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Towards the elimination of mother-to-child transmission of HIV in low-prevalence and concentrated epidemic settings in Eastern Europe and Central Asia

Report prepared by

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Abbreviations and acronyms

ACTG 076	AIDS Clinical Trial Group 076
AIDS	acquired immunodeficiency syndrome
ANC	antenatal care
ART	antiretroviral therapy
BCG	Bacille Calmette-Guérin (TB vaccine)
cART	combination antiretroviral therapy
CD4	cell cluster of differentiation antigen 4 cell (a subgroup of T lymphocytes)
CI	confidence interval
CIS	Commonwealth of Independent States
CS	caesarean section
DHS	Demographic and Health Survey
DNA	deoxyribonucleic acid
DBS	dried blood spot
EU	European Union
FSW	female sex worker
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
HAART	highly active antiretroviral therapy
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HCV	hepatitis C virus
HCW	health-care worker
HIV	human immunodeficiency virus
IDU	injecting drug use
IDUs	Injecting drug users
M&E	monitoring and evaluation
MARPs	most-at-risk populations
MCH	maternal and child health
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MMR	mumps, measles and rubella (vaccine)
MSM	men who have sex with men

MTCT	mother-to-child transmission
NGO	non-governmental organization
OST	opioid substitution therapy
PCR	polymerase chain reaction
PMTCT	prevention of mother-to-child transmission (of HIV)
PLHIV	people living with HIV
RNA	ribonucleic acid
sdNVP	single-dose nevirapine
STI	sexually transmitted infection
TB	tuberculosis
UN	United Nations
UA	unlinked anonymous
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
WHO	World Health Organization
ZDV	zidovudine [also known as azidothymidine (AZT)]

Summary

Introduction

The year 2011 will mark the 30th anniversary of the beginning of the AIDS epidemic. World leaders will meet at a high-level meeting at the United Nations to take stock of how far they have come in delivering on their promises to combat AIDS. In 2015 countries will report progress in achievement of Millennium Development Goals (MDGs). Prevention of mother-to-child HIV transmission and treatment of mother and children with HIV infection are linked with progress towards MDGs 4, 5 and 6.

Central and Eastern Europe and the Commonwealth of Independent States (CEE/CIS) is the only region in the world where HIV epidemic is on the rise. An estimated 1.4 million people were living with HIV in the CEE/CIS region¹ in 2010, more than twice that reported in 2000. Adult HIV prevalence in the region was estimated at 0.8% in 2010, double that reported a decade ago. HIV prevalence rates above 1% have been reported in three countries (Estonia, Russian Federation and Ukraine) with lower rates elsewhere in the region. Deaths among HIV-positive people have continued to increase in CEE/CIS in 2010. The proportion of adult HIV cases among women varies from 17% to 47% across the region, mostly affecting women of reproductive age. Cumulatively almost 100,000 HIV-positive mothers have given birth to children in CEE/CIS since the beginning of HIV epidemic until 2010. However, the majority of those births occurred over the past five years.

During the last decade, there has been a major shift in the understanding of the scientific evidence and of the programmatic requirements for preventing HIV infection in infants. Countries with low-level and concentrated HIV epidemics could face a challenge when preventing HIV infection in infants because HIV is perceived to affect a relatively small number of children and is sometimes not seen as a priority by policy makers. This is largely due to the fact that there is insufficient awareness of AIDS, limited understanding of the magnitude, impact and long-term consequences of the epidemic and the fact that HIV mostly affects populations that tend to be socially excluded and marginalized. Important advocacy steps were undertaken in the CEE/CIS countries by the international community and national partners towards increasing awareness and generating more support and commitment for responding to the epidemic, including for the prevention of HIV infection in infants. In 2004, CEE/CIS countries committed to the goal of the virtual elimination of HIV infection in infants by 2010, a goal that was endorsed at the Dublin Inter-Ministerial Conference on AIDS. The Strategic Framework for the Prevention of HIV Infection in Infants in Europe, published in 2004, outlined the areas of priority action including a comprehensive approach with four key components: primary prevention of HIV infection among parents-to-be; prevention of unintended pregnancies among women living with HIV; prevention of HIV transmission from mothers living with HIV to their infants; and care, treatment and support for mothers living with HIV, their children and families.

Prevention of mother-to-child transmission (PMTCT) programmes in the CEE/CIS region were designed against a background of post-Soviet health systems with inherited hierarchical and compartmentalized structures and a curative rather than public health approach to dealing with disease burden. Integrating HIV prevention and care, including specific interventions to prevent mother-to-child transmission of HIV,

¹ Central and Eastern Europe and the Commonwealth of Independent States (CEE/CIS) UNICEF geographic region consists of 22 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Kosovo (under United Nations Security Council Resolution 1244), Kyrgyzstan, Moldova, Montenegro, The former Yugoslav Republic of Macedonia, Romania, Russian Federation, Serbia, Tajikistan, Turkey, Turkmenistan, Ukraine, and Uzbekistan.

into existing maternal and child health (MCH) and reproductive health services became a major priority action for scaling up key PMTCT services. This has been accompanied by advocacy efforts to ensure equity of access to services for marginalized women, including sex workers and drug-using women, so that they are able to receive the support they need to care for themselves and their children.

This review presents information on progress achieved in PMTCT programmes in CEE/CIS to date and spells out some areas for further action. It recognizes that despite the important progress achieved in most countries, there are many women who are 'missed' by antenatal care (ANC) services or present for services late – mostly in labour or at delivery. They tend to be precisely those who are at higher risk and most vulnerable to HIV infection, thus missing the chance to benefit from prophylactic interventions that would reduce risk of HIV infection, in their infants. Throughout the region, prejudice and stigma surrounding behaviours such as drug use, and the resulting fear of discrimination, tend to push women who inject drugs into concealing their drug use from health-care providers and/or seeking services rather late in pregnancy. Some studies from the region indicate that HIV-positive pregnant women using drugs have more than a two-fold risk of transmitting HIV to their infants compared to HIV-positive women who never used drugs. Other groups that are equally difficult to reach include ethnic minorities, migrant women, refugees, sex workers, trafficked women and, in some settings, prisoners.

The road towards the elimination of mother-to-child transmission (MTCT) of HIV in CEE/CIS is one that makes every effort to ensure a truly universal access to HIV prevention, treatment, care and support for all, including those that are most marginalized and excluded from society. It is only through concerted efforts aimed at reaching and providing services and support to the most marginalized, while respecting their rights and dignity, that true elimination of vertical transmission will be achieved.

The HIV epidemic in CEE/CIS

Injecting drug use (IDU) has driven the HIV epidemic in the CEE/CIS region, which has a high population prevalence of IDU (e.g., 1–2% of the population in the Russian Federation and Ukraine), with an estimated 3.7 million injecting drug users (IDUs) in the region overall. Increased drug trafficking from Afghanistan and local drug production, together with other socio-economic factors such as high unemployment, are associated with the growing IDU epidemic. Up to half of IDUs in some Russian and Ukraine cities are HIV-infected, although prevalence varies within and between countries. There have been some recent indications of declining HIV prevalence rates among IDUs with short injecting histories in Ukraine. Overall, between 5% and 40% of IDUs across the region are thought to be women. Several studies have identified higher HIV prevalence among female compared with male IDUs, most likely reflecting risky sexual behaviour, including exchanging sex for drugs and money, as well as injecting practices. HIV prevalence up to 62% has been reported among female sex workers (FSWs) who also inject drugs. There are estimated to be over 500,000 FSWs in the Russian Federation and Ukraine alone. Second-generation surveillance has demonstrated variable HIV prevalence among FSWs within countries, ranging from 2% to 48% in the Russian Federation and from 4% to 31% in Ukraine. A large and growing HIV epidemic among the IDU population has the potential to fuel heterosexual transmission, particularly in the context of young ages at initiation of IDU, high sexual activity levels, high rates of sexually transmitted infections (STIs) and low condom use, all widely reported across the region. An increasing proportion of new HIV infections among women are among those who do not inject drugs themselves, but who have acquired HIV sexually from an injecting drug using partner.

HIV among pregnant women

Estimated HIV prevalence in pregnant women has reached 0.23% in Moldova, 0.46% in the Russian Federation and 0.52% in Ukraine, where prevalence exceeds 1.0% in some areas. In CEE/CIS in 2007, 17,496 HIV-infected pregnant women were reported, 75% from the Russian Federation and 21% from Ukraine. IDU is often under-reported by pregnant women, but use of hepatitis C virus (HCV) positivity as a biomarker indicating high likelihood of IDU history suggests that up to three in five HIV-infected women in the Russian Federation have an IDU history. A substantial proportion of HIV-infected pregnant women report high-risk sexual partners, including partners who inject drugs (up to 60%), have a history of imprisonment (up to 40%) and have HIV (up to 30%). In Central Asia,² an emerging risk factor for HIV acquisition among women is having a sexual partner who is a migrant worker. Specific advocacy efforts are required to emphasize the need to pay increased attention to women, especially young women and their partners, highlighting the strong and direct relationship between primary prevention activities (or the lack of them) and the number of infections in infants. High rates of STIs are seen among HIV-infected pregnant and postpartum women in CEE/CIS, highlighting the high prevalence of unsafe sexual behaviours. Syphilis prevalence as high as 14% in HIV-infected pregnant women has been reported from the Russian Federation, with prevalence of Chlamydia of up to 20%.

HIV testing and counselling

Prompt identification of HIV infection in a pregnant woman allows timely application of PMTCT interventions and maternal treatment, if required. Although provider-initiated HIV testing is increasingly available in CEE/CIS, progress has been uneven. Most countries in the European Region have universal antenatal HIV testing (i.e., recommended for all women), mostly with an opt-out policy. Antenatal testing coverage rates of above 95% have been reported from countries including Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Russian Federation and Ukraine, and 10 CEE/CIS countries achieved the target of coverage rates exceeding 80% in 2008. Repeat testing in the third trimester is part of the testing strategy in several countries, including Belarus, Kazakhstan, Moldova, the Russian Federation and Ukraine. The approach of offering intrapartum rapid HIV testing and counselling in order to reach women who have not accessed ANC has also been adopted by many countries. Concerns remain regarding the quality of antenatal testing and counselling in the region, and the need for adequate training of health-care workers.

Knowledge about HIV and potential for PMTCT among reproductive-aged women

Some achievements in improving accurate knowledge of how HIV is transmitted and of prevention strategies among young women (aged 15–24 years) have been gained in the region; for example, in Moldova the percentage of young women having comprehensive and correct knowledge more than doubled from 19% in 2000–2003 to 42% in 2005–2008, with increases from 3% to 31% in Uzbekistan.

² In this document, the term 'Central Asia' applies to the sub-group of five countries of the CEE/CIS region: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

Progress in PMTCT and management of HIV-infected pregnant women

Countries in CEE/CIS have demonstrated remarkable progress in PMTCT during the past decade. Political commitment and the leadership of maternal and child health services have helped to achieve major decreases in the rates of HIV transmission to infants. The CEE/CIS region has the highest coverage of HIV-infected pregnant women and their infants with antiretroviral prophylaxis among all low- and middle-income countries worldwide, with an estimated 53% of infected pregnant women receiving antiretrovirals for PMTCT in 2009. Significant progress in expanding coverage has been achieved in several countries, with 85–100% of diagnosed HIV-infected pregnant women receiving antiretroviral prophylaxis in 2009 in Belarus, Georgia, Kazakhstan, Moldova, Russian Federation and Ukraine. These coverage rates need to be considered in the light of the number of diagnosed HIV-infected pregnant women delivering, which varies substantially by country, for example, with almost 9,000 deliveries in the Russian Federation compared with fewer than 100 in Tajikistan. At the end of 2006, most CEE/CIS countries reported universal availability of highly active antiretroviral therapy (HAART) for pregnant women and children who meet the clinical criteria for the initiation of treatment. However, the pattern of use of antiretroviral drugs in pregnancy varies considerably by country; although combination antiretroviral therapy for PMTCT is becoming increasingly common, use of zidovudine monotherapy and/or single-dose nevirapine continue in some settings. Progress in the assessment of HIV-infected pregnant women for **eligibility for HIV treatment** has been uneven, with some countries achieving 90% assessment levels whilst others have achieved less than 10%.

Reported rates of **elective caesarean section delivery** among HIV-infected women vary considerably in the region, with the highest rates reported in Belarus and Georgia (>70%) and with several countries having rates below 25%, including Moldova and the Russian Federation. Most HIV-infected women **formula feed** their infants, which is acceptable, feasible, affordable, sustainable and safe in most but not all CEE/CIS settings. Free breast milk substitutes are provided to HIV-infected women in a number of countries, although gaps in service provision are reported.

In some CEE/CIS countries, capacity for virological testing is limited and antibody testing after age 12 months remains the main approach to **diagnosis of HIV-exposed infants**. However, some countries are achieving high coverage of HIV-exposed infants with virological tests, including Kazakhstan, with 95% coverage by age two months. Use of dried blood spots as a strategy to decentralize diagnostic services remains as yet untapped in the region.

In Western European countries,³ significant progress has already been made towards virtual elimination of mother-to-child transmission (MTCT), with **MTCT rates** below 1% widely reported. In the CEE/CIS region, MTCT rates remain higher, in part reflecting the use of abbreviated PMTCT prophylaxis, although there have been impressive declines in MTCT rates in some countries; rates below 2% have been reported from Moldova and between 4–7% in Belarus, the Russian Federation and Ukraine. According to UNAIDS estimates, 7,000 infant infections have been averted by PMTCT programmes in the CEE/CIS region since their introduction. However, the number of new paediatric HIV infections increased from 3,000 in 2001 to 3,700 in 2008, despite greater PMTCT coverage and most likely reflecting the rising number of HIV-infected pregnant women delivering.

Pregnant, HIV-infected IDUs are a population group of specific relevance to the region. These women have high risk of coinfection with HCV and sexually transmitted infections and often have

³ In this document, the term 'Western Europe' applies to the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, and United Kingdom.

poor access to PMTCT interventions. There have been some initiatives in CEE/CIS succeeding in creating links between ANC services and other programmes targeting drug using pregnant women. Introduction of individual case management helped to create linkages between the mainstream health service and outreach work. As a result of such interventions, a significant decrease in numbers of HIV-positive pregnant women without ANC and late presentation in labour has been observed. Caution should be taken in interpreting some national statistics regarding decreasing proportions of HIV-positive women without ANC and late presentation in labour; this could be an artefact due to the increased proportion of HIV-positive women from the mainstream population. Absolute numbers of women with late presentation to services could be a better indicator showing access to ANC. In the Russian Federation there was little change in absolute numbers of HIV-positive women without ANC between 2003 and 2008: it was 1,200 (20.5%) and 1,297 (14.6%) respectively. Although most CEE/CIS countries have established opioid agonist maintenance treatment programmes, linkages with PMTCT services generally remain weak and regional expertise with respect to pregnancy is lacking.

An international technical consultation organized by UNAIDS, UNICEF, UNODC and WHO in 2008 facilitated policy makers to reconsider their positions regarding key interventions for pregnant women using street drugs. Opioid substitution therapy (OST) for drug dependence during pregnancy, harm-reduction programmes and programmes targeted at marginalized groups are in the list of policies of many countries in CEE/CIS.

Family planning in HIV-infected women

Policies and guidelines for the family planning and provision of free contraception to HIV-positive women exist in the majority of CEE/CIS countries, although implementation appears to be weak. In the Russian Federation, up to 37.8% of pregnancies among HIV-positive women were terminated in 2008. The need to address the fragmented approach to prevention of unwanted pregnancies in HIV-infected women is underscored by the high rates of infant abandonment by HIV-positive mothers in some settings.

Treatment and prognosis among HIV-infected children

Elimination of MTCT is unachievable without provision of care, treatment and support services for HIV-positive children. Cumulatively, an estimated 18,000 children were living with HIV in the CEE/CIS region by December 2009. There is a political commitment to offering relevant services to HIV-positive children. An estimated 49% of HIV-positive children below 15 years of age were receiving HAART in 2009. This is a major improvement, with a three-fold increase compared with 2005. The largest increases were observed in the Russian Federation, Ukraine and Uzbekistan.

With the new treatment guidelines, it is estimated that more children will be placed in antiretroviral therapy (ART) in the coming years. Therefore it is important to sustain an uninterrupted supply of antiretroviral drugs and to support adherence for children already receiving treatment, as well as ensuring that all children in need will be provided with timely and high quality treatment. To achieve it there is a need to expand services and strengthen the capacity of primary health care to support lifelong HIV care and treatment for HIV-positive children close to the place where they live.



1. Introduction

Globally estimated, 33.4 million people were living with HIV in 2009, including 15.7 million women and 2.1 million children (1). The HIV epidemic in the CEE/CIS region became established more recently compared with most other parts of the world, being limited to isolated cases only in the late 1980s and early 1990s, mostly acquired abroad. However, CEE/CIS countries have experienced very rapidly accelerating HIV epidemics and, by 2008, an estimated 1.5 million people were living with HIV in this region, 600,000 more than in 2001 – a 66% increase (1). Nearly 90% of HIV cases in the region have been in the Russian Federation or Ukraine to date. Recent and dramatic growth in HIV prevalence has been reported from parts of Central Asia, for example, with a more than 11-fold increase in newly diagnosed HIV cases in Uzbekistan between 2001 and 2006 (2). According to UNAIDS estimates, in 2008, 110,000 people were newly infected with HIV and regional prevalence was 0.7% (0.6–0.8%). Women now account for nearly half of newly reported HIV infections in the Russian Federation and Ukraine. As expected of an infection primarily acquired by women through sexual intercourse and IDU, most infected women are of childbearing age. MTCT of HIV is the primary route of infection in children and the vast majority of HIV-infected children in Eastern Europe and Central Asia have acquired the virus from their mothers, although infections among children due to HIV-contaminated blood transfusions and injections with contaminated needles have been reported within outbreaks in Kazakhstan, Kyrgyzstan, the Russian Federation and Uzbekistan.

2. Global and regional commitments, goals and targets

A United Nations General Assembly Special Session (UNGASS) dedicated to HIV/AIDS was held in June 2001 with a Declaration of Commitment on HIV/AIDS issued, committing to reduce the proportion of infants infected with HIV by 50% by 2010, by ensuring that 80% of pregnant women and their children have access to essential prevention, treatment and care services to reduce MTCT. CEE/CIS countries had additionally stated their commitment to the virtual elimination of HIV infection in infants by 2010, which was endorsed by the Dublin Inter-Ministerial Conference in 2004 (see Box).

Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia

Dublin Action 11: Ensure that HIV-positive women and expectant mothers have access to high quality maternal and reproductive health-care services in order to prevent mother-to-child transmission.

Dublin Action 12: By 2010, eliminate HIV infection among infants in Europe and Central Asia (with elimination defined as less than 2% of all new infections being acquired by an infant from its infected mother).

Dublin Action 14: By 2005, to develop national and regional strategies and programmes to increase the capacity of women and adolescent girls to protect themselves from the risk of HIV infection, and reduce their vulnerability to HIV/AIDS (3).

Reaffirmation of the UNGASS commitments was made by the Group of Eight (G8) in 2005 and 2007, the Abuja Call to Action towards an HIV-free and AIDS-free generation in 2005 and the Political Declaration of the United Nations General Assembly 2006 High-Level Meeting on AIDS to work towards universal access to HIV prevention, treatment, care and support. In May 2009, UNAIDS issued a call for the virtual elimination of MTCT of HIV by 2015, through substantial improvements to the delivery of prevention of MTCT (PMTCT) services worldwide.

The Strategic Framework for the Prevention of HIV Infection in Infants in Europe was published in 2004 and developed by UNAIDS, UNFPA, UNICEF, and WHO Europe. It outlined strategies and key priority actions for the implementation of the prevention of HIV infection in infants at a national level, with the aim of achieving the Dublin Declaration goals (4).

The Strategic Framework promotes a comprehensive approach to the prevention of HIV infection in infants and young children, consisting of four components or 'prongs':

1. Primary prevention of HIV infection among parents-to-be;
2. Prevention of unintended pregnancies among women living with HIV;
3. Prevention of HIV transmission from mothers living with HIV to their infants;
4. Care, treatment and support for mothers living with HIV, their children and families.

Furthermore, the Strategic Framework adheres to the principle of a public health approach to increasing access to PMTCT services, in order to ensure availability of high-quality services at a population level while finding a balance between the best standards of care and what is feasible within resource-constrained settings. This involves the use of standardized, evidence-based regimens and simplified approaches to clinical and laboratory monitoring.

PMTCT activities directly contribute to the action on MDG 4 (to reduce child mortality), MDG 5 (to improve maternal health) and MDG 6 (to combat HIV/AIDS, malaria and other diseases).



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3. Mother-to-child transmission background

Mother-to-child transmission of HIV can take place in utero, during labour, at delivery and postnatally through breastfeeding. Before the widespread use of PMTCT interventions, transmission rates ranged from 15–20% in Western Europe to 16–30% in the United States, 25–40% in Africa and 13–48% in South and South-East Asia (5). Prolonged breastfeeding (beyond 12 months of age) is associated with an approximate doubling of overall MTCT risk, with the risk remaining for as long as breastfeeding continues (6). Maternal viral load (plasma HIV ribonucleic acid (RNA) level) is the best individual predictor of MTCT risk; other risk factors reported include mode of delivery, duration of rupture of membranes, prematurity, cervico-vaginal viral load, low CD4 cell count, maternal symptomatic HIV disease/AIDS, coinfections, viral subtype and host genetic factors (5).

Reducing the number of HIV-infected women of childbearing age will have a profound effect in reducing the number of infants at risk of infection as for each and every avoided HIV infection in a woman of childbearing age there is an avoided infection in any child she might have. Estimates from models indicate that a decrease in antenatal HIV prevalence of 10% (e.g., from 30% to 20%) would result in a 33% reduction in the annual number of HIV infections in infants (7). The addition of family planning services to PMTCT programmes in order to prevent unintended pregnancy in HIV-infected women is not only a highly cost-effective approach to preventing new infections in infants, but also has the potential to reduce the incidence of infant abandonment. Specific interventions to prevent transmission from an infected mother to her infant include prophylaxis or treatment with antiretroviral drugs, safer delivery practices and infant feeding counselling and support (8;9).

In Western Europe, significant progress has already been made towards the virtual elimination of MTCT. For example, in Sweden, since 1999 no child born to a mother with diagnosed HIV infection has acquired the virus (10). Surveillance and cohort studies have reported the achievement of very low rates of MTCT on a population level in Western Europe. For example, in the United Kingdom and Ireland National Study of HIV in Pregnancy and Childhood, in 2000–2006, the overall MTCT rate was 1.2% (95% CI, 0.9–1.5) and 0.8% for women who received at least 14 days of ART (11). In the French Perinatal Study, the MTCT rate for the period 1997–2004 was 1.3% (95% CI, 1.0–1.6) (12) and in the

European Collaborative Study, the MTCT rate was 1.0% in 2005–2007 (13). In the Italian Register of HIV Infection in Children, an MTCT rate of 1.3% (95% CI, 0.7–2.3) was recently reported for children born in 2002–2004 (14), while in Denmark, the MTCT rate was 0.5% in 2000–2008 (15).

Time chart: MTCT in Europe and key milestones

Pre-1994	No antiretroviral prophylaxis available for PMTCT MTCT rates in Western Europe around 15–20%
1994	Results of ACTG 076 clinical trial showing 68% efficacy of zidovudine (ZDV) monotherapy (antenatal, intrapartum and neonatal) in PMTCT
1994–1996	<u>Western Europe</u> Rapid uptake of ZDV monotherapy for PMTCT MTCT rates decreased to 8–10% <u>CEE/CIS</u> Explosive outbreaks of HIV among IDUs in some cities in Belarus, Russian Federation, and Ukraine
1997	HAART becomes standard of care for adults requiring treatment
1999	Mode of delivery trial and meta-analysis demonstrate that elective caesarean section (CS) halves MTCT risk <u>Western Europe</u> MTCT rates <3% reported with use of ZDV monotherapy and elective CS
2000	<u>CEE/CIS</u> PMTCT programmes started
2002	<u>Western Europe</u> Use of antenatal HAART decreases MTCT <2%
2002–2010	<u>Western Europe</u> MTCT rates <1-2% Antenatal HAART used by around 80% of HIV-infected pregnant women <u>CEE/CIS</u> MTCT rates around 4–7%

(16–21)



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4. HIV epidemiology and prevalence

4.1 National HIV prevalence

According to UNAIDS estimates, there were 1.5 million people living with HIV (PLHIV) in Eastern Europe and Central Asia in 2008 (low estimate: 1.4 million; high estimate: 1.7 million), compared with 650,000 in 2001. Adult HIV prevalence was estimated at 0.7% (0.6–0.8) in 2008, representing a doubling since 2001 (0.4%). Three countries have HIV prevalence rates above 1% (Estonia, the Russian Federation, and Ukraine) and Latvia has the next highest prevalence, at 0.4%, with substantially lower rates elsewhere in Eastern Europe and Central Asia (see Table 1). The proportion of adult HIV cases among women varies from 17% to 47% across countries.

4.2 Epidemiological background

HIV is believed to have become established in Eastern Europe after the infection was introduced into the heterosexual population in the southern Ukraine ports on the Black Sea in the early 1990s, the subtype (subtype A) being linked to those found in Central Africa (22), and to MSM population of Eastern European countries being linked to MSM contacts with partners from Western Europe and the United States (23). HIV entered the IDU population a few years later and rapidly spread within and beyond the area. Explosive spread of HIV among IDUs in some cities in Eastern Europe was first noted in the late 1990s (20), with reported cases rising year on year and throughout the Russian Federation and Ukraine. By the mid-2000s, the epidemic among IDUs was still in progress and a growing proportion of new HIV cases were being diagnosed among women (24). A new wave of HIV transmission began in the Russian Federation in 2008 – 54,000 cases were diagnosed in that year, a 36% growth over 2006. The main contribution to this trend came from five regions in Siberia that had previously reported a 'stable' HIV situation. In 2007–2008, these regions experienced increases of new HIV cases ranging from 125% to almost 700%; IDU played a dominant role (25).

Table 1
Estimated number of PLHIV, CEE/CIS and Baltic States, 2007 (26)

Country	Estimated HIV prevalence	Estimated number of adults	Estimated number of women	% of adult cases among women
Armenia	0.1	2,400		
Azerbaijan	0.2	7,800	1,300	17
Belarus	0.2	13,000	3,900	30
Bosnia and Herzegovina	<0.1	<500	-	-
Croatia	<0.1	<500	-	-
Estonia	1.3	9,900	2,400	24
Georgia	0.1	2,700	<1,000	
Kazakhstan	0.1	12,000	3,300	28
Kyrgyzstan	0.1	4,200	1,100	26
Latvia	0.8	10,000	2,700	27
Lithuania	0.1	2,200	<1,000	-
Moldova	0.4	8,900	2,600	29
Romania	0.1	15,000	7,000	47
Russian Federation	1.1	940,000	240,000	26
Tajikistan	0.3	10,000	2,100	21
Turkmenistan	<0.1	<500		
Ukraine	1.6	440,000	190,000	43
Uzbekistan	0.1	16,000	4,600	28

(26)

The HIV epidemic in the CEE/CIS region became established within the context of a concurrent epidemic of STIs, ongoing since the early 1990s. Syphilis notifications had increased up to 175-fold between 1990 and 1997 and, although declining after this time, STIs remain an important public health problem, with syphilis rates remaining higher than levels reported prior to the early 1990s (27;28). Incidence of syphilis was 92.1 and 94.6 per 100,000 in Kazakhstan and the Russian Federation respectively in 2003, decreasing to 45.9 and 62.1 per 100,000 in 2007 (29). The high prevalence of STIs in the region is a facilitating factor for the sexual spread of HIV and disproportionately affects marginalized populations, including sex workers and their clients, IDUs and migrants (28).

4.2.1 Injecting drug use

The CEE/CIS region is characterized by an extraordinary amount of IDU in the population – for the Russian Federation, the number of IDUs per capita is twice as high as in the United States and eight times that in China (25). Substantial increases in the extent of IDU have been apparent in some CEE/CIS countries since the break-up of the former Soviet Union, as indicated by a growing number of registered drug users as well as by behavioural surveys. This trend may have been promoted by unfavourable socio-economic conditions, including rising poverty, unemployment, poverty and migration, but position on drug-trafficking routes from Afghanistan is also a major driver of the drug addiction epidemic in the area (30). Sentinel surveillance in Central Asia countries has indicated increased use of heroin among IDUs in recent years, with a concomitant decline in the use of home-made opiates ('khanka'), consistent with the premise that the growth in heroin trafficking is playing a key role; in Kyrgyzstan and Tajikistan, 98% of IDUs in 2009 reported using heroin, while khanka use more than halved between 2006 and 2009 from 28% to 12% in Kazakhstan, and decreased by a third in Kyrgyzstan, from 19% to 12% (31).

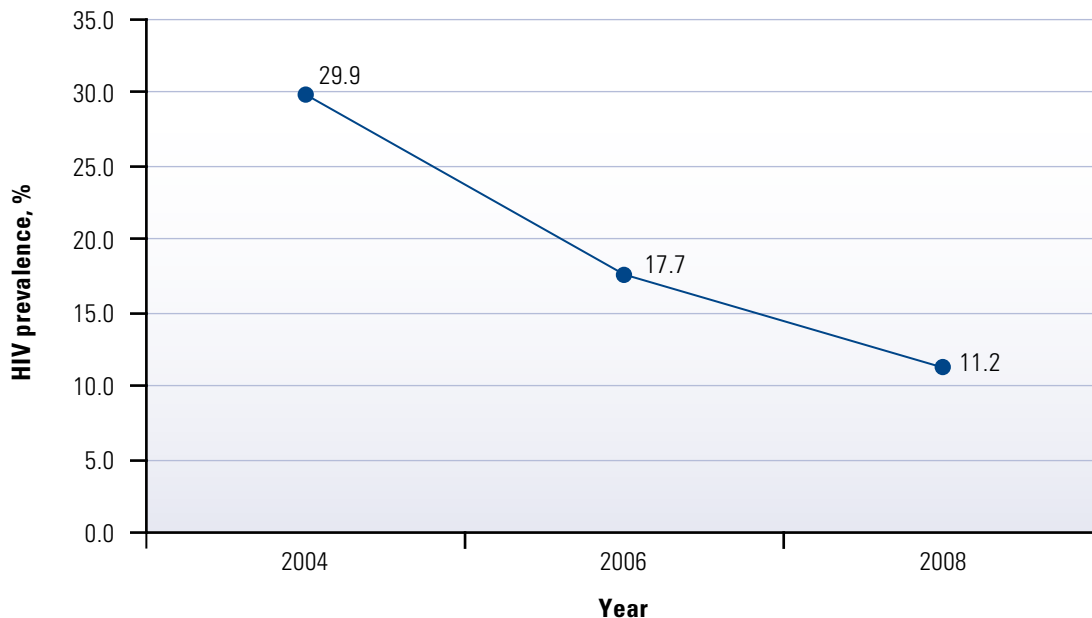
There are currently an estimated 3.7 million IDUs in the CEE/CIS region (32) and IDU prevalence is estimated at 1–3% of the adult population in the Russian Federation (33), 1.6–3% in Kazakhstan, 1.5% in Tajikistan and 1–2% in Ukraine (34). A trend towards declining age at initiation of IDU in the Russian Federation has been noted (20) and, in St Petersburg, there was a nine-fold increase in the number of teenage IDUs between 2000 and 2006 (35). IDU has driven the HIV epidemic to date and has been the primary route of HIV transmission. For example, in the Russian Federation in 2001, 93% of registered HIV cases were among IDUs (36). More recently, the proportion of newly diagnosed HIV cases attributed to IDU has declined, and was approximately 57% in the Eastern European part of the CEE/CIS region in 2007 (37). Initial 'explosive' outbreaks of HIV infection among IDUs in specific urban settings, such as Togliatti City and Kaliningrad in the Russian Federation, took place in the mid- to late-1990s, where HIV prevalence has now reached 50% or higher (38). Elsewhere, HIV prevalence rates started to rise more recently; for example, in St Petersburg, HIV prevalence among IDUs rose from 4% in 1999 to 19% in 2000 (39;40).

HIV prevalence estimates among IDU populations in the CEE/CIS region vary both within and between countries (see Table 2). In Ukraine, sentinel surveillance has documented an HIV prevalence of 62.8% among IDUs in Poltava, whilst rates are considerably lower in Sumy, at 18% (1). The epidemic has now spread beyond the urban settings where it originated, with HIV prevalence of 14% in a recent rural community sample of IDUs (41). However, sentinel surveillance surveys among IDUs in eight urban sites in Ukraine have demonstrated a dramatic decrease in median HIV prevalence among IDUs with a brief history of IDU (less than two years), from 29.9% in 2004 to 17.7% in 2006, and 11.2% in 2008 (see Figure 1). According to HIV Alliance Ukraine, the magnitude of the decrease was more pronounced in large cities where harm-reduction programmes have reached high levels of coverage (25). In Kazakhstan, sentinel surveillance has indicated a slight decrease in HIV prevalence among IDUs, from 4% in 2007 and 2008 to 2.9% in 2009. Elsewhere in Central Asia, sentinel surveillance has identified substantially higher HIV prevalence among IDUs: in Tajikistan, this reached 17.3% in 2009, while in Kyrgyzstan, there was a doubling of HIV prevalence among IDUs between 2008 and 2009, from 6.8% to 14.3% (31). Furthermore, in some cities, repeated surveillance has revealed a very rapid spread of HIV among IDUs, for example HIV prevalence among IDUs in Dushanbe (Tajikistan) increased from 4% in 2001 to 24% in 2006. The variable HIV prevalence among IDUs between different cities is illustrated by Kyrgyzstan, where prevalence was 2% in Bishkek and 13% in Osh Province (42). Very high HIV prevalence among IDUs has been reported in Estonia, at 62% in Tallinn in 2005, while in Riga (Latvia) prevalence among IDUs was 22.5% in 2007.

Table 2
HIV prevalence among IDUs, results from research studies

Study details	Setting	HIV prevalence	% female IDUs	Reference
Cross-sectional survey of 423 IDUs recruited by indigenous field workers in the community	Togliatti City, Russian Federation	56%	37%	(38)
Residual blood in syringes among 101 syringe exchange clients	St Petersburg, Russian Federation	10.9%	39%	(40)
Testing of 8,056 patients with alcohol (n=5,595) or drug (n=2,460) dependence at a treatment centre	Leningrad Oblast, Russian Federation	4.8%	11%	(43)
Cohort of active IDUs (80% with recent needle sharing, reflecting inclusion criteria), n=898	St Petersburg, Russian Federation	30.1%	29%	(35)
Cross-sectional survey of active IDUs (n=1,473)	Moscow, Volgograd and Barnaul, Russian Federation	14%, 3% and 9% respectively	30%	(44)
Respondent-driven sampling and audio-computer assisted survey interviewing with unlinked anonymous antibody testing (n=761)	Belgrade, Serbia	3%	18%	(45)
	Podgorica, Montenegro	0%	7%	
Snowball sampled survey of 315 IDUs	Vinnitsya Oblast, Ukraine	14% overall, 14% in women	18%	(41)
Community-recruited sample of 778 IDUs with unknown HIV status	Kiev, Odessa and Makeevka/Donesk, Ukraine	34%, 51% and 17% respectively	22%	(46)
Respondent-driven sample of 350 IDUs obtaining syringes from pharmacies and syringe exchange programmes	Tallinn, Estonia	56%	15%	(47)
Cross-sectional survey of 701 community-recruited IDUs	Tashkent, Uzbekistan	29.8%	5%	(48)

Figure 1
Decreasing HIV prevalence among recently initiated IDUs (<2 years injecting histories) in eight cities in Ukraine with high coverage of harm-reduction programmes (25)



4.2.2 Female injecting drug users

Women comprise a minority (up to 30%) of IDU populations in the Eastern European part of the CEE/CIS region, with lower proportions generally reported in Central Europe and Central Asia (around 20%) (45;49;50). A recent substudy of new IDU initiates (injecting for <2 years) in a multi-city survey in the Russian Federation reported a surprisingly high proportion (78%) of women (51). This finding is concerning as it may indicate a growth in IDU among women. New female IDU initiates may be particularly vulnerable to acquisition of HIV, as they tend to need help with injection, which is strongly associated with syringe sharing (52). Few studies have specifically focused on female IDUs or compared them to male IDUs, partly because these women are a harder population to access, as they tend to have lower levels of engagement with drug services than men. Research among IDUs in Canada identified an elevated risk of incident HIV infection among female IDUs compared with their male counterparts, with a cumulative HIV incidence rate at 48 months of 16.6% versus 11.7% respectively; there was a two-fold increased risk of HIV seroconversion among women who reported unsafe sex and those who had help with injection (52). In Ukraine, one multi-city study of IDUs found that women had significantly higher HIV prevalence than men (17% versus 12%) (53), which is consistent with the Canadian findings, while in a study in Kazakhstan, female IDUs were 2.5 times more likely to be HIV-positive than males (54). In sentinel surveillance in Central Asia, female IDUs comprise up to a quarter of IDU respondents; in 2009, HIV prevalence was somewhat higher in female than in male IDUs in Kazakhstan (3.6% versus 2.8% respectively), whilst in Kyrgyzstan and Tajikistan, females had lower HIV prevalence (6.2% versus 16.1% and 13.9% versus 17.7% respectively) (31).

Although heroin is the most commonly injected drug in the CEE/CIS region, injection of psychostimulants has increased in some settings, with 27–37% of IDUs in St Petersburg and 35–40% in Kiev and Donetsk injecting these drugs (49;53;55). Higher rates of psychostimulant use among women than men have been reported. In one Russian study, psychostimulant injectors had a three-fold higher hazard of HIV seroconversion compared with heroin injectors (49), consistent with the associations between psychostimulant use and younger age, greater frequency of injection and high levels of sexual activity (53;55;56). This trend may result in a rising proportion of female IDUs with elevated risk of HIV infection.

A high level of coinfection with STIs has been reported in IDU populations, elevating the risk of both sexual transmission and acquisition of HIV. Syphilis prevalence is an estimated 7–11% among Russian IDUs (40;57) and in a convenience sample of 159 IDUs in St Petersburg; 42% of those HIV-negative and 56% of those HIV-infected had a current STI (55). In a study of HIV-infected pregnant women in Ukraine, 5.7% of IDUs had a positive serological test result for syphilis, compared with 3.5% in non-IDUs (58). Twenty-eight per cent of female IDUs in a study in Dushanbe (Tajikistan) had syphilis (75% of whom reported transactional sex) compared with 13% of males (59), while sentinel surveillance in Central Asia in 2009 indicated a syphilis prevalence of 9–12% among IDUs (31).

High STI prevalence among IDUs indicates high rates of unsafe sex, and may also indicate problems accessing treatment for STIs. In one study, 81% of IDUs in St Petersburg reported having sex without a condom at least once in the previous three months, with condom use particularly low among individuals with regular partners (55). In Vinnitsya (Ukraine), a recent survey indicated that 53% of IDUs reported no or inconsistent use of condoms (41). Research among drug users in Germany showed a 4.5-fold increased risk of syphilis infection among females compared with males, with the risk especially elevated in women exchanging sex for drugs or money, highlighting the importance of these intersecting risk factors (60).

4.2.3 Sex work

The sex trade, like the drugs trade, has experienced considerable growth in the CEE/CIS region since the dissolution of the former Soviet Union (28;61;62). The increase in commercial sex work has occurred concurrently with a growing geographical spread, and the size of the commercial sex worker population is difficult to estimate with any accuracy, exacerbated by the range of types of sex work engaged in (e.g., street-based, brothel-based, transient etc.) and the illegal nature of sex work in many countries (28;62). There are an estimated 150,000 to 300,000 sex workers in the Russian Federation, with 1–3 per 1,000 of the total population in most Russian cities engaged in commercial sex (63); however, in Moscow, up to 1% of the city population is estimated to engage in sex work, with a sex worker population in the range of 30,000 to 150,000 (62). In one study, 4% of St Petersburg's schoolgirls aged 15–17 years reported having received money for sex (64), while a survey in Saratov Oblast among 15- to 25-year-olds indicated that 2% of females had exchanged sex for money. In Ukraine, the size of the FSW population is estimated to be between 110,000 and 250,000 (65), with 2–4 per 1,000 city residents in Kiev and Odessa exchanging sex for money (62). In Central Asia, commercial sex work is increasing, associated with high unemployment levels and poverty, especially among women (48;66). This is illustrated by the estimated 40% rise in the number of FSWs in Tashkent between 1997 and 2003 (66;67). In Kazakhstan, the prevalence of sex workers varies between cities, at 1 per 1,000 of the population in Pavlodar, 2 per 1,000 in Almaty and 4 per 1,000 in Shimkent (62).

Second-generation surveillance in the Russian Federation has demonstrated variable HIV prevalence among FSWs: rates as high as 48% have been reported in St Petersburg, at 15% in Moscow and Yekaterinburg, 6–8% in Nizhny Novgorod, Chelyabinsk and Krasnoyarsk, with rates somewhat lower in Siberia, at 2% in Tomsk (24;63). Sentinel surveillance in Ukraine has indicated HIV prevalence of 4% among FSWs in Kiev, reaching 31% in Poltava, with national estimates in the range of 8–30% (65). In Central Asia, HIV prevalence among sex workers was around 2% in Kazakhstan, Kyrgyzstan and Tajikistan in 2007 (68); sentinel surveillance indicated HIV prevalence of 1.3% in Kazakhstan, 1.6% in Kyrgyzstan and 2.7% in Tajikistan in 2009 (69). Table 3 provides HIV prevalence data from a range of selected studies of FSWs in the CEE/CIS region and Lithuania.

IDU and sex work are intersecting HIV risk behaviours, with IDUs having sex with FSWs (around 20% of male IDUs in Central Asia) (42) and many female IDUs exchanging sex for drugs, money or goods. FSWs who inject drugs tend to be the most marginalized subgroup of sex workers, i.e., those working on the streets. The proportion of the female IDU population who engages in sex work varies across settings: for example, in the Russian Federation, this ranges from 28% in St Petersburg (40) to 43% in Togliatti City (70), while in Kaliningrad, 82% of HIV-positive IDUs reported commercial sex (71). In Ukraine, 10% of IDUs in a study in Vinnitsya Oblast reported exchanging sex for drugs or drugs for sex (41). The proportion of FSWs who inject drugs similarly varies between and within countries. In Central Asia, at least 10–30% of FSWs are thought to inject drugs (42), while in Tallinn and Madrid these proportions are 7% and 9% respectively (72;73).

Table 3
HIV prevalence from selected studies of FSWs in the CEE/CIS region and Lithuania

Study/sample details	Setting	% IDU	HIV prevalence	Reference
Unlinked anonymous cross-sectional survey in 2005–2006 (n=227)	Tallinn, Estonia	7%	7.6%	(72)
Street workers attending a health facility in 2000 (n=96)	Vilnius, Lithuania	34%	3.8%	(74)
IDU sex workers recruited in community settings by field workers in 2001 (n=66)	Togliatti City, Russian Federation	100%	62%	(75)
Cross-sectional study; women at remand centre (79% FSWs) in 2001–2002 (n=202)	Moscow, Russian Federation	4%	3.7%	(76)
Cross-sectional study with outreach worker recruitment in 2003–2004 (n=448)	Tashkent, Uzbekistan	9%	10.0%	(66)

HIV prevalence among women engaging in both IDU and sex work is generally considerably higher than in the general FSW population. For example, in Kazakhstan, 14% of FSWs who injected drugs were estimated to have HIV compared with 2% in non-drug-using FSWs (68); in a large Spanish study of FSWs, HIV prevalence was 15.9% in those who injected drugs and 0.7% overall (77), while in Togliatti City (Russian Federation) two thirds of women who were both FSWs and IDUs were HIV-infected (see Table 3). Data from the 2009 sentinel surveillance in Central Asia indicate substantially higher HIV prevalence among HCV-positive than HCV-negative FSWs, respectively 7.2% versus 0.6% in Kazakhstan, 7.4% versus 1.4% in Kyrgyzstan and 15.7% versus 1.8% in Tajikistan (69).

HIV prevalence among FSWs in Western Europe tends to be lower and more stable than that reported in CEE/CIS, which may reflect the lower proportions of FSWs in the West who also inject drugs. For example, HIV prevalence of 1% in Barcelona (78), 1.8% among immigrant FSWs in Catalonia (73) and <2% in London (79) has been reported.

4.2.4 Bridging populations

A large and growing HIV epidemic among the IDU population has the potential to fuel heterosexual transmission, particularly in the context of young ages at initiation of IDU, high sexual activity levels, high concurrent STI rates and low condom use. Among women with sexual route of infection, the available evidence suggests that exposure to HIV-infected male IDUs is the major risk throughout the CEE/CIS region. Studies in the Russian Federation and Ukraine have reported high levels of sexual activity among IDUs at around 80–95% (40;53;55) and usually a minority (~30%) of IDUs report a long-term sexual partner (i.e., spouse or cohabiting partner) (53). Multiple concurrent sexual partnerships are not uncommon: a quarter of IDUs in one study reported both regular and casual partners and, concerningly, this group used condoms less frequently than those with only casual partners (55). A high proportion (40–60%) of IDUs in the CEE/CIS region have non-IDU sexual partners (40;53;55;75), with male IDUs considerably more likely to have non-IDU partners than female IDUs (53). Sexual partners of male IDUs with both sexual and injecting risk behaviours are likely to be at high risk of HIV infection, not only because of their IDU partners' elevated risk of HIV acquisition but also due to their greater likelihood of acquiring a concurrent STI infection, which facilitates sexual transmission of HIV.

There is increasing evidence from across the CEE/CIS region that a growing proportion of new HIV infections among women are among those who do not inject drugs themselves, but who have acquired HIV sexually from an IDU sex partner. For example, in Georgia, among HIV-infected women diagnosed by 2006, less than a fifth reported IDU (or were also infected with HCV – a biomarker suggestive of IDU, which is rarely transmitted sexually) and 83% reported having an IDU sex partner (80). Of HIV-infected pregnant women in Tajikistan to date, 56% have had partners who were IDUs (81), while in Kazakhstan, 31% of pregnant women with HIV infection delivering in 2009 reported an IDU sexual partner (82).

However, it can be difficult to ascribe a specific mode of acquisition to many new HIV cases, particularly as IDU may be under-reported. In the Russian Federation, 62% of newly detected HIV cases among women reported heterosexual acquisition in 2008. However, studies have shown that a substantial proportion of HIV-infected women who deny IDU are HCV-positive: although the percentage of women reporting IDU in St Petersburg decreased from 2004 to date (from 62% in 2004–2005 to 40% in 2008–2009), 25% of the women reporting no IDU were HCV-positive in 2008–2009. In Orenburg, where only 4% of HIV-positive

women were known IDUs, an additional 20% were HCV-positive. On the basis of these findings, it seems likely that nationally in the Russian Federation IDUs still account for about half of the female cases, rather than only 38% (25).

4.3 HIV infection among pregnant women

4.3.1 Prevalence

The most reliable method of obtaining antenatal seroprevalence data is the use of unlinked anonymous (UA) testing of residual blood samples taken for routine antenatal or neonatal tests (as infants of HIV-infected mothers acquire maternal HIV antibodies in utero). A benefit of using neonatal blood spots is that it includes all women, i.e., those diagnosed before or during ANC and those remaining undiagnosed in pregnancy, and thus provides an accurate estimate that is not based on access to services (83). This method has been used in a range of Western European countries to monitor levels and trends of HIV prevalence in pregnant women.

In the United Kingdom, the neonatal UA serosurvey includes around 70% of live births in the country (84). In 2008, the HIV prevalence among pregnant women in England and Scotland was estimated to be 2.8 per 1,000 overall, or 1 in 486 women giving birth. Prevalence is highest in London (3.7 per 1,000), where it has been stable since 2004. Prevalence in the rest of England has increased substantially over the past 10 years (five-fold), but remains low at 1.5 per 1,000 (83). This trend partly reflects the introduction of a policy of dispersal of asylum seekers and refugees away from London (84).

In the absence of UA testing, use of antenatal HIV test results can be used to estimate prevalence in the pregnant population, although this will only be a good approximation in the context of very high coverage and uptake of antenatal HIV testing; for example, if there is low coverage and/or if women at greatest risk of HIV infection are those least likely to receive antenatal HIV testing, then this approach will underestimate the true antenatal prevalence. In countries with high antenatal HIV testing coverage, together with a policy for rapid testing at delivery for women with undocumented status, such as Kazakhstan, the Russian Federation, and Ukraine, antenatal prevalence estimates based on these tests are likely to be a relatively good approximation of true prevalence among women who choose to continue their pregnancies. Table 4 presents national and regional estimates of HIV prevalence from selected CEE/CIS countries with available data. In the Russian Federation and Ukraine, substantial increases in HIV seroprevalence among pregnant women between 2000 and 2007 are apparent. This trend must be considered in the context of expanding coverage of pregnant women with HIV testing; for example, in Ukraine, the coverage of pregnant women with HIV testing was 85% in 2000, rising to above 95% since 2003 (85). In the Russian Federation, the number of new HIV cases among pregnant women per 100,000 tested is reported to have grown 190-fold between 1996 and 2003 (24).

Table 4
Antenatal HIV prevalence in selected countries, data from antenatal HIV testing

Country	Prevalence (%)	Year	Details	Reference
Belarus	0.44	2000	Unlinked anonymous testing in three cities (Svetlogorsk, Oktyabrsk and Zhlobin)	(86)
Moldova	0.1 0.21 0.23	2005 2006 2007	National estimates based on antenatal HIV testing	(87)
Romania Constanta County	0.18	2000–2002	Estimates based on antenatal and intrapartum HIV testing	(88)
Russian Federation	0.03 0.46	2000 2006–2007	National estimates based on antenatal HIV testing	(63;86)
Kaliningrad Oblast	0.14 0.10	2004 2005	Estimates based on antenatal HIV testing (code 109)	(24)
Yekaterinburg Oblast	0.86 0.79	2004 2005		
Irkutsk Oblast	1.02 0.77	2000 2005		
Tver Oblast	0.2	2006		
St Petersburg	2.3	2004-05	Women delivering at the two high-risk maternity hospitals	(89)
Ukraine	0.52	2007	National estimate based on antenatal HIV testing	(86) (90)
Nicolaiev Oblast	1.25	2007	Regional estimates	
Kiev Oblast	0.20 1.14	2000 2007		
Odessa Oblast	0.35 1.03	2000 2007		
Western oblasts	0.05–0.09	2007		

In St Petersburg, in the context of a rapid HIV testing and PMTCT at two high-risk maternity hospitals, HIV prevalence was 2.3% overall in 2004–2007. Among the women eligible for rapid testing, HIV prevalence was 6.5% among the 30% who had no HIV tests during pregnancy at all, and 0.4% among the remaining women whose most recent HIV test was performed in early pregnancy and had been negative. Incidence of HIV among this latter group of women with negative tests before 34 weeks was estimated to be in the range of 0.8 to 2.3 per 100 person-years (89).

Data on HIV prevalence among subpopulations of pregnant women are limited. In the United Kingdom, data linkage with the UA newborn survey within one area (North Thames, which includes parts of London and non-metropolitan districts) has allowed investigation of HIV prevalence by maternal geographic origin: HIV prevalence was highest in women born in sub-Saharan Africa (2.09% in 2002), with rates of 0.03% among United Kingdom-born women, 0.09% among CEE/CIS-born women and 0.3% among Western European-born women (excluding the United Kingdom) in the same year (84). On a national level, United Kingdom-born pregnant women delivering in 2008 had a prevalence of 0.53 per 1,000, representing a gradual increase since 2000, when the figure stood at 0.16 per 1,000 (83). In a study in Romania, Roma women and migrants from Central Asia were five times and seven times more likely to be HIV-infected than other women tested in the context of a pilot PMTCT programme in 2000–2002 (88).

WHO/UNICEF Report Card data – 2007

- 17,496 HIV-infected pregnant women reported in the CEE/CIS region
- No HIV-infected pregnant women were reported from The former Yugoslav Republic of Macedonia or Bosnia and Herzegovina
- The Russian Federation and Ukraine contributed the largest proportion of HIV-infected pregnant women in the CEE/CIS region at 75% (n=13,110) and 21% (n=3,633) respectively.

4.3.2 Characteristics of HIV-infected pregnant women

Studies of HIV-infected pregnant women in the CEE/CIS region have, unsurprisingly, demonstrated that the large majority of women are either married or cohabiting with a partner. In CEE/CIS countries, infected women tend to be younger than their counterparts in Western Europe, most likely a reflection of a tendency to start childbearing at younger ages or, possibly, a younger age at HIV infection (91). In a large study of more than 750 HIV-infected pregnant women from five regions across the Russian Federation in 2004–2006, most were married (varying from 26% to 35% by region) or cohabiting (varying from 29% to 37%); between a quarter and a third of women reported that their likely mode of HIV acquisition was IDU, but this was considered to be an underestimate as up to 63% were HCV-infected, which is a biomarker indicating a high chance of past or current IDU. A substantial proportion of women reported having high-risk sexual partners: 37–43% with a history of imprisonment, 31–61% IDUs and 8–29% HIV-infected. The percentage of women reporting sexual contact with commercial partners was lowest in Yekaterinburg (5%) and highest in St Petersburg (22%). More than half of IDU pregnant women in St Petersburg had been using drugs for ≥3 years; among the IDUs, around two thirds reported having shared someone else's injecting equipment and 60–80% had drawn up from common container (24). Another Russian study of 458 HIV-infected pregnant and postpartum women carried out in 2005 had highly consistent results, with 30% of women reporting that they had most likely acquired HIV through IDU and 58% reporting sexual acquisition (92).

In a cohort study of HIV-infected pregnant women in Ukraine, there has been a significant decrease in the proportion of those reporting IDU as their most likely mode of acquisition, from 36% in 2000–2001 to 14% in 2006–2007; overall 33% reported heterosexual risk factors (the majority having an IDU sex partner), but nearly half did not report any specific risk factors for HIV acquisition (21). This latter group

shared more similarities with the women reporting heterosexual acquisition than those reporting IDU histories, and it seems likely that they acquired HIV sexually with casual or regular partners. Of note, this study enrolls women in some of the highest-prevalence cities in Ukraine, including Odessa, Kiev and Micolaiev, where HIV prevalence among pregnant women is estimated to be 1.03%, 1.14% and 1.25% respectively (1).

In Kazakhstan, one in five HIV-infected pregnant women delivering in 2009 reported IDU, while one third had IDUs as sexual partners (82). An emerging risk factor for women diagnosed as HIV-infected in Central Asia is having a sexual partner who is a migrant worker. There is a growing reliance on migration for employment in countries such as Tajikistan, where an estimated 600,000 to 1,000,000 people work abroad, and Kyrgyzstan, where up to 500,000 are economic migrants (93;95). Increased risk behaviours among migrants whilst away from home are well recognized in general (96) and a recent study reported that many Tajik male migrant workers in Moscow are having unprotected sex with commercial sex workers (97), putting their partners at home at risk on their return. Sentinel surveillance among migrants has demonstrated HIV prevalence of 0.9% in Uzbekistan (98) and 0.5% in Tajikistan (99); in Uzbekistan, 93% of male migrants reported having sex with a FSW during their most recent migration, although this figure was substantially lower in Tajikistan (24%) (98;99).

Pregnant women conceiving naturally have necessarily had unprotected sex in order to become pregnant. A recent study from Ukraine showed that less than half of HIV-infected pregnant women consistently used condoms all or most of the time in pregnancy (100). Consistent with this finding, and their HIV status, are the high rates of STIs seen among HIV-infected pregnant and postpartum women. Prevalence of syphilis of 3–14% has been reported from Russian studies of HIV-infected pregnant women, with 2% rates reported from Ukraine, while prevalence of Chlamydia is somewhat higher, at 6–20% (24;92;100).



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5

5. HIV testing and counselling

5.1 Introduction

HIV testing and counselling is the gateway to HIV prevention, treatment and care services. Testing and counselling also provide the opportunity to develop knowledge of HIV and to facilitate behavioural changes, if appropriate. Knowledge of one's HIV status is important to allow infected individuals to receive appropriate and timely medical treatment and psychosocial support and to provide the opportunity to prevent onward transmission. Prompt diagnosis of HIV infection remains one of the most important challenges faced with regard to the control and management of the HIV pandemic. For example, horizontal transmission is estimated to be 3.5 times greater by HIV-infected individuals who are unaware of their status compared with those who know their status (101). For MTCT, this figure is even higher – as MTCT risk can be reduced from around 25% to 1%. Prompt diagnosis of HIV infection allows monitoring of health status and timely initiation of treatment. However, a large proportion of HIV-infected individuals are unaware of their status and diagnosed late, with severe immunodeficiency and/or AIDS. A recent review indicated that 29–38% of new HIV cases in Western Europe have delayed diagnosis, defined as an initial CD4 count less than 200 cells/mm³ (102); delayed diagnosis increases the risk of HIV-related morbidity and mortality due to the lack of timely initiation of ART. In the United Kingdom, 27% of PLHIV were estimated to be unaware of their HIV status in 2008; of all the people who died with HIV in the same year, 57% had been diagnosed as HIV infected with a CD4 count less than 200 cells/mm³ within three months of diagnosis, highlighting the need for earlier HIV testing (83).

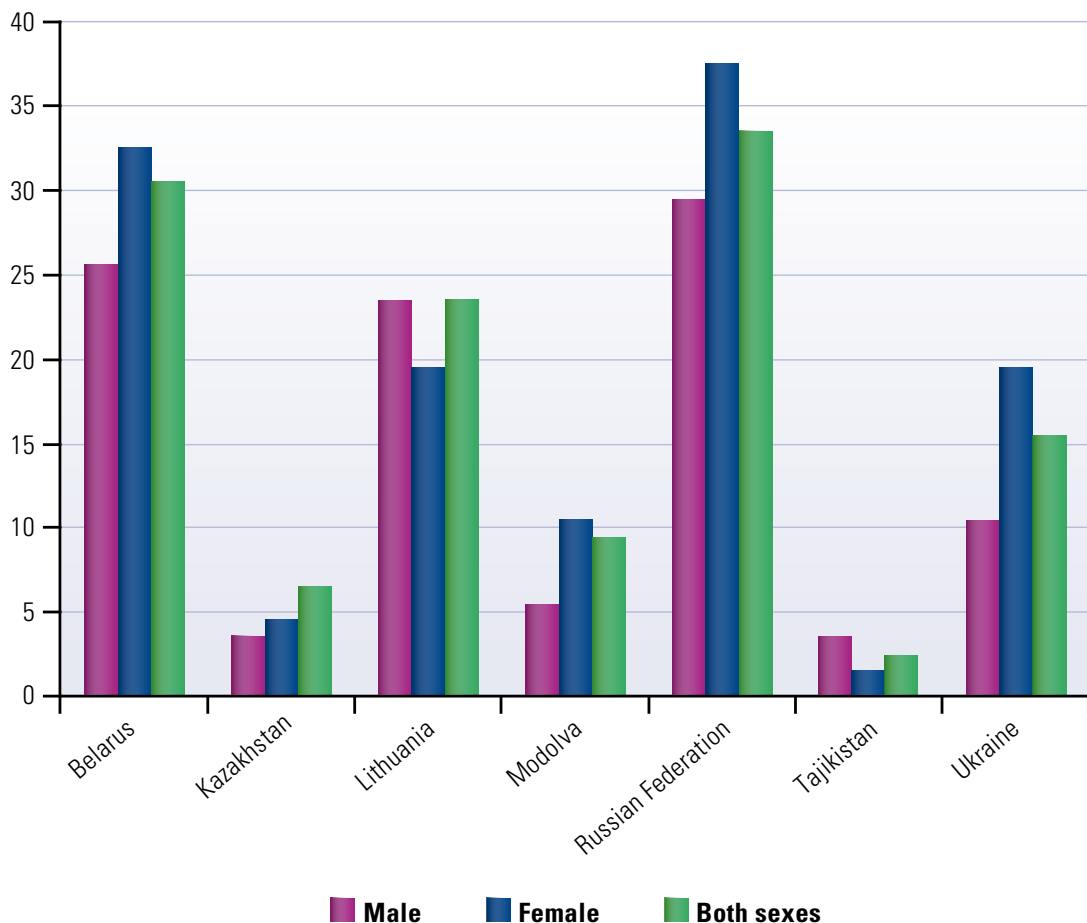
5.2 Access to HIV testing outside pregnancy

Most countries in the CEE/CIS region have national policies on HIV testing and counselling, with promotion of provider-initiated testing in selected health facilities, such as those providing ANC and TB, sexual health and harm-reduction services for IDUs. A priority is to expand the availability and accessibility of testing and counselling to populations most at risk (103). Although testing and

counselling is increasingly available, progress has been uneven across the region (103). Countries with high recent HIV testing coverage of the adult population include Belarus, the Russian Federation and neighbouring Lithuania, where more than 25% of adults surveyed in 2007 had been tested in the previous 12 months and received their results (see Figure 2).

According to the Ukraine 2007 Demographic and Health Survey (DHS), over 80% of men and women knew where they could go to access HIV testing, although rural individuals were less likely to know than those living in urban areas; half (52%) of the women in the survey had been tested for HIV, significantly more than men (28%), mainly due to previous antenatal HIV testing. In Moldova, pre-marriage HIV counselling and testing for couples has been established, although the quality of the counselling offered requires evaluation (87).

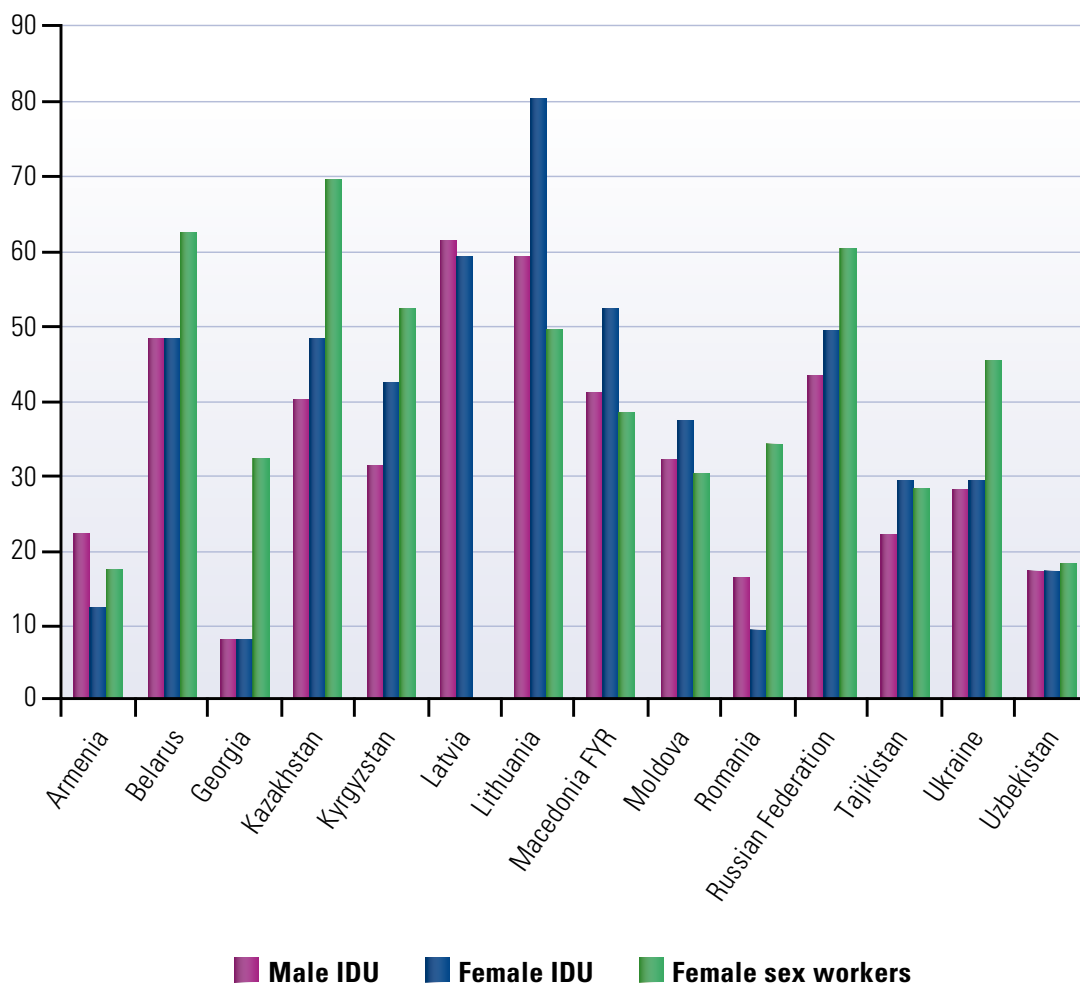
Figure 2
Percentage of men and women aged 15–49 years who had an HIV test in the last 12 months and received their results [UNGASS Indicator 7] (2007 data)



Some specific groups may face problems accessing HIV testing even where this is available. These include IDUs, sex workers and other marginalized groups. Figure 3, indicating the percentage of male and female IDUs and FSWs who had an HIV test in the previous 12 months and received their results, shows that female IDUs have similar access to HIV testing as male IDUs in most countries; in fact, in several countries,

female coverage with HIV counselling and testing is higher, possibly reflecting additional exposure to testing as a result of HIV testing in pregnancy. Data from Central Asia indicate that although a large number of HIV tests are being carried out annually (e.g., nearly 2 million in Kazakhstan in 2009) only a very small proportion are in IDUs – 1% in Kazakhstan, 0.6% in Kyrgyzstan (31). In a recent study of FSWs in Tallinn, 34% reported never having had a previous HIV test and 81% of those infected were unaware of their HIV status (72). Qualitative studies in the Russian Federation and Serbia have identified a reluctance of IDUs to access HIV testing because of concerns regarding confidentiality, lack of trust in services and previous experience of stigma during health services contact (104). Such findings underscore the need for outreach with rapid point-of-care testing (or low threshold access to testing), which can help to overcome social and structural barriers to HIV counselling and testing among IDUs. Examples of innovative methods of service delivery include mobile gynaecological clinics in Ukraine, which offer HIV and STI testing to women from marginalized populations including sex workers and IDUs (105). An evaluation in Ukraine found that key barriers to access were the legal limits on service providers, particularly the use of rapid tests (which is limited to public health settings and excludes NGOs) and insufficient funding for the public HIV testing system (106).

Figure 3
Percentage of most-at-risk populations (MARPs) who had an HIV test in the last 12 months and received their results [UNGASS Indicator 8] (2007 data)



5.3 Antenatal HIV testing

A prerequisite for the application of PMTCT interventions is the timely identification of HIV-infected pregnant women, and antenatal HIV testing is, therefore, crucial for the success of a PMTCT programme and should be a public health priority. Antenatal HIV testing in pregnancy aims to identify HIV-infected women in order that they may receive optimal treatment and care, to allow the application of PMTCT interventions and to identify HIV-infected infants as early as possible, in situations where MTCT occurs. Antenatal HIV testing, as any other provider-initiated testing and counselling, should also be considered as an opportunity to provide information on how to prevent onward transmission for women identified as infected, and on how to prevent future acquisition of infection for uninfected women, including during the remainder of the pregnancy and beyond.

Most CEE/CIS countries have good ANC coverage (above 98%), providing the opportunity to reach the majority of the pregnant population with testing and counselling during routine ANC.

5.3.1 Diagnosis before pregnancy

In most CEE/CIS countries, currently the majority of HIV-infected pregnant women do not know their infection status at the time they become pregnant and are therefore identified as the result of antenatal or intrapartum HIV testing. For example, 70–75% of HIV-positive pregnant women in Kazakhstan and Uzbekistan diagnosed in 2009 tested positive in pregnancy for the first time. However, country PMTCT reports to UNICEF indicate that, in Belarus, Georgia and the Russian Federation, more than half of the HIV-infected pregnant population in 2007 had already been diagnosed prior to their most recent pregnancy. Findings from a multi-site study in the Russian Federation are consistent with this, with half of the HIV-infected pregnant women who delivered having been aware of their infection from before pregnancy (92).

In Western Europe, an increasing proportion of HIV-infected pregnant women are already aware of their status before they become pregnant, reflecting previous access to testing and counselling outside ANC or in a previous pregnancy. In the United Kingdom, around half of HIV-infected pregnant women reported in 2005 had been diagnosed before pregnancy, rising to 70% in 2008; much of this pattern can be explained by sequential pregnancies in previously diagnosed women (107).

In the CEE/CIS region, some groups of infected women are more likely to know their status before pregnancy than others, including those diagnosed in a previous pregnancy and women from most-at-risk populations (MARPs). In one study of HIV-infected pregnant women in Ukraine, IDUs were three times more likely to know their HIV status before pregnancy, and women with IDU partners were 50% more likely to know than other women (21); a significant increase in the proportion of women aware of their positive HIV status before pregnancy over time was identified, growing from around a quarter in 2000–2001 to a third in 2006–2007, which is consistent with the scale-up of HIV counselling and testing in Ukraine following approval of the national protocol for HIV testing in December 2005.

5.3.2 Testing policies

In generalized HIV epidemics, the offer of HIV testing and counselling to all women in pregnancy, during delivery and postnatally, is recommended by international guidelines. Although there is evidence to show that provider-initiated HIV screening in antenatal services in low-prevalence settings is cost-effective (108),

guidelines currently recommend that, in such settings and in those with concentrated epidemics, the decision to incorporate HIV testing and counselling into standard antenatal services should be based on the local epidemiological, financial and social context. The WHO Europe PMTCT clinical protocol (2006) states that HIV testing should be voluntary, thus women should be aware of the system in place and how to refuse testing (109). An opt-out strategy is where women are informed of the tests that are routinely performed in pregnancy (which are usually carried out for all women, but can be for selected groups of women) and have to specifically opt out of this systematic testing. In an opt-in strategy, separate and specific informed consent is obtained for HIV testing, which is offered separately from other antenatal tests.

The European Consensus guidelines on the management of HIV infection and pregnancy endorsed the recommendation (rather than just the offer) of HIV counselling and testing to all pregnant women, as the standard of care in 2001 (110). In a review of antenatal HIV testing policies in European Union (EU) Member States carried out in 2005, five countries reported having no national HIV testing policy; of the remaining 18 countries responding, all had policies for voluntary antenatal HIV testing, two had selective testing of high-risk groups only (Denmark and Malta), and the remaining 16 had HIV testing policies recommending testing of all pregnant women, with a mixture of opt-in and opt-out strategies (111). Since this survey was carried out there has been an intensification of screening policies, with a more recent survey in 2007 identifying a shift towards opt-out testing policies in the EU, with countries such as Portugal, Slovakia and Spain changing from opt-in to opt-out policies (see Table 5) (112). Ukraine adopted its policy for opt-out HIV testing for all pregnant women in 2000 (113), while the Russian Federation included HIV testing into routine care of all pregnant women since the early 1990s. Policies for antenatal HIV testing vary across Central Asia, from testing all pregnant women on an opt-out basis in Kazakhstan and Kyrgyzstan (adopted in 2006 and 2007, respectively) to mandatory testing of all pregnant women in Turkmenistan. Universal opt-out testing takes place in regions most affected by HIV in Tajikistan. In Uzbekistan, there was an opt-out selective testing policy between 2005 and 2008, with testing offered to all women in some areas, such as in Yangiyul, while in other areas HIV testing is provided only to women perceived to be at high risk, including IDUs, FSWs, and wives of former prisoners; a universal opt-out policy was initiated in 2009.

Countries, in which a policy for antenatal HIV testing is an integral part of ANC for all women and with an opt-out policy in place, generally cover the highest proportion of pregnant women with an HIV test. Selective HIV testing strategies often result in missed diagnoses of HIV-infected pregnant women and thus missed opportunities for prevention of HIV infection in infants. Sweden was one of the first countries, in 1987, to adopt a policy of voluntary testing of all women on an opt-out basis, and has achieved acceptance rates of 90–99%, which are believed partly to reflect the fact that HIV testing has been included within routine care for all women for such a long time period (114). Experience in the United Kingdom has illustrated how coverage of pregnant women with HIV testing can be increased from low to very high levels with a change from an opt-in to an opt-out policy with testing offered to all: an opt-out policy was adopted in 1999, linked to government targets, in response to unacceptably poor ascertainment of HIV infection in pregnancy (more than 70% of HIV-infected women delivering in 1999 were unaware of their status); there was a rapid improvement in coverage and uptake compared to levels under the previous selective approach, reaching 88% by 2003 (115) and currently above 90% (83).

Table 5
Antenatal HIV testing policies in selected countries

No antenatal HIV screening policy	Opt-out universal screening	Opt-in universal screening	Opt-in selective screening
Belgium Greece Hungary Italy Slovenia	Armenia Azerbaijan Belarus Bulgaria Czech Republic Estonia Georgia Kazakhstan Kyrgyzstan Malta Moldova Netherlands Norway Russian Federation Sweden Ukraine United Kingdom	Austria Finland France Germany (opt-out) Ireland Latvia Lithuania Poland Portugal Slovakia (opt-out) Spain (opt-out) Switzerland Uzbekistan	Denmark Malta Tajikistan

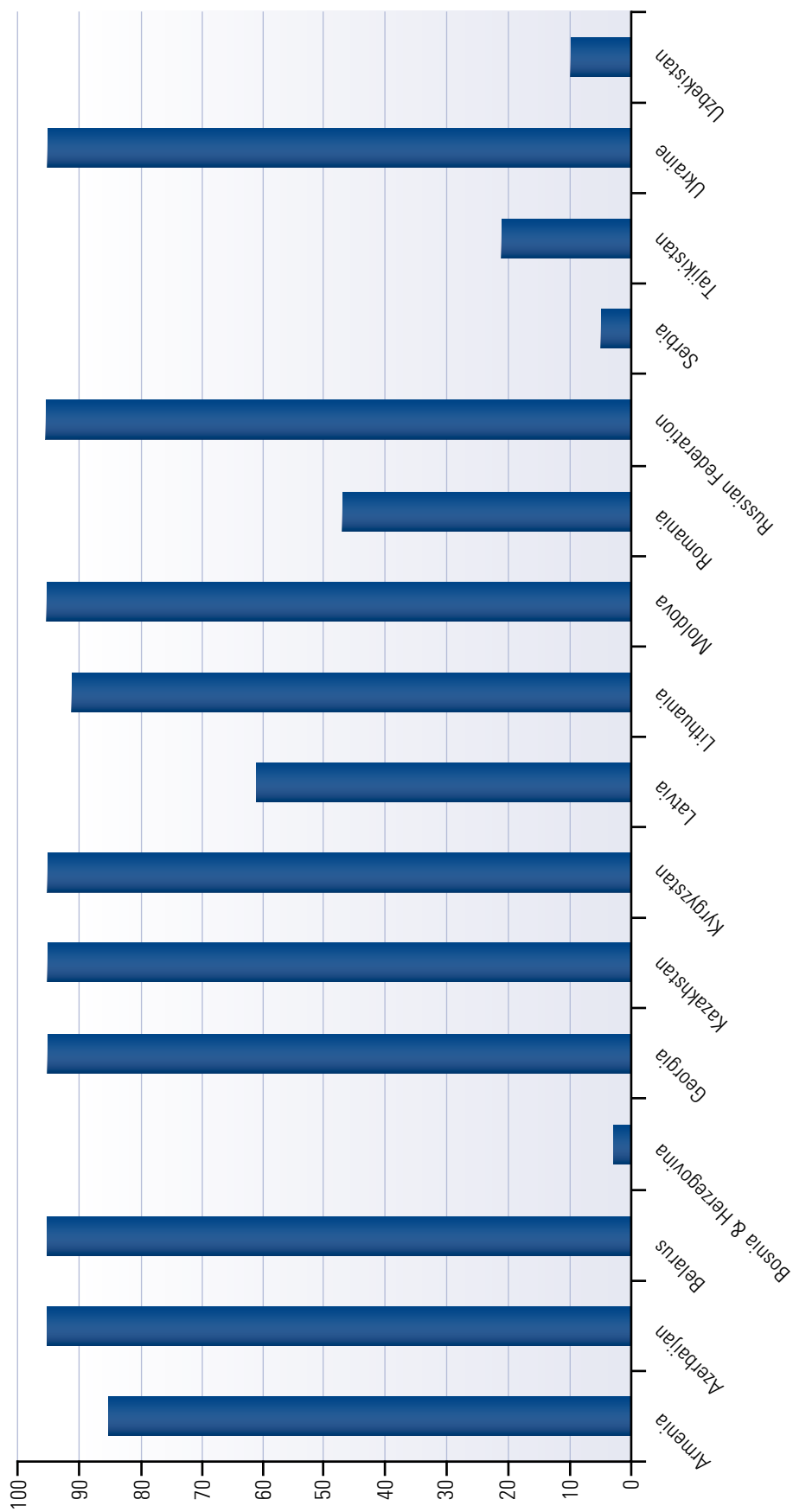
Data from Mounier-Jack S, Nielsen S, Coker RJ. HIV testing strategies across European countries. *HIV Med* 2008 July; 9 Suppl 2:13-9, and other sources.

In middle- and lower-income settings in the CEE/CIS region, several countries have demonstrated dramatic recent improvements in coverage of ANC facilities with HIV testing and counselling in the past few years. For example, in Kazakhstan, the number of ANC facilities with HIV testing available rose from 48 in 2005 to 3,471 in 2007, while a three-fold increase took place in Moldova between 2006 and 2007, from 43 to 144, in both cases reflecting the integration of HIV testing within routine ANC for all women, with an opt-out policy (WHO/UNICEF Report Card data). In 2008, 10 middle- and lower-income countries achieved the target of coverage rates of HIV testing and counselling among pregnant women exceeding 80% – Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, the Russian Federation and Ukraine (see Figure 4) (103). These achievements in expansion of HIV testing among pregnant women largely reflect the adoption and implementation of an opt-out routine testing strategy for all women.

In Ukraine, where this strategy was introduced in 2000, the percentage of pregnant women receiving an HIV test increased very rapidly, from 54% in 1999 to 84% in 2000 and 97% in 2003 (113). In Tajikistan, where the policy is for provider-initiated testing and counselling of women from high-risk groups, combined with universal testing in most affected regions, there are currently plans to scale up HIV testing to include all pregnant women attending the regional reproductive health centres (116).

For a test to be voluntary, women have to know that they can opt out and how to do so. Concerns have been raised that opt-out testing, together with high targets for coverage of pregnant women with HIV tests, could result in violation of women's autonomy and right to informed consent, particularly in situations where women are not adequately informed of the screening strategy. A recent review of antenatal HIV screening policies in low- and middle-income countries, including Moldova, the Russian

Figure 4
Estimated coverage of pregnant women with HIV testing, 2008 (%)



Note: All countries shown with 95% coverage have >95% coverage.

Federation, Ukraine and Uzbekistan, reported that, although the national policies stated that consent was required for testing, definitions of consent varied widely (117). A number of studies have identified women who were unaware that they had been tested for HIV until they received the result of a positive test, including those in Spain, the United Kingdom (118;119) and in the Russian Federation, where in one study 11% of HIV-infected women did not know that they had been tested (92). National reporting from the Russian Federation indicated that pre-test counselling was conducted only in 50% of pregnant women and post-test counselling among 87% of HIV-positive women in 2008 (WHO/UNICEF Report Card data).

In settings with an opt-in testing strategy, where women have to make an active choice to be tested, studies have identified that the woman's perception that she is of low risk for HIV infection, fear of negative reaction from partners, fear of stigma and religious or cultural beliefs are the main reasons for decline of testing (117;119;120). One study in the United Kingdom found that women refusing HIV antenatal screening had higher prevalence of another blood-borne virus, hepatitis B virus (HBV), thus indicating potential for infection with HIV also (121). This finding has subsequently been backed up by the findings of a United Kingdom audit of perinatal HIV transmissions in 2002–2005, in which 54 of the 87 infected infants were born to undiagnosed mothers, of whom 35% had declined HIV testing (122).

Strategies to increase coverage rates of HIV testing among pregnant women include training to improve understanding among health-care professionals working in ANC with respect to the benefits of early HIV testing (particularly in settings with an opt-in strategy) and the re-offer of an HIV test to women who refuse the initial offer later in pregnancy, giving them a chance to discuss testing with their partner and to assimilate the information provided (123). Coverage will also depend on the availability of testing commodities, and ensuring a continued and uninterrupted supply is a key strategy to attain high coverage rates.

5.3.3 Repeat HIV testing in late pregnancy

Repeat HIV testing in the third trimester of women with negative tests earlier in pregnancy may identify women with recent HIV infection, i.e., women who seroconvert during pregnancy or those who were in the window period when they had their first test in pregnancy, and is recommended as a strategy in specific settings (e.g., high-prevalence areas) or situations (e.g., pregnant women with high and ongoing risk of infection) (4). Repeat testing in the third trimester is part of the antenatal HIV testing strategy in several countries, including Kazakhstan, Moldova, the Russian Federation, and Ukraine. In the St Petersburg PMTCT and rapid testing at delivery programme, incidence of HIV among the group of women who had negative tests before 34 weeks was estimated to be in the range of 0.8 to 2.3 per 100 person-years (89), highlighting how repeat testing can identify newly infected women who seroconvert during pregnancy.

5.3.4 Rapid HIV testing in labour

The offer of intrapartum rapid HIV testing and counselling (if HIV status is unknown) for women in labour is recommended as a component of comprehensive services for PMTCT in WHO guidelines and is included in many national guidelines across Europe, including Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Sweden, Ukraine, and the United Kingdom. This approach is particularly important in reaching women who have not accessed any or adequate ANC. Although ANC coverage in Europe is generally high, IDUs, FSWs and other marginalized groups such as migrants often experience problems in accessing ANC, but are also usually the groups at greatest risk of HIV infection (89;124).

The St Petersburg PMTCT and rapid testing at delivery programme has been in operation since 2004 in the two maternity hospitals in the city receiving referrals of 'high-risk' women, i.e., those without ANC and without or with inadequate HIV testing in pregnancy (89). In a recent audit, a third of women eligible for rapid testing had no HIV tests during pregnancy at all, with the remainder having a negative test in early pregnancy but no repeat HIV test after 34 weeks of pregnancy. Rapid test results were available by delivery for 90% of women and, of the positive women, 76% received single-dose nevirapine (sdNVP), with 98% of their infants receiving sdNVP (89). This compares with a coverage rate of 42% prior to the rapid testing programme (124). Among the quarter of positive women not receiving any PMTCT prophylaxis, the most common reason was late presentation in labour and receipt of rapid test results after delivery. The MTCT rate was 8.6%, but more than a third of infants were lost to follow-up before infection status could be determined.

Evidence from a multi-site cohort study in Ukraine has confirmed that IDUs are a group of women particularly likely to be diagnosed through intrapartum rapid testing, with this group having a more than three-fold increased likelihood of diagnosis during labour than HIV-infected pregnant women without an IDU history and without an IDU sexual partner; most women with a positive rapid HIV test received sdNVP (69%) (21).

Intrapartum rapid HIV testing should be seen as a specific strategy particularly targeted at hard-to-reach groups of women without or with limited ANC. Although there are considerable benefits to diagnosis of HIV-positive women even at this late stage, with the possibility of reducing MTCT risk through the use of intrapartum and neonatal antiretroviral prophylaxis and avoidance of breastfeeding, as demonstrated by the findings above from the Russian Federation and Ukraine, it is often too late to provide intrapartum prophylaxis to these women. Risk of MTCT is therefore usually considerably higher than if these women had accessed ANC and HIV testing earlier in pregnancy, and attention should be focused on improving access to ANC among these groups of marginalized women.

5.3.5 Timing and quality of antenatal HIV testing and counselling

Timing of the HIV testing in pregnancy is important, particularly for women who need treatment for their own health as well as for PMTCT. This depends to a certain extent on timing of presentation to ANC. The proportion of women attending ANC 'late' (after 16 weeks of pregnancy) in the general population varies nationally across Europe, from around 4% in France and Italy to 18% in Portugal and 29% in Ireland (125). The new 2009 WHO guidance update for use of antiretrovirals for PMTCT includes the recommendation for earlier initiation of prophylaxis (from 14 weeks of pregnancy), with the rationale that an earlier start will limit the potential for loss to follow-up that may occur when delaying prophylaxis until the third trimester of pregnancy, together with findings from observational studies that have demonstrated the benefits of longer duration of prophylaxis with regard to PMTCT (126). The new goal is to start prophylaxis in the second trimester rather than in the middle of the third trimester. This new guidance underscores the importance of ensuring that HIV testing and counselling is provided to pregnant women in a timely manner.

In one large Russian study of HIV-infected pregnant women admitted to hospital for delivery, although around half were already aware of their HIV status before the pregnancy, among those pregnant women with unknown HIV status, 32% were not diagnosed until after 28 weeks of pregnancy (92). In this same study, a quarter of women had not used ANC services, with the reasons for non-use including transport problems, distance from home, previous negative experiences and not wanting such care.

A Ukraine cohort study of HIV-infected pregnant women has indicated some encouraging trends with respect to late diagnosis in pregnancy, demonstrating a halving in the proportion of women not diagnosed until delivery (reflecting lack of ANC) between 2004–2005 and 2006–2007, from 12% to 6%; furthermore, among women with unknown HIV status at the start of pregnancy, the proportion diagnosed in the first or second trimester increased from 47% in 2000–2001 to 73% in 2006–2007 (21).

Several reports have highlighted concerns regarding the quality of antenatal testing and counselling in the CEE/CIS region. In one review of antenatal HIV testing policies, the authors stressed the lack of policy recommendations to advise women on potential risks of HIV testing before giving consent in several countries, including Moldova, the Russian Federation, and Ukraine; additionally, they commented on the lack of specification of any pre-test counselling requirements in the Uzbekistan policy document (117). Several recent studies and in-country evaluations of PMTCT have highlighted variable coverage and quality of post-test counselling and a lack of adequate training of health-care workers (HCWs) carrying out such counselling in some settings, including Kyrgyzstan (127), Moldova (87), the Russian Federation (24), and Ukraine (90). In a recent situation analysis in Moldova, only 20% of pregnant women had received pre-test counselling and, among those with a positive test result, 40% received no post-test counselling (87). In a large Russian study, 52% of HIV-infected women in St Petersburg and 55% of those in Kaliningrad received no pre- or post-test counselling in 2005–2006 (24).

The vertical system of HIV services in many CEE/CIS countries means that women with a positive HIV test are referred to AIDS centres for confirmatory testing and post-test counselling, as in the Russian Federation and Ukraine. This introduces potential for delay in initiation of appropriate treatment and care or for loss to follow-up, as women may face specific barriers to accessing care at AIDS centres, including geographical barriers and, potentially, a lack of an understanding of the need for attendance without delay, the latter particularly an issue in situations where women have received no or limited pre-test counselling or information. However, this is not the system throughout the region and in Georgia, for example, post-test counselling is carried out in the same setting as pre-test counselling and testing, in Women Health Centres and hospitals (128).

In settings with opt-out testing strategies, pre-test counselling is often limited or even non-existent and post-test counselling is not provided for women with negative tests. This represents a missed opportunity for primary prevention, as it is likely that not even those women at elevated risk of HIV acquisition are identified as such by health-care providers, for example, women with IDU partners. In a system where more emphasis was placed on counselling for all women, this group of HIV-negative women could be reached with primary prevention messages enabling them to protect themselves against future infection. Pregnant women appear to be at increased biological risk of HIV infection compared with other women, and this may be compounded by their own or their partners' risky behaviours (129). The high seroconversion rate seen in pregnant women in St Petersburg underscores the need for primary prevention among high-risk HIV-negative pregnant women (89). In a United Kingdom audit of perinatal HIV transmissions in 2002–2005 among infected children born to undiagnosed mothers, at least 20% were born to women who seroconverted during pregnancy (122).

There is a lack of partner testing in the context of antenatal HIV testing in the CEE/CIS region as a whole. Tajikistan is the only country to have made progress towards increasing coverage of testing of partners, with 32% of male partners of pregnant women receiving HIV testing also being tested in 2007 (WHO/UNICEF Report Card data).



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6. Knowledge about HIV and potential for PMTCT among reproductive-aged women

One of the most important prerequisites for HIV prevention is accurate knowledge of how HIV is transmitted and of strategies for preventing transmission. Assessment of knowledge of HIV/AIDS within a population reflects the level of success of information, education and communication programmes and other activities around the promotion of knowledge of appropriate HIV prevention methods.

Although surveys have identified a relatively high level of inadequate knowledge of HIV/AIDS in some parts of the CEE/CIS region, several countries have made substantial achievements in enhancing knowledge among young women, with the percentage of such women (aged 15–24 years) having comprehensive and correct knowledge increasing between 2000–2003 and 2005–2008 from 7% to 23% in Armenia, from 19% to 42% in Moldova and from 3% to 31% in Uzbekistan. However, trends towards improving knowledge of AIDS with higher socio-economic status and education remain apparent in some countries, including Armenia and The former Yugoslav Republic of Macedonia. The Ukraine 2007 Demographic and Health Survey (DHS) indicated a good knowledge of ways of avoiding HIV among women, with around nine in ten women recognizing use of condoms (92%), limiting sex to one partner who has not been infected with HIV (89%) and a combination of both (85%) as ways of avoiding HIV. However, some specific groups of women continue to have poor knowledge: for example, over 25% of Roma women have never heard of AIDS and only 14% of those who have heard of AIDS are aware of how HIV is transmitted (130).

With regard to specific knowledge of MTCT, in Kazakhstan 55% of women aged 15–49 years in a 2006 Multiple Indicator Cluster Survey (MICS) (131) had knowledge that HIV can be transmitted from mother to child. In Uzbekistan, 92% of women aged 15–49 years in a 2006 MICS survey had knowledge that HIV can be transmitted from mother to child, with 73% knowing that transmission can occur during pregnancy, during labour and through breastfeeding, while the respective figures for Tajikistan were 37% and 27% in 2005 (131). In the other surveyed countries in CEE/CIS, the proportion of women with appropriate knowledge of MTCT (i.e., could correctly identify the three routes above) was around 40–50%.



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7. PMTCT and management of HIV-infected pregnant women

7.1 Antiretroviral prophylaxis and treatment

7.1.1 Coverage levels

The CEE/CIS region has the highest coverage of HIV-infected pregnant women and their infants with antiretroviral prophylaxis among all low- and middle-income countries worldwide. Overall in the CEE/CIS region, it was estimated that 45% of HIV-infected pregnant women received antiretrovirals for PMTCT in 2008, with a low estimate of 37% coverage and a high estimate of 57%. Some countries have made significant progress in expanding the coverage of antiretroviral prophylaxis among HIV-infected pregnant women, with 85–100% of diagnosed HIV-infected pregnant women receiving antiretroviral prophylaxis in 2008 in Belarus, Georgia, Kazakhstan, Moldova, the Russian Federation, and Ukraine (see Table 6).

These coverage rates need to be considered in the light of the number of diagnosed HIV-infected pregnant women delivering, which varies enormously by country and reflects a variety of factors, including antenatal HIV prevalence, antenatal HIV testing coverage, number of pregnant women delivering, and terminated pregnancies annually. Thus, for example, in 2008, the Russian Federation reported almost 9,000 and Ukraine more than 4,000 deliveries to diagnosed HIV-infected women annually, whilst Belarus, Kazakhstan and Moldova currently report between 100 and 300 deliveries and Georgia, Kyrgyzstan and Tajikistan fewer than 30 deliveries each year. There are also worrying trends in Uzbekistan, with rapid growth of HIV prevalence in ANC clinics.

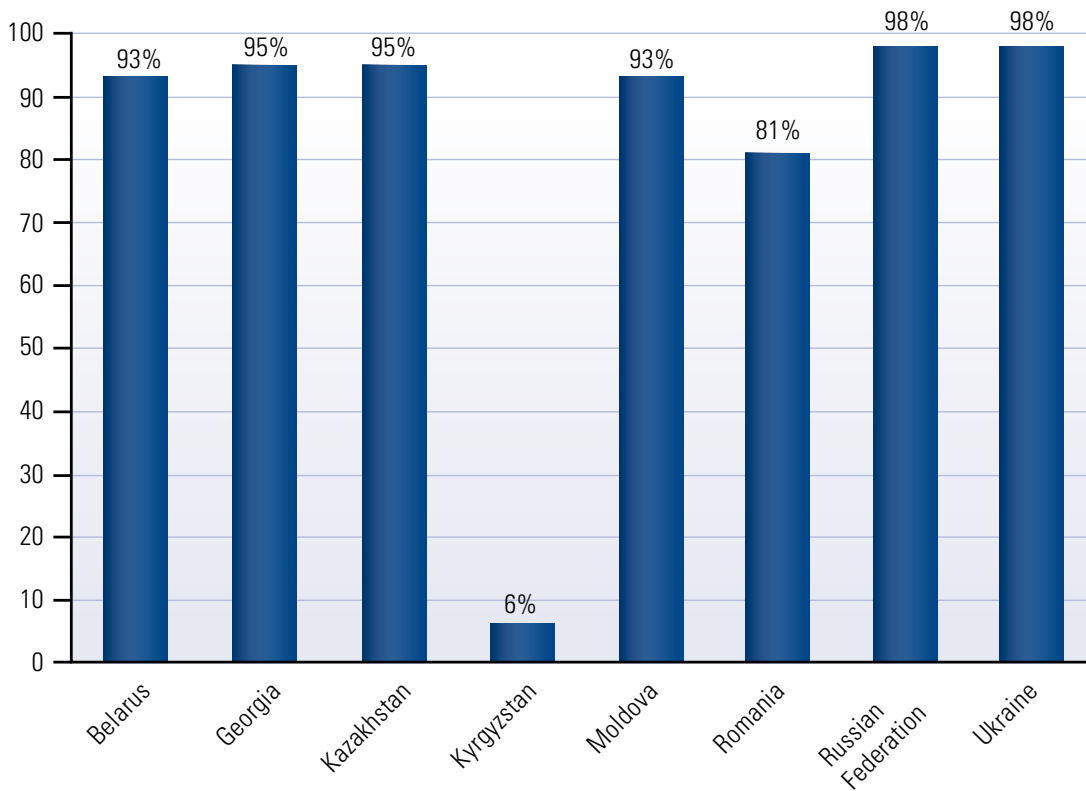
Table 6
Estimated percentage of HIV-infected pregnant women who received antiretrovirals for PMTCT in 2008

Country	Reported % coverage of women	Estimated coverage of pregnant women		Reported % coverage of infants
		Low estimate	High estimate	
Armenia		9%	40%	
Belarus	89%			93%
Bulgaria		3%	9%	
Georgia	100%	78%	>95%	95%
Kazakhstan	88%		>95%	95%
Kyrgyzstan	5%	5%	19%	6%
Moldova	95%			93%
Romania	55%	32%	>95%	81%
Russian Federation	92%			98%
Serbia		3%	12%	
Ukraine	89%	82%	>95%	98%
Uzbekistan		17%	74%	

(132)

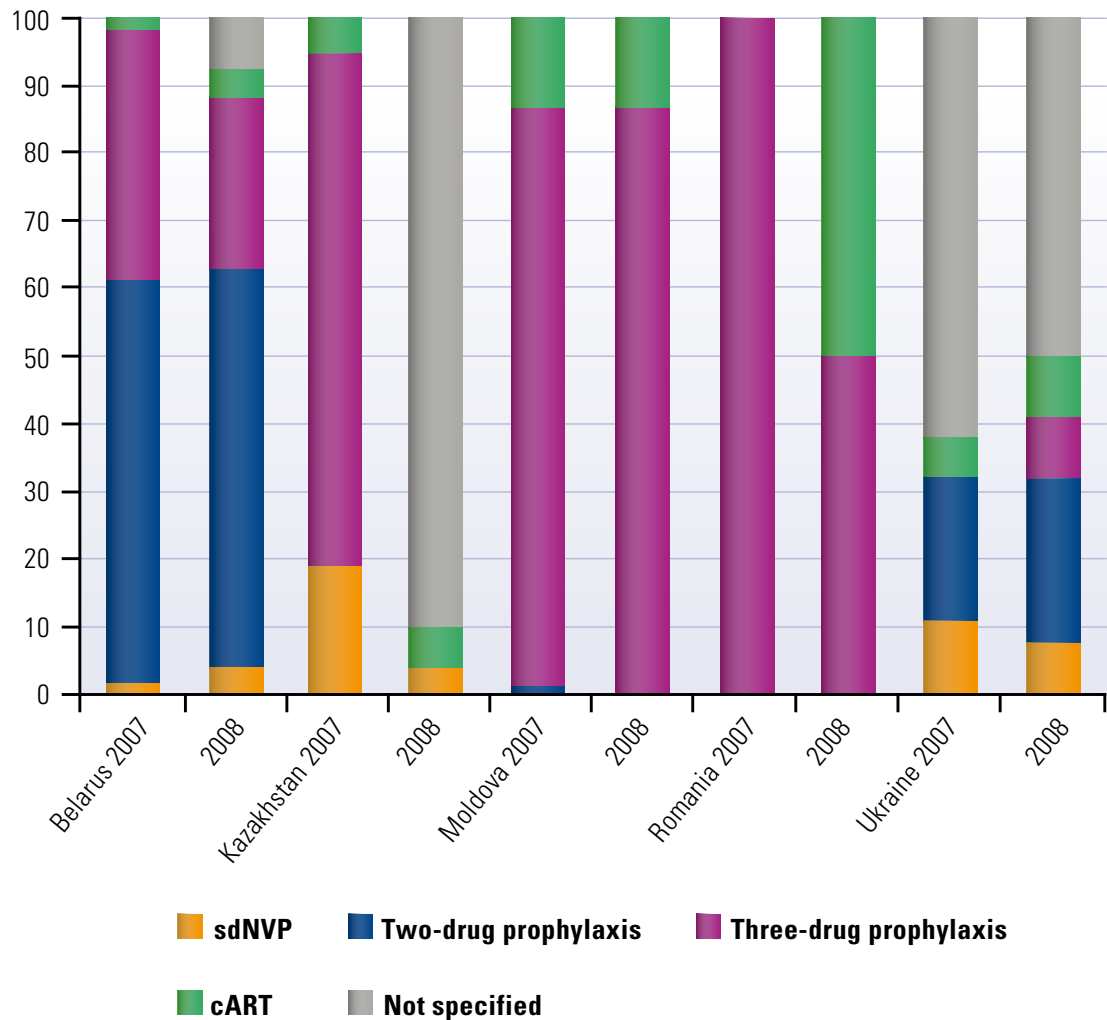
Coverage of infants born to HIV-infected mothers with antiretroviral prophylaxis is generally as high as or higher than the levels reported for antenatal prophylaxis (see Figure 5). Higher coverage of infants with prophylaxis compared with their mothers indicates a variety of factors, including late diagnosis of infected women and the system of referring women to AIDS centres for antiretroviral prophylaxis or treatment, which introduces potential for women not accessing these services.

Figure 5
Coverage of infants born to HIV-infected women with antiretroviral prophylaxis, selected countries, 2008



The pattern of use of antiretroviral drugs in pregnancy varies considerably from country to country. For example, in Georgia and Moldova, all HIV-infected women not requiring treatment for their own health receive combination antiretroviral therapy (cART), i.e., three-drug combination, whilst in Belarus a quarter of women receive triple-drug prophylaxis, with use of dual antiretroviral prophylaxis predominating (see Figure 6). In the Russian Federation, the Project for the Prevention of HIV, Hepatitis B and C and Diagnosis and Treatment of HIV implemented in 2006 and 2007 included the objective of access to a full course of treatment for all HIV-positive pregnant women for PMTCT. In Ukraine, the PMTCT programme was updated with the recommendation for triple-drug prophylaxis in 2008; no HIV-infected women in 2007 received triple-drug prophylaxis, but this increased to 9% overall in 2008 (with a further 9% of women receiving treatment with cART in pregnancy).

Figure 6
Type of antiretroviral regimen among HIV-infected women receiving prophylaxis or treatment during pregnancy, selected countries, 2007–2008



7.1.2 Assessment of eligibility for HIV treatment

Progress in the assessment of HIV-infected pregnant women eligible for HIV treatment (based on clinical status and/or CD4 count) has been uneven in the CEE/CIS region. For example, although around 90% or more of all infected pregnant women are assessed for eligibility in Georgia, Kazakhstan, Moldova, and Ukraine, less than 5% are assessed in Kyrgyzstan. In most countries, infected women are referred to AIDS centres for clinical and immunological assessment, although in some countries, such as Kyrgyzstan, blood samples are collected and transported for CD4 count monitoring at AIDS centres (116). In some countries, such as Kyrgyzstan and Tajikistan, only one or two centres have the capacity to perform these laboratory tests (116).

In countries achieving high levels of treatment-eligibility assessments among HIV-infected pregnant women, 3–13% of women receive ART for their own health. This is consistent with findings from studies of HIV-infected pregnant women in these settings, where a minority of women have moderate to severe

HIV disease and/or severe immunodeficiency (21), and in Georgia 10% of HIV-infected pregnant women have been reported to have AIDS (128). A higher proportion of HIV-infected pregnant women in Romania were eligible for ART in 2008 (27%) than in other countries in the region, which is partly explained by a growing number of pregnancies among the cohort of young women who were infected parenterally in the 1980s (133).

7.2 Mode of delivery and obstetric management

7.2.1 Elective caesarean section delivery

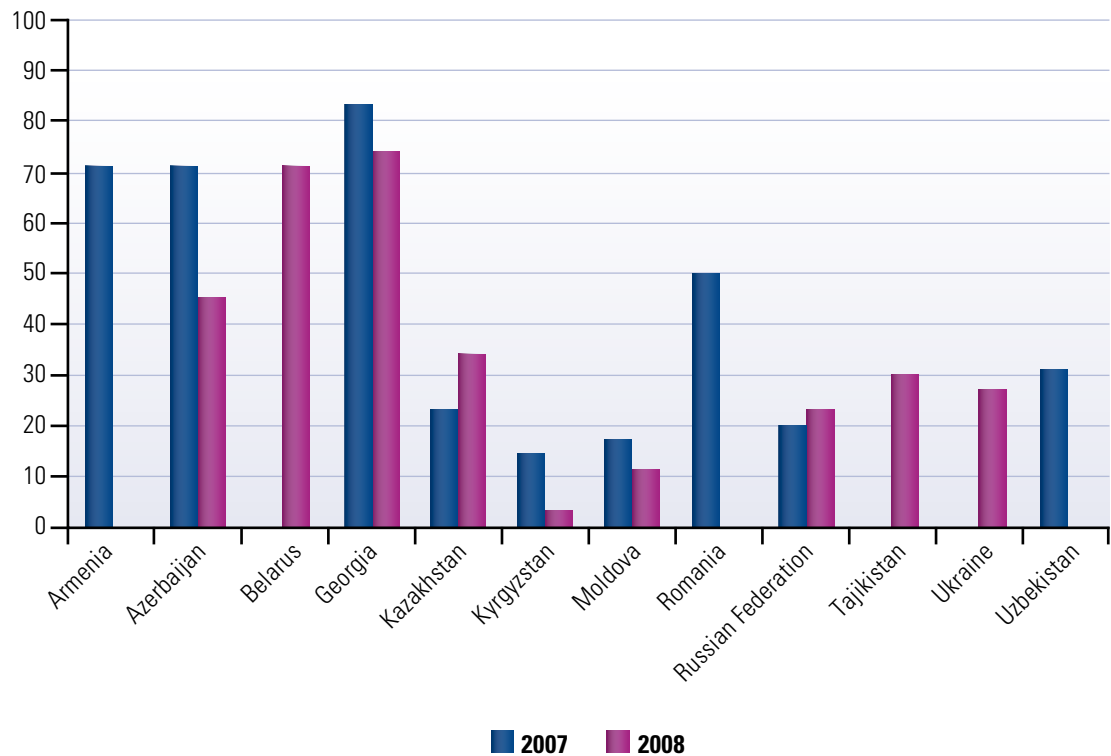
In non-breastfeeding populations, most transmissions from mother to infant occur around the time of delivery. The effectiveness of elective caesarean section (CS) in reducing MTCT was first suggested by observational studies in the early 1990s, with an approximate halving of risk. In 1999, the results of the only randomized controlled trial of vaginal delivery versus elective CS demonstrated an 80% efficacy for planned elective CS (17), while a large international individual patient data meta-analysis reported a 50% decreased MTCT risk associated with elective CS (18). In Western Europe today there is a lack of consensus with respect to the additional benefit of elective CS for women who are treated with cART. This is reflected in a range of policies for mode of delivery for HIV-infected women, with some national guidelines continuing to recommend an elective CS for women on cART with undetectable viral loads (for example, in Austria, Germany and Sweden), whilst most others do not. There is consensus, however, that in the situation of a detectable viral load at the end of pregnancy or when women received only mono zidovudine (ZDV) prophylaxis, an elective CS is generally recommended. Current WHO Europe clinical protocols provide guidance on mode of delivery in different clinical scenarios, for example, with elective CS recommended if women have viral loads above 1,000 copies/ml towards the end of the third trimester or, in the absence of viral load testing, if the woman has <95% adherence to HAART (109).

Reported rates of elective CS delivery among HIV-infected women vary considerably in the CEE/CIS region, with the highest rates reported in Belarus and Georgia (>70%) and with several countries having rates below 25%, including Moldova and the Russian Federation (Figure 7). Data on mode of delivery in 2009 from Central Asia show improvements in coverage with elective CS in Kazakhstan, Tajikistan and Uzbekistan, where elective CS rates reached 43%, 34% and 58% respectively (health sector response report).

In terms of its effectiveness as a PMTCT intervention in this setting, a Ukrainian study reported a near-halving of MTCT risk associated with elective CS delivery, consistent with findings earlier in the epidemic in Western Europe (17;21;134). However, in this study there was considerable variation in the application of elective CS as a PMTCT intervention across sites, with highest elective CS rates documented in Simferopol at 60% and lowest in Kiev at 10%.

A study in the Russian Federation showed that although a high proportion of postnatal HIV-infected women had a good knowledge of antiretroviral prophylaxis for PMTCT (80%) only a third were aware that elective CS was a PMTCT intervention (92). This finding is consistent with the generally low application of elective CS in the HIV-infected population in this country.

Figure 7
Rates of elective caesarean section delivery among HIV-infected women delivering, selected countries, 2007 and 2008



7.2.2 Obstetric management

A number of obstetric risk factors that may elevate MTCT risk have been identified in observational studies. These include use of invasive obstetric procedures, such as fetal scalp monitoring and episiotomy, in addition to prolonged duration of rupture of membranes. Limited information is available on the characteristics of delivery among HIV-infected women in the CEE/CIS region. In one Russian study, nearly half of vaginal deliveries were affected by one or more of the following: obstetric injuries, premature rupture of membranes and non-progressing labour. Overall 12% of women had artificial rupture of membranes, 12% had episiotomies and 12% an induction of labour (92).

7.3 Infant feeding

Breastfeeding is associated with an approximate doubling of MTCT risk with the risk remaining as long as the infant is breastfed (6). Complete avoidance of breastfeeding eliminates the risk of transmission postnatally, whilst exclusive breastfeeding and stopping breastfeeding at six months carry less risk of postnatal transmission compared to prolonged 'mixed' breastfeeding. Other mechanisms to reduce postnatal transmission include maternal antiretroviral prophylaxis or treatment during breastfeeding to reduce viral load and antiretroviral prophylaxis to the breastfeeding infant (post-exposure prophylaxis).

In Western Europe, most HIV-infected women formula feed their infants. In resource-limited settings, the risks of transmission with breastfeeding need to be weighed against the hazards of not

breastfeeding on an individual basis. Formula feeding is acceptable, feasible, affordable, sustainable and safe in most but not all settings in the CEE/CIS region. However, in some areas, such as parts of Central Asia, it may be considered stigmatizing not to breastfeed. Although provision of free breast milk substitutes to HIV-infected women is a component of the PMTCT policy in a number of countries in the region, in reality evaluations have suggested that there are sometimes gaps in service provision, for example, due to procurement problems (116;135).

A recent evaluation in Central Asia reported that in Kazakhstan, where free formula is provided, among mothers who were assessed in 2008 for infant feeding practices three months postpartum 97% were formula feeding their infants. In Kyrgyzstan, procurement problems resulted in coverage of only 20% of babies of HIV-positive mothers with formula, with the result that 80% received mixed feeding in 2008 (116). In Tajikistan, an evaluation of PMTCT services in 2007 found weak implementation of the policy for replacement feeding and provision of free formula (81). Reports from the Russian Federation indicate that 2.2% of children born to HIV-positive mothers were breastfed from several days to several months.

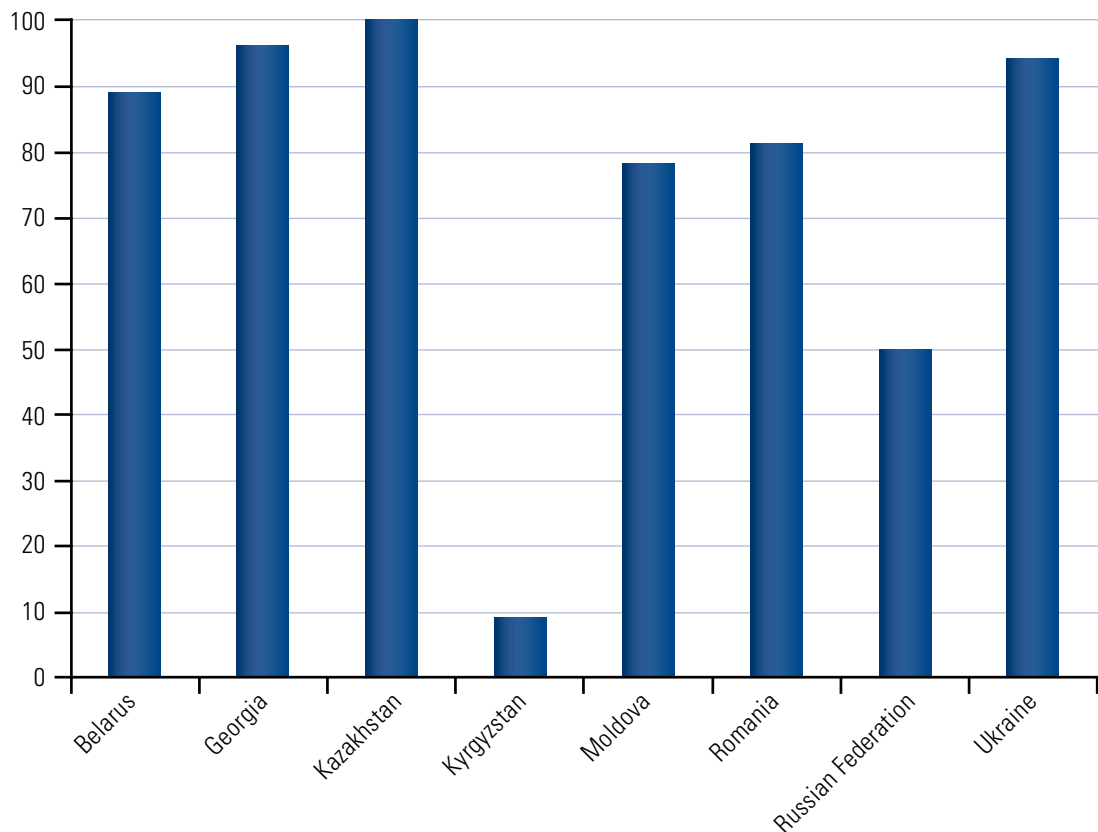
In Moldova, evaluations of HCWs with respect to their infant feeding counselling skills showed that most have adequate skills and knowledge, but that practical support, for example demonstration of how to prepare formula correctly, is much less common, with only just over a quarter providing such a demonstration to women.

7.4 Early diagnosis of infants born to HIV-infected mothers

Early diagnosis of HIV infection in an infant born to an HIV-infected mother is complicated by the passive transfer of maternal HIV antibodies in utero and their persistence in child's blood until the age of 18 months. An HIV antibody test, the gold standard test for diagnosis of HIV infection in older children and adults, therefore cannot give a definitive diagnosis of infection in an infant until he or she is 15–18 months old, when maternal antibodies will have disappeared (in most cases this occurs at around 12 months). Early diagnostic tests for infants born to HIV-infected mothers include deoxyribonucleic acid (DNA) or ribonucleic acid polymerase chain reaction (RNA PCR) tests. Benefits of early diagnosis of HIV infection include earlier initiation of ART for infected infants, shorter durations of cotrimoxazole prophylaxis, and timely tuberculosis (BCG) and mumps, measles and rubella (MMR) vaccinations for infants found to be uninfected. The shorter monitoring process required with early virological diagnosis helps to reduce uncertainty and stress for parents and can limit loss to follow-up (which can be a major challenge when diagnosis is based on antibody testing). Early diagnosis of HIV infection in infants also allows more accurate evaluation of effectiveness of PMTCT interventions and MTCT rates.

Figure 8 shows the proportion of infants born to HIV-infected mothers who have received either a virological or antibody test by age 12 months in selected countries in the region. With specific reference to virological testing, in Ukraine, 41% of infants tested by age 12 months had received early diagnosis with a virological test and this proportion reached 100% in Georgia. In Kazakhstan, 95% coverage of HIV-exposed infants with virological testing by age two months was achieved in 2008.

Figure 8
Percentage of infants born to HIV-infected mothers who have been tested (virological or antibody test) by age 12 months, 2008



Virological testing requires specialist laboratory capacity and the number of facilities with this availability is limited in some countries in the CEE/CIS region. In Ukraine, early diagnosis of HIV-exposed infants with PCR testing was introduced in November 2005, with facilities in three interregional laboratories; there are plans for another four interregional laboratories. Kazakhstan has a similar system, with a network of five laboratories providing virological testing, whilst in Kyrgyzstan and Tajikistan there is a single laboratory in each with this capacity. A recent evaluation in Ukraine identified substantial regional variation in coverage, with some oblasts having <20% coverage of infants with virological testing, and also highlighted the need for training to increase knowledge of the value and importance of early diagnosis and a better system for reporting back results to families (90). In Georgia, there is a policy for DNA PCR testing of HIV-exposed infants at 48 hours after delivery and at age four months (128).

Loss to follow-up of infants with indeterminate HIV status is a problem particularly associated with a reliance on antibody testing for HIV diagnosis. Other factors associated with increased loss to follow-up include intrapartum HIV diagnosis, inadequate counselling of and information provision for HIV-infected women during ANC and postpartum and the referral of mothers to AIDS centres for diagnosis. In the St Petersburg PMTCT and rapid testing at delivery programme, low follow-up of HIV-infected women and their babies was highlighted as a critical area for improvement, with 38% of HIV-exposed infants having undetermined HIV status at 12–24 months after birth due to loss to follow-up (89).

Use of dried blood spots (DBS) is a useful technology for lower-income settings: the advantages of this approach include the ease of collection (venepuncture is not necessary as DBS can be obtained with heel prick) and storage and shipping without the need for refrigeration. Currently, to perform infant HIV diagnosis, either blood samples are sent to reference laboratories or mothers and their infants are referred to attend facilities with appropriate laboratory capacity. There is potential to use DBS technology within PMTCT programmes in the region, as this approach has been used effectively in sentinel surveillance and research projects. Such an approach could be used to decentralize diagnostic services, as primary HCWs could collect DBS from HIV-exposed infants, but this potential to improve timeliness and coverage of infant HIV diagnosis remains as yet untapped in the region.

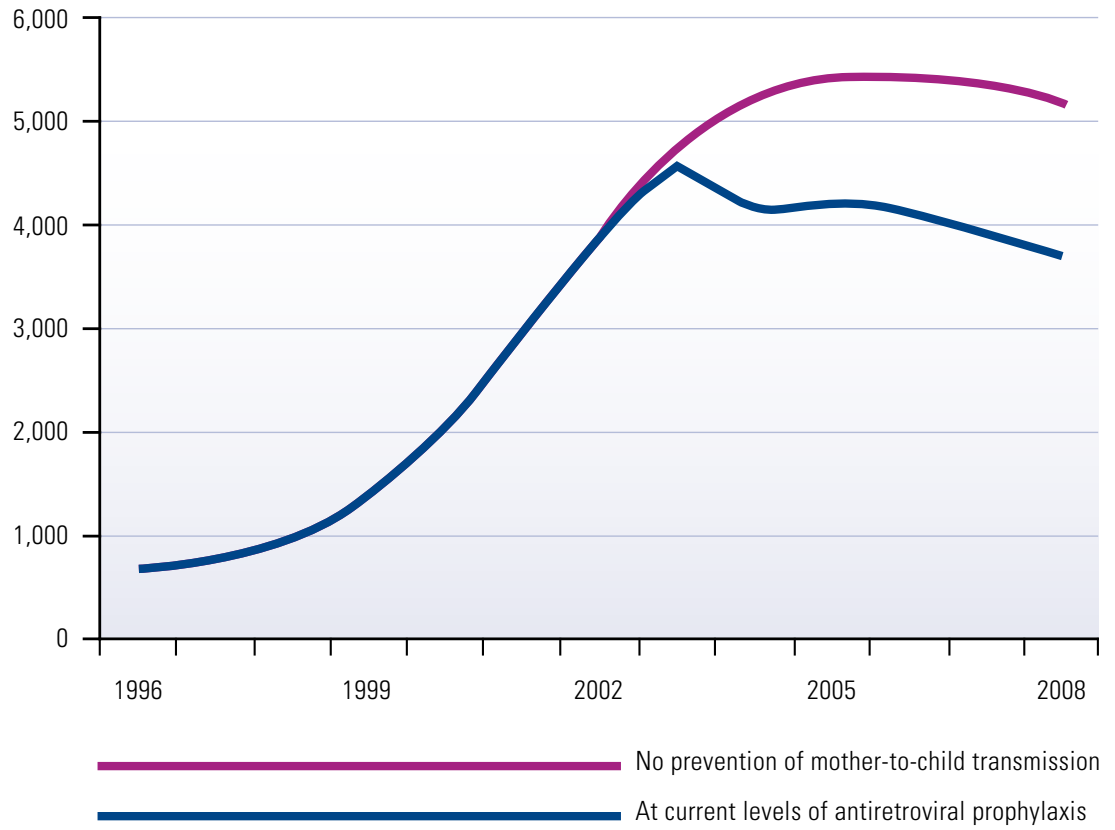
7.5 Mother-to-child transmission rates

In non-breastfeeding populations, MTCT rates (i.e., the percentage of infected infants born to HIV-positive mothers) are expected to be between 20% and 30% without any interventions. Virtual elimination of MTCT involves reducing this percentage to below 2%.

In Ukraine, according to national data, the MTCT rate has declined from 27.8% in 2001 to 6.2% in 2007. In a cohort study in Ukraine, including approximately one third of HIV-infected women delivering nationally, the MTCT rate declined from 15.2% in 2001 (95% CI, 10.2–21.4) to 6.8% in 2007 (95% CI, 5.3–8.4); stratified by receipt of antiretroviral prophylaxis or treatment, MTCT rates ranged from 26.7% among women receiving no treatment to 3.9% for those receiving triple-drug regimens (all of whom had indications for treatment for their own health) (21). In the Russian Federation, the Moscow AIDS centre has reported MTCT rates of 7.3% among HIV-infected pregnant women and 11.0% among those also infected with HCV. Enhanced perinatal surveillance data from St Petersburg, covering more than 90% of HIV-infected women delivering in the city in 2004–2006, indicated MTCT rates of 3.9% among mother-infant pairs covered with three components of ZDV (antenatal, intrapartum and neonatal), 8.6% among those where mother and infant received sdNVP and 12.4% among those where only the mother or the infant received sdNVP; of note, only 62% of infants had known infection status (124). In Moldova, the national MTCT rate declined from 10.0% in 2002 to 1.7% in 2007, representing virtual elimination of vertical transmission of HIV (87), whilst in Belarus, MTCT rates declined to 4.7% in 2007.

Recent UNAIDS estimates indicate that 7,000 infant infections have been averted by PMTCT programmes of antiretroviral prophylaxis in the CEE/CIS region since their introduction (see Figure 9). Despite the expanding coverage in the Russian Federation, Ukraine and elsewhere in the region with PMTCT programmes, the number of new paediatric HIV infections increased from 3,000 in 2001 to 3,700 in 2008, most likely reflecting the growing number of HIV-infected pregnant women delivering.

Figure 9
Estimate of the number of infant infections at current levels of antiretroviral prophylaxis in the CEE/CIS region (1)



7.6 Some country examples

Belarus

PMTCT policy

- PMTCT policy updated in 2008:
 - Opt-out policy for antenatal HIV testing;
 - HIV testing and counselling of pregnant women takes place at primary care level, with repeat testing in the third trimester;
 - Rapid testing in labour recommended for women without second HIV testing and with undocumented HIV status;
 - Obstetricians and infectious disease specialists in primary care facilities are responsible for HIV diagnosis, monitoring and treatment of HIV-infected women (since 2001);
 - Routine follow-up and antiretroviral distribution for HIV-infected women provided by obstetrician in antenatal clinic;
 - Use of triple-drug PMTCT prophylaxis for pregnant women from 28 weeks of gestation.
- 2003:
 - PMTCT policy with ZDV starting from 14–34 weeks of gestation;
 - Neonatal ZDV prophylaxis for six weeks;
 - sdNVP for women diagnosed in labour and for neonates NVP twice with second dose after 72 hours;
 - Elective CS recommended mode of delivery for HIV-infected women;
 - Breastfeeding replacement recommended for all infants of HIV-positive mothers.

PMTCT coverage

- >95% coverage of pregnant women with HIV testing.
- 89% coverage of HIV-infected pregnant women with antiretroviral prophylaxis or treatment.
- 93% coverage of infants born to HIV-infected mothers with antiretroviral prophylaxis.
- MTCT rate of 4.7% reported in 2007.
- Remaining **challenges** include:
 - Improving PMTCT coordination between intersectoral services;
 - Revising protocols (simplification and reduction in the number);
 - Increasing human capacity via staff education;
 - Developing improved PMTCT monitoring and evaluation (M&E);
 - Strengthening drug procurement system.

Kazakhstan

PMTCT policy

- Routine offer of HIV test to all pregnant women on an opt-out basis, with testing at pregnancy registration and repeated in the third trimester, introduced mid-2006.
- Most recent PMTCT policy approved in December 2008:
 - All ANC facilities provide voluntary counselling and testing;
 - Rapid testing in labour for women with undocumented HIV status with provision of sdNVP;
 - Triple-drug prophylaxis for PMTCT from 24 weeks of gestation;
 - Neonatal prophylaxis;
 - Elective CS for women with HIV RNA levels >1,000 copies/ml or those with unknown viral load;
 - Provision of free infant formula.
- Referral of HIV-positive women to AIDS centres for assessment (CD4 count and clinical assessment) for treatment eligibility and receipt of antiretroviral prophylaxis or treatment.

PMTCT coverage

- >95% coverage of pregnant women with HIV testing.
- 88% coverage of HIV-infected pregnant women with antiretroviral prophylaxis or treatment (although around 50% continue to receive ZDV monotherapy despite new policy).
- 95% coverage of infants born to HIV-infected mothers with antiretroviral prophylaxis.
- 95% coverage of HIV-exposed infants with virological testing by age two months.
- 96% of HIV-infected pregnant women assessed for ART eligibility.
- Remaining **challenges** include:
 - Consolidating ongoing improvements to M&E system, particularly regarding collation and analysis of data on a national level;
 - Moving towards greater coverage with triple-drug prophylaxis for PMTCT;
 - Reviewing infant feeding practices.

Moldova

PMTCT policy

- PMTCT policy updated in 2008:
 - Opt-out policy for antenatal HIV testing;
 - HIV testing and counselling of pregnant women takes place at primary care level, with repeat testing in the third trimester;
 - Rapid testing in labour recommended for women with undocumented HIV status (since 2007);
 - Use of triple-drug PMTCT prophylaxis for pregnant women from 24 weeks of gestation;
 - Use of dual prophylaxis for infants;
 - Provision of free infant formula for first year of life.
- HIV-infected women referred to one of two AIDS centres for clinical assessment and ART.
- Four maternity hospitals are designated hospitals for deliveries to HIV-infected women and only these hospitals have antiretroviral drug stocks for PMTCT.

PMTCT coverage

- >95% coverage of pregnant women with HIV testing.
- 95% coverage of HIV-infected pregnant women with antiretroviral prophylaxis or treatment.
- 93% coverage of infants born to HIV-infected mothers with antiretroviral prophylaxis.
- MTCT rate of <2% reported in 2007.
- Remaining **challenges** include:
 - Sustainability in the face of increasing numbers of HIV-infected pregnant women;
 - Access of most-at-risk women to ANC and PMTCT;
 - Integration of comprehensive PMTCT services into maternal and child health (MCH) services;
 - Better access to emergency PMTCT prophylaxis for all HIV-infected women diagnosed intrapartum;
 - Provision of infant feeding counselling postnatally;
 - Effective linkage between PMTCT services, other HIV prevention services and family planning services;
 - Improved quality of training for HCWs;
 - Accurate M&E of the PMTCT programme.

(87)

Russian Federation

PMTCT policy

- Long-established universal opt-out policy for antenatal HIV testing.
- Repeat testing in the third trimester and intrapartum rapid testing for women with undocumented HIV status.
- Use of triple-drug PMTCT prophylaxis since 2009.
- Neonatal prophylaxis for infants.
- Provision of free infant formula.

PMTCT coverage

- >95% coverage of pregnant women with HIV testing.
- 92% coverage of HIV-infected pregnant women with antiretroviral prophylaxis or treatment.
- 98% coverage of infants born to HIV-infected mothers with antiretroviral prophylaxis.
- Remaining **challenges** include:
 - Improving the coverage and quality of test counselling in pregnancy;
 - Earlier diagnosis of HIV-positive pregnant women with unknown infection status at the start of pregnancy.

Ukraine

PMTCT policy

- Opt-out policy for antenatal HIV testing.
- HIV testing and counselling of pregnant women takes place at primary care level, with repeat testing in the third trimester.
- Rapid testing in labour recommended for women with undocumented HIV status (since 2003).
- 2001: PMTCT prophylaxis based on sdNVP.
- 2003: Policy updated with ZDV starting from at least 28 weeks of gestation and one week of neonatal ZDV prophylaxis; addition of sdNVP for women diagnosed after 28 weeks of gestation, with extended neonatal prophylaxis (four weeks).
- 2008: use of triple-drug PMTCT prophylaxis for pregnant women from 24 weeks of gestation.
- Free provision of infant formula.

PMTCT coverage

- >95% coverage of pregnant women with HIV testing.
- 89% coverage of HIV-infected pregnant women with antiretroviral prophylaxis or treatment.
- 98% coverage of infants born to HIV-infected mothers with antiretroviral prophylaxis.

National evaluation

- ✓ Current PMTCT framework involves all four pillars of PMTCT.
- ✓ Multisectoral approach with five ministries sharing responsibility has improved collaboration and coordination.
- ✓ Trend towards increased earlier diagnosis in pregnancy and decreasing proportion of women diagnosed in labour provide the opportunity for provision of more potent antiretroviral prophylactic regimens.
- ✓ Excellent progress in PMTCT coverage.
- ✗ Marginalized populations have limited access to comprehensive PMTCT services.
- ✗ Limited capacity for monitoring health status of HIV-infected pregnant women (CD4, viral load).
- ✗ No system of quality assurance of PMTCT; M&E requires updating.
- ✗ No decentralization of HIV services (treatment, diagnosis, follow-up).
- ✗ Avoidance of supply gaps and improvements needed in procurement.

Findings from a multi-site cohort study of HIV-infected pregnant women and their children

- The proportion of HIV-infected women with intrapartum diagnosis halved between 2004–2005 and 2006–2007, from 12% to 6%.
- The percentage of women not receiving any antiretroviral prophylaxis declined significantly from 18% in 2001 to 7% in 2007.
- After 2003, use of antenatal prophylaxis (with ZDV) grew substantially and use of sdNVP alone declined.
- Median antenatal ZDV prophylaxis duration increased from 24 to 72 days between 2000 and 2007.
- MTCT risk was reduced by 43% with elective CS versus vaginal delivery and by 75% with ZDV versus no prophylaxis in adjusted analyses.

(21) (90)

7.7 Gaps and challenges in the implementation of PMTCT

The annual assessment of the health sector response to HIV/AIDS carried out by WHO, UNAIDS and UNICEF includes identification of the main barriers to the implementation of PMTCT. Summary results from eight countries in the CEE/CIS region (Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Romania, Tajikistan and Ukraine) are presented in Figure 10, which demonstrate that the most important challenges relate to funding and M&E. On a country level, none of these barriers were identified in the reporting from Belarus and Kazakhstan, with the remaining countries each reporting between four and seven of these gaps and challenges.

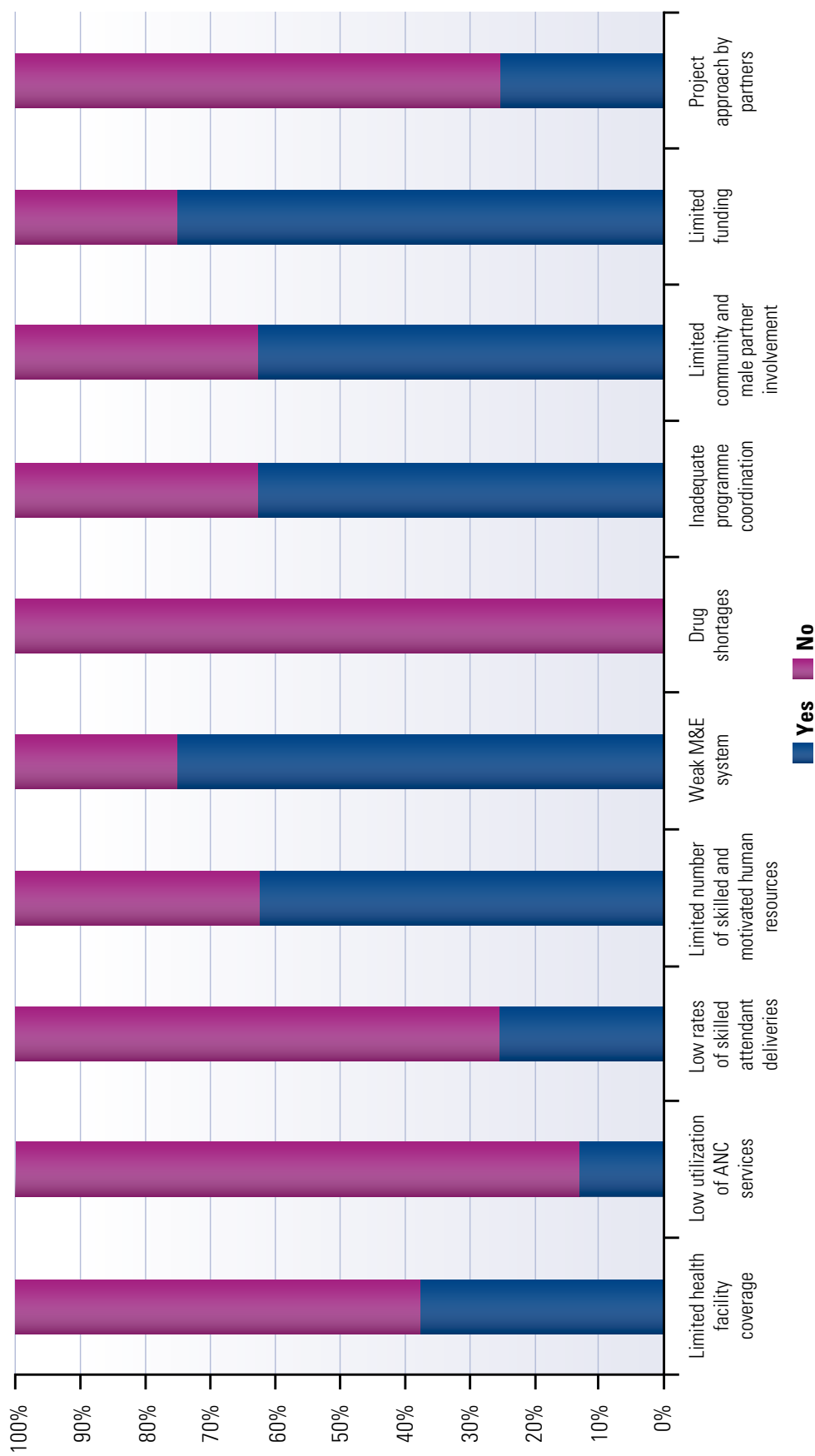
The efficiency of PMTCT services, as well as other HIV programmes, depends on the availability of appropriate resources for testing and treatment/prophylaxis. A recent assessment in Almaty and Temirtau (Kazakhstan), although not specifically addressing PMTCT, drew attention to the issue of antiretroviral drug stock-outs and highlighted the need to examine and support the supply chain for commodities used in the treatment of HIV (136). Similarly, a 2007 evaluation in Ukraine identified a need to develop adequate systems for forecasting drug needs and for managing supplies between regions in the context of the long-term requirement to scale up ART (88).

7.8 Injecting drug-using women and PMTCT

Female IDUs frequently have low uptake of health-care services. This not only reflects difficulties faced in accessing health care but may also arise from specific avoidance of medical care in some cases; for example, if they have previously encountered stigma, discrimination or other negative experiences. High rates of late presentation to ANC by pregnant IDUs have been reported in the CEE/CIS region, with many IDUs not presenting until labour itself. For example, in one Ukrainian study, IDU women were 3.5 times more likely to be diagnosed through rapid intrapartum testing than non-IDU women, with 22% of IDUs with unknown HIV status at conception diagnosed through intrapartum testing compared to only 5% of non-IDUs (137). Regardless of their HIV infection status, female IDUs are more likely than other women to deliver babies with health problems, including neonatal abstinence syndrome, low birth weight and other complications of preterm delivery and other congenital infections, which underscores the critical need to improve their access to ANC (138). Studies in the Russian Federation have reported HCV coinfection rates of 50–65% and HBV coinfection rates of 10–20% among HIV-infected pregnant or postnatal women (either all or predominantly IDUs), with STI coinfection rates of 20–37% among those not reporting sex work increasing to nearly 60% among IDU sex workers (24;75;92).

PMTCT policies which incorporate the recommendation for rapid HIV testing in labour for women with undocumented HIV status provide the potential to identify undiagnosed HIV-infected IDUs at this time. Such policies are in place in several countries in the CEE/CIS region, including Kazakhstan, Moldova, the Russian Federation, and Ukraine. However, experience from the St Petersburg PMTCT and rapid testing at delivery programme demonstrates that, even in this context, IDUs were three times more likely to deliver without receiving a rapid test compared with other women, largely reflecting their tendency to be admitted at advanced stages of labour (89). Several cities and countries, including St Petersburg and Moldova, operate systems where only a small number of specialist 'high-risk' maternity hospitals have immediate access to PMTCT prophylaxis for intrapartum use. The lack of comprehensive access to such services is also likely to play a part in preventing adequate coverage of IDUs with PMTCT prophylaxis (87;89). Even in the situation where a rapid test is performed, some HIV-infected

Figure 10
Major gaps and challenges in the implementation of PMTCT*



* based on national responses from Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Romania, Tajikistan and Ukraine.

IDUs will not receive intrapartum prophylaxis because the test result is not received in time. In the St Petersburg programme, 24% of women with a positive rapid test result did not receive any antiretroviral prophylaxis, although 98% of infants born to infected mothers received prophylaxis (89).

Among the group of IDUs who are covered with intrapartum prophylaxis, the MTCT risk will be considerably higher than if they had received antenatal prophylaxis. Furthermore, female IDUs' risk of MTCT may also be elevated by their concurrent coinfections, some of which could have been diagnosed and treated with adequate access to ANC. For example, identification of maternal syphilis allows treatment to take place, preventing congenital syphilis infection and reducing MTCT risk, as syphilis coinfection in pregnancy has been associated with a four-fold increased risk of MTCT in one birth cohort study in Ukraine (58). Recent findings from the same cohort showed that IDU women were nearly one and a half times more likely to transmit HIV to their infants compared with non-IDU women, even after accounting for their lower coverage with PMTCT and higher rate of preterm delivery (another MTCT risk factor); unadjusted MTCT rates for the period 2000–2008 were 13.8% for IDUs compared with 6.1% for non-IDUs, while among IDUs who only received their HIV diagnosis through intrapartum rapid testing the MTCT rate was 20.3% (137).

IDUs and PMTCT: Findings from the European Collaborative Study on HIV-infected pregnant women in Ukraine

Cohort study of HIV-infected pregnant women and their children:

- One in five women had an IDU history and at least one fifth were using street drugs during pregnancy
- 65% were HCV coinfecting, 10% were HBsAg-positive and 2% had syphilis
- An increasing proportion of IDUs were aware of their HIV status before pregnancy (from 31% in 2000–2001 to 67% in 2008–2009)
- Among IDUs with unknown status at conception, 22% were diagnosed through rapid testing at delivery compared with 5% of non-IDU pregnant women
- IDUs had substantially worse access to PMTCT prophylaxis than other women
 - Overall one in five received no antiretroviral prophylaxis compared with one in fourteen non-IDUs
 - 24% IDU women received only sdNVP compared with 9% among non-IDUs
- However, this situation has improved over time
 - IDUs delivering in 2008–2009 were nearly three times more likely to receive PMTCT prophylaxis than those delivering before 2002 (slightly less of an improvement than among non-IDUs)
- IDUs had an MTCT rate of 13.8% compared with 6.1% among non-IDUs in 2000–2008.

(137)

7.8.1 Opioid agonist maintenance treatment

Treatment of drug dependence among IDUs with opioid agonist maintenance treatment is associated with a stabilization of their health and social situation and allows access to a variety of health services (138). This approach has been shown to significantly reduce opioid and other drug use, mortality, criminal activity, HIV risk behaviours and treatment retention compared with detoxification or no treatment (139). Reflecting the large evidence base of the benefits of opioid agonist maintenance treatment, methadone and buprenorphine are both on the WHO list of essential medicines. For pregnant women, access to such maintenance treatment has the potential to allow access to ANC services, including PMTCT. Recently updated WHO guidelines include the recommendation that opioid-dependent pregnant women should be encouraged to start treatment with methadone or buprenorphine, although preference is given to the former as there is a better understanding of the safety of methadone in pregnancy (139). Pregnant women already on such maintenance therapy should continue throughout the pregnancy, to reduce the risk of maternal relapse and the poor pregnancy outcomes associated with severe opiate withdrawal.

The high prevalence of history of drug treatment among active IDUs in the CEE/CIS region underscores the elevated failure rate of detoxification in this setting and the need for a shift in drug-dependence treatment policy; for example, in one study in Ukraine 45% of IDUs had previous drug-dependence treatment (detoxification), while figures ranging from 36% to 40% have been reported from studies in the Russian Federation (40;41;140). All countries in the CEE/CIS region, with the exception of the Russian Federation, have now established opioid agonist maintenance treatment programmes. However, in many countries implementation has not yet been scaled up from pilot programmes, while in Uzbekistan the pilot programme has been closed by the government. Furthermore, linkages with PMTCT services generally remain weak. Of note, methadone maintenance treatment has been included in the most recent PMTCT protocols in Kyrgyzstan and Ukraine. A recent review of services for pregnant drug users in the CEE/CIS region indicated that a small number of pregnant women have utilized such programmes in Kyrgyzstan, Ukraine and Uzbekistan (50). Barriers preventing pregnant IDUs or those with children from accessing drug treatment programmes include concerns about separation from their children and loss of child custody; objections by partners have also been identified as barriers preventing women from accessing these services (50).

There is a lack of regional expertise in offering opioid agonist maintenance treatment to pregnant women in the CEE/CIS region, together with some gaps in local knowledge. For example, in a recent evaluation in Moldova, more than half of HCWs surveyed stated that they would counsel drug-using pregnant women to stop using drugs immediately (which is not recommended as acute drug withdrawal is associated with intrauterine death) and fewer than 5% reported that they would refer women to a methadone treatment programme (87).



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8. Family planning and HIV-infected women

Provision of family planning services to HIV-infected women is not only important for the prevention of unintended pregnancies and to allow women to adequately space their childbearing, but also with regard to prevention of onward transmission to sexual partners.

Although many HIV-infected women of childbearing age have established partners who are also HIV-infected (concordant HIV status), a substantial proportion of infected women are either without a current partner or in a discordant couple (i.e., have an HIV-negative partner). Use of barrier contraception for couples where both partners are infected as well as for discordant couples is recommended, in the former case to prevent super-infection or infection with a different strain of HIV, and in the latter to prevent heterosexual transmission of HIV. In a study in Ukraine of postnatal HIV-infected women, 27% had an HIV-negative sexual partner, 40% had an HIV-positive partner, and the remaining third either did not know their partner's status, or had no current partner (100;141). Women in concordant relationships were half as likely to use condoms postnatally as those in discordant couples.

Unintended pregnancy among HIV-infected women may elevate the risk of both MTCT and infant abandonment, particularly among marginalized women (e.g., IDUs, illegal migrants) who may not engage with ANC services, receive ART or PMTCT, or have access to safe abortion. Unintended pregnancy rates are likely to be high among IDUs who have low use of effective contraception. Furthermore, pregnant IDUs may not realize that they are pregnant until it is too late to terminate the pregnancy, due to drug-related amenorrhea, putting this group at increased risk of infant abandonment.

Policies for the provision of free contraception to HIV-positive women exist in several countries of the CEE/CIS region. However, the implementation of such policies appears to be weak and in-country evaluations have indicated fragmented implementation of prevention of unwanted pregnancies in HIV-infected women in countries including Moldova (87) and Ukraine (90). A recent study in Moldova found that family planning counselling for HIV-positive women was mostly provided at the AIDS centre, but when this was provided at a local level quality was sometimes inadequate (87). A Ukraine study of postnatal HIV-infected women highlighted the unmet need for contraception among

HIV-infected women in this setting, as 23% had not planned their most recent pregnancy, 20% were not currently using any family planning method (although some of these women reported not being sexually active at the time) and a further 20% were using non-effective methods (such as coitus interruptus). Furthermore, the most important factor associated with lack of postnatal contraception was affordability, despite the national policy of free provision (100;141). In Kyrgyzstan, an evaluation in 2007 reported that distribution of contraception to HIV-infected women is via NGOs and is not linked to HIV treatment and care services. Furthermore, interrupted supply of family planning commodities is reported from Central Asia.



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9. Infant abandonment

Infant abandonment in Western Europe by HIV-infected mothers today is rare, but was a relatively common problem earlier in the epidemic. In a cohort study of children born to HIV-infected mothers from eight Western European countries, 6.5% of infants born in 1986–1996 were abandoned by their mothers at birth. At this time, 45% of mothers enrolling in the cohort were active IDUs; one in ten infants remained in hospital beyond the usual postpartum stay, of whom half were suffering from neonatal abstinence syndrome; and most infant abandonments (i.e., those in the postnatal period) were associated with maternal IDU. By six months of age, around a quarter of children of IDUs were no longer living in parental care, compared with only 5% among those with non-IDU mothers (142;143).

In the CEE/CIS region, infant abandonment rates among children of HIV-infected mothers as high as 12% have been reported from Ukraine (144) and around 20% from the Russian Federation (UNICEF 2004). Abandonment rates amongst HIV-infected mothers must be considered in the context of background levels of abandonment: in the Russian Federation an estimated 0.5% of infants are placed in institutional care nationally, with some substantial regional variation, for example, with this figure reaching 1% in St Petersburg (145). In Ukraine, this figure is estimated to be around 1% (146).

In the Russian Federation, a study in St Petersburg in 1998–2002 found that 26% of HIV-infected women without ANC and 4% of those with ANC abandoned their infants to the custody of the state (147). More recently, an audit of the St Petersburg PMTCT and rapid testing at delivery programme revealed that 50% of HIV-positive women delivering in a seven-month period in 2004 had abandoned their babies (124). Of note, all these women were identified through rapid testing during labour and almost all women who abandoned their infants reported that the pregnancy was unplanned. Elsewhere in the Russian Federation, Kaliningrad region has had a similarly high proportion of HIV-positive women who have abandoned their infants (18%, 1987–2003), whilst this figure is below 10% in the Moscow, Orenburg and Tatarstan regions (145).

More recent Russian data from 2008 indicate considerable variability in rates of infant abandonment among HIV-positive women by region, with much more uniform and substantially lower rates among

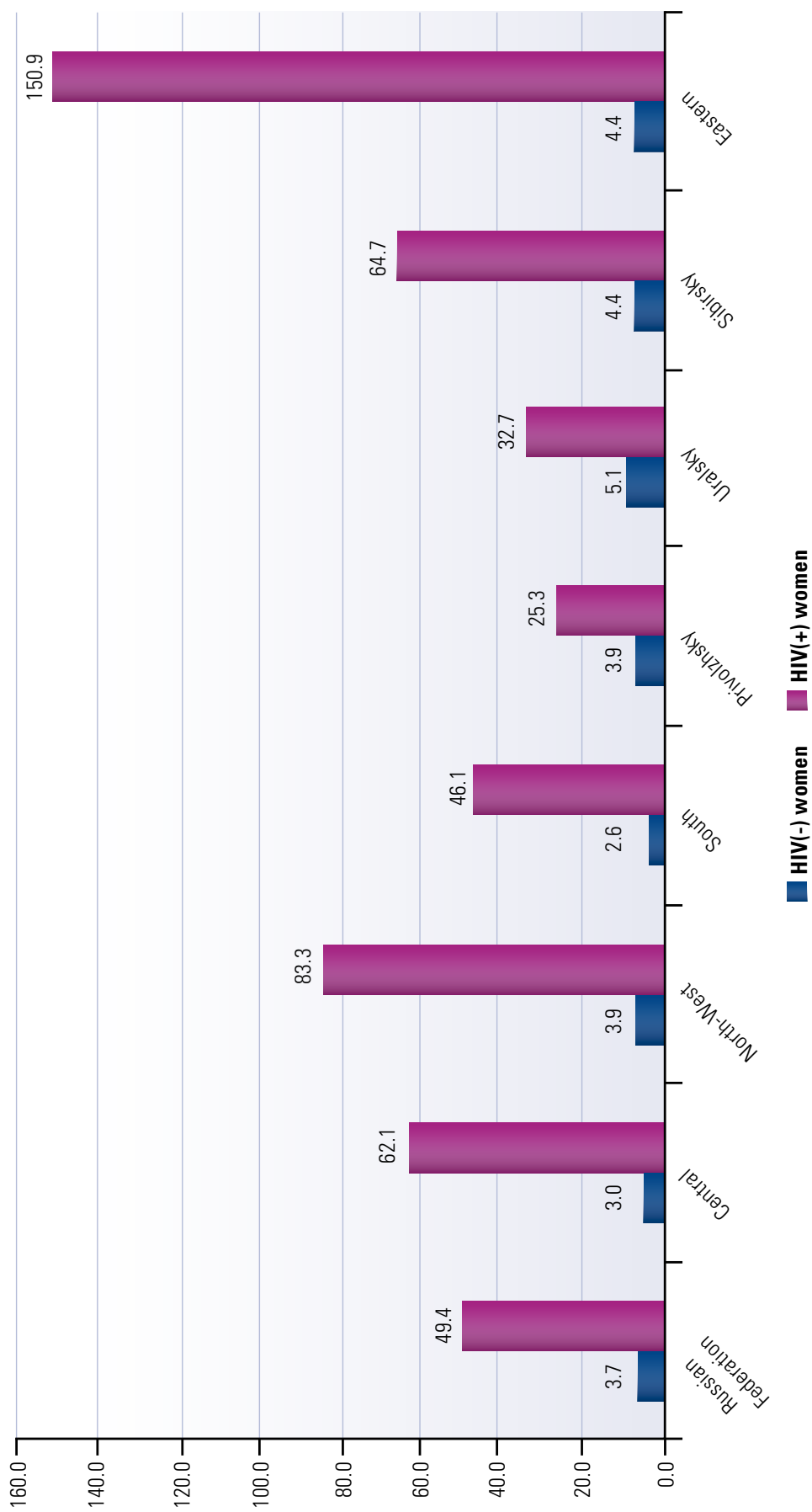
women without HIV infection (see Figure 11) (148). Of note, the estimated proportion of HIV-infected women abandoning their infants has declined over time in the Russian Federation, from 11% in 2000 to 5% in 2003 and 6.6% in 2008 (145;148). In a cohort study of HIV-infected pregnant women and their infants in Ukraine, the proportion of women abandoning their infants at birth was lower than that reported in other studies, at around 2% overall, but with a similar declining trend, from 4% in 2000–2002 to 1.5% in 2006–2009 (149). This decline occurred concurrently with the scale-up of PMTCT, and women receiving antenatal ART had a significantly reduced risk of infant abandonment compared with women receiving sdNVP only (because of late HIV diagnosis) after adjusting for socio-demographic factors including IDU; women without cohabiting partners and those who were active IDUs were more likely to abandon their infants (149).

Country reports to WHO/UNICEF have indicated that no HIV-infected women delivering in 2008 had abandoned their infant in the first year of life in Georgia, Kazakhstan, Kyrgyzstan, Romania and Tajikistan, with 1%, 4% and 5% of women abandoning their infants in Moldova, Azerbaijan and Belarus respectively.

An in-depth qualitative study of infant abandonment by HIV-infected mothers, including women who did and who did not abandon their infants, as well as their families and HCWs from four regions in the Russian Federation, concluded that HIV was not the primary reason for infant abandonment (150). The key factors increasing the likelihood of abandonment identified in this study were unwanted pregnancy, lack of family support, drug and alcohol use, fear of the infant having birth defects or disabilities and marginalized socio-economic status. Of these, the strongest was unwanted pregnancy: the researchers identified gaps in contraceptive knowledge in this group of HIV-infected women, a lack of interest in contraception, fears about hormonal contraception and a belief that contraception is ineffective. The study also identified that women are sometimes advised or pressured to abandon their babies by their own families or by health-care professionals, although there were also cases where a baby's grandparents happily took on their care. Other studies have found many of the same factors to be associated with infant abandonment, but additionally have reported that single parenthood and already having one or more children also elevate risk (144;149). Among IDUs, abandonment of infants very soon after delivery may be precipitated by the woman's need to leave the hospital to seek drugs; this, together with the high rates of unintended pregnancy, poor access to abortion services and frequent alienation from family members, is likely to help to explain the higher rates of abandonment among this group. Widespread negative attitudes of medical professionals towards HIV-infected pregnant women and mothers have been reported in several studies and the high likelihood of stigmatizing and discriminatory treatment of drug-using women may further elevate their likelihood of abandonment (145;150).

Abandoned infants of HIV-infected pregnant women are more likely to be infected than those who remain in parental care (149). This is an indication of overlapping risk factors (particularly lack of ANC and the resultant lack of comprehensive PMTCT interventions) rather than a tendency for women to selectively abandon infected children, as in the majority of cases women are unaware of their infant's infection status at the time of abandonment.

Figure 11
Abandonment of infants after delivery (per 1,000 live births) in Russian Federation in 2008



9.1 Approaches to prevent abandonment

As infant abandonment does not seem to be caused by maternal HIV itself, but is rather a reflection of the myriad of problems faced by HIV-infected and at-risk women, a key prevention approach involves strengthening the provision and quality of medical and social services for all marginalized women and not only those with HIV infection. This includes ANC, drug substitution programmes, family planning services and financial support, with an emphasis on providing non-stigmatizing and non-discriminatory care, which may require provision of education and training for HCWs. Examples of approaches to prevent child abandonment include the MAMA+ project, which has been implemented in St Petersburg and also in Kiev, Donetsk and Simferopol (Ukraine): the project empowers HIV-positive mothers to keep their children by providing them with comprehensive, individualized services, including family visits, counselling and assistance in accessing welfare support (151).



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10. Termination of pregnancy among HIV-infected women

The proportion of pregnancies among HIV-infected women ending in termination is difficult to compare across countries as the ways in which these data are collected vary and are influenced by HIV testing policies. In the Russian Federation in 2007 and 2008, 40% and 38% respectively of all pregnant women testing positive for HIV had a termination of pregnancy, and women receiving HIV testing included both women attending ANC and those seeking terminations of pregnancy. In Ukraine, data on terminations of pregnancy among HIV-infected women are available only for those women with known HIV infection status from before pregnancy, with rates of termination of 9% in 2007 and 14% in 2008 reported. In Kazakhstan, where all pregnant women were tested for HIV as in the case of the Russian Federation, 34% of pregnancies in HIV-positive women ended in termination in 2008 and 38% in 2009 (health sector response data).

The circumstances under which pregnancies in HIV-infected women in Eastern Europe and Central Asia are terminated are therefore likely to vary. For example, some may occur among women already aware of their HIV status before the pregnancy, but who did not plan to become pregnant and did not want to continue their pregnancy, whilst others may have been among women who had already decided to terminate their pregnancy before they were aware of their HIV infection. Low use of effective contraception among HIV-infected women in Eastern Europe, as reported in a number of studies (100;150), suggests that this may be a common situation. Another scenario may be where a woman underwent an abortion subsequent to an antenatal diagnosis of HIV infection.

There are a few anecdotal reports of HIV-infected women being recommended to have an abortion by HCWs. Such practices reflect both a lack of knowledge and training with respect to the risks of MTCT and the benefits of PMTCT and the discriminatory attitudes towards HIV-positive women held by some HCWs. Although it is essential that HIV-positive women should have access to safe abortion services, it is equally important that there is no form of coercion regarding termination of pregnancy. Under the assumption that any HIV-infected woman who wants to terminate her pregnancy can access appropriate services, then a declining proportion of terminations of pregnancies among HIV-infected women over time could be interpreted positively as a reduced incidence of unwanted pregnancies in this population.

11. Treatment and prognosis among HIV-infected children

Many countries in the CEE/CIS region have prioritized ART for HIV-infected children and this is reflected in the growing number of infected children receiving HAART in the region over time (see Figure 12). The increasing number of children on HAART in Ukraine and the Central Asian republics has been particularly noteworthy. In the case of the Central Asian countries, the number of children newly initiated on HAART reflects responses to the outbreaks of hospital-acquired HIV infection among children in Kazakhstan, Kyrgyzstan and Uzbekistan in 2006, 2007 and 2008 respectively. UNICEF estimates that 82% of HIV-infected children under 15 years of age in CEE/CIS were receiving HAART in 2008 (132).

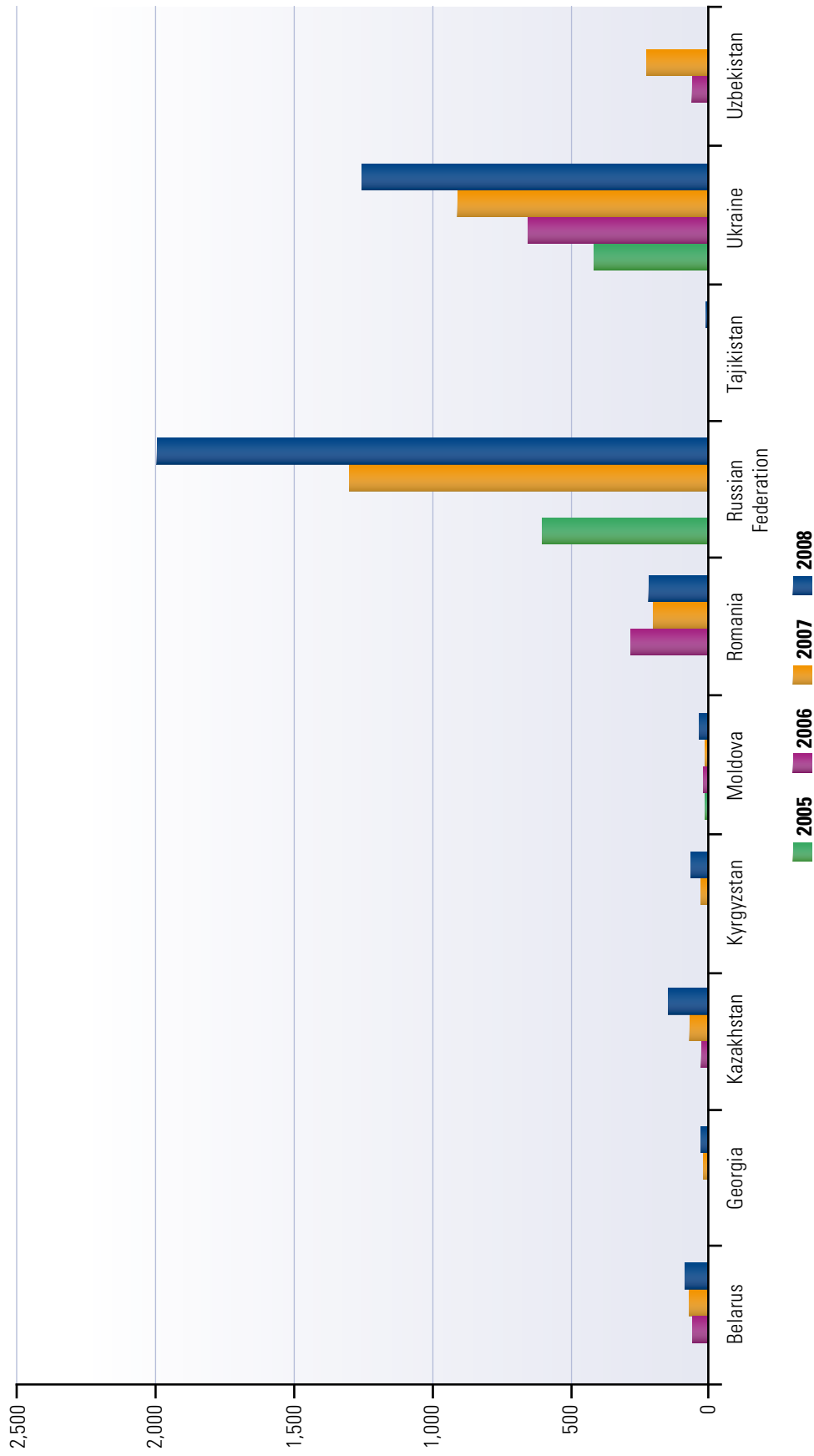
11.1 AIDS mortality among children in Europe

Studies in Western Europe have shown that, if untreated, around 20% of children with vertically-acquired HIV infection will die before their first birthday, rising to 40% by age five years; these figures are considerably lower than those seen in Africa where around 35% of infected children will die before age one without treatment, and nearly half by their second birthday (152;153).

In Western Europe, HAART use among infected children has resulted in substantial declines in AIDS-related mortality. In the United Kingdom and Ireland, crude mortality among HIV-infected children has declined from 8.2 deaths per 100 child-years in the years up to 1997, to 0.9 deaths per 100 child-years in 2003–2006, with a decline in a combined rate of AIDS and mortality from 13.3 cases per 100 child-years before 1997 to 2.5 cases per 100 child-years in 2003–2006 (154). Survival analysis among Italian children with vertically-acquired HIV indicated that mortality was an estimated 25% at age five years in children born in 1985–1995, but decreased to an estimated 3% among those born since 2000. In this Italian cohort, incidence of AIDS events declined from 28 per 100 child-years among children born before 1996 to 4.8 events per 100 child-years among those born in 2000–2005 (155). In a recent pooled analysis involving several Western and Central European cohorts of HIV-infected children, the cumulative probability risk of AIDS or death at age one year was an estimated 11.7% in infants who did not start HAART until after age three months and 1.6% in those starting HAART before age three months, increasing to 21.5% and 4.6% respectively at age five years; in adjusted analyses, the risk of AIDS or death was found to be three times lower in infants who initiated HAART before age three months compared with those for whom treatment was deferred (156).

There are relatively few studies on natural or treated history of HIV disease in children living in the CEE/CIS region. In Romania, where the paediatric population is characterized by a high proportion with parenterally-acquired HIV infection, the annual mortality rate among children in a cohort followed in Constanta up to mid-2002 ranged from 8% to 14%, while among the 450 infected children receiving HAART at the Romanian-American Children's Centre, annual mortality was substantially reduced, at 3% (157). In a Ukraine birth cohort of HIV-infected children ongoing since 2000, 11% of children had died to date (most with AIDS) at an average of six months of age. From survival analysis, an estimated 6% of children will have died or progressed to AIDS by age six months overall, increasing to 16% at age 12 months; however, cumulative probability risk of death decreased significantly over time, with an estimated 13% of children born in 2000–2003 having died by age 12 months compared with 4% for children born in 2004–2008, most likely reflecting the national scale-up of access to paediatric HIV diagnosis, treatment and care (158).

Figure 12
Trends in the number of HIV-positive children (aged <15 years) receiving HAART, 2005–2008



Considerations for the future

The expansion of the HIV epidemic in CEE/CIS has been alarmingly rapid, with a doubling of HIV prevalence over a 10-year period. Specific challenges in combating the HIV epidemic are faced in low-prevalence and concentrated epidemic settings, particularly where the most affected individuals belong to the most socially marginalized and excluded populations such as IDUs, but there are also some significant opportunities. The elimination of vertically-acquired HIV infection is one such opportunity and this report has highlighted that substantial progress to achieving an HIV-free generation has been made in the region in a relatively short time frame.

Coverage of diagnosed HIV-positive pregnant women with antiretroviral prophylaxis for PMTCT has exceeded 85% in several countries in CEE/CIS, including the Russian Federation and Ukraine where more than 90% of the HIV-positive pregnant women in the region live. Elimination of vertical transmission targets have been reached in some countries, such as Moldova, whilst considerable progress towards elimination has been made elsewhere, including in Belarus, Kazakhstan, the Russian Federation and Ukraine.

Considerations for the future include strengthening PMTCT programmes, especially with respect to equity, quality and sustainability. In particular, reaching the most vulnerable groups of pregnant women with timely, appropriate and non-stigmatizing ANC services is a key goal. Evidence-based interventions such as OST need to be made available and accessible for drug-using pregnant women.

As highlighted in the recent UNICEF Call to Action, intensive efforts are also needed to ensure that those HIV-positive pregnant women needing treatment receive this promptly; this is not only beneficial for their own health but also for the health and social care of their children. Improving access to family planning in order to prevent unintended pregnancies in HIV-positive women will be another important challenge in the region. Intensification of PMTCT approaches and the implementation of the most up-to-date WHO guidelines are major considerations for the future, including the use of HAART rather than abbreviated antiretroviral regimens for PMTCT prophylaxis in those countries currently without such a policy. Sustainability also needs consideration given the likely increases in the overall number of HIV-positive pregnant women identified through antenatal testing, as well as future childbearing among infected mothers with an established HIV diagnosis.

New guidance that all HIV-infected children aged below two years should start ART underscores the necessity of improving early diagnosis of infants born to HIV-positive mothers across the region. Consideration is also needed with respect to improving the detection of infections in older children, who would otherwise remain undiagnosed and thus untreated. The number of HIV-infected children receiving ART in the region is growing, reflecting strong commitment to scaling up paediatric HIV treatment. Therapeutic management of children with HIV requires specialized and up-to-date knowledge and there is a growing cadre of HCWs with appropriate clinical expertise. The provision of treatment and care for infected children will become increasingly complex and demanding, not only because of the need to treat infants but also because of the new challenges associated with caring for infected children on lifelong treatment, as they grow up to become adolescents and young adults.

The importance of ongoing surveillance of HIV has been highlighted by the recent new wave of transmissions in Siberia, the rapid acceleration of the epidemic in Uzbekistan and the escalating HIV prevalence among IDUs in Tajikistan. Women comprise a growing proportion of those living with HIV in the region, underscoring the importance of a comprehensive approach to PMTCT as a key component of broader prevention strategies. Behavioural surveillance is also critical as a means of understanding the evolving epidemiology in the region and to help focus prevention efforts. For example, there is a need for close monitoring of the reported increases in stimulant injection in the region, particularly among women, while the observation of an increasing proportion of women among new IDU initiates in the Russian Federation needs further investigation. The growing evidence pointing to the greater vulnerability of female IDUs to HIV acquisition underlines the need for innovative and gender-specific approaches to prevention and harm reduction.

Clearly, the CEE/CIS region is highly likely to be one of the first to achieve the goal of eliminating HIV transmission to infants. While the goal is within reach, with the increasing overall numbers of HIV infections in women, elimination will require sustained and intensified efforts as well as the ongoing commitment of financial resources. Moreover, with a sustained effort and quality improvements countries may be able to move from the goal of less than 2% MTCT rates and achieve a more ambitious goal of less than one HIV-positive child per 100,000 live births. Every country will need to identify actions relevant to its context and make a sustained effort that will not only focus on improving the coverage and quality of services but also generate synergies between the AIDS responses and the broader issues of human rights of women and girls and gender equity in the region.

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