese and Somalis of both sexes, aged 18–49, who had lived in Denmark for one or more years. It was administered in Arabic and Somali in four locations and supplemented by 13 semi-structured interviews. **Results:** Education, sex, and nationality, but not length of residence in Denmark, were positively associated with knowledge about HIV/AIDS. Less than half of both men and women scored more than 70% on the knowledge portion of the questionnaire, while Sudanese knew more than Somalis. Men had a more negative attitude towards condoms than women, but greater knowledge about them. One-third of the women reported never having seen or heard of a condom, and almost half had never received information about condoms. Both sexes preferred receiving such information from the TV or friends instead of family doctors or HIV-positive individuals. **Conclusions:** This study suggests that knowledge about HIV/AIDS is low in these two Danish immigrant groups, both of which are characterized by reported incidence rates that are higher than the national average. The groups receive little information, while condom knowledge is particularly low among poorly educated women, and men have a negative attitude to condom use. The findings indicate a need for targeted, culturally sensitive HIV/AIDS information and advice.

**Key Words:** Africa, condoms, Denmark, heterosexual transmission, immigrants, knowledge/attitude/practice studies

### Introduction

There has been a tendency to discuss the HIV/AIDS epidemic in high and low-income countries as if they were worlds apart. This tendency is well founded in differences in incidence, prevalence, modes of transmission, and access to treatment and care. However, current patterns of migration have brought these worlds closer together. At the end of 2003, there were an estimated 5,000 people living with HIV in Denmark. HIV prevalence was 0.09% among the general population, 0.03% among Danish-born heterosexuals, and 0.34% among immigrants [1].

During the 1980s, Denmark had the highest AIDS incidence in Europe [2]. By 2001, however, the AIDS incidence rate was well below the European Union (EU) average. While most Western European countries now report an increase in new HIV cases, this is not the situation in Denmark [3]. During the last 10 years, HIV incidence has been stable, averaging 282 new cases reported annually [4]. All HIV-positive individuals requiring treatment can receive it free from the state.

The number of new HIV cases among men born in Denmark is falling, while the figure for women born in Denmark is low and stable [4]. However,

Denmark now leads Europe in heterosexual acquisition of HIV from a partner from a high endemic area [5]. During the last decade, the pattern of HIV transmission has changed and the HIV incidence rate is about four times higher in immigrants than in native Danes. Around one-third of newly diagnosed HIV-infected persons are immigrants, mostly from Africa, and this group makes up one half of all heterosexually transmitted cases of HIV. The percentage of immigrants in new cases of HIV reported has increased almost every year, more than doubling from 16% in 1990 to 37% in 2000, a figure that remained the same in 2003 [1,6]. Here, it should be noted that while these figures are reported as incidence, they may in fact represent prevalence, as surveillance data shows that that most HIV infections diagnosed in immigrants originating from countries with generalized HIV epidemics were probably acquired in their country of origin [3].

At the end of 2003, there were 442,036 immigrants in Denmark (8.2% of the population), including 42,836 from Africa, of which Somalis represent 17,363 and Sudanese 535 [7]. The HIV prevalence rate was 0.41% for Somalis and 1.6% for Sudanese.

Today, in Denmark, immigrants have access to the same HIV/AIDS counselling services as native-born Danes, as well as to some health information material translated into their own language. In spite of the growing number of immigrants in Denmark and the increasing rates of HIV/AIDS among them vis-à-vis people born there, few scientific studies have examined immigrants' knowledge, attitudes, and practices in respect of HIV/AIDS and sexuality, either in Denmark or in Western Europe as a whole. This study seeks to contribute to the knowledge about two particularly affected immigrant groups in Denmark as studies of minority groups elsewhere show that increased condom literacy can lead to improved protective sexual behaviour [8]. The paper describes a knowledge, attitudes, and practices (KAP) study on HIV/AIDS and condom use administered to Somali and Sudanese immigrants in Denmark. Particular attention has been paid to the level of interest in HIV/AIDS, the preferred sources for information about HIV/AIDS, sex, and nationality.

### **HIV/AIDS in Sudan**

By the end of 2003, the number of people living with HIV/AIDS in the Middle East and North Africa was 600,000. Of those, there were 500,000 cases in Sudan alone [9]. Heterosexual transmission

accounted for 94% of cases. HIV prevalence has been increasing due to nomadic groups that move between Sudan and neighbouring high-prevalence countries, refugees from Eritrea and Ethiopia, and civil war, which has put more people at risk as they flee to cities or are subjected to coerced sexual relations with soldiers [10,11]. A study of 49 Sudanese refugees, attending antenatal clinics, revealed that not one woman reported ever using a condom and only three knew that HIV can be sexually transmitted [12]. As women of reproductive age are one of the target groups for family planning information the fact that they report low knowledge on condoms is an indicator of general low knowledge in the population.

### **HIV/AIDS in Somalia**

There is little published information available about HIV/AIDS in Somalia because of the war in that country, which has since 1991 left the country without a central government and led people to emigrate to neighbouring countries or to seek asylum in Western Europe. According to UNAIDS, the prevalence of HIV/AIDS in Somalia is considered as 1%, which is low compared with other countries in the region. However, HIV infection appears to be increasing rapidly in the country, with wide regional variations. Studies report that the HIV prevalence among blood donors is 4.4% in the Gedo region and 2.9% in Sool and Middle Shabell, and that the prevalence of HIV among women attending antenatal clinics rose from 0.84% in 1999 to 3.0% in 2000 [13].

### **Material and methods**

This study was a knowledge, attitudes, and practices (KAP) study, employing a questionnaire with closed-ended answers. It was hand-delivered to 246 purposively selected Sudanese and Somali immigrants of both sexes, aged 18–49. None of the participants was married with another or reported being in a relationship with another participant. They were recruited through Danish language schools, national clubs, and cultural centres in order to reach a broad range of informants. The questionnaire was administered in Arabic and Somali in four locations, including the capital. These areas are home to more than 52% of the Sudanese and 43% of the Somalis living in Denmark. The questionnaires were supplemented by semi-structured interviews.

*Questionnaire*

The 78-item questionnaire was based on several other KAP surveys on HIV/AIDS [14–18]. No question had more than four possible answers.

The questionnaires were translated into Arabic and Somali. As one of the authors (HMH) speaks Arabic, but not Somali, we had a professional translator translate the questionnaire into Somali. Both versions were pilot tested, and data were collected in the spring of 2003 with the help of three assistants, who gave participants the questionnaires and collected them from agreed locations where the participants could leave them. The questionnaire was divided into five themes:

1. demographic information;
2. knowledge about HIV/AIDS, its modes of transmission and condoms;
3. patterns of sexual behaviour;
4. attitudes towards HIV/AIDS and condoms;
5. sources of information about HIV/AIDS.

Data from the questionnaires were entered and analysed with Epi Info 2002 (Centers for Disease Control and Prevention, Atlanta, Georgia). Respondents were dichotomized into groups with high knowledge about AIDS and its modes of transmission – those who correctly answered more than 70% of the knowledge questions in a given area – and groups with low knowledge, with regard to the second section of the questionnaire: knowledge about HIV/AIDS, its modes of transmission and condoms. This classification of low- and high-knowledge respondents was adapted from previous studies, e.g. that of Loue et al., which considered a score of 75% high knowledge [19].

The significance of the variables was tested with chi-squared tests and, where frequencies were less than five, Fisher's exact test. All demographic variables were cross-tabulated with the other four themes of the survey.

*Semi-structured interviews*

Face-to-face semi-structured interviews were conducted with 13 people, representing both sexes and countries. The choice of informants was purposive, i.e. they were chosen to reflect the variety of religion, sex, education, and age found in the sample, though such a low number does not provide a representative sample. All interviews were conducted in privacy.

The analysis employed the immersion/crystallization approach [20,21], in which comparison was made between the interview transcription and

questionnaire of each respondent to reach a fuller understanding of his or her answers. The answers were then grouped together into the five themes. Finally, the main information was crystallized, and useful insights into the questionnaire responses were summarized.

*Ethical considerations*

Written and oral explanations of the study were provided to the informants in Arabic or Somali before they gave oral consent to participate in the study. The explanations emphasized that participation in the study was voluntary, anonymous, and confidential.

**Results**

Four criteria were used to select respondents and participants: age, nationality, immigration status, and length of residence in Denmark. Of 246 questionnaires distributed, 17 were excluded because they did not meet these criteria, in spite of initially appearing to do so. Thirty-seven of the questionnaires were not returned. A total of 192 questionnaires were returned (78%) by qualifying immigrants from Somalia (56%) and Sudan (44%). Respondents were aged 18 to 49, with a mean age of 31.8.

Of the Somalis in the study, 44% did not have any interest in issues related to HIV/AIDS, 37% had little interest, and 19% were very interested in knowing and hearing about HIV/AIDS. Among the Sudanese, 6% had no interest in hearing about HIV/AIDS, 23% had little interest, 66% were very interested, and 5% did not answer.

*Demographic characteristics of the respondents*

As shown in Table I, women represented 57% of the Somali respondents, but only 17% of the Sudanese respondents. The majority of the respondents were married and had lived in Denmark for 1 to 10 years. More than half of the Sudanese respondents had completed university, versus only 13% of the Somalis.

**Knowledge about HIV/AIDS**

Eleven items of the questionnaire were related to general knowledge about HIV/AIDS. Respondents who answered eight or more of the items correctly were defined as highly knowledgeable; all others were considered to have a low degree of knowledge. While there is a significant gap in knowledge about



Table I. Demographic profile of the respondents.

Variables	Somalis		Sudanese		Total (n=192)
	Number (n=107)	% of responses	Number (n=85)	% of responses	
Age					
18–27	36	33.7	18	21.2	54
28–37	50	46.7	41	48.2	91
38–49	21	19.6	26	30.6	47
Sex					
Women	61	57.0	14	16.5	75
Men	46	43.0	71	83.5	117
Marital status					
Married	62	57.9	45	53.0	107
Steady partner	8	7.5	11	12.9	19
Single	35	32.7	25	29.4	60
No response	2	1.9	4	4.7	6
Level of education					
Illiterate	14	13.1	0	0.0	14
Primary school	33	30.9	3	3.5	36
Middle/Secondary school	32	29.9	3	3.5	35
High school	13	12.1	32	37.7	45
University or higher	14	13.1	44	51.8	58
No response	1	0.9	3	3.5	4
Length of residence in Denmark					
1–5 years	38	35.5	61	71.8	99
6–10 years	53	49.6	17	20.0	70
11–35 years	16	14.9	7	8.2	23

HIV/AIDS between Somali women and men ( $p < 0.001$ ), this was not the case with the Sudanese (Table II). However, both Sudanese men and women knew significantly more than their Somali counterparts.

Knowledge about HIV/AIDS was also significantly associated with educational level ( $p < 0.001$ ). Of the respondents who had finished high school or university, 56% had a high degree of knowledge about AIDS, while only 13% of the respondents who had finished primary or secondary school did. None of the 14 respondents who were illiterate was highly knowledgeable about HIV/AIDS.

Table II. Level of knowledge about HIV/AIDS by sex.

Level of knowledge	Female		Male	
	n	(%)	n	(%)
Sudanese				
High (%)	9	64.29	45	64.29
Low (%)	5	35.71	25	35.71
Total (%)	14	100.00	70	100.00
Did not respond	0		1	
Somali				
High (%)	3	4.92	10	21.74
Low (%)	58	95.08	36	78.26
Total (%)	61	100.0	46	100.0

Age was another significant predictor of such knowledge. The subgroup of young people aged 18 to 24 ( $n=26$ ) knew significantly less than the rest of the sample group ( $p < 0.001$ ). Only two of these young people (8%) were categorized as having high knowledge, versus 39% of the 25–49 age group.

#### Knowledge about modes of HIV transmission

There were 21 questions related to knowledge about modes of transmitting HIV. Those who answered 15 or more correctly were considered to have a high degree of knowledge. Women knew significantly less about the modes of HIV transmission than men ( $p < 0.005$ ). Table III shows the level of knowledge of HIV transmission by level of education, which also showed a significant association ( $p < 0.001$ ). However, the period of residence in Denmark and age were not significant.

#### Knowledge about condoms

Respondents were asked to respond to three questions/statements about their knowledge of condoms. Table IV reveals that knowledge about condoms is lower among women; 34% of them reported never having seen or heard of a condom and almost half had never received information about using them.

Table III. Level of education and level of knowledge about modes of HIV transmission.

Educational level	High knowledge		Low knowledge		Total	
	<i>n</i> =99	(%)	<i>n</i> =89	(%)	<i>n</i>	(%)
High level of education (high school or higher)	74	74.75	29	32.58	103	100.00
Low level of education (no more than secondary school)	25	25.25	60	67.42	85	100.00
No educational level provided	1		3		4	

### *Sexual patterns*

In total, 66% of the participants answered the question "How many partners did you have in the last 12 months?" Some 57% of the women and 61% of the men reported being monogamous; 27% of these women and 30% of these men were classified as practising potentially risky behaviour, defined as having multiple sexual partners in the last 12 months.

Regular condom use was very low among women, as compared with men. Of the 87% of the women who responded to this question, 74% of them did not use condoms, while only 27% of the responding 85% of the men did not. Of the 26% of the women who used condoms, 53% used them to avoid pregnancy, 35% to avoid AIDS, and only 12% to avoid both. Among the 73% of the men who used condoms, 69% used them to avoid AIDS, 24% to avoid pregnancy, and 7% to avoid both.

Of those not using condoms, 52% of the women and 74% of the men responded that they did not use a condom because they were sure that their partner was healthy; 35% of the women did not use condoms because their partner refused, while only 7% of the men answered that their partner refused to use condom. Price and availability were cited as the reason for non-use by fewer than five respondents (15%) for each topic.

### *Attitudes towards condoms and AIDS*

The response rates to the questions in this section were all above 90%. To the question of whether

condoms make sex less enjoyable, 20% of the women and 62% of the men answered "yes".

To the question "Are condoms only used for occasional partners?" 22% of the women and 55% of the men answered "yes".

When asked about whether they would eat or drink with a friend who has HIV/AIDS, 34% of the women and 69% of the men answered that they would. It should be noted that for Somalis and Sudanese, eating with a friend would mean eating from the same dish.

Finally, when asked if they would like to have an HIV/AIDS blood test, 65.8% of the responding women and 83.5% of the responding men reported that they would like to have a blood test for HIV/AIDS.

### *Preferences for sources of information about HIV/AIDS*

For information about HIV/AIDS, the most popular source for both men and women was TV, followed by newspapers. Among the men, 56% would like to receive information from friends, while 47% of the women would. Both sexes were less interested in obtaining information about HIV/AIDS from family doctors, and even less from their parents or from HIV/AIDS patients.

### *Results of semi-structured interviews*

Of the 13 participants who participated in the semi-structured interviews, 7 were women; 8 were Sudanese. The men were more willing to talk during the interviews than the women, as evidenced by their

Table IV. Condom knowledge.

Question/statement	Female ( <i>n</i> =75)				Male ( <i>n</i> =117)			
	Yes		No		Yes		No	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1. Have you seen or heard about condoms?	47	66.20	24	33.80	108	96.43	4	3.57
2. Have you ever received instructions or information about using condoms?	35	50.72	34	49.28	84	76.36	26	23.64
3. Condoms can prevent sexually transmitted diseases other than AIDS	41	80.39	10	19.61	93	87.74	13	12.26

longer answers. The mean age of the participants was 36.7, and the mean length of their residence in Denmark was 6 years.

Both men and women in this group were highly knowledgeable about basic aspects of HIV/AIDS and its modes of transmission, while both had difficulty answering advanced questions such as how to differentiate between HIV and AIDS. For example, no one was able to correctly answer whether or not HIV can be transmitted by breastfeeding or by a pregnant mother to her foetus. Responding to the question of whether they would like to take a blood test for AIDS, the majority stated that they did not mind because they were sure of their status.

All 13 interviewees knew about condoms, but few had received instructions on how to use them. When asked whether they felt a need for information about condoms and their use, there were discrepancies. One common reply was, "I know a better way to prevent myself from getting AIDS, and that is by having sexual relations with only my wife". One participant said, "No thanks. I don't know much about condoms, but I don't need to know anything because I'm not going to use one, because I'm a responsible person. I don't go to prostitutes and I'm far away from homosexual men." Participants were not afraid of HIV/AIDS, did not consider condoms relevant and would not modify their current behaviour because they believed that they were "not involved in risky behaviour" such as "homosexuality and prostitution". As another participant put it, "The condom is for illegal sexual relations, which are not acceptable to me as a Muslim". None of the participants mentioned risk factors like multiple partners or needle sharing.

## Discussion

This study shows that the majority of the respondents (64.5%) have low knowledge about HIV/AIDS in general, and 46.3% have low knowledge about the modes of HIV transmission. Moreover, young people in this study knew strikingly less than those over the age of 24. Their levels of knowledge are in stark contrast to that of the population at large. For example, young people (aged 15–19) in the Danish population report that their knowledge about sexuality and HIV is from primary school and that they know how AIDS is transmitted and how they can protect themselves against it. More than 80% of them also understand that the concept of safer sex often involves using a condom [22].

Somali immigrants are the largest group of African immigrants in Denmark and the seventh largest group of immigrants overall. While the number of Sudanese immigrants is much smaller, the rapidly increasing incidence of HIV/AIDS in Sudan makes them an important group to study.

Immigrants suffer higher rates of HIV infection than native-born Danes. They also suffer higher incidences of other sexually transmitted infections (STIs), although the differences are less pronounced. These disparities describe a general sexual and reproductive health gap within Danish society. However, while HIV transmission among immigrants to Denmark is often assumed to take place primarily in their countries of origin, the transmission of STIs such as syphilis and gonorrhoea is assumed to take place in Denmark [23], making the prevention of the latter a more realistic goal for Danish health authorities. Nevertheless, where individuals, both Danish and immigrant, become infected should be further investigated by employing the serological testing algorithm for recent HIV seroconversion (STARHS) or other assays that can identify recent infections, as it affects the accuracy of reported incidence and related prevention strategies [3].

Within the country's larger immigrant population, there are currently no notable differences in HIV incidence between the two sexes [23]. However, the present study does reflect gender-based differences, in both knowledge and the capacity and power to act on such knowledge; there were more women than men whose partners refused to wear condoms. The low level of knowledge about condoms among female respondents, for example, demonstrates that this subgroup is not adequately educated about sex and related topics in either their native countries or Denmark. The low level of condom use revealed by the present study was also found in Sudan by a study of men and women in three North African countries. It found that the use of condoms in Sudan was roughly 20%, in Ethiopia 50%, and in Djibouti 70% [24]. However, while HIV is more prevalent among women in Sudan, seven of the eight known HIV-positive Sudanese in Denmark are men.

Recent reports [25–28] point to a clear association between level of education and knowledge about HIV/AIDS and its transmission, especially with regard to girls. These reports show that going to school is a protective measure for girls and that they acquire an increased understanding of HIV prevention and testing when they are better educated. One important study, investigating the knowledge of AIDS among American-born and foreign-born Hispanics in the United States, found that respondents who have achieved a higher educational level

are more knowledgeable about AIDS than those who have less education [29]. The results of our study echo this finding.

Danish prevention efforts have been characterized by two main approaches. Initially (1986–94), broad HIV/AIDS information campaigns tried to reach the general population, with targeted interventions for high-risk groups. Later (1995–present), as it became clear that Denmark was not experiencing the epidemic that had been feared, the high-risk group interventions continued but the HIV campaigns aimed at the general populace broadened to embrace other STIs. While some information has been translated into Arabic and other languages, only the two largest cities currently offer special HIV/AIDS counselling services for ethnic minorities.

Denial and stigmatization continue to have strong repercussions on HIV prevention in both low- and high-income countries, a situation confirmed by our findings as well as those of other studies [30–32]. The results of this study show that around 70% of both sexes prefer not to get information about HIV/AIDS from parents, and that TV is preferred as a source of information over friends and even family doctors. A recent study in Belgium of the sexual behaviour of second-generation immigrants from Morocco revealed that talking about sexuality in the family is taboo [33].

Age is often an important factor associated with the level of knowledge about HIV/AIDS [19]. The results of this study indicate that the age of the respondents is predictive of HIV/AIDS knowledge. Young people showed a strikingly low level of knowledge, but the generalizability of this finding is limited by the small sample size of only 26 young people (aged 18–24).

One study among Latino immigrants in the United States found that the length of residence in the country is positively correlated with AIDS knowledge [34]. However, the results of the present study did not show a significant relationship between length of residence in Denmark and the level of knowledge about HIV/AIDS. A larger sample size may have revealed a relationship.

Organizations in the African immigrant community of Denmark are spearheading the use of cultural mobilizers and public health promoters drawn from their own community. This study indicates that there is a need for such population-specific strategies. At the healthcare system level, more testing coupled with partner notification could be beneficial [35], yet despite the increase in immigrant-associated HIV there are cogent practical and ethical arguments against the mandatory testing of immigrants [36]. The major obstacle to reducing the incidence of

HIV/AIDS in the Somali and Sudanese communities is their poor understanding of the disease and how to prevent it, especially among those who have the least education.

## Conclusions

In Denmark, the HIV's modes of transmission are changing, and incidence and prevalence rates are increasing among immigrants. This study examined two immigrant groups, Somalis and Sudanese, and found knowledge about HIV/AIDS to be very low. Many of these immigrants reported having received little information on the subject. Educational interventions will need to consider that condom knowledge is particularly lacking among the groups' poorly educated women, while its men have a negative attitude toward condom use. Our study showed that Somali and Sudanese immigrants in Denmark appear relatively uninterested in HIV/AIDS information, and those who do show interest would prefer to receive information from sources such as TV and newspapers rather than a family doctor or friends. This has implications for the provision of adequate information and advice about HIV/AIDS in an appropriate, culturally sensitive way.

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Research paper

## Access to highly active antiretroviral therapy (HAART) for injecting drug users in the WHO European Region 2002–2004

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### Abstract

Providing equitable access to highly active antiretroviral treatment (HAART) to injecting drug users (IDUs) is both feasible and desirable. Given the evidence that IDUs can adhere to HAART as well as non-IDUs and the imperative to provide universal and equitable access to HIV/AIDS treatment for all who need it, here we examine whether IDUs in the 52 countries in the WHO European Region have equitable access to HAART and whether that access has changed over time between 2002 and 2004. We consider regional and country differences in IDU HAART access; examine preliminary data regarding the injecting status of those initiating HAART and the use of opioid substitution therapy among HAART patients, and discuss how HAART might be better delivered to injecting drug users. Our data adds to the evidence that IDUs in Europe have poor and inequitable access to HAART, with only a relatively small improvement in access between 2002 and 2004. Regional and country comparisons reveal that inequities in IDU access to HAART are worst in eastern European countries.  
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**Keywords:** Antiretroviral therapy; Access; HIV/AIDS; Injecting drug use; Europe

### Introduction

The World Health Organization (WHO) has committed to scaling up access to highly active antiretroviral treatment (HAART) for all those in need, and confirmed that injecting drug users (IDUs) should have equitable and universal access to HIV/AIDS prevention, treatment and care, including to HAART (WHO, 2006; WHO, UNAIDS, UNODC, 2005). Such commitment and confirmation are extremely welcome in the WHO Europe an Region, where the overwhelming majority of HIV cases in eastern Europe are IDUs, and where IDUs contribute significantly to older HIV/AIDS epidemics in many western European countries. It has been reported elsewhere that IDUs are least likely to receive HAART com-

pared to other groups (Aceijas et al., 2006; Open Society Institute, 2004; Wolfe, 2007). Drug users have sub-optimal access to HAART and initiate it at more advanced stages of infection (Kohli et al., 2005). Patients with a history of injection drug use have lower rates of access to HAART, even in those countries with relatively good access for the general population (Celentano et al., 2001; Van Asten et al., 2003; Wood et al., 2003a,b). Canadian and US studies have shown that in the late 1990s, when HAART was widely available free of charge in those countries, only 27 and 14 per cent of eligible IDUs respectively, received HAART (Celentano et al., 1999; Strathdee et al., 1998).

Large European cohort studies, including the multi-site EuroSIDA Study (Mocroft et al., 1999), show no significant differences in HIV progression among IDUs compared to other transmission groups (men having sex with men or heterosexuals) receiving HAART. Although some studies have shown that HAART was less effective in drug users than in others (Lucas, Cheever, Chaisson, & Moore, 2001;

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Poundstone, Chaisson, & Moore, 2001), some of these differences might be explained by confounding factors, including treatment selection (Vlahov and Celentano, 2006); socioeconomic differences between IDUs and non-IDUs (Bouhnik et al., 2002; Wood et al., 2000; Wood et al., 2005) and higher rates of undiagnosed and untreated mental illness among IDUs (Bouhnik et al., 2005; Regier et al., 1990).

Given the evidence that IDUs can adhere to HAART as well as non-IDUs and the imperative to provide universal and equitable access to HIV/AIDS treatment for all who need it, here we examine whether IDUs in Europe are receiving the HAART they need. We examine whether IDUs, compared to non-IDUs, have equitable access to HAART; whether that access has changed over time; consider regional and country differences in IDU HAART access; look at preliminary data regarding the injecting status of those initiating HAART and the use of opioid substitution therapy among HAART patients and discuss how HAART might be better delivered to injecting drug users.

## Method

Since the end of 2002 the WHO Regional Office for Europe has been systematically monitoring access to HIV/AIDS treatment and care for people living with HIV/AIDS (PLWHA) in the European region. Three standardised surveys, each evaluating a range of HIV/AIDS treatment and care related indicators in the 52 Member States of the WHO European Region, were conducted between January 2003 and July 2005. The three surveys collected data as of 31 December 2002, 31 June 2004 and 31 December 2004 and, the most recent survey also collected treatment data for mid-2005. The purpose of these surveys was to monitor the progress towards achieving universal access to treatment and care for PLWHA in the WHO European Region, as well as monitoring access of particular groups to essential prevention, treatment and care services. Particular focus was placed on injecting drug users, as they represent the main group of people living with HIV/AIDS in most eastern European countries and contribute significantly to HIV/AIDS populations in many central and western European countries. Each survey provides point-in-time measurements of the progress in HAART scale-up and, in particular, of the level of access for injecting drug users.

The questionnaires for the surveys were developed by the Sexually Transmitted Infections/HIV/AIDS programme at the WHO Regional Office for Europe. In addition, literature searches using *PubMed*, as well as communication with other WHO offices and partners, were undertaken to identify similar surveys to increase the comparability between the results of these and other surveys as well as to ensure that indicators thought to be relevant had been included. Prior to sending out the questionnaires, pilot testing was carried out to identify technical weaknesses of the instruments, ensure high validity and reliability and examine how the questionnaire

worked when applied to the intended target group. Translation and back translation in the Russian language was also conducted. To ensure comparability between different point-in-time measurements, the wording of core questions, such as those measuring the number of patients receiving HAART by route of transmission, was kept unchanged in all three surveys.

The surveys were sent to government-designated HIV/AIDS surveillance focal points in each WHO European Member State, followed by individual country-level follow-up in order to improve the response rate and quality of the provided data. Data were entered into Excel spreadsheets for comparison and descriptive analyses. The 52 Member States were grouped into three geographic areas, in accordance with those used by the European Centre for the Epidemiological Monitoring of AIDS (EuroHIV), a WHO European Office collaborating centre<sup>1</sup>. Data from the surveys on (1) the overall scale-up of HAART in the European Region; (2) equity in access to HAART related to geography; gender; age and imprisonment; and (3) capacity for further HAART scale-up are analysed and presented elsewhere (Bollerup, Donoghoe, Lazarus, Nielsen, Matic, in press; Bollerup, Lazarus, Donoghoe, Nielsen, & Matic, submitted for publication).

Here, we examine equity in access to HAART for injecting drug users in the three European sub-regions (west, centre and east) and countries in these sub-regions, by comparing the proportion of all HIV cases reported in the injecting drug use transmission category with the proportion of HAART recipients in the IDU transmission category, at two different points-in-time (December 2002 and December 2004). Surveillance data on reported HIV cases by IDU transmission category were derived from the European Centre for the Epidemiological Monitoring of AIDS (EuroHIV). Data reported on HAART recipients in the IDU transmission category were derived from responses to the survey question: "How many of the cumulative number of people receiving HAART as of 31 December 2004 (or the latest 2004 data available) have been infected through injecting drug use?" Data are adjusted for those cases receiving HAART but for whom the HIV transmission route was unknown.

This comparison serves as a proxy measure for IDU access to HAART, assuming that no access means no members of the IDU transmission group were receiving HAART. It is a crude measure, in that it might be influenced by bias associated with the reporting of IDU as the presumed route of

<sup>1</sup> West (23 countries: Austria, Andorra, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, The Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland and United Kingdom), Centre (14 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Hungary, Poland, Romania, Serbia and Montenegro, Slovakia, Slovenia, The former Yugoslav Republic of Macedonia and Turkey) and East (15 countries: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan).

transmission for HIV in many European countries. The proportion of reported IDUs out of the total number of HIV cases, or total number of patients on HAART, might be affected by reporting bias due to stigma towards IDU in many countries. The strength of this bias may vary across countries and this may influence (and make more difficult) the comparison of access to HAART among IDU across countries. Further, our crude measure assumes that a similar proportion of all HIV cases reported in the injecting drug use transmission category and the proportion of HAART recipients in the IDU transmission category reflects equity in access. There could be other reasons why these proportions might not be similar, for example, where an older non-injecting HIV epidemic precedes a more recent injecting epidemic. Finally reported HIV cases do not necessarily reflect the need for HAART, as this need is a product of the number of infections and the stage of infection reached. Those more recently infected might not yet require or benefit from HAART.

Since not all 52 countries responded to the surveys at both points in time, to provide regional comparisons and illustrate trends we have presented data in Table 1 for three cohorts: A (all countries reporting HAART data at end 2002); B (all countries reporting HAART data at end 2004); and C (countries reporting HAART data both at end 2002 and end 2004). Table 1, summarises the data and lists the number and names of countries in each cohort. Country comparisons are presented in Table 2, which presents the data on the proportion of IDUs among all reported HIV and AIDS cases and compares that with the proportion of IDUs receiving HAART by country within each region, in 2002 and 2004. The table also shows the cumulative number of AIDS deaths reported in IDUs among the total number of AIDS deaths with a known transmission route.

Our analysis also assumes that those in the IDU transmission category are a proxy for those who were *still* injecting when they initiated HAART, an assumption that we attempted to examine further. In 2004, two additional questions were added to the survey: “How many of the cumulative number of people receiving HAART as of 31 December 2004 (or latest 2004 data available) were current injecting drug users *at the time of entry into treatment* (had injected within the last four weeks) and How many of the cumulative number of people receiving HAART as of 31 December 2004 (or latest 2004 data available) were former injecting drug users *at the time of entry into treatment* (had not injected within the last four weeks)”. These data, though only provided by 15 countries, are presented in Table 3.

Since opioid substitution therapy (OST) has been proven to improve injecting drug users’ access and adherence to HAART, a further question was asked regarding OST: “How many of the cumulative number of people receiving HAART as of 31 December 2004 (or latest date available) receive substitution therapy?” Again only a small number of countries responded (18/52 35 per cent) and these data are presented in Table 4.

## Findings

### *Injecting drug users’ access to HAART (European regional comparisons)*

Table 1 presents the data on the number and proportion of IDUs among all reported HIV cases and compares that with the number and proportion of IDUs receiving HAART at two points in time: December 2002 and December 2004. Data are adjusted for reported HIV cases with unknown transmission route and those cases receiving HAART but for whom the HIV transmission route was unknown. With regard to the WHO European Region as a whole, all three country cohorts demonstrate inequities in access to treatment for drug injectors at both points in time. In cohort A, representing 27 countries surveyed in 2002, 46 per cent of reported HIV cases were in the IDU transmission category, yet only 10 per cent of those receiving HAART were IDUs. In 2004, cohort B, representing 29 countries, 64 per cent of reported HIV cases were IDUs and 35 per cent of HAART recipients were IDUs. In a smaller number of countries providing data at both points of time – cohort C, representing 19 countries – the number of reported HIV cases in the IDU transmission category was relatively stable (45 per cent in 2002 and 43 per cent in 2004) and the inequities in access most apparent with only 5 per cent of HAART recipients IDU in 2002, increasing to 6 per cent in 2004. These data suggest that IDU access to HAART in the European region as a whole was extremely inequitable, with only a relatively small improvement in HAART access for IDUs between 2002 and 2004.

### *Western Europe*

These inequities become more apparent when the data are considered by geographic region. Western European cohort B, representing eight western European countries, suggest that IDU access to HAART in 2004 was reasonably equitable, with 36 per cent of HIV cases in the IDU transmission category and 38 per cent of HAART recipients IDU. This suggests that a greater proportion of HAART recipients were IDU than were reported HIV cases in the IDU transmission category. This might reflect the older, more established IDU HIV epidemics in some western European countries, meaning a greater number of IDUs in need of HAART. Cohort A, also representing eight western European countries, suggests greater inequity with only 10 per cent of HAART recipients IDU in 2002 compared with 31 per cent of reported HIV cases in the IDU transmission category. In a small number of western European countries providing data in both years – cohort C representing five western European countries – inequities are apparent, though relatively small and stable over time.

### *Central Europe*

In central Europe the pattern is similar to that in western Europe. Inequities are more pronounced in 2002 than

Table 1  
Injecting drug users' access to HAART in the WHO European Region (regional comparisons) 31 December 2002 and 31 December 2004

Region	2002		2004	
	Number of reporting countries	Reported HIV cases IDUs (per cent among total reported HIV cases with known transmission route) <sup>a</sup>	IDUs on HAART (per cent among total reported people on HAART with known transmission route)	Number of reporting countries
West	A (8) <sup>b</sup>	37,179 (31)	3,984 (10)	B (8) <sup>c</sup>
	C (5) <sup>d</sup>	4,698 (9)	805 (4)	C (5) <sup>d</sup>
Centre	A (8) <sup>e</sup>	538 (29)	121 (19)	B (9) <sup>f</sup>
	C (5) <sup>g</sup>	519 (39)	121 (21)	C (5) <sup>g</sup>
East	A (11) <sup>h</sup>	47,922 (73)	15 (14)	B (12) <sup>i</sup>
	C (9) <sup>j</sup>	47,867 (73)	15 (14)	C (9) <sup>j</sup>
Europe	A (27) <sup>k</sup>	85,639 (46)	4,120 (10)	B (29) <sup>l</sup>
	C (19) <sup>m</sup>	53,106 (45)	941 (5)	C (19) <sup>m</sup>

A (n): all countries reporting HAART data at end 2002 (number of reporting countries), B (n): all countries reporting HAART data at end 2004 (number of reporting countries), C (n): countries reporting HAART data both at end 2002 and end 2004 (number of reporting countries).

<sup>a</sup> For countries without consistent national HIV case reporting systems (Austria, Italy, Spain, Serbia and Montenegro) reported AIDS cases are used. Data Source: European Centre for the Epidemiological Monitoring of AIDS (EuroHIV, 2004).

<sup>b</sup> Andorra, Finland, Germany, Luxembourg, Malta, The Netherlands, Norway, United Kingdom.

<sup>c</sup> Andorra, Austria, Finland, Malta, The Netherlands, Portugal, Spain, United Kingdom (HAART data exclude Scotland, December 2003 data).

<sup>d</sup> Andorra, Finland, Malta, The Netherlands, United Kingdom.

<sup>e</sup> Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Former Yugoslav Republic of Macedonia, Serbia and Montenegro, Slovakia, Slovenia.

<sup>f</sup> Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Hungary, Romania, Serbia and Montenegro, Slovakia, Slovenia.

<sup>g</sup> Bosnia and Herzegovina, Croatia, Serbia and Montenegro, Slovakia, Slovenia.

<sup>h</sup> Armenia, Belarus, Estonia, Kazakhstan, Kyrgyzstan, Lithuania, Republic of Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

<sup>i</sup> Armenia, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Ukraine, Uzbekistan.

<sup>j</sup> Armenia, Belarus, Estonia, Kazakhstan, Kyrgyzstan, Lithuania, Republic of Moldova, Ukraine, Uzbekistan.

<sup>k</sup> Andorra, Albania, Armenia, Bosnia and Herzegovina, Belarus, Bulgaria, Croatia, Estonia, Finland, the Former Yugoslav Republic of Macedonia, Germany, Kazakhstan, Kyrgyzstan, Lithuania, Luxembourg, Malta, The Netherlands, Norway, Republic of Moldova, Serbia and Montenegro, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan.

<sup>l</sup> Andorra, Armenia, Austria, Bosnia and Herzegovina, Belarus, Croatia, Cyprus, Czech Republic, Estonia, Finland, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Malta, The Netherlands, Republic of Moldova, Portugal, Romania, Russian Federation, Serbia and Montenegro, Slovakia, Slovenia, Spain, United Kingdom (HAART data exclude Scotland, December 2003 data), Ukraine, Uzbekistan.

<sup>m</sup> Andorra, Armenia, Belarus, Bosnia and Herzegovina, Croatia, Finland, Estonia, Kazakhstan, Kyrgyzstan, Lithuania, Malta, The Netherlands, Republic of Moldova, Serbia and Montenegro, Slovakia, Slovenia, Ukraine, United Kingdom, Uzbekistan.

Table 2  
 Injecting drug users' access to HAART in the WHO European Region (country comparisons) 31 December 2002 and 31 December 2004

Country	2002		2004	
	Reported HIV cases IDUs (per cent among total reported HIV cases with known transmission route) <sup>a</sup>	IDUs on HAART (per cent among total reported people on HAART with known transmission route)	Reported HIV cases IDUs (per cent among total reported HIV cases with known transmission route) <sup>a</sup>	IDUs on HAART (per cent among total reported people on HAART with known transmission route)
<b>West</b>				
Andorra <sup>b</sup>	0 (–)	0 (0)	1 (25)	1 (25)
Austria <sup>c</sup>	561 (29) <sup>d</sup>	–	585 (29) <sup>d</sup>	511 (24)
Belgium	616 (7)	–	668 (6)	–
Denmark	366 (11)	–	403 (10)	–
Finland	265 (21)	15 (2)	298 (20)	100 (11)
France <sup>e</sup>	12,627 (24) <sup>d</sup>	–	12,875 (23) <sup>d,f</sup>	–
Germany	2,075 (14)	3,000 (17)	2,320 (13)	–
Greece	240 (5)	–	259 (5)	–
Iceland	18 (11)	–	20 (12)	–
Ireland	385 (24)	–	500 (22)	–
Israel	477 (15)	–	574 (15)	–
Italy <sup>g</sup>	29,832 (60) <sup>d</sup>	–	30,929 (59) <sup>d</sup>	–
Luxembourg	86 (18)	39 (16)	92 (16)	–
Malta <sup>h</sup>	0 (–) <sup>d</sup>	0 (0)	2 (17)	1 (2)
Monaco <sup>i</sup>	16 (40) <sup>d</sup>	–	16 (40) <sup>d,k</sup>	–
The Netherlands <sup>l</sup>	441 (6)	238 (6)	563 (6)	331 (5) <sup>m</sup>
Norway	469 (19)	140 (20)	484 (18) <sup>k</sup>	–
Portugal	4,812 (54)	–	6,690 (48)	262 (46)
San Marino	12 (35)	–	12 (32) <sup>k</sup>	–
Spain <sup>n</sup>	41,502 (66) <sup>d</sup>	–	43,364 (65) <sup>d</sup>	31,500 (57)
Sweden	879 (15)	–	936 (15)	–
Switzerland	3,192 (31)	–	3,382 (29)	–
United Kingdom	3,949 (7)	552 (4)	4,202 (6)	623 (3) <sup>o</sup>
West total (average)	19,099 (15)	3,984 (10)	22,574 (14)	33,329 (38)
<b>Centre</b>				
Albania	1 (1)	No HAART	1 (1)	–
Bosnia and Herzegovina	9 (19)	0 (0)	14 (16)	4 (29)
Bulgaria	12 (3)	0 (0)	12 (3) <sup>k</sup>	–
Croatia	24 (12)	12 (9)	30 (10)	19 (9) <sup>p</sup>
Cyprus	5 (1)	–	5 (1)	0 (0)
Czech Republic	22 (4)	10 (3) <sup>q</sup>	34 (5)	11 (4)
Hungary	11 (1)	1 (0.3) <sup>q</sup>	14 (2)	5 (2)
Macedonia, the Former Yugoslav Republic of	6 (10)	0 (0)	6 (9)	–
Poland	4,761 (83)	650 (50) <sup>q</sup>	5,162 (82)	–
Romania	7 (0.4)	2 (<0.1) <sup>q</sup>	11 (1)	3 (0.1)
Serbia and Montenegro <sup>r</sup>	472 (41) <sup>d</sup>	105 (33)	504 (40) <sup>d</sup>	150 (37)
Slovakia	2 (2)	0 (0)	2 (2)	1 (3)
Slovenia	12 (7)	4 (5)	12 (6)	6 (6) <sup>p</sup>
Turkey	99 (9)	–	105 (8)	–
Centre total (average)	4,986 (44)	784 (11)	5,455 (41)	199 (3)
<b>East</b>				
Armenia	107 (55)	No HAART	154 (57)	No HAART
Azerbaijan	211 (61)	No HAART	310 (62)	No HAART
Belarus	3,605 (76)	0 (0)	4,412 (71)	36 (54)
Estonia <sup>s</sup>	2,396 (84)	2 (4)	2,396 (84)	45 (44)
Georgia	263 (71)	4 (50) <sup>q</sup>	433 (68)	36 (72)
Kazakhstan	2,689 (89)	No HAART	3,624 (83)	33 (94)
Kyrgyzstan	302 (84)	No HAART	534 (83)	No HAART
Latvia	1,768 (84)	46 (45) <sup>q</sup>	2,145 (81)	84 (53)
Lithuania	595 (84)	0 (0)	781 (83)	6 (11)
Republic of Moldova	1,315 (82)	No HAART	1,635 (74)	61 (53)
Russian Federation	122,226 (92)	–	144,600 (88)	185 (7)

Table 2 (Continued)

Country	2002		2004	
	Reported HIV cases IDUs (per cent among total reported HIV cases with known transmission route) <sup>a</sup>	IDUs on HAART (per cent among total reported people on HAART with known transmission route)	Reported HIV cases IDUs (per cent among total reported HIV cases with known transmission route) <sup>a</sup>	IDUs on HAART (per cent among total reported people on HAART with known transmission route)
Tajikistan	55 (85)	No HAART	191 (87)	No HAART
Turkmenistan	0 (0)	No HAART	0 (0)	–
Ukraine	35,629 (77)	13 (35)	46,222 (72)	558 (53)
Uzbekistan	1,228 (87)	No HAART	2,977 (82)	No HAART
East total (average)	172,389 (87)	65 (30)	210,414 (83)	1,044 (24)
WHO European Region total (average)	196,474 (58)	4,833 (10)	238,443 (55)	34,572 (35)

<sup>a</sup> Data source: European Centre for the Epidemiological Monitoring of AIDS (EuroHIV, 2004).

<sup>b</sup> HIV/AIDS surveillance system started in 2004; data include many cases diagnosed in previous years. Transmission group unknown for 86 per cent of cases.

<sup>c</sup> HIV data not available by transmission group.

<sup>d</sup> Reported AIDS cases.

<sup>e</sup> New HIV reporting system started gradually in 2003.

<sup>f</sup> June 2004 data.

<sup>g</sup> HIV reporting exists in 7 out of 20 regions/provinces (Bolzano, Friuli Venezia-Giulia, Lazio, Modena, Piemonte, Trento, Veneto).

<sup>h</sup> New HIV reporting system started in 2004.

<sup>i</sup> No HIV reporting system.

<sup>j</sup> Not adjusted for unknown transmission route.

<sup>k</sup> December 2003 data.

<sup>l</sup> New HIV reporting system started in 2002.

<sup>m</sup> March 2005 data.

<sup>n</sup> HIV reporting exists in some regions only.

<sup>o</sup> Excludes Scotland. December 2003 data.

<sup>p</sup> May 2005 data.

<sup>q</sup> Data from Central and Eastern European Harm Reduction Network (CEEHRN) survey, May 2002. Note: numbers of patients on any ARV, not only HAART.

<sup>r</sup> HIV data not available by transmission group before 2002.

<sup>s</sup> HIV data not available by transmission group for adult cases in 2003 or 2004.

2004, suggesting increasing equity over time. In cohort A, representing eight central European countries, 19 per cent of HAART recipients in 2002 were IDU compared with 29 per cent of reported HIV cases in the IDU transmission category. Cohort B, representing nine central European countries, suggests that the equity gap narrowed in 2004 where 11 per cent of reported HIV cases were in the IDU transmission category and 3 per cent of HAART recipients were IDU. A pattern of inequity is also demonstrated in the five central European countries providing data at both points in time, cohort C, where the proportion of reported HIV cases in the IDU transmission category was relatively stable (39 per cent in 2002 and 34 per cent in 2004) as was the proportion of IDU HAART recipients (21 per cent in 2002 and 22 per cent in 2004).

### Eastern Europe

The greatest inequities are in eastern Europe, where IDUs represent more than 70 per cent of reported cases in all three cohorts at both points in time. In cohort A – representing 11 eastern European countries surveyed in 2002 – only 14 per cent of HAART recipients were IDU while 73 per cent of HIV cases were in the IDU transmission category. In 2004, there was little improvement. Cohort B – representing 12 countries – shows that only 24 per cent of HAART recipients were

IDUs while 83 per cent of HIV cases were in the IDU transmission category. This pattern of inequity is also apparent in the nine eastern European countries providing data at both points of time. While the proportion of reported HIV cases in the IDU transmission category was relatively stable (73 per cent in 2002 and 74 per cent in 2004) inequities in access are most apparent with only 14 per cent of HAART recipients being IDUs in 2002, increasing to 52 per cent in 2004. Much caution should be exercised in interpreting these data because of the extremely low numbers of persons receiving HAART in eastern European countries. The overall pattern is one of extreme inequity in IDU access to HAART, but with improvement between 2002 and 2004.

### Injecting drug users' access to HAART (country comparisons)

Regional inequities in access for IDUs are illuminated further when country-specific data are examined. Table 2 presents the data on the number of IDUs among all reported HIV cases with a known route of transmission and compares that with the number of IDUs with a known route of transmission receiving HAART by country within each region, in 2002 and 2004. Again, caution should be exercised in interpreting these data, particularly where the overall numbers of HAART recipients are low.

Table 3  
Current drug injectors among IDUs on HAART in 15 reporting countries (December 2004)<sup>a</sup>

Region	Number of IDUs on HAART who are current injecting drug users (per cent among total reported IDUs on HAART)
<b>West</b>	
Finland	35 (35)
Malta	0 (0)
West total (average)	35 (35)
<b>Centre</b>	
Bosnia and Herzegovina	0 (0)
Croatia	3 (16)
Czech Republic	10 (91)
Hungary	0 (0)
Serbia and Montenegro	10 (7)
Slovakia	0 (0)
Slovenia	2 (33)
Centre total (average)	25 (13)
<b>East</b>	
Belarus	4 (11)
Georgia	7 (19)
Kazakhstan	0 (0)
Lithuania	0 (0)
Republic of Moldova	27 (44)
Russian Federation	0 (0)
East total (average)	38 (11)
WHO European Region total (average)	98 (15)

<sup>a</sup> Current injecting drug users at the time of entry into treatment (had injected within the last 4 weeks).

Of note here is the number of countries that were unable to provide data on the number of HAART recipients who were IDUs in *both* years. Of 52 WHO European Member States, only 18 (35 per cent) were able to provide data for both 2002 and 2004. However, 39 Member States (75 per cent) were able to provide such data for both or either 1 of the 2 years. Where data are available patterns in access and equity emerge. Aggregating all data for all reporting countries for the whole European region reveals relative stability in: the proportion of IDU cases among reported HIV cases (58 per cent in 2002 and 55 per cent in 2004). These data suggest inequity in access to HAART—only 10 per cent of those receiving HAART in all reporting countries in 2002 were IDU. This proportion increased to 35 per cent in 2004.

Injectors in most *western European* countries had relatively equitable access to HAART. For example, in the Netherlands, where the proportion of reported HIV cases in the IDU transmission category was relatively stable (6 per cent in 2002 and 2004) so was the proportion of IDU HAART recipients (6 per cent in 2002 and 5 per cent in 2004). Austria does not report HIV cases by transmission category; however employing AIDS cases as a proxy a reasonable degree of equity in 2004 is apparent, with 24 per cent of HAART

Table 4  
Number of people on HAART who receive opioid substitution therapy (OST) in 18 reporting countries (December 2004)

Region	Number of IDUs on HAART who also receive OST (per cent among total reported IDUs on HAART)
<b>West</b>	
Finland	35 (35)
Malta	1 (100)
West total (average)	36 (36)
<b>Centre</b>	
Bosnia and Herzegovina	1 (25)
Croatia	8 (42)
Czech Republic	0 (0)
Hungary	0 (0)
Romania	0 (0)
Serbia and Montenegro	100 (67)
Slovakia	0 (0)
Slovenia	5 (83)
Centre total (average)	114 (57)
<b>East</b>	
Belarus	0 (0)
Georgia	0 (0)
Kazakhstan	0 (0)
Latvia	5 (6)
Lithuania	3 (50)
Republic of Moldova	0 (0)
Russian Federation	0 (0)
Ukraine	0 (0)
East total (average)	8 (1)
WHO European Region total (average)	158 (12)

recipients IDUs compared with 29 per cent of reported AIDS cases in the IDU transmission category. Equity for IDUs is also apparent in other western European countries, such as Germany, Luxembourg, Norway, and Portugal and, to a lesser extent, in Spain and the United Kingdom. In the Netherlands and the United Kingdom, this relative equity was sustained over time. Less equity is observed in Finland in 2002 and 2004, although there were substantial improvements between 2002 and 2004. Because different countries reported in 2002 and 2004 the overall number of IDUs receiving HAART in western Europe is of less interest than the average proportion of IDUs receiving HAART, which increased from 10 per cent in 2002 to 38 per cent in 2004.

In *central Europe* a more complex pattern emerges. In 2002, in several central European countries IDUs had no access to HAART. These included countries with relatively small proportions of HIV cases in the IDU transmission category, such as Albania, Bulgaria and Slovakia and countries with few cases but more substantial proportions of HIV and AIDS cases in the IDU transmission category such as Bosnia and Herzegovina and the former Yugoslav Republic of Macedonia. Several other central European countries provided HAART to IDUs in a more equitable fashion. For

example, in Slovenia, where the proportion of reported HIV cases in the IDU transmission category was relatively stable (7 per cent in 2002 and 6 per cent in 2004) so was the proportion of IDU HAART recipients (5 per cent in 2002 and 6 per cent in 2004). Similarly, there was an equitable and relatively stable situation in Croatia. Serbia and Montenegro did not report HIV cases by transmission category before 2002. However, employing AIDS cases as a proxy, a reasonable degree of inequity in 2002 is apparent with 33 per cent of HAART recipients reported as being IDUs, as compared with 41 per cent of reported AIDS cases in the IDU transmission category. Serbia and Montenegro data for 2004 demonstrate more equity, with only 37 per cent of HAART recipients being IDUs as compared with 40 per cent of reported AIDS cases in the IDU transmission category. Poland has large numbers and proportions of reported HIV cases in the IDU transmission category. No HAART data by transmission category are available for 2004, but 2002 data suggest some inequity, with 83 per cent of reported HIV cases in the IDU transmission category but only an estimated 50 per cent of HAART recipients reported as being IDUs. Because different countries reported in 2002 and 2004, notably Poland, which reported 650 IDUs on HAART in 2002 but failed to report in 2004, the overall number of IDUs receiving HAART in central Europe is not a useful measure. The average proportion of IDUs receiving HAART decreased from 11 per cent in 2002 to 3 per cent in 2004; however, caution in interpreting these data is advised because Poland, with its large numbers of IDUs, did not report number of IDUs receiving HAART in 2004.

In *eastern Europe*, where injecting drug use was and remains the major mode of HIV transmission, the issue of equity in access for IDUs is clouded by the general lack of availability of HAART. In 2002, HAART was unavailable in 8 of 15 eastern European countries (Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, the Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan). In two other countries, where limited HAART was available (Belarus and Lithuania), no HAART recipients were IDUs. In the Russian Federation, no data on IDU recipients of HAART were reported. Small numbers of IDUs – just 65 in total – were reported to be receiving HAART in 2002 in Estonia, Latvia, Georgia and Ukraine. These data suggest that in 2002 the majority of eastern European countries were not providing HAART, and in those countries that were, access to IDUs was inequitable.

The 2004 data show that HAART remained unavailable in five eastern European countries (Armenia, Azerbaijan, Kyrgyzstan, Tajikistan and Uzbekistan). No data were available regarding HAART in Turkmenistan. In the nine eastern European countries providing HAART, inequities are apparent. In 2004, in Ukraine, where 72 per cent of reported HIV cases were in the IDU transmission category, only 53 per cent of HAART recipients were in the IDU transmission category. In the Russian Federation, 88 per cent of reported cases are IDUs, yet only 7 per cent of HAART recipients were IDUs. In Lithuania, 83 per cent of reported cases were IDUs, yet only 11 per cent of HAART recipients were IDUs. The 2004 data

suggest some improvements in access for IDUs as compared with 2002. The overall number of IDUs receiving HAART in eastern Europe increased from 65 in 2002 to 1,044 in 2004, although the relative proportion of IDUs receiving HAART decreased from 30 per cent of the total number receiving HAART in 2002 to 22 per cent in 2004. Over the same time period, the relative proportion of IDUs among all reported HIV cases declined slightly from 87 to 83 per cent.

#### *Injecting drug users' access to HAART (current injectors)*

These data may hide further inequity since our analysis is based on the assumption that those in the IDU transmission category are a proxy for those who were *still* injecting when they initiated HAART. Given that current IDUs are often excluded from HAART because of concerns about adherence, this is at best an optimistic assumption. It should be noted that a large proportion of the reported IDUs on HAART may not be *current* injecting drug users (defined as having injected within the last 4 weeks).

Table 3 shows that in the 2004 survey, only 15 countries (29 per cent) were able to provide data on the number of current injectors initiating HAART. These data show great variation in the proportion of IDUs receiving HAART who were current injectors when they initiated HAART. In 7 of the 15 reporting countries, none of the IDUs receiving HAART were current injectors. In the other eight countries the proportion of current injectors ranged from 7 per cent in Serbia and Montenegro to 91 per cent (10 out of 11 cases) in the Czech Republic. There was a lack of data on the degree to which current injectors access HAART, particularly from western and eastern European countries, which have the largest IDU-related HIV epidemics.

#### *Injecting drug users' access to HAART (opioid substitution therapy)*

There is scarce data regarding the degree to which IDU recipients of HAART also received opioid substitution therapy (OST).

Table 4 shows that only 18 countries were able to provide data on the number of people on HAART who also received OST by December 2004. In 10 of the 18 reporting countries, no IDU recipients of HAART were receiving OST. In the remaining eight, the proportion of IDU HAART recipients ranged from 6 per cent in Latvia to 100 per cent in Malta, where the only IDU receiving HAART was also receiving OST. Relatively high proportions of IDUs receiving HAART were also receiving OST in Serbia and Montenegro and Slovenia.

## **Discussion**

The survey data reported in this study add to the evidence that IDUs in Europe have poor and inequitable access to



HAART, with only a relatively small improvement in access between 2002 and 2004. As in other developed countries with good access to HAART (Celentano et al., 2001; Van Asten et al., 2003; Wood et al., 2003a,b), these inequities are apparent even in western European countries. Inequities are more apparent in central Europe and extremely so in eastern Europe. These data suggest that European injecting drug users are dying without ever accessing HAART. This is unacceptable, since HAART is as effective for IDUs as for other people with HIV/AIDS. Given appropriate support, former and active IDUs can adhere equally as well as others and should have equal access to HAART. Current or past drug use should not be a criterion for deciding who should receive HAART. Studies, including some from Europe (Bassetti et al., 1999; Carrieri et al., 1999) and Canada (Wood et al., 2000), show that clinicians are reluctant to prescribe antiretroviral treatment to HIV-infected IDUs and often require the patient to be drug free before prescribing ART, due to the mistaken belief that they have lower levels of adherence (Bangsberg et al., 2001; Bogart, Kelly, Catz, & Sosman, 2000), which in turn may lead to elevated rates of antiretroviral resistance, which in turn could limit future treatment options and, more worryingly, result in the transmission of drug-resistant strains of the virus. In reality, resistance to all major classes of antiretrovirals is similar among IDUs and non-IDUs and withholding HAART from IDUs as a strategy to prevent resistance is unsupported by the evidence (Wood et al., 2005). There are few data available on the relative equity in access between current and former injectors. Anecdotal evidence suggests that active drug injectors rarely, if ever, get access to HAART. Limited data presented here on current injectors are inconclusive, although it is notable that 7 of the 15 reporting countries included no current injectors among those they report to be on HAART. Further investigation and evidence, for example on policies that expressly forbid HAART administration to active injectors, would be useful. Special attention should be paid to the particular needs of former and active IDUs when administering HAART, including those related to: substance dependence, particularly drug interactions between HAART, illicit drugs and opioid substitution treatment; co-morbidities, particularly mental health; and co-infections, particularly hepatitis C and tuberculosis. WHO guidance on HIV/AIDS treatment care specifically for injecting drug users is available and expressly states that current or past drug use should not be a criterion for deciding who should receive antiretroviral treatment (WHO Regional Office for Europe, 2006).

A public health policy that addresses the need to treat both substance dependence and HIV/AIDS improves patient well-being, reduces stigma and promotes delivery of comprehensive, ethical medical care. The most effective response consists of a combination of prevention, treatment, care and support within a harm-reduction framework. Harm reduction is highly effective for IDUs in supporting prevention, treatment and care. Where comprehensive HIV care has been provided to IDUs in an accessible and non-judgmental

way, high proportions have been attracted to, and retained in, effective antiretroviral treatment. Combining HIV/AIDS care with substance dependence treatment services (including harm reduction, detoxification and opioid substitution therapy) and psychosocial services has been particularly successful (Clarke, Keenan, Ryan, Barry, & Mulcahy, 2002; Mesquita, 2004; Sambamoorthi, Warner, Crystal, & Walkup, 2000; WHO, UNAIDS, UNODC, 2005). Directly administered antiretroviral therapy in methadone clinics (DAART) is a particularly promising strategy (Clarke et al., 2002; Conway et al., 2004; Lucas et al., 2006; Palepu, Horton, Tibbetts, Meil, & Samett, 2004) and adherence has been demonstrably strengthened by use of buprenorphine (Moatti et al., 2000). Provision of good quality opioid substitution therapy is an essential HIV/AIDS treatment component and is highly effective in addressing opioid dependence. There are few good data from Europe on the number and proportions of those receiving both OST and HAART. Limited data presented here suggest great variation in the combined use of OST and HAART. It is well documented that OST coverage is much higher in western Europe than in eastern Europe, where OST is extremely limited or totally unavailable (Donoghoe, 2006). Efforts to promote the widespread expansion of OST in those countries that remain resistant to its use— notably the Russian Federation— where such treatment is prohibited, need to be sustained. A supportive environment, upholding the human rights and dignity of IDUs and helping to expand and improve access to drug dependence treatment, should be ensured. Countries with HIV epidemics fuelled by injecting drug use should respond immediately to the needs of IDUs with preventive and treatment services, including harm reduction, opioid substitution therapy and equitable access to HAART.

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Policy analysis

## HIV/hepatitis coinfection in eastern Europe and new pan-European approaches to hepatitis prevention and management

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### Abstract

**Issues:** HIV/hepatitis coinfection in Europe; WHO European clinical protocols on the management of people coinfecting with HIV/AIDS and hepatitis B or C (HBV or HCV); stakeholder recommendations for better HCV services.

**Introduction:** The increasing availability of highly active antiretroviral therapy throughout Europe and central Asia has changed comorbidity and mortality patterns among people living with HIV/AIDS (PLWHA) as liver disease has increasingly replaced AIDS as the cause of death in PLWHA in western European countries. The average prevalence of HCV among PLWHA is 40 per cent, and much higher in countries where the HIV epidemic is driven by injecting drug use. Access to hepatitis treatment for PLWHA and IDUs is still very limited in Europe due to a lack of clear clinical management guidelines for HIV/hepatitis coinfections, high costs and a national failure to recognise hepatitis as a critical health issue.

**Description:** In October 2006, the WHO Regional Office for Europe issued protocols for the clinical management of HIV/HCV and HIV/HBV coinfections. They include diagnostic algorithms adjusted for resource availability, and guidelines for the management of patients who do not yet need treatment, those who need only hepatitis or only HIV/AIDS treatment, and those who need both.

Though the protocols should provide practical guidelines for physicians and assist in the development of national treatment standards, there is still a need for targeted prevention, treatment and care interventions. To expand access to hepatitis prevention and treatment, public awareness needs to be raised and national political leaders need to address hepatitis as a public health issue. Effective public health measures include price reductions for anti-hepatitis drugs; targeted testing, counselling and prevention activities; increased access to hepatitis B and C treatment and to HBV vaccination for the populations most at risk.

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**Keywords:** Hepatitis; HIV; Treatment; Europe

### Introduction

The global disease burden of hepatitis B (HBV) and C (HCV) is staggering, with an estimated 350 million cases of

chronic HBV and an estimated 180 million of chronic HCV (WHO, 2000b). By contrast, an estimated 39.5 [34.1–47.1] million individuals are living with HIV worldwide (UNAIDS & WHO, 2006), of which 2–4 million are coinfecting with HBV and 4–5 million are coinfecting with HCV (Alter, 2006). This same recent review of coinfection epidemiology estimated the prevalence of chronic HBV infection in HIV-positive patients from western Europe and the United States to be 6–14 per cent, with no significant differences among HIV risk groups (injecting drug users (IDUs) and men who

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have sex with men (MSM) as well as heterosexuals. This picture is in striking contrast to that of chronic HCV infection in people living with HIV/AIDS (PLWHA): 25–30 per cent of all HIV patients are HCV-positive, and 72–95 per cent of HIV-positive IDUs (Alter, 2006).

Although the prevalence of viral hepatitis is high, the associated mortality is also substantial. It is estimated that globally between 500 000 and 1 million people die annually of HBV-related illness (Rizzetto, 2005) and another 250 000 of HCV-related causes (Lavanchy, 2004).

As highly active antiretroviral therapy (HAART) has become more widely available throughout Europe and central Asia, the epidemiology of comorbid conditions and causes of mortality for PLWHA has evolved. Hepatic disease, cardiovascular disease and pulmonary disease are now rapidly replacing AIDS-defining illnesses as the major cause of death in PLWHA (Palella et al., 2006; Smit et al., 2006); therefore, special attention should be paid to coinfection with hepatitis B and C while assessing the burden of liver disease in PLWHA. In certain risk groups, such as IDUs, MSM and haemophiliacs, the absolute number of deaths from hepatic disease has increased (Smit et al., 2006) due to the high prevalence of hepatitis B/C coinfection with HIV. Despite the changes in the natural history of HIV/AIDS in the HAART era, information on the epidemiology of liver disease, viral hepatitis and HIV coinfection is limited. This paper describes more particularly the increasing trends in liver disease in eastern Europe, paying special attention to the prevention and treatment of hepatitis B/C and HIV coinfection (see Figs. 1 and 2).

The epidemiology of HIV and hepatitis coinfection is significant, as both viruses share common routes of transmission (injecting drug use and sexual transmission, though the latter is considerably less common for HCV with an estimated 0–3 per cent of HCV cases related to sexual intercourse; Highleyman, 2002). One crucial difference, however, is the greater infectivity of hepatitis. HCV is about 10 times

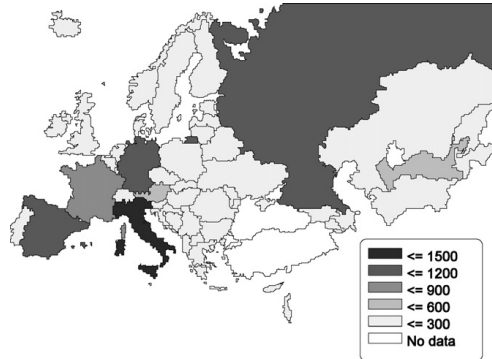


Fig. 2. Annual mortality due to viral hepatitis\* in the WHO European region, 2003. (\*) Includes some or all types of hepatitis A–E depending on the availability of data. Source: WHO Regional Office for Europe Centralized Information System for Infectious Diseases, <http://data.euro.who.int/CISID>, accessed August 30, 2006.

(Michielsens & Bottieau, 2005) and HBV 50–100 times more infectious than HIV (WHO, 2000a).

Coinfection also presents a treatment challenge, and the impact of each disease on the natural progression of the other is critical for effective clinical management (WHO, 2006a; WHO, 2006b). HBV infection is often more severe in PLWHA (Konopnicki et al., 2005), in whom HCV disease progression is also usually accelerated (Swan, 2006). Additionally, hepatitis B or C patients who are HIV-positive tend to progress more rapidly to end-stage liver disease (ESLD) with more severe liver fibrosis, as well as more likely progress to hepatocellular carcinoma, than patients without HIV. However, the reverse – more rapid HIV disease progression in individuals infected with HBV or HCV – has *not* been shown to be significant.

### Hepatitis and hepatitis/HIV coinfection in the European region

The aetiology of chronic liver disease in Europe includes a combination of excessive alcohol consumption, viral hepatitis (B and C) and obesity. For western European PLWHA who are coinfecting with either HCV or HBV, the most frequent causes of death are related to liver disease—more often than to AIDS-defining infections. This trend represents a striking change in the epidemiology of HIV/AIDS-related deaths, which previously were due more to opportunistic infections rather than coinfections.

The WHO European region, which incorporates 53 countries including the former Soviet Union, Turkey and Israel, presents an interesting case, with several areas of contrasting endemicity close to each other. For example, eastern European and central Asian countries report high HBV prevalence rates, while western and northern European countries report low ones. Even among IDUs, recognised as the most

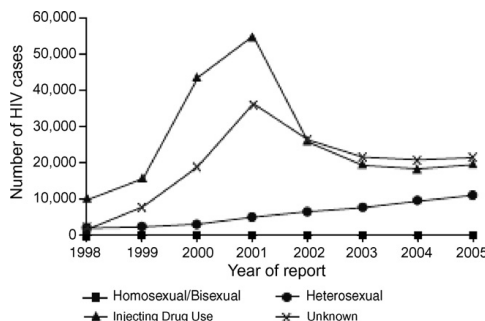


Fig. 1. Number of newly diagnosed cases of HIV by transmission group and year of report in eastern Europe (14 countries), 1998–2005. Source: European Centre for Epidemiological Monitoring of AIDS (EuroHIV). HIV/AIDS surveillance in Europe: end-year report 2005. Saint-Maurice, Institut de Veille Sanitaire, 2006, No. 73.

Table 1  
Recent epidemiological data for selected WHO European region member states from the former Soviet Union<sup>a</sup>

Country	HBV prevalence	HBV incidence 2005 (per 100 000 population)	HCV prevalence	HCV incidence 2005 (per 100 000 population)	HCV/HIV coinfection
Armenia	8 per cent <sup>b</sup>	2.7 <sup>c</sup>	n/a	n/a	67 per cent
Azerbaijan	8 per cent <sup>b</sup>	3.33 <sup>c</sup>	n/a	1.40 <sup>c</sup>	n/a
Belarus	2 per cent <sup>b</sup>	11.2 <sup>c</sup> (acute)	1.4 per cent	60.6 (all types) <sup>c</sup>	76 per cent
Estonia	3 per cent <sup>b</sup>	9.55 (2004)	n/a	9.37	n/a
Georgia	1.7 or 11.4 (BsAg vs. cAg)	7.1	6.7 per cent (2003)	4.1 (acute), 17.9 (chronic)	58.6 per cent
Kazakhstan	10 per cent <sup>b</sup>	11.65 (2004)	3.1 <sup>c</sup>	1.38 (2003)	n/a
Kyrgyzstan	10 per cent <sup>b</sup>	10	n/a	4.08	80 per cent <sup>d</sup>
Latvia	3 per cent <sup>b</sup>	9.04 (2004)	n/a	4.78	n/a
Lithuania	3 per cent <sup>b</sup>	4.13	n/a	2	n/a
Republic of Moldova	10 per cent <sup>a</sup>	9.62	4.9 per cent	3.08	n/a
Russian Federation	5 per cent <sup>b</sup>	10.44	2 per cent <sup>b</sup>	4.47	24 per cent
Ukraine	2–3 per cent <sup>c</sup>	1.24 (2004)	n/a	n/a	10 per cent
Uzbekistan	10 per cent <sup>b</sup>	11.42 (2004)	n/a	n/a	n/a

n/a means no data is being collected, no surveillance being done or the data is not available.

<sup>a</sup> Turkmenistan and Tajikistan are not included in this analysis due to a lack of data.

<sup>b</sup> Parents of Kids with Infectious Diseases (PKIDS).

<sup>c</sup> Personal communication from WHO country offices.

<sup>d</sup> Among injecting drug users.

at-risk population for both HIV and hepatitis infection due to the sharing of injecting equipment, the large European Union (EU) range of HBV prevalence (6–85 per cent positive) and HCV prevalence (17–95 per cent positive) indicates that individual European countries and regions have strikingly different disease burdens (EMCDDA, 2004a).

In an effort to consolidate and analyse the hepatitis situation in eastern Europe, the WHO Regional Office for Europe developed a series of “report cards” for the former Soviet Union, focusing on epidemiologic surveillance data (Table 1), testing availability, prevention, and treatment availability and cost for both HBV and HCV (Tables 2 and 3). HBV prevalence rates are estimated to be as high as 10 per cent in four eastern European countries and 5 per cent in the Russian Federation, the most populous country in the area. Although HCV national prevalence data is lacking for most countries, it is estimated to be more than 6 per cent in Georgia and about 2 per cent in the Russian Federation. It should be noted, how-

ever, that these estimates are considered unreliable, partly due to the lack of HCV prevalence figures for injecting drug users (estimated to be at close to 2 million; IHRD/OSI, 2006), whose rates in Russia were shown to be very high (54–70 per cent) in a recent study (Rhodes et al., 2006).

The burgeoning hepatitis crisis in the European region is largely due to limited access to prevention measures, diagnostic tests, treatment and care in most of the region's 53 constituent countries, particularly those in central Asia and the rest of eastern Europe. Limited surveillance for hepatitis B and C in the general population of these countries, as well as for hidden epidemics among haemodialysis patients and hard-to-reach groups such as IDUs and sex workers, makes accurate estimates of the disease burden especially difficult. In many parts of the European region, the high cost of technology limits access to the serologic and molecular assays that are critical to not only the diagnosis of hepatitis B and C, but also the management and treatment of liver disease.

Table 2  
Availability and cost (US\$) of hepatitis B treatment in the countries of the former Soviet Union<sup>a</sup>

Country	Interferon	Lamivudine <sup>b</sup>	Adefovir	Tenofovir <sup>b</sup>
Armenia	Yes (1 000/month)	Yes (1 200/month)	No	Yes
Azerbaijan	Yes	Yes (4 000/course)	No	No
Belarus	No (only children)	No	No	No
Estonia	Yes	Yes	Unknown	Unknown
Georgia	Yes (1 000/month)	Yes (250/month)	No	Yes (but only GFATM)
Kazakhstan	Yes	Yes	No	No
Kyrgyzstan	Yes	Yes	No	No
Latvia	n/a	n/a	n/a	n/a
Lithuania	Yes (free)	Yes (free)	Yes (not compensated)	Yes (free)
Republic of Moldova	Yes (5 900–16 600/year)	Yes	No	No
Russian Federation	Yes (but prohibitively expensive)	Yes	Clinical trials only	No
Ukraine	Yes (300/month)	Yes (5/month)	No	No
Uzbekistan	Yes	Yes	No	No

n/a means no data is being collected, no surveillance being done or the data is not available.

<sup>a</sup> Turkmenistan and Tajikistan are not included in this analysis due to a lack of data.

<sup>b</sup> Only used for patients coinfecting with HIV and hepatitis B.

Table 3  
Availability and cost (US\$) of hepatitis C treatment in former Soviet Union<sup>a</sup>

Country	Availability of PEG-IFN	Availability of ribavirin	Cost of HCV combination treatment
Armenia	Yes	Yes	1 000/month
Azerbaijan	Yes	Yes	10 000–20 000/year
Belarus	No (only children)	No	10 000/year
Estonia	Yes	Yes	Unknown
Georgia	Yes	Yes	1 000/month
Kazakhstan	Yes	No	Unknown
Kyrgyzstan	Yes	Yes	19–280/dose
Latvia	n/a	n/a	n/a
Lithuania	Yes (20/dose std; 270/dose peg)	Yes (600/month)	8 400/year
Republic of Moldova	Yes	Yes	5 900–16 600/year
Russian Federation	Yes	Yes (but expensive)	1 000–3 000/month
Ukraine	Yes	Yes	12 000–24 000/year
Uzbekistan	Yes (but rare due to cost)	Yes (but rare due to cost)	3 600/course

<sup>a</sup> Turkmenistan and Tajikistan are not included in this analysis due to a lack of data.

Treatment of hepatitis C with drugs such as pegylated interferon (PEG-IFN) and ribavirin (RBV) is not widely available, and where it is, it is extremely costly for the average patient (up to US\$ 24 000 per patient). Other effective drugs, such as adefovir (ADF) for treatment of hepatitis B and tenofovir (TDF) for treatment of hepatitis B and HIV coinfection, are not licensed in many countries of the region, particularly in eastern Europe, in contrast to lamivudine for treatment of hepatitis B/HIV coinfection.

No country anywhere in Europe has more than 23 per cent access to hepatitis treatment (Salmon, Robain, Rockstroh, & Benhamou, 2006). And in the group at highest risk for hepatitis, injecting drug users, access to antiretroviral treatment, opioid substitution therapy and hepatitis treatment is substandard or even grossly deficient almost everywhere. Finally, many countries lack the guidelines needed for effective diagnosis and treatment of hepatitis B and C, especially in the presence of HIV coinfection.

#### European treatment and care protocols for hepatitis and HIV coinfection

Because of a similar need for clinical guidance in the treatment and care of PLWHA, the WHO Regional Office for Europe has developed a set of 13 clinical protocols designed to streamline and standardise clinical guidelines for the management of HIV patients. Three of these protocols focus on viral hepatitis, providing a structured, evidence-based approach to the management of hepatitis B or C and HIV coinfection and other co-morbidities and co-conditions in HCV/HIV or HBV/HIV coinfecting patients, as well as to the prevention of hepatitis A, B and C and other hepatotoxic factors in PLWHA (WHO, 2006a; WHO, 2006b). Perhaps most importantly, they provide optimal diagnosis and treatment algorithms based on the availability of resources and capacity in different European countries. Finally, all 13 protocols were translated from English into Russian to maximise their effectiveness for the region, and both versions are available online at <http://www.euro.who.int/aids>.

While these new clinical guidelines will indubitably improve the quality of hepatitis care and treatment, it is just as important to secure political and popular commitment to hepatitis prevention and management. World hepatitis awareness day, which falls every year on October 1, provides one opportunity to increase the profile of the disease as a critical public health issue. For instance, in 2006 the WHO Regional Office in Copenhagen hosted the event in cooperation with the European Liver Patients Association (ELPA), the European Association for the Study of the Liver (EASL) and Sir Bob Geldof, using the occasion to urge people at risk for hepatitis B and C to get tested.

#### Hepatitis C and injecting drug use on the public agenda

While prevalence data on hepatitis B and C among IDUs is limited, active drug injectors are the group most affected by hepatitis, due to high-risk behaviours that include sharing needles and other injecting equipment. In some places in central and eastern Europe, HCV prevalence among IDUs is as high as 90 per cent (EMCDDA, 2004a).

The prevalence of HCV among HIV-positive individuals is also very high, averaging 40 per cent in eastern Europe, with rates up to 70–95 per cent in Estonia, the Russian Federation and Ukraine (CEEHRN, 2007). Yet prevention measures that target IDUs in eastern Europe are minimal. Not only do most IDUs and people in drug treatment not receive HCV treatment, but they are often explicitly excluded from treatment because of fears of drug–drug interactions and the possibility of re-infection, regardless of their clinical indication, willingness to undergo therapy and the efficacy of HCV treatment in this population. The assumption that IDUs will not adhere to HCV treatment is often used to justify withholding treatment from IDUs, although recent studies have showed that adherence among current and former IDUs was comparable to that of non-users (Robaey et al., 2006; Van Thiel, Anantharaju, & Creech, 2003). At the same time, pan-European hepatitis guidelines state that active drug use cannot be used as

a criterion to exclude people from treatment and call for an equal and non-judgmental approach towards all people needing treatment, including IDUs (Alberti et al., 2005).

There is obviously a need for intensified, comprehensive action from all stakeholders, including policy-makers, international organisations, health care authorities and service providers. With this in mind, the Central and Eastern European Harm Reduction Network (CEEHRN) organised a consultation in March 2006 on HCV and drug use in the new EU member states and neighbourhood countries. "Hepatitis C and Drug Use: Towards Awareness and Action" brought together representatives from nongovernmental organisations, medical service providers, researchers, drug users and people living with HCV to share good practice examples in effective prevention, diagnostics, care and treatment.

Following the consultation, CEEHRN developed a set of recommendations entitled *Hepatitis C among drug users in the new EU member states and the neighbourhood* (CEEHRN, 2006). In conjunction with the clinical protocols developed by WHO and recent studies from Europe concluding that HCV treatment is cost-effective in addition to extending and improving quality of life (EMCDDA, 2004b), these recommendations should facilitate the development of a policy framework for effective hepatitis prevention and management. The recommendations are designed to engage a wide variety of stakeholders, such as national policy-makers, intergovernmental and international agencies (including the relevant United Nations and EU bodies), development agencies and donors, health care authorities, health care and drug treatment providers, prison authorities and researchers, in the dialogue surrounding HCV prevention, management and treatment. The concrete recommendations, most of which are equally applicable to HBV, for the various stakeholders are as follows.

#### *Policy-makers*

Policy-makers should make a greater public commitment to HCV, with a special focus on the health needs of the most affected group—IDUs. For the same reason, policy-makers should also reconsider the effect of repressive drug legislation on IDUs, which poses a grave public health threat by restricting users' ability to benefit from HCV prevention, diagnostic and care services. In developing drug policies, policy-makers should consult the people they affect most: users and their organisations in addition to care providers, both governmental and non-governmental.

#### *International organisations*

Intergovernmental organisations and international agencies can and should develop relationships with national governments and civil society groups to foster coordinated and effective action against hepatitis, especially among high-risk groups such as prisoners and IDUs. The inequalities in the provision of prevention and treatment services highlight

the need for international declarations and strategies for the prevention and management of viral hepatitis.

Donor organisations and foreign development agencies, especially those providing support for HIV prevention and care, have likewise a responsibility to target hepatitis with specific programmes and increase the funding for basic and applied research in hepatitis and drug dependency.

#### *Health care authorities and providers*

Most countries in the European region lack official treatment guidelines for HCV, especially for HCV/HIV coinfection. Where such recommendations do exist, they tend to exclude IDUs from treatment. Health care authorities should make efforts to enrol drug users in treatment programmes on the basis of clinical criteria, and to improve the way they develop and apply drug use and hepatitis treatment guidelines, basing such guidelines on international practice, medical ethics and scientific evidence. Finally, due to complications in people with other hepatitis coinfections, these authorities should prioritise improving the accessibility and availability of hepatitis A virus (HAV) and HBV vaccinations to high-risk groups, linking vaccination programmes with low-threshold facilities for IDUs with the goal of reaching more IDUs.

#### *Harm-reduction service providers*

Since prevention measures have not adequately prevented the spread of HIV in most countries of eastern Europe (Donoghoe, 2006), the much greater transmissibility of HCV is particularly worrying. Low-threshold facilities that provide services for drug users should incorporate HCV testing and counselling in their services and offer more harm-reduction services, including the provision of sterile injecting equipment other than needles and syringes (cookers, swabs and cottons), opioid substitution therapy, trainings on safer drug injecting, and HAV and HBV vaccination.

#### *Prison authorities*

In prison, HCV prevalence is many times higher than in the general population (Stöver & Lines, 2006). Detention facility and prison authorities should thus make a concerted effort to provide hepatitis prevention services, such as ensuring safe tattooing and safer injecting, treatment programmes and testing that is at least equivalent to what is provided in the world outside (UNODC, WHO and UNAIDS, 2006). Improved confidentiality and voluntary testing for HIV and HCV should also be implemented in these facilities.

#### *The research community*

Researchers and scientists interested in hepatitis research can establish networks with patient advocacy groups and service providers to seek funding based on comprehensive



anti-hepatitis efforts. The collaboration between ELPA and EASL is one such step, but it needs to expand to include eastern European countries. Additional research on high-risk groups and hepatitis should also be undertaken, including formative research that addresses the development of innovation in prevention and treatment of hepatitis and drug use.

## Conclusion

While HIV/AIDS has long been acknowledged a public health priority in the European region, the much more prevalent viruses hepatitis B and C remain hidden epidemics, despite affecting millions of more people. A lack of awareness among health care officials, a lack of strong advocacy at the international and national levels, and the unavailability or unaffordability of treatment are the most immediate barriers to confront, particularly in eastern Europe where these deficiencies have led to premature mortality and increased public health spending. In 2006, the European consultation on HCV and drug use and the launching of pan-European clinical protocols for HIV/hepatitis coinfection both helped advance the agenda. Yet individual countries must still work concertedly to raise awareness among their general populations; to develop prevention programmes; to make hepatitis B immunisation more accessible, especially to high-risk groups; to provide universal access to hepatitis B, hepatitis C and HIV treatment while simultaneously developing strategies to reduce the price of such treatment; to improve hepatitis surveillance.

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**TB/HIV coinfection: policy and epidemiology in 25 countries in the WHO European Region**

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## **Abstract**

### **Objectives**

The aims of this study were to collect and review TB/HIV data for Europe and to provide an overview of current health policies addressing the coinfection.

### **Methods**

We collected reported cases of TB/HIV from the 25 most-affected member states of the WHO European Region. Countries were also asked whether they had implemented health policies covering collaborative TB/HIV activities and what their main achievements, obstacles and needs were in addressing TB/HIV.

### **Results**

Twenty countries reported registering a total of 6925 TB/HIV cases in 2005. Among TB patients tested, 3.3% were found to be HIV-positive, up from 2.1% in 2004. The male-to-female ratio was 2.7:1. The largest percentage of coinfections were reported in people aged 25-34 years (47.8%). Recommended TB/HIV policies have been implemented in many of the countries

### **Conclusion**

Case finding has improved in many countries and the reported incidence of TB/HIV is increasing in the European Region, particularly among young adults, though it remains low compared to other parts of the world. It is important to screen all TB patients for HIV but it is even more relevant to screen and prevent TB in HIV-infected patients. Strengthened coordination of existing TB and HIV services is still needed.

**Keywords:** Tuberculosis, HIV, TB/HIV coinfection, central Asia, Europe

## Introduction

TB and HIV epidemics can fuel each other in several ways. HIV infection is the greatest single risk factor for developing TB. The lifetime risk for a TB-infected person to develop clinical TB is about 5–10% in an HIV-negative person and 50% in an HIV-positive person. TB leads to death within months in 90% of those coinfecting if left untreated [1].

Collaboration between tuberculosis (TB) and HIV communities is essential in order to maximize access to existing, effective interventions [2]. In the WHO European Region, an estimated 65 734 and 65 000 people died of TB and HIV, respectively, in 2005 [3,4].

HIV also complicates the TB epidemic because TB is more difficult to diagnose in people living with HIV, and because TB progresses faster in this population. TB is the only major AIDS-related opportunistic infection that poses a risk to HIV-negative people [5]. Observers have pointed out that TB could become uncontrollable in the region in the case of even a moderate HIV epidemic [6].

According to WHO estimates from 2005, there were 445 025 cases of TB in the WHO European Region, and 13 572 (3.0%) of them were also infected with HIV [4]. Reported cases from the European Region suggest that about 10% of all AIDS deaths are due to TB and 2.1% of all TB deaths are attributable to AIDS. However, TB-related mortality is not a very good indicator of the burden of TB/HIV, as people living with HIV who are being treated for TB run a high risk of dying from *other* opportunistic infections during the six-to-eight months of treatment – meaning that they often die *with* TB rather than *from* TB [1]. In a 2003 study, it was estimated that 2.8% of all TB in the European Region was attributable to HIV. This figure compares favourably to 9% globally and, for example, 56% in Zimbabwe [1].

There are several reasons to be concerned about a dual TB/HIV epidemic in the WHO European Region. To begin with, this region has the lowest coverage of DOTS (directly observed treatment, short-course – the internationally preferred approach to TB control) of the six WHO regions (60%). Together with the African Region, it has the lowest treatment success rate among new smear-positive TB cases (74%). At the same time, countries in eastern Europe are experiencing the world's highest incidence of multidrug-resistant TB (MDR-TB).

TB/HIV calls for a health system response that includes establishing a mechanism for collaboration, decreasing the burden of TB in people living with HIV by curing TB, decreasing the burden of HIV in TB patients through combination antiretroviral treatment, and coordinating surveillance of the two infections [4].

The epidemiological surveillance data currently available has been described as insufficient to monitor the overlap between HIV and TB [6]. Unfortunately, the countries with the highest TB burden are also the countries with the poorest case reporting [7]. To increase the data quality of reported TB/HIV cases, we conducted a follow-up survey on the implementation of WHO-recommended policies for addressing TB/HIV in these countries and an epidemiological update on reported TB/HIV incidence in the European Region, including a breakdown by sex and age. Finally, we present the current achievements of European Region health systems in addressing TB/HIV, as well as the obstacles and needs they face.



## Methods

Data on TB/HIV cases, testing and policies were extracted from the 2006 annual WHO/EuroTB data collection questionnaire [8], which has only collected data on TB/HIV from all 53 countries in the WHO European Region (whose 53 member states range from western Europe to the former Soviet Union) since 2004. This survey has 10 sections including reporting systems, TB notification data, treatment outcomes, MDR-TB and financial components, and is compiled into an Excel file. A follow-up survey focusing on TB/HIV was distributed to 25 selected countries in March 2007 due to major data gaps in the annual survey. The 18 high-priority countries for TB are Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, the Republic of Moldova, Romania, the Russian Federation, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan. An additional 7 countries (Austria, Belgium, France, Italy, Portugal, Spain and Switzerland) were included based on the criterion of having an estimated HIV prevalence among TB cases of at least 7.5% [4].

WHO counterparts in the countries' national TB and HIV programmes were asked to update and confirm the existing data on TB/HIV testing and case reporting in 2004 and 2005, and to provide information on their current health policies addressing TB/HIV.

The TB/HIV Working Group of the Stop TB Partnership has developed several policy guidance documents to assist countries in implementing and monitoring collaborative TB/HIV services [9-11]. In the present survey, countries were asked whether they have implemented the three main objectives for collaborative TB/HIV activities:

1. to establish mechanisms for collaboration between TB and HIV control programmes
2. to decrease the burden of TB in people living with HIV
3. to decrease the burden of HIV in TB patients [10].

A 2006 survey by WHO's Stop TB Partnership collected descriptions of the major achievements and obstacles in addressing TB/HIV in the Region's 18 high-priority TB countries. In our follow-up questionnaire, we also asked the remaining countries to report their major achievements, obstacles and needs in addressing TB/HIV.

## Results

By May 2007, 24 of the 25 countries had responded to the questionnaire. However, they did not all provide all the requested data. Data on the number of TB patients who were tested for HIV was available in 14 countries for 2004 and 15 countries for 2005. The number of TB patients who were HIV-positive was available in 16 countries for 2004 and 19 countries for 2005. Questions on current health care policies were answered by between 21 and 24 countries, while 21 countries provided a description of the major achievements and obstacles in their health system response to TB/HIV.

### *Estimated burden of TB, HIV and TB/HIV*

Table 1 shows the estimated burden of HIV and TB in the 25 countries studied. The highest total numbers of people living with HIV are found in the Russian Federation, Ukraine, Italy, Spain and France, respectively. The highest total numbers of TB patients are found in the Russian Federation, Uzbekistan, Romania, Kazakhstan and Turkey, respectively.

As presented in Table 1, the five countries with the highest 2005 HIV prevalence *within* TB cases, as estimated by WHO, are all found in western Europe: Spain (15.8%), Italy (13.1%), France (11.2%), Portugal and Switzerland (both 10.8%).

**Table 1. TB/HIV cases in high-priority TB and TB/HIV countries, WHO European Region, 2005**

	People living with HIV (UNAIDS estimate) <sup>a</sup>	Newly reported TB cases (WHO estimate) <sup>b</sup>	HIV prevalence in adult TB cases (WHO estimate) <sup>b</sup>	TB patients tested for HIV (reported data)	TB patients found to be HIV-positive (reported data)	Incidence of TB/HIV per 100 000 population (reported data)
Armenia	2 900	2 140	0.9%	270	6	0.2
Austria	12 000	942	8.0%	—	16	0.2
Azerbaijan	5 400	6 364	0.7%	—	18	0.2
Belarus	20 000	6 015	2.0%	—	139	1.4
Belgium	14 000	1 330	7.5%	937	52	0.5
Bulgaria	<500	3 012	—	644	12	0.2
Estonia	10 000	568	7.4%	470	33	2.5
France	130 000	7 793	11.2%	—	—	—
Georgia	5 600	3 695	1.3%	674	13	0.3
Italy	150 000	3 975	13.1%	1 141	121	0.2
Kazakhstan	12 000	21 347	1.5%	22 303	181	1.2
Kyrgyzstan	4 000	6 346	0.8%	1 990	55	1.1
Latvia	10 000	1 444	4.5%	1 226	53	2.3
Lithuania	3 300	2 146	1.0%	1 528	3	0.1
Portugal	32 000	3 457	10.8%	1 756	546	5.2
Moldova	29 000	5 817	6.0%	3 392	19	0.5
Romania	7 000	29 143	—	10 791	30	0.1
Russian Federation	940 000	170 422	6.2%	85 537	3 533	2.5
Spain	140 000	11 839	15.8%	3 480	394	0.9
Switzerland	17 000	528	10.8%	—	—	—
Tajikistan	4 900	12 854	0.8%	—	—	—
Turkey	<2 000	21 089	—	—	—	—
Turkmenistan	<500	3 393	0.1%	—	—	—
Ukraine	410 000	46 183	7.9%	—	1 554	3.3
Uzbekistan	31 000	30 173	1.2%	21 513	147	0.6
<b>Total</b>	<b>1 993 100</b>	<b>402 015</b>	<b>—</b>	<b>157 652</b>	<b>6 925</b>	<b>1.8</b>

<sup>a</sup> UNAIDS 2006 [3].

<sup>b</sup> WHO 2007 [4].

In comparing Table 2 with Table 1, it is clear that WHO estimates of HIV prevalence in TB cases are generally much higher than the countries' own estimates (when they exist). For example, Austria estimates HIV prevalence at 0.7% of its TB cases, whereas the WHO figure is 8%. The only exceptions are Azerbaijan and Portugal, where the national estimates exceed the WHO estimates.

### *Reported cases of TB/HIV*

In the original WHO/EuroTB survey, 10 of the 25 countries being considered here reported on TB/HIV cases in 2005, for a total of 1019. As presented in Table 1, 20 countries reported TB/HIV case data in the follow-up survey. They reported a total of 6925 TB/HIV cases, which gives an incidence rate of 1.6 per 100 000 population in the reporting countries. Of these, Portugal had the highest incidence with 5.2 per 100 000, followed by Ukraine with 3.3, Estonia and the Russian Federation with 2.5 and Latvia with 2.3.

Table 2. **TB/HIV collaboration mechanisms, 2007**

	National body responsible for coordinating TB/HIV activities	National plan for collaborative TB/HIV activities	National surveillance system for HIV prevalence in TB patients	National estimate of HIV prevalence in TB patients, 2005
Armenia	Yes	No	No	No
Austria	No	No	No	0.7%
Azerbaijan	Yes	Yes	Yes	15%
Belarus	No	No	Yes	No
Belgium	—	No	No	No
Bulgaria	Yes	Yes	No	No
Estonia	Yes	Yes	Yes	No
France	—	—	No	No
Georgia	Yes	Yes	No	No
Italy	No	No	No	Yes
Kazakhstan	No	No	No	0.3%
Kyrgyzstan	No	No	Yes	Yes
Latvia	Yes	No	Yes	3.8%
Lithuania	No	Yes	Yes	0.2%
Portugal	—	—	Yes	15.4%
Moldova	No	Yes	Yes	2.4%
Romania	No	No	Yes	0.6%
Russian Federation	Yes	Yes	Yes	1.6%
Spain	—	—	No	5%
Switzerland	No	No	No	4%
Tajikistan	Yes	Piloting <sup>a</sup>	Piloting <sup>a</sup>	—
Turkey	No	No	No	No
Turkmenistan	No	No	—	—
Ukraine	No	No	No	No
Uzbekistan	Yes	Yes	No	No

<sup>a</sup> A pilot project in Dushanbe started at the end of 2005. Results will be summarized at the end of 2007, and the plan will be implemented countrywide.

Sixteen countries<sup>1</sup> reported TB/HIV data for both 2004 and 2005. These countries registered 2388 cases in 2004 and 2861 cases in 2005, which is a 19.8% increase in one year. Ukraine represented 88% of this increase. There were declines of 1.9%, 10% and 23.3% in three countries: Belgium, Kazakhstan and Portugal, respectively.

<sup>1</sup> Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Portugal, the Republic of Moldova, Romania, Ukraine and Uzbekistan

### *Case finding in countries*

Information on the number of TB patients who were tested for HIV in 2005 was available in 16 of the 25 countries selected for the follow-up survey. As presented in Table 1, a total of 157 652 TB patients were tested for HIV, of whom 3.3% tested positive.

We also requested countries to provide updated TB/HIV data for 2004. Fourteen countries reported that a total of 56 954 TB patients were tested for HIV in 2004, of whom 2.1% were found to be HIV-positive.

In 2005, the Russian Federation tested 85 537 TB patients for HIV, representing 54% of all reported patients in the WHO European Region, and found 3533 coinfecting cases (51% of all reported cases in the Region).

The number of TB patients testing positive for HIV in 2005 accounted for 53% of the estimated HIV incidence in the reporting countries.

### *Sex and age distribution of coinfecting cases*

Sex-disaggregated data was available in 16 of the reporting countries. A total of 4054 (73.3%) men and 1479 (26.7%) women were registered among the coinfecting patients in 2005, for a male-to-female ratio of 2.7:1 in the reporting countries.

Fourteen countries were able to provide age-disaggregated data. The majority (47.8%) of coinfections were reported in people aged 25–34 years, followed by those aged 35–44 (25.3%). Fewer than 1% of the TB/HIV cases were younger than 15. There was no significant gender difference in the age distribution of coinfections.

### *Implementation of policies on collaborative TB/HIV activities*

1. Establishing mechanisms for collaboration. Table 2 shows that 9 countries (43% of the countries responding to this question) have a national body responsible for coordinating TB/HIV activities; 8 countries (36%) have a national plan for collaborative TB/HIV activities; 10 countries (42%) have a national surveillance system to monitor HIV among TB patients; and 13 countries (57%) have a national estimate of the HIV prevalence among TB patients in 2005, with reported estimates ranging from 0.2% in Lithuania to 15.4% in Portugal.

2. Decreasing the burden of TB in people living with HIV. Table 3 shows that 14 countries (61% of countries responding to this question) reported having a national policy for annually screening people living with HIV for TB; 12 countries (55%) have a national policy offering isoniazid prophylaxis to people living with HIV; 13 countries (57%) have a national policy for offering cotrimoxazole prophylaxis to people living with HIV; and 15 countries (71%) have a national policy to control the spread of TB in congregate (crowded) settings.

3. Decreasing the burden of HIV in TB patients. Table 4 shows that 21 countries (88% of reporting countries) have a national policy offering HIV testing and counselling to TB patients, though in two of these countries the service is only offered in larger cities or the main TB facilities. Four countries (29%) have a policy for introducing HIV prevention methods to TB patients, while Tajikistan is piloting such a policy; 13 countries (81%) have a policy to ensure HIV/AIDS care and support for people living with HIV; and 21 countries (91%) have a national policy to offer antiretroviral therapy (ART) to people living with HIV.

### *National achievements and planned activities*

Twenty-one of the countries described their main achievements in addressing TB/HIV in the previous year (2006) and their planned TB/HIV activities for the following year (2007).

The TB/HIV activity that was most frequently implemented was intensified case finding of HIV among TB patients, cited by 12 countries for the previous year. Eight countries had also intensified case finding of TB among people living with HIV, including one that placed a special emphasis on case finding among prisoners and another on case finding among injecting drug users. Ten countries described an improved collaboration between HIV and TB institutions, programmes or specialists. Eight countries had improved their monitoring and registration of coinfecting cases. Four countries had improved use of ART, three had improved isoniazid preventive treatment and one country had improved cotrimoxazole provision.

**Table 3. National policies to decrease the burden of TB in people living with HIV (PLHIV), 2007**

	National policy to screen PLHIV for TB annually	National policy to offer isoniazid prophylaxis to PLHIV	National policy to offer cotrimoxazole prophylaxis to PLHIV	National policy to control TB transmission in crowded settings
Armenia	Yes	Yes	Yes	No
Austria	No	No	No	Yes
Azerbaijan	Yes	No	Yes	No
Belarus	Yes	Yes	Yes	Yes
Belgium	No	No	—	—
Bulgaria	Yes	Yes	No	Yes
Estonia	Yes	No	No	Yes
France	No	— <sup>a</sup>	Yes	—
Georgia	Yes	Yes	No	No
Italy	No	Yes	No	Yes
Kazakhstan	Yes	Yes	Yes	Yes
Kyrgyzstan	No	Yes	Yes	No
Latvia	Yes	No	Yes	Yes
Lithuania	Yes	No	No	Yes
Portugal	—	—	No	—
Moldova	No <sup>b</sup>	No	Yes	Yes <sup>c</sup>
Romania	Yes	Yes	No	Yes
Russian Federation	Yes	Yes	Yes	Yes
Spain	—	—	—	—
Switzerland	No	No	Yes	No
Tajikistan	Yes	Yes	Yes	Piloting
Turkey	No	No	No	Yes
Turkmenistan	No	No	No	Yes
Ukraine	Yes	Yes	Yes	Yes
Uzbekistan	Yes	Yes	Yes	Yes

<sup>a</sup> Only sputum smear-positive cases where patient is immunocompromised.

<sup>b</sup> Although the country has declared its intention to screen, it is not enforced. Once the SYMETA system is operational, however, it will be possible to do so.

<sup>c</sup> Including the penitentiary system (DOTS and DOTS+).

Planned activities for the next year fell into many of the same areas. The intensified case finding of HIV among TB patients was mentioned by seven countries, while just four mentioned case finding of TB among people living with HIV. Strengthened collaboration between TB and HIV institutions was planned in seven countries, improved monitoring and registration of coinfecting cases in six, development of clinical guideline/protocols for TB/HIV in six, improved access to preventive TB treatment in five, TB/HIV training activities in five and creation/approval of a joint TB/HIV plan in three.

**Table 4. National policies to decrease the burden of HIV in TB patients, 2007**

	National policy to offer HIV counselling and testing to TB patients	National policy to educate TB patients about HIV prevention	National policy to ensure care and support for PLHIV	National policy to offer ART to PLHIV
Armenia	Yes <sup>a</sup>	—	—	Yes
Austria	No	No	Yes	Yes
Azerbaijan	Yes	—	—	Yes
Belarus	Yes	—	—	Yes
Belgium	No	—	—	—
Bulgaria	Yes	—	—	Yes
Estonia	Yes	No	No	Yes
France	Yes	—	Yes	Yes
Georgia	Yes <sup>b</sup>	No	Yes	Yes
Italy	Yes	No	Yes	Yes
Kazakhstan	Yes	No	Yes	Yes
Kyrgyzstan	Yes	—	—	No
Latvia	Yes	Yes	Yes	Yes
Lithuania	Yes	Yes	Yes	Yes
Portugal	Yes	No	Yes	Yes
Moldova	Yes	Yes	Yes	Yes
Romania	Yes	No	Yes	Yes
Russian Federation	Yes	No	Yes	Yes
Spain	Yes	—	—	—
Switzerland	Yes	No	Yes	Yes
Tajikistan	Yes	Piloting	Piloting	Yes
Turkey	No	—	No	Yes
Turkmenistan	—	—	—	No
Ukraine	Yes	Yes	Yes	Yes
Uzbekistan	Yes	—	—	Yes

<sup>a</sup> In the main TB facilities.

<sup>b</sup> In five major cities.

#### *National obstacles and needs*

Twenty-one countries also described the major obstacles that their health systems face in addressing TB/HIV, and what they need to overcome these obstacles. The most widespread problem was a general lack of coordination between TB and HIV control programmes. Nine countries reported the absence of either a coordination mechanism between TB and HIV programmes, a joint monitoring/surveillance system or a joint national plan for TB/HIV. Four

countries mentioned a lack of funds, financial instability or dependency on international assistance as their main obstacle.

Other obstacles included difficulties in supplying antiretroviral drugs and other medications for treating HIV and TB. One country (Kyrgyzstan) mentioned that cotrimoxazole is excluded from its national list of essential drugs. Other problems were related to treatment failure, the absence of a voluntary HIV counselling and testing system for TB patients, difficulties in diagnosing TB in an HIV-positive person and the absence of routine TB screening for people living with HIV. Some countries also struggled with a lack of TB/HIV expertise and basic human resources.

On being asked to name their greatest challenge, seven countries said it lay in strengthening national coordination and collaboration of TB and HIV programmes. Four countries said it was human resources and staff training, three better funding, three the development of clinical guidelines/protocols for TB/HIV, three joint protocols for case management and two a joint monitoring system.

## Discussion

This study found that the reported incidence of TB/HIV coinfection in the 25 most-affected countries of Europe and central Asia is low, but increasing, due to improved case finding. Cases of TB/HIV coinfection are unevenly distributed across the European Region. In 2005, TB was reported as the AIDS-defining disease in 22% of all cases in the western subregion,<sup>2</sup> 24% of cases in the central subregion<sup>3</sup> and 52% of cases in the eastern subregion<sup>4</sup> [12].

Almost three quarters of the reported cases (2005) in our study were male. This can be compared to the male-to-female ratio of TB cases in 2005, which was 2.1:1 [4], and to HIV, which was 1.5:1 [13]. Almost half were aged 25–34, whereas the majority of TB cases in 2005 were found in the same age group (23.4%), but the cases were much more evenly distributed among age groups: 15–24 years: 15.7%; 35–44 years 21.5%; and 45–54 years 20.9% [4]. Available HIV data revealed that 68.4% of the case were in the 25–49 age group, which roughly encompasses two of the categories used for TB/HIV and TB alone, and shows a very similar pattern to the coinfection one [13].

Many of the countries with the greatest burden of coinfection report a variety of health system-related obstacles affecting case finding, prevention and treatment. They include parallel TB- and HIV-control systems, lack of a national coordination body and lack of a national policy on coinfection. Major surveillance gaps further complicate the situation, as the prevalence of TB/HIV is only reported as a rough estimate in most countries. One major limitation of this study is that country data was supplied by WHO counterparts at the national level, through the HIV/AIDS and TB programmes. In many cases, the organizations where

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<sup>2</sup> Based on reported cases from Andorra, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Monaco, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

<sup>3</sup> Based on reported cases from Bulgaria, Croatia, the Czech Republic, Hungary, Malta, Montenegro, Poland, Serbia, Slovakia, Slovenia and Turkey.

<sup>4</sup> Based on reported cases from Azerbaijan, Belarus, Estonia, Kazakhstan, Lithuania, the Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan.

these individuals work were also the main source of information for the current international estimates.

*Policy considerations for an integrated health system response*

Coordination between existing services is central and should be emphasized over the creation of new national programmes, as described in the policy guidance of the Stop TB Partnership [10]. The implication is that, despite the findings in a recent review of TB/HIV collaboration [2], much can be accomplished at present funding levels with existing resources – for instance, ensuring continuity of care for coinfecting prisoners entering or leaving a prison system [14]. Once in place, health policies that encourage collaboration between HIV and TB programmes can result in more effective and efficient case finding, counselling, treatment, drug provision, staff training and surveillance.

To integrate TB/HIV activities in a health care system, it is essential to establish a mechanism for such collaboration and organizational structures to plan and manage it. Policy recommendations for achieving this objective include setting up a coordinating body for TB/HIV activities at all levels, conducting surveillance of HIV prevalence among TB patients, carrying out joint TB/HIV planning, and conducting monitoring and evaluation [10]. Our study shows that such mechanisms are lacking in most of the countries surveyed.

Policy recommendations for decreasing the burden of TB in people living with HIV oblige integration of TB and HIV services to establish intensified TB case-finding among HIV patients, introduce isoniazid preventive therapy and ensure TB infection control in health care and crowded settings [10]. While each of these recommendations has been implemented by about half of the countries we surveyed; only seven have implemented them all.

Policy recommendations for decreasing the burden of HIV in TB patients also require an integrated system to provide TB patients with HIV testing and counselling, introduce HIV prevention methods, initiate cotrimoxazole preventive therapy (which reduces the morbidity and mortality in TB/HIV patients [15–17], ensure HIV/AIDS care and support, and introduce ART [10]. Our study showed that most countries do not have an HIV prevention policy for TB patients. Furthermore, while the vast majority of countries do have a policy to offer ART to people living with HIV, it is not clear how much of the treatment need is being met or whether countries are providing universal access. Universal access should be understood as not merely high coverage, but equitable access to all in need of treatment [18].

Experience shows that the different resources and agendas of a TB control programme and an HIV control programme often make it difficult to integrate the two operationally [19]. In eastern Europe, for example, TB control institutes were established more than a century before the emergence of HIV. Today, the differences between programmes are still evident, with TB programmes being generally large, bureaucratic and poorly funded, while HIV programmes are new and usually well funded [20]. Our study did not review how well programmes are being implemented, only if they were in place.

Researchers have recently acknowledged the importance of understanding the broad health systems context in order to make effective changes in TB programmes, which are often vertically organized [21]. The traditional approach for dealing with epidemics is to employ specialized health services that are centrally directed through specific legislation. As a result, the regulatory framework often has to be changed before collaborative activities can be implemented [6]. Though there have been attempts to integrate TB and HIV efforts in



countries with newly reformed primary care systems, and though a new WHO European Region protocol calls for increased integration [22], other protocols in use often still refer patients to different facilities for counselling, testing and treatment services, an area that future research should address.

#### *Surveillance of TB/HIV*

A recent assessment rated 33 of the 53 countries in the WHO European Region as having poor quality information on TB incidence, based on notification data, population surveys and vital registration systems [7]. The countries with the worst TB surveillance rankings were also the ones with the highest estimated incidence rates. Prior to our survey, 10 of the 25 countries we selected as having been most affected by TB and TB/HIV reported data for 2005. In our follow-up survey, 20 countries reported TB/HIV cases for 2005. The difference clearly demonstrates the need for better international reporting.

The 20% increase that we found in TB/HIV incidence from 2004 to 2005 is partially explained by intensified case finding in the reporting countries. However, it is worth noting that only 42% of the reporting countries have a national surveillance system to monitor the prevalence of HIV in TB cases. One of the causes of the poor level of surveillance is that, as we discovered in our survey, it is illegal to link the HIV and the TB databases in many countries for reasons of confidentiality and data protection.

#### *Testing and counselling*

The TB/HIV cases presented in Table 1 have been tabulated through HIV testing of TB patients. The notable increase in the number of TB patients tested for HIV between 2004 and 2005 is mainly accounted for by the Russian Federation, where data is only available for 2005. However, the total incidence of TB/HIV cases in any country is likely to be higher as some people at the time of TB diagnosis are already known to be HIV positive. Data on case finding of TB among people living with HIV is currently not being collected by any international organization.

Not enough TB patients are tested for HIV to meet the target of the Stop TB Strategy, which calls for testing and counselling 85% of all TB patients treated in DOTS programmes [11]. Even fewer countries test people living with HIV for TB. Our survey findings indicate that European countries place more emphasis on HIV testing of TB patients than TB screening of people living with HIV, even though the latter may be more cost-effective for case finding of TB/HIV. In any case, diagnosing and treating TB in HIV care settings will help increase coinfection case finding and improve TB treatment completion rates [19].

#### *High-risk groups*

In populations where TB is not generalized, both TB and HIV tend to be concentrated in the same subpopulations, and countries can improve the efficacy of TB/HIV interventions by targeting high-risk groups, such as injecting drug users, prisoners, sex workers, men who have sex with men, homeless people and migrant populations [6].

The situation in prisons is particularly problematic. TB is reported to be 20–60 times more prevalent in eastern European prisons than in the general population [23]. Although many countries in the subregion have been developing pilot programmes for needle and syringe exchange, promotion of condom use and TB treatment, the ineffectual relationship between prison health authorities and the ministry of health in most former Soviet countries has made it difficult for the two sectors to integrate health care provision or share expertise [20].

The stigmatization of and discrimination against eastern Europeans with TB or HIV – the first infection associated with the destitute and the incarcerated, the other with drug users, men who have sex with men, and sex workers – has meant slow implementation of national population-based education and information programmes and scant attention in the mass media [20].

Harm-reduction programmes for safer drug use and sexual behaviour target HIV directly and therefore TB indirectly [24]. However, in spite of evidence that such programmes can reduce the adverse consequences of HIV, TB and MDR-TB they are generally inadequate in scale and coverage in central and eastern Europe [25,26]. In order to reduce stigmatization and facilitate the prevention of HIV (and thus TB), several countries in western Europe have decriminalized injecting drug use, while countries in central and eastern Europe have started decriminalizing lifestyles associated with risk such as homosexuality and sex work.

#### *HIV and multidrug-resistant TB*

People living with HIV are particularly vulnerable to MDR-TB because of their increased susceptibility to infection through nosocomial transmission, malabsorption of TB medication, acquired rifamycin resistance and poor response to TB treatment [27,28]. This fact underscores how prompt TB diagnosis and treatment is needed for people living with HIV in order to prevent drug resistance from developing and spreading.

However, evidence so far is conflicting on whether HIV is capable of fuelling an MDR-TB epidemic. Coinfected patients are less likely to transmit resistant strains [29] and population-based studies have not found an association between HIV and MDR-TB [28].

The high level of multidrug resistance poses a special challenge to the TB situation in the European Region. TB patients in some countries of the Region are ten times more likely to have MDR strains than TB patients in the rest of the world [30]. Among the WHO regions, only the African Region has a lower treatment success rate for new TB patients. While the low treatment success in the African Region is mostly due to HIV coinfection, in the European Region it is mostly due to MDR-TB. The problem in Europe is especially evident among people who have been previously treated; the DOTS treatment success rate for such patients is 54%, the lowest rate in all six regions.

Eastern European nations are experiencing particularly high levels of TB and MDR-TB, as well as an escalating HIV epidemic. This combination is potentially disastrous for both TB control and HIV care. To date, there is still a scarcity of data to systematically document the impact of HIV on TB in the Region. In order to inform appropriate policy and programme interventions, there must be a strengthening of TB surveillance systems, HIV surveillance systems and health information systems including up-to-date methods of epidemiological and behavioural surveillance, for both risk groups and the general population.

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V



# Midwifery at the crossroads in Estonia: attitudes of midwives and other key stakeholders

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**Background.** Since the initiation of health sector reforms in Estonia in 1992, the Baltic state has experienced a steep decline in the number of midwives and midwife graduates. At the same time, there has been a rapid increase, first in sexually transmitted infections and then in human immunodeficiency virus. The aim of this study was to draw on the perceptions of Estonia's midwives and other health care stakeholders to delineate the current situation of midwifery in the country, in the context of a sexually transmitted infection/human immunodeficiency virus epidemic.

**Materials and methods.** Data were obtained by sending a 32-question questionnaire, based on an agenda developed through semistructured interviews, to all midwives in Estonia. A nominal group technique was employed with key stakeholders to determine the extent of their agreement with the questionnaire's major findings.

**Results.** The response rate to the questionnaire was 75%. There was no significant association between work satisfaction and independent variables of age, ethnicity, work abroad, increased responsibility, and involvement in postpartum care and counseling. There was, however, a significant association between work satisfaction and salary. The group process revealed that although there is no agreement on the role of family doctors and midwives in antenatal care, there is a general agreement that midwives should be more involved in postpartum care and that their tasks need to be better defined.

**Conclusions.** Almost half of the responding Estonian midwives are dissatisfied with their job, especially their salary. Increased responsibility for antenatal and postpartum counseling, with concurrent salary adjustments, may help stop the decline in the number of midwives, as could the opening up of new areas of work. A further reduction of the high abortion and sexually transmitted infection/human immunodeficiency virus rates is a critical challenge for Estonia, and midwives could be employed in services to do this, similar to their Nordic neighbors. Current indications suggest, however, that the number of midwives, especially new graduates, will continue to decline.

**Key words:** antenatal care; Estonia; health policy; health sector reform; midwifery; pregnancy

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## Abbreviations:

ANC: antenatal Care; CI: confidence interval; EEK: Estonian Kron; EU: European Union; ICPD: International Conference on Population and Development; ORs: odds ratios; STI: Sexually transmitted disease; WHO: World Health Organisation.

The World Health Report 2000 defined health sector reforms as, "sustained, purposeful changes to improve the efficiency, equity and effectiveness of the health sector" (1). The 15 countries of the former Soviet Union have, to varying degrees,



attempted to bring about such changes through the introduction of family medicine, health insurance, decentralization, gatekeeping, privatization, and other programs. However, in attempting to create a structure for implementing change, the reforms have often overlooked the individual groups of actors (2).

Since the initiation of health sector reforms during independence in 1991, the number of midwives in the Baltic country of Estonia has almost halved. The first reforms were initiated to improve the quality and effectiveness of the health care system. The goal of the second round of reforms was to improve the efficiency of the system by focusing on primary health care. A chief concern is the continuing high proportion of patients seeking and receiving specialist care, despite existing reforms promoting primary care services.

The most important of the current reforms has been the introduction of family medicine in 1998 and the payment arrangements that accompanied it (3). Family doctors were allowed to establish themselves as independent contractors and were encouraged to provide antenatal care (ANC). However, no formal relationship was made between the family doctors and the midwives, who had previously provided ANC but for the most part continued to work alongside obstetrician-gynecologists at hospitals.

The term midwife is derived from an Old English expression meaning "with woman." In evaluating the midwife's fundamental role, the key question is how much the midwife should be with the woman before, during, and after delivery. In Sweden, for example, there is a long tradition of midwives providing pregnancy counseling, health education, and emotional and social support during pregnancy and postpartum, and they have gradually assumed a role in reproductive health care as well (4). In the United Kingdom, in spite of the medicalization of pregnancy (5), midwives have maintained their place as the most senior professional present at the majority of deliveries (6).

In 2001, Estonia reported the highest increase in the incidence of HIV infections in the world, as well as high prevalence rates of most other sexually transmitted infections (STIs), such as syphilis, which increased from 7.4 per 100 000 population in 1991 to 72 in 1995 and was still around 30 in 2001 (7). At the same time, there has been a decline in the number of Estonian hospitals, hospital beds, midwives and graduating midwives, and physicians and graduating physicians. While reducing costs has been a key aspect of the health reforms, so has been the promotion of primary health care; yet the role of midwives remains unclear.

This study explores how midwives and other major stakeholders in the Estonian health system view midwifery. Specifically, the relationship between job satisfaction among midwives and age, ethnicity (Estonian or Russian), plans to work abroad, salary, interest in more responsibility, and involvement in postpartum care and counseling were analyzed.

## The Estonian context

### Centralized health care

From 1940 to 1990, Estonia implemented a Soviet "Semashko" health care model, in which care was funded from the state budget and directed by the government through central planning. There was an overprovision of hospital beds, an excessive number of hospitals (Fig. 1), many of which were poorly equipped and staffed, and no private health care sector. All citizens had nominally free access to primary health services, which were provided by specialists at polyclinics (8).

In 1991, shortly before regaining independence, Estonia passed legislation to implement a social health insurance system, which came into effect the following year. To change the form of health care financing and decentralize, a complete reorganization of the Semashko system was needed (9). The system's main problems were surplus capacity in the secondary and tertiary care sectors, user dissatisfaction, and inadequate funding (10). Today, as one of the first former Soviet countries to have acceded to the European Union, Estonia is facing increasing pressure for further reform (11).

Some of these ongoing second-round reforms were enacted to increase public involvement in

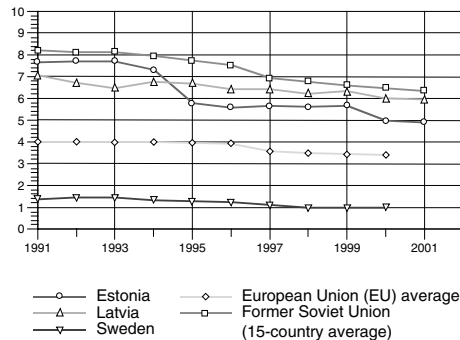


Fig. 1. Hospitals per 100 000 population in Estonia and other parts of Europe. Source: WHO Regional Office for Europe, European health for all database, 2003.

health care (9). Since 1997, when reforms of primary care were initiated, patients have gained a greater freedom of choice. They are free to choose any primary care doctor or specialist with whom their regional health insurance fund has a contract (12). The preferred first-contact provider, the family doctor, has an incentive to attract patients, as he/she is funded on a capitation basis. However, the absence of a mandatory gatekeeper system, which would require referrals to obtain secondary care, has led many Estonians to continue seeking specialist care first, bypassing the primary care setting entirely (9).

### Midwifery in Estonia

The Estonian Master Plan for Midwifery 2002–2015 defines a midwife (*ammaemand*) as a person who “having been regularly admitted to a midwifery educational programme recognized by Estonian legislation, has successfully completed the prescribed course of studies in midwifery and has acquired the requisite qualifications to be registered at the Estonian Health Board and legally licensed to practise midwifery” (13). The main professional skills are listed in Box 1. This definition is based on the 1990 definition of the International Confederation of Midwives and accepted by the International Federation of Gynecology and Obstetrics and the World Health Organization (WHO).

The plan further states that a midwife must be able to provide women with the supervision, care, and advice needed during pregnancy, labor, and the postpartum period; conduct deliveries on her own; and care for newborn and infant children. The services she offers should include preventative measures, the detection of abnormal conditions in mother and child, the procurement of medical assistance, and the execution of emergency measures in the absence of medical help. In addition, she has an important role in the health counseling and education of not only women, but also families and community.

The Estonian curriculum for midwifery consists of both theoretical and practical training, totaling 180 weeks (4.5 years) in all. It is a direct-entry training program with an integrated nursing component. The practical training includes 50 deliveries, 100 antenatal checkups, and 100 postpartum checkups.

### The number of midwives

As of December 2002, there were 264 members of the Estonian Association of Midwives, but

not all active midwives belong to the association. The Ministry of Social Affairs’ register of health care workers is not yet complete, and the actual number of midwives in the country can only be estimated. The Health Care Services Organization Law, which took effect on January 1 2002, defines health care professionals as physicians, nurses, and midwives who are registered with the Health Care Board (14). As of May 2003, some 350 midwives were registered. The current ministry figure of 453, equivalent to 368 full-time midwives, is based on the reporting of personnel numbers by individual health care facilities. If the trends shown in Fig. 2 are any indication, then this figure is likely to be lower in 2003–2004. In addition, there are approximately 100 women trained as midwives who are now working as family nurses or nurses elsewhere. However, if a certified midwife has not worked as a midwife for 5 years, she loses her right to do so, and in order to regain the right to practice she must complete special courses.

In addition to the decline in the overall midwife population, the number of graduating midwives has also fallen steeply (Fig. 3) and is among the lowest in the 52 Member States of the European Region. As the overall population has declined from 1.56 to 1.36 million inhabitants during the same period, the decline in the raw number of new graduates is even steeper than what Fig. 3 shows. The drastic declines in 2000 and 2001 can be largely explained by changes to the

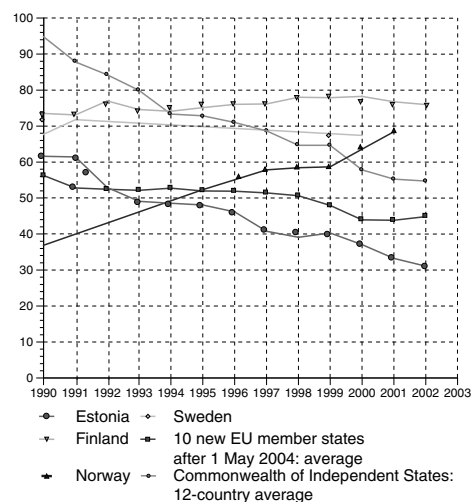


Fig. 2. Midwives per 100 000 population. Source: WHO Regional Office for Europe, European health for all database, 2004.

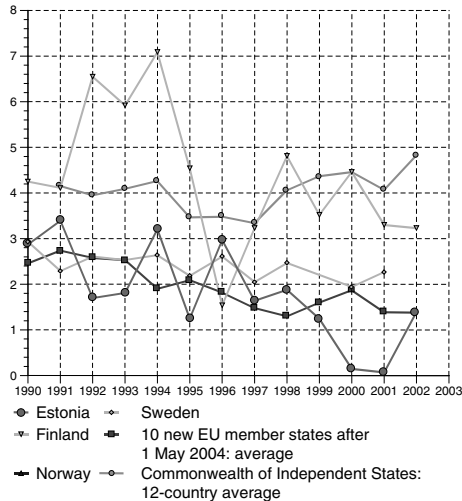


Fig. 3. Midwives graduated per 100 000 population. Source: WHO Regional Office for Europe, European health for all database, 2004.

midwifery medical school curricula; in 1997, the 3-year program was changed to a 4.5-year program, which led to almost no new graduates in 2000 and 2001.

## Materials and methods

A combination of quantitative and qualitative methods was used for this study, which was carried out in three phases. A series of face-to-face semistructured interviews with midwives and doctors laid the groundwork for the questionnaire. After the questionnaires were returned, the results were discussed with major stakeholders in the health care system.

The questionnaire was designed to investigate the decline in midwifery and to explore whether lessons learned in other settings, where midwives do more than deliver babies and provide ANC, could be applied in Estonia. The third stage of the study, the stakeholder discussions, aimed at reaching agreement on some of the survey's results. It provided further insight into what needs to be considered in defining the role and responsibilities of midwives and reforming the current ANC provision scheme (see Nominal group process section).

## Questionnaire

**Subjects.** The study population comprised all 264 members of the Estonian Association of Midwives and an additional 102 midwives working in Estonian health care facilities. For the purposes of this study, the health care facilities targeted were the 18 hospitals that have a delivery department or maternity ward, as well as their outpatient clinics for women; four outpatient clinics not affiliated with hospitals; two hospitals where there are outpatient clinics for women but not maternity wards; and three health centers where midwives are known to be working with family doctors as nurses.

**Methods.** A self-administered postal questionnaire was developed with a midwife and obstetrician-gynecologist,

piloted with four midwives, and then revised. It was written first in English, translated into Estonian, and then back-translated to English to ensure the quality of the translation. The 32-question survey consisted of four parts. The first part focused on demographic data (such as age, education, income, and place of work); the second part investigated attitudes about the respondent's current degree of responsibility, job satisfaction, training needs, and self-perceptions; the third part looked at antenatal care; and the last part was for comments, which were all subsequently translated into English.

Three weeks after mailing out the questionnaire, reminders were made by telephone to the head midwives at all 27 health care facilities where midwives were known to be working, as well as to the Family Planning Association, which runs youth counseling clinics where midwives also work. The replies were returned anonymously in pre-addressed, stamped envelopes.

**Statistical methods.** The data from the questionnaire were recorded and analyzed using Epi Info 2002 Revision 2 (Centers for Disease Control and Prevention, Atlanta, Georgia) and Stata 8 for Windows. Two researchers entered the data. The data sets were compared by the data compare function in Epi Info 6.04, and inconsistent entries were reconciled.

The Kolmogorov-Smirnov *D*-test, a goodness-of-fit test which evaluates whether a given distribution is not significantly different from the one hypothesized, was used to analyze the age distribution. For the analysis, age was dichotomized into a categorical variable:  $\leq 40$  and  $> 40$ .

To analyze the statistical relationship between work satisfaction as a binary-dependent variable and independent variables of age, nationality, plans to work abroad, salary, interest in more responsibility, and involvement in postpartum care and counseling, Chi-square tests were used. Odds ratios (ORs) were then calculated to check the differences between the base group and the other variables, one by one. The first category of each variable in Table II was defined as the baseline; ORs in the baseline categories are one, and the other categories were compared with the baseline. The adjusted ORs were computed by using a logistic regression model, and the effects of all variables on each other were assessed in order to control for confounding and take into account the effect of modification of independent variables on one another. The objective of the model was not prediction, but checking for the confounding effect among variables; therefore, all variables were included. ORs were presented with 95% confidence intervals.

## Nominal group process

**Subjects.** Twenty experts were invited to participate in the third stage of the study, the nominal group process. These were one representative each from the Association of Obstetrician-gynecologists, the Estonian Association of Midwives, the Estonian Health Insurance Fund, the Association of Patients, WHO, the Family Planning Association, and the Ministry of Social Affairs, as well as two additional midwives, an obstetrician-gynecologist, and a researcher formerly employed at the ministry. In addition, individual meetings were held with a family doctor and the head of the Family Planning Association, as they were unable to participate in the group meetings. Their rankings are included.

**Methods.** This nominal group process, a variation of the Delphi technique (15), began with a controlled feedback interaction to discuss select results from the midwifery survey. It was followed by the participants' anonymous

Table I. Description of midwives in Estonia

Variable	Frequency	Percentage
Age (years)		
≤40	160	58.6
>40	106	38.8
Not given	7	2.6
Mean (SD)	39.86 (9.9)	
Nationality		
Estonian	205	75.1
Russian	59	21.6
Others	7	2.6
Not given	2	0.7
Salary (EEK per year after taxes)		
<25 000	16	5.9
25 000–35 000	95	34.8
35 000–45 000	94	34.4
45 000–60 000	48	17.6
>60 000	8	2.9
Not given	12	4.4
Planning to work abroad		
No	220	80.6
Yes	29	9.5
Not given	27	9.9
Midwives should be involved in postpartum care and counseling		
No	21	7.7
Yes	247	90.5
Not given	5	1.8
Interested in more responsibility		
No	125	45.8
Yes	134	49.1
Not given	14	5.1
Job satisfaction		
No	131	48
Yes	137	50.2
Not given	5	1.8

Table II. Crude and adjusted odds ratios (ORs) between job satisfaction and other variables

Variable	Satisfied versus nonsatisfied	
	Crude OR (95% CI)	Adjusted OR (95% CI)
Age (years)		
≤40	1.00	1.00
>40	1.00 (0.63–1.68)	0.72 (0.39–1.30)
Ethnicity		
Estonian	1.00	1.00
Russian	0.93 (0.51–1.69)	0.98 (0.48–2.00)
Salary (EEK per year)		
<35 000	1.00	1.00
35 000–45 000	1.75 (0.99–3.09)	1.90 (0.99–3.59)
>45 000	4.66 (2.26–9.64)	4.90 (2.18–11.20)
Planning to work abroad		
No	1.00	1.00
Yes	1.35 (0.57–3.17)	1.20 (0.59–3.90)
Involvement in postpartum care		
No	1.00	1.00
Yes	0.75 (0.29–1.92)	0.99 (0.33–2.95)
Interest in more responsibility		
No	1.00	1.00
Yes	0.78 (0.48–1.29)	0.88 (0.49–1.58)

ranking, on a self-administered written form, of their degree of agreement with each of 10 preformulated key statements. These statements were based on the findings of the questionnaire sent to the midwives in order to test whether other stakeholders would agree with the main results. A 9-point scale, with one indicating complete disagreement and nine complete agreements, was employed. If, after discarding the highest and lowest single rating, the remaining ratings lay within a single 3-point range, agreement was considered to exist. Disagreement was defined as at least one of the remaining ratings being 1–3 and at least one 7–9. Other combinations were considered to be partial agreement (16). All proceedings were tape-recorded, and additional written comments in English were made anonymously by the participants on the ranking forms.

## Results

### Midwifery questionnaire

Of the 366 questionnaires sent out, 274 were completed and returned, for a response rate of 75%. The mean age of the responding midwives was 39.8. The age distribution has a slightly positive skewness (0.5) and this is significant ( $P = 0.01$ ).

Midwives in Estonia often either perform deliveries (49%) or ANC (56%), with just a few doing both or something completely different. Table I is a general description of midwives in Estonia, as based on the survey results. More than a fifth of the respondents were Russian, whereas Russians represent 28% of the general population. More than two-thirds earn between EEK 25 000 and 45 000 annually (EEK 1000 = USD 78), and some 10% plan to work abroad. The vast majority of the midwives support their involvement in postpartum care and counseling. Overall, just less than half of the respondents would like more responsibility at work and approximately the same number are dissatisfied with their job. Both issues are further discussed below.

When analyzing the results, particular attention was paid to possible relationships between job satisfaction and age, nationality, and salary. Table II shows that there was no statistically significant association between job satisfaction as a dependent variable and the independent variables of age, nationality, plans to work abroad, interest in more responsibility, or involvement in postpartum care and counseling, as measured by Chi-square tests, supported by crude and adjusted ORs. There was, however, a significant association between job satisfaction and salary. Further analysis showed that the Russian midwives earned less than their Estonian counterparts: 60% were in the lowest salary category against 37% of the Estonian midwives.

All the ORs are close to the adjusted OR, showing that there was no confounding effect between variables.

The significant association between work satisfaction and salary was at EEK >45 000, which 21.2% of the respondents earned. The ORs show a positive linear association between job satisfaction and salary.

According to one midwife, salary was not traditionally associated with satisfaction:

"You have to consider that at the beginning of the '90s we had good motivation. We wanted to build up something, start a new Estonia... At this point the salary wasn't so important because we all had bad situations. We all knew that we had to start and do something, but now, today, salary is important, because what we have seen is that for some people the best is never coming and for others it comes extremely quickly and it doesn't always depend on professional skills."

One participant in the group discussions elaborated, stating that "Most health care professionals are dissatisfied because of the changes in the health care system." And another added, "Most of the midwives like their job [profession] but dissatisfaction is the result of an unclear role and future, and job management."

### Conclusions of the panel

Of the 20 invited experts, three declined due to conflicting engagements and four did not show up to either of the two meetings. The 13 participants represented all major areas of health care and were very interested in the study topic, meeting for 90 minutes each. The results of the ranking of 10 key statements, which were designed to help interpret the results of the midwifery survey and assess where areas of agreement among key stakeholders lie, are summarized in Table III.

While there was some agreement on most issues, the two areas of disagreement dealt with the role of family doctors in ANC. Most of the participants felt that family doctors should be in charge of ANC, but few felt that they should carry it out. This is in sharp contrast to the 96.5% of the survey respondents who felt that family doctors should not be in charge of ANC overall. Suggestions ranged from "involve midwives with family doctors officially, not as nurses, but as midwives," to the use of family nurses, as a number of them have midwifery training.

One participant recounted that, though family doctors can perform ANC according to current guidelines, in 1999–2000 only approximately 4–5%

of pregnant women visited their family doctors in the city of Tartu. During 2001–2002, the number of family doctors performing ANC decreased, in part owing to a lack of experience and interest. If a physician sees only 10–12 pregnant patients annually, "she gains too little experience and prefers to refer the patient to an obstetrician-gynecologist." There are also financial disincentives to providing ANC, and again referral is often seen as the preferential option.

As another participant put it, "For 50 years ANC has been done by gynecologists with midwives, not GPs, and midwives have better experience." Another added, "This [the family doctors] can be one of the choices." That said, several participants brought up the point that it was not midwives themselves but their work that was important, and that whoever could carry it out adequately should be supported, "They [family doctors] have family nurses who could do the job and at the same time they could also hire part-time midwives if necessary."

One respondent stated that "there should be certain criteria for when the family doctor/nurse can take responsibility for ANC," while another said, "the family doctors should carry out ANC if they feel that they are able to do it."

Regarding salary (Table III, statement 5), a priority issue for the midwives, most participants felt that midwives were not adequately paid, but there was only partial agreement. One participant summed it up as, "Compared to other health care

Table III. Degree of consensus among stakeholders

Statement	Level of agreement	Median
1. The main task of midwives is to deliver babies	PA	5
2. The decline in midwifery is primarily due to job dissatisfaction	PA	4
3. The decline in the number of midwives is likely to continue	A	5
4. Midwives have good reason to be dissatisfied with their job situation	PA	7.5
5. Midwives are adequately paid	PA	3
6. It is important for Estonia to stop the decline in the number of midwives	PA	8
7. Family doctors should be in charge of antenatal care	D	7
8. Family doctors should carry out antenatal care	D	4
9. Midwives should be more involved in postpartum care	A	9
10. Models in which midwives have more responsibility, e.g. Finland and Sweden should be the gold standard for Estonia	PA	8

A, agreement; PA, partial agreement; D, disagreement; 1, completely disagree; 9, fully agree.

Box 1. A midwife's professional skills include

- Ability to evaluate ethical issues.
- Theoretical knowledge.
- Clinical proficiency.
- Teaching and advising skills.
- Knowledge of health promotion.
- Ability to work in a team.
- Ability to research.
- Administrative skills.
- Ability to handle cultural differences.
- Communication skills.

The data are taken from Estonian Master Plan for Midwifery 2002–2015.

professionals it's OK, but in general the income could be higher."

## Discussion

The survey results show that Estonian midwives, regardless of their age or ethnicity, are not a homogeneous group with regard to attitudes to key issues. Forty-eight percent reported that they were not satisfied with their jobs, but when compared to six other key variables, the only significant association was with salary level. Slightly less than half would like increased responsibility, but a clear majority felt that midwives should be involved in postpartum care and counseling. The key stakeholders involved in the group process fully agreed with the latter, but otherwise had differing opinions on almost all statements, especially those concerning the role of the family doctors, where not even partial agreement could be reached.

### *Methodological issues*

Owing to the lack of a complete register of midwives in Estonia, it was not possible to ensure that all midwives received a questionnaire. In addition, the structured questionnaire clearly did not accommodate all answers, as several respondents wrote comments in the margins or marked two boxes when only one should have been marked.

The results of the stakeholder group discussions may have been colored by the composition. It was difficult to ensure, for example, that an equal number of family doctors, midwives, and obstetrician-gynecologists would attend, and the numbers ended up being unbalanced.

This study's principal limitation was, perhaps, that it focused exclusively on medical professionals and government officials, but did not explore the attitudes of mothers and prospective mothers toward potential changes. Randomized controlled trials and qualitative research from other countries show not only that women prefer to see midwives for ANC (17), but that when midwives are in

charge, the quality of care is often better (18,19), as measured by both patient satisfaction (20–22) and concrete outcomes (23). Nevertheless, taking into account the small size of the country, it can be assumed that the results of this study provide a comprehensive picture of the attitudes of midwives and key stakeholders in midwifery.

### *The salary of midwives*

The midwives in Estonia are clearly dissatisfied with their salaries, though this feeling is apparently relatively recent. During the panel discussions, the fact that hospital directors are the only hospital employees who can receive large bonuses was brought up, emphasizing the importance of fair wages. Nevertheless, midwife salaries were seen as a minor problem by the participants, who felt that midwives are not particularly poorly paid. They also added that wage differences often depend on whether the midwife works in the delivery ward, antenatal department, or postpartum rooms. Moreover, they can vary from region to region and especially between cities and rural areas.

It is revealing to consider the results of a study on motivation and satisfaction among another group of Estonian medical professionals. When family doctors were asked to indicate their degree of satisfaction with 13 different aspects of their jobs, they ranked income last (24) and family doctors earn significantly more than midwives. The same study reported that independently working practitioners reported greater work satisfaction than employed doctors with regard to both income and the opportunity to use their skills to the maximum, a finding that may well be applicable to midwives. Ultimately, if midwives are to be given increased responsibilities, their salaries will have to be adjusted. As one midwife put it, "Due to the insufficient wages, I'm not ready to take on more responsibility".

### *Job satisfaction*

The Master Plan for Midwifery 2002–2015 characterizes a midwife as a specialist in the promotion of sexual and reproductive health and gynecologic care. That midwives in Estonia are often not treated as specialists, with the concomitant respect and responsibility, is probably one of the main reasons, in addition to salary, that almost half of the questionnaire respondents stated they were not satisfied with their job. This dissatisfaction was also recognized by the stakeholder panels, which also revealed a shortcoming

of the questionnaire, namely that the term satisfaction is very open to interpretation. This was partially remedied in the nominal group process, which delved further into the specific activities of midwives and family doctors.

The increased responsibilities and independence given to midwives at Fertilitas, a private clinic in Tallinn, are one of the indications that changes may be on the way.

Legislation on midwife reimbursement and society's mixed perceptions of midwifery, two of the main issues facing midwives in the United States of America (25), are also sources of dissatisfaction for midwives in Estonia. In spite of a long midwifery tradition, the number of midwives has declined much more rapidly than the overall birth rate has, as measured by the number of midwives per 1000 crude births (Fig. 4). While the number of midwives did increase during certain periods with respect to the number of crude births, the number of midwives with respect to population has declined every year but one since 1991, from 61 per 100 000 in 1991 to 31 in 2002 (Fig. 2). The survey results indicate that many midwives feel left out as they watch the government prioritizing family medicine and promoting its provision of ANC, while a Cochrane systematic review demonstrates that ANC can be effectively led by midwives, with the involvement of obstetrician-gynecologists for high-risk pregnancies or in the event of complications (26).

#### Family medicine and midwifery

While it was clear that all of the group participants supported the family medicine reform,

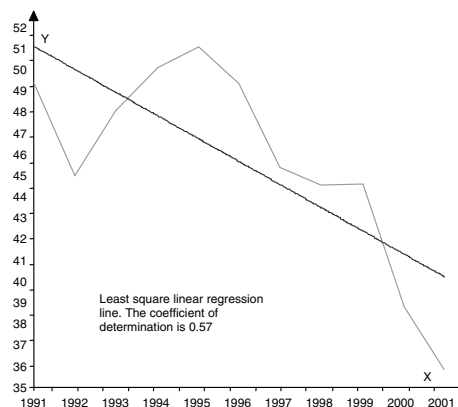


Fig. 4. Number of midwives per 1000 crude births in Estonia, 1991–2001. Source: Based on data from the WHO European health for all database, accessed 20 May 2003.

there was a lack of a clear understanding of the respective responsibilities of obstetrician-gynecologists, family doctors, nurses, and midwives, especially with regard to ANC. The family medicine system developed patient lists in order to guarantee better continuity of care (12); hence, a mechanism for pregnant women to at least meet their midwife before delivery could be ensured. At present, a midwife performs her duties in collaboration with fellow midwives, as well as doctors, patients, and other maternity team members, but has little or no contact with family doctors, although she may practice in hospitals, clinics, health units, other health facilities, and residences.

According to the Master Plan for Midwifery, one of the main challenges facing the profession is to ensure autonomy through the continuous advancement of midwifery, relevant legislation, and ongoing training. But unlike family medicine, there are currently no laws governing midwifery in Estonia, and instead of being regulated, the rights and activities of a midwife depend on the rules of the particular health care facility she is working in and sometimes on the personal relationship and trust between her and the obstetrician-gynecologist.

A WHO evaluation of primary care in Estonia concludes that the lack of information about the use and activities of nursing staff indicates that the system has not fully discovered the value and benefit of trained nurses in family practice (3). It adds that nurses probably work more as practice assistants or secretaries than real primary health care team members. This is a situation often akin to that of midwives working alongside obstetrician-gynecologists. The report concludes by recommending multiprofessional collaboration as one of the key issues in a well-developed primary health care system, and it was clear during the discussions that this is not yet the case for family doctors and midwives.

#### The midwife's potential extra role

The findings suggest that those involved in Estonian health care reform ought to consider other possibilities inherent in the midwife's traditional role. In a country where every other pregnancy ends in abortion, one obvious area would be discussing women's family planning needs with them. In addition, in light of the outbreaks of syphilis and gonorrhoea in the mid-1990s and HIV since 1999, another obvious area is STI/HIV counseling. Such work is in accordance with the International Conference on Population

and Development (ICPD) Programme of Action and the Millennium Development Goals, both of which Estonia is signatory to. The ICPD established priorities in the field of sexual and reproductive health and rights (27), while the Millennium Development Goals set targets for improving maternal health and for halting and reversing the spread of HIV/AIDS (28).

In addition to the current responsibilities that Estonian midwives perform in this field at youth counseling clinics, an expanded definition of their responsibilities could also cover other components of reproductive health such as family planning counseling and STI testing (29,30), at outpatient clinics in rural areas and maternity wards in urban settings. Voluntary counseling and testing for HIV ideally starts with group pretesting information sessions, and pregnant women are an obvious target group as all Estonian women are guaranteed ANC after their twelfth week of pregnancy. With 98.5% of the survey respondents saying that midwives should be involved in counseling, a new policy initiative in this direction makes good sense.

Right now, the Estonian Association of Midwives is working with the Ministry of Social Affairs on the first act to address midwifery directly. The current draft describes a midwife as a specialist in sexual education, contraception, pregnancy, childbirth, and the postpartum period. The drafters would do well to consider the practice of midwifery elsewhere. Most panel participants acknowledged Nordic models as the gold standard for the profession, and in Sweden, for example, midwives play leading roles in family planning (4). But the example of midwives in other regions can suggest other possibilities; for instance, in southern Africa midwives play an important role in fighting HIV/AIDS (31).

At present, the number of Estonian midwives who take on non-traditional roles is small. Approximately 15 of the country's midwives teach, eight at the medical school, while 25 midwives are involved in youth counseling and family planning. Figure 5 shows the current responsibilities of midwives in Estonia by degree of activity. Three of the boxes, for ANC, deliveries, and postpartum care, are white, representing the profession's primary activities. The remaining seven boxes represent tasks that are being successfully carried out by midwives in other countries.

## Conclusions

As the first nationwide study of Estonian midwives, the present investigation found that the

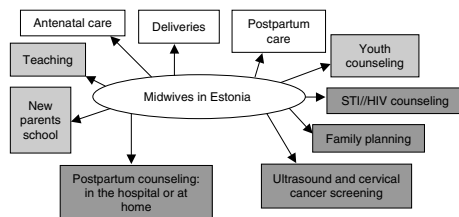


Fig. 5. Midwives in Estonia: areas of work by degree of involvement.

Note: White represents current main responsibilities, light gray represents some responsibility, and dark gray represents very little or no involvement. STIs, sexually transmitted infections; HIV, human immunodeficiency virus.

Source: Adopted from Lazarus et al. Observations on Reproductive Health Programs in the Baltic States. *International Journal of Gynecology and Obstetrics* (2004) 87, 277–280.

decline in midwife numbers and status is integrally related to the reduction of their responsibilities, which was a result of the introduction of family medicine. These changes are also partly attributable to the accelerated reform of the country's post-Communist health care system, e.g. the closure of hospitals and a general reduction in the number of health care specialists. Current indications, as reported by the midwives themselves, suggest that the number of midwives, especially new graduates, will continue to decline.

Two of the most daunting challenges that the Estonian health care system now faces are how to continue to bring down its high abortion and HIV infection rates. Using midwives to provide family planning and STI services has proven effective in neighboring countries, and while a few midwives have begun to offer such services in Estonian youth counseling centers, this study indicates that for further progress it should be a part of more midwives' roles.

Salary increases, augmented responsibility for antenatal, and postpartum care and counseling, and involvement in family planning and STI initiatives are some of the measures that could improve the situation of Estonia's midwives and also the population in general.

## Acknowledgments

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**A multilevel analysis of condom use among adolescents in Europe**

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## **Abstract**

### **Objectives**

The present study examines which individual and national factors affect condom use among adolescents.

### **Study design**

This was a multilevel analysis.

### **Methods**

This study reviews the data on bullying, alcohol use and condom use in the 18 European countries and subnational entities providing them in the 2002 Health Behaviour in School Aged Children survey. Another eight contextual variables were also scrutinised. Three multilevel logistic regression models were applied consecutively (analysing for crude geographical and school variance in condom use, adjusting for gender and adjusting all variables for each other).

### **Results**

Among the 15-year-olds studied, 7.0% of the total variance in condom use was explained by school-related factors (intraschool-level correlation) and 5.8% by national/regional factors. In the empty model, condom use was significantly associated with gender, alcohol consumption, predominant national religion and national HIV prevalence. In the full model, there was also a significant association with the Human Development Index ranking, gross domestic product, Gini coefficient and Gender-related Development Index.

### **Conclusions**

This study suggests that while alcohol, gender, human development level, income, religion and HIV prevalence affect condom use in young Europeans, these factors do not explain all the variation. Nonetheless, since some of these factors are not traditionally associated with young people's sexual and reproductive health, these findings should enable more nuanced health policy programming.

**Keywords:** Adolescents, Multilevel analysis, Reproductive health, Sexual health, Europe

## **Introduction**

The initial impetus for this study came from work on the Sexual Awareness for Europe (SAFE) project, which included identifying evidence-based priorities for sexual and reproductive health interventions. The project timeframe coincided with the enlargement of the European Union (EU) in 2004 and 2007 from 15 to 27 member states. The enlargement focused attention on health status in the new members and the implications for health in Europe as a whole.<sup>1-3</sup> The new EU countries are typically poorer socioeconomically than the older members, as exemplified by a lower gross domestic product (GDP) and a lower ranking on the Human Development Index (HDI); they also tend to have less experience with democratic political institutions. Yet it was not clear if these differences corresponded to differences in the sexual and reproductive health of their young people.

Such macro factors are often neglected in health behaviour studies,<sup>4,5</sup> which tend to focus on aspects of an individual's behaviour. Ecological approaches, such as multilevel analysis, can identify how societal structures affect individual health.<sup>6-11</sup>

Many contraceptive studies have focused on individual factors.<sup>12</sup> Fewer studies have examined the impact of contextual factors, and they have been conducted primarily in the United States<sup>13,14</sup> or low-income countries, recently for instance in Bangladesh<sup>15</sup> and India.<sup>16</sup>

Understanding contextual factors, such as group level variables, is essential to the development and implementation of effective HIV prevention initiatives. For the expanded EU, the present study should provide insight into how to reduce unwanted pregnancy and the spread of sexually transmitted infections among young people by describing some of the key factors, both individual and contextual, that affect condom use.

## **Methods**

### *Participants*

Data were obtained from the only available source of comparable data on adolescent health behaviour in Europe, the Health Behaviour in School-aged Children (HBSC) survey. The HBSC has a standardised protocol that requires that specially trained personnel, teachers or school nurses administer the questionnaires in classrooms. Questionnaires were distributed during ordinary class hours. Students were informed that participation was voluntary, and that responses would be treated as anonymous. The 18 countries and subnational regions in Europe for which the 2002 HBSC survey had data on bullying, alcohol use and condom use<sup>17</sup> were Austria, Belgium (Flemish), Estonia, Finland, France, Greece, Hungary, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and, in the United Kingdom, England, Scotland and Wales.

### *Individual variables*

The anonymous records of the students in the HBSC included a range of different parameters, of which the following were chosen as most relevant from a reproductive health perspective: gender (understood here as the student's biological sex); level of alcohol consumption (high level of use being defined as drinking at least 2-4 times a week); and bullying behaviour (defined as bullying others at least 2-3 times a month in "the previous couple of months").

Data on condom use came from the HBSC question on form of contraception used during last sexual intercourse. This question was asked only of 15-year-olds.

#### *School-level variables*

At the school level, data on whether or not young people bullied others was aggregated, drawing on the questionnaire item used for bullying behaviour in the individual variables.

#### *Country-level variables*

Eight contextual factors were assessed for impact on condom use among adolescents.

1. *National socioeconomic level* was considered by using the continuous variable of per capita GDP rank (based on a purchasing power parity (PPP) measured in American dollars) minus HDI rank.<sup>18</sup> (PPP is designed to correct for differences in national price levels.) The GDP data for the HDI report were provided by the World Bank, based on GDP figures from national account data and price data from the latest International Comparison Program surveys.
2. *Socioeconomic distribution* in the country was measured with the Gini coefficient index.<sup>18</sup> It measures the extent to which the distribution of income among individuals or households within a country deviates from a perfectly equal distribution. A value of 0 represents perfect income equality and a value of 100 perfect inequality.
3. The *HDI rank* is a continuous variable. The HDI is a composite index measuring average achievement in three basic dimensions of human development: a long and healthy life, knowledge and a decent standard of living.<sup>18</sup>
4. The *Gender-related Development Index* is a composite index measuring average achievement in the three basic dimensions captured in the HDI, but adjusted to account for inequalities between men and women.<sup>18</sup>
5. The *main religion* variable is categorical, e.g. Catholic or “other Christian”. The main religion was defined as a religion to which more than 50% of the population is reported to adhere to.
6. A *sexuality education index* was developed on the basis of *Sexuality Education in Europe: A reference guide to policies and practices*,<sup>19</sup> which assessed school-based sexuality education in 26 European countries. The authors of this article developed the index to create a binary variable for multilevel regression analysis. It draws on the answers to three questions used for the reference guide: 1) Is sex education mandatory? 2) If so, what year did it become mandatory? 3) At what age does sex education officially begin? The data were weighted such that those countries where sex education is mandatory were ranked above those in which it is not. Next, the age when sex education officially begins was added to the equation, followed by the year when it became mandatory. Finally, a review of the descriptive material for each country’s sexuality education was undertaken to assess the material’s adequacy. The resulting binary variable was countries/regions with adequate sex education and those without.
7. *Place of residence* was divided between western Europe (defined as the EU countries before the 2004 enlargement) and eastern Europe (countries acceding in 2004).

8. The estimated percentage of people living with HIV/AIDS (*HIV prevalence*) at the end of 2001 among adults aged 15–49.<sup>20</sup> The variable was dichotomized as either high (>0.3)% or low.

Where data were not disaggregated by subnational entity (i.e. England, Flanders, Scotland and Wales), the national figures were used instead.

### *Analytical approach*

Because of the hierarchical structure of the data – students within schools within countries – possible intra-school and intra-country correlation in the probability of contraceptive use was explored by consecutively applying three multilevel logistic regression models. The first model was empty, in that only the crude school and national/subnational variance were analysed. In the second model, all variables were adjusted for gender. In the third (full) model, all the individual variables were adjusted for each other, and the national variables were added one at a time: religion, sexuality education, place of residence, Gini coefficient, HDI ranking, GDP, Gender-related Development Index and HIV prevalence.

Odds ratios (ORs) with 95% confidence intervals were calculated for all binary variables and p-values for the four continuous variables by using a stepwise logistic regression trend test. For all binary variables, the school effect, intra-school correlation (a measure of the degree of similarity among the outcomes of members of the same school), country/region effect and intra-country/region correlation were also calculated, as well as the variance and standard error.

The MLwiN Beta version 2.00 and the SPSS version 12.0.1 were used to perform the analyses.

## **Results**

Out of the 28 306 students included in the study, 5918 (20.9%) had had their sexual debut (see Table 1) and their age ranged from 14.2 to 17.2. Almost all (98%) of the participants were aged 14.5 to 16.5, with a mean age of 15.6. Table 1 shows self-reported condom use by country/region, which varied from 52.7% in Sweden to 89.1% in Greece.

**Table 1. Condom use among 15-year olds by country/region in the European Union\***

Country		Condom use		Total (% of those who had sexual debut in the study population)
		Yes	No	
Austria	Count	197	46	243 (19.8)
	%	81.1%	18.9%	100.0%
Belgium (Flemish)	Count	322	141	463 (23.8)
	%	69.5%	30.5%	100.0%
England	Count	485	214	699 (37.6)
	%	69.4%	30.6%	100.0%
Estonia	Count	144	59	203 (16.4)
	%	70.9%	29.1%	100.0%
Finland	Count	303	172	475 (27.9)
	%	63.8%	36.2%	100.0%



France	Count	438	98	536 (21.4)
	%	81.7%	18.3%	100.0%
Greece	Count	230	28	258 (20.6)
	%	89.1%	10.9%	100.0%
Hungary	Count	194	61	255 (19.6)
	%	76.1%	23.9%	100.0%
Latvia	Count	119	42	161 (15.3)
	%	73.9%	26.1%	100.0%
Lithuania	Count	237	75	312 (16.9)
	%	76.0%	24.0%	100.0%
Netherlands	Count	206	64	270 (21.9)
	%	76.3%	23.7%	100.0%
Poland	Count	226	83	309 (14.6)
	%	73.1%	26.9%	100.0%
Portugal	Count	135	52	187 (23.9)
	%	72.2%	27.8%	100.0%
Scotland	Count	252	117	369 (33.1)
	%	68.3%	31.7%	100.0%
Slovenia	Count	178	66	244 (24.2)
	%	73.0%	27.0%	100.0%
Spain	Count	223	35	258 (15.4)
	%	86.4%	13.6%	100.0%
Sweden	Count	167	150	317 (26.9)
	%	52.7%	47.3%	100.0%
Wales	Count	246	113	359 (32.8)
	%	68.5%	31.5%	100.0%

\* No data were available for the Czech Republic, Cyprus, Denmark, Germany, Ireland, Italy, Luxembourg, Malta or Slovakia.

Table 2 presents a descriptive overview of five of the contextual variables by country (separate figures for subnational regions were not available). Ten countries were predominantly Roman Catholic, while the other six were “other Christian”. The countries’ HDI rank ranged from 6th (Sweden) to 48th (Latvia), out of 177 nations. All of the pre-enlargement (2004) EU members except Portugal ranked higher than the newly acceded member states. In 13 countries, the HDI rank was higher than its GDP rank, with Sweden topping the list and Austria at the bottom. Again, all pre-enlargement EU countries except for Portugal ranked higher than the newly acceded members. Gini coefficients ranged from 25.0 in Belgium and Sweden to 38.5 in Portugal.

**Table 2. Descriptive overview of country variables**

Country	Main religion	HDI (ranking, 2005)	GDP per capita (PPP US\$) rank minus HDI rank*	Gender-related Development Index rank, 2003	Gini coefficient	HIV prev. (2001)
Austria	Roman Catholic	0.936 (17)	-8	19	30.0	0.2
Belgium	Roman Catholic	0.945 (9)	3	9	25.0	0.2
Estonia	Other Christian	0.853 (38)	4	35	37.2	1.0
Finland	Other Christian	0.941 (13)	3	10	26.9	<0.1
France	Roman Catholic	0.938 (16)	-1	16	32.7	0.3
Greece	Other Christian	0.912 (24)	2	24	35.4	0.2
Hungary	Roman Catholic	0.862 (35)	5	31	26.9	0.1
Latvia	Other Christian	0.836 (48)	7	43	33.6	0.4
Lithuania	Roman Catholic	0.852 (39)	8	36	31.9	0.1
Netherlands	Roman Catholic	0.943 (12)	-1	12	30.9	0.2
Poland	Roman Catholic	0.858 (36)	12	33	34.1	0.1
Portugal	Roman Catholic	0.904 (27)	5	26	38.5	0.5
Slovenia	Roman Catholic	0.904 (26)	4	25	28.4	<0.1
Spain	Roman Catholic	0.928 (21)	3	21	32.5	0.5
Sweden	Other Christian	0.949 (6)	14	4	25.0	0.1
United Kingdom**	Other Christian	0.939 (15)	3	15	36.0	0.1

\* A positive figure indicates that the HDI rank is higher than the GDP per capita (PPP US\$) rank, a negative the opposite.

\*\* Includes England, Scotland and Wales.

Table 3 presents the three components of the sexuality education reference guide used to create the sexuality education index, the second contextual variable in the multilevel analysis. Sex education was mandatory in all but four countries (Lithuania, Poland, Spain and the United Kingdom). However, that does not mean that it is not taught in all or part of those four countries. Among countries where it is compulsory, Portugal was the latest to institute it (1999). The age when sexuality education officially begins ranged from 5 to 13, with the content reported as being adjusted accordingly.

**Table 3. Components of the sexuality education in schools index**

Country	Sexuality education mandatory	Year made mandatory	Age when sexuality education officially begins
Austria	yes	1970	10
Belgium	yes	1995	6
Estonia	yes	1992	10
Finland	yes	1970	7
France	yes	1998	6
Greece	yes	1995	6
Hungary	yes	1975	10
Latvia	yes	1998	7
Lithuania	no	N/A	-
Luxembourg	yes	1973	6

Netherlands	yes	1993	13
Poland	no	N/A	12
Portugal	yes	1999	5
Spain	no	N/A	14
Sweden	yes	1955	6
United Kingdom	no	N/A	5/7

--: Information not available.

Table 4 reports the full results of the factors that affected adolescent condom use. The results for each model are as follows.

#### *Empty model*

To provide a general overview of the data, each variable was entered in the empty model separately, and the result was not controlled for other variables. The percentage of the total variance in condom use that was explained by school-related factors (intra-school correlation) was 7.0%, and the percentage explained by country/region-related factors (intra-country/region correlation) was 5.8%, for a total of 12.8%.

Gender had a statistically significant impact on condom use, with girls being 1.66 times less likely to use a condom than boys. Alcohol use (1.17) and religion (1.47) were also found to be significant, while bullying, sex education and place of residence were not.

#### *Gender-adjusted model*

The variables were adjusted for gender in the second model because the empty model showed that boys and girls behaved differently with regard to condom and alcohol use and perhaps with regard to bullying, and because the distribution of predominant national religion among male and female participants was unequal. In comparison to the empty model, the OR for alcohol increased slightly to 1.26 and decreased slightly for religion (1.42), while bullying now became significant (1.17).

#### *Full model*

In the full model, all three individual variables were adjusted for each other. Gender and alcohol remained significant, but not bullying. Then the contextual variables were entered into the model one at a time. Gender was more significant than in the empty model (1.73). A high level of alcohol consumption (at least 2–4 times a week) implied a 1.24 times higher risk of not using a condom. Bullying was also tested at the school level (not shown in table) and was not found to be significant in any of the models.

The predominant national religion changed only slightly compared to the previous two models, accounting for 4.9% of the variation in condom use among countries/regions. Where Catholicism did not predominate, there was a 1.46 greater likelihood of not using a condom.

Table 4. **Factors affecting non-condom use**

	Odds ratio (95%)	School effect (Variance (SE))	Intra- school correlation	Region effect (Variance (SE))	Intra- country/region correlation
<b>Empty model</b>		0.246 (0.052)	7.0%	0.201 (0.077)	5.8%
Gender (Girls)	1.66 (1.48–1.86)*	0.238 (0.053)	6.7%	0.180 (0.070)	5.2%
Alcohol (High level of drinking)	1.17 (1.02–1.33)*	0.244 (0.050)	6.9%	0.206 (0.080)	5.9%
Bullied (do bully)	1.03 (0.89–1.19)	0.262 (0.050)	7.4%	0.212 (0.080)	6.1%
Religion (Christian other than Catholic)	1.47 (1.31–1.65)*	0.264 (0.050)	7.4%	0.179 (0.080)	5.2%
Sex education (inadequate)	1.03 (0.92–1.15)	0.262 (0.050)	7.4%	0.212 (0.078)	6.1%
West Europe vs. East Europe	0.95 (0.82–1.10)	0.262 (0.050)	7.4%	0.210 (0.079)	6.0%
High HIV prevalence	0.78 (0.66–0.93)*	0.252 (0.054)	7.1%	0.210 (0.078)	6.0%
<b>Gender adjusted model</b>					
Alcohol (High level of drinking)	1.26 (1.10–1.44)*	0.254 (0.052)	7.2%	0.188 (0.074)	5.4%
Bullied (Do bully)	1.17 (1.01–1.36)*	0.249 (0.052)	7.0%	0.192 (0.072)	5.5%
Religion (Christian other than Catholic)	1.42 (1.27–1.60)*	0.252 (0.052)	7.1%	0.162 (0.070)	4.7%
Sex education (inadequate)	1.02 (0.91–1.15)	0.250 (0.052)	7.1%	0.190 (0.071)	5.5%
West Europe vs. East Europe	1.01 (0.88–1.17)	0.250 (0.052)	7.1%	0.186 (0.071)	5.4%
High HIV prevalence	0.76 (0.66–0.94)*	0.243 (0.053)	6.9%	0.188 (0.071)	5.4%
<b>Full model</b> (All individual factors (gender, alcohol, bullying) are in the same model and adjusted for each other)		0.252 (0.053)	7.1%	0.194 (0.075)	5.6%
Gender (Girls)	1.73 (1.53–1.95)*				
Alcohol (High level of drinking)	1.24 (1.08–1.42)*				
Bullied (do bully)	1.13 (0.97–1.32)				
Full model + Religion	1.46 (1.30–1.65)*	0.256 (0.053)	7.2%	0.170 (0.073)	4.9%

(Christian other than Catholic)					
Full model + Sexuality education (inadequate)	1.00 (0.89–1.13)	0.253 (0.053)	7.1%	0.201 (0.074)	5.8%
Full model + West Europe compared to East Europe	1.01 (0.87–1.17)	0.254 (0.053)	7.2%	0.198 (0.075)	5.7%
Full model + high HIV prevalence	0.80 (0.67–0.95)*	0.254 (0.055)	7.2%	0.201(0.075)	5.8%
<b>Trend test</b>					
Full model + Gini Coefficient index	P≤0.00*	0.255 (0.053)	7.2%	0.197 (0.069)	5.6%
Full model + HDI	P≤0.00*	0.254 (0.053)	7.2%	0.188 (0.066)	5.4%
Full model + GDP rank minus the HDI rank	P≤0.00*	0.257 (0.054)	7.2%	0.139 (0.050)	4.1%
Full model + Gender-related development index	P≤0.00*	0.254 (0.053)	7.2%	0.179 (0.061)	5.2%

\* Significant impact.

Whether the students lived in western or eastern Europe, and whether or not there was an adequate sex education system in place nationally, revealed no significant variation between the two regions of Europe or the schools.

In the last part of analysis, four more contextual variables were entered in the model and the Gini coefficient, the HDI ranking, the national socioeconomic level (GDP per capita rank minus HDI rank) and the Gender-related Development Index rank were all shown to be significant ( $p \leq 0.001$ ).

In countries with “high” HIV exposure (prevalence  $\geq 0.3\%$ ) – Estonia, Latvia, Portugal and Spain – there was significantly more condom use (76.8%) than in countries with low exposure (72.0%).

Table 5 sets out the overall numbers and percentages of the study population with respect to the three individual variables (gender, alcohol use and bullying) and the binary contextual variable that was shown to be significant in the models employed in the analysis and presented in Table 4 (religion). While boys were more likely to report condom use than girls, those who exhibited risk behaviours like consuming alcohol were slightly more likely to report not using them. When disaggregated by gender, this also became true for bullying (see Table 4). In countries where Roman Catholicism was the predominant religion, condom use was more common.

Table 5. **Variables impacting on condom use in Europe**

	Do not use condoms N (%)	P-value
<i>Gender*</i>		P≤0.000*
Boys	706 (22.6)	
Girls	910 (32.6)	
<i>Alcohol*</i>		P≤0.025*
Low use	1189 (26.6)	
High use	412 (29.7)	
<i>Bully others**</i>		P≤0.679
No	1296 (27.2)	
Yes	305 (27.8)	
<i>National religion***</i>		P≤0.000*
Roman Catholic	721 (23.5)	
Other Christian	895 (31.6)	
<i>HIV prevalence***</i>		P≤0.005*
High	188 (23.2)	
Low	1428 (28.0)	

\* Significant in the empty and gender-adjusted models (see Table 4).

\*\* Significant in the gender-adjusted model (see Table 4).

\*\*\* Significant in the empty and gender-adjusted models and full model (see Table 4).

## Discussion

This study found that condom use in the EU countries/regions and schools studied is affected by alcohol use, a history of bullying behaviour and gender, in addition to the national factors of predominant religion, HIV prevalence rate and a range of socioeconomic indicators. The study population was sexually active 15-year-olds and the factors examined were specific risk behaviours, lifestyle factors and contextual, group level indicators. Since there is a high inverse correlation between condom use and the prevalence of STIs and unwanted pregnancies, condom use can be employed as a proxy for some aspects of reproductive health status, and as a consequence, these results warrant attention and further research.

However, while the findings suggest numerous factors that affect condom use, variation remains among the schools and countries/regions studied which is not explained by these factors. Furthermore, while the study shows that condom use varies widely among EU countries and subnational entities, these figures mask sub-national variances among different population groups, regions or even schools. Additional research needs to uncover the additional variables correlated with adolescent condom use.

Given the scarcity of comparable data for individuals, such studies will likely need to focus on individual countries or small groups of countries. This study, for example, did not look at ethnicity, as this variable was not available from the HBSC dataset. Elsewhere, this factor has been considered important, both as a variable in its own right<sup>21</sup> and because of the interrelated effect of ethnicity and gender.<sup>22, 23</sup> Furthermore, the HBSC dataset only provided sexual health data for 15-year-olds, of whom just over one fifth were sexually active in the countries studied, and data were missing for some EU countries participating in the HBSC study overall.

### *Intra-school and intra-country/region correlations*

Individuals attending the same school may be more similar to each other than to individuals attending other schools, as they share a number of economic, social, pedagogical and other characteristics that may condition a similar health status. In this sense, schools can be considered as “clusters” of individuals sharing a common propensity for similar outcome within clusters. Our study showed a very low level of intra-school correlation and one that remained relatively stable between the models. The level was, however, higher than the intra-region/country correlation. The combined variance in the empty model (12.8%) reveals that most of the variance in condom use is unaccounted for in this study, though the study does show a number of individual and contextual variables not studied before in a cross-national European study on the subject.

### *The European context*

The accession of ten new countries to the European Union decreased the average for the EU on most major health indicators, including life expectancy, HIV, syphilis and tuberculosis rates.<sup>24</sup> At the same time, in many of the new EU countries health systems themselves were still marked by an over-supply of hospitals and specialists, with an insufficient focus on primary health care including health promotion.<sup>25, 26</sup> Given this situation, in particular with regards to the absence or poor quality of sexuality education in many countries,<sup>19</sup> and given that aspects of sexual and reproductive health cannot be addressed in isolation, the national and international contexts must also be considered. Ecological models can be especially useful in studying such contextual variables and their impact. According to such models, behaviours are influenced by intrapersonal, social, cultural and physical environment variables. These variables play a critical role in determining population health and how it is distributed, and therefore, some interventions should be directed at elements of this larger context.<sup>4</sup>

Yet ecological approaches have been slow to influence public health practice in addressing risk behaviours. This is likely not only because individual or more proximal environmental variables often have a stronger impact than distal ones<sup>27</sup> but also because they are often easier to address than structural interventions. Nevertheless, researchers and policy-makers often fail to acknowledge the relevance of the environment in which sexuality education, for example, or condom promotion programmes are implemented. The prevailing approach has been to help young people cope with risk environments by trying to change their attitudes and behaviours, for instance by promoting sexual abstinence or the use of contraception. This model fails to address adequately how environmental factors or specific risk environments<sup>28</sup> may influence attitudes and behaviour or how certain other behaviours that affect reproductive health, e.g. the use of alcohol, may in part be responses to environmental conditions.

One major review study on sexual and reproductive health that addresses contextual issues like a supportive environment, poverty and unemployment finds that they determine variations and trends in sexual behaviour.<sup>29</sup> However, the studies cited are from the United States or low-income countries and not Europe.

### *Contextual variables*

The HDI ranking looks at average achievements and does not address the distribution of human development within a country. Therefore, it was decided to include the Gini coefficient, which reports income distribution in a country and the Gender-related Development Index, which while a part of the HDI reports an important contextual variable of

its own; although the HBSC data were disaggregated by sex, self-reported sexual behaviour opens up for reporting biases. The *Human Development Report*<sup>18</sup> provides an in-depth discussion of how the data for the HDI is collected, shortcomings in the process and how it should be considered.

Even before EU enlargement in 2004, commentators were drawing attention to the economic gap<sup>30</sup> between the EU member states and the candidates for accession. As an important measure of progress and development, it was noted that the new member states had a per capita GDP that was only around half of that of the average of the then current member states. This study shows that GDP coupled with the HDI rank did influence condom use and further research should seek to clarify if this has changed over time and how much GDP alone impacts on condom use and if the latency period before it may have an effect can be measured.

HIV prevalence. While HIV prevalence is low in Europe, it has been increasing rapidly in the countries of eastern Europe, particularly in Estonia and Latvia. Together with the two western European countries studied that had the highest HIV prevalence (Portugal and Spain), we compared these four countries with the remaining countries/regions to see if condom use was more widespread there. While there was significantly more use in the four countries with the highest HIV prevalence, it should be noted that the epidemics in these countries have been largely driven by unsafe injecting drug use.<sup>31</sup> However, this first analysis reveals that the extent of the HIV epidemic in a country may be influencing its condom promotion policies or simply use among young people. However, as discussed elsewhere,<sup>32</sup> HIV is more than a sexual health crisis in Europe. More research needs to look at the linkages between the epidemiology of the spread of HIV and the policies to combat it.

Sexuality education. Sexuality education has been studied in detail and its exact impact on reproductive health outcomes is still unknown. However, in their review study Wellings and colleagues<sup>29</sup> find that “School-based sex education improves awareness of risk and knowledge of risk reduction strategies, increases self-effectiveness and intention to practice safer sex...” In this sense, sexuality education should be understood as a public good given the difficulty in measuring its impact on sexually transmitted infection or HIV rates.

As the understanding of sexuality education differs much from country to country, it was decided in this study to group countries into two groups, rather than rank them from 1 to 18. For example, in Portugal, the official data reports mandatory sex education since 1999, starting at a very young age. However, the provision of sexuality education in Portugal is said to be irregular, partly because there is no official programme. Therefore, the indicators in the index were considered in the light of a recent review of sexuality education in Europe.<sup>19</sup>

#### *The regression models*

The strategy of employing three multilevel regression models sought to quantify the size of the country differences (first model) and calculate how much of this variance was due to a different individual composition of countries (second model). Finally, the third model informed of a possible association between national level variables and the probability of contraceptive use that is independent of measured young people’s characteristics. In addition, this model demonstrated how much of the country differences in contraceptive use can be explained by the variables studied. Further research could seek to dichotomise such variables and make stronger assessments of the situation in countries. As such a dichotomisation would require value judgements on what a “good” or “high” level of e.g. human development or



gender equity is. This study solely employed a trend test to assess whether or not they had an effect on young school-going European's condom use.

#### *Health Behaviour in School-aged Children Study (HBSC)*

The HBSC is a cross-national study conducted in collaboration with the WHO Regional Office for Europe. The study aims to gain new insight into, and increase the understanding of young people's health and well-being, health behaviours and their social context. Initiated in 1982, there were 36 participating countries and regions in the 2002 wave. The 18 of these with complete datasets which belonged to the EU were included in this study.

The majority of the young people in these 18 countries and regions had not had sexual intercourse, therefore the results must be treated with caution. Moreover, the HBSC study does not present a full picture of young people's sexual behaviour as it only covers those in their sixteenth year and who attended school. In addition to condom use, the HBSC reports contraception use by "at least one form". As our analysis sought to assess the impact on unintended pregnancy *and* sexually transmitted infections, only the condom use indicator was employed. This second indicator does shed light on an important finding in our study. Young people in countries with a predominantly Roman Catholic religion used condoms significantly more than their counterparts in non-Catholic countries. However, when the "at least one form" of contraception indicator is reviewed,<sup>12, 17</sup> it shows that this changes for many countries/regions, e.g. England, Finland, Scotland, Sweden and Wales. Poland, on the other hand moves from sixth lowest with regards to condom use to the lowest with regards to the at least one form of contraception. Knowing that girls in Sweden, for example, often use oral contraception, helps explain the lower condom use there, but given the recent increase in Chlamydia in this country, it shows that more research is needed to understand such behaviours in-depth.

While ecological model attribute a crucial role to the social and physical environment in determining a population's level and distribution of health, such statistical data can be easily misinterpreted. Inferences about the nature of individuals should not assume that all members of a group exhibit characteristics of the group at large. To avoid this, further analysis of the variables found to be significant in this study should be undertaken and stratified sampling should be employed. The HBSC can provide the needed data to undertake such studies.

Across Europe, key stakeholders – such as parents, religious leaders, health care providers, politicians and the mass media – have a tremendous impact on sexual and reproductive health issues. However, without up-to-date, accurate information, it will be impossible to measure the successes and failures. This study has already identified a number of gaps and suggestions for future directions.

#### **Conclusions**

This study suggests that while alcohol, bullying, gender, gender equity, human development, HIV prevalence and religion all affect young Europeans' condom use, variation in such use remains among schools and countries/regions which the factors studied do not account for. Further study of both the unexplained factors, especially the contextual variables, is warranted. Nevertheless, the study findings should enable more nuanced national health policies. In particular, health policy-makers across the EU should consider factors not

traditionally associated with the sexual and reproductive health of young people, notably alcohol use.

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