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AIDS epidemic update



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UNAIDS
20 avenue Appia
CH-1211 Geneva 27
Switzerland

T (+41) 22 791 36 66
F (+41) 22 791 48 35

unaids@unaids.org
www.unaids.org

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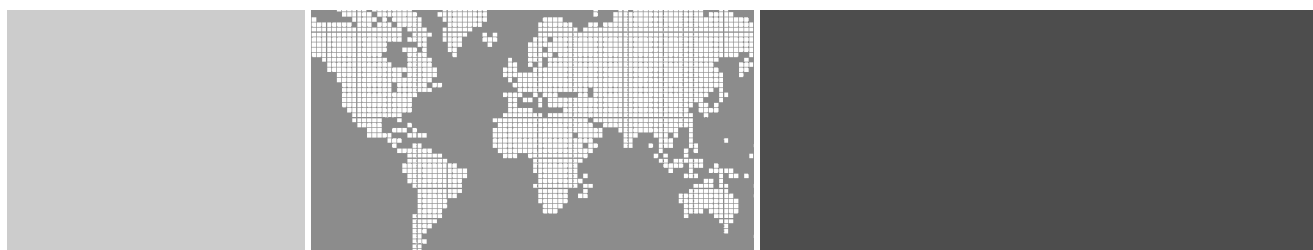
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AIDS epidemic update: December 2006





Global summary of the AIDS epidemic December 2006

Number of people living with HIV in 2006

Total	39.5 million (34.1–47.1 million)
Adults	37.2 million (32.1–44.5 million)
Women	17.7 million (15.1–20.9 million)
Children under 15 years	2.3 million (1.7–3.5 million)

People newly infected with HIV in 2006

Total	4.3 million (3.6–6.6 million)
Adults	3.8 million (3.2–5.7 million)
Children under 15 years	530 000 (410 000–660 000)

AIDS deaths in 2006

Total	2.9 million (2.5–3.5 million)
Adults	2.6 million (2.2–3.0 million)
Children under 15 years	380 000 (290 000–500 000)

The ranges around the estimates in this table define the boundaries within which the actual numbers lie, based on the best available information.

Regional HIV and AIDS statistics and features, 2004 and 2006

	Adults and children living with HIV	Adults and children newly infected with HIV	Adult (15–49) prevalence (%)	Adult and child deaths due to AIDS
Sub-Saharan Africa				
2006	24.7 million [21.8–27.7 million]	2.8 million [2.4–3.2 million]	5.9% [5.2%–6.7%]	2.1 million [1.8–2.4 million]
2004	23.6 million [20.9–26.4 million]	2.6 million [2.2–2.9 million]	6.0% [5.3%–6.8%]	1.9 million [1.7–2.3 million]
Middle East and North Africa				
2006	460 000 [270 000–760 000]	68 000 [41 000–220 000]	0.2% [0.1%–0.3%]	36 000 [20 000–60 000]
2004	400 000 [230 000–650 000]	59 000 [34 000–170 000]	0.2% [0.1%–0.3%]	33 000 [18 000–55 000]
South and South-East Asia				
2006	7.8 million [5.2–12.0 million]	860 000 [550 000–2.3 million]	0.6% [0.4%–1.0%]	590 000 [390 000–850 000]
2004	7.2 million [4.8–11.2 million]	770 000 [480 000–2.1 million]	0.6% [0.4%–1.0%]	510 000 [330 000–740 000]
East Asia				
2006	750 000 [460 000–1.2 million]	100 000 [56 000–300 000]	0.1% [<0.2%]	43 000 [26 000–64 000]
2004	620 000 [380 000–1.0 million]	90 000 [50 000–270 000]	0.1% [<0.2%]	33 000 [20 000–49 000]
Oceania				
2006	81 000 [50 000–170 000]	7100 [3400–54 000]	0.4% [0.2%–0.9%]	4000 [2300–6600]
2004	72 000 [44 000–150 000]	8000 [3900–61 000]	0.3% [0.2%–0.8%]	2900 [1600–4600]
Latin America				
2006	1.7 million [1.3–2.5 million]	140 000 [100 000–410 000]	0.5% [0.4%–1.2%]	65 000 [51 000–84 000]
2004	1.5 million [1.2–2.2 million]	130 000 [100 000–320 000]	0.5% [0.4%–0.7%]	53 000 [41 000–69 000]
Caribbean				
2006	250 000 [190 000–320 000]	27 000 [20 000–41 000]	1.2% [0.9%–1.7%]	19 000 [14 000–25 000]
2004	240 000 [180 000–300 000]	25 000 [19 000–35 000]	1.1% [0.9%–1.5%]	21 000 [15 000–28 000]
Eastern Europe and Central Asia				
2006	1.7 million [1.2–2.6 million]	270 000 [170 000–820 000]	0.9% [0.6%–1.4%]	84 000 [58 000–120 000]
2004	1.4 million [950 000–2.1 million]	160 000 [110 000–470 000]	0.7% [0.5%–1.1%]	48 000 [34 000–66 000]
Western and Central Europe				
2006	740 000 [580 000–970 000]	22 000 [18 000–33 000]	0.3% [0.2%–0.4%]	12 000 [<15,000]
2004	700 000 [550 000–920 000]	22 000 [18 000–33 000]	0.3% [0.2%–0.4%]	12 000 [<15 000]
North America				
2006	1.4 million [880 000–2.2 million]	43 000 [34 000–65 000]	0.8% [0.6%–1.1%]	18 000 [11 000–26 000]
2004	1.2 million [710 000–1.9 million]	43 000 [34 000–65 000]	0.7% [0.4%–1.0%]	18 000 [11 000–26 000]
TOTAL				
2006	39.5 million [34.1–47.1 million]	4.3 million [3.6–6.6 million]	1.0% [0.9%–1.2%]	2.9 million [2.5–3.5 million]
2004	36.9 million [31.9–43.8 million]	3.9 million [3.3–5.8 million]	1.0% [0.8%–1.2%]	2.7 million [2.3–3.2 million]

Table 1



INTRODUCTION

Main global and regional trends

Promising developments have been seen in recent years in global efforts to address the AIDS epidemic, including increased access to effective treatment and prevention programmes. However, the number of people living with HIV continues to grow, as does the number of deaths due to AIDS. A total of 39.5 million [34.1 million–47.1 million] people were living with HIV in 2006—2.6 million more than in 2004. This figure includes the estimated 4.3 million [3.6 million–6.6 million] adults and children who were newly infected with HIV in 2006, which is about 400 000 more than in 2004.

In many regions of the world, new HIV infections are heavily concentrated among young people (15–24 years of age). Among adults 15 years and older, young people accounted for 40% of new HIV infections in 2006.

Sub-Saharan Africa continues to bear the brunt of the global epidemic. Two thirds (63%) of all adults and children with HIV globally live in sub-Saharan Africa, with its epicentre in southern Africa (see pages 10–23). One third (32%) of all people with HIV globally live in southern Africa and 34% of all deaths due to AIDS in 2006 occurred there.

Declines in national HIV prevalence are being observed in some sub-Saharan African countries, but such trends are currently neither strong nor widespread enough to diminish the epidemics' overall impact in this region (see pages 10–23).

Almost three quarters (72%) of all adult and child deaths due to AIDS in 2006 occurred in **sub-**

Saharan Africa: 2.1 million [1.8 million–2.4 million] of the global total of 2.9 million [2.5 million–3.5 million]. Overall sub-Saharan Africa is home to an estimated 24.7 million [21.8 million–27.7 million] adults and children infected with HIV—1.1 million more than in 2004.

In the past two years, the number of people living with HIV increased in every region in the world. The most striking increases have occurred in **East Asia** and in **Eastern Europe** and **Central Asia**, where the number of people living with HIV in 2006 was over one fifth (21%) higher than in 2004.

Since 2000/2001, HIV prevalence among young people has declined in eight of 11 countries with sufficient data to analyze recent trends.

The 270 000 [170 000–820 000] adults and children newly infected with HIV in **Eastern Europe** and **Central Asia** in 2006 showed an increase of almost 70% over the 160 000 [110 000–470 000] people who acquired HIV in 2004. In **South** and **South-East Asia**, the number of new HIV infections rose by 15% in 2004–2006, while in the **Middle East** and **North Africa** it grew by 12%. In **Latin America**, the **Caribbean** and **North America**, new infections in 2006 remained roughly the same as in 2004.

Globally, and in every region, more adult women (15 years or older) than ever before are

Regional HIV statistics and features for women, 2004 and 2006

		Number of women (15+) living with HIV	Percent of adults (15+) living with HIV who are women (15+) (%)
Sub-Saharan Africa	2006	13.3 million [11.5–15.2 million]	59
	2004	12.7 million [11.0–14.5 million]	59
Middle East and North Africa	2006	200 000 [100 000–370 000]	48
	2004	180 000 [89 000–330 000]	49
South and South-East Asia	2006	2.2 million [1.3–3.6 million]	29
	2004	2.0 million [1.2–3.3 million]	29
East Asia	2006	210 000 [110 000–370 000]	29
	2004	160 000 [90 000–280 000]	27
Oceania	2006	36 000 [17 000–90 000]	47
	2004	32 000 [16 000–81 000]	47
Latin America	2006	510 000 [350 000–800 000]	31
	2004	450 000 [310 000–670 000]	30
Caribbean	2006	120 000 [85 000–160 000]	50
	2004	110 000 [80 000–150 000]	50
Eastern Europe and Central Asia	2006	510 000 [330 000–810 000]	30
	2004	410 000 [260 000–650 000]	30
Western and Central Europe	2006	210 000 [160 000–300 000]	28
	2004	190 000 [140 000–260 000]	28
North America	2006	350 000 [190 000–570 000]	26
	2004	300 000 [160 000–510 000]	26
TOTAL	2006	17.7 million [15.1–20.9 million]	48
	2004	16.5 million [14.2–19.5 million]	48

Table 2

Percent of adults (15+) living with HIV who are female, 1990–2006

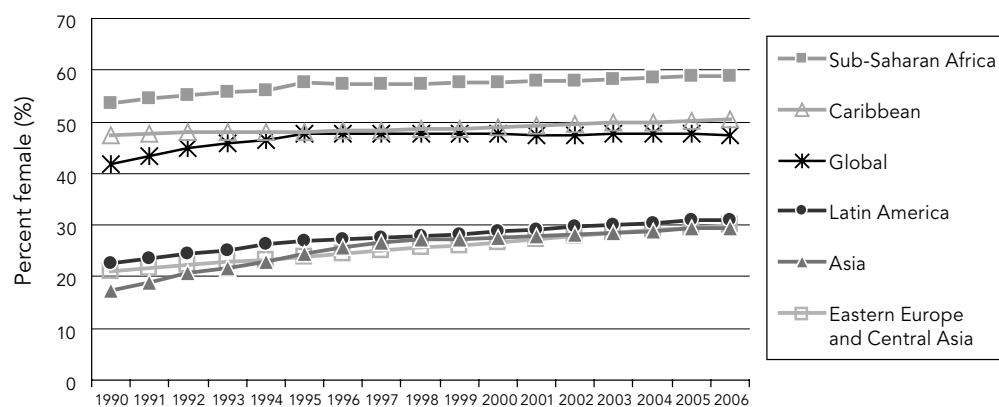


Figure 1

now living with HIV. The 17.7 million [15.1 million–20.9 million] women living with HIV in 2006 represented an increase of over one million compared with 2004 (see Table 2). In **sub-Saharan Africa**, for every ten adult men living with HIV, there are about 14 adult women who are infected with the virus. Across all age groups, 59% of people living with HIV in sub-Saharan Africa in 2006 were women. In the **Caribbean**, the **Middle East** and **North Africa**, and **Oceania**, close to one in every two adults with

Focusing on risk

The centrality of high-risk behaviour (such as injecting drug use, unprotected paid sex and unprotected sex between men) is especially evident in the HIV epidemics of Asia, Eastern Europe and Latin America (see Figure 2). In **Eastern Europe** and **Central Asia**, for example, two in three (67%) prevalent HIV infections in 2005 were due to the use of non-sterile injecting drug use equipment. Sex workers and

Proportions of HIV infections in different population groups by region, 2005

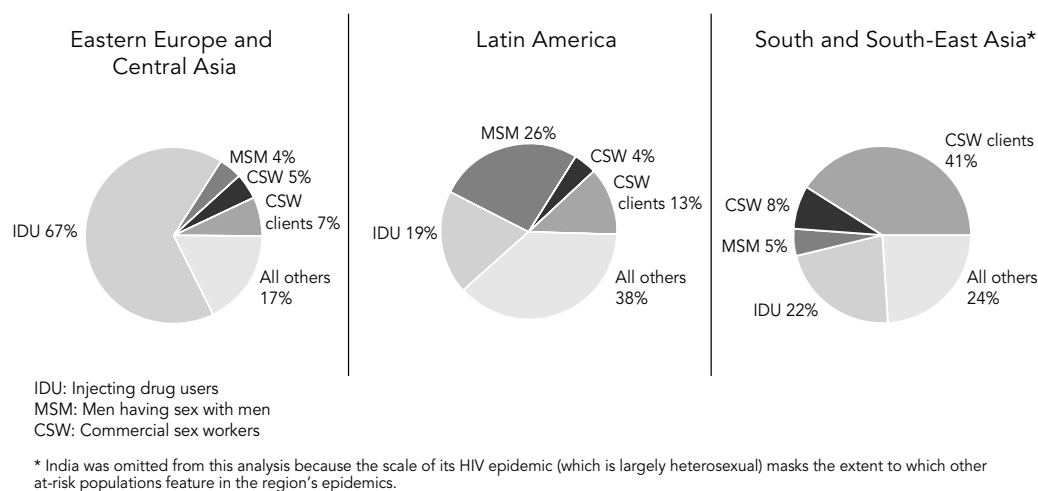


Figure 2

HIV is female. Meanwhile, in many countries of **Asia**, **Eastern Europe** and **Latin America**, the proportions of women living with HIV continue to grow.

Access to treatment and care has greatly increased in recent years, albeit from a very low starting level in many countries. Nevertheless, the benefits are dramatic. Through the expanded provision of antiretroviral treatment an estimated two million life years were gained since 2002 in low- and middle-income countries. In sub-Saharan Africa alone, some 790 000 life years have been gained, the vast majority of them in the past two years of antiretroviral treatment scale-up. In Latin America, where wide-scale treatment provision began earlier, some 834 000 life years have been gained since 2002.

their clients, accounted for about 12% of HIV infections.

Paid sex and injecting drug use accounted for a similar overall proportion of prevalent HIV infections in **South** and **South-East Asia** (see pages 24–36). Excluding India, almost one in two (49%) prevalent HIV infections in 2005 were in sex workers and their clients, and more than one in five (22%) infections were in injecting drug users. A small but significant proportion of infections (5%) were in men who have sex with men. In **Latin America**, in contrast, one in four (26%) of the HIV infections in 2005 were in men who have sex with men, while 19% were in injecting drug users. Although HIV prevalence in sex workers is relatively low in this region (see pages 48–52), they and their clients accounted for almost one in six (17%) HIV infections.

Although the epidemics also extend into the general populations of countries in those regions, they remain highly concentrated around specific population groups. This highlights the need to focus prevention, treatment and care strategies effectively on population groups that are most at risk of HIV infection.

Latest regional developments

Almost 25 million people are living with HIV in **sub-Saharan Africa**—63% of all persons with HIV globally. Considerable efforts have been made towards improving access to antiretroviral treatment in recent years. Nonetheless, 2.1 million [1.8 million–2.4 million] Africans died of AIDS in 2006—almost three quarters (72%) of all AIDS deaths globally.

Hardest-hit is southern Africa (see pages 10–23), where **Zimbabwe** remains the only country where national adult HIV prevalence has declined. The declining trend appears to be partly associated with behaviour changes dating back to the mid- to late-1990s.

Meanwhile, the HIV epidemics in **Mozambique, South Africa** and **Swaziland** continue to grow. An estimated one in three (33%) adults in **Swaziland** was living with HIV in 2005—the most intense epidemic in the world. In **South Africa**, which in terms of sheer numbers has one of the world's largest HIV epidemics, prevalence of HIV among women attending public antenatal clinics was more than one third (35%) higher in 2005 than it had been in 1999. While HIV infection levels among young pregnant women appear to be stabilizing, they continue to increase among older women. The epidemic is having a significant impact. Death rates from natural causes for women aged 25–34 years increased fivefold between 1997 and 2004, and for males aged 30–44 they more than doubled. A large part of those increases is due to the AIDS epidemic (see pages 10–23).

In East Africa, where HIV infection levels have been lower than in the south of the continent, the general trend of a stabilizing or a declining HIV prevalence appears to be continuing. National HIV prevalence among pregnant women has declined in **Kenya**, as it has in **Tanzania** and, to a lesser extent, in **Rwanda**. In many other countries though, discrepant trends are often being found at local levels (see

pages 19–20). Meanwhile, new research indicates a possible erosion of the gains **Uganda** made against AIDS in the 1990s, and HIV prevalence has again been rising in some rural areas. A sudden increase in infection levels among pregnant women in 2005 in **Burundi**'s capital, Bujumbura, could reverse the general, post-2000 decline in HIV prevalence in that country.

West and Central Africa's smaller epidemics show divergent trends. There are signs of declining HIV prevalence in urban parts of **Burkina Faso, Côte d'Ivoire** and **Ghana**, but in **Mali** the HIV epidemic appears to be growing. A recent development in sub-Saharan Africa is the emergence of injecting drug use as a potential factor in the HIV epidemics of several countries, notably those of **Kenya** and **Tanzania** (as well as **Nigeria** and **South Africa**).

In Asia, national HIV infection levels are highest in South-East Asia, where combinations of unprotected paid sex and unprotected sex between men, along with unsafe injecting drug use, are the largest risk factors for HIV infection. HIV outbreaks among men who have sex with men are now becoming evident in **Cambodia, China, India, Nepal, Pakistan, Thailand** and **Viet Nam**. In very few of these countries, national AIDS programmes adequately address the role of sex between men in the epidemics. HIV outbreaks are being found in **Afghanistan** and **Pakistan**, particularly among injecting drug users. High levels of use of non-sterile injecting equipment and other risk behaviours offer the HIV epidemic considerable scope for growth in these two countries.

The HIV epidemic in **India** is best described as a series of epidemics, widely varied with respect to prevalence levels, risk factors for infection and transmission patterns. Some of these epidemics appear to be stable or diminishing in parts of the south, while others are growing at a modest rate elsewhere (see pages 27–30). In **China**, where the authorities have greatly expanded the AIDS response, HIV is spreading gradually from most-at-risk populations (especially injecting drug users and commercial sex workers and clients) to the general population, and the number of HIV infections in women is growing (see pages 24–27).

Latin America's epidemics remain generally stable, with **Brazil** in particular providing proof that a dual emphasis on prevention and treatment

can keep an HIV epidemic under control (see pages 48–52). Outbreaks of the virus continue to be found among injecting drug users and men who have sex with men in most countries of South America. Although largely a hidden behaviour, sex between men likely accounts for as much as one tenth of reported HIV cases in the **Caribbean**. In that region, HIV prevalence remains stable in the **Dominican Republic** and has declined in urban parts of **Haiti**, but there are some localized indications that the epidemics in both countries could start to increase again if prevention efforts are not enhanced.

In most countries with generalized epidemics and repeated surveys there are some positive trends in young people's sexual behaviours. The future course of the world's HIV epidemics hinges in many respects on the behaviours young people adopt or maintain, and the contextual factors that affect those choices.

Racial and ethnic minorities in the **United States of America** continue to be disproportionately affected by the HIV epidemic, while Aboriginal people are over-represented in **Canada's** epidemic (see pages 55–56). There, as in **Western** and **Central Europe**, the main risk factor for HIV remains unprotected sex between men. HIV prevalence ranges between 10% and 20% among men who have sex with men in several countries in Western Europe, amid evidence of increased casual and unprotected sex in this population group. At the same time, approximately three quarters of heterosexually acquired HIV infections in Western and Central Europe are among immigrants and migrants. This fact underlines the need to adapt prevention, treatment and care services so that they reach these populations.

The HIV epidemics in **Eastern Europe** and **Central Asia** are still relatively young, and they continue to grow—most strikingly in **Ukraine**, which has the highest HIV prevalence in all of Europe (see pages 37–43). There, as in the **Russian Federation's** expanding epidemic

and in the smaller but growing epidemics of **Tajikistan** and **Uzbekistan**, the use of non-sterile injecting drug equipment remains the main mode of HIV transmission. The HIV epidemics in these regions are most greatly affecting young people; in the Russian Federation, for example, some 80% of people with HIV are younger than 30 years of age. In the Russian Federation and Ukraine, women (many of them less than 25 years old) bear a growing proportion of the HIV burden, accounting for more than 40% of new HIV diagnoses in 2005.

Inadequate HIV surveillance remains a hindrance in many countries—including **Europe**, the **Caribbean**, **Central America**, the **Middle East** and **North Africa**. This makes it difficult to discern precisely the patterns and trends of some HIV epidemics, and hinders the design and implementation of potentially effective responses. There are recent exceptions, among them **Iran**, which has acted on improved HIV information gathering by expanding its AIDS response among at-risk populations.

HIV and sexual behaviour trends among young people

In 2001, the United Nations' *Declaration of Commitment on HIV/AIDS* outlined a goal of reducing HIV prevalence by 25% in young people in the most-affected countries by 2005, in order to monitor progress in preventing new infections. Determining real time trends in HIV incidence, and in particular the impact of prevention programmes on HIV incidence—ideally requires longitudinal studies of large numbers of people. Given the practical difficulties of conducting such studies, it has been proposed to use HIV prevalence in young women aged 15–24 attending antenatal clinics as a proxy measure for incidence.

To assess progress towards this goal, countries in which national prevalence exceeds 3% were asked by the WHO/UNAIDS Working Group on Global HIV/AIDS and STI surveillance to participate in this endeavour.

HIV prevalence has declined since 2000/2001 in eight of 11 countries with sufficient data to analyze recent trends among young people (see Table 3).¹ In **Kenya**, HIV prevalence among

¹ Data from the 30 most-affected countries were examined, all but two of them (Bahamas and Haiti) in sub-Saharan Africa. Analysis of HIV trends required that at least three rounds of data from consistent HIV surveillance sites in 2000–2005 be available. Only a minority of countries (11 out of 30) had or shared such data.

young pregnant women declined significantly by more than 25% in both urban and rural areas. Similar declines were evident in urban areas in **Côte d'Ivoire**, **Malawi** and **Zimbabwe**, and in rural parts of **Botswana**. Less prominent (and non-significant) declines were observed in urban **Botswana**, **Burundi** and **Rwanda** and in rural **Tanzania** and **Zimbabwe**. There was no evidence of a decrease in HIV infection levels among young people in **Mozambique**, **South Africa** or in **Zambia**.

Using results from national surveys conducted at least twice in the same country during the period 1992–2005, trends in behaviours among young people were assessed. In **Kenya**, behaviour trend data point to a significant reduction over time in the kinds of sexual behaviour that place people at risk of HIV infection. The proportion of young persons having sex with non-regular partners decreased in **Haiti** (men only), **Kenya** and **Malawi** (young men and women), and **Zambia** (women only), but increased in **Cameroon**, and **Uganda** (women only). Meanwhile, condom use rates with non-regular partners seemed to increase in some of the surveyed countries, including **Cameroon**, **South Africa**, **Tanzania** and **Uganda** (young men and women), **Malawi** (young men only), and **Kenya** and **Zambia** (young women only). In a few countries, most notably **Cameroon**, there appeared to be simultaneous shifts towards both safer and high-risk behaviours—with increases in the percentages of young people who engage in high risk sexual activities occurring alongside rising rates of condom use during casual sex with a non-regular partner, for example.

Unfortunately, relatively few countries were able to provide extensive behavioural trend data for young people and many countries had insufficient or no data on HIV prevalence trends among young people—including some of the countries with exceptionally high HIV prevalence in southern Africa. This reinforces the need to expand HIV surveillance activities as a matter of urgency.

The future course of the world's HIV epidemics hinges in many respects on the behaviours young people adopt or maintain, and the contextual factors that affect those choices. Some recent, positive changes are evident among young people in parts of the Caribbean and sub-Saharan Africa, particularly in East Africa.

**Trends among 15–24-year-olds in high-prevalence countries:
HIV prevalence among pregnant women (2000–2005) in sentinel surveillance systems,
and selected sexual behaviours among women and men (1992–2005) from national surveys**

Country	Prevalence trend*		Age at sexual debut**		Sex with non-regular partner***		Condom use during sex with non-regular partner****	
	Urban	Rural	Females	Males	Females	Males	Females	Males
Angola	ID	ID						
Bahamas	ND	ND						
Botswana	▼ NS	▼ ≥ 25%						
Burundi [#]	▼ NS	↔						
Cameroon	ID	ID	↔	▼	▲	▲	▲	▲
Central African Republic	ND	ND						
Chad	ID	ID	▼	↔				
Congo	ND	ND						
Côte d'Ivoire	▼ ≥ 25%	ID	▼					
Democratic Republic of the Congo	ID	ID						
Djibouti	ND	ND						
Gabon	ND	ND						
Haiti	ND	ND	▲	▲		▼		
Kenya	▼ ≥ 25%	▼ ≥ 25%	↔	↔	▼	▼	▲	↔
Lesotho	ID	ID						
Malawi [#]	▼ ≥ 25%	↔	▼	▼	▼	▼	↔	▲
Mozambique [‡]	↔		↔					
Namibia	ID	ID	↔					
Nigeria	ID	ID	↔	↔				
Rwanda	▼ NS	ND	↔					
South Africa [§]	↔		↔	↔	↔	↔	▲	▲
Swaziland	ND	ND						
Togo	ID	ID						
Uganda	ND	ND	▼		▲	↔	▲	▲
United Republic of Tanzania	↔	▼ NS	↔	▼	↔	↔	▲	▲
Zambia [¶]	↔		↔		▼	↔	▲	↔
Zimbabwe	▼ ≥ 25%	▼ NS	▼	↔			↔	↔

Note: Highlighted cells indicate positive trends in prevalence or behaviour.

- Legend:** *
- * Consistent sites used in the analysis of median prevalence by year for a minimum of three years. Significance test based on H0: slope=0. Analyses of countries with more than three years of data based on the following number of consistent urban and rural sites: Botswana (10,10), Burundi (3,3), Côte d'Ivoire (9 urban), Kenya (20,13), Malawi (11,8), Mozambique (5 South, 8 Center, 7 North), Rwanda (6 urban), Tanzania (11,8), Zimbabwe (7,6)
 - ** Among 15–19-year-olds, proportion reported having had sex by age 15. Analyses based on DHS and South Africa national surveys conducted between 1992 and 2005.
 - *** Among 15–24-year-olds, proportion reported having had sex with a non-regular partner in the last year. In South Africa, the proportion among 15–24-year-olds reporting more than one sexual partner in the last 12 months. Analyses based on DHS and South Africa national surveys conducted between 1992 and 2005.
 - **** Among 15–24-year-olds, proportion reporting having used condoms the last time they had sex with a non-regular partner. Analyses based on DHS and South Africa national surveys conducted between 1992 and 2005.
 - ▲ Statistically significant increase.
 - ▼ Statistically significant decrease.
 - ▼ ≥ 25% Statistically significant decrease of more than 25%.
 - ▼ NS Decrease over time but not statistically significant.
 - ↔ No evidence of decrease.
 - ID Insufficient data, i.e. less than three years of data received.
 - ND Data not received.
 - [#] Semi-urban and urban areas were combined in analysis of urban data.
 - [‡] No data received in response to UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance process; analyses based on data in South Africa surveillance report.
 - [¶] No data received in response to UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance process; analyses based on data reported in Zambia 2005 surveillance report. Analysis based on urban and rural data combined.
 - [‡] Analysis in Mozambique performed for South, North and Central.

Table 3



SUB-SAHARAN AFRICA

In 2006, almost two thirds (63%) of all persons infected with HIV are living in sub-Saharan Africa—24.7 million [21.8 million–27.7 million]. An estimated 2.8 million [2.4 million–3.2 million] adults and children became infected with HIV in 2006, more than in all other regions of the world combined. The 2.1 million [1.8 million–2.4 million] AIDS deaths in sub-Saharan Africa represent 72% of global AIDS deaths. Across this region, women bear a disproportionate part of the AIDS burden: not only are they more likely than men to be infected with HIV, but in most countries they are also more likely to be the ones caring for people infected with HIV.

Across sub-Saharan Africa, women are more likely than men to be infected with HIV, and they are more likely to be the ones caring for people infected with HIV.

While there is evidence that some of the epidemics in this region are diminishing, most country trends appear to be stable. In essence this reflects equilibrium: the number of people newly infected with HIV roughly equal the number of people dying of AIDS.

Provision of antiretroviral therapy has expanded dramatically in sub-Saharan Africa: more than one million [930 000–1.15 million] people were receiving antiretroviral treatment by June 2006, a tenfold increase since December 2003 (WHO/UNAIDS, 2006). Scale-up efforts have been espe-

cially strong of late in a few countries, including Botswana, Kenya, Malawi, Namibia, Rwanda, South Africa, Uganda and Zambia.

However, the sheer scale of need in this region means that a little less than one quarter (23%) of the estimated 4.6 million [4–5.4 million] people in need of antiretroviral therapy in this region are receiving it (WHO/UNAIDS, 2006).

Southern Africa

Southern Africa remains the epicentre of the global HIV epidemic: 32% of people with HIV globally live in this subregion and 34% of AIDS deaths globally occur there.

The only evidence of declining national adult HIV prevalence in southern Africa comes from **Zimbabwe**, where both HIV prevalence and incidence have fallen (UNAIDS, 2005). Antenatal clinic data show HIV infection levels in pregnant women hovering at 30%–32% in the early 2000s before declining to 24% in 2004. In the capital, Harare, prevalence among pregnant women peaked at over 36% in 1996 before falling to approximately 21% in mid-2004 (Mahomva et al., 2006; Hargrove et al., 2005; Mugurungi et al., 2005). However, inconsistencies and biases in some of the data mean that the extent of the decline in HIV prevalence might not be as substantial as indicated by the antenatal clinic HIV data (UNAIDS, 2005). Meanwhile, a downward trend in HIV prevalence has also been observed in rural populations in Manicaland amid some evidence of sexual behaviour change (Gregson et al., 2006).

The observed declines in prevalence appear to be related to a combination of factors, especially reductions in casual sex relations with non-regular partners, along with increases in condom use and later sexual debuts (Mahomva et al., 2006; UNAIDS, 2005). In Manicaland in 2001–2003, for example, half as many sexually experienced men (49%) said they had recently had sex with a casual partner, compared with 1998–2000. Consistent condom use with casual partners increased for women (from 26% to 37% over the same periods), though not for men (Gregson et al., 2006). A combination of increased AIDS awareness, relatively extensive health infrastructure and growing anxiety about AIDS mortality appears to have prompted such behaviour changes. In addition, high mortality rates have contributed considerably to the decline in HIV prevalence.

Nevertheless, approximately one in five adults (20.1% in a range of 13.3%–27.6%; UNAIDS, 2006) in Zimbabwe is living with HIV—one of the worst HIV epidemics in the world. The estimated average life expectancy (at birth) for women in Zimbabwe is now among the lowest in the world: 34 years. For men, it is estimated to be 37 years (WHO, 2006). Food shortages, impoverishment, forced removals and drought have compelled many hundreds of thousands of Zimbabweans to migrate in search of livelihood opportunities. The possible effects of these upheavals on HIV transmission trends are not yet apparent, but could prove to be profound—as could the effects of Zimbabwe's economic crisis on its antiretroviral treatment programme.

Zimbabwe's decline in HIV prevalence appears to be partly associated with behaviour changes dating back to the mid-to late-1990s.

In **South Africa**, some 5.5 million [4.9 million–6.1 million] (UNAIDS, 2006)² people, including 240 000 [93 000–500 000] children younger than 15 years, were living with HIV in 2005 (UNAIDS, 2006). HIV data gathered in the country's extensive antenatal clinic surveillance system suggest that HIV prevalence has not yet reached a plateau.

The latest data show a continuing, rising trend nationally in HIV infection levels among pregnant women attending public antenatal clinics: from 22.4% in 1999 to 30.2% in 2005 (a 35% increase) (see Figure 3) (Department of Health South Africa, 2006). However, HIV prevalence among young people may be stabilizing. Antenatal surveillance suggests that HIV prevalence among 15–24-year-old pregnant women has remained relatively stable since 2000 at 14%–16% among 15–19-year-olds and 28%–31% among 20–24-year-olds (Department of Health South Africa, 2006).

As in the rest of sub-Saharan Africa, the epidemic in South Africa disproportionately affects women. Young women (15–24 years) are four times more likely to be HIV-infected than are young men: in 2005, prevalence among young women was 17% compared with 4.4% among young men (Shisana et al., 2005). Those infection levels were similar to those found in the 2003 national survey of 15–24-year-olds when 15.5% of young women and 4.8% of young men were found to be HIV-infected (Pettifor et al., 2004). One in three women aged 30–34 years were living with HIV in 2005, as were one in four men aged 30–39 years, according to the 2005 national HIV household survey. In addition, high infection levels were found among men older than 50 years, more than 10% of whom tested HIV-positive (Shisana et al., 2005).

Having emerged a little later than most other HIV epidemics in the subregion, South Africa's epidemic has now reached the stage where increasing numbers of people are dying of AIDS. The latest official mortality data show total deaths (from all causes) in South Africa increased by 79% from 1997 to 2004 (from 316 505 to 567 488) (Statistics South Africa, 2006). Death rates from natural causes for women aged 25–34 years increased fivefold between 1997 and 2004, and for males aged 30–44 they more than doubled over that period. A large proportion of the rising trend in death rates is attributable to the AIDS epidemic (Anderson and Phillips, 2006; Actuarial Society of South Africa, 2005; Medical Research Council, 2005; Bradshaw et al., 2004; Dorrington et al., 2001), and the increasing death toll has driven average life expectancy below 50 years in three provinces (Eastern Cape, Free State and KwaZulu-Natal) (Actuarial Society of South Africa, 2005).

² All estimates of the total number of people living with HIV in a given country are for 2005.

OUTBREAKS OF EXTENSIVELY DRUG-RESISTANT TUBERCULOSIS

At the beginning of 2005, extensively drug resistant tuberculosis (XDR-TB) was detected in KwaZulu-Natal and has highlighted the lethal combination of HIV and TB in South Africa, where an estimated 60% of TB patients overall are also HIV-infected.

Of the 53 persons initially diagnosed with XDR-TB at a district hospital in the KwaZulu-Natal province, from January 2005 to March 2006, 44 tested for HIV and each of them was found to be HIV-positive. Mortality was very high: 52 of the patients died within, on average, a month of initial sputum collection. By early October 2006, XDR-TB had been identified at 33 health-care facilities across KwaZulu-Natal (Medical Research Council, WHO, CDC, 2006).

TB drug resistance arises mainly because of inadequate TB control, poor patient or clinician adherence to standard TB treatment regimens, poor quality drugs or inadequate drug supplies. People living with HIV are particularly vulnerable to developing drug-resistant TB because of their increased susceptibility to infection and progression to active TB.

This outbreak underscores the need to rapidly ensure prompt TB diagnosis and effective TB treatment for persons living with HIV in order to prevent drug resistance from developing and spreading. Access to TB culture and drug sensitivity testing must be improved, and effective infection control practices must be introduced in HIV care clinics to prevent the spread of TB.

The problem, however, is not unique to sub-Saharan Africa. In March 2006, WHO and the US Centers for Disease Control and Prevention (CDC) reported that 2% of TB cultures performed at 25 supranational reference laboratories fulfilled the criteria for extensively drug resistant TB, and concluded that extensively drug resistant TB was present in all regions of the world (CDC and WHO, 2006). Because TB culture and drug sensitivity testing are not carried out routinely in most resource-poor settings, the actual extent of the epidemic is not yet known.

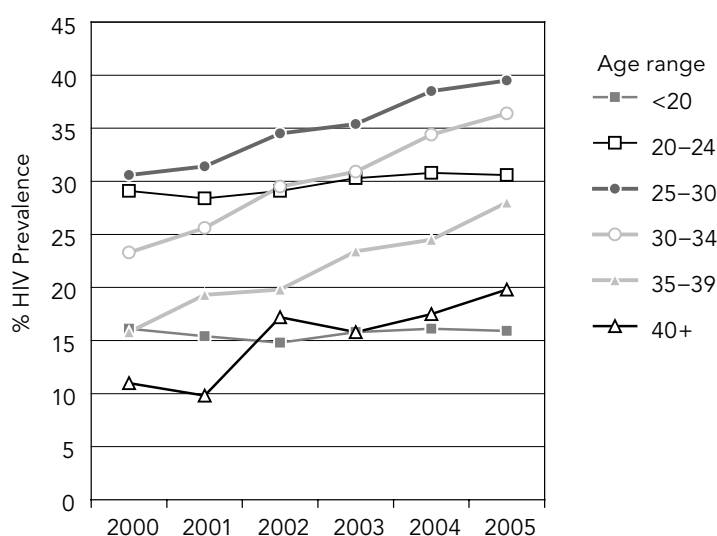
From 9 to 10 October 2006, WHO convened a meeting of a Global XDR-TB Task Force to review available evidence and to develop an emergency action plan to prevent and contain XDR-TB, as well as measures to manage the disease in patients. During this meeting, the definition of XDR-TB was revised³.

This meeting followed an expert consultation meeting in Johannesburg, 7–8 September 2006, organized jointly by the South African Medical Research Council, WHO and CDC, at which a seven-point action plan was developed:

- conduct rapid surveys of extensively drug resistant TB;
- enhance laboratory capacity;
- improve technical capacity of clinical and public health managers to effectively respond to XDR-TB outbreaks;
- implement infection control precautions;
- increase research support for anti-TB drug development;
- increase research support for rapid diagnostic test development;

³ XDR-TB: resistance to at least the two most powerful first-line anti-TB drugs rifampicin and isoniazid, to a fluoroquinolone and to one or more of the following injectable drugs: amikacin, kanamycin and capreomycin.

HIV prevalence by age group among antenatal clinic attendees in South Africa, 2000–2005



Source: Department of Health (2006, National HIV and Syphilis Prevalence Survey South Africa; 2003, National HIV and Syphilis Antenatal Sero-Prevalence Survey in South Africa)

Figure 3

In South Africa, death rates from natural causes for women aged 25–34 years increased five-fold between 1997 and 2004, and for males aged 30–44 it more than doubled.

Yet a large proportion of South Africans do not believe they are at risk of becoming infected with HIV. Some 13% of the persons who took their first HIV test in the 2005 national household survey were found to be HIV-positive. Until then, most of them had declined to take an HIV test because they felt they were at no risk of infection. Overall, half the respondents *who were found to be infected with HIV* had reported that they felt they were at no risk of acquiring HIV (Shisana et al., 2005). Approximately two million South Africans living with HIV do not know that they are infected and believe they face no danger of becoming infected—and therefore are unaware that they can transmit the virus to others. In the absence of an increase in HIV testing uptake, HIV-infected persons typically would only become aware of their status when they become

symptomatic, which can also limit the potential benefit of antiretroviral treatment.

Swaziland now has the highest adult HIV prevalence in the world: 33.4% [21.2%–45.3%]. As in **Lesotho** (see Figure 4), many young women in Swaziland appear to be abstaining from sex until at least their late teens. In one study, almost two in three (61%) female secondary school students said they had not yet had sex (Buseh, 2004). However, it appears that once young women do become sexually active they encounter huge risks of acquiring HIV. Among young women (15–24 years) attending antenatal clinics, HIV prevalence was 39% nationally and 43% in Manzini (Ministry of Health and Social Welfare Swaziland, 2005).

National adult HIV infection levels are also high in **Botswana**, **Lesotho** and **Namibia** (20%–24%). In **Namibia**, an estimated 230 000 [110 000–360 000] people were living with HIV in 2005. Adult national HIV prevalence was estimated at 19.6% [8.6%–31.7%] in 2005 (UNAIDS, 2006), with the worst-affected areas being Caprivi in the northeast (where 43% of pregnant women have been found to be HIV-infected), Erongo in the centre (HIV prevalence

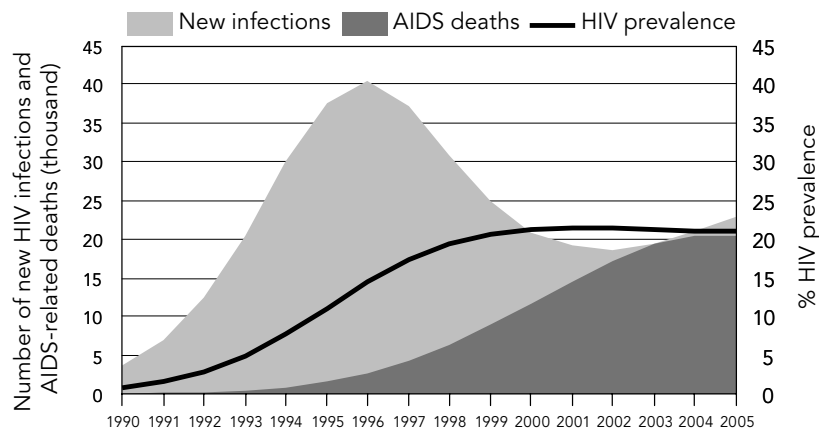
of 27%) and Oshana in the north (prevalence of 25%) (Ministry of Health and Social Services Namibia, 2004). Programmes aimed at reducing mother-to-child transmission of HIV reportedly ensured that 16% of HIV-infected pregnant women in Namibia received antiretroviral prophylaxis in 2005—a considerable improvement on the 0.1% coverage reported two years earlier (Ministry of Health and Social Services Namibia, 2005).

Recent population-based HIV surveys, along with other HIV data, provide a more precise picture of **Botswana's** HIV epidemic, where prevalence remains among the highest in the world. A slight decrease in HIV prevalence among pregnant women nationally has been evident since 2001 (36%) to 33% in 2005, especially among those aged 15–24 years, which suggests the epidemic could be abating. Nevertheless, at least 40% of pregnant women aged 25–39 years were living with HIV in 2005, as was one in two pregnant women aged 30–34 years. In the latter age group, HIV infection levels still appear to be on the rise (Seipone, 2006).

and Tutume districts—both in the north-east (Ministry of Health Botswana, 2006). Surprisingly, comprehensive knowledge of HIV remains low: only about one in three young people aged 15–24 both correctly identified ways of preventing the sexual transmission of HIV and rejected major misconceptions about HIV transmission, which seems to follow the regional pattern (National AIDS Coordinating Agency Botswana, 2005). On the other hand, it is estimated that one in three adults in Botswana know their HIV status, and there appears to be widespread public support for the opt-out voluntary counselling and testing system introduced in 2003 (Weiser et al., 2006).

Adult HIV prevalence in **Lesotho** has remained relatively stable in recent years—but at high levels, with almost one in four (23.2% with a range of 21.9%–24.7%) adults living with HIV in 2005 (UNAIDS, 2006) As Figure 2 illustrates, similar to many other countries in sub-Saharan Africa, the apparent stability in Lesotho's epidemic masks high rates of new HIV infections and AIDS deaths. Lesotho will need to overcome a host of chal-

Estimated number of annual new infections and AIDS-related deaths among adults (15+) in relation to the stabilizing trend of estimated prevalence rate among adults (15–49), Lesotho, 1990–2005



Source: Government of Lesotho/UNAIDS, 2006.

Figure 4

Infection levels in pregnant women vary considerably across Botswana, and range from 21% in the Goodhope district in the south to 47% in Selebi-Phikwe, a populous mining community in the east. More than 40% of pregnant women were found to be HIV-infected in the Francistown

and Tutume districts—both in the north-east (Ministry of Health Botswana, 2006). Surprisingly, comprehensive knowledge of HIV remains low: only about one in three young people aged 15–24 both correctly identified ways of preventing the sexual transmission of HIV and rejected major misconceptions about HIV transmission, which seems to follow the regional pattern (National AIDS Coordinating Agency Botswana, 2005). On the other hand, it is estimated that one in three adults in Botswana know their HIV status, and there appears to be widespread public support for the opt-out voluntary counselling and testing system introduced in 2003 (Weiser et al., 2006).

those liaisons (Ministry of Health and Social Welfare Lesotho and ORC Macro, 2004).

Efforts to increase HIV prevention among young people also require improvement. Some 15% of young women and 27% of young men (aged 15–24 years) are sexually active before their 15th birthday, yet 40% of surveyed parents do not want children in their early teens to learn about condoms at school. Only 18% of young men and 26% of young women knew how to prevent the sexual transmission of HIV and harboured no major misconceptions about HIV when surveyed in 2004 (Ministry of Health and Social Welfare Lesotho and ORC Macro, 2004). The impact of the epidemic on young women is dire. For women aged 18–19 years, less than 10% are HIV-positive, but by the time they celebrate their 22nd birthday, 30% will have acquired HIV, and by the time they reach 24 years, almost 40% will have been infected. For a large proportion of young women in Lesotho, delaying sex seems simply to be postponing eventual HIV infection (NAC and UNAIDS, 2006).

Having expanded its HIV sentinel surveillance system to all provinces in recent years, **Angola** is gradually acquiring a better understanding of its epidemic. At less than 5%, national adult HIV prevalence in Angola is lower than in any other southern African country. The HIV epidemic, though, varies dramatically between different provinces. HIV prevalence among pregnant women ranges from less than 1% in the central province of Bie to as high as 9% in the province of Cunene, along the Namibian border (Instituto Nacional de Luta contra a SIDA, 2005). Such variance partly reflects the relative inaccessibility of parts of the country during Angola's long-running conflict, which ended in the mid-1990s.

Whereas it is too early to discern precise trends in Angola's epidemic, data from **Mozambique** show a significant increase in HIV infection levels since the turn of the century. The HIV prevalence in pregnant women (15–49 years) rose from 11% in 2000 to 16% in 2004 (Conselho de Combate Nacional ao HIV/SIDA, 2006), one of the steepest increases seen in sub-Saharan Africa in recent years.

HIV infection levels in pregnant women are highest in the south and centre of the country. Especially sharp rises have been found in Maputo City, Maputo Province, Sofala and Gaza, where HIV prevalence ranged between 18% and 27% in

2004. At sentinel sites in Quelimane (Zambezia province) and Beira (Sofala province), one in three women seeking antenatal care services was HIV-positive in 2004 (National STD and HIV/AIDS Control Programme, 2005). In parts of the north, where the epidemic initially advanced at a much slower pace than elsewhere in the country, HIV prevalence in pregnant women has almost doubled since 2000—reaching 9.2% and 11% in Nampula and Niassa, respectively, in 2004. The fact that prevalence has also been rising in young pregnant women suggests that new infections continue to increase, and may signal further growth in the country's epidemic (Conselho Nacional de Combate ao HIV/SIDA, 2006).

Almost a million people [940 000 with a range of 480 000–1.4 million] were living with HIV in **Malawi** in 2005. Adult national HIV prevalence was estimated at 14.1% [6.9%–21.4%] in 2005 (UNAIDS, 2006), close to the 12.7% adult prevalence reported in the 2004 Demographic and Health Survey (National Statistical Office and ORC Macro, 2005).

HIV infection levels in Malawi overall appear to have stabilized since the turn of the century, with median HIV prevalence measured at sentinel surveillance sites fluctuating between 15% and 17% in 2001–2005 (National AIDS Commission Malawi, 2005). However, infection levels decreased at semi-urban and urban HIV surveillance sites from 26%–27% in 1999 to 17%–20% in 2005 (National AIDS Commission Malawi, 2005). In the capital, Lilongwe, HIV prevalence among women using antenatal services peaked at 27% in 1996 before receding to 17% in 2003. That decline, however, was not sustained in 2005, when prevalence among pregnant women increased slightly to 19% (Bello, Chipeta, Aberle-Grasse, 2006; National AIDS Commission Malawi, 2005).

Some behavioural changes appear to be associated with the observed declines in HIV prevalence. When surveyed in 2000, smaller percentages of women and men reported having sex with multiple partners, compared with 1996. The proportion of young men (aged 15–24 years) with two or more casual partners, diminished by more than half (from 28% to 12%), while among young women it declined from 3% to less than 1%. More young women reported using condoms with casual partners in 2000, compared with 1996 (31% versus 22%), although condom

use rates for young men stayed the same at 38%. The percentage of women and men abstaining from sex in the previous 12 months altered slightly between 1996 and 2000 (for women it rose from 21% to 22%, and for men it increased from 17% to 20%) (National Statistical Office and ORC Macro 2001 and 1997). In addition, it is likely that rising mortality rates (which doubled between 1992 and 2000) could be responsible for large parts of the observed declines in HIV prevalence.

At current levels of HIV prevalence and in the absence of treatment, young persons in Zambia face a 50% life-time risk of dying of AIDS.

Although Malawi is a small country, its epidemic varies considerably from place to place. At 17.6% in 2004, adult HIV prevalence in the southern region was roughly three times higher than in the central region and twice as high as in the northern region (National Statistical Office and ORC Macro, 2005). The epidemic in the north has been growing, with HIV prevalence tripling from around 5% in 1998 to above 15% in 2003 in rural areas (Bello, Chipeta, Aberle-Grasse, 2006; Ministry of Health and Population Malawi, 2005). This trend in the north may be related to socio-economic growth in and around Mzuzu city and along major transportation routes (Bello, Chipeta, Aberle-Grasse, 2006; Ministry of Health and Population Malawi, 2005).

As in other countries in the region, HIV prevalence among young women (15–24 years) in Malawi is much higher than among men of similar age: 9% compared with 2% overall, and 13% compared with less than 1% in urban areas (National Statistical Office and ORC Macro, 2005). Only one in four young women demonstrated comprehensive knowledge of HIV when surveyed in 2004, compared with more than one in three men (National Statistical Office and ORC Macro, 2005).

Overall HIV prevalence among women attending antenatal clinics in **Zambia** has also stayed relatively stable since the mid-1990s, and has remained at 19%–20% between 1994 and 2004 among pregnant women aged 15–39 years. Yet the data show divergent, localized patterns and

trends, with HIV infection levels in pregnant women aged 15–44 years ranging from under 10% at some sites to over 25% at several others. HIV prevalence was highest in urban areas along the country's main transport routes, such as Kabwe, Livingstone and Ndola (Ministry of Health Zambia, 2005).

A slight decline in HIV infection levels—from 28% in 1994 to 25% in 2004—has been observed in urban areas among pregnant women aged 15–39 years. That decline was most pronounced among 20–24-year-old pregnant women (prevalence dropped from 30% in 1994 to 24% in 2004) and their 15–19-year-old counterparts (prevalence fell from 20% in 1994 to 14% in 2004) (Ministry of Health Zambia, 2005).

In rural areas, however, HIV prevalence increased marginally from 11% to 12% in 1994–2004 (Ministry of Health Zambia, 2005). Among older pregnant women (30–39 years) in urban areas, HIV prevalence rose considerably (from 24% to 30%) in 1994–2004. Among young pregnant women in some urban sites (such as Mongu), HIV prevalence has remained high (at 28%–30% during 1994–2004), while in some rural sites, infection levels almost doubled in the same period (from 7% to 14% in Kalabao, for example) (Sandoy et al., 2006; Ministry of Health Zambia, 2005). At current levels of HIV prevalence, young persons in Zambia face a 50% life-time risk of dying of AIDS, in the absence of treatment (Ministry of Health Zambia, 2005).

The island nations off the southern African coast are experiencing much smaller epidemics. National adult HIV prevalence in **Madagascar** was well under 1% in 2005, with an estimated 49 000 [16 000–110 000] living with HIV. However, knowledge of HIV is poor and condom use is highly infrequent. Only one in five Malagasy could name two methods for preventing the sexual transmission of HIV when surveyed in 2003–2004. Almost one in three (31%) young women (aged 15–24 years) and almost three in four (72%) young men said they had had sex with a casual partner in the previous 12 months—yet only about one in 10 (12%) of those young men and one in 20 (5%) of the women reported using a condom the last time they had sex with a casual partner (Institut National de la Statistique and ORC Macro, 2005a).

Mauritius needs to focus stronger prevention efforts on injecting drug users and especially on those who also engage in sex work (Dewing et al., 2006). Among injecting drug users, exposure to non-sterile injecting equipment is the main risk factor for HIV infection in the currently small HIV epidemic in Mauritius. There, about three quarters of the HIV infections diagnosed in the first six months of 2004 were among injecting drug users (Sulliman and Ameerberg, 2004). Use of non-sterile injecting equipment appears to be common: when surveyed in 2004, 80% of injecting drug users said they had shared needles in the previous three months. Among those who agreed to be tested for HIV, 4% were found to be infected. A large percentage of sex workers (75%) said they injected drugs, and condom use was infrequent (only 32% had consistently used condoms during the previous three months). When tested for HIV, 13% of surveyed sex workers were found to be HIV-infected (Sulliman, Ameerberg, Dhannoo, 2004).

East Africa

In East Africa, the general trends of stabilizing or declining HIV prevalence appear to be continuing.

Having diminished during the 1990s, **Uganda's** epidemic has stabilized overall. National adult HIV prevalence was 6.7% [5.7–7.6%] in 2005 but it was significantly higher among women (nearly 8%) than among men (5%) (UNAIDS, 2006; Ministry of Health Uganda and ORC Macro, 2006). Approximately one million [850 000–1.2 million] people were living with HIV in Uganda in 2005 (UNAIDS, 2006). Regionally, prevalence was lowest in the West Nile region and highest in the Kampala, Central and North-Central regions (over 8%) (Ministry of Health Uganda and ORC Macro, 2006).

Trends vary in Uganda's epidemic. HIV prevalence fell sharply among pregnant women in Kampala and other cities from the early 1990s to the early 2000s, in the context of significant behaviour change (including sexual abstinence and condom use during casual sex) and increased AIDS mortality (Kirungi et al., 2006). However, in some rural areas there is now evidence of an increase in HIV infection. Prevalence rose from a low of 5.6% in men and 6.9% in women in 2000, to 6.5% in men and 8.8% in women in 2004, according to data gathered in a study done in 25 villages. A similar trend, dating to 2002, was found among pregnant women at about half the

CONFLICT AND HIV RISK

New research findings from Uganda cast doubt on the widely held assumption that internally displaced persons and refugees are more likely to be HIV-infected than people in ostensibly more stable settings. Acholiland, in northern Uganda, is home to an estimated two million internally displaced persons. At just over 8%, HIV prevalence in the region is high (Ministry of Health Uganda and ORC Macro, 2006). However, a study among pregnant women in the Gulu, Kitgum and Pader districts has found that women living *outside* protected camps had a higher risk of being HIV-infected than their displaced counterparts living in protected camps. This might be due to the reduced mobility and increased access to health and prevention services of women in some of the camps (Fabiani et al., 2006). A recent review of HIV literature on displaced persons in eight countries (including Uganda) also failed to find evidence that conflict increases HIV transmission (Spiegel and Harroff-Tavel, 2006).

VERY HIGH MALARIA RATES FOUND IN HIV-INFECTED PERSONS

Unexpectedly high levels of HIV infection are being found in adults seeking treatment for malaria in Uganda. More than 30% of adults presenting at district health centres with uncomplicated falciparum malaria were co-infected with HIV. Clinical treatment for malaria was three times more likely in adults with HIV. The findings are in line with a growing body of evidence from elsewhere in sub-Saharan Africa that malaria tends to occur with increased frequency and severity in HIV-infected adults. This underlines the need for new strategies of HIV testing and counselling for adults with uncomplicated falciparum malaria (Kamya et al., 2006).

antenatal surveillance sites included in this study (Shafer et al., 2006). The large-scale roll-out of antiretroviral drugs (and prolonged lifespan of people on treatment) cannot account for the fact that there were more people living with HIV. The treatment roll-out only began in 2004, whereas the increase in the percentage of people living with HIV started several years earlier, around 2000. The rural study found that HIV *incidence* in older men and women (40–49 years) increased since 2000; among men, incidence in fact peaked at levels higher than those observed in 1990–1994. The finding was echoed in the 2004–2005 national HIV household survey, which noted high infection levels among middle-aged Ugandans (Ministry of Health Uganda and ORC Macro, 2006). Behavioural changes could be at work. The rural study, for example, found that the percentage of men aged 40 years and older who said they had at least two casual partners in the previous month had increased between 2000–2004 (Shafer et al., 2006).

Further research is needed to validate these apparent trends, but the current findings do hint at the possible erosion of the gains Uganda made against AIDS in the 1990s. Such an interpretation finds support in national behavioural data which show erratic condom use (about half the men and women aged 15–49 years reported using a condom the last time they had sex with a casual partner) and rising numbers of men who had sex with more than one sexual partner in the previous year, according to the 2004–2005 national HIV household survey (Ministry of Health Uganda and ORC Macro, 2006).

More encouraging, meanwhile, are recent study findings (from rural Tororo) that persons receiving antiretroviral therapy had significantly less risk of transmitting HIV after two years on treatment, partly due to a strong reduction in viral load and less frequent unprotected sex (Bunnell et al., 2006).

With 1.3 million people [1.1 million–1.5 million] currently living with HIV, **Kenya** is still contending with a serious AIDS epidemic, despite evidence of declining HIV prevalence among pregnant women (Cheluget, Marum, Stover, 2006; WHO, 2005a; Baltazar, 2005). National adult HIV prevalence fell from 10% in the late 1990s to about 7% in 2003 (Ministry of Health Kenya, 2005) and just over 6% [5.2–7.0%] in 2005 (UNAIDS, 2006). There has also been

a steep drop in infection levels among pregnant women at a majority of antenatal sites with consistent and comparable HIV data. At some of those sites, HIV prevalence fell from 25% in 1998 to 8% in 2004, while in others it declined from 15% in 2001 to 4.3% in 2004 (Cheluget, Marum, Stover, 2006).

In East Africa, the general trends of stabilizing or declining HIV prevalence appear to be continuing. However, recent research hints at the possible erosion of the gains Uganda made against AIDS in the 1990s.

The potential reasons for these trends are complicated. Major HIV prevention efforts were mounted in Kenya from 2000 onwards, and there is evidence that more people have been delaying their sexual debuts, that condom use rates have increased and that a smaller percentage of adults has multiple sex partners. However, new HIV infections appear to have peaked in the mid-1990s already, before the scale-up of prevention programmes occurred. This suggests that other factors—including increasing AIDS mortality and the saturation of infection among people most at risk—provided most of the impetus for the reduction in HIV prevalence observed in the past several years (Cheluget, Marum, Stover, 2006). It is to be hoped that the recently observed changes in behaviour will maintain the declining trend. A new concern, however, is the emergence of injecting drug use as a factor in Kenya's epidemic. Among injecting drug users in Mombassa, for example, 50% were found to be HIV-infected in a 2004 study (Ndetei, 2004), while a study in Nairobi found 53% of injecting drug users were HIV-positive (Odek-Ogunde, 2004).

An estimated 1.4 million [1.3 million–1.6 million] adults and children were living with HIV in the **United Republic of Tanzania** at the end of 2005, making it one of the most-affected countries in the world. Here, too, HIV infection levels have diminished somewhat—from 8.1% to 6.5% nationally between 1995 and 2004 (Somi et al., 2006), and from 14% to 11% among pregnant women in Dar es Salaam between 1995–2003 (Urassa et al., 2006). In Mbeya and Iringa, the worst-affected regions in the country, HIV

infection levels ranged between 15% and 19% in several urban areas in 2004 (Swai et al., 2006; National Bureau of Statistics Tanzania and ORC Macro, 2005).

On the other hand, high HIV prevalence has been observed at rural antenatal sites: 8% and 11% at Ilembo and Igamba in the Mbeya region in 2004, for example (Swai et al., 2006). According to projections, the number of new HIV infections in rural areas (where about three quarters of the country's population live) could be twice as high as in urban areas by 2010. This reinforces the need to ensure sufficient resources for prevention, treatment and care are also developing in rural parts of the country (Somi et al., 2006).

There are signs that injecting drug use, which has spread rapidly in East Africa (McCurdy et al., 2005a) could also become a contributing factor in Tanzania's epidemic. HIV prevalence among Tanzanian injecting drug users is not yet known, but practices highly likely to transmit the virus are common. Up to one in three injecting drug users in Dar es Salaam has used non-sterile injecting equipment, according to one small study, and a majority of female injecting drug users also sell sex. Especially risky is a practice called 'flashblood' (known as 'backloading' in some other countries), which involves drawing blood back into the syringe after having injected heroin, and then passing the syringe to a companion. Common among injecting female sex workers in Dar es Salaam, and reportedly intended to share a 'high' with companions who cannot afford their own drugs, this practice carries a very high risk of HIV transmission (McCurdy et al., 2005b).

Injecting drug use also features in **Zanzibar's** smaller epidemic. HIV prevalence among women attending antenatal clinics was 0.9% in 2005. However, one in three injecting drug users was found to be infected with HIV in a recent study. Almost half (46%) the injecting drug users reported using non-sterile needles. In addition, almost one in five injecting drug users was found to be infected with syphilis, which suggests that a combination of unsafe injecting and sexual practices was prevalent among injecting drug users (Dahoma et al., 2006).

Rwanda's epidemic has stabilized in the 2000s, but HIV prevalence remains high in the capital, Kigali, where approximately 13% of pregnant women were HIV-positive in 2003. Rwanda has expanded HIV surveillance, especially in rural

areas (where HIV prevalence has been shown to be significantly lower, at 3% or less among pregnant women, than in urban areas), and introduced improved HIV estimation methodologies in recent years (Kayirangwa et al., 2006). For this reason, only data from consistent surveillance sites should be compared over time. Such a comparison shows a drop in HIV prevalence among pregnant women in urban areas, particularly in 1998–2003. In Kigali, prevalence declined from a little over 16% to 13% in that period, while in two other urban areas it declined from 9.5% to 5.8%. That declining trend appears to have weakened in recent years. In rural areas, meanwhile, HIV prevalence has remained stable, albeit at considerably lower levels (between 2.1% and 2.8% in 1998–2003) (Kayirangwa et al., 2006). Preliminary results of the latest Demographic and Health Survey show HIV infection levels are more than three times higher in urban than in rural areas: 7.3%, compared with 2.2%. The highest prevalence continues to be found in Kigali, where infection levels are 2–3 times higher than elsewhere in the country (Institut National de la Statistique et al., 2005).

Just over 3% [2.7%–3.8%] of adults—approximately 150 000 people—were living with HIV in 2005 in neighbouring **Burundi**, where divergent trends are evident in different parts of the country. HIV prevalence among young (15–24 years) pregnant women declined from 13% to 9% in 2000–2004 (prevalence from 13% to 9%) at antenatal clinics in Bujumbura and other urban areas (Ministère de la Santé Publique Burundi, 2005). However, the latest sentinel surveillance data show a sharp rise in HIV infections among antenatal clinic attendees in Bujumbura (from 12.6% in 2004 to 18% in 2005), with infection levels among young (15–24-year-old) antenatal clinic attendees almost doubling from 8.6% in 2004 to 15.5% in 2005. In 2004–2005, prevalence in pregnant women also rose in rural areas (Ministère de la Santé Publique Burundi, 2005).

Based on HIV data collected at antenatal clinics, national adult HIV prevalence in **Ethiopia** in 2005, with infection levels more than five times higher in urban (10.5%) than in rural (1.9%) areas. A gradual decline in HIV prevalence among pregnant women has been found at some antenatal clinics in Addis Ababa and in other urban areas, most notably since 1997–98 (Federal Ministry of Health, 2006). However, prevalence remains high in Addis Ababa overall (where it has

remained at 14%–16% since the mid-1990s) and in other urban areas (where it has stayed between 11% and 13% in the same period) (Hladik et al., 2006). About 80% of the country's population lives in rural areas, and prevalence among women attending antenatal clinics there rose from 1.9% in 2000 to 2.6% in 2003 and 2.2% in 2005 (Hladik et al., 2006; Federal Ministry of Health Ethiopia, 2004; Federal Ministry of Health Ethiopia, 2006).

Since a minority of pregnant women attend such clinics in Ethiopia, HIV data collected at antenatal clinics present an incomplete picture of epidemiological trends. Results from the 2005 Demographic and Health Survey (which included more than 13 000 men and women from all regions) therefore enable a fuller picture to be drawn of Ethiopia's epidemic. According to the survey, 1.4% of adults (15–49 years) were living with HIV in 2005, with prevalence among adult women double that among adult men. Infection levels were much higher in urban areas (5.5% among adults) than in rural areas (0.7%) (Central Statistical Agency and ORC Macro, 2006).⁴

The most recent data from neighbouring **Eritrea** also indicate a stable epidemic, with 2.4% of women seeking antenatal care testing HIV-positive. This is consistent with the HIV prevalence of 2.8% and 2.4% found in 2001 and 2003, respectively. Prevalence ranged from over 7% in Assab (in the south) and 6% at Assia (in the centre of the country), to 0% in Shieb (also in the centre) (Ministry of Health Eritrea, 2006).

No new HIV data are available for **Somalia**, where a 2004 sentinel surveillance survey found comparatively low HIV infection levels of 0.9% among pregnant women nationally. At some antenatal clinics, HIV prevalence was considerably higher than in 1999—at Hargeisa it had risen from 0.7% to 1.6%, while in Berbera it had risen from 0% to 2.3% (WHO, 2005a). Knowledge of HIV transmission is low and condom use very rare: more than 85% of young men and women, aged 15–24 years, have never used a condom, according to one survey (WHO, 2005b).

West and Central Africa

National adult HIV prevalence continues to be much lower in **West Africa** than in other parts of sub-Saharan Africa. National adult HIV prevalence surpasses 4% only in **Côte d'Ivoire**, and is 2% or lower in several other countries, especially those of the Sahel. As in most of East Africa, HIV infection trends are generally stable although declining prevalence has been noted among pregnant women in several cities, including Ouagadougou (**Burkina Faso**), Abidjan (**Côte d'Ivoire**) and Lomé (**Togo**) (WHO, 2005).

Only India and South Africa have more people infected with HIV than does **Nigeria**, where an estimated 2.9 million [1.7 million–4.2 million] people were living with the virus in 2005 (UNAIDS, 2006). Approximately 300 000 adults were newly infected with HIV in 2005. When the improved assumptions used to obtain current estimates of HIV prevalence among pregnant women are applied to previous rounds of sentinel surveillance, the overall trend in HIV infection levels among pregnant women in Nigeria appears to be stable. Nationally, about 4.4% [4.2%–4.6%] of women attending antenatal clinics were found to be infected with HIV in 2005, but prevalence in pregnant women exceeded 5% in almost a dozen states. The epidemic shows considerable variation, with state-wide prevalence ranging from as high as 10% in Benue (in the North Central zone) and 8% in Akwa Imbom (South South zone) to under 2% in Ekiti, Oyo (both in the South West zone), and in Jigawa (North West zone). In some states, HIV prevalence among pregnant women is higher in rural than in urban areas, while in others the reverse is being found. More detailed research is required to achieve a better understanding of the reasons for these varying patterns (Federal Ministry of Health Nigeria, 2006).

National adult HIV prevalence remains just under 1% [0.4%–1.5%] in **Senegal** (UNAIDS, 2006), although infection levels in adults are more than twice as high (2.2% and 2%, respectively) in the Ziguinchor and Kolda regions in the south (Centre de recherche pour le Développement Humain et MEASURE DHS+, 2005). Sex work still appears to be the main factor in Senegal's

⁴ The differences between HIV estimates based on antenatal clinic data and those presented in this population-based survey seem to derive mainly from the limited coverage of antenatal care services in Ethiopia and differences in geographical coverage between the two surveillance systems. It is worth noting that HIV prevalence in the population-based survey among women who had received antenatal care was the same—3.5%—as the prevalence estimate derived from antenatal clinic data (Central Statistical Agency and ORC Macro, 2006).

epidemic, with HIV prevalence as high as 30% among sex workers in Ziguinchor, for example. There remains a danger of HIV spreading from sex workers and their clients to the general population (Gomes do Espirito Santo and Etheredge, 2005).

Research is identifying a previously hidden aspect of the epidemic in Senegal: the role of sex between men as a risk factor for HIV infection. Conducted in five urban areas (Dakar, Kaolack, Mbour, Saint-Louis and Thiés), a study has found HIV prevalence of 22% in men who have sex with men, most of whom (94%) said they also had sex with women (Wade et al., 2005). This population of men who have sex with men could serve as a potential bridge for HIV transmission to women who ordinarily would be at low risk of infection. Only about half of the men in the study reported using condoms during sex with men or women in the previous month (Wade et al., 2005).

There are signs of declining HIV prevalence in urban parts of Burkina Faso, Côte d'Ivoire and Ghana, but Mali's epidemic appears to be growing.

The HIV epidemic in **Mali** could be growing, after having remained stable for many years. A comparison of data from sentinel surveillance sites with consistent information for 2002–2005 shows HIV prevalence among pregnant women rising from 3.3% in 2002 to 4.1% in 2003 and 2005. Similarly among 15–19-year-old pregnant women, HIV infection levels have risen (from 2.5% in 2002 to 3.4% in 2005), as they have among those older than 35 years (1.5% in 2002 to 4.5% in 2005). Usually, infection levels would tend to be higher among slightly older women, who have been sexually active for longer and therefore are more likely to have become infected. Overall, HIV prevalence was highest in the Ségou region, where 5.1% of pregnant women were found to be HIV-infected in 2005—a reminder that serious, localized epidemics are under way in this large country (Ministère de la Santé Mali, 2005).

Guinea is experiencing one of the smaller AIDS epidemics in sub-Saharan Africa. Adult HIV prevalence was an estimated 1.5% [1.2%–1.8%]

in 2005, and approximately 85 000 [69 000–100 000] people were living with HIV. The recent national household survey shows that HIV infection levels are highest in urban areas, where they exceeded 2% among adults in the capital, Conakry (Direction Nationale de la Statistique Guinée and ORC Macro, 2006).

New HIV data is still pending for **Côte d'Ivoire**, where civil conflict has hindered HIV surveillance and probably also HIV prevention work. Available HIV data suggest a relatively stable but serious epidemic, with at least 4% of adults living with HIV in 2005 (UNAIDS, 2006). HIV data for **Togo** also point to a serious epidemic, with the Maritime, Plateaux and Savanes regions, and the capital, Lomé, worst-affected (WHO, 2005). At least 7% of women attending antenatal clinics in those parts of the country have tested HIV-positive (WHO, 2005; Ministère de la Santé Togo, 2004). Overall adult HIV prevalence was an estimated 3.2% [1.9–4.7%], and about 110 000 [65 000–160 000] people were living with HIV in 2005 (UNAIDS, 2006).

Neighbouring **Bénin** has a smaller epidemic with about 87 000 [57 000–120 000] people living with HIV in 2005 and adult HIV prevalence estimated at 1.8% [1.2%–2.5%] (UNAIDS, 2006). At the limited number of urban sentinel sites with HIV data dating back to the mid-1990s, a declining trend in HIV infections has been apparent since 2000, with HIV prevalence having fallen from about 4% (2001) to under 2% (2005). At the same time, high HIV infection levels (ranging from 3% to over 5%) have been found among women attending antenatal clinics in both urban and rural parts of the Atlantique and Mono départements. Overall, though, Benin's epidemic appears to be stable, with HIV prevalence in antenatal clinic attendees ranging between 1.8% and 2.2% since 2003 (Ministère de la Santé Bénin, 2006) (Alary et al., 2002).

In neighbouring **Ghana**, where adult HIV prevalence was estimated at 2.3% [1.9%–2.6%] in 2005 (UNAIDS, 2006), there are signs that the country's epidemic could be in decline. Having risen steadily to a peak of 3.6% in 2003, HIV infection levels among women attending antenatal clinics declined subsequently to 3.1% in 2004 and 2.7% in 2005 (National AIDS/STI Control Programme, 2006). The 2003 national survey showed that, unlike most countries in sub-Saharan Africa, HIV prevalence in Ghana overall

differs only slightly between urban and rural areas of Ghana (2.3% versus 2.0%) (Ghana Statistical Service, Noguchi Memorial Institute for Medical Research, ORC Macro, 2004). At the same time, HIV spread differs from region to region, with prevalence among pregnant women ranging from 1.2% in the northern region to 4.7% in the eastern region (National AIDS/STI Control Programme, 2006).

HIV infections are especially prevalent among older Ghanaians, especially in women aged 35–39 years and in men aged 40–44 years (Akwaru et al., 2005). However, among pregnant women, most of the HIV cases are found in the 25–34-year-old age group (National AIDS/STI Control Programme, 2006). As in many other countries, marriage appears to be a significant risk factor for women in Ghana, while mobility is a strong risk factor among men (Akwaru et al., 2005). Married women were almost three times more likely to be HIV-infected than women who had never been married (Ghana Statistical Service, Noguchi Memorial Institute for Medical Research, ORC Macro, 2004).

Research conducted in three prisons in Nsawan and Accra in Ghana has uncovered high HIV prevalence among inmates (19%) and prison officers (8.5%) who participated in the study. The study's small sample size might have led to an overestimation of HIV prevalence, but the findings indicate HIV outbreaks are occurring in those prisons. Overall, almost one in three of the male inmates participating in the study reported having had sex with other men (inside or outside the prison), while a small percentage of inmates said that they injected drugs. Skin tattooing might also be a cause of some in-prison HIV transmission. It appears that many of the HIV-infected inmates acquired the virus in prison; although a majority of them had been imprisoned for about 10 years, none had reached a symptomatic stage of AIDS, which indicates relatively recent infection (Adjei et al., 2006).

There are also signs of declining HIV prevalence to Ghana's north, in **Burkina Faso**, where adult HIV prevalence remained an estimated 2% [1.5%–2.5%] (UNAIDS, 2006). Among young women (aged 15–24 years) attending antenatal clinics in urban areas, HIV infection levels fell by half between 2001–2003, to below 2% amid indications from national survey data that more

citizens of Burkina Faso are protecting themselves and their sex partners against possible HIV infection (Présidence du Faso, 2005; Institut National de la Statistique et de la Démographie and ORC Macro, 2004). The south and west of the country (including Poni province, where adult HIV prevalence was 3.7% in 2003) is notably more affected by the epidemic than are the eastern regions (Institut National de la Statistique et de la Démographie and ORC Macro, 2004).

In sparsely populated **Chad**, a recent national HIV survey has found adult HIV prevalence of 3.3%. In the country's five largest cities and towns, over 6% of adults were living with HIV and in the capital, N'Djamena, prevalence was 8%. There is considerable room for improving HIV prevention. Fewer than one in ten (8%) men and women said they had used a condom the last time they had sex, and about 4% of men and 2% of women said they had exchanged sex for money at some stage (but only about half of them used a condom when doing so). Basic knowledge of HIV is poor: only one in four men and women knew how to prevent sexual transmission of HIV and rejected major misconceptions about the virus (République du Tchad, 2005).

Incomplete HIV data make it difficult to discern clear trends in most countries of Central Africa, but **Cameroon** and the **Central African Republic** appear to be most affected. In the latter, almost 11% [4.5–17.2%] of adults (aged 15–49 years) were living with HIV in 2005 (UNAIDS, 2006), while adult HIV prevalence in the former exceeded 5% [4.9%–5.9%] (UNAIDS, 2006). Infection levels are highest in the north-west and eastern regions (almost 9%) and lowest in the north of **Cameroon** (2% or lower) (Institut National de la Statistique et de la Démographie and ORC Macro, 2005b). According to the 2005 Demographic and Health Survey, prevalence was almost twice as high for adult women than for men (15–49 years) (6.8% compared with 4.1%). The survey found widespread awareness of AIDS but poor knowledge of HIV: more than one third of women did not know the methods for preventing sexual transmission of HIV (Institut National de la Statistique and ORC Macro, 2004).

It is estimated that as many as one million [560 000–1.5 million] people, more than 100 000

[40 000–270 000] of them children younger than 14 years, were living with HIV in the **Democratic Republic of the Congo** in 2005 (UNAIDS, 2006). However, HIV surveillance data are unavailable for many parts of this large country. To its west, in the smaller and less populous **Republic of the Congo**, some 120 000 [75 000–160 000] people were living with HIV in 2005 (UNAIDS, 2006). In 2005, 4.9% of women attending antenatal clinics were HIV-infected. Prevalence among pregnant women varied widely, though—from as low as 2% in Djambala to 9% in Sibiti and 10% in Gamboma. In the capital, Brazzaville, some 4% of antenatal clinic attendees were HIV-infected (Ministère de la Santé et de la Population République du Congo, 2005).

In sum, sub-Saharan Africa's HIV epidemics are following divergent trends. There is evidence of diminishing or stable HIV spread in most east African and west African countries, along with signs of growing epidemics in a few countries. In southern Africa, only Zimbabwe presents evidence of a strong decline in national HIV prevalence. In several other countries—including South Africa—the epidemics do not yet show signs of abating.



ASIA

An estimated 8.6 million [6.0 million–13.0 million] people were living with HIV in Asia in 2006, including the 960 000 [640 000–2.5 million] people who became newly infected in the past year. Approximately 630 000 [430 000–900 000] died from AIDS-related illnesses in 2006. The number of people receiving antiretroviral therapy has increased more than threefold since 2003, and reached an estimated 235 000 [180 000–290 000] by June 2006. This represents about 16% of the total number of people in need of antiretroviral treatment in Asia. Only **Thailand** has succeeded in providing treatment to at least 50% of people needing it (WHO/UNAIDS, 2006).

China

In **China** an estimated 650 000 [390 000–1.1 million] were living with HIV at the end of 2005 (Ministry of Health China, UNAIDS, WHO, 2006, UNAIDS, 2006). Although HIV infections have been detected in each province of this large country, most have been reported in Henan, Yunnan, Guangxi, Xinjiang and Guangdong province, while Ningxia, Qinghai and Tibet appear to have been spared HIV outbreaks to date (Ministry of Health China, UNAIDS, WHO, 2006).

Having begun in rural areas before spreading to cities—an unusual pattern (Zhao et al., 2006)—China's injecting drug use-related HIV epidemic has reached alarming proportions. Nearly half (44%) of the people living with HIV in China are believed to have been infected while injecting drugs (Ministry of Health China, UNAIDS,

WHO, 2006; Lu et al., 2006), and almost 90% of HIV infections acquired in that manner have occurred in seven provinces (Yunnan, Xinjiang, Guangxi, Guangdong, Guizhou, Sichuan and Hunan) (Ministry of Health China, UNAIDS, WHO, 2006). Reportedly, half (49%) of injecting drug users have used non-sterile injecting equipment at some stage (China State Council AIDS Working Committee and UN Theme Group on HIV/AIDS in China, 2004). Therefore, it is not surprising that HIV prevalence has exceeded 50% among injecting drug users in parts of Xinjiang, Yunnan and Sichuan provinces (Mingjian et al., 2006; Ministry of Health China, UNAIDS, WHO, 2006; MAP, 2005a), nor that HIV prevalence has risen suddenly among injecting drug users (in southwest Sichuan province, for example, where prevalence among urban injecting drug users rose from 11% to 18% between 2002 and 2004 (Zhang et al., 2006).

Half the new HIV infections in China in 2005 occurred during unprotected sex. With HIV spreading gradually from most-at-risk populations to the general population, the number of HIV infections in women is growing.

After opening its first needle and syringe exchange project in 1999, China has launched similar projects in 18 provinces, and 92 of them were operating in 2006. The benefits are beginning to materialize. Data collected at six

needle exchange sites suggest that the use of non-sterile needles ranged from 27%–79% when the projects began, but had fallen to 12%–56% by end-2005 (Wu et al., 2006). At an outreach-based needle and syringe exchange in Hunan province, the proportion of injecting drug users sharing needles decreased from 43% to 23% in 2003–2005, while HIV knowledge and awareness increased fourfold (from 21% to 80%) (Chen et al., 2006). Unfortunately, harm reduction projects still encounter resistance at provincial and lower government levels in some places. As a result, China's response varies considerably in type and quality from place to place (Qian et al., 2006). Along with expanding the number of methadone clinics and needle and syringe exchange sites further, basic HIV knowledge must still be improved among injecting drug users and their partners: a study among injecting drug users in Yunnan province, for example, found that one in five did not know that needle-sharing carries a risk of HIV transmission (Christian et al., 2006).

Sexual risk behaviours among injecting drug users compound the likelihood of HIV spread among and beyond injecting drug users (Zhao et al., 2006). National surveillance data suggest that as many as 11% of drug users also engage in high-risk sexual activities (Ministry of Health China,

UNAIDS, WHO, 2006). More than one third of the sexually active drug users participating in one study said that they used non-sterile needles, yet only 4% of that group used condoms consistently with their regular sexual partners (Liu et al., 2006). In Yunnan province, two thirds of injecting drug users (enrolled in detoxification centres) said that they did not use a condom when buying sex in the previous month, and more than half said they had never bought a condom (Christian et al., 2006).

Many male drug users buy sex, and as many as half of female drug users also sell sex, whether intermittently or frequently (Liu et al., 2006; Yang et al., 2005). In some provinces (such as Sichuan) a small but significant percentage of sex workers also inject drugs, and they tend to have more clients but use condoms less frequently than their non-injecting counterparts (MAP, 2005a; MAP, 2005b).

Poor knowledge of HIV and high rates of unprotected sex mean that sex workers who do not inject drugs also face a high risk of becoming infected with HIV. Only one in three establishment-based sex workers surveyed in Yingjian county of Yunnan Province, for example, were using condoms consistently with clients and one

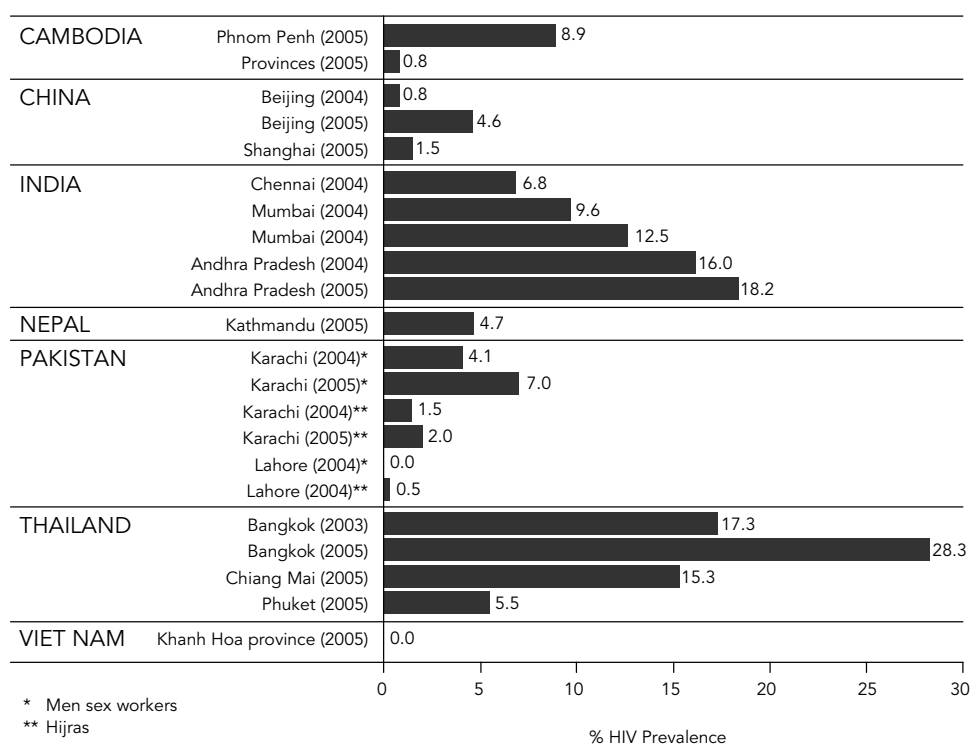
MIGRATION AND HIV RISK IN CHINA

There is considerable speculation about the possible impact of large-scale migration and population movements on the evolution of China's epidemic. It is widely assumed that male migrants are more likely to visit sex workers, thus putting themselves and their other sexual partners at risk of HIV and sexually transmitted infections. Assumptions that migrants will feature strongly in China's epidemic are based on the large number of migrants (an estimated 120–150 million), evidence of the association between migration and HIV from studies of migrants elsewhere (especially in southern Africa) (Lurie et al., 1997; Lurie et al., 2003) and HIV surveillance among migrants in some cities (Hesketh et al., 2006).

In China, some evidence seems to support such expectations. In Suining and Luzhou (Sichuan province), for example, the majority of clients of sex workers are migrant workers, who buy sex often (on average 11 times in the previous six months) and tend not to use condoms regularly (only 36% used one the last time they paid for sex) (Wan and Zhang, 2006). In an earlier (2002) study in Beijing, Nanjing and Shanghai, one in ten migrant men said they had paid for sex at some stage (Wang et al., 2006).

But generalizations should be avoided. The situation differs across the country, especially in those parts of China where significant numbers of migrants are moving with their partners. Thus, the first population-based study among Chinese workers and migrants in Zhejiang province's capital, Hangzhou, found no HIV infections. There are several possible reasons for such findings. Up to half of the migrant workers in China are female and are unlikely to engage in paid sex. In parts of the country, a large proportion of migrants move with their partners—as one third of the migrant workers in the Hangzhou study had done. Many migrants also seem to maintain relatively conservative, traditional attitudes toward casual sex (Hesketh et al., 2006).

HIV prevalence among men who have sex with men in selected parts of Asia, 2003–2005



Sources: [XVI International AIDS Conference abstracts, 2006] – (Cambodia) M.Phalkun, et al. HIV, sexually transmitted infections, related risk behaviour among Cambodian men who have sex with men; (China) X.Ma, et al. Possible rise in HIV prevalence among men who have sex with men in Beijing; (India) S.Kumta et al. Sociodemographics, sexual risk behaviour and HIV among men who have sex with men attending voluntary counselling and testing services in Mumbai, India; Sravankumar K, Prabhakar P, Myrthi/STI/HIV Study Group. High risk behaviour among HIV positive and negative men having sex with men (MSM) attending Myrthi clinics in Andhra Pradesh, India; (Nepal) L.B. Acharya, et al. HIV and STI prevalence among MSM in Kathmandu, Nepal; (Pakistan) A. Altaf, et al. Behavioral characteristics of male and eunuch (hijra) sex workers in Karachi, Pakistan; (Thailand) F. van Griensven, et al. Surveillance of HIV prevalence among populations of men who have sex with men in Thailand, 2003–2005; (Viet Nam) M. Truong Tan, et al. HIV risk behavior and prevalence among MSM in Khanh Hoa province, Viet Nam. National Study of Reproductive Tract and Sexually Transmitted Infections. Survey of High Risk Groups in Lahore and Karachi, 2005. National AIDS Control Program, DFID and FHI. (Pakistan); NACO, 2004; Andhra Pradesh State AIDS Control Society (2004). 8th round of national annual sentinel surveillance for HIV, Andhra Pradesh. Hyderabad, APSACS. (India)

Figure 5

in five said they *never* used a condom (Hesketh et al., 2005). In another study in the Yunnan province, one in five sex workers was found to be HIV-infected (Wang, Yang et al., 2006). Violence is a further concern: in one recent study, 49% of sex workers said they had been sexually assaulted, and a strong correlation was found between such high incidence of violence and the presence of sexually transmitted infections (Choi SY, 2006). Consequently, HIV prevalence in sex workers overall has increased substantially during the past decade, from 0.02% in 1994 to just under 1% (0.93%) in 2004, according to sentinel surveillance data (Ministry of Health China, UNAIDS, WHO, 2006).

Appropriate interventions to reduce the risk of HIV transmission during paid sex do make a difference—especially when buttressed by part-

nerships with the health authorities, police and establishment managers. Three years after a 100% condom use programme was introduced in Li county, Hunan province, self-reported condom use increased almost fourfold (from 24% in 2002 to 88% in 2005) and the number of reported sexually transmitted infections fell by almost two thirds (from 513 to 192) (Chen Y et al., 2006). The legal, policy and operational environments will need to be harmonized, however, if such achievements are to become more commonplace.

Meanwhile, more light is being shed on the role of sex between men in China's epidemic. It is now estimated that some 7% of HIV infections in China were acquired during unsafe sex between men (Lu et al., 2006), with new studies revealing high rates of unprotected sex between men who have sex with men, signifi-

cant proportions of whom also have sex with women (17%–41%) or sell sex (17%) (Jiang al., 2006; Xu et al., 2006; Liu, Wang et al., 2006). In a study in Jiangsu province, for example, almost one half of men who have sex with men said they had had unprotected anal intercourse in the previous three months. None was HIV-positive, but the prevalence of other sexually transmitted infections was high (7% had syphilis and 8% had HSV-2) (Jiang et al., 2006). In the midst of this behaviour, HIV can spread quickly once it does establish a presence. Such a trend could be under way in several cities. In Beijing, HIV prevalence of 3% and 4.6%, respectively, has been found in two studies among men who have sex with men (Choi KH et al., 2006; Ma et al., 2006). One in five of the men participating in the latter study (in 2005) had never heard of HIV, and more than two in three reported unprotected sex in the previous six months (Ma et al., 2006). Meanwhile, in Shanghai, HIV prevalence of 1.5% was found among men who have sex with men in a 2004–2005 study (Choi K et al., 2006).

Serious epidemics among men who have sex with men are being uncovered in Cambodia, China, India, Nepal, Pakistan, Thailand and Viet Nam.

Overall, it is estimated that half the new HIV infections in China in 2005 occurred during unprotected sex. With HIV spreading gradually from most-at-risk populations to the general population, the number of HIV infections in women is growing, too (Ministry of Health China, UNAIDS, WHO, 2006). By 2004, women already accounted for 39% of reported HIV cases (compared with 25% just two years earlier). Recent analysis of the HIV test results of 138 000 pregnant women in almost half the counties of Yunnan province found 0.3% were HIV-positive, but prevalence varied from 0% to as high as 1.6% in specific counties (Zhang, Hu, Hesketh, 2006). In parts of Henan and Xinjiang provinces, HIV prevalence higher than 1% has been found among pregnant women and women receiving premarital and clinical HIV testing (Ministry of Health China, UNAIDS, WHO, 2006), indicating that the virus is spreading relatively freely in some locales.

Meanwhile the epidemic among former blood and plasma donors in provinces such as Anhui, Hebei, Henan, Hubei and Shanxi continues (Cohen, 2004), although HIV appears not to have spread into the general population as dramatically as feared (Mastro and Yip, 2006). Among villagers in one county of Shanxi province (where most HIV infections were related to blood and plasma donations), overall HIV prevalence was 1.3% in 2004. But the infections appeared to be concentrated among former donors (4.1% of whom were HIV-positive), with only 0.1% of villagers who had not been donors testing HIV-positive (Wang, Jia et al., 2006). Such trends have been attributed to the limited sexual networks of some rural populations (Mastro and Yip, 2006). But a different situation has been found in villages of rural Anhui, where 15% of former plasma donors were HIV-infected, as were 5% of residents with no history of plasma donations. Most of the latter probably were infected during unprotected sex with HIV-positive spouses or casual partners (Ji et al., 2006). Approximately 69 000 former commercial blood and plasma donors and recipients were living with HIV in 2005 (Ministry of Health China, UNAIDS, WHO, 2006).

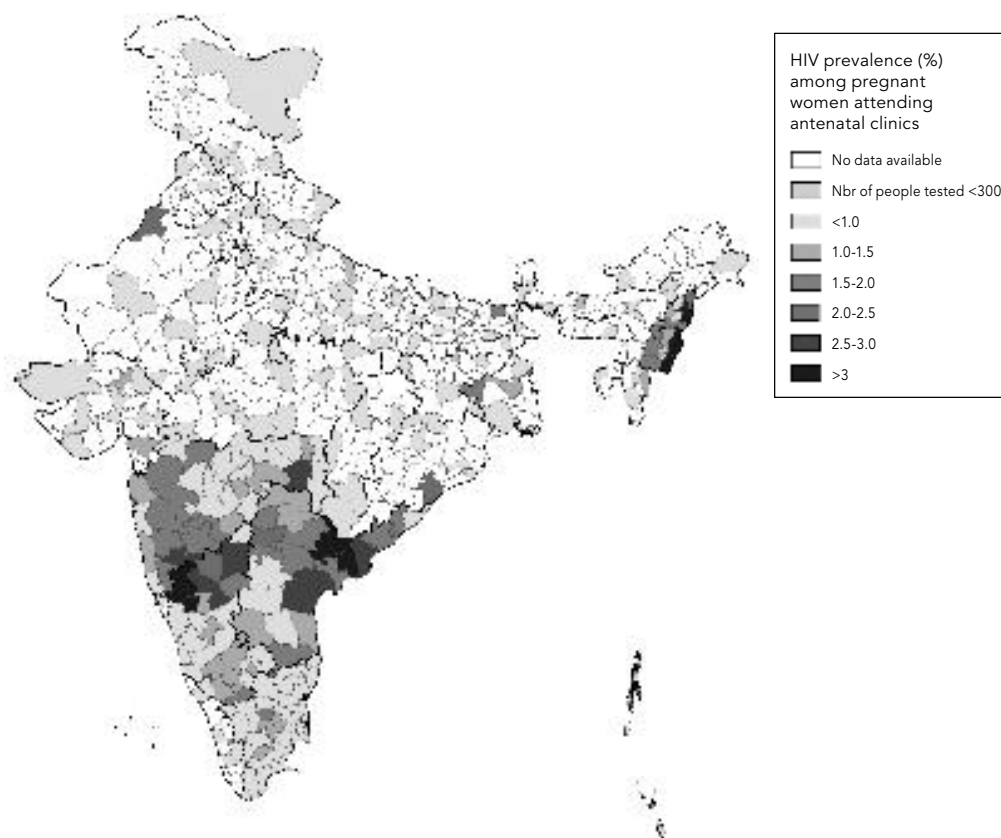
Although expanded in recent years, basic elements in China's HIV response still need to be improved. HIV awareness is very low (including among political leaders at some levels) and stigma remains a problem in many areas (Ministry of Health China, UNAIDS, WHO, 2006). Almost one in three (30%) health professionals in Yunnan Province, for example, said they would not treat an HIV-positive person (Hesketh et al., 2005). Whether or not China curbs its growing epidemic will depend largely on the extent to which it succeeds in limiting the spread of HIV among and between injecting drug users, sex workers and their clients.

India

The world's second-most populous country, **India**, is experiencing a highly varied HIV epidemic which appears to be stable or diminishing in some parts while growing at a modest rate in others. Approximately 5.7 million [3.4 million–9.4 million] people, of which 5.2 million were adults aged 15–49 years, were living with HIV in 2005.

As in China, the majority of HIV infections in India appear to be occurring in a few

HIV prevalence in India – by district, 2005



Source: NACO. Sentinel Surveillance data, ANC Sites (2005).

Figure 6

regions. In the case of India, about two thirds of reported HIV infections have been in six of the country's 28 states—mainly in the industrialized south and west and in the north-eastern tip. On average, HIV prevalence in those states is 4–5 times higher than in the other Indian states. The highest prevalence rates are found in the Mumbai-Karnataka corridor, the Nagpur area of Maharashtra, the Nammakkal district of Tamil Nadu, coastal Andhra Pradesh, and parts of Manipur and Nagaland (in the north-east of India) (National AIDS Control Organization, 2005a; World Bank, 2005). Notably, in the south of the country, infection levels in rural and urban populations tend to be similar (World Bank, 2005).

A recent analysis of HIV data from 216 antenatal clinics and 132 sexually transmitted infection clinics for 2000–2004 suggest that HIV prevalence among women aged 15–24 years in southern states declined from 1.7% in 2000 to

1.1% in 2004 (Kumar et al., 2006). HIV infection levels also fell among men aged 20–29 years who attended sexually transmitted infection clinics in the south. (There was no evidence of declining prevalence in northern states.) The authors have attributed the trends to a postulated rise in condom use by men and female sex workers in southern India, which is presumed to have reduced the transmission of HIV (Kumar et al., 2006). However, further analysis of the data collected suggests that the apparent reduction in HIV prevalence in the south is due mainly to a decline in HIV prevalence in Tamil Nadu (John, 2006). Other analysts contend that insufficient evidence exists to support the attribution of a decline in HIV prevalence in the south to behaviour change (Hallett and Garnett, 2006).

The bulk of HIV infections in India are occurring during unprotected heterosexual intercourse (National AIDS Control Organization, 2005b). Consequently, women account for a

growing proportion of people living with HIV (some 38% in 2005), especially in rural areas. HIV infection levels of over 1% have been found among pregnant women in Andhra Pradesh, Maharashtra and Karnataka (National AIDS Control Organization, 2004a). In 2004, mean HIV prevalence of 1.6% was found in pregnant women in Karnataka, with AIDS the leading reported cause of death in some northern districts; in some rural sub-districts, prevalence ranged between 1.1% and 6.4% among adults, underlining the highly varied character of the epidemic (Moses et al., 2006).

A large proportion of women with HIV appear to have acquired the virus from regular partners who were infected during paid sex (Lancet, 2006). In Mumbai and Pune (in Maharashtra), for example, where 54% and 49% of sex workers, respectively, have been found to be HIV-infected (NACO, 2005c), the likelihood of transmitting HIV to clients and their partners can be high. Indeed, in the higher-prevalence states of the south, most HIV transmission appears to be occurring between sex workers and their clients, and their other sex partners (Kumar et al., 2005). In Karnataka, for example, almost one quarter (23%) of 1100 female sex workers taking part in a recent study were HIV-infected, as were almost one half (47%) of the women operating out of brothels (Ramesh et al., 2006).

HIV prevention efforts targeted at sex workers are being implemented in India. However, the law enforcement context of sex work is complex and often acts as a barrier against effective HIV prevention and treatment efforts (Dandona et al., 2006b). In addition, the interventions tend to mostly target brothel-based sex workers, who represent a minority of sex workers. Some prevention programmes run by sex workers—in Sonagachi, Kolkata, for example—have encouraged safe paid sex practices and have been associated with lower HIV prevalence (Kumar, 1998; Jana et al., 1998). Building on those experiences, sex workers organizations have expanded their primary prevention programme throughout the state of West Bengal to reach some 28 000 sex workers in almost 50 areas (Roy et al., 2006). However, risk-taking during paid sex is still commonplace in other parts of India. In Andhra Pradesh, for example, one in four sex workers canvassed in 13 districts had never used a condom, and one in two used them inconsistently. More than half the street-based sex workers said they

never or seldom used condoms. Notably, those women who knew that HIV infection could be prevented and who had access to free condoms were significantly more likely to be using condoms consistently (Dandona et al., 2005).

Injecting drug use is the main risk factor for HIV infection in the north-east (especially in the states of Manipur, Mizoram and Nagaland), and features increasingly in the epidemics of major cities elsewhere, including in Chennai, Mumbai and New Delhi (MAP, 2005a; National AIDS Control Organization, 2005). Products injected include pharmaceuticals that are not illegal (such as buprenorphine, pentazocine and diazepam), in addition to heroin. In Chennai, 31% of injecting drug users were found to be HIV-infected in a recent study (Srikrishnan et al., 2006).

Using non-sterile injecting drug equipment is the main risk factor for HIV infection in the north-east of India (especially in Manipur, Mizoram and Nagaland), and features increasingly in the epidemics of cities such as Chennai, Mumbai and New Delhi.

Currently, interventions among injecting drug users tend to be inconsistent, and too small and infrequent to yield demonstrable results (Basu and Koliwad, 2006). Harm reduction programmes need to be extended and expanded as a matter of urgency in those parts of India with serious drug injecting-related HIV epidemics. Failing that, there is a possibility that the combination of injecting drug use and paid sex could lead to larger HIV epidemics. A recent study among men seeking treatment for sexually transmitted infections in Mumbai clinics showed that among those patients who injected drugs, 12% were HIV-positive, 80% of whom had recently (in the past three months) paid for sex and 27% of whom had themselves sold sex (Yu et al., 2006). As of 2006, several needle exchange programmes were operating in the North East, West Bengal and Delhi; however, only one project using substitution therapy has been started, in the state of Manipur.

There has been little research on the role of sex between men in India's HIV epidemic. In the two states where such data have been collected,

HIV prevalence of 6.8% and 9.6% were found among men who have sex with men in Chennai and Mumbai, respectively (NACO, 2004b). More recently, HIV prevalence of 12% was found among men who have sex with men seeking voluntary counselling and testing services in Mumbai, and 18% prevalence was found at 10 clinics in Andhra Pradesh (Kumta et al., 2006; Sravankumar, Prabhakar, Mythri STI/HIV Study Group, 2006). Those HIV infection levels were comparable to the 16% prevalence found in that state in sentinel surveillance conducted among men who have sex with men in 2004 (Andhra Pradesh State AIDS Control Society, 2004). In some areas, a substantial proportion of men who have sex with other men also sell sex: in a large study in Andhra Pradesh, for example, one in four of the men sold sex to other men (Dandona et al., 2006a). Poor knowledge of HIV has been found in groups of men who have sex with men. In Bangalore, for example, three in four men who have sex with men did not know how the virus is transmitted, and a large proportion of them engaged in unprotected sex with other men (Anthony et al., 2006).

The extent and effectiveness of India's efforts to increase safe sex practices between sex workers and their clients, and between men who have sex with men (and their other sex partners) will likely determine the scale and development of India's HIV epidemic (Kang et al., 2005). In the north-east states, as well as in major cities elsewhere, extensive harm reduction programmes are equally vital. Amid all this, more must be done to combat stigma—which remains rife in all walks of Indian society, including among health-care workers (Mahendra et al., 2006)—and to reduce the gender and other inequalities that make HIV prevention and treatment such a huge challenge in this country (Lancet, 2006).

The highest national HIV infection levels in Asia continue to be found in South-East Asia, where combinations of unprotected paid sex and sex between men, along with unsafe injecting drug use, are fuelling the epidemics in most countries.

Viet Nam's epidemic continues to increase, with HIV having been detected in all 64 provinces and all cities. The number of people living with HIV has doubled since 2000, and reached an estimated 260 000 [150 000–430 000] in 2005. Some 40 000 people are being infected with HIV each year (Ministry of Health Viet Nam, 2005), the

vast majority of them injecting drug users and persons who buy or sell sex.

The use of non-sterile injecting equipment is widespread in Viet Nam, with an estimated one in five injecting drug users having done so in the previous three months, according to one recent study (Longfield et al., 2006). As a result, HIV infection levels in injecting drug users have grown from 9% in 1996 to over 30% in 2003 (Ministry of Health Viet Nam, 2005; Hien et al., 2004), and reaching levels of infection as high as 63% (in Hanoi) and 67% (in Hai Phong) in 2005 (Pham et al., 2006; Luu Thi Minh, Tran Nhu et al., 2006a).

The highest national HIV infection levels in Asia continue to be found in South-East Asia, where combinations of unprotected paid sex and sex between men, along with unsafe injecting drug use, are sustaining the epidemics.

A strong overlap between sexual risk-taking and injecting drug use is evident in several Vietnamese cities. Large proportions of male injecting drug users engage in unprotected sex, including paid sex (40% in Bac Ninh province in the north of Viet Nam, for example) (Schumacher et al., 2006). Additional evidence of injecting drug use and sex work among young male migrant workers (16–26 years of age) in Hanoi confirms the need for prevention programmes that target both the sexual and drug-related risk among migrants (Giang et al., 2006). As well, significant percentages of female sex workers also inject drugs. In Hanoi, for example, 21% of 'middle-class' and 39% of 'lower-class' female sex workers participating in one study injected drugs, and many of them had drug-injecting 'love mates' and clients (Tran et al., 2005a). Only 5% of the women said they used condoms during sex with 'love mates' (Tran et al., 2005b). The outcome of such compounded risk-taking can be dramatic. In Hai Phong (the country's largest port city), HIV infection levels among female sex workers were more than twice as high as those among their counterparts in Ho Chi Minh city in 2004 (30% compared with 12%). The differences appeared to be related to the larger percentage of Hai Phong sex workers who also injected drugs (29%)

compared with those in Ho Chi Minh City (12%) (Luu Thi Minh, Tran Nhu et al., 2006b).

The rapid evolution of Viet Nam's epidemic is especially evident in Lang Son province, along the border between Viet Nam and China. In the wake of a prevention project targeting injecting drug users, HIV incidence among injecting drug users fell by a third and HIV prevalence remained steady or declined, depending on the area. However, up to 12% of sex workers and 18% of the sexual partners of injecting drug users have been found to be infected with HIV, and in some places prevalence among pregnant women attending antenatal clinics has passed the 1% mark (Hammet et al., 2006).

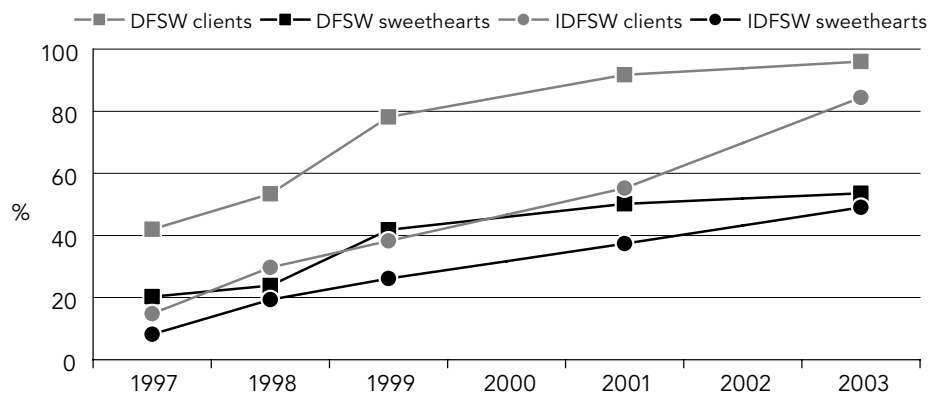
Strategies to reduce HIV in female sex workers should include efforts to reduce their stigmatization, encourage less sharing of drug paraphernalia, and promote voluntary counselling and testing, as well as more appealing marketing of condoms (Tran et al., 2005b). To succeed, a more enabling policy and institutional environment needs to

(National Institute of Hygiene and Epidemiology and ORC Macro, 2006).

Current trends therefore suggest that most of the impetus for Viet Nam's epidemic stems from a combination of unprotected commercial sex and unsafe drug injecting practices—making this an obvious area for focusing stronger prevention efforts. Behavioural trends, though, are liable to change with time—especially in countries undergoing profound social and economic transitions.

Cambodia's epidemic appears to be stabilizing, having diminished since the late 1990s. There is strong evidence that behaviour change efforts introduced by the state and nongovernmental organizations have been effective, particularly in the sex industry. In 2003, 96% of brothel-based (direct) sex workers in five cities (Phnom Penh, Battambang, Sihanoukville, Siem Reap, Kampong Cham) said they were using condoms consistently with clients, compared with 53% in 1997 (Gorbach et al., 2006). Male clients of sex workers also report high rates of consistent condom use

Condom use of direct and indirect female sex workers with commercial partners and with sweethearts, Cambodia, 1997–2003



DFSW – Direct female sex workers; IDFSW – Indirect female sex workers

Source: National Center for HIV/AIDS, Dermatology and STDs, 2004.

Figure 7

be cultivated. In particular, stronger harmony is needed between HIV policies, the legal context and policing approaches. Knowledge and awareness of HIV needs to be increased as well. Currently, fewer than half of young people demonstrate comprehensive knowledge of HIV

during paid sex—85% and higher, depending on the group (Sopheab et al., 2006). HIV prevalence levels among brothel-based sex workers fell from 43% in 1995 to 21% in 2003 (National Center for HIV/AIDS, Dermatology and STIs, 2004). Among non-brothel-based (indirect) sex workers,

condom use rates also rose—from 30% in 1997 to 84% in 2003 (Gorbach et al., 2006), while HIV prevalence declined from 20% in 1998 to 15% in 2002 (Lengh et al., 2004).

Sustaining such achievements will require continual efforts. Cambodia's sex industry is in flux, with more women selling sex outside of brothel settings (where safer sex initiatives tend to be most effective) (Gorbach et al., 2006) and staying in sex work for longer periods. This could lead to some older sex workers foregoing condom use more often as they seek to compete with younger counterparts in a tougher market.

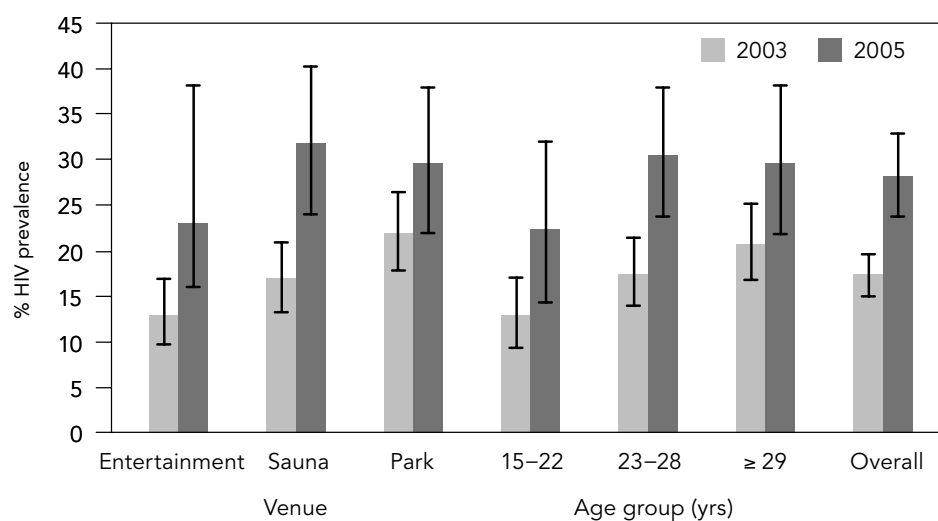
However, HIV prevalence among pregnant women attending antenatal clinics did not change much between 1997–2003 (it dipped slightly from 2.3% to 2.1%) (Phal et al., 2006). This suggests that significant numbers of women are still being infected—likely by husbands and boyfriends who probably acquired HIV during paid sex (National Center for HIV/AIDS, Dermatology and STIs, 2004; Gorbach et al., 2000). Women comprised almost half (47%) of people living with HIV in Cambodia in 2003, compared with just over one third (37%) in 1998. Indeed, a high proportion of married women

(41%) admit being concerned about being infected by their husbands (Sopheab et al., 2006).

Little data are available on HIV trends among men who have sex with men. A 2000 survey in Phnom Penh found 15% of men who have sex with men were infected with HIV, while a more recent survey in the capital found 8.9% were HIV-positive (Phalkun et al., 2006). In the provincial cities of Battambang and Siem Reap, HIV prevalence was very low, at 0.8%. However, condom use was rare: a mere 16% of the men said they used condoms consistently during anal sex (compared with 54% in the capital). Among men who sold sex, only 18% used condoms consistently during those encounters (Phalkun et al., 2006). Given such behavioural trends, there is a strong likelihood that HIV could spread rapidly among men who have sex with men in cities like Battambang and Siem Reap once the virus establishes itself in those networks.

In neighbouring **Thailand**, an estimated 580 000 [330 000–920 000] adults and children were living with HIV at the end of 2005 (UNAIDS, 2006). The number of new annual HIV infections continues to drop—the estimated 18 000 new infections in 2005 were 10% less than in

Prevalence of human immunodeficiency virus among men who have sex with men,* by recruitment venue and age group — Bangkok, Thailand, 2003 and 2005



*Refers to men who have sex with men but who were not enrolled at venues where male sex workers or transgendered persons congregate.

Source: van Griensven F., MMWR, 2006.

Figure 8

2004. However, a large percentage of new HIV infections are occurring in people considered to be at low risk of infection (Gouws et al., 2006). Approximately one third of new infections in 2005 were in married women who probably were infected by their spouses, according to the country's Ministry of Public Health. The government is now encouraging married couples to be tested regularly for HIV and to use condoms more often. Some social changes might also increase the risk of HIV infection: premarital sex is no longer a rarity among young Thais, yet only a minority (20%–30%) of sexually active young people uses condoms consistently (Punpanich et al., 2004).

Meanwhile men who have sex with men in Thailand remain at high risk of HIV infection. In Bangkok, HIV prevalence has risen steeply among men who have sex with men—from 17% in 2003 to 28% in 2005. Among those 22 years of age or younger, prevalence rose from 13% to 22% in the same period, which indicates high underlying HIV incidence. Infection levels were 15% in Chiang Mai and 5.5% in Phuket. Among male sex workers, prevalence ranged from 11% in Chiang Mai, 14% in Phuket and 19% in Bangkok—implying low rates of consistent condom use during paid sex. Troubling, too, is the lack of awareness among men who have sex with men about their HIV serostatus. Fully 80% of the men found to be infected with HIV had either never before been tested for the virus or had believed they were HIV-negative (Van Griensven et al., 2006). Overall, an estimated one fifth (21%) of new HIV infections in Thailand occur in men who have unsafe sex with men (Gouws et al., 2006). There is urgent need for programmes that reduce sexual risk behaviour and promote more frequent HIV counseling and testing in these networks.

A large proportion of new HIV infections in Thailand are in people considered to be at low risk of infection: about one third of new infections in 2005 were in married women who were probably infected by their spouses.

HIV rates among female sex workers are difficult to ascertain. Some research points to comparatively low HIV infection levels among women

selling sex. For example, national HIV sentinel surveillance showed 7.7% of brothel-based and 4.2% of non-brothel-based female sex workers were living with HIV in 2005 (Plipat and Teeraratkul, 2006). Other research has highlighted a recent trend of erratic condom use by female sex workers. Women selling sex in Bangkok, Chang Mai and Mae Hong Son reported using condoms in just over one half of commercial sex encounters. Similarly, fewer than one third of young men surveyed in the north of the country said they always used condoms with sex workers (Buckingham et al., 2005).

Injecting drug use continues to be a risk factor for infection in Thailand's multifaceted epidemic. An estimated 45% of injecting drug users attending treatment clinics have been found to be infected with HIV (Punpanich et al., 2004), and an estimated 3%–10% of injecting drug users in Thailand are estimated to be newly infected with HIV each year (Kawichai et al., 2006). This is due chiefly to the large proportion of injecting drug users who use contaminated injecting equipment (some 35%, according to one recent study) (Longfield et al., 2006).

Thailand needs to reinvigorate its safer sex campaigns, and ensure that its overall HIV prevention programme encompasses men who have sex with men and injecting drug users more assuredly. For a start, HIV surveillance in those population groups must be increased; the number of provinces reporting HIV infections in men seeking treatment for sexually transmitted infections and drug users receiving methadone treatment has reportedly declined by more than 50% in the past five years (Iamsirithaworn and Detels, 2006). In addition, there is a pressing need to expand outreach programmes that can provide comprehensive harm reduction services to injecting drug users (Kawichai et al., 2006), as well as scale-up and improve the accessibility of services for voluntary HIV counselling and testing throughout the country.

In neighbouring **Myanmar** there are early indications that the epidemic might be diminishing (Wiwat, Brown, Calleja-Garua, 2005). HIV infection levels have declined among pregnant women (1.3% in 2005, down from 2.2% in 2000) (National AIDS Programme Myanmar, 2005) and among men seeking treatment for other sexually transmitted infections (from 8% in 2001 to 4% in 2005) (National AIDS Programme Myanmar,

2005). Nevertheless, the country is experiencing a serious epidemic, with an estimated 360 000 [200 000–570 000] people living with HIV at the end of 2005, and national adult HIV prevalence of approximately 1.3%. HIV prevalence of 2.2% among young people (15–24 years of age) in 2005 is a cause for serious concern (National AIDS Programme Myanmar, 2005). So, too, are the high HIV infection levels found in most-at-risk groups, such as sex workers and injecting drug users. Some 43% of injecting drug users and nearly one in three (32%) sex workers countrywide were living with HIV in 2005—proportions that have changed little since 2000 (National AIDS Programme Myanmar, 2005). In a study in urban and rural communities in seven townships, only 16% of youth (15–24) reported being sexually active and of the men, only 3% of youth reported having sex with sex workers in the past year. The proportion of men who reported using condoms consistently with sex workers was 60% among young men and 50% among older men (Thwe et al., 2005). Meanwhile, nongovernmental organizations working with the informal support of the authorities have established pilot programmes to bring HIV prevention services to injecting drug users. More than 11 000 injecting drug users are believed to have benefited from such efforts in 2005 (National AIDS Programme Myanmar, 2005).

In **Pakistan**, high HIV infection levels among groups of injecting drug users could cross over into other populations, including male and female sex workers. In Larkana, 8% of injecting drug users were HIV-infected in 2005 (Abbasi, 2006), as were at least 6% in Faisalabad, Lahore, Sargodha and Sialkot, where a majority of injecting drug users were either married or sexually active (Nai Zindagi, 2006). In Karachi, 26% of injecting drug users participating in a 2005 study were found to be HIV-infected (Emmanuel, Archibald, Altaf, 2006). The majority of infected drug users had one risk factor in common: they used non-sterile injecting equipment. Even the most basic elements of effective harm reduction are lacking. Only one half of the injecting drug users taking part in a study in Karachi and Rawalpindi, for example, knew that HIV could be transmitted through using unclean needles—and as many of them said they had used non-sterile injecting equipment in the previous month (Abbas, 2006).

Rates of condom use are still low during commercial sex encounters. Fewer than one in five female sex workers—and one in 20 of their

male counterparts—in Karachi and Rawalpindi said they had consistently used condoms during the previous month (Abbas, 2006). In an earlier study in Karachi, one in four sex workers could not recognize a condom (Ministry of Health Pakistan, DfID, Family Health International, 2005). In addition, a 2005 study has confirmed that HIV transmission is occurring within the sexual networks of male and eunuch (*hijra*) sex workers in Karachi. The study found 7% of the male sex workers and 2% of the *hijras* were HIV-infected (Altaf et al., 2006). In another study in Karachi, 4% of male sex workers and 2% of *hijras* tested positive. Very high levels of other sexually transmitted infections indicate widespread sexual risk-taking. In the latter study, 23% of the male sex workers had syphilis and 36% had gonorrhoea, while among the *hijras*, 62% had syphilis and 29% gonorrhoea. Indeed, only 4% of male sex workers and less than 1% of the *hijras* said they used a condom the last time they had sex with a man. Also of note is the finding that one in four of the male sex workers said they also bought or sold sex to women (Ministry of Health Pakistan, DfID, Family Health International, 2005). Such high-risk behaviour must be addressed in order to limit the further spread of HIV in and beyond those sexual networks.

There is evidence that HIV is now present in neighbouring **Afghanistan**, where conditions favour the rapid spread of HIV. Afghanistan's emerging epidemic is likely to hinge on a combination of injecting drug use and unsafe paid sex. In Kabul, 4% of injecting drug users are HIV-infected, according to a new study. Almost one third (31%) of the injecting drug users participating in the study said they used contaminated injecting equipment. More than one half (54%) of them had been imprisoned and, among those, one third (32%) had injected drugs while behind bars. Large proportions of these drug users (all male) engaged in other high-risk behaviour as well: one third (32%) had sex with men or boys, and more than two thirds (69%) bought sex (Todd et al., 2006a). At the very least, basic HIV knowledge must be increased quickly. Only about half of the injecting drug users knew that using unclean syringes carries a high risk of HIV transmission or that condoms can prevent infection (Todd et al., 2006b).

The high HIV infection levels found among **Indonesia's** estimated 145 000–170 000 injecting drug users (Pisani, 2006) herald possible wider HIV

outbreaks in the country. Some 170 000 [100 000–290 000] adults were living with HIV in 2005 (UNAIDS, 2006). As recently as 1998, no HIV infections were being detected among injecting drug users seeking treatment in Jakarta, the capital (Pisani, 2006). But by early 2002, more than 40% of injecting drugs users surveyed at rehabilitation centres in Jakarta were testing HIV-positive, and subsequently even higher infection levels have been reported in Pontianak (Borneo) (Riono and Jazant, 2004; MAP, 2005a). More recent data show that 13% of injecting drug users in West Java are HIV-positive (Ministry of Health Indonesia, 2006).

In studies, most injecting drug users report high-risk practices, including using non-sterile injecting equipment and frequent unprotected sex, often with several partners (Pisani et al., 2003). Between 21% and 32% of injecting drug users in Denpasar, Medan, Bandung and Jakarta reported always using non-sterile needles. Condom use is rare: only 14%–27% of injecting drug users in Medan, Jakarta and Denpasar said they used one the last time they had sex (Statistics Indonesia and Ministry of Health Indonesia, 2006). Risk behaviours are common-place also in Indonesia's prisons, where HIV prevalence of 13% was found among inmates in West Java in 2005, 18% in Jakarta and 36% in Banten (Ministry of Health Indonesia, 2006).

HIV outbreaks are being found in some most-at-risk populations in Afghanistan and Pakistan, where widespread risk behaviours offer the HIV epidemic scope for future growth.

As in several other Asian HIV epidemics, injecting drug use and sex work networks overlap in Indonesia. Between one quarter (in Jakarta, Medan and Bandung) and almost one half (in Surabaya) of injecting drug users had unprotected paid sex in the previous year (Statistics Indonesia and Ministry of Health Indonesia, 2006). Unless counteracted by preventive practices, those linkages could expedite the wider and more rapid spread of HIV. Substantial proportions of sex workers are infected with HIV in parts of Indonesia: 6% in Yogyakarta and Riau, 7% in Jambi and 8% in West Java (Statistics Indonesia, 2006; Ministry of Health Indonesia, 2006).

Condom use in sex work might be improving in some places, though. About 60% of sex workers surveyed in 16 cities in 2005 said they had used a condom with their most recent client (Statistics Indonesia and Ministry of Health Indonesia, 2006). On the other hand, in Jakarta, three quarters of sex workers operating out of massage parlours and clubs, and 85% of those working out of brothels, said they had not used condoms with any of their clients in the previous week (MAP, 2005b).

In Papua, on the edge of this sprawling archipelago, HIV is now well-established in the general population. Almost 1% of adults in several villages have been found to be living with HIV (MAP, 2004). With injecting drug use not widespread in Papua, the chief contributing factor in this localized epidemic appears to be unprotected, paid sex in a culture in which as many as 10%–15% of young men (aged 15–24 years) buy sex. In the late 1990s, HIV prevalence in commercial sex workers was around 1%–2% in most urban areas. By 2004, however, prevalence had increased to 9% in Timika, 14% in Nabire, 15% in Merauke and 16% in Sorong (National AIDS Commission Indonesia, 2006).

An estimated 69 000 [33 000–220 000] people were living with HIV in 2005 in **Malaysia**, where the most common risk factor for HIV infection was exposure to contaminated drug injecting equipment (which accounted for three in four HIV infections in 2002, most of them in men, aged 20–40 years) (UNAIDS, 2006). HIV prevalence among pregnant women seeking antenatal care has remained very low (0.04% in 2002). Infection levels of 41% and 31% have been found among injecting drug users in the provinces of Keleantan and Terengganu, respectively (Ministry of Health Malaysia and WHO, 2004). More recently, one in five (19%) heroin users who enrolled for drug treatment in Muar tested HIV-positive (Chawarski et al., 2006).

Up-to-date HIV data from Malaysia are limited, but the available information indicates that a small but growing proportion of new HIV infections (17% in 2002, up from 7% seven years earlier) is attributable to unsafe sex, much of it between current or former injecting drug users, their sexual partners and sex workers (Ministry of Health Malaysia and WHO, 2004; Huang and Hussein, 2004). Similar to their counterparts in other south-east Asian countries, the

Malaysian authorities have tried to respond by cracking down on drug users: almost 39 000 were arrested in 2004 alone, most of them heroin users (National Drug Agency, 2005). It is not clear what, if any, effect this and/or increased concerns about HIV might be having on drug-use trends. It is worth noting, though, that the Muar study found that significant proportions of drug users had opted for smoking rather than injecting heroin or had stopped using non-sterile needles (Chawarski et al., 2006). Meanwhile, buprenorphine and methadone maintenance treatments are now more widely available in the private sector and is being evaluated for use in public health HIV clinics (Chawarski et al., 2006). Better coordination of HIV prevention (the purview of the Ministry of Health) and drug rehabilitation and treatment efforts (vested with the Internal Affairs Ministry) would improve the situation (Chawarski et al., 2006).

In the **Philippines**, where HIV is being transmitted primarily during unprotected sex (National Epidemiology Center, 2006), national adult HIV prevalence remains well under 0.1% (UNAIDS, 2006). About one third of HIV infections diagnosed since 1984 have been in returning overseas Filipino workers (mostly in seafarers and domestic workers) (National Epidemiology Center, 2006). Efforts to screen and treat sex workers for sexually transmitted infections, along with other prevention efforts initiated since the early 1990s have possibly helped contain the spread of the virus during paid sex (Mateo et al., 2003). Less than 1% of sex workers are infected with HIV, according to successive sentinel surveillance rounds since 2002 (Department of Health Philippines, 2005). HIV prevalence higher than 1% has not yet been detected among men who have sex with men, either (Department of Health, 2005). There is no guarantee this situation will continue. Condom use is not the norm during paid sex (when surveyed in 2002, just 6% of sex workers said they used condoms with all their clients in the previous week) (MAP, 2005b), and the use of non-sterile injecting equipment among injecting drug users is a common practice in some areas (such as Cebu City) (Wi et al., 2002; Mateo et al., 2003; Department of Health Philippines, 2003). In such light, the apparent complacency among young Filipinos about the epidemic (three in five 14–20-year-olds believe they cannot contract HIV) gives cause for concern.

Approximately 17 000 [10 000–29 000] adults and children were living with HIV in Japan in 2005. An increasing number of HIV infections are being found in men who have sex with men, who account for at least 60% of annual reported HIV infections (Shimada et al., 2006). Some 780 new HIV infections were reported in 2004, up from the 640 reported in the previous year and more than double the number reported in the mid-1990s (Nemoto, 2004).



EASTERN EUROPE AND CENTRAL ASIA

The number of people living with HIV in Eastern Europe and Central Asia rose in 2006, as it had in 2005. An estimated 270 000 people [170 000–820 000] were newly infected with HIV in 2006, bringing to 1.7 million [1.2 million–2.6 million] the number of people living with HIV—a twentyfold increase in less than a decade. Although the rate of new HIV infections appears stable after the steep increases observed in 2001, an increase in the number of new HIV cases was again reported in 2005, compared to the two previous years (EuroHIV, 2006a).⁵

Almost one third of newly diagnosed HIV infections in this region are in people aged 15–24 years. The majority of young persons with HIV live in two countries: the **Russian Federation** and **Ukraine** which, together, account for approximately 90% of all people living with HIV in this region (EuroHIV, 2006a).

As the epidemics evolve, more people are developing HIV-related illnesses and are dying. Progress in expanding access to antiretroviral therapy has been slow. As of mid-2006, fewer than 24 000 people were receiving antiretroviral treatment—13% of the estimated 190 000 people who need the drugs (WHO/UNAIDS, 2006). Individuals who use non-sterile injecting drug equipment remain especially poorly served by efforts to roll-out antiretroviral therapy. Although they represent more than two thirds of HIV cases in the region, they comprise only about one

quarter of people receiving antiretroviral therapy (WHO/UNAIDS, 2006). In the context of such inadequate treatment and care coverage, the AIDS death toll in Eastern Europe and Central Asia grew in 2006 to 84 000 [58 000–120 000].

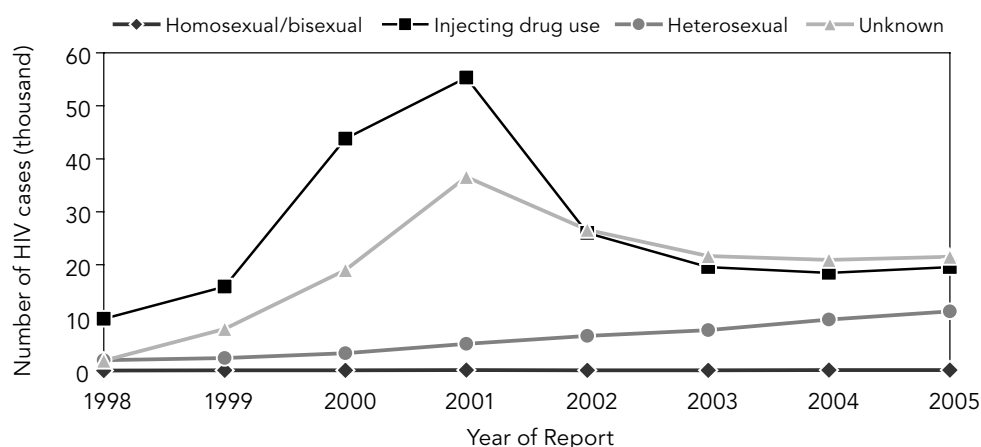
In Eastern Europe overall, using non-sterile injecting drug equipment remains the predominant mode of HIV transmission. In 2005, the use of non-sterile equipment accounted for almost two thirds (63%) of the reported HIV cases for which information on the mode of transmission was available. An increasing proportion of HIV infections (37% of reported cases in 2005), however, are estimated to be occurring during unprotected sexual intercourse (EuroHIV, 2006a). Consequently, women (many of them younger than 25 years of age) bear a growing part of the HIV burden; in 2005, they accounted for 41% of new reported HIV infections (EuroHIV, 2006a).

The Russian Federation and Ukraine account for about 90% of HIV infections in Eastern Europe and Central Asia, where the use of non-sterile injecting drug equipment remains the main mode of HIV transmission.

The HIV epidemic in the **Russian Federation** continues to grow. A little more than 35 500 new HIV cases were reported in 2005, and just

⁵ This analysis is based chiefly on reported HIV diagnoses. A significant limitation of using annual HIV diagnoses to monitor the HIV epidemic is that this yardstick does not represent the total incidence, as it may include infections that occurred several years earlier, and it only captures those people that have been tested. As a result, HIV trends based on reported HIV cases can be skewed by changes in the HIV testing intake or by changes in patterns of reporting. Whenever possible, this analysis alerts readers to instances where such changes have occurred.

Number of newly diagnosed cases of HIV infection by transmission group by year of report for fourteen eastern European countries*, 1998–2005



*Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan

Source: EuroHIV, 2006.

Figure 9

under 13 500 were registered in the first six months of 2006, bringing to nearly 350 000 the total number of infections documented since the epidemic began (AIDS Foundation East West, 2006). However, the official count reflects only those persons who have been in direct contact with Russia's HIV reporting system. The actual number of people estimated to be living with HIV is much higher: 940 000 (560 000–1.6 million) at the end of 2005 (UNAIDS, 2006). The majority of them are young: some 80% of people living with HIV in the Russian Federation are aged 15–30 years (Federal Service for Surveillance on Consumer Protection and Human Well-Being, 2006).

While officially reported HIV cases tend to be a poor guide to the actual *scale* of the epidemic, they can cast light on salient *trends*. The annual number of new reported HIV cases in the Russian Federation rose rapidly in the late 1990s, peaked at more than 87 000 in 2001, then declined steeply before stabilizing at 33 000–36 000 in 2003–2005 (EuroHIV, 2006a). A partial explanation for the decline in HIV diagnoses after 2001 is that fewer HIV tests have been carried out in some population groups at high risk of HIV infection, such as people who inject drugs and prisoners. In 2000–2004, 51% fewer HIV tests were done among injecting drug users

and 30% fewer were carried out among prisoners (Federal AIDS Center, 2005). In the case of injecting drug users, the decline in the number of HIV tests reflects the fact that some injecting drug user communities accessible to social and medical workers became saturated with HIV, leaving a shrinking number of users who had not yet been tested for HIV. (Once an injecting drug user tests HIV-positive, that individual is not tested again.) In addition, the overall number of drug users appears to have decreased; there were 17% fewer newly registered drug users in 2003 compared with 2002, for example (Ministry of Health and Social Development, 2004). Accordingly, the number of new HIV diagnoses among injecting drug users and prisoners—and, consequently, also the overall number of new reported HIV cases—decreased.

At the same time, routine HIV testing of injecting drug users who either had never been tested before or who had tested HIV-negative suggests that a significant decline in HIV incidence occurred among injecting drug users after 2001 (Pokrovskiy, 2006). That suggests that HIV infections in people who use non-sterile drug injecting equipment may have reached saturation levels around the turn of the century, at least in those parts of the country where HIV had spread quickly among large concentrations

of injecting drug users. As a result, the number of new HIV infections overall fell substantially. Consequently, Russia's epidemic is gradually changing. The number of new, reported HIV cases among people who use non-sterile drug injecting equipment has decreased almost fivefold in 2001–2005 (from more than 48 000 to just over 10 000) (EuroHIV, 2006a). In addition, the *proportion* of new HIV cases likely to have been linked to non-sterile injecting drug use equipment has also shrunk (from more than 90% in 2000 to 66% in 2005) (Federal Research and Methodological Center for AIDS Prevention and Control, 2005).

Russia's epidemic is hitting young people hardest: some 80% of persons with HIV are 15–30 years old.

Meanwhile, the proportion of new HIV infections due to unprotected sex has grown. More than 40% of new reported HIV infections in 2005 were among women, a larger proportion than ever before (Pokrovskiy, 2006). A minority of those women probably acquired the virus while using non-sterile drug injecting equipment. Most, however, are believed to have been infected during unprotected sex with a drug-injecting partner. Such diffusion of HIV is especially evident in those regions which had experienced the earliest outbreaks of HIV (such as the Kaliningrad oblast, Krasnodarskiy Krai and Nizhniy Novgorod oblast). However, the trend is also visible in areas with younger epidemics (including the cities of Moscow and St Petersburg, Novgorod, Orenburg, Rostov and Volgograd). Among pregnant women in St Petersburg, for example, HIV prevalence increased from 0.02% in 1999 to 1.25% in 2002 (Khaldeeva et al., 2002). Unless effective prevention efforts are expanded—especially among injecting drug users and their sexual partners, as well as among sex workers and their clients—the Russian Federation's AIDS epidemic will continue to grow.

The exponential rise in HIV infections in the 1990s was caused primarily by increases in HIV infections among large networks of injecting drug users, many of whom subsequently transmitted the virus to sexual partners. As a result, the epidemic growth rate appears to have slowed.

However, there is a possibility that HIV prevalence levels could increase again. Firstly, in many regions, HIV in drug injecting populations has not yet reached saturation levels and there remains a danger of increased HIV incidence in such areas. Secondly, as HIV spreads into the general population and larger numbers of people acquire the virus through unprotected sex, new infections could peak again in the future (Pokrovskiy, 2006). However, both outcomes can be avoided if effective programmes can reach and enable the most vulnerable sections of the population to protect themselves against HIV infection. The Russian Federation still has a window of opportunity for achieving that. Having risen steeply between 1999 and 2002, the rate of new HIV diagnoses in pregnant women stabilized subsequently, which suggests that the spread of HIV beyond injecting drug users is not yet as strong as previously feared (Pokrovskiy, 2006).

In the meantime, using non-sterile injecting equipment remains the predominant risk factor in Russia's epidemic. Social and economic factors (including high youth unemployment, a boom in drug trafficking, and the growth of informal economies) associated with the disintegration of the former Soviet Union have fuelled rampant injecting drug use in the Russian Federation (Rhodes et al., 2006). A study in St Petersburg, for example, has found that almost two thirds (62%) of drug users are un- or underemployed (Kozlov et al., 2006).

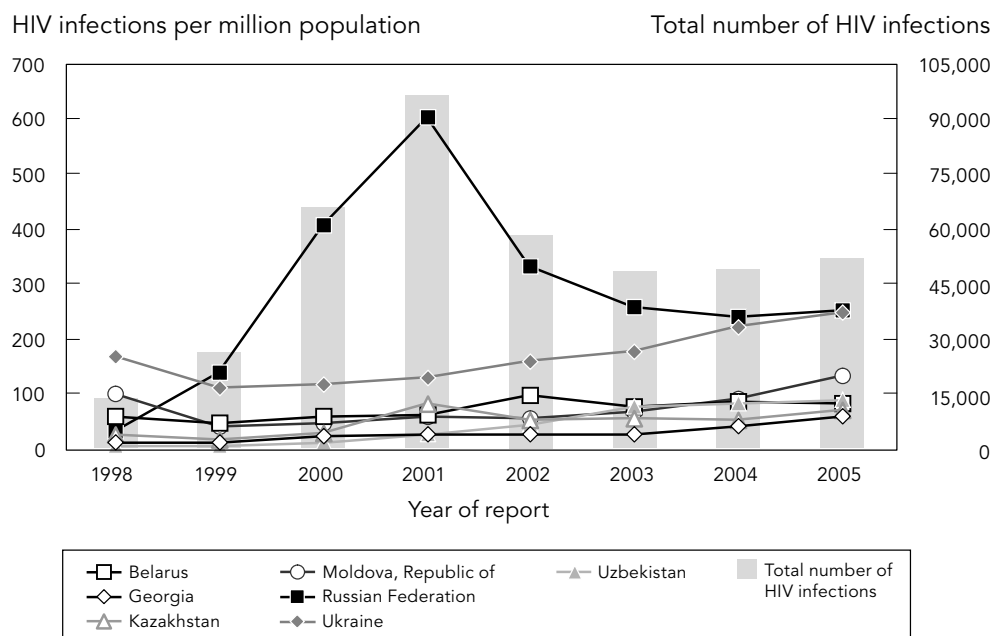
There is wide variation in HIV prevalence among injecting drug users in different regions and locales, possibly reflecting varying risk behaviour. In different studies, HIV prevalence has ranged from as low as 3% in Volgograd (Rhodes et al., 2006) and 3.5%–9% in Barnaul, to 12%–14% in Moscow (Rhodes et al., 2006); Koshkina et al., 2003), 30% in St Petersburg (Shaboltas et al., 2006), and more than 70% in Biysk (Pasteur Scientific and Research Institute of Epidemiology, 2005a). Up to two thirds of the injecting drug users testing HIV-positive in such studies were unaware that they had been infected (Rhodes et al., 2006). More recently, in St Petersburg, HIV *incidence* of 5% was found among injecting drug users, the majority of whom (79%) reported using non-sterile equipment (Kozlov et al., 2006). In some cities of Russia, more harm reduction projects are now in operation, but they are too few in number and too small in scale to significantly affect overall HIV trends.

Meanwhile, the fact that 8% of injecting drug users in Moscow and 20% in Volgograd have been found to have syphilis indicates that unprotected sex is common among many injecting drug users (Rhodes et al., 2006). In some cities, notably St Petersburg, there is a strong association between injecting drug use and sex work: one in three female injecting drug users there have reported selling sex for money or drugs (Kozlov et al., 2006). Meanwhile, the very high HIV prevalence found among sex workers in that city (48%) is largely due to the fact that the majority of sex workers also inject drugs and therefore potentially also use non-sterile equipment for injection (Smolskaya et al., 2005). High HIV infection levels of 14%–16% have also been found

sex workers in Moscow reported injecting drugs (Smolskaya et al., 2004) and HIV prevalence among them is low (3%) (AIDS Infoshare, 2005).

Given that injecting drug users and sex workers face high odds of detention or imprisonment, it is not surprising that the total number of HIV cases reported in Russia's prison system increased from 7500 in 1999 to 32 000 in 2005 (Ministry of Health and Social Development, 2006). A recent study among injecting drug users in Moscow found an increased risk of HIV infection among those who had been imprisoned (Rhodes et al., 2006). In some countries elsewhere in the world, the provision of sterile needles and syringes within prisons forms part of wider-ranging prevention programmes. Unfortunately, in this

Annual newly diagnosed HIV infections per million population by country and total number of HIV infections, Eastern Europe and Central Asia, 1998–2005



Source: EuroHIV, 2006.

Figure 10

in sex workers in Volgogradskaya Oblast, Altayskiy Kray (Pasteur Scientific and Research Institute of Epidemiology, 2005b) and in Ekaterinburg (Smolskaya et al., 2004). Unlike in St Petersburg where sex workers tend to operate independently, sex workers in Moscow tend to operate within highly organized structures where injecting drug use is actively discouraged. Fewer than 5% of

region such public health approaches to harm reduction still appear to be overshadowed by more traditional, law enforcement approaches for dealing with illegal drug use.

As in other countries in the region, the extent of HIV transmission among men who have sex with men has been poorly researched in Russia. In

one study, carried out in Tomsk and Ekaterinburg in 2003, 0% and 4.8% HIV prevalence, respectively, was found in men who have sex with men. However, 60% of the men said they had not used a condom the last time they had sex with another man (Smolskaya et al., 2004). In a recent internet-based survey, 12% of men who have sex with men said they had exchanged sex for money or gifts, but almost two thirds said they always used condoms, whether with regular or casual partners (Population Services International, 2006). Such prevalent unsafe behaviour, in a wider context of widespread injecting drug use and increased sexual transmission of HIV, could lead to a growing epidemic in this population group (EuroHIV, 2006b). Indeed, the HIV prevalence of 0.5% found during diagnostic testing of men who have sex with men in 2004 in the Russian Federation was higher than the 0.2% reported in 2000 (EuroHIV, 2006b).

Ukraine's HIV epidemic continues to grow. Annual HIV diagnoses have more than doubled since 2000, reaching 13 786 in 2005 and bringing to over 97 000 the total number of officially recorded HIV infections (Ministry of Health Ukraine, 2006a). Since that tally only includes infections among people who have been tested at government facilities, the actual number of people living with HIV in Ukraine is considerably higher—an estimated 377 000 [250 000–680 000] at the end of 2005. National adult HIV prevalence was estimated at 1.5% [0.8%–4.3%] in 2005 (Ministry of Health Ukraine et al., 2006b).

The epidemic in Ukraine is still concentrated primarily among most-at-risk populations. HIV prevalence has consistently exceeded 5% among injecting drug users, sex workers and men who have sex with men, but remains less than 1% among pregnant women in urban areas (Ministry of Health Ukraine et al., 2006b). Although increasing numbers of new, sexually transmitted HIV cases involve people who do not have a history of injecting drug use (Grund J-P et al., 2005), using non-sterile injecting drug equipment remains the major risk factor for HIV infection in this epidemic. More than 45% of new HIV infections reported in the first half of 2006 were in injecting drug users (Ministry of Health Ukraine et al., 2006a). While the proportion of injecting drug users among all new cases of HIV has decreased (by way of comparison, it

was approximately 60% in the first six months of 2001), there is no evidence that the epidemic among injecting drug users is declining. In the first half of 2006, the number of injecting drug users registered with HIV increased by 34% in comparison with 2003 (Ministry of Health Ukraine et al., 2006a).

HIV prevalence is very high among injecting drug users, and ranges from 10% in the city of Sumy to over 66% in the city of Mykolayiv (Ministry of Health Ukraine, 2006b). In the capital, Kiev, almost 49% of injecting drug users have been found to be HIV-infected (Ministry of Health Ukraine, 2006b). According to one estimate, more than half (55–60%) of all new HIV infections attributed to sexual transmission in the heavily affected regions of Donetsk and Odessa have been due to unprotected sex with an infected drug-injecting partner (Scherbinska et al., 2006).

Evidence is emerging of previously hidden epidemics in Russia and Ukraine among men who have sex with men.

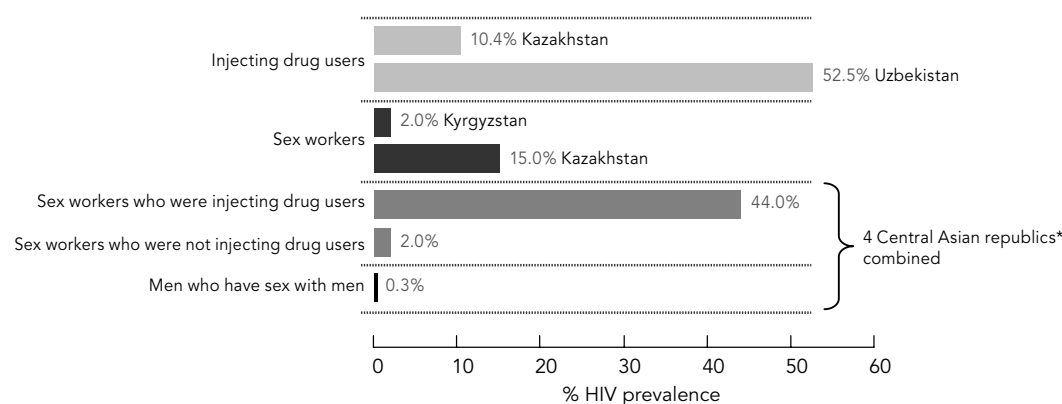
Sex work is an important contributing factor in Ukraine's HIV epidemic. In annual HIV sentinel surveillance conducted in 2005, 8% of female sex workers were found to be HIV-infected in Kiev. In several other cities, HIV prevalence was considerably higher, with at least one in four (25%–29%) female sex workers in the cities of Poltava, Odessa, Lutsk and Donetsk, and almost one in three (32%) in the city of Mykolayiv found to be HIV-infected (Ministry of Health Ukraine et al., 2006a).

Ukraine presents a vivid example of how swiftly an HIV epidemic can move beyond most-at-risk populations and into the general population. The proportion of persons infected through heterosexual transmission of HIV has increased from 14% of new cases during 1999–2003 to over 35% of new cases in the first six months of 2006 (Ministry of Health Ukraine et al., 2006a). Among the 8058 newly reported cases of HIV in the first half of 2006, 41% were women, most of them in their peak reproductive years (Ukrainian AIDS Centre, 2006). HIV prevalence among pregnant women in Ukraine is now among the highest in all of Europe: 0.31% in mid-2006,

having risen from 0.002% in 1995 (Ministry of Health Ukraine et al., 2006a). As of mid-2006, HIV prevalence among pregnant women in five heavily affected regions of Ukraine (Chernigiv, Donetsk, Odessa, Dnipropetrovsk, and Mykolayiv) exceeded 0.8% (Ukrainian AIDS Centre, 2006). The number of children born to HIV-positive mothers also continues to rise, and reached a record 1320 in the first six months of 2006 (Ministry of Health Ukraine et al., 2006a). Nevertheless, Ukraine has made significant progress in reducing the rate of mother-to-child

Two further facets of the country's epidemic also require attention. As in most countries with serious injecting drug use-related HIV epidemics, HIV is prevalent in places of incarceration. In Ukraine's penitentiary system, a little more than 4300 prisoners were registered as HIV-infected in mid-2006 (State Department for the Execution of Punishment, 2006), and 1530 prisoners who were newly reported as HIV-infected in the first six months of 2006 (Ukrainian AIDS Centre, 2006). It is estimated that the HIV prevalence among incarcerated persons has risen from 9%

HIV prevalence among injecting drug users, sex workers and men who have sex with men in Central Asia, selected studies, 2005



* Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan

Source: [XVI International AIDS Conference abstract] – CDC Central Asia offices (Almaty & Tashkent), National and City HIV/AIDS centers.

Figure 11

transmission. By the end of 2005, more than 90% of HIV-infected pregnant women were receiving antiretroviral prophylaxis to reduce the transmission of the virus to their newborns. This has led to a threefold reduction (from 28% to 8%) in the mother-to-child transmission rate since 2001 (Ministry of Health Ukraine, 2006a; Ministry of Health Ukraine, 2006b). However, HIV diagnosis and prevention of mother-to-child transmission among women who do not access antenatal screening, as well as the timely and accurate diagnosis of HIV among newborns, remain important challenges.

in 2003 to 14% in mid-2006 (Ukrainian AIDS Centre, 2006).

Studies of the role of sex between men in Ukraine's HIV epidemic are rare. Ukraine rescinded the criminalization of homosexual intercourse in 1991, but men who have sex with men remain stigmatized in Ukrainian society. Limited HIV sentinel surveillance in this population group has revealed HIV prevalence of 28% and 9%, respectively, in the cities of Odessa and Mykolayiv (Ministry of Health Ukraine, 2006a). Efforts to strengthen HIV knowledge and preventive behaviour in prisoners and men

who have sex with men must be improved and expanded.

Although much smaller in scale, some of the epidemics elsewhere in the region are also growing. Since 2001, the rates of newly reported HIV infections have more than doubled in **Georgia** (from 20 per million to 54 in 2005) and the **Republic of Moldova** (from 55 to 127), and almost quadrupled in **Uzbekistan** (from 22 to 83) (EuroHIV, 2006a).

The biggest epidemic in Central Asia is in **Uzbekistan**, which straddles major drug-trafficking routes (Godinho et al., 2005) and where the number of reported HIV cases in Uzbekistan has more than doubled since 2001, reaching 2198 in 2005 (EuroHIV, 2006a). An estimated 31 000 [15 000–99 000] people were living there with HIV in 2005 (UNAIDS, 2006). Concentrated largely in and around the capital, Tashkent, the epidemic is being driven by increasing numbers of HIV infections among injecting drug users—which rose from 447 in 2001 to 1140 in 2005 (EuroHIV, 2006a; Todd et al., 2005; WHO, 2005). Fully 30% of injecting drug users, most of them unemployed, have tested HIV-positive in a study in Tashkent. Low rates of condom use reported by the injecting drug users highlight the danger of sexual transmission of HIV to their partners (Sanchez et al., 2006), and the likelihood that this epidemic will continue to expand.

More concerted efforts are needed to curb the spread of HIV among and beyond **Kazakhstan's** large injecting drug user population (believed to exceed 100 000 people) (Ministry of Health Kazakhstan et al., 2004). Seventeen percent of 200 injecting drug users participating in a study in Temirtau were found to be HIV positive (Ministry of Health Kazakhstan et al., 2005), and injecting drug users accounted for more than two thirds (68%) of the 964 new HIV cases reported in Kazakhstan in 2005 (one third more than the 699 reported in 2004) (EuroHIV, 2006a). It is estimated that over 1200 persons living with HIV are in penitentiaries (WHO, 2005).

Much smaller epidemics are under way in **Kyrgyzstan** and **Tajikistan**. There, too, most new HIV cases involve injecting drug users. In **Tajikistan**, the number of officially reported HIV diagnoses among injecting drug users has grown fourfold since 2001 (from 31 to 142 in

2005) (EuroHIV, 2006a). Almost 16% of injecting drug users are infected with HIV, as are more than 6% of prisoners, according to recent sentinel surveillance in two cities (Ministry of Health Tajikistan, 2006). Unlike **Tajikistan**, the epidemic in **Kyrgyzstan** currently appears to be relative stable, with 130–170 new HIV cases having been reported annually since 2001 (EuroHIV, 2006a). Very few HIV cases have been reported in Turkmenistan, and little is known about the patterns or trends of HIV transmission there (EuroHIV, 2006a).

In **Belarus**, new reported HIV cases have stayed relatively constant (at 710–780 annually) in recent years (EuroHIV, 2006a). Most newly reported HIV infections were acquired during unprotected sex, often from persons who had been infected as a result of using non-sterile drug injecting equipment (WHO, 2005). HIV infection levels as high as 34% (in Zhlobine) and 30% (in the capital, Minsk) have been found in injecting drug users (WHO, 2005). The majority of HIV cases are concentrated in Minsk, and in the Homyl region (in the south).

In Uzbekistan, which straddles major drug-trafficking routes, the number of reported HIV cases has more than doubled, and in Tajikistan they have risen fourfold, since 2001.

More than twice as many new HIV cases were reported in the **Republic of Moldova** in 2005, compared to 2002 (533, up from 209). About half of the new infections are attributable to unprotected sexual activities (EuroHIV, 2006a). In **Georgia**, a rising trend in new HIV cases has also been observed: the 242 infections recorded in 2005 were more than double the number reported in 2002 (EuroHIV, 2006a). Among HIV cases for whom the mode of transmission is known, most are attributable to non-sterile drug injecting equipment (WHO, 2005). The same trends have been observed in **Armenia**, where a majority of injecting drug users with HIV are believed to have been infected in the Russian Federation or Ukraine. About half of the HIV cases registered by 2005 were in the capital, Yerevan (WHO, 2005).



CARIBBEAN

Nearly three quarters of the 250 000 [190 000–320 000] people living with HIV in the Caribbean are in the two countries of the island of Hispaniola: **Dominican Republic** and **Haiti**. But national adult HIV prevalence is high throughout the region: 1%–2% in **Barbados**, **Dominican Republic** and **Jamaica**, and 2%–4% in the **Bahamas**, **Haiti** and **Trinidad and Tobago**. **Cuba**, with prevalence below 0.1%, is the exception. Overall, an estimated 27 000 [20 000–41 000] people became infected with HIV in 2006 in the Caribbean. Although HIV infection levels have remained stable in the Dominican Republic and have declined in urban parts of Haiti, more localized trends suggest that both countries need to guard against possibly resurgent epidemics.

Several countries are making inroads against their epidemics, with the benefits of wider access to antiretroviral treatment; this is especially evident in the **Bahamas**, **Barbados**, **Cuba** and **Jamaica** (WHO/UNAIDS, 2006). Nevertheless, AIDS claimed 19 000 [14 000–25 000] lives in the Caribbean in 2006, making it one of the leading causes of death among adults (15–44 years).

The Caribbean's largely heterosexual epidemics occur in the context of harsh gender inequalities and are being fuelled by a thriving sex industry, which services both local and foreign clients. Sex between men, a hidden phenomenon in the generally homophobic social environments found in this region, is a smaller but important factor, and unsafe sex between men is believed to account for about one tenth of reported HIV cases in the region (Caribbean Commission on Health and Development, 2005; Inciardi, Syvertsen, Surratt, 2005).

The latest HIV data for **Haiti** estimate national adult HIV prevalence of 2.2%, with prevalence highest in the Nippes (3.8%), South (2.9%) and North (2.6%) departments (Institut Haitien de l'Enfance and ORC Macro, 2006). In Haiti's capital, Port-au-Prince, and other urban areas, HIV prevalence in pregnant women decreased by two thirds during 1993–2004, from 9.4% to 3.3%. But the trend is not evident in rural areas or among young pregnant women (24 years and younger).

Several countries are making progress in controlling their epidemics, with the benefits of wider access to antiretroviral treatment especially evident in the Bahamas, Barbados, Cuba and Jamaica.

The declining trends are most likely related to some positive behaviour changes that have become evident. For example, almost all (98%) the female sex workers surveyed in Port-au-Prince reported using condoms the last time they sold sex. In the general population, more people were either using condoms with casual partners or opting for abstinence and fidelity at the turn of the century, compared to the mid-1990s. However, HIV incidence had already begun declining around 1990, before the behaviour changes were observed. It is likely, therefore, that increased mortality and improvements in blood safety also contributed to the decline in HIV prevalence. For example, HIV prevalence among blood donors in Port-au-Prince peaked at 6%–7% in the late 1980s but then declined

considerably during the next decade, falling to 1.8% in 2004. In addition, circular migration—people moving to urban areas and then returning to rural areas to seek home-based care once they fall seriously ill—may also have contributed to the downward trends seen in urban areas such as Port-au-Prince (Gaillard et al., 2006).

There are signs that **Haiti's** epidemic could take a turn for the worse. As noted, there is no evidence of declining HIV prevalence among pregnant women in rural areas. Indeed, condom use remains infrequent in rural areas: only 16% of women and 31% of men living in rural areas said they used a condom the last time they had casual sex (Institut Haitien de l'Enfance and ORC Macro, 2006). Especially vulnerable are impoverished women in rural areas, where economic dependence on men has been found to be one of the main risk factors for HIV infection (Louis et al., 2006). In addition, more young Haitians are becoming sexually active, they are doing so at younger ages and a minority of them use condoms during casual sex (Gaillard et al., 2006). Just over one in four (about 28%) sexually active young women (15–24 years) used a condom the last time they had sex with a casual partner, as did four in ten (about 42%) of their male counterparts (Institut Haitien de l'Enfance and ORC Macro, 2006). In Cerca-la-Source, in central Haiti, one in five out-of-school, sexually active youths (aged 14–25 years) did not know what condoms were, while one in two knew of condoms but did not use them regularly (Westerbs et al., 2006). HIV programmes appear not to be reaching young people everywhere. New data show that 4.2% of young women in the West, Nippes and North departments of Haiti were HIV-infected in 2005 (double the 2% prevalence among young men) (Ministry of Public Health and Population Haiti, 2006).

At the same time, despite being one of the poorest countries in the world, Haiti is making steady, if slow, progress in providing antiretroviral therapy to people in need, mainly because of the pioneering work of nongovernmental organizations (Cohen, 2006a). Coverage is still comparatively low—approximately 12% of people in need of treatment were receiving it in 2005 (WHO/UNAIDS, 2006). However, the effects are demonstrably positive. Among AIDS patients receiving antiretroviral therapy in Port-au-Prince, 87% of adults and 98% of children were alive after one year. Without treatment, 70% of them

would have died within 12 months (Severe et al., 2005).

In the **Dominican Republic**, HIV prevalence in pregnant women has remained relatively stable overall, with national adult prevalence estimated at 1.1% [0.9%–1.3%] in 2005 (UNAIDS, 2006; Secretaria de Estado de Salud Pública y Asistencia Social de Republica Dominicana, 2005a). The country's epidemic hinges to a considerable extent on HIV transmission between sex workers and their clients, with HIV prevalence in the country's estimated 100 000 female sex workers ranging from 2.5% to over 12%, depending on the locale (Cohen, 2006b). Sex tourism features increasingly in the Dominican Republic (as it does in other countries of this region), but local men still form the mainstay of the country's sex trade (Cohen, 2006b). Starting in the mid-1990s, a decline in HIV prevalence has been noted at antenatal clinics in the capital, Santo Domingo—a trend that probably reflects efforts to promote safer commercial sex in the city (Secretaria de Estado de Salud Pública y Asistencia Social de Republica Dominicana, 2005b). For example, condom use increased from 75% to 94% in 12 months among sex workers who participated in a community solidarity prevention project in the capital (Kerrigan et al., 2006).

Sex between men, a hidden behavior in the Caribbean, could account for about one tenth of reported HIV cases in this region.

The highest infection levels are found in the *bateyes* (shantytowns housing sugar cane plantation workers, mostly from Haiti) (Secretaria de Estado de Salud Pública y Asistencia Social de Republica Dominicana, 2005a). Prevalence as high as 12% has been found among 40–44 year-old male residents in some *bateyes* (Cohen, 2006b). It is estimated that about one quarter of *bateyes* are serviced by government health-care clinics, but the marginalization of these communities, along with language barriers and a wariness of officialdom, means the services often are not accessed (Cohen, 2006b).

The balanced approach adopted in **Barbados**—emphasizing both HIV prevention and treatment—is showing encouraging results. HIV infection levels in young pregnant women

declined in the early 2000s (from 1.1% in 2000 to 0.6% in 2003) (Kumar and Singh, 2004). At the same time, the introduction of antiretroviral treatment in 2001 has led to a steep decline in AIDS death rates since the late 1990s—from 34.2 per 100 000 persons (older than 16 years) in 1997–1999 to 17.2 per 100 000 persons during 2003–2005. However, AIDS is still a significant cause of premature deaths among adults, mainly because many people still opt for treatment only after they have become severely ill (Kilaru et al., 2006). A study to assess uptake of health-care services among women diagnosed with HIV infection between 1994 and 2004 found that more than one third (37%) never attended an HIV clinic for treatment and care after learning their HIV status. As a result, mortality rates among these women were high (Kumar et al., 2006).

HIV prevalence among young pregnant women has also declined in the **Bahamas**—from 3.6% in 1996 to 3% in 2002—and infection levels have also fallen among persons seeking treatment for other sexually transmitted infections. The Bahamas has been successful in reducing mother-to-child transmission of HIV and in reducing the annual number of deaths attributable to AIDS through the provision of antiretroviral therapy (Caribbean Commission on Health and Development, 2005; Department of Public Health The Bahamas, 2004).

The balanced approach adopted in Barbados—emphasizing both HIV prevention and treatment—is showing encouraging results.

Guyana's antiretroviral therapy programme, which reached more than half the persons in need by mid-2006 (WHO/UNAIDS, 2006) may yet reverse the rising trend in AIDS deaths seen there in recent years. In 2005, AIDS still ranked among the leading causes of death among 25–34-year-olds in this, the second-poorest country in the Caribbean (Guyana Presidential Commission on HIV/AIDS, 2006). HIV appears to have spread into the general population from most-at-risk populations, with national adult HIV prevalence estimated at 2.4% [1.0%–4.9%]

in 2005. But HIV transmission during paid sex remains the most important risk factor for infection. Exceptionally high HIV infection levels are still being found among female sex workers: 31% in Georgetown, for example (Allen et al., 2006). Prevalence of 17% among people attending sexually transmitted infection clinics was recorded in 2005, providing further evidence that unsafe sex remains commonplace. A study to determine the role of sex between men in Guyana's epidemic has found that 21% of men who have sex with men in its Demerara-Mahaica region (in the northeast) were infected with HIV (Guyana Presidential Commission on HIV/AIDS, 2006). Little new HIV data are available for **Suriname**, where the adult national HIV prevalence was estimated to be 1.9% [1.1%–3.1%] in 2005 (UNAIDS, 2006).

National HIV adult prevalence in **Jamaica** appears to have stabilized, and was estimated at 1.5% [0.8%–2.4%] in 2005 (UNAIDS, 2006). However, about 2% of pregnant women in the St. James and Westmoreland parishes of Jamaica tested HIV-positive in 2005, and HIV infection levels are high among persons attending sexually transmitted infection clinics, exceeding 5% in the parishes of Kingston and St. Andrew, and St. James (Ministry of Health Jamaica, 2006). Sex work features prominently in Jamaica's mainly heterosexual HIV epidemic. Almost 9% of female sex workers tested HIV-positive in one recent study, which found that the older, lower-income women who used crack cocaine and operated from the street were most at risk of infection (Gebre et al., 2006). Crack cocaine use is a major risk factor for HIV infection in women in **Trinidad and Tobago**. One in five crack users were found to be HIV-infected in a study at a rehabilitation centre for female substance users (Reid, 2006).

By far the smallest epidemic in the region is in **Cuba**, where both national adult HIV prevalence and prevalence among persons seeking treatment for sexually transmitted infections was below 0.1% [<0.2%] in 2005 (UNAIDS, 2006; Ministerio de Salud de Cuba, 2006). Overall, about 80% of HIV diagnoses have been among men, with unsafe sex between men the main risk factor for HIV transmission (Ministerio de Salud de Cuba, 2006). Despite intensive efforts to control the epidemic, the number of people diagnosed with HIV has increased since 1996.

After the introduction of locally produced antiretroviral drugs in 2001, annual AIDS mortality rates fell by 72% and opportunistic infections declined by 76%, while average survival time after the diagnosis of AIDS rose from a little more than one year to five years (Perez et al., 2006).

In contrast to the rest of the region, injecting drug use is the most important risk factor for HIV transmission in **Bermuda** and **Puerto Rico**'s relatively small epidemics. Very high HIV infection levels are being found among injecting drug users in Puerto Rico. HIV incidence was 3.4% among drug users in Bayamon, 20%–25% of whom were infected with HIV (Deren et al., 2004). Injecting drug use in places of incarceration appears to be commonplace: 53% of injecting drug users who had been incarcerated said they had injected in prison (Kang et al., 2005). There is a pressing need for effective harm reduction programmes in Puerto Rico, including places of incarceration.



LATIN AMERICA

Although the patterns of the HIV epidemics are changing in some Latin American countries, the epidemics in this region overall remain stable, with new HIV infections totalling about 140 000 [100 000–410 000] and 65 000 [51 000–84 000] people dying of AIDS in 2006. Two thirds of the estimated 1.7 million [1.3 million–2.5 million] people living with HIV in Latin America reside in the four largest countries: **Argentina**, **Brazil**, **Colombia**, and **Mexico**. However, estimated HIV prevalence is highest in the smaller countries of Central America where it was just under 1% in **El Salvador**, **Guatemala** and **Panama**, 1.5% in **Honduras** and 2.5% in **Belize** in 2005 (UNAIDS, 2006).

Outbreaks of HIV are occurring among injecting drug users and men who have sex with men in South America.

HIV transmission is occurring in the context of factors common to most of Latin America: widespread poverty and migration, insufficient information about epidemic trends outside major urban areas and rampant homophobia. In particular, the role of unprotected sex between men in many of Latin America's epidemics tends to be publicly denied and ignored in HIV strategies—especially in Central America and in the Andean region of South America (Cohen, 2006a). Unprotected sex between men accounts for as much as 25%–35% of reported AIDS cases in countries such as **Argentina**, **Bolivia**, **Brazil**, **Guatemala** and **Peru** (Montano et al., 2005). In

addition, HIV-infected people face stigma and discrimination, even from health-care workers (Cohen, 2006a). Meanwhile, HIV infection levels among female sex workers are widely varied. HIV prevalence is very low in some South American countries, such as **Chile** and **Venezuela** (Bautista et al., 2006), but prevalence rates of between 2.8% and 6.3% have been found in cities in **Argentina** (Montano et al., 2005; Bautista et al., 2006; Pando et al., 2006), and 6% prevalence has been reported among sex workers in parts of **Brazil** (Okie, 2006; Trevisol and da Silva, 2005).

The most populous country in Latin America, **Brazil**, is home to 620 000 [370 000–1 million] people living with HIV, one third of all persons living with the virus in Latin America (UNAIDS, 2006). The country's emphasis on prevention and treatment has helped to keep its HIV epidemic stable for the past several years (Okie, 2006). Amid the concerted promotion of sex education and AIDS prevention in schools, condom use, harm reduction and HIV testing, adult national HIV prevalence has remained steady at roughly 0.5% since 2000. While the percentage of young people who are sexually active changed little between 1998 and 2005, condom use rates increased dramatically—by more than one third among 15–24-year-old men and women (Berquo, 2005). Among Brazilians of all ages, condom use increased by almost 50% during the same period (Berquo, 2005).

HIV infections acquired during injecting drug use have declined in several cities, particularly those with older epidemics, alongside a general

shift away from the use of non-sterile injecting equipment. One large survey in 2004 found that more than three quarters of injecting drug users did not use non-sterile drug equipment or syringes (Okie, 2006). The decline in HIV infections among injecting drug users appears to be associated with the introduction of harm reduction programmes, changing drug use habits (especially an increase in the inhaling or smoking of 'crack' cocaine), and mortality among drug users (Fonseca et al., 2006).

Notwithstanding such achievements, HIV infection levels among injecting drug users are still high. In the south of the country, the epidemics among injecting drug users appear not to be abating (Hacker et al., 2006). Meanwhile, a cross-sectional study in the states of Bahia, Rio Grande do Sul and Sao Paulo, has found that 37% of injecting drug users were infected with HIV, and those infection levels were significantly associated with incarceration and having unprotected sex with other men (Caiiffa et al., 2006). In the latter study, more than one quarter (26%) of the injecting drug users reported having unprotected sex with other men, apparently as a means of financing their drug use. Such findings reinforce the need to address both sexual and drug-related risk practices in drug users (Ferreira et al., 2006). In addition, a strong association between crack use and HIV infection is apparent in several cities, including Porto Alegre (where 27% of crack users were found to be infected) (Pechansky et al., 2006).

Unprotected sex between men remains a significant factor in HIV transmission and accounts for nearly half of the sexually transmitted HIV infections in Brazil. As HIV spreads from the most-at-risk populations to other lower-risk populations, women are increasingly being infected. In a study among pregnant women in 27 municipalities in southern Brazil in 2003, 0.5% HIV prevalence was reported (Cardoso et al., 2005) and women have been accounting for an increasing number of AIDS cases in recent years. Poorer sections of the population appear to be most vulnerable, with increasing HIV infection rates being found among poorly educated people in the lower socioeconomic strata (Cardoso et al., 2005; Fonseca et al., 2003).

It is estimated that one third of adults in Brazil have been tested for HIV (the majority of them women aged 25–39 years) (Paiva, Pupo, Barboza,

2006), and that about one in three HIV-infected Brazilians is aware of his or her HIV status (Okie, 2006). Antiretroviral provision is among the most comprehensive in the world, and is yielding positive results. Nationally, mother-to-child transmission of HIV declined substantially, from 16% in 1997 to less than 4% in 2002 (Dourado et al., 2006). AIDS mortality rates decreased by 50% between 1996 and 2002, while AIDS-related hospitalizations fell by 80% during the same period (Okie, 2006).

In **Argentina**, national adult HIV prevalence was an estimated 0.6% [0.3%–1.9%] in 2005. Most of the estimated 130 000 [80 000–220 000] people living with HIV are in the provinces of Buenos Aires, Cordoba and Santa Fe. In various studies up to 44% of injecting drug users (Vignoles et al., 2006), 7%–15% of men who have sex with men (Montano et al., 2005), and 6% of female sex workers (Montano, et al., 2005; Bautista et al., 2006) have been found to be HIV-infected. As much as one quarter (28%) of inmates in some city prisons have tested HIV-positive (Ministerio de Salud de Argentina, 2004).

Brazil's dual emphasis on prevention and treatment has helped to keep its HIV epidemic under control.

Due to a combination of factors (including the maturation of the epidemic and the effects of the 2001 economic crisis), unprotected sex has in recent years been the main mode of HIV transmission (Cohen, 2006b). It is estimated that unprotected sexual intercourse (mainly heterosexual) accounted for about four in five new HIV diagnoses in 2005. Men still outnumber women among the total reported HIV cases, but the male-to-female ratio for new HIV diagnoses has narrowed to 1.3:1 (from 15:1 in 1988) (National AIDS Programme, 2005; Ministerio de Salud Argentina, 2004).

Injecting drug use appears to have declined overall, especially after 2001 when many injecting drug users switched to smoking cheaper, low-grade cocaine paste. In Buenos Aires, for example, injecting drug users accounted for only 5% of new infections between 2003 and 2005 (Cohen, 2006b). But there are indications that injecting drug users have also been driven deeper under-

ground by the stigma that associates injecting drug use with AIDS and death. Many of the drug users who still inject drugs tend to do so on their own and the earlier injecting networks appear to have disintegrated. In addition, while AIDS mortality rates overall started to decline in Argentina after 1996, the same trend has not been observed among injecting drug users, who have experienced large numbers of deaths in recent years. This suggests that injecting drug users have not benefited sufficiently from the country's antiretroviral treatment programme (Rossi et al., 2006).

Approximately 9600 [4600–30 000] persons were living with HIV at the end of 2005 (UNAIDS, 2006) in **Uruguay**, where unprotected sex (mostly heterosexual) is the main route of HIV transmission (National AIDS Programme Uruguay, 2006). Nevertheless, infection levels are high among certain groups in the capital, Montevideo, where the epidemic is concentrated: 22% among men who have sex with men (Montano et al., 2005), 19% among injecting drug users and 10% among non-injecting drug users (Vignoles et al., 2006). Female sex workers appear to have lower prevalence levels and various studies show that between 0.3% and 1.3% have acquired HIV (Montano et al., 2005; Bautista et al., 2006). At least half of the people needing antiretroviral treatment were receiving it by mid-2006 (WHO/UNAIDS, 2006).

Paraguay's epidemic is of a similar scale, with about 13 000 [6200–41 000] people living with HIV at the end of 2005 (UNAIDS, 2006). Men comprise the majority of HIV cases (74%), with exposure to non-sterile drug injecting equipment and unprotected sex between men being the main modes of HIV transmission (National AIDS Programme Paraguay, 2006).

Unprotected sex, especially between men, is the main risk factor for HIV infection in the smaller epidemic in **Chile**, where about 28 000 [17 000–56 000] people were living with HIV at the end of 2005 (UNAIDS, 2006). Increasing numbers of women are acquiring HIV, many from male partners who acquired the virus during unprotected sex with other men.

In **Peru**, HIV appears to be mainly affecting men who have sex with men. HIV prevalence in that population group is high—10% in Iquitos and its surrounding area (Cohen, 2006c), and an average of 14% in six other cities (Lama et al., 2006), including the capital, Lima, where up to

23% of men who have sex with men have tested HIV-positive (Montano et al., 2005; Ministerio de Salud de Peru, 2005). Sexual risk behaviours in this group are common. In some coastal cities, more than two thirds of men report recent unprotected sex (Konda et al., 2006). When surveyed, almost half (47%) of the men who have sex with men said they also had sex with women—yet HIV prevalence among women has remained very low, at approximately 0.2% (Cohen, 2006d).

The epidemics in Central America are complex and growing, with prevalence in some countries the highest in Latin America; paid sex and sex between men are the main risk factors for HIV infection.

Sex between men is also the main risk factor for HIV infection in the epidemics in the other Andean countries, including **Bolivia** (HIV prevalence of 24% has been found in Santa Cruz among men who have sex with men), **Ecuador** (HIV prevalence of 28% in Guayaquil and 15% in Quito) and **Colombia** (HIV prevalence of 20% in Bogotá) (Montano et al., 2005). In none of these three countries does HIV prevalence exceed 4% among female sex workers, and it is well under 1% in several cities (Montano et al., 2005; Khalsa et al., 2003; Mejía et al., 2002). However, in a 2005 study among 120 sex workers in Barranquilla, Colombia, HIV prevalence of 3.3% was found—the highest HIV prevalence found to date in the country. A 2002 study in Bogotá, had found 0.7% prevalence among sex workers. HIV prevalence among injecting drug users was 1% in a 2003 study in Bogotá. Overall in Colombia, HIV prevalence in sentinel surveillance among pregnant women was 0.65% in 2005, up from 0.24% in 1999. While the majority of new HIV case reports continue to be among men, the male-to-female ratio has narrowed from close to 10:1 in the early 1990s to 2-3:1 in 2003–2005 (ONUSIDA y Ministerio de la Protección Social de Colombia, 2006). Men also comprise the majority of the 110 000 [54 000–350 000] people living with HIV in **Venezuela**, where most of the reported HIV infections to date occurred during unprotected sex between men (Ministerio de Salud de Venezuela, 2005).

Although incomplete, available HIV surveillance data show that the epidemics in **Central America** are complex and growing, with prevalence in some countries the highest in Latin America. Sex between men and the commercial sex trade appear to be the major risk factors for HIV infection. At the same time there is evidence of more generalized HIV transmission, especially along transport corridors and in areas along the Caribbean coast of the region. Many of the countries of **Central America** have hidden epidemics of HIV among men who have sex with men, including **Belize**, Costa Rica, **El Salvador**, **Guatemala**, **Nicaragua** and **Panama**. In **Nicaragua**, for example, 7.6% of men who have sex with men were found to be HIV-infected (and 11% had syphilis), while 15% tested HIV-positive in **El Salvador**. In both countries, one in five men also reported having had sex with a female partner in the previous six months (Soto et al., 2006). In **Guatemala**, 12% HIV prevalence was found among men who have sex with men, half of whom regarded themselves as heterosexual or bisexual (Ministerio de Salud Pública y Asistencia Social de Guatemala, 2003; Proyecto Acción SIDA de Centroamérica, 2003). The female partners of many of those men are therefore at risk of acquiring HIV from them.

As in several other Central American countries, less is known about the HIV epidemic outside **Guatemala's** capital or among its indigenous (mainly Mayan) peoples who represent nearly half the total population. Available data indicate the widespread presence of HIV among the indigenous population, but not necessarily at higher levels than among the Ladino (a mixed Amerindian-Spanish) population. Sentinel surveillance among pregnant women in 2003 found slightly lower HIV rates among Mayan women than among Ladino women (Hernandez and Aguilar, 2004). In HIV cases and AIDS cases reported to the Health Ministry in 2004, Ladinos represented 74% of cases while Mayans accounted for 22%—while in 2005, Ladinos were 69% of the total and Mayans 28% (Garcia, 2005). Nevertheless, Mayan populations account for the majority of HIV cases and AIDS cases in eight of Guatemala's 22 departments, and HIV has been found in these populations in every department nationwide—a serious concern given that these groups already face high levels of poverty and maternal mortality, as well as scant access to health-care services (Presidential Secretariat for

Planning and Programming Guatemala, 2006). Adding weight to such concerns are the study findings among tuberculosis patients (three quarters of them Mayan) in Quetzaltenango, which show HIV infection levels tripled (from 4.2% to 12%) between 1995 and 2002 (Cohen, 2006d).

In **Honduras**, the epidemic seems especially severe among ethnic minorities—in this case, the Garifuna, the Afro-Honduran descendants of West African slaves. Studies conducted among Garifuna communities have found HIV prevalence of 8%–14% (Secretaria de salud de Honduras, 1998). However, HIV infection has spread widely in Honduras. Infection levels are highest among men who have sex with men (13% of whom have tested HIV-positive in a 2005 study), female sex workers (up to 11% of whom have been found to be HIV-infected) (Secretaria de Salud de Honduras, 2003a; Secretaria de Salud de Honduras, 2003b; Ghee et al., 2006), and prisoners (HIV prevalence of 8%) (Cohen, 2006e). But the epidemic is increasingly affecting women, who comprised just under half (47%) of recorded HIV cases in 2004. Nationally, HIV prevalence in antenatal clinic attendees was 1.4% in 2004, but reached as high as 3%–4% in Valle de Sula (Ministry of Health Honduras, 2006). An estimated 63 000 [35 000–99 000] Hondurans were living with HIV at the end of 2005 (UNAIDS, 2006).

Unprotected sex between men features centrally in the epidemics of most Latin American countries.

Mexico's large population means that despite a low adult national HIV prevalence—estimated at 0.3% [0.2%–0.7%], there were 180 000 [99 000–440 000] people living with HIV in 2005 (UNAIDS, 2006; Bravo-Garcia, Magis-Rodriguez, Saavedra, 2006). Mexico's epidemic is concentrated primarily among men who have sex with men, sex workers and their clients, and injecting drug users. Sex between men is believed to account for more than half (57%) the HIV infections recorded to date (Bravo-Garcia, Magis-Rodriguez, Saavedra, 2006a), though there are indications of increasing risk for HIV infection among women (Magis-Rodriguez et al., 2004).

HIV prevalence of 4% has been found among injecting drug users in Tijuana (Magis-Rodriguez et al., 2005), and there are some indications that HIV infections may be increasing in some cities along with the United States of America border where sex work and injecting drug use are widespread. In Tijuana and Vera Cruz, 6% of female sex workers were found to be HIV-infected in a 2003 study (Magis et al., 2006a), while in Tijuana and Ciudad Juarez, a 2004–2006 study found HIV prevalence of 6% among female sex workers—and 16% among those who injected drugs (Patterson et al., 2006). High prevalence has also been found among male sex workers: 25% in Monterrey, for example, in a 2005 study (Gayet et al., 2006a) and 20% in Guadalajara and Mexico City (Magis et al., 2006b). A study among male long-distance truck drivers in Monterrey found 0.7% were HIV-infected (double the estimated national adult HIV prevalence). More than one quarter of them had paid for sex in the previous year and one sixth of them had never used a condom (Gayet et al., 2006b). There is also evidence of significant HIV spread in rural parts of the country, with migration (including migration between Mexico and the United States of America) apparently a contributing factor (Cohen, 2006f).



NORTH AMERICA, WESTERN AND CENTRAL EUROPE

In these two regions, the total number of people living with HIV continues to increase, in great part due to the life-prolonging effects of antiretroviral therapy, a relatively steady number of new HIV infections each year in North America and an increase in the number of new HIV diagnoses in Western Europe since 2002⁶. Overall, approximately 2.1 million [1.5 million–3.0 million] people were living with HIV in 2006, including the 65 000 [52 000–98 000] who acquired HIV in the past year. In the context of widespread access to effective antiretroviral treatment, comparatively few people died of AIDS—30 000 in a range of 24 000–45 000—in 2006.

Worldwide, only seven countries are estimated to have more people living with HIV than the **United States of America** (USA): 1.2 million [720 000–2.0 million] in 2005 (UNAIDS, 2006). Based on data from the 35 states and areas⁷ with long-term, confidential name-based HIV reporting, the most common risk factor for HIV infection remains unsafe sex between men (accounting for about 44% of HIV or AIDS cases reported in 2001–2004), followed by unprotected heterosexual intercourse (34% of cases) and the use of non-sterile drug injecting equipment (17%) (US Centers for Disease Control and Prevention, 2006a). (However, note that the

35 states and territories do not include some of the states which have reported the largest number of AIDS cases, such as California, Illinois, Maryland and Pennsylvania.)

The proportion of women among new HIV or AIDS diagnoses has increased dramatically—from 15% before 1995 to 27% in 2004. Approximately three quarters of women newly diagnosed with HIV were infected during unprotected sex (US Centers for Disease Control and Prevention, 2006b), often with male partners who were infected when injecting drugs, or during commercial sex or sex with other men (McMahon et al., 2004; Valleroy et al., 2004; Montgomery et al., 2003). However, a significant proportion (20%) of women diagnosed with HIV in 2004 acquired HIV during unsafe injecting drug use.

The total number of people infected with HIV continues to increase—mainly due to the life-prolonging effects of antiretroviral therapy, the steady number of new HIV infections in North America and an increase in new HIV diagnoses in Western Europe.

⁶ This analysis is based chiefly on reported HIV diagnoses. A significant limitation of using annual HIV diagnoses to monitor the HIV epidemic is that this yardstick does not represent the total incidence, as it may include infections that occurred several years earlier, and it only captures those people that have been tested. As a result, HIV trends based on reported HIV cases can be skewed by changes in the HIV testing intake or by changes in patterns of reporting. Whenever possible, this analysis alerts readers to instances where such changes have occurred.

⁷ Since 2000, the following 35 areas have had laws or regulations requiring confidential name-based HIV infection reporting in the USA: Alabama, Alaska, Arizona, Arkansas, Colorado, Florida, Idaho, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, Wyoming, Guam, and the U.S. Virgin Islands. Since July 1997, Florida has had confidential name-based HIV infection reporting only for new diagnoses.

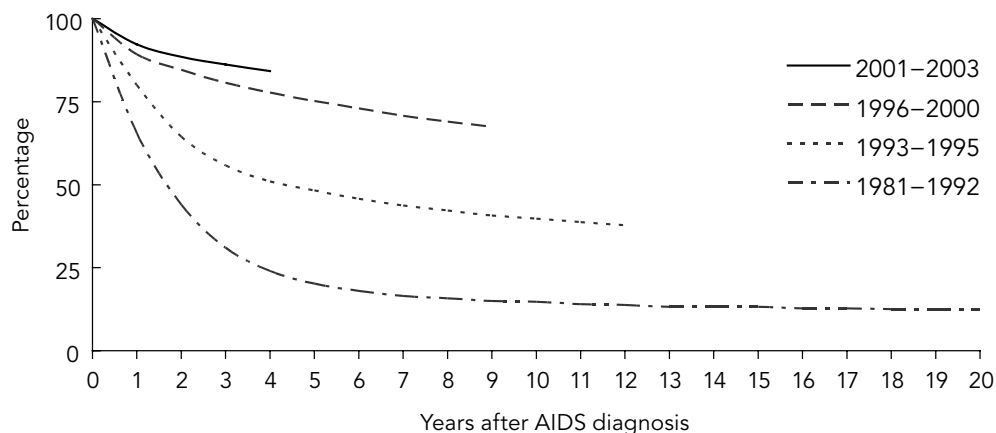
Men still account for the majority of HIV or AIDS diagnoses in the United States—about 73% in 2004. Almost two thirds (65%) of HIV infections diagnosed among men in 2004 were attributable to unsafe sex with other men (US Centers for Disease Control and Prevention, 2006b), and several studies have reported evidence of an increase in unsafe sexual behaviour in this population group (US Centers for Disease Control and Prevention, 2006c).

Racial and ethnic minorities continue to be disproportionately affected by the HIV epidemic. In 2001–2004, 50% of AIDS diagnoses were among African-Americans (who constitute only 12% of the US population) and 20% among Hispanics (14% of the US population). The rate of new HIV or AIDS diagnoses was seven times higher among African-American men than among white men in 2004 (131.6 compared with 18.7 per 100 000 persons) and 21 times higher among African-American women than among white women (67 compared with 3.2 per 100 000 persons) (US Centers for Disease Control, 2006a). One recent study has suggested that the high rates of incarceration of African-American men (approximately one in 12 of whom have been in jail or prison) could be associated with the disproportionate HIV infection rates among African-American men and women (Johnson and Raphael, 2006).

Approximately one half (49%) of African-American men diagnosed with HIV or AIDS in 2005 acquired the virus during unprotected sex with another man, while most African-American women (78%) became infected during unprotected heterosexual intercourse (US Centers for Disease Control and Prevention, 2006d). Several studies have shown that African-American men who have sex with men face significantly higher risk of HIV infection, yet report similar or less sexual risk behaviour, compared with other men (Harawa et al., 2004; Koblin et al., 2006). This indicates that other factors (possibly including the prevalence of other sexually transmitted infections) could be aggravating the risks of HIV infection in African-American men who have sex with men. Meanwhile, the use of non-sterile injecting drug equipment remains the second-leading cause of HIV infection in African-American women and the third-leading cause among African-American men (US Centers for Disease Control and Prevention, 2006c).

Provision of antiretroviral therapy has resulted in a decline in AIDS death rates of 80% between 1990 and 2003 (Crum et al., 2006). HIV treatment in the United States has become increasingly effective, with the proportion of people surviving for two years or longer after AIDS diagnosis growing from 64% in 1993–1995 to 85% in 1996–2005 (US Centers for Disease

Percentage of persons surviving through June 2005, by years after acquired immunodeficiency syndrome (AIDS) diagnosis cohorts during 1981–2003 and by year of diagnosis—United States



Source: CDC. Twenty-Five Years of HIV/AIDS — United States, 1981–2006. MMWR 2006.

Figure 12

Control and Prevention, 2006a). At least 3 million years of life have been saved as a direct result of effective treatment and care of AIDS patients (Walensky et al., 2006).

An estimated one quarter of people living with HIV do not know that they have been infected with the virus (Glynn and Rhodes, 2005), which complicates the HIV response. Persons unaware of their infection are unlikely to access appropriate treatment and care services until relatively late in the progression of AIDS disease, which limits the effectiveness of treatment. They are also less likely to take precautions to avoid transmitting HIV to others. Potentially, individuals who are unaware of their HIV-infected status may account for 54%–70% of all new sexually transmitted HIV infections in the United States of America (Marks et al., 2006).

The proportion of women among newly infected HIV cases or AIDS diagnoses has increased dramatically in the USA—from 15% before 1995 to 27% in 2004.

The latest HIV data from **Canada** highlight the need to ensure effective strategies are in place to prevent new HIV infections and to provide services for vulnerable populations, such as injecting drug users, men who have sex with men and Aboriginal people.

At the end of 2005, there were an estimated 58 000 [48 000–68 000] people living with HIV in Canada, which represents an increase of 16% over the 2002 estimate of 50 000 [41 000–59 000] (Boulos et al., 2006). In addition, it was estimated that 2300 to 4500 new infections occurred in 2005. Men who have sex with men comprised almost half (46%) of those new infections, making them the most-affected group. About 14% of the new infections were attributed to unsafe injecting drug use (less than the 19% estimated for 2002), and 37% were attributed to unprotected heterosexual intercourse. Just under half of the infections acquired via heterosexual intercourse were in persons who were born in a country where HIV is endemic (Boulos et al., 2006). There was a slightly increasing trend in new HIV infections among women: they represented 27% of new infections in 2005, compared with an estimated 24% in 2002 (Boulos et al.,

2006). Of note, one in four persons with HIV in Canada is unaware of his or her infection (Boulos et al., 2006).

Aboriginal people in Canada are disproportionately affected by many social, economic and behavioural factors, such as high rates of poverty, substance abuse and sexually transmitted infections, as well as limited access to or use of health-care services, which together appear to increase their vulnerability to HIV infection (Public Health Agency of Canada, 2006). Aboriginal people continue to be over-represented in Canada's epidemic: the overall HIV infection rate among Aboriginal persons was estimated to be almost three times higher than for non-Aboriginals. In 2005, Aboriginal persons accounted for 9% of new infections (Boulos et al., 2006), yet they comprise only 3.3% of Canada's population (Statistics Canada, 2001).

The characteristics of HIV transmission among Aboriginal persons differ from those of the general population. In the 2005 estimates, injecting drug use was the most common mode of transmission among Aboriginal persons, accounting for 53% of new infections among Aboriginal Canadians compared to 14% among all Canadians. The remaining new infections among Aboriginals were largely attributed to HIV exposure during heterosexual intercourse (33%) and sex between men (10%) (Boulos et al., 2006).

Aboriginal people continue to be over-represented in Canada's epidemic, with the HIV infection rate among Aboriginal persons almost three times higher than for non-Aboriginals.

There is a special need for targeted interventions that are specifically designed for Aboriginal youth, especially women. A larger proportion (33%) of Aboriginal persons diagnosed with HIV are younger than 30 years, compared with the general population (20%). A study among injecting drug users in Vancouver found that Aboriginal youth who inject drugs were over four times more likely to be HIV-infected at enrolment in a drug programme than were their non-Aboriginal counterparts (Miller et al., 2006). Unusually, among the Aboriginal injecting

drug users in that study, almost two thirds were female—a pattern which helps explain why two thirds (65%) of the HIV diagnoses among Aboriginal women up to December 2005 were attributed to transmission during injecting drug use (Public Health Agency of Canada, 2006).

As in many other countries, injecting drug use during incarceration appears to be common in Canada. According to a recent study among persons admitted to remand facilities in the province of Ontario, the use of non-sterile injecting equipment behind bars is common, especially among injecting drug users held in federal prison facilities. Among the latter, 6% tested HIV-positive in this study; almost half (47%) of those infected with the virus said they had shared injecting equipment while imprisoned. Such findings reiterate the need to expand prison harm reduction programmes, including needle- and syringe-exchange programmes (Calzavara et al., 2006).

Across the Atlantic, some 740 000 [580 000–970 000] people were living with HIV in Western and Central Europe in 2006. Most information about the patterns and trends in the epidemics in Western Europe are derived from AIDS and HIV case reports. However, the HIV case reporting system does not cover all countries or all areas within countries. In particular, national HIV data were not reported in 2005 for Italy, Norway and Spain (EuroHIV, 2006a).

About three quarters of heterosexually acquired HIV infections in Western and Central Europe are among immigrants and migrants. Prevention, treatment and care services must be adapted so that they reach these populations.

In Western Europe, just over one third (35%) of HIV infections diagnosed in 2005 occurred during sex between men, while more than half (56%) were acquired during heterosexual intercourse. About three quarters of heterosexually acquired HIV infections were among immigrants and migrants (EuroHIV, 2006a), reinforcing the need to adapt prevention, treatment and care services so that they reach these populations.

The rate of new HIV diagnoses nearly doubled during the period 1998–2005 in Western Europe—from 42 cases per million population in 1998 to 74 per million in 2006. The largest increases have been reported in the **United Kingdom**, where HIV remains one of the principal communicable disease threats (British Medical Association, 2006). Annual, new HIV diagnoses in the United Kingdom have doubled since 2000, exceeding 7200 in 2004 and reaching 7700 in 2005 (Health Protection Agency United Kingdom, 2005). The epidemic is focused to a considerable extent in London where almost half (43%) of new diagnoses were made in 2005. However, new diagnoses have been increasing gradually in other regions since 1999, including areas where HIV infections had previously been rare (such as the East and North East, Wales and Yorkshire) (Health Protection Agency United Kingdom, 2006).

Three quarters of new HIV diagnoses in heterosexual men and women were among people originating from countries outside the UK, mainly from sub-Saharan Africa (Health Protection Agency United Kingdom, 2006). Indeed, persons infected in sub-Saharan Africa are now the group most-affected by HIV in the United Kingdom, slightly more so than men who have sex with men. Research in the Midlands and southern England suggests that stigma and fear of discrimination discourage a large proportion of Africans in the United Kingdom from testing for HIV (Elam et al., 2006).

Meanwhile, levels of HIV and other sexually transmitted infections remain high among men who have sex with men, who represent about one third of all new HIV diagnoses (2252 in 2005). The number of new HIV diagnoses among men who have sex with men has increased by almost 50% since 2000 (Health Protection Agency, 2006), underlining the need to overhaul prevention efforts targeting this population group (Elford et al., 2005).

Two other trends are worth noting. About one third of persons with HIV do not know that they have been infected (British Medical Association, 2006). They therefore are not receiving the treatment and care they may need, and are at risk of transmitting the virus to others. In addition, knowledge of HIV appears to be deteriorating. In a 2005 survey, 79% of respondents nationally (and

only 70% in London, the area with the highest HIV prevalence in the country) knew that HIV can be transmitted through unprotected sex, compared with the 91% in 2000. The percentage of people who failed to name a single way in which HIV can be transmitted rose from 6% to 8% in 2000–2005 (National AIDS Trust, 2006).

Studies among specific populations of men who have sex with men show HIV prevalence of 10%–20% in Western Europe, and several studies in France, Spain, Switzerland and the United Kingdom have reported increases in the proportion of men who have sex with men who report having recently engaged in higher-risk sex (Balthasar, Jeannin, Dubois-Arber, 2005; Moreau-Gruet, Dubois-Arber, Jeannin, 2006; Dodds et al., 2004). This underlines the need to strengthen HIV prevention and treatment programmes in this population group (EuroHIV, 2006b). Several other countries are experiencing an increase in new HIV diagnoses among men who have sex with men. Compared to 2001, the number of HIV diagnoses in this population group was three quarters higher in the **Netherlands** (75%), more than two thirds higher in **Portugal** (68%) and **Switzerland** (71%), and 40% higher in **Belgium** in 2005 (EuroHIV, 2006a). Outbreaks of other sexually transmitted infections are accompanying this trend in some countries, which points to increased sexual risk behaviours among men who have sex with men. For example, in the **Netherlands**, syphilis cases in men who have sex with men more than tripled in 2000–2004 (Van de Laar et al., 2005). In **Germany**, new HIV diagnoses in men who have sex with men more than doubled in 2001–2005 (EuroHIV, 2006a), and this population group accounted for an estimated 70% of newly diagnosed HIV infections in 2005 (Robert Koch Institut, 2005). Overall, an estimated 49 000 [29 000–81 000] people were living with HIV in Germany in 2005 (UNAIDS, 2006). The epidemics in the Scandinavian countries remain small and stable overall, although there has been an increase in HIV diagnoses among men who have sex with men in **Sweden** since 2002 (from 68 to 97 in 2005) (EuroHIV, 2006a).

The effectiveness of harm reduction programmes in reducing HIV infections among injecting drug

users is evident in several countries. In **Portugal**, for example, HIV diagnoses among injecting drug users were almost one third (31%) lower in 2005, compared with 2001 (857 versus 1247) (EuroHIV, 2006a). Harm reduction programmes have been associated with a decrease in injecting drug use, use of contaminated needles and syringes and HIV infections among injecting drug users in **Spain**. HIV prevalence among injecting drug users declined by half in Barcelona (44% to 21% between 1995 and 2001–2003) and Sevilla (44% to 22%), both cities with long-standing harm reduction programmes. In contrast, in Madrid, where such programmes were introduced only in the late 1990s, HIV prevalence among injecting drug users remained stable (37% in 1995 and 35% in 2001–2003) (de la Fuente et al., 2006). A drop in HIV infections among injecting drug users has been seen in the **Netherlands** too—from 174 new diagnoses in 2002 to 29 in 2005. Among drug users in Amsterdam, the epicentre of that country's injecting drug-related HIV epidemic, there has been a sustained decline in the use of non-sterile needles and HIV incidence. Most new HIV infections among drug users in Amsterdam are now occurring during unprotected heterosexual intercourse—a reminder that harm reduction programmes must also pay specific attention to promoting safer sex practices (Lindenburg et al., 2006).

Studies show HIV prevalence of 10%–20% among men who have sex with men in Western Europe, and there is evidence from several countries of increased higher-risk unprotected sex in this population group.

The epidemics in Central Europe remain small in comparison with the rest of Europe. Only four countries reported more than 100 new HIV diagnoses in 2005: **Poland** (where 652 people were newly diagnosed with HIV), **Turkey** (332), **Romania** (205), **Serbia and Montenegro**⁸ (112) and **Hungary** (110) (EuroHIV, 2006a). The epidemic patterns vary considerably. Unprotected heterosexual intercourse is the main mode of infection in most countries, including **Albania**,

⁸ At the time of compilation, these statistics were taken from the country formerly known as Serbia and Montenegro. At the time of printing, it is known as the Republic of Serbia and the Republic of Montenegro (see <http://www.un.org/Depts/Cartographic/map/profile/serbia.pdf>).

Bosnia and Herzegovina, Bulgaria, Romania and **Turkey**, while unsafe sex between men predominates in **Croatia, Czech Republic, Hungary** and **Slovenia**, and using non-sterile injecting drug equipment is the main risk factor for HIV infection in the epidemics in **Poland** (EuroHIV, 2006a; Rosinska, 2006).

In the Baltic, the sudden increase in the number of HIV infections diagnosed around the turn of the century appears to have abated and the HIV epidemics are now growing at a slower pace. There has been a steady decrease in the number of new HIV diagnoses in **Latvia** (from 542 to 299 in the same period) (Health Protection Inspectorate Estonia, 2006; EuroHIV, 2006a). In **Lithuania**, 110–135 new HIV infections have been diagnosed annually in the past three years (EuroHIV, 2006a). Approximately 10 000 [6100–17 000] people were living with HIV in **Latvia** in 2005, as were an estimated 3300 [1600–10 000] in **Lithuania** (UNAIDS, 2006). New reported HIV cases in **Estonia** have also decreased (from 899 in 2002 to 621 in 2005). Nevertheless, the estimated adult national HIV prevalence of 1.3% [0.6%–4.3%] in Estonia in 2005 was the second-highest in all of Europe (after Ukraine). A total of more than 5000 HIV infections have been reported since the epidemic began in Estonia, and it is estimated that the actual number of people living with HIV in 2005 was twice as high (10 000 with a range of 4800–32 000) (Health Protection Inspectorate Estonia, 2006; UNAIDS, 2006).



MIDDLE EAST AND NORTH AFRICA

AIDS epidemics in this region are diverse. An estimated 68 000 [41 000–220 000] people acquired HIV in 2006, bringing to 460 000 [270 000–760 000] the total number of people living with the virus in the region. AIDS killed approximately 36 000 [20 000–60 000] people in the past year. Most reported HIV infections have been in men, but the proportion of infected women is increasing (UNAIDS, 2006).

Uneven (and, in many places, inadequate) HIV surveillance systems make it difficult to gauge precisely the patterns and trends of the epidemics in many countries of this region—especially among most-at-risk groups such as injecting drug users, sex workers and men who have sex with men. However, improved data collection in some countries (such as **Algeria, Iran, Libya** and **Morocco**) show that localized HIV epidemics exist across the region, while a generalized epidemic persists in **Sudan**.

Inadequate HIV surveillance in many countries of this region makes it difficult to discern the patterns and trends of their diverse epidemics—especially among most-at-risk groups such as injecting drug users, sex workers and men who have sex with men.

Sudan has by far the biggest AIDS epidemic in this region. Adult HIV prevalence was 1.6% [0.8%–2.7%] in 2005 and some 350 000

[170 000–580 000] people were living with HIV. HIV prevalence of over 2% has been found among women seeking antenatal care in the White Nile state, for example (Ministry of Health Sudan, 2006). There are fears that HIV transmission could accelerate and broaden in the aftermath of more than two decades of war, as the lives of former refugees and displaced persons gradually return to normal. For example, HIV prevalence as high as 4.4% has been found among some formerly displaced adults in Yei in the south, along the Ugandan border (Kaiser et al., 2006). More prevention efforts are being mounted in the south, including voluntary counselling and testing initiatives (in Juba, for example), and a handful of antiretroviral treatment sites are now operating.

The epidemic is not confined to the south, however (Ministry of Health Sudan, 2005). A 2005 study among police officers in Khartoum State, for example, found that 1% were HIV-infected. Knowledge of HIV was extremely poor: only 2% of the men knew that condoms can prevent HIV transmission (Abdelwahab, 2006). In addition, unsafe sex between men appears to be a contributing factor in the epidemic in Khartoum State, according to another study which found HIV prevalence of 9.3% among men who have sex with men. Almost all the men participating in the study claimed to have more than one sexual partner, and two thirds said that they had sold sex. Just over half the men were unaware of the risk of HIV infection during unprotected anal sex and only 3% of them said that they used condoms consistently (Elrashied, 2006).

High HIV prevalence among injecting drug users has been documented in several countries, notably **Iran** and **Libya**. However, injecting drug use occurs in many other countries of this region, and the use of non-sterile injecting equipment appears to be common. Various studies show that as many as four in ten injecting drug users in **Algeria**, five in ten in **Egypt** and **Morocco**, and six in ten in **Lebanon** have used non-sterile syringes.

Given the large number of injecting drug users in **Iran**—as many as 137 000, according to the Ministry of Health and Medical Education (Gheiratmand et al., 2006)—the high HIV infection levels found among injecting drug users in this country is a major concern. Almost one in four (23%) injecting drug users participating in a recent study in the Iranian capital, Tehran, were found to be HIV-infected (Zamani et al., 2006), as were 15% of those receiving treatment at centres in the same city in an earlier study (Zamani et al., 2005). In both instances, a history of using non-sterile injecting equipment in prison was the main factor associated with infection, underscoring the need for harm reduction programmes in prisons and other places of incarceration. In Marvdasht, 85% of injecting drug users said that they had used drugs in prison and 19% said that they had used non-sterile injecting equipment there (Day et al., 2006). The Iranian authorities have recognized that prisons are a risk environment, and condoms and substitution therapy are being provided in some detention facilities. Meanwhile, other research is revealing varied injecting behaviour in different social groups (with between 30% and 100% of injecting drug users using non-sterile syringes, depending on their socioeconomic status)—a reminder of the need to tailor harm reduction and other HIV programmes appropriately (Razzaghi et al., 2006).

In **Iran**—and elsewhere in this region—substantial proportions of young people, including injecting drug users, are sexually active. A majority of injecting drug users seeking treatment in Tehran are sexually active, yet only half the injecting drug users participating in a 2005 study said they had ever used a condom during sex (Zamani, 2005). More broadly, some 28% of 15–18-year-old male youths taking part in another study were sexually active. Yet half of them had never seen a condom, and fewer than half knew

that condoms could prevent sexually transmitted infections (Mohammadi et al., 2006). When high school students in Tehran were surveyed, one third of the respondents believed HIV could be transmitted by mosquitoes and one fifth thought they could acquire the virus in public swimming pools (Tavoosi et al., 2004). Such generalized ignorance and lack of preventive behaviour puts young people at considerable risk of HIV infection.

Iran has expanded its HIV response considerably in recent years. Clean syringe distribution and methadone treatment projects are operating, and government clinics now provide free HIV counselling, testing and treatment. **Libya**, where HIV prevalence of 18% has been found among prisoners (Sammud, 2005), will need to follow suit and expand its response in order to control the HIV epidemic.

Unprotected sex (including during paid sex and sex between men) is the other major factor in the region's epidemics. HIV infections levels of 9%–10%, 2.2% and 4.4% have been found among female sex workers in Saida and Tamanrasset in **Algeria** (Fares et al., 2004), **Morocco** (Ministère de la Santé Maroc, 2005) and **Sudan** (Federal Ministry of Health Sudan, 2002), respectively. Indeed, in **Algeria** and **Morocco**, unprotected sex accounts for the majority of reported HIV infections, and women represent an increasing proportion of people living with HIV (Ministère de la Santé Maroc, 2005). At some antenatal clinics in the south of Algeria, more than 1% of pregnant women have tested HIV-positive (Institut de Formation Paramédicale de Parnet, 2004). In **Saudi Arabia**, almost half (46%) of reported HIV cases have been attributed to unprotected sex. There, two thirds (67%) of all HIV cases have been reported in three cities: Jeddah, Riyadh and Damman (Al-Mazroui et al., 2005).

Effective HIV prevention programmes that target most-at-risk populations can still prevent wider and more serious HIV epidemics in several countries in the Middle East and North Africa. Progress in providing antiretroviral therapy in this region remains slow, with only 4000 people estimated to be on treatment at the end of 2005 (compared with about 1000 at the end of 2003). It is estimated that some 75 000 people in the region need antiretroviral therapy (WHO/UNAIDS, 2006).



OCEANIA

An estimated 7100 [3 400–54 000] people acquired HIV in Oceania in 2006, bringing to 81 000 [50 000–170 000] the number of people living with the virus. Three quarters of those persons are in **Papua New Guinea**, where the epidemic is serious and growing. (UNAIDS, 2006).

Papua New Guinea's adult national HIV prevalence of 1.8% [0.9%–4.4%] implies that about 57 000 [31 000–140 000] people older than 15 years were living with HIV in 2005 (UNAIDS, 2006). Prevalence in urban areas could be as high as 3.5%, according to estimates (National AIDS Council Secretariat Papua New Guinea, 2006). The epidemic grew vigorously in the late 1990s, and there are no signs that it is abating. At least 2000 new HIV infections have been reported annually since 2002.

The HIV epidemic in Papua New Guinea continues to expand, amid a plethora of risk factors that could promote further growth unless prevention efforts are stepped up quickly.

High rates of sexually transmitted infections (in both urban and rural areas), early sexual initiation, a common practice of concurrent sexual partnerships, high rates of transactional sex, very low rates of condom use and widespread physical and sexual violence against women provide the epidemic with considerable potential for further growth. One study in rural and peri-urban areas found that 55% of interviewed women had exchanged sex for money and/or goods and

36% of men had paid for sex. In addition, up to 12% of men living in rural and peri-urban areas have reported occasionally having sex with other men (Asian Development Bank, 2006). In Port Moresby, meanwhile, only about one quarter (24%) of young men and one eighth (13%) of young women said they used condoms (National AIDS Council Secretariat Papua New Guinea, 2006). Young women are especially vulnerable: HIV infection levels among those aged 15–29 years are twice as high as among men of the same age (National AIDS Council Secretariat Papua New Guinea, 2006).

While available HIV data are cause for concern, they also suggest that Papua New Guinea can still contain its growing epidemic if effective and well-targeted HIV prevention programmes are expanded quickly, and are sustained. One priority has to be the prevention of HIV transmission between sex workers and their clients, and their other partners. Some 14% of female sex workers in the capital, Port Moresby, have been found to be HIV-infected (National AIDS Council Secretariat Papua New Guinea, 2006). Three quarters (74%) of the sex workers in Goroka and Kainantu (in the Eastern Highlands Province) had at least one sexually transmitted infection, while one fifth (21%) had gonorrhoea and one quarter (24%) had syphilis. None of the 200 sex workers tested in those two cities was HIV-positive, but once HIV enters such sexual networks, it is likely to spread rapidly. The rapid introduction of effective and appropriate prevention programmes could protect those sex workers and their clients from HIV (Gare et al., 2005).

Expanding the AIDS response is proving a challenge and is being hampered by the large number of cultural and linguistic groups (some 800), geographical difficulties, high levels of stigma and discrimination associated with HIV, low literacy and employment levels and overburdened health-care systems. Projects aimed at preventing the transmission of HIV from mothers to children, for example, have been introduced at six hospitals in the country, yet fewer than 3% of HIV-positive pregnant women were receiving antiretroviral prophylaxis in 2005 (National AIDS Council Secretariat Papua New Guinea, 2006). While there is now greater recognition of the threat posed by HIV, surveillance systems need to be strengthened further, and prevention programmes have to become better-focused and must be extended into rural areas.

Australia's HIV epidemic still centres mainly on unsafe sex between men, which has accounted for more than two thirds of newly diagnosed HIV infections so far this decade. New HIV diagnoses peaked at over 1000 annually in the late-1980s and early-1990s, and then declined to between 500 and 600 at the turn of the century. In recent years, though, new diagnoses have been rising again—to 899 in 2004 and 954 in 2005 (National Centre in HIV Epidemiology and Clinical Research, 2006). A resurgence of unsafe sex between men appears to be the major risk factor for these new infections. In one recent study in Sydney and Melbourne, the majority of recently infected men who have sex with men reported high rates of unprotected sex with multiple partners. Recreational drug use during sex was prevalent in this same population (Volk et al., 2006). The tenfold increase in syphilis cases between 1999 and 2003 (Fairley, Hocking, Medland, 2005) and the sharp increases since 2000 in unprotected sex between men in Sydney (Prestage et al., 2005) suggest that the preventive practices nurtured in the 1980s and 1990s have lost some of their effect.

Australia's epidemic follows a different pattern in the country's Indigenous population among whom exposure to non-sterile injecting drug use equipment is a major factor; it accounted for one in five HIV diagnoses in Indigenous persons in 2000–2004 (compared with fewer than one in twenty diagnoses in the overall population) (National Centre in HIV Epidemiology and Clinical Research, 2005). Indigenous women are especially at risk for HIV infection: they are 18

times more likely to be HIV-infected than are non-Indigenous women, and three times more likely than non-Indigenous men (Wright et al., 2005).

Meanwhile the benefits of improved antiretroviral therapy are evident in the longer survival rates of persons diagnosed with AIDS. Median survival time among persons diagnosed with AIDS increased from 17 months prior to 1995 to 45 months in 2001. It is estimated that more than half (53%) of the people living with HIV in 2004 were receiving antiretroviral therapy (National Centre in HIV Epidemiology and Clinical Research, 2005).

New HIV diagnoses in **New Zealand** reached a high of 218 in 2005, the highest number since testing began in 1985 (Ministry of Health New Zealand, 2006a). The trend is partly due to increasing numbers of HIV diagnoses among men who have sex with men, mostly (more than 90%) in the Auckland region on the North Island (Ministry of Health New Zealand, 2006b). Unsafe sex between men accounted for a little more than one half (51%) and heterosexual intercourse for more than one third (37%) of new HIV diagnoses in 2005. In the latter instance, the vast majority (possibly as much as 90%) of HIV infections were acquired outside New Zealand (Ministry of Health New Zealand, 2006b). Meanwhile, improved antiretroviral treatment has reduced AIDS deaths from more than 30 per year in 1996–1997 to fewer than 10 per year in 2005 (Ministry of Health New Zealand, 2006a).

None of the other countries and territories in this region have reported more than 300 HIV cases since testing commenced (Secretariat of the Pacific Community, 2005). However, risk factors associated with HIV outbreaks are prevalent in many of those countries and territories. Only one quarter of persons deemed at-risk of HIV infection in **Fiji**, **Kiribati** and **Vanuatu**, for example, know how to prevent HIV infections and do not harbour major misconceptions about HIV transmission. In **Samoa**, **Solomon Islands** and **Vanuatu**, 9% of young men said they had bought sex in the previous 12 months, yet only one in ten of them reported using condoms consistently during commercial sex. About 12% of young men said they used condoms consistently with casual partners. Meanwhile, one in five (22%) of young men reported having sex with other men (Cliffe, Wang, Sullivan, 2006).

MAPS

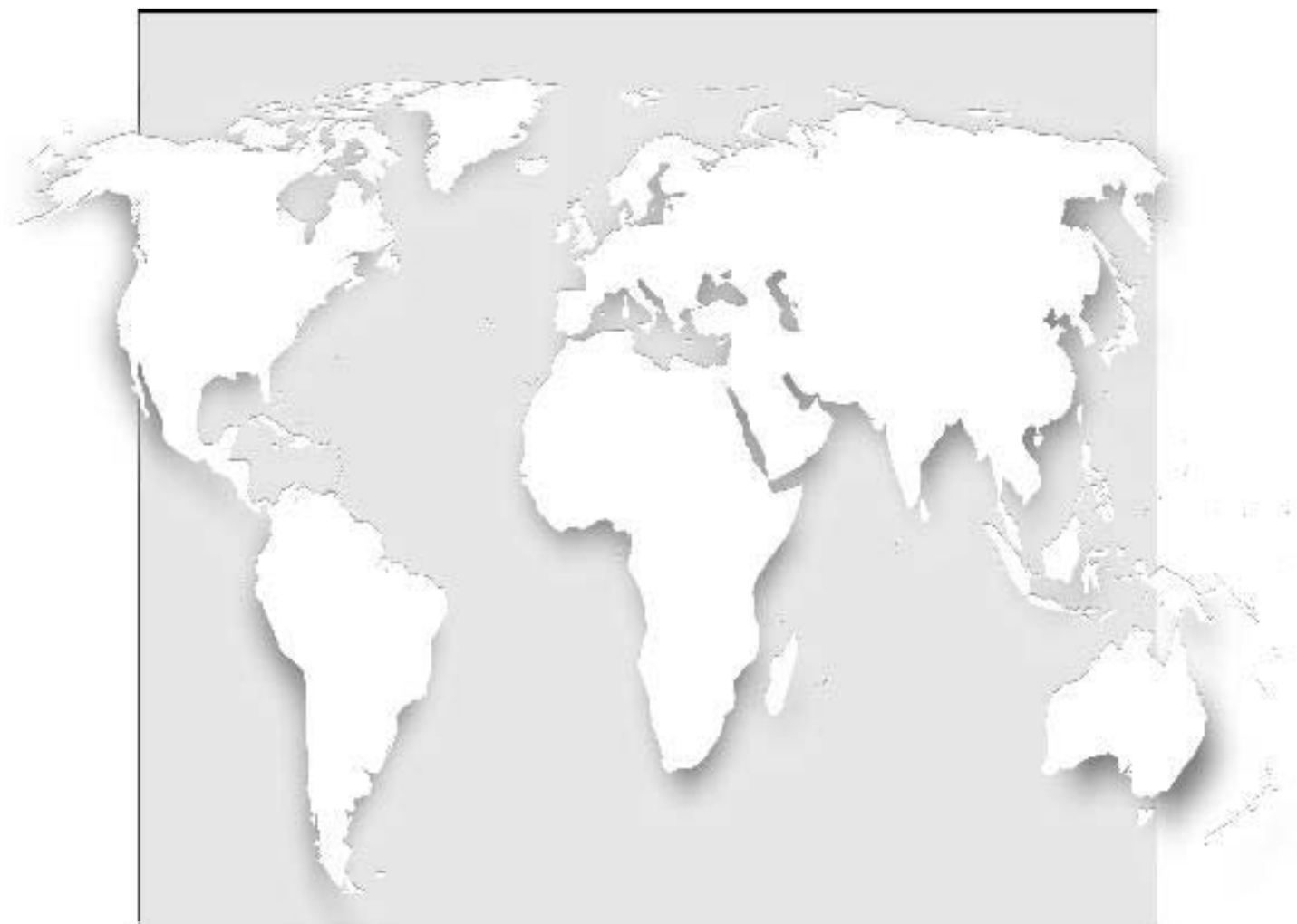
Global estimates for adults and children, 2006

Adults and children estimated to be living with HIV in 2006

Estimated number of adults and children newly infected with HIV during 2006

Estimated adult and child deaths from AIDS during 2006

GLOBAL ESTIMATES FOR ADULTS AND CHILDREN, 2006

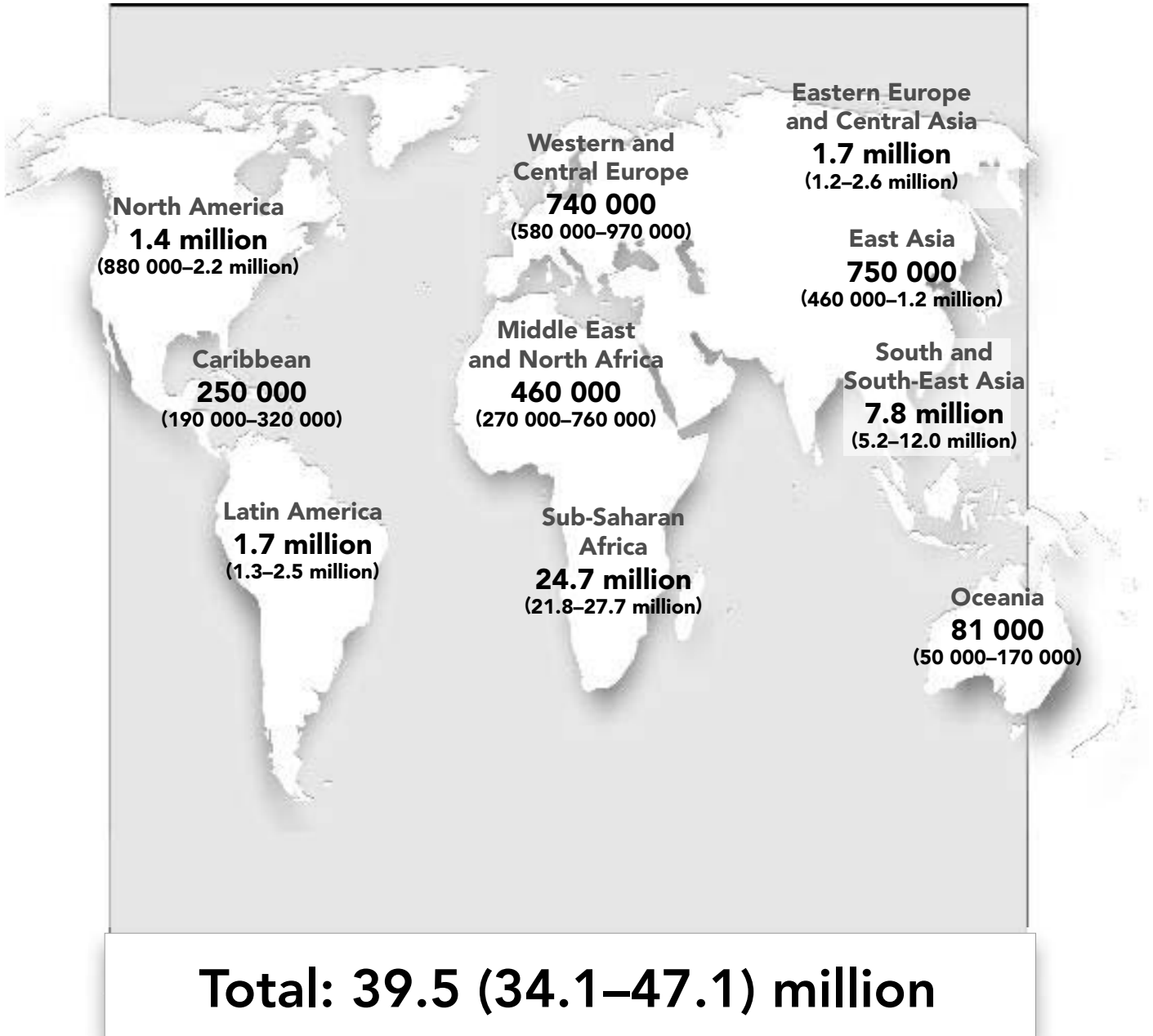


People living with HIV	39.5 million (34.1–47.1 million)
New HIV infections in 2006	4.3 million (3.6–6.6 million)
Deaths due to AIDS in 2006	2.9 million (2.5–3.5 million)

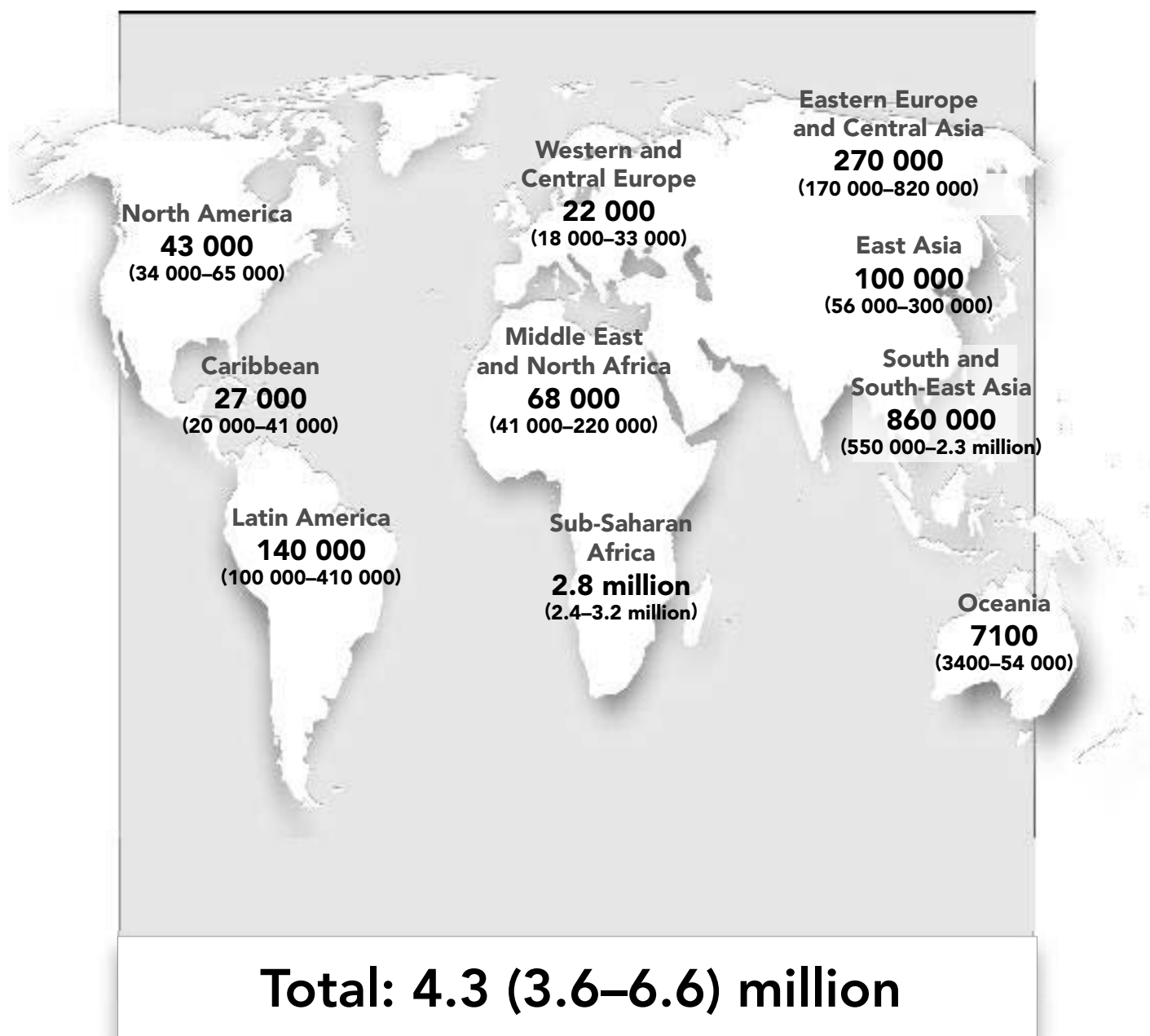
The ranges around the estimates in this table define the boundaries within which the actual numbers lie, based on the best available information.



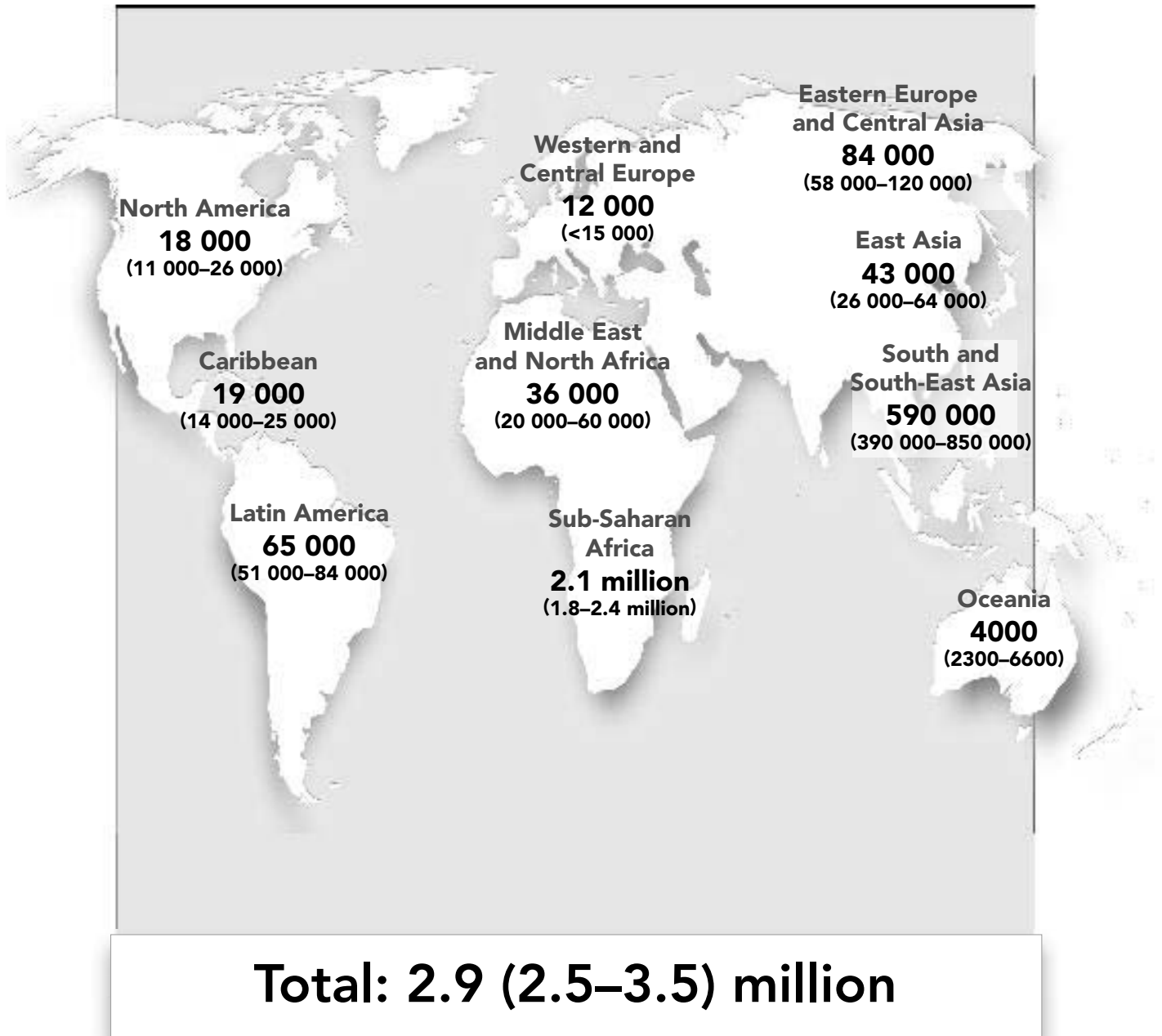
ADULTS AND CHILDREN ESTIMATED TO BE LIVING WITH HIV IN 2006



ESTIMATED NUMBER OF ADULTS AND CHILDREN NEWLY INFECTED WITH HIV DURING 2006



ESTIMATED ADULT AND CHILD DEATHS FROM AIDS DURING 2006





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UNAIDS
20 AVENUE APPIA
CH-1211 GENEVA 27
SWITZERLAND

T (+41) 22 791 36 66
F (+41) 22 791 41 87

www.unaids.org