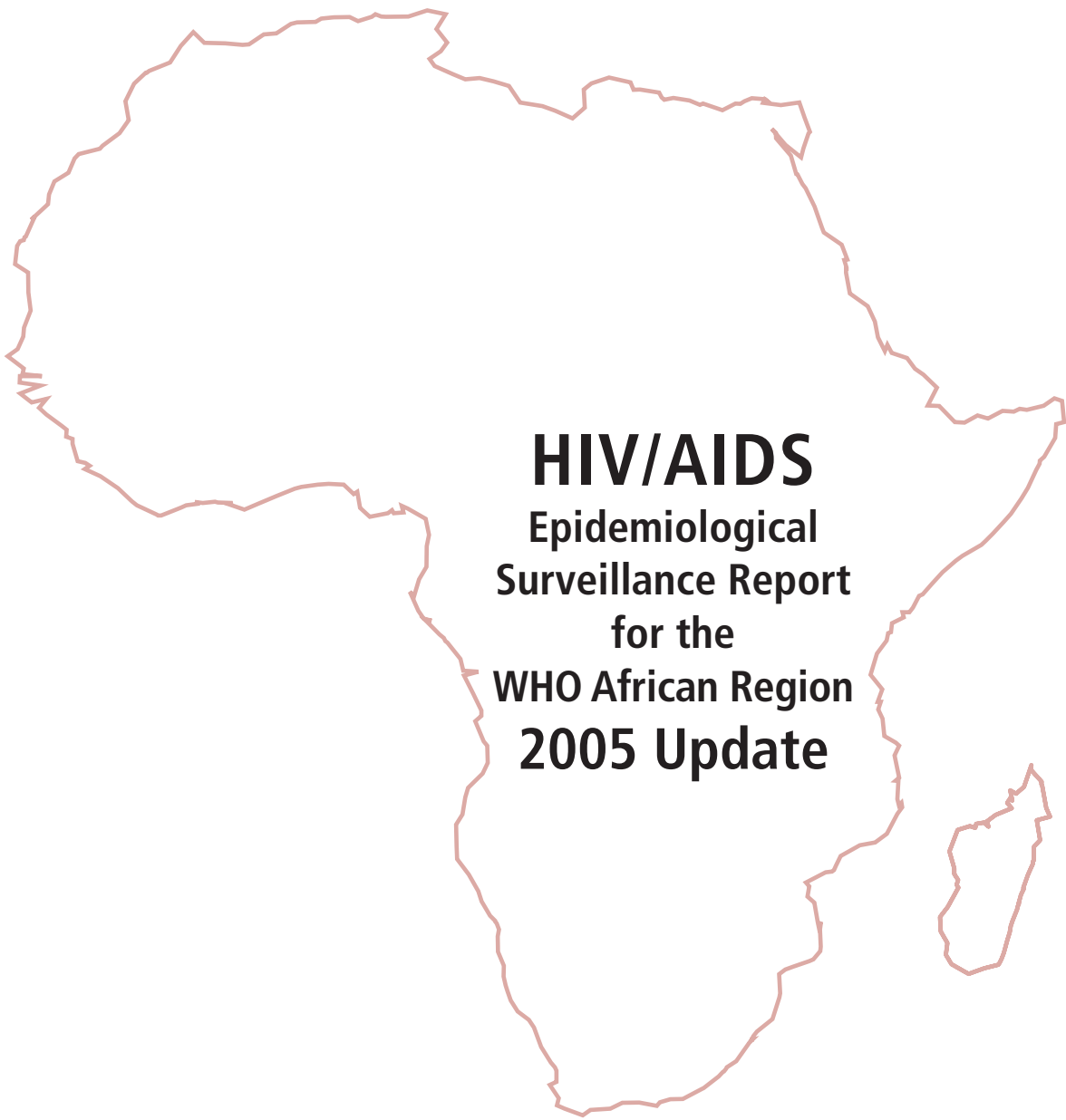


**World Health  
Organization**

REGIONAL OFFICE FOR

**Africa**

Harare, Zimbabwe  
December 2005



# **HIV/AIDS**

## **Epidemiological Surveillance Report for the WHO African Region 2005 Update**



REGIONAL OFFICE FOR

**World Health  
Organization**

**Africa**

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## Foreword

An accurate picture of the current HIV/AIDS epidemic and epidemiological trends is key for directing national HIV/AIDS responses. To this end, many countries in the WHO African Region have made considerable efforts to improve the HIV surveillance systems that generate data on HIV trends and current infection levels. Several countries have expanded HIV surveillance among pregnant women attending antenatal clinics (ANCs) by improving geographical coverage and rural representation. A number of countries have also conducted population-based HIV serosurveys to complement data from other HIV surveillance systems, particularly ANC-based HIV surveillance, by providing HIV prevalence data on men as well as on the remote, rural populations that ANC HIV surveillance systems do not usually capture.

While the WHO African Region remains the Region most affected by HIV/AIDS, there is encouraging news that more countries are observing a decline in HIV prevalence among pregnant women attending ANCs (ANC attendees). Countries such as Burkina Faso, Burundi, Kenya and Zimbabwe, have joined the ranks of Uganda, where HIV prevalence declined in the early to mid-1990s. There are also some positive signs of modest declining HIV trends in cities like Abidjan (Côte d'Ivoire) and Lilongwe (Malawi).

Southern Africa is the most affected subregion, where HIV prevalence rates have stabilized at unacceptably high levels, exceeding 25% in some countries, while in others the epidemic is still growing. Even in eastern Africa, where declining HIV-prevalence rates have occurred, the rates remain unacceptably high at around 7%. Most countries in west and central Africa have stable HIV trends below 5%.

There are both marked diversity and wide variations in HIV prevalence levels and trends within and between countries and in the subregions, between rural and urban populations. Women are more infected than men, particularly among the young age groups. Plans and programmes must take this diversity into consideration.

The WHO Regional Office for Africa continues to place high priority on HIV surveillance systems and thus will continue to provide technical leadership and support in this area.

It is hoped that the readers of this report will use this update as a technical support tool for advocacy to improve national HIV/AIDS responses, including consolidating and improving HIV surveillance systems in the WHO African Region.

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## Preface

In September 2003, the World Health Organization published a detailed review of the HIV/AIDS epidemic and surveillance practices in the 46 countries of the WHO African Region. The current report, *HIV/AIDS epidemiological surveillance report for the WHO African Region: 2005 Update*, provides the most recent update of the HIV/AIDS situation in that part of the world.

The report does not include national HIV/AIDS estimates or determinants for the Region's HIV/AIDS epidemic. Rather, it offers a synthesis and analysis of data generated by HIV surveillance systems in the Region's subregions and countries. Data were drawn chiefly from surveillance of HIV among attendees of antenatal clinics (ANCs); population-based HIV serosurveys conducted in elected countries; behavioural data, primarily from the demographic and health surveys; and sexual behaviour surveys known as behavioural surveillance surveys (BSS). Additional data come from sexually transmitted infection (STI) surveillance and selected special studies and research.

Emerging trends in the Region are also highlighted in the report, particularly gender differences in the HIV/AIDS epidemic as well as the magnitude of HIV infection among young people.

## List of acronyms

AFRO	WHO Regional Office for Africa
AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Clinic
ART	Antiretroviral Treatment
ARVs	Antiretroviral drugs
BBSS	Biological Behavioural Surveillance Surveys
CDC	Centers for Disease Control and Prevention
DHS	Demographic and Health Survey
DHS+	Demographic and Health Survey plus HIV testing
EPP	Estimation and Projection Package
ERG	Epi Reference Group
GUD	Genital Ulcer Disease
HIV	Human Immunodeficiency Virus
HDR	HIV Drug Resistance
HSV	Herpes Simplex Virus
IDUs	Injecting Drug Users
MICS	Multiple Indicator Cluster Survey
MoH	Ministry of Health
MTCT	Mother-to-child transmission
PMTCT	Prevention of Mother-to-Child Transmission
STI	Sexually Transmitted Infection
TB	Tuberculosis
UNGASS	United Nations General Assembly Special Session
UNICEF	United Nations Children's Fund
UNAIDS	Joint United Nations Programme on AIDS
WHO	World Health Organization



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## Executive summary

Expanding the reach and scope of HIV surveillance systems remains a critical part of the WHO African Region's response to its biggest health challenge – the HIV/AIDS epidemic. In the last several years the Region's 46 countries have made considerable efforts to improve and broaden their HIV sentinel surveillance systems, particularly those that are antenatal care-based, by increasing geographical coverage and rural representation.

More countries have fully implemented systems following second-generation HIV surveillance strategies. While the Region saw a slight decrease in the total number of ANC HIV sentinel sites used during the 2003–2004 period as compared with 2002, new data provided by the national population-based HIV serosurveys conducted in 17 countries over the last several years have compensated for this decline. Furthermore, about 20 national population-based surveys are planned in the next biennium. Other new tools to complement HIV surveillance, like HIV incidence assays have been developed and are being tested in the Region.

## Trends in HIV prevalence

Country reports have confirmed the HIV epidemic's diversity and the extreme variations in HIV prevalence rates within countries, between countries and between subregions. HIV prevalence rates among ANC attendees in countries in southern Africa continue to grow and are considerably higher than the HIV infection rates in other parts of Africa. But there are bright spots on the horizon. More countries have shown a declining HIV prevalence among ANC attendees, particularly, Burkina Faso, Burundi, Kenya and Zimbabwe, which join the ranks of Uganda, where HIV prevalence declined markedly in the early to mid-1990s. There are also some encouraging signs in some cities like Abidjan (Côte d'Ivoire) and Lilongwe (Malawi) and some areas of the United Republic of Tanzania, where modest HIV declines have been observed.

Although most countries in eastern Africa have registered declining HIV prevalence trends, their HIV prevalence rates are still unacceptably high, at around 7%. Most countries in western Africa continue to have levels of HIV prevalence rates below 5% and with stable HIV prevalence trends. However, in some countries such as Senegal, with low HIV prevalence, a recent increase in HIV prevalence among ANC attendees has been reported, it being more pronounced among those women 15 to 24 years of age. Countries in southern Africa, with the exception of Angola, have the highest HIV prevalence rates among ANC attendees aged 15 to 24 years, varying from 17.4% to 39.4%. In some countries like Lesotho, Mozambique and Swaziland, HIV prevalence rates are still increasing at slower rates compared to the 1990s. In central Africa, HIV prevalence data remain limited, making it impossible to monitor trends in most of the countries. However, available data in some countries in this subregion do show stable trends.

Population-based data corroborate findings from ANC-based HIV prevalence data, showing significant variations in HIV prevalence rates among the adult general population in the different countries. Overall national HIV prevalence rates among 15- to 49-year-old men and women in this population vary from 0.7% in Senegal to 23.6% in Lesotho. More women are infected than men, with some countries showing a range of 1.3- to 2-fold sex ratios. These surveys generally confirmed what ANC sentinel surveillance data show about HIV prevalence differences between rural and urban areas. However, in some countries, the survey showed lower-than-expected HIV prevalence in rural areas. This is explained by the fact that the survey drew from ANC-based surveillance and rural ANCs are located largely in semi-urban areas.

Differences in HIV prevalence rates between urban and rural areas are marked in almost all countries in eastern Africa, with urban rates being much higher than those in rural areas. In most of the countries in western and central Africa, the differences are small. On the other hand, ANC-based HIV prevalence rates in almost all countries in southern Africa show that urban and rural HIV prevalence rates are close.

Data on sexual behaviours, mainly generated by demographic and health surveys (DHS), indicate that higher-risk sex and premarital sex continue to be common in many of the Region's countries. Those with sufficient behavioural data to monitor trends indicate increasing condom use rates in higher-risk sex for both men and women, and also during premarital sex. Multiple risk factors contribute to HIV spread. Therefore, analysis and triangulation of data from different types and sources will help in understanding the dynamics of the HIV epidemic in countries, thus enabling a better and more comprehensive HIV/AIDS response.

Recent data on HIV prevalence among special populations groups with higher risk behaviours are limited. HIV prevalence surveys are not conducted frequently in most of the countries and just a few in western Africa carry them out regularly. Even those with low-level epidemics, where HIV surveillance among special groups is key to monitoring progress and trends in the epidemic, are not conducting these surveys.

There are two HIV subtypes in the WHO African Region, HIV-1 and HIV-2. HIV-1 is the most predominant, accounting for 98% of all HIV infections in the region. There is a high degree of HIV-1 genetic variability, which has implications for vaccine development. Several subtypes and recombinants of HIV-1 have been found and it is critical to continue gathering information on subtypes for possible vaccine development.

### **Next steps**

Despite the improving HIV surveillance systems among the ANC attendees, few countries collect, analyse and report age on the pregnant women recruited into ANC surveillance, making it difficult to monitor trends, especially among young people aged 15–24. The latter is a proxy indicator for HIV incidence 'new infections' and being one of the United Nations General Assembly Special Session (UNGASS) indicators, Member States are required to report it. Thus, to guide planning and programming of interventions, countries should be encouraged to collect, analyse and report the age of ANC attendees recruited into ANC HIV surveillance.

Population-based surveys have provided valuable information on HIV prevalence on both men and women as well as on prevalence in 'remote rural' areas, which has been an important complement to ANC-based data. However, countries need to standardize the methodology for conducting such surveys to ensure high-quality data. They need to be conducted to harmonize with the existing systems, not to substitute for them, especially ANC HIV sentinel surveillance, which remains key to monitoring HIV infection trends in countries with generalized epidemics. Population-based surveys are not ideal for monitoring trends, since the intervals between surveys tend to be too long.

Countries need to incorporate biological and behavioural surveillance among special populations into their national HIV surveillance systems to obtain crucial information for designing and implementing appropriate prevention interventions. This is especially important for countries with concentrated epidemics.

With the scaling up of ARVs, drug resistance has become a public health issue. Thus, HIV surveillance systems in countries should coordinate efforts with partners and experts that are implementing HIV Drug Resistance (HDR) surveillance and monitoring systems. Coordination of these kinds of efforts will maximize investment and produce better information.



## 1 Introduction

By the end of 2004 the WHO African Region claimed close to two thirds of all the people living with HIV/AIDS worldwide. Some 26 million people in the Region are living with HIV/AIDS, implying that 9 out of 100 adults aged 15–49 years are HIV-infected. Millions of people are in need of HIV treatment and care; an estimated 4.7 million need antiretroviral drugs (ARVs).

The current report provides the latest data on the HIV/AIDS epidemic since the *HIV/AIDS epidemiological surveillance update for the WHO African Region 2002* was published in September 2003. In addition to assessing HIV prevalence trends within countries and subregions, this update presents an epidemiological synthesis and analysis of data generated by the surveillance systems, primarily for the years 2000–2004.

The report also examines the current status of HIV infection among young people. It underscores, among other trends, gender differences in the HIV/AIDS epidemic, using data from the population-based HIV serosurveys. An overview assessment is provided of the surveillance system status, especially HIV surveillance among ANC attendees in the Region.

Data are derived from the surveillance of HIV infection among ANC attendees and STI prevalence studies/surveys among the same group; population-based HIV serosurveys conducted in selected countries; and behavioural data, mainly from the demographic and health surveys (DHS) and behavioural surveillance surveys (BSS). Additional data are drawn from selected special studies and research.

Out of 46 countries in the Region, 32 countries, or 70%, collected and reported information on HIV prevalence among pregnant women attending ANCs in 2003–2004. Moreover, 17 have conducted national population-based HIV serosurveys since 2000. More than 20 countries are preparing to conduct or repeat similar surveys in the next biennium.

This analysis is intended to provide information for the National AIDS Councils, ministries of health and all in-country stakeholders, United Nations agencies, and international development partners. The information serves as a technical support tool for advocacy and resource mobilization, planning and designing of HIV/AIDS interventions to enhance national response.



## 2 HIV surveillance systems in Africa: recent developments

In January 2004, a conference was convened in Addis Ababa, Ethiopia to explore new strategies for surveillance in resource-constrained countries, and for its use in monitoring and evaluating HIV activities. The newest approaches and lessons learned for HIV/AIDS surveillance were summarized in a report and technical publications based on that conference (Diaz T, Buvé M, 2005). Recommendations were made for countries as well as bilateral and multilateral donors to improve HIV surveillance in countries.

### HIV surveillance among ANC attendees: pregnant women

Most countries in the WHO African Region have generalized epidemics, i.e. epidemics in which HIV prevalence among ANC attendees consistently exceeds 1%. In most countries worldwide, HIV surveillance systems rely on monitoring prevalence mainly among this population. This is because the prevalence of HIV among pregnant women is a good indicator of the epidemic's spread in the general population, since the level of HIV infection among pregnant women is similar to that in the general population of men and women aged 15–49 years (Zaba and Gregson, 1998). As a system, HIV surveillance among ANC attendees is also relatively affordable and much cheaper than, for example, the national population-based HIV serosurveys.

More countries have been reporting HIV sentinel surveillance among ANC attendees (Table 1). In 2003–2004, 32 countries (70%) reported HIV sentinel surveillance data as compared to 29 countries in 2002. Most of the countries that have recently emerged from conflicts, such as the Democratic Republic of the Congo, Eritrea and Sierra Leone, have renewed their efforts and managed to re-establish HIV sentinel surveillance systems among ANC attendees. Other countries like Angola are advanced in setting up regular ANC HIV sentinel surveillance.

Many countries have expanded the HIV surveillance 'monitoring' system among ANC attendees to increase the geographical distribution and coverage of the sentinel sites. With nearly two thirds of the Region's population living in rural areas, they have sought especially to increase rural representation. Out of the 770 ANC HIV sentinel sites used in 2003–2004, 240 (about 31%) were located in rural areas. This move to increase the number of rural sites being used could affect trends in country-median HIV prevalence. The available HIV prevalence data indicate that the Region's rural areas, especially those in the eastern Africa subregion, have lower rates than urban areas.

HIV surveillance among ANC attendees remains vital to monitoring HIV trends and the epidemic's progress. Most countries in the Region continue to rely chiefly on using ANC attendees to monitor both trends in the HIV infection and its magnitude. Blood specimens taken during routine antenatal care, for example for syphilis serology, are unlinked and screened anonymously for HIV antibodies.

Most countries in the Region conduct ANC sentinel surveillance once every year or two, depending on the national HIV sentinel surveillance protocol/guidelines. At each of the sentinel sites (with the exception of South Africa), 300–500 first-time ANC attendees are recruited in a period of 6 to 8 weeks. In the rural areas, where ANC attendance rates may be low, countries usually extend the sampling period to 10–12 weeks. In South Africa, over 400 clinics are selected using probability proportionate to size every year and at each of the selected clinic sites, 40–50 first-time ANC attendees are recruited. The short sampling period of 6 to 8 weeks allows for estimation of point prevalence.

In 2004, a review of the quality of HIV surveillance systems worldwide concluded that the trend among the 53 countries with generalized epidemics (most of them in Africa) has been toward improved HIV surveillance systems, with 58% of the countries having a fully implemented system, an increase from 24 to 31 countries (Calleja et al. 2004).

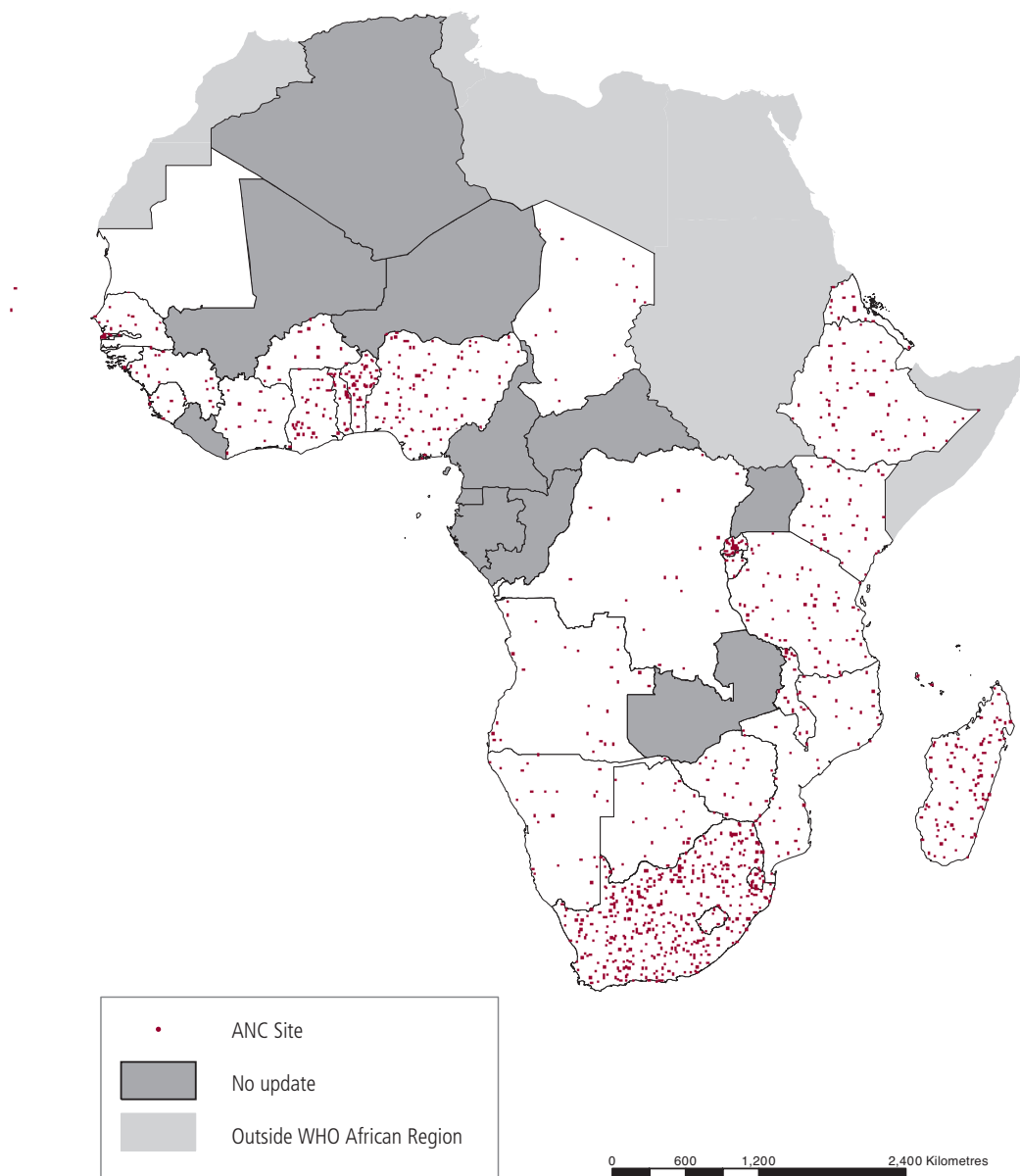


### ANC HIV sentinel surveillance and data on prevention of mother-to-child transmission (PMTCT)

The use of anonymous unlinked HIV testing among ANC attendees in HIV sentinel surveillance when there are available ARVs and MTCT programmes being put in place has been questioned. WHO and its main partners in HIV surveillance – like the Centers for Disease Control and Prevention (CDC) and UNAIDS – have been conducting comparisons of MTCT- and ANC-based data in the same sites in several countries in the Region. Results are still preliminary and discordant in some countries. Eventually, if MTCT coverage approaches 80–90% in country and if the information systems are sound and yield reliable results as well as similar data to that obtained from ANC HIV sentinel surveillance, then ANC HIV surveillance as such could eventually disappear. However, for now, it remains the cornerstone of HIV sentinel surveillance systems in the Region and in many other countries worldwide.

Fig. 1

ANC HIV sentinel surveillance activity in the WHO African Region, 2003–2004



Increasing the number of sentinel sites and expanding HIV sentinel surveillance systems are both good, if really necessary. However, for countries to produce high-quality data, using sentinel sites consistently and maintaining good supervision of ANC HIV surveillance activities is crucial. Available information from country reports shows that countries have improved supervision of ANC HIV sentinel surveillance activities. Consistent use of sites remains an issue in some countries. Figure 2 illustrates a decreasing number of total ANC sites in 2003–2004 as compared to 2002. This may be attributed to several countries conducting population-based surveys and being preoccupied with these surveys. There are 20 countries preparing to conduct surveys, and even countries like Mali and Zambia are planning their second population-based survey with HIV testing. But generally, since 2000, there has been an improvement in the number of sites being used in the WHO African Region for surveillance of HIV among ANC attendees.

Fig. 2

Number of ANC sentinel sites used by year, 1991–2004

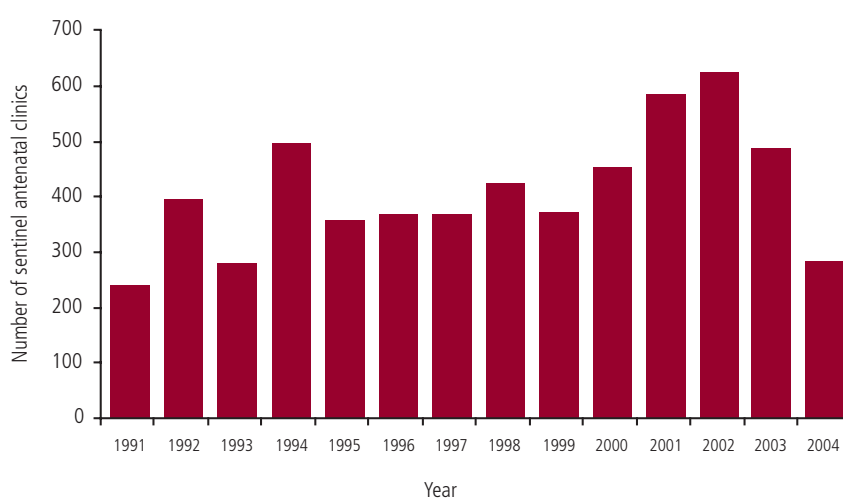


Table 1

## ANC HIV sentinel surveillance activity in the WHO African Region by country

Countries	Total population (thousands)	Urban population (%)	ANC coverage (%)	Year of last ANC round and data available	No. of ANC sites	HIV data available on young people Yes or No
<b>Southern Africa</b>	<b>121 356</b>	<b>42</b>				
Angola	14 078	35	-	2004	25	N
Botswana	1 795	49	97	2003	21	Y
Lesotho	1 800	29	88	2003	6	Y
Malawi	12 337	15	90	2003	19	N
Mozambique	19 182	33	71	2004	36	N
Namibia	2 011	31	91	2004	24	N
South Africa	45 214	58	94	2003	400	Y
Swaziland	1 083	27	-	2004	17	Y
Zambia	10 924	40	96	2002	24	Y
Zimbabwe	12 932	36	93	2004	19	Y
<b>Eastern Africa</b>	<b>189 056</b>	<b>22</b>				
Burundi	7 068	9	79	2003	7	Y
Eritrea	4 297	19	49	2003	12	Y
Ethiopia	72 420	16	27	2003	65	Y
Kenya	32 420	34	76	2003	35	Y
Rwanda	8 481	6	92	2003	24	Y
United Republic of Tanzania	37 671	33	93	2004	57	Y
Uganda	26 699	15	91	2002	17	N
<b>Central Africa</b>	<b>89 847</b>	<b>37</b>				
Cameroon	16 823	50	75	2002	27	Y
Central African Republic	3 912	42	67	2002	48	Y
Chad	8,854	24	42	2003	16	Y
Congo	3 818	66	-	2002	5	N
Democratic Republic of the Congo	54 417	31	-	2004	12	N
Equatorial Guinea	507	49	37	No system	-	na
Gabon	1 351	82	94	2003	3	N
Sao Tome and Principe	165	48	-	No system	-	na
<b>Western Africa</b>	<b>284 009</b>					
Algeria	33 339	58	58	2000	5	N
Benin	6 918	43	80	2003	39	Y
Burkina Faso	13 393	17	61	2004	12	Y
Cape Verde	473	64	99	2004	5	N
Côte d'Ivoire	16 897	44	88	2004	12	N
Gambia	1 462	31	-	2004	6	N
Ghana	21 377	36	88	2004	34	Y
Guinea	8 620	28	71	2004	18	N
Guinea Bissau	1 538	32	62	No system	-	na
Liberia	3 487	45	83	No system	-	na
Mali	13 409	31	47	2002	9	Y
Mauritania	2 980	59	48	2001	13	N
Niger	12 415	21	41	2000	5	Y
Nigeria	127 177	45	64	2003	86	Y
Senegal	10 339	48	77	2003	12	N
Sierra Leone	5 168	37	68	2003	8	N
Togo	5 017	34	82	2004	19	Y
<b>Indian Ocean</b>	<b>20 004</b>					
Comoros	790	34	74	2004	3	N
Madagascar	17 901	30	73	2003	94	N
Mauritius	1 233	42	-	No system	-	na
Seychelles	80	65	-	2003	ns	ns
<b>WHO African Region</b>	<b>704 272</b>	<b>36</b>				

Y=Yes, N=No, na=not available, ns=not specified

### New insights into HIV infection: national population-based HIV serosurveys

In the last four to five years there has been renewed interest in conducting national population-based HIV serosurveys in the WHO African Region, where, out of 46 countries, 17 have carried them out since 2001 (Table 2). In 2001, an additional two countries (Eritrea and Guinea) conducted population-based surveys in subpopulations considered vulnerable and at higher risk to HIV infection. Nearly 20 other countries are planning to conduct them or already are.

Countries in the Region have adopted two major approaches to conducting national population-based serosurveys. Cameroon, Ghana, Guinea, Kenya, Lesotho, Malawi, Mali, Senegal, Tanzania Mainland (United Republic of Tanzania) and Zambia have added an HIV testing component to the already-planned Demographic and Health Surveys, now widely referred to as DHS+. Burundi, Niger, Sierra Leone, South Africa, Uganda, Zanzibar (the United Republic of Tanzania) and Zimbabwe have carried out special HIV/AIDS surveys, some of them called AIDS Indicator Surveys (AIS). The choice of what type of approach to adopt has depended mainly on the survey's objectives and availability of financial resources.

Table 2

#### Recent experience with national population-based HIV prevalence surveys in the WHO African Region, 2001–2004

Country	Year of survey	Type of survey: DHS or HIV/AIDS special survey?	Study population by age in years (men and women)	Specimen collected
Mali	2001	DHS	15–49	Dried blood spot
Zambia	2001/2002	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Zimbabwe	2001–2002	Young adult HIV/AIDS	15–29	Dried blood spot
South Africa	2002	HIV/AIDS	2 years and above	Saliva (mucosal transudate)
Zanzibar*	2002	HIV/AIDS	10 years and above	Dried blood spot
Niger	2002	HIV/AIDS	15–49 years	Dried blood spot
Sierra Leone	2002	HIV/AIDS	15–49 years	Dried blood spot
Burundi	2002	HIV/AIDS	12 years and above	Venous blood
Kenya	2003	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Ghana	2003	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Burkina Faso	2003	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
United Republic of Tanzania Mainland*	2003	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Cameroon	2004	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Uganda	2004	HIV/AIDS	0–4 years, 15–59 years	Venous blood
Senegal	2004	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Guinea	2004	DHS	15–49 years	Dried blood spot
Lesotho	2004	DHS	Women 15–49 years Men 15–59 years	Dried blood spot
Malawi	2004	DHS	15–49 years	Dried blood spot

\*From the United Republic of Tanzania

In the epidemic's early stages in the late 1980s, only four countries (Burundi, Côte d'Ivoire, Rwanda and Uganda) conducted national population-based HIV prevalence surveys and only Rwanda conducted one in the 1990s.

Currently, there are less invasive techniques that can be used to collect specimens in population-based HIV serosurveys. Some of these technologies include collection of blood onto a filter paper using a finger prick (dried blood spots) and saliva (mucosal transudate), using a specially treated absorbent pad attached to a plastic stick that is placed between the cheek and gum.

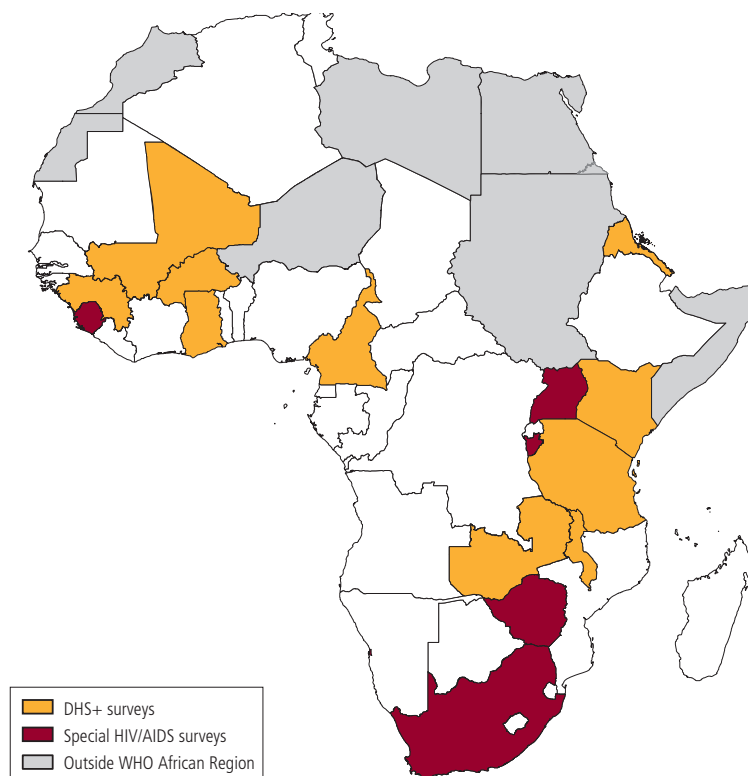
Although most of the population-based surveys collected behavioural information, they did not link HIV results to individual questionnaires. However, in 2003, the Kenya DHS + did link an HIV prevalence component with the anonymous questionnaires. This approach makes possible a further analysis of risk factors and provides a better understanding of HIV dynamics in the populations. Since then, most of the DHS+ have been using anonymous-linked methods.

Population-based surveys provide information on both men and women. Clearly, the nature of ANC HIV surveillance makes provision of information on men impossible. However, the nature of sampling techniques applied in population-based surveys, makes it possible to include the 'real and remote' rural populations, which ANC sentinel surveillance does not usually capture.

Population-based HIV prevalence surveys should not, however, be considered as the gold standard even if they are conducted on a much wider cross section of the population than ANC sentinel surveillance. Nor should they be taken as a substitute for ANC sentinel HIV surveillance, rather, the data generated by them should constitute a valuable addition to the data accruing from other HIV surveillance systems. All population-based surveys have non-response bias and they exclude persons living in special institutions such as schools, hostels and hospitals. For national population-based surveys to be cost-effective they need to be repeated every 5–10 years and thus are not 'ideal' for monitoring trends since the countries have to wait for at least 15 years to get enough data points to assess them. The UNAIDS/WHO Surveillance working group on HIV/AIDS/STI has published guidelines recently on how to conduct HIV population-based surveys and how to reconcile their results with ANC-based surveillance data to improve HIV/AIDS estimates (WHO/UNAIDS, 2005).

Fig. 3

**Population-based HIV prevalence surveys in the WHO African Region, 2000–2004**



### Special populations surveys/studies: the forgotten populations

Special populations are defined as populations whose sexual behaviours make them vulnerable or which have a higher risk to HIV infection. These subpopulations include sex workers and their clients' 'bridging populations', long-distance truck drivers, military, STI patients, migrant labourers and youth.

In the 1980s, a number of countries in the WHO African Region extensively monitored HIV prevalence among sex workers and other populations, especially STI patients and long-distance truck drivers. Since then, surveys among sex workers and other special groups have tended to be conducted infrequently. Even in countries with concentrated and low-level epidemics, where surveillance of special groups is the cornerstone to HIV surveillance, it is not done or is conducted irregularly.

Since the 1980s, only Senegal has consistently monitored trends in HIV infection among sex workers. A number of other countries such as Angola, Benin, Burkina Faso, the Democratic Republic of the Congo, Eritrea, Guinea, Niger, Togo and the United Republic of Tanzania have collected data on HIV prevalence among sex workers in urban areas for the period 2001–2002. Some countries, like Kenya, Nigeria and South Africa, have conducted assessments or biological behavioural surveillance surveys (BBS) among injecting drug users (IDUs).

In 2003, Benin conducted an HIV prevalence survey among STI patients, which it has been doing since 1996. Seychelles has also been conducting HIV prevalence studies among this population since 1990 (Seychelles MoH, 2004).

In the past, some other countries such as Algeria, Lesotho, Namibia, Nigeria, Swaziland and Uganda have carried out HIV surveillance among STI clinic attendees. However, over time, there has been a decreasing trend in the number of countries conducting HIV surveillance among STI clinic attendees. HIV prevalence among STI patients is an indicator of the epidemic's severity but its value in monitoring HIV trends is limited because HIV prevalence among STI patients is affected by many factors, including health-care-seeking behaviours; lack of a well-defined population attending a clinic; outbreaks of STIs as well as availability of health personnel and drugs at the clinics.

Other special populations studied extensively in the past have included military recruits, tuberculosis (TB) patients and long-distance truck drivers, but lately surveillance activities in these groups have been very limited. Senegal conducted an HIV surveillance survey among TB patients in five sites in 2002 and 2003. Monitoring of HIV prevalence among TB patients can be used as an entry point for other programmes, such as counselling, care and treatment with ARVs. Recent guidelines on how to monitor HIV infection among TB patients were published in 2004 as well.

Questions have arisen as to what role special groups such as sex workers and bridging populations play in transmitting HIV to the general population. In a study conducted in Cotonou, researchers concluded that most of the transmission in the capital city was due to clients of sex workers transmitting HIV to their partners (Lowndes et al., 2002). Similar results were found in Accra in 2004, where a study among sex workers' clients and their partners concluded that most of the HIV infection cases in the capital were due to transactional sex (Coté et al., 2004). Thus, it seems that paid sex is an important factor in HIV dissemination at least in countries with relatively low HIV prevalence. These bridging populations may be playing an important role in countries with high HIV prevalence rates.

In countries with low-level epidemics, monitoring of HIV, STIs and sexual behaviours in special populations (e.g. sex workers, military recruits, long-distance truck drivers and STI patients), who are at higher risk for HIV infection, is the backbone of HIV surveillance. Studies conducted in the Region show that there is substantial sexual mixing between populations at higher-risk for HIV infection and the general population. Thus, HIV infections in the populations at higher risk for HIV infection have a bearing on the dynamics of the spread of HIV. Monitoring of HIV prevalence trends in these special populations is useful for determining the "hotspots" of infections and hence directing the design of appropriate and timely interventions in both countries with low-level and generalized epidemics.

### **AIDS case and laboratory HIV surveillance reporting**

Countries with a low-level HIV epidemic such as Algeria, Mauritius and Seychelles continue to focus their surveillance activities around AIDS case reporting and laboratory HIV infection surveillance. AIDS case reports are valuable in these countries for advocacy and planning purposes.

The focus and interest in AIDS case reporting in many countries in the WHO African Region has waned, especially in those countries with generalized epidemics. Universal AIDS case reporting is a rich source of information for advocacy and planning short-term interventions, but the Region's experience with it has largely been incomplete, and hence limits the value of the generated AIDS case data in the national response to HIV/AIDS.

Surveillance of AIDS cases monitors infections that occurred many years back. Since HIV infection is latent, countries that focus only on AIDS case surveillance are likely to miss hidden epidemics and risk factors. This may result in delays in providing timely action. With increasing accessibility of ARVs in the Region, the implications for ARVs on reported AIDS cases are not yet known.

In 2004, there was a consensus meeting held to review clinical staging and AIDS surveillance definition in the era of antiretroviral treatment (ART). The new guidelines for clinical staging of an HIV advanced illness surveillance were published in 2005. These new recommendations were developed in light of the scaling up of ART, which is increasingly a major public health activity in the WHO African Region. New recommendations and tools for HIV/AIDS case surveillance are being created and will be implemented in the coming years.

### **Behavioural surveys**

The last decade has seen considerable progress in collecting behavioural data. Information on sexual behaviours contributes to understanding HIV infection trends. The DHS are the main sources of data on behaviours in the Region. They are conducted every five years in many countries worldwide, including in the WHO African Region. Other sources include the BSS, and the UNICEF Multiple Indicator Cluster Surveys. Because it takes some time before any noticeable change in behaviours is registered among the general population, behavioural surveys need to be repeated at least at a five-year interval in the general population in order for them to detect behaviour trends.

International organizations and in-country stakeholders have reached a consensus on the questions and key indicators to monitor. Some of the key indicators include higher-risk sex in the last year (defined as sex with a non-marital, non-cohabiting sexual partner), condom use at the last sex with a higher-risk sexual partner; median age at first sex among young people aged 15–24 years; premarital sex among 15- to 24-year-olds; and condom use during premarital sex among 15- to 24-year-olds. The standardization of questions and indicators allows for comparison within and between countries.

### **Measuring HIV incidence**

HIV incidence, defined as the rate of new HIV infections over a defined period of time, is also known as the rate of HIV seroconversion. The gold standard method for estimating HIV incidence is through prospective cohort studies that measure the rate of new infections in a well-defined group of at-risk individuals followed over time. However, prospective cohort studies that measure HIV incidence are logistically difficult to implement, prone to biases that can distort the resulting estimates of HIV infection observed and very expensive.

Over the last decade, a variety of laboratory assays have been developed to estimate HIV incidence using cross-sectional data. Unfortunately most of them were useful only for B subtype. CDC has been developing a promising new assay for the detection of recent HIV infection in resource-constrained settings – the BED-capture enzyme immunoassay (BED-CEIA). This assay uses a multi-subtype synthetic peptide and measures the increasing proportion

of HIV-IgG to total IgG after seroconversion. The advantage of the BED-CEIA is that it has a single-window period, regardless of the subtype of infection; therefore, it is designed to work well in populations with different HIV-1 subtypes.

BED-CEIA has been successfully evaluated in populations in B and E subtypes in the United States of America and Thailand, as well as in cohorts from Ethiopia, India, Kenya, the Netherlands and Zimbabwe, and which comprise A, B, C, and D subtypes (Bharat Parekh, personal communication). In all evaluations, specimens yielded a range of normalized optical densities that correlate well with time since seroconversion. In addition, the assay has been successfully implemented in cross-sectional studies in Cambodia, Ethiopia, South Africa, Thailand and the United States (Hu, 2003; Nesheim, in press; Vonthanak, in press). Surveillance for new infections using these developed assays has not yet been established in the WHO African Region. But BED has been tested in Ethiopia and South Africa and training of laboratory technicians in these assays has been undertaken by CDC in Rwanda and South Africa.

Studies on HIV incidence are the best method for monitoring the occurrence of new infections. HIV-1 incidence data can provide point estimates of the current state of HIV-1 transmissions and help target valuable resources in a timely manner. The successful impact of interventions can be confirmed many years earlier when using incidence data. HIV incidence data would be an important complement to the HIV prevalence data from the existing HIV surveillance systems.

### **Estimating the burden of HIV infections: increasing capacity for making HIV/AIDS estimates and projections at country level**

Almost all the Region's countries use surveillance data primarily from ANC sentinel surveillance to perform estimates and projections. To maximize the use of surveillance data, UNAIDS and WHO, in collaboration with other partners, have developed software using mathematical models to assist countries in making country HIV/AIDS estimates. In a series of 12 regional workshops, from April–September 2003, 261 national epidemiologists from 127 countries worldwide, including those from all 46 countries in the WHO African Region were trained to use the developed tools relevant to their level of the epidemic (Garnett et al., 2004). In February 2005, training of trainers (TOT) was also conducted. Currently, most countries in the Region are able to perform their own estimates and projections as a result of these trainings. The mathematical models used in the WHO African Region are the Estimation and Projection Package (EPP), Spectrum Projection Package and the Workbooks.

EPP provides a framework within which HIV surveillance data can be explored, generating a national representation of the epidemic to date. EPP allows for stratification of the national population into groups and allows the appropriate weighting of surveillance data to be user-defined, taking into consideration the epidemiological situation. The Spectrum Projection Package allows for exploration of the impact of AIDS on the population. Details on these models and the workbooks can be obtained in *Methods and tools for HIV/AIDS estimates and projections* (Garnett et al., 2004).

Based on the estimates made using the models described above, the WHO African Region remains the worst-affected region with HIV/AIDS in the world. It has close to two thirds of all the people living with HIV/AIDS. At the end of 2003, some 26 million people (estimated range from 23.8–28.9 million) in the Region were living with HIV/AIDS, meaning that 7 out of 100 adults between 15–49 years of age are HIV-infected. In 2003 alone, an estimated 3 million people in the Region became newly infected with HIV while 2.2 million died of AIDS (UNAIDS, 2004). The HIV/AIDS epidemic has negated many of the health, social and economic gains in the worst-affected countries in the Region, including child survival and life expectancy.



### **HIV/AIDS estimates and ART needs: antiretroviral treatment requirements among HIV-infected people**

WHO launched the 3 by 5 initiative in December 2003, aiming to put 3 million people on ART by December 2005. However, this represents only about half of the total needs. The new strategy being proposed by the G8 and the UN 2005 World Summit is called *Universal Access by 2010*. To achieve this goal through effective programme development and strategy implementation, ART needs for each country must be estimated accurately. The methodology as well as the tools and instruments to estimate the number of people requiring ARV treatment has been based on the estimates done using the tools described above. They employ ANC HIV sentinel surveillance data generated by WHO African Region countries to estimate HIV incidence, HIV prevalence, and AIDS-mortality.

In summary, the number of adults with advanced HIV infection who are eligible for ART is estimated as the number of people who will die this year and next without ART. Spectrum software calculates the total number of adults in need of ART by adding the number of adults newly in need of it in a given year, the number of adults who were on treatment in the previous year and survived into the current year, plus those who were in need last year, but have not yet been put on treatment.

The WHO treatment guidelines in 2003 recommended that in resource-limited settings, HIV-infected adults and adolescents should start ART therapy when the infection has been confirmed and there are signs of clinical advanced disease (HIV disease stage IV, regardless of CD4 cell count; stage III with CD4 cell count below 350 cells per mm<sup>3</sup>) or laboratory evidence of severe immunosuppression (CD4 cell count below 200 per mm<sup>3</sup> or, if not available, lymphocyte count below 1200 mm<sup>3</sup> with symptomatic disease).

According to the assumptions described above, about 4.7 million people (0–49 years) need ARV in the WHO African Region. Extreme variation among countries exists since countries with more mature epidemics would have a higher proportion of people requiring ARV. ART needs will be growing in the near future since ART coverage has been increasing in Africa (from 3% in December 2003 to 11% in June 2005). On the other hand, the need for ART is underestimated since people 50 years old and older are not yet included. This is because the models currently used only provide estimates of HIV/AIDS for children and adults 15–49 years old. Changes in treatment guidelines and decisions on when to start ART treatment will influence the total requirement for ART in countries.

With scaling-up of ARVs, drug resistance has become a public health issue as countries with more advanced programmes in ARV have shown some degree of HIV drug resistance (HDR) among treated and untreated patients. To address this issue, for the last few years WHO has been coordinating WHO HIVResNet, a network of experts, institutions and partners collaborating on HDR issues.

### 3 HIV/AIDS in Africa: the current situation

The current situation concerning HIV infection levels in the WHO African Region is presented below using data primarily generated by ANC sentinel surveillance in the period 2003–2004 and, in selected countries, from the population-based HIV serosurveys conducted in the Region since 2000.

#### ANC attendees

Of the 46 countries in the WHO African Region, 32 (70%) had information on HIV prevalence among pregnant women attending ANC during the period 2003–2004.

Data from HIV prevalence among ANC attendees show marked diversity and wide variations in HIV prevalence rates within the countries, between countries and between subregions. In 2003 and 2004, the median HIV prevalence rates varied from <1% in Comoros, Seychelles and Madagascar, Cape Verde to 38.5% in Botswana and 42.2% in Swaziland (Table 3).

HIV prevalence rates among ANC attendees in countries in southern Africa are much higher than HIV infection rates in other parts of Africa. With the exception of Angola in 2003–2004, all southern African countries had median HIV prevalence rates exceeding 15%. The median HIV prevalence among ANC attendees in Angola was 2.4%. But even within the southern Africa countries themselves, there are variations in those rates. In 2003–2004, median HIV prevalence rates among ANC attendees varied from 2.4% in Angola to 16.2% in Mozambique, 27.9% in South Africa and 42.2% in Swaziland.

ANC attendees in other parts of the WHO African Region have median HIV prevalence rates of less than 10%. The median HIV prevalence rates among ANC attendees in eastern African countries varied from 1.8% in Eritrea to 8.5% in Ethiopia in 2003–2004. Three of the eastern countries of Ethiopia, Kenya and the United Republic of Tanzania (mainland) have median HIV prevalence rates that are close and almost similar (8.5% in Ethiopia, 8.0% in Kenya and 7.0% in the United Republic of Tanzania). Uganda had no 2003–2004 data to make a comparison possible but the data on HIV prevalence from the recent population-based survey conducted there corroborates this finding.

Most countries in western Africa have country median HIV prevalence rates among ANC attendees of below 5%, with the exception of Côte d'Ivoire. Median HIV prevalence rates among ANC attendees varied from 0.3% in Cape Verde to 1.4% in Gambia and 8.3% in Côte d'Ivoire.

Data from countries in central Africa for the period 2003–2004 were limited. The median HIV prevalence rates among ANC attendees from the three countries that had data varied from 4.2% in the Democratic Republic of the Congo to 5.9% in Gabon.

ANC attendees in Chad had an HIV prevalence of 4.6%. No data were available among ANC attendees in Cameroon and the Central African Republic for 2003–2004, the two countries in the subregion that had the highest prevalence rates of 10.3% and 14.8% respectively in 2002.

Table 3

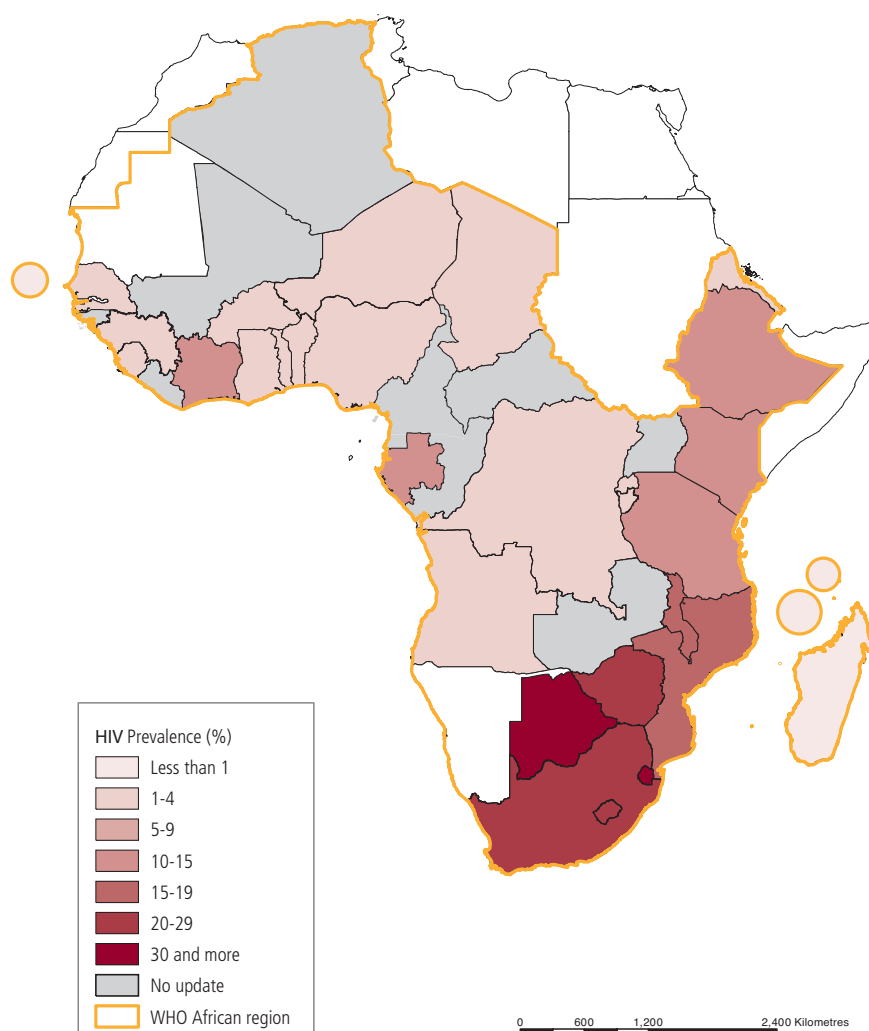
**Median HIV prevalence (%) among women attending ANC, by year and location in 2003–2004**

Countries by subregion	Year	All sites		Urban sites		Rural sites	
		N	HIV Prevalence	N	HIV Prevalence	N	HIV Prevalence
Southern Africa							
Angola	2004	25	2.4	21	2.8	3	1.8
Botswana	2003	21	38.5	10	34.4	11	39.9
Lesotho	2003	6	28.4	2	31.0	4	27.6
Malawi	2003	19	17.0	3	20.8	16	16.6
Mozambique	2004	36	16.2	11	19.0	25	13.8
Namibia	2004	24	18.0	16	18.9	8	18.0
South Africa	2004	400	29.5	na	na	na	na
Swaziland	2004	16	42.2	7	44.5	9	40.3
Zimbabwe	2004	19	20.5	10	20.1	9	21.9
Eastern Africa							
Burundi	2003	7	4.8	4	6.1	3	2.1
Ethiopia	2003	65	8.5	37	11.3	28	3.0
Eritrea	2003	12	1.8	7	2.9	5	0.7
Kenya	2003	35	8.0	21	8.5	14	7.0
Rwanda	2003	24	4.6	11	6.4	13	2.8
Tanzania (Mainland)	2004	57	7.0	57	11.2	11	3.7
Central Africa							
Chad	2003	16	4.6	12	5.0	4	3.4
Democratic Republic of the Congo	2003	17	4.2	13	4.3	4	3.4
Gabon	2003	3	5.9	3	5.9	0	na
Western Africa							
Benin	2003	39	1.8	26	2.8	13	1.3
Burkina Faso	2004	12	2.5	6	2.7	6	1.5
Côte d'Ivoire	2004	12	8.3	12	8.3	0	na
Gambia	2004	6	1.4	2	1.4	4	0.8
Ghana	2004	34	3.1	23	3.4	11	2.8
Guinea	2004	18	4.2	9	4.1	9	4.3
Nigeria	2003	86	4.3	36	4.7	50	4.1
Senegal	2003	12	1.9	12	1.9	na	na
Togo	2004	19	3.6	10	5.5	9	1.8
Sierra Leone	2003	8	3.0	5	4.0	3	0.7
Cape Verde	2004	5	0.3	5	0.3	0	na
Indian Ocean							
Madagascar	2004	94	0.18	na	na	na	na
Comoros	2004	3	<1	na	na	na	na
Seychelles	2003	ns	<1	na	na	na	na

Countries not listed had no ANC data for 2003–2004; some of these countries not listed, e.g. Cameroon and Uganda, had population-based HIV prevalence data for 2004. na=data not available, ns=not specified. Semi-urban sites were considered as urban sites.

Fig. 4

**Median HIV prevalence among women aged 15–49 years attending ANC by country, in the WHO African Region, 2003–2004**



### Young pregnant women aged 15–24 years

While WHO African Region countries have improved in their reporting of age of pregnant women recruited into the ANC sentinel surveillance systems, as Table 1 illustrates, only less than half of these countries are including this information. Of the few countries that do collect data on age, a number of them focus on reporting the age of 15- to 19-year-olds. Prevalence among 15- to 19-year-old ANC attendees is a relatively unstable indicator of trends in HIV incidence and prevalence, and thus prevalence among the ANC attendees 15–24 years of age is a preferred measure. This makes it difficult to monitor the UNGASS indicator, which requires monitoring of HIV prevalence among the young ANC attendees aged 15–24 years. HIV prevalence among the 15- to 24-year-olds is used as proxy indicator of the new infections (incidence). HIV infections among 15- to 24-year-olds reflect more new infections than old infections.

Available ANC-based surveillance data indicate wide variations in HIV prevalence among young ANC attendees aged 15–24 years in the subregions, within countries and also between countries.

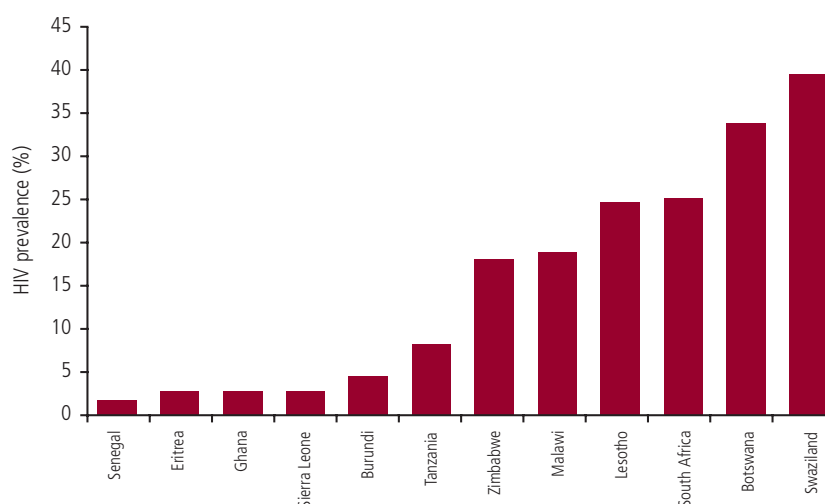
In 2003–2004, the HIV prevalence among young ANC attendees aged 15–24 years ranged from <1% in the Indian Ocean islands of Comoros and Madagascar to 33.6% in Botswana and 39.4% in Swaziland (Fig. 4). For Botswana and Swaziland, it means that 3–4 out of 10 young pregnant women aged 15–24 years are HIV-infected.

Countries in southern Africa have the highest HIV prevalence rates among ANC attendees aged 15–24 years, exceeding 15%, an indicator of an epidemic that is still growing at unacceptably high levels. These HIV infection rates in southern Africa are followed by those among ANC attendees in eastern Africa countries, which vary between 2.0% in Eritrea to 7.3% in the United Republic of Tanzania. These rates are also unacceptably high.

HIV infection rates among ANC attendees in western Africa are lower than those in eastern Africa but recent data indicate a gradual increase in HIV infection rates among 15- to 24-year-old ANC attendees aged 15–24 years in some countries in western Africa. An HIV prevalence of 1.2% among young ANC attendees aged 15–24 years in Senegal, which previously had rates of <1% indicates a growing epidemic.

Fig. 5

**Median HIV prevalence among young pregnant women aged 15–24 years attending ANCs in selected countries, 2003–2004**



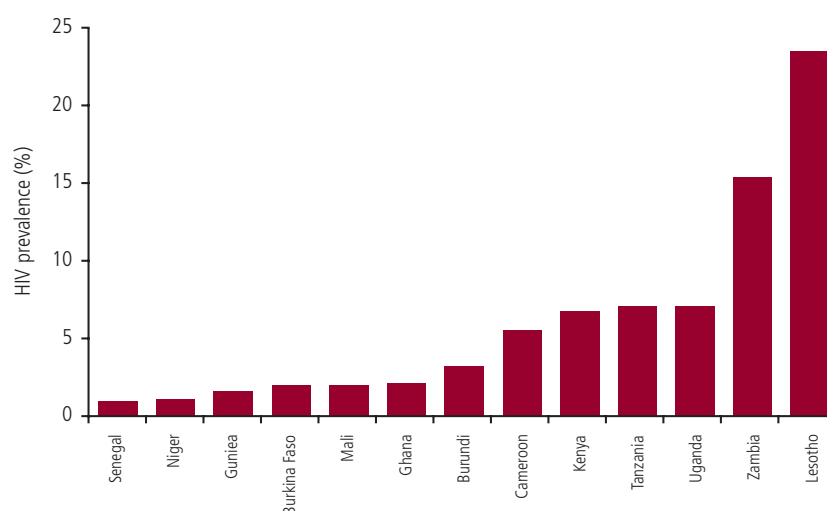
### Adult general population (women and men)

Population-based data show significant variations in HIV prevalence rates among the adult general population in the various countries, which corroborates findings from ANC-based HIV prevalence data showing that the WHO African Region does not have one uniform epidemic. Overall national HIV prevalence rates among the adult general population (men and women) aged 15–49 years vary from 0.7% in Senegal to 23.6% in Lesotho (Fig.6). The population-based data support ANC-based surveillance data findings, which show that southern African countries are the most infected, followed by eastern Africa countries and central and western African countries respectively.

Wide variations in HIV prevalence among the general population also exist within countries. For instance, in Senegal, rates varied from 0.1% in Dioubel region to 2% in Kolda region, while in Lesotho rates varied from 17.8% in Mokhotlong to 29.8% in Leribe.

Fig. 6

**HIV prevalence among the general adult population aged 15–49 years (men and women) in selected countries in the WHO African Region: data from population-based HIV serosurveys, 2001–2004**



### Women are more infected with HIV than men

Results from all the surveys conducted in several WHO African Region countries indicate that women are more infected with HIV than men, with the exception of the population-based survey results in Burkina Faso, where similar rates were found in men (1.9%) and in women (1.8%). The gender differences in HIV prevalence are more marked in the young age groups under 25 years of age (Table 4). Young women aged 15–24 years are about 2 to 5 times more likely to be infected than young men of the same age. Generally, women aged 15–49 years are about 1.3 to 2 times more likely to be infected than men. In Sierra Leone, which recently emerged from political conflict, women aged 15–49 years were more than 6 times as likely to be infected with HIV as men (0.2% for men vis-à-vis 1.3% for women).

Table 4

**HIV prevalence in the general population by age and sex: data from national population-based surveys in selected countries, 2000–2004**

Country	Men				Women			
	Response rate (%)	HIV prevalence			Response rate (%)	HIV prevalence		
		N	15–49 years	15–24 years		N	15–49 years	15–24 years
Burkina Faso	86	3065	1.9	0.6	92	4086	1.8	1.3
Burundi	na	2161	3.0	1.6	-	2338	5.0	3.6
Cameroon	89.8	5097	4.1	1.4	92.1	5252	6.8	4.8
Ghana	80	4054	1.5	0.1	89	5109	2.7	1.1
Guinea	90.6	2616	1.9	0.7	87.8	3772	1.5	0.6
Kenya	70	2879	4.5	1.3	76	3153	8.7	5.9
Lesotho	64.9	2041	19.3	6.3	78.1	3085	26.5	15.0
Mali	76	2978	1.3	0.3	85	3864	2.0	1.3
Niger	na	2988	0.8	0.3	-	3062	1.1	0.8
Senegal	75.6	3973	0.4	0.08	84.5	4278	0.9	0.5
Sierra Leone	68	991	0.2	na	na	1421	1.3	na
South Africa	58	2270	12.8	6.1	67	3555	17.7	12.0
The United Republic of Tanzania	77	4494	6.3	3.1	84	5735	7.7	4.1
Uganda	82.8	8201	5.8	2.0	88.1	10090	8.1	5.1
Zambia	73	1734	12.9	3.0	79	2073	17.7	12.0
Zimbabwe	76	3893	-	5.0	73	4305	-	18.0

Na=not available

### Urban–rural HIV prevalence differences

HIV prevalence rates among ANC attendees indicate marked differences in the HIV prevalence rates between urban and rural areas in almost all the countries in eastern Africa (Table 3). The picture in western Africa is mixed; in some countries slight differences exist in HIV prevalence rates among ANC attendees in urban areas and ANC attendees in rural areas, while in others the differences are large. The pattern is different in most of the southern African countries; HIV prevalence rates among ANC attendees in the urban clinics are close to those among ANC attendees in rural areas. In central Africa, there are small differences in HIV prevalence rates among ANC attendees in urban and rural areas. These urban–rural differences are confirmed by the results from population-based HIV surveys.

Generally, HIV prevalence data from population-based surveys are consistent with the observations in the ANC-based HIV prevalence data that HIV prevalence in rural areas is, in general, much lower than in urban areas. In eastern Africa, there are huge differences between HIV prevalence rates in rural and urban areas. On the other hand, there are small to large differences in HIV prevalence rates between urban and rural areas in western Africa countries.

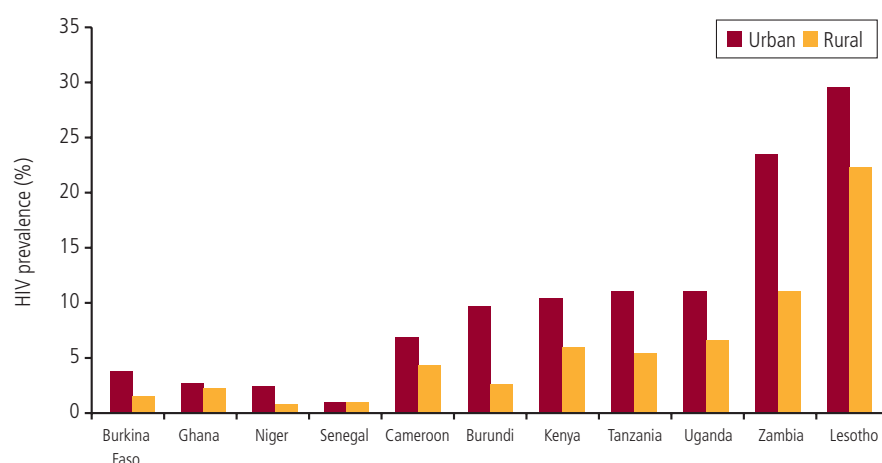
Population-based data show that in Burundi in eastern Africa, HIV prevalence rates among the general adult population in urban areas were more than three times those in rural areas (9.4% in urban areas versus 2.5% in rural areas).

In Kenya, Uganda and the United Republic of Tanzania, HIV prevalence rates in urban areas were almost twice those in rural areas (Fig. 7). Similarly, in Burkina Faso and Niger, in western Africa, HIV prevalence rates among the adult general population were about three times higher than those in rural areas. On the other hand, there was a slight difference in HIV prevalence rates among the general adult population living in urban and rural areas in Ghana (2.3% in urban areas and 2.0% in rural areas), while in Senegal, there was no difference in HIV prevalence in the general adult population living in urban and rural areas (0.7% in urban areas and 0.7% in rural areas). Population-based data showed a large difference in HIV prevalence between the general population in urban and rural areas in Zambia;

HIV prevalence in urban areas was almost double that in rural areas. In Lesotho, the difference between the HIV prevalence rate in the general population in urban areas (29.3%) and that in rural areas (22%) was not so large.

Fig. 7

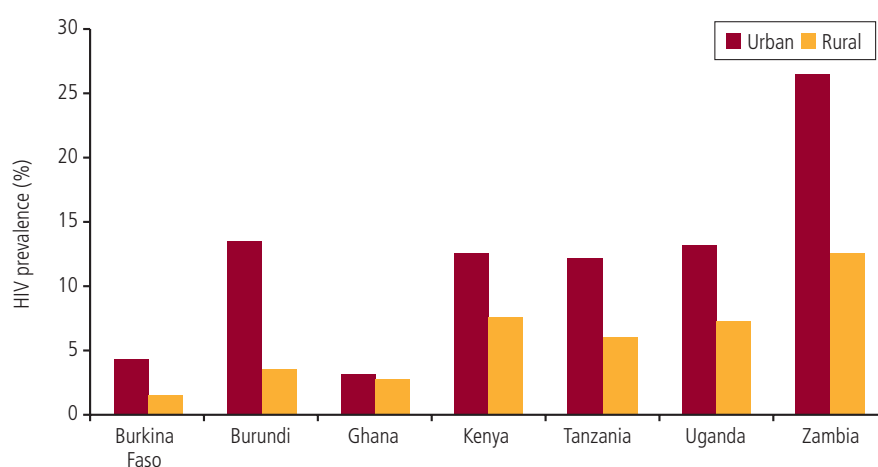
**Population-based HIV prevalence among men and women aged 15–49 years in rural and urban areas in selected countries, 2001–2005**



Data from population-based HIV prevalence surveys show that women and men residing in rural areas have much lower HIV prevalence rates than men and women living in urban areas (Fig. 7). In Burundi, HIV prevalence among women living in rural areas (2.9%) was six times lower than that of women living in urban areas (13%), while in Kenya, Uganda and the United Republic of Tanzania women in rural areas had almost half the rate of HIV prevalence found in women residing in urban areas. In Burkina Faso, HIV prevalence among women living in rural areas (1.2%) was three times lower than that among women living in urban areas (4%). In Ghana, however, the difference was not marked (2.9% for the women in urban areas versus 2.5% for women in rural areas). Similarly, men living in rural areas, with the exception of Ghana, had lower HIV prevalence rates than men in urban areas (Fig. 8).

Fig. 8

**Population-based HIV prevalence among women aged 15–49 years in rural and urban areas in selected countries, 2001–2004**



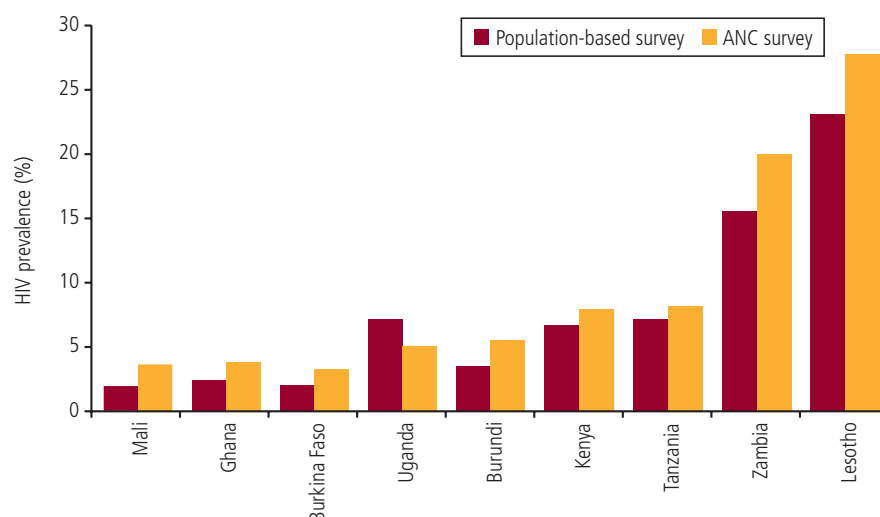


### Interpreting HIV results from population-based surveys and reconciling them with ANC sentinel surveillance data

In most countries, HIV prevalence as reported from population-based serosurveys tends to be somewhat lower than HIV prevalence observed among women attending ANCs, particularly in the young 15- to 19-year age group. But in some cases like Uganda, HIV prevalence from the population-based survey was higher than that shown by ANC sentinel surveillance (Fig. 9). However, direct comparison of HIV prevalence among women attending ANCs with HIV prevalence among both men and women combined in the same cluster of the population-based survey showed that the two sets of data were close, implying that HIV prevalence among pregnant women can be used as a proxy indicator for HIV prevalence levels and trends in the general population in countries with generalized epidemics (WHO/AFRO, 2002).

Fig. 9

**HIV prevalence among the general population (men and women) compared to median HIV prevalence among pregnant women 15–49 years attending ANCs in selected countries, 2001–2004**

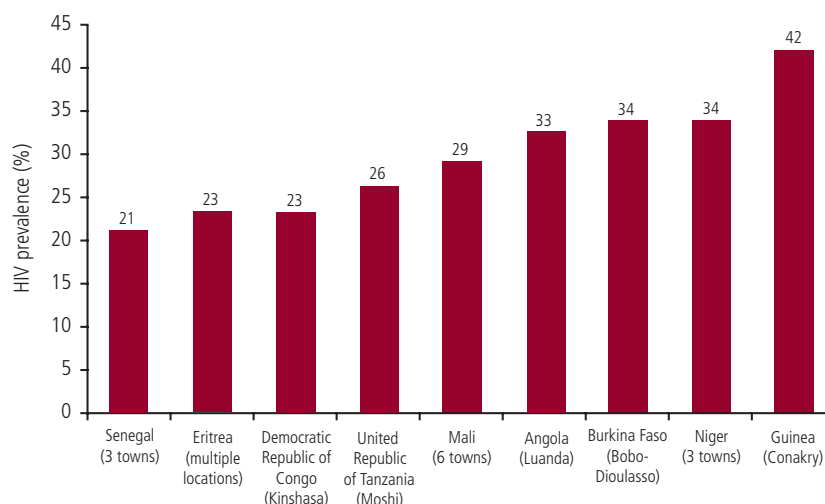


### The missing link: HIV prevalence in special populations

Recent data on HIV prevalence among special groups in the WHO African Region are limited. HIV prevalence surveys/studies are conducted infrequently. In countries with low levels of HIV prevalence, monitoring of the prevalence of HIV, STI and sexual behaviours in special populations at higher risk to HIV infection is the cornerstone of HIV surveillance.

In 2003, median HIV prevalence among sex workers studied in three sites in Senegal was 20.9% with a range of 10.9% (Fig. 10) in Thies and 30.3% in Ziguinchor. HIV prevalence among sex workers in Senegal's capital city Dakar was 20.9%. In 2001–2002, HIV prevalence among sex workers studied in towns in nine countries across the WHO African Region varied from 19% in Dakar (Senegal) to 42% in Conakry (Guinea). In the other towns, one quarter to one third of the sex workers are infected. For example, in Bobo-Dioulasso (Burkina Faso), Luanda (Angola) and six towns in Mali, HIV prevalence rates among sex workers were 34%, 33% and 29% respectively.

Fig. 10

**Median HIV prevalence among female sex workers in selected countries, 2001–2004**

Only Senegal and several other countries in western Africa have sufficient data to monitor HIV infection trends among sex workers – and only Senegal had data for 2003. Sex workers have persistently had much higher HIV prevalence rates, exceeding 20% in the WHO African Region, underscoring the need for appropriate interventions among these special populations. Recent data from Senegal indicate a slight, gradual increase in HIV prevalence among sex workers from levels below 20% since the 1980s to 20.9% in 2003 (Fig. 11). In 2003, HIV prevalence among sex workers increased in two of the Senegal sites. In Ziguinchor, the rates increased from 28.5% in 2002 to 30.3% in 2003 and in Dakar from 19% in 2001–2002 to 20.4% in 2003.

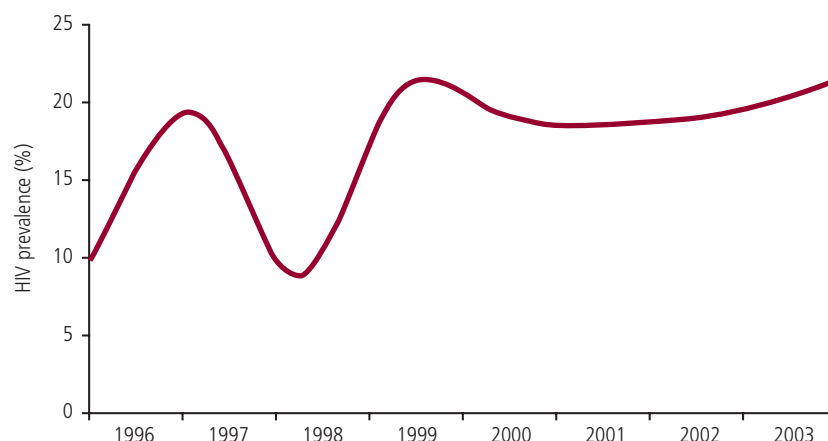
Côte d'Ivoire and Benin, which monitored trends in sex workers from 1991 to 1998–1999, indicated that sex workers in these countries had much higher rates than those seen in Senegal. In 1999, sex workers in Cotonou, Benin had an HIV prevalence rate of 40.6%; and this was a decline from 52% in 1994. In Abidjan, Côte d'Ivoire, the HIV prevalence rate among sex workers was 32% in 1998, a decline from 67% in 1994. The declines in the two countries were attributed to the increasing use of condoms (Ghys et al., 2002; Alary et al., 2002). No recent data exist on sex workers in Benin and Cotonou to assess whether the declines in HIV prevalence rates among them were sustained.

Two studies conducted in Ghana and Benin showed the role of sex workers and bridging population 'clients' in transmitting HIV in countries with generalized HIV epidemics. The major risk factor for HIV transmission in Accra and Cotonou were sex worker clients, who transmitted HIV to their partners (Lowndes et al., 2002; Coté, 2004). Female sex workers and possible other bridging populations seem to play a large part in transmitting HIV in west Africa. It is likely that these bridging populations are key actors in the HIV dynamics even in other WHO African Region countries with generalized epidemics.

Other populations like IDUs, are reported to exist in nine African countries, although their numbers and HIV prevalence are not very well known (Aceijas et al., 2004). A WHO rapid assessment study reported (Adelakan, 2000) that out of nearly 400 drug users in Lagos 9.6% were HIV-positive.

Fig. 11

Trends in median HIV prevalence in female sex workers in Dakar, 1996–2003



### The debate on HIV prevalence among children

The main mode of HIV transmission to children in the Region is from an infected mother to her child. Mother-to-child transmission occurs at a rate of 25–35% to children of HIV-infected women who are not receiving PMCT services. This transmission rate depends on a number of factors like the mother's viral load, breast-feeding practices and use of PMCT services, including the use of antiretroviral therapy (ART). Other modes of HIV transmission to children include contaminated injections, blood transfusions and sexual abuse. Without good health-care services, including use of ARVs, studies have shown that in the absence of treatment, most of the children infected with HIV die before the age of five years.

Data on HIV prevalence in children in the Region are limited. A population-based survey in Burundi in 2002 found children aged 12–14 years in the urban and rural areas with relatively low HIV prevalence rates of 1.5% and 0% respectively. On the other hand, a population-based survey conducted in South Africa in the same year found a relatively high HIV prevalence of 6.2% among children aged two to nine years (Shisana & Simbayi, 2002). There was no significant difference between HIV prevalence among girls (5.8%) and boys (6.5%). The authors considered unsafe injections to be a possible cause of HIV transmission to these children. However, epidemiological information on HIV and AIDS cases in the Region seem not to support this observation since AIDS cases among the 5- to 14-year age group (which is likely to have more injections since children at this age are more susceptible to tropical diseases like malaria) are much lower than those in adolescents and adults aged 15 years and above.

Following the findings of the South Africa, the Nelson Mandela Foundation commissioned further research into the HIV risk factors for HIV infection among children aged two to nine years. The study concluded that the overwhelming majority of children who were HIV-positive had HIV-positive mothers, thus the main mode of transmission was mother to child; only 1.4% of the children had negative mothers and could have had another mode of transmission (Shisana et al., 2005).

It has been demonstrated (Mulder et al., 1996) that seroconversions in children of HIV-negative women are rare: 0.12 seroconversions per 1000-person years. It was also found (Ekpini et al., 1997) that none of the children born to 274 women not infected with HIV seroconverted over a period of up to 48 months after birth.

### The variability of HIV: HIV subtypes

HIV-1 is characterized by high genetic variability, rapid evolution and diversification. The implications of HIV-1 variability for the virus transmissibility, differential pathology and disease progression may present a challenge for international strategies to control the HIV/AIDS pandemic, including international research efforts to develop safe and globally effective HIV vaccines.

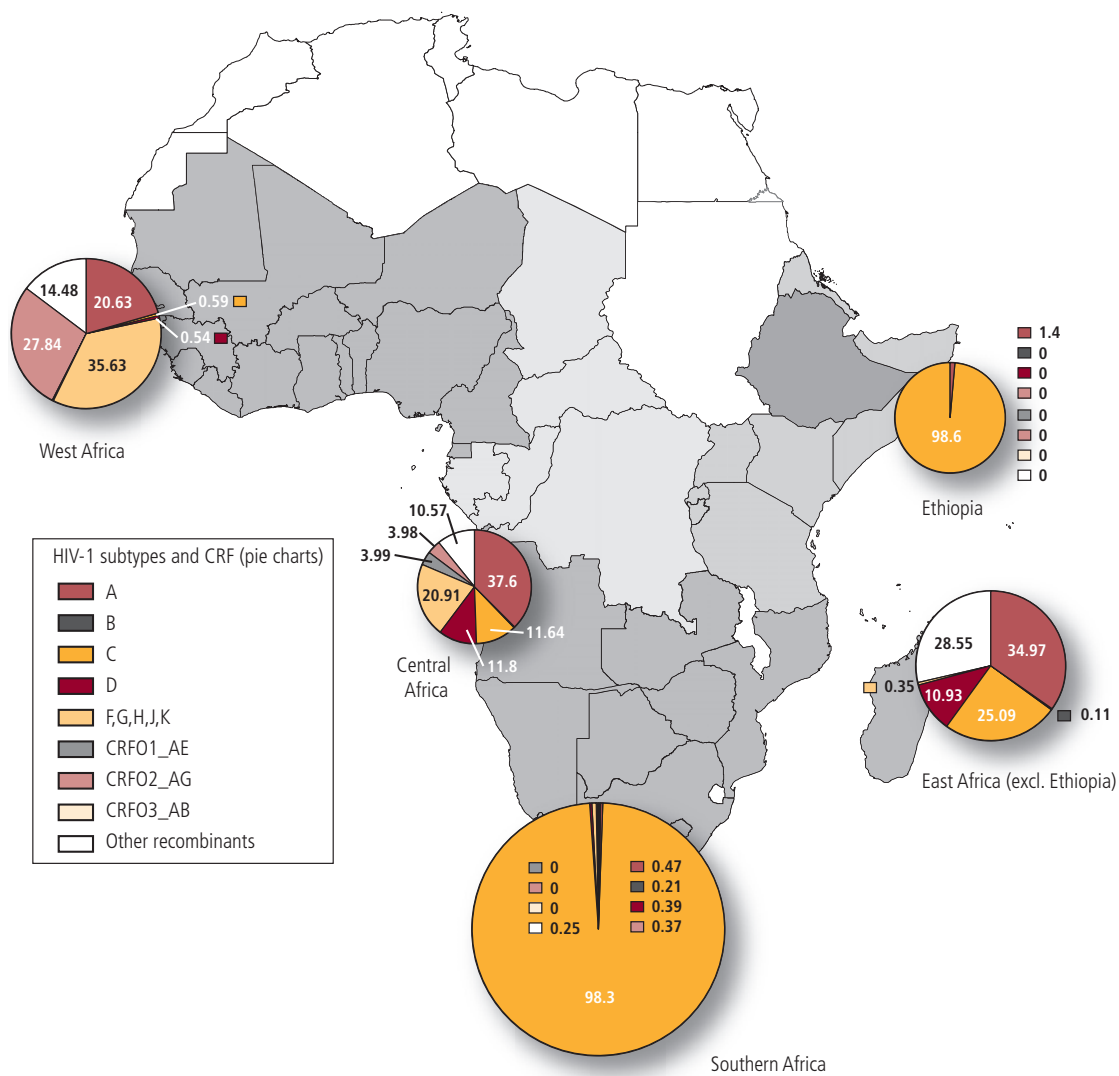
The current genetic classification of HIV-1 includes three genetic groups, namely a major group (group M), an outlier group (group O) and a non-M/non-O group (group N). Most of the globally prevalent HIV-1 strains are classified as group M viruses, which are further subdivided into different genetic subtypes, designated with letters from A to K. However, studies of the HIV-1 full-length (FL) genome sequences demonstrated complex patterns of HIV-1 inter-subtype recombination, which has resulted in identification of circulating recombinant forms (CRF), some of which start playing an important role in driving regional, newly emerging epidemics.

Multiple HIV-1 molecular epidemiology studies produced data on the global spread of HIV-1 subtypes. However, many of these studies were biased by a number of epidemiological constraints, mostly related to sample size, selection of appropriate target populations that were representative of leading modes of transmission, and incident cases of HIV infections. Establishing reliable surveillance mechanisms to monitor the contribution of specific genetic variants of HIV to the dynamics of the pandemic would be essential to fill these gaps. With this objective in mind, WHO and UNAIDS have conducted a study to estimate the current regional and global distribution of HIV-1 subtypes in 2005. The HIV epidemic in Africa is characterized by an extremely broad range of genetic diversity, in which most of the known genetic subtypes and CRFs could be found. The study's results are presented in Figure 12.

Overall, it was estimated that HIV-1 genetic subtypes and CRFs play a differential role in the regional sub-epidemics. The subtype C strains accounted for half (50%) of all infections worldwide. Subtypes A, B, D and G accounted for 12%, 10%, 3% and 6%, respectively. The subtypes F, H, J and K together caused 0.94% of infections. The circulating recombinant forms CRF01\_AE and CRF02\_AG were each responsible for 5% of cases. CRF03\_AB only plays a small role in eastern Europe and central Asia. Other recombinants accounted for the remaining 8% of infections worldwide. All recombinant forms taken together were therefore responsible for 18% of infections worldwide.

While there are certain regions that are dominated by one subtype of HIV, (e.g. subtype C in Ethiopia and southern Africa and CRF\_02 in west Africa), all other subregional epidemics are characterized by the presence of multiple genetic subtypes, CRFs and unique recombinant forms.

Fig. 12

Distribution of HIV-1 subtypes and CRF in the WHO African Region, 2000–2004<sup>a</sup><sup>a</sup> Size of circles is proportional to the number of infected people.

## 4 HIV/AIDS in Africa: recent HIV trends

The most significant and robust method of tracking the HIV epidemic over time is by following trends in HIV prevalence reported in the same sentinel surveillance sites. To obtain a summary (national figure) for the country, the median HIV prevalence is calculated, median HIV prevalence being defined as the middle value of the HIV prevalence rates reported in a series of ANCs.

Recent HIV trends in the subregions were analysed using the annual national HIV median prevalence rates. Most countries have expanded their ANC sentinel surveillance in recent years – especially after 2000 – to include more rural sites, which have had lower HIV prevalence rates than their urban counterparts. This may have an effect on the country median HIV prevalence rates, an issue that should be considered when interpreting subregional and country HIV median prevalence rates.

In the southern Africa subregion, the median HIV prevalence rates were analysed using those of Botswana, Namibia, South Africa, Swaziland and Zimbabwe, countries which consistently had HIV prevalence data from 1998 to 2003–2004. In eastern Africa Burundi, Ethiopia, Kenya, Rwanda and the United Republic of Tanzania were used to assess the trends in that subregion. Uganda, which had been observing declining HIV prevalence rates in previous years, had no data for 2003–2004. Only two countries in central Africa – Chad and the Democratic Republic of the Congo – had sufficient data for monitoring trends. Cameroon, which has consistently had data, had none for 2003–2004. In western Africa Benin, Burkina Faso, Côte d'Ivoire, Ghana, Nigeria and Senegal were used to assess trends in that subregion since they had sufficient data from 1998 (Table 5).

Table 5

### Subregional median HIV prevalence trends among pregnant women aged 15–49 years attending ANCs, 1997–2004

Subregion	Median HIV prevalence (%)			
	1997–1998	1999–2000	2001–2002	2003–2004
<b>Southern Africa</b>	<b>30.9</b>	<b>33.1</b>	<b>26.2</b>	<b>29.5</b>
Botswana	37.3	34.6	36.3	38.5 <sup>a</sup>
Namibia	15.6	18.1	22.5	18.0
South Africa	21.3	25.4	26.2	29.5
Swaziland	30.9	33.4	38.2	42.2
Zimbabwe	31.0	33.1	24.8	20.5
<b>Eastern Africa</b>	<b>10.0</b>	<b>11.6</b>	<b>6.4</b>	<b>7.0</b>
Burundi	4.5	5.0	5.3	4.8
Ethiopia	9.2	11.6	11.5	8.5
Kenya	14.7	14.4	6.4	8.0
United Republic of Tanzania	14.5	14.1	8.1	7.0
Rwanda	10.0	8.9	4.2	4.6
<b>Central Africa</b>	<b>4.9</b>	<b>4.9</b>	<b>na</b>	<b>4.4</b>
Chad	5.0	5.0	na	4.6
Democratic Republic of the Congo	4.8	4.8	na	4.2
<b>Western Africa</b>	<b>3.9</b>	<b>4.4</b>	<b>3.4</b>	<b>3.1</b>
Benin	1.9	3.8	1.8	1.8 <sup>a</sup>
Burkina Faso	7.0	5.8	4.6	2.5
Côte d'Ivoire	10	9.0	7.1	8.3
Ghana	3.4	2.3	3.2	3.6 <sup>a</sup>
Nigeria	4.3 <sup>b</sup>	5.0 <sup>c</sup>	na	4.3 <sup>a</sup>
Senegal	0.9 <sup>b</sup>	0.8	1.1	1.9 <sup>a</sup>

na=not data, a=year 2003, b=year 1999, c=year 2001.

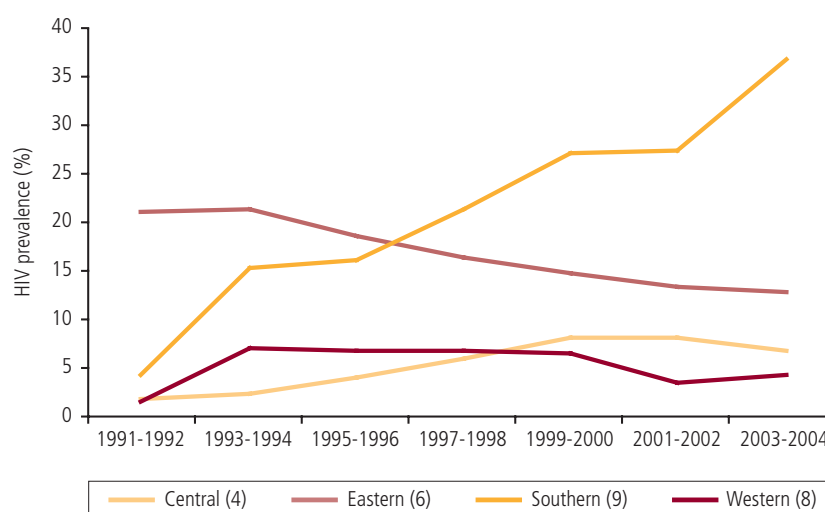
Protocols for HIV sentinel surveillance differ; some countries conduct surveys once a year while for others it is every two years. Median prevalence rates are calculated using all the sentinel sites in ANC sentinel surveillance rounds and not only sites that were used consistently over the years.

The data indicate a fluctuating HIV prevalence trend tending toward stabilization in southern Africa at high levels approaching 30%. A stabilizing trend may mean that the new HIV infections occurring are equal to the number

of deaths, thus masking an epidemic that is still growing. The high prevalence rates among young ANC attendees aged 15–24 years in southern Africa suggest that the epidemic is still growing. The HIV prevalence data among ANC attendees in some countries in the subregion, such as Botswana and Swaziland, indicate an epidemic that is still growing though at rates slower than the exponential ones of the 1990s. In eastern Africa, the data indicate a declining trend in HIV infection in the subregion from a prevalence of 10% in 1997–1998 to 7% in 2003–2004. In central Africa, the data suggest a more or less stable trend at a prevalence rate close to 5%. However, this should be interpreted with caution because HIV surveillance systems in the Region are weak and the data are limited to a few countries. On the other hand, data in the western Africa subregion show a modest decline from 3.9% in 1997–1998 to 3.1% in 2003–2004, with clear declines in Burkina Faso and more stable rates in the other countries.

Fig. 13

**Trends in median HIV prevalence among pregnant women aged 15–49 years attending ANCs in four subregions, 1991–2004**



Data on HIV prevalence among ANC attendees in capital cities have been available the longest. HIV infection trends reveal enormous diversity within these cities, showing that HIV epidemics are not uniform and are growing at different rates. Figure 13 illustrates the HIV prevalence trend in the subregion cities between 1991 and 2004.

HIV prevalence data among ANC attendees in nine cities in southern Africa, including Gauteng and Manzini provinces in which Johannesburg (South Africa) and Manzini (Swaziland) are located indicate an increasing trend in HIV prevalence in most of the southern African cities, from 21.3% in 1997–1998 to 36.9% in 2003–2004. Modest declines have been observed among ANC attendees in Harare (Zimbabwe) and Lilongwe (Malawi). The current HIV prevalence rate (36.9%) in the southern Africa cities is almost three times higher than that (12.8%) for the capital cities in eastern Africa and similar to what the HIV prevalence rates were in the eastern Africa cities in the 1990s.

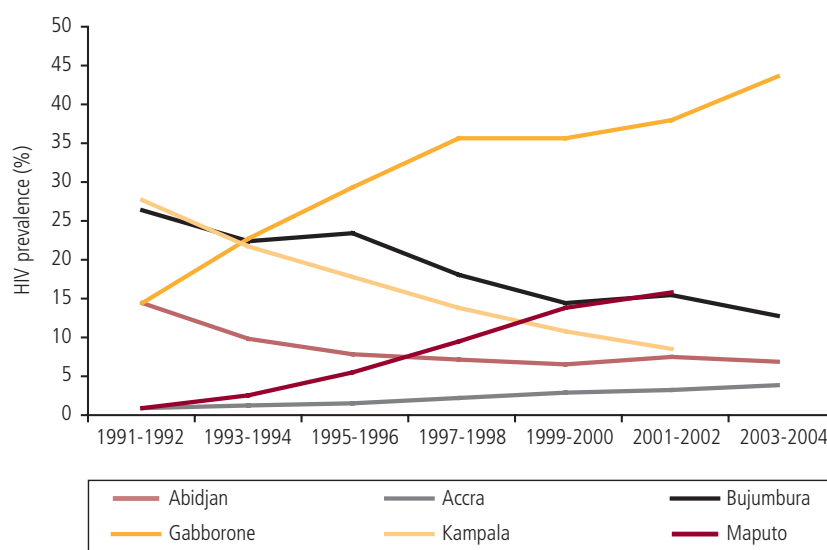
The HIV prevalence rate data among ANC attendees in the six cities in eastern Africa indicate a continuing decline from 16.3% in 1997–1998 to 12.8% today. Even with this decline, however, the 12.8% HIV prevalence rate remains unacceptably high and requires continued, concerted efforts to prevent and control the epidemic in the subregion.

ANC attendees in eight cities of western Africa have demonstrated a modest decline in HIV prevalence, from 6.5% in 1997–1998 to 4.0% in 2003–2004. Significant declines have been observed among ANC attendees in the cities of Ouagadougou (Burkina Faso), Abidjan (Côte d'Ivoire) and Lome (Togo), with a modest decline in Lagos (Nigeria), and a slight increasing trend in Dakar (Senegal) and Accra (Ghana).

Data on HIV prevalence among ANC attendees in the cities of central Africa show growing trends in HIV infection. This should be interpreted with caution, however, since surveillance has been irregular. Increasing trends have been observed in Bangui (Central Africa Republic), N'djamena (Chad) and Libreville (Gabon). Trends in Yaoundé (Cameroon) are fluctuating, with a mix of declining and increasing rates (Fig. 14).

Fig. 14

**Trends in median HIV prevalence among pregnant women aged 15–49 attending ANC in selected cities in the subregions, 1991–2004**



### Pregnant women aged 15–24 years

Few countries in the Region have provided sufficient data to monitor HIV trends in pregnant women attending ANC. Most countries are not reporting age consistently on pregnant women.

Trends in HIV prevalence are varied among 15- to 24-year-old women attending ANC in countries in the WHO African Region. Only a few countries such as Burkina Faso, Burundi, Uganda and Zimbabwe (and Ethiopia's inner city of Addis Ababa) are observing declining trends among young ANC attendees aged 15–24 years while others such as Lesotho and Swaziland are experiencing increasing trends in HIV infection. Trends are stabilizing – though at varying HIV infection levels – in countries like Botswana, Ghana and South Africa. In Ghana, the HIV prevalence rates appear to be stabilizing below 5%, in South Africa at about 25% and in Botswana at over 30%.

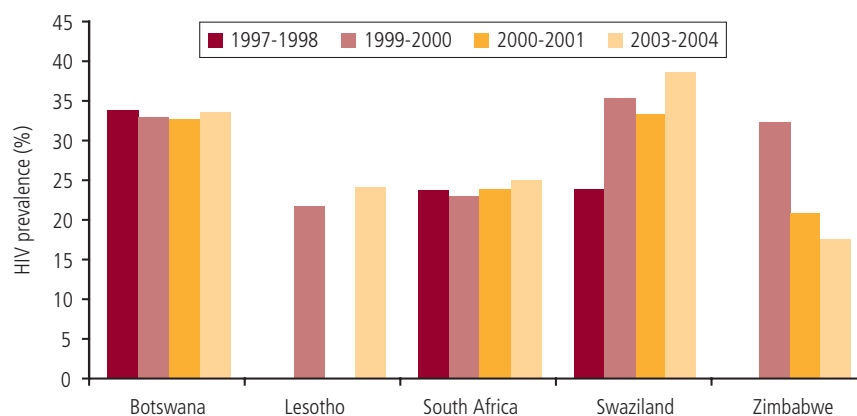
In Burundi, HIV infection rates among young ANC attendees have declined from 6.4% in 1999 to 3.9% in 2003. In Zimbabwe, HIV infection rates among ANC attendees aged 15–24 years have decreased from 32.2% in 2000 to 20.8% in 2002 and to 17.4% in 2004.

In South Africa, HIV prevalence rates among ANC attendees aged 15–24 years, which soared in the 1990s, appear to have slowed down recently, though they remain relatively high at 23.5% in 2002, 24.8% in 2003 and 25.1% in 2004. Significant increasing HIV infection trends have been observed among pregnant women aged 15–24 years in Swaziland, where the rates have increased from 33.4% in 2002 to 39.4% in 2004 (Fig. 15).



Fig. 15

**Trends in median HIV prevalence among young pregnant women aged 15–24 years in countries in southern Africa, 1997–2004**

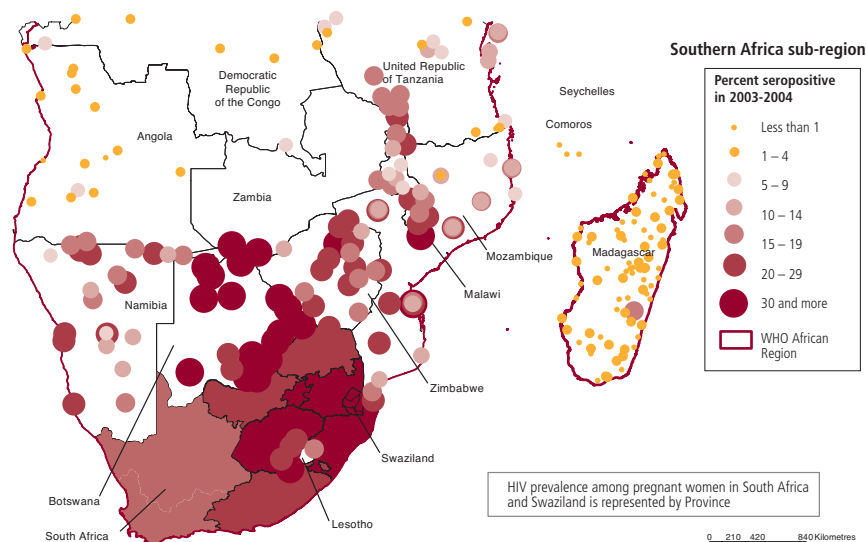


### Southern Africa

This subregion, comprising 10 countries (Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe), has an estimated population of 121 million (United Nations Population Division, 2004), of which 42% lives in urban areas and 58% in rural areas. More than 90% of all pregnant women attend ANC in southern Africa, a relatively high figure. As in other countries in the Region and worldwide, HIV sentinel surveillance remains key in tracking the epidemic. Data for the period 2003–2004 are available from 9 out of the Region's 10 countries.

Fig. 16

**HIV prevalence among pregnant women aged 15–49 years attending ANC in southern Africa: data reported by clinic site, 2003–2004**



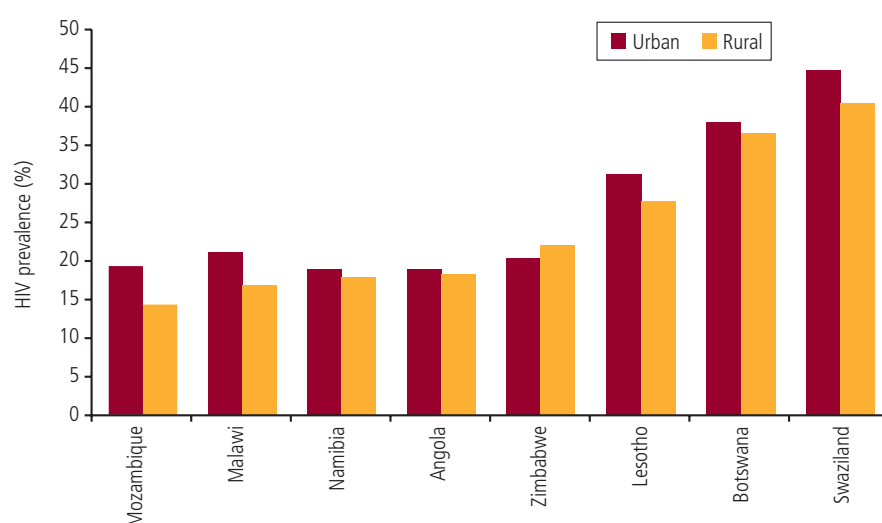
Data on HIV prevalence among ANC attendees show that southern Africa is the subregion most affected by HIV (Fig. 16). Half of the southern African countries have HIV prevalence rates among ANC attendees of over 20%. HIV prevalence levels show great diversity, ranging from 2.4% in Angola to 16.2% in Mozambique to 42.2% in Swaziland.

In 2003–2004, HIV prevalence rates among ANC attendees were 42.2% in Swaziland, 37.4% in Botswana, 28.4% in Lesotho, 27.9% in South Africa, 20.5% in Zimbabwe, 18% in Namibia and 17% in Malawi and 16.2% in Mozambique.

Data show that in most of the countries in southern Africa, HIV prevalence rates among ANC attendees in rural and urban areas are close. This is a different picture from that seen in the eastern countries, where HIV prevalence among ANC attendees in rural areas is much lower than in urban areas (Fig. 17).

Fig. 17

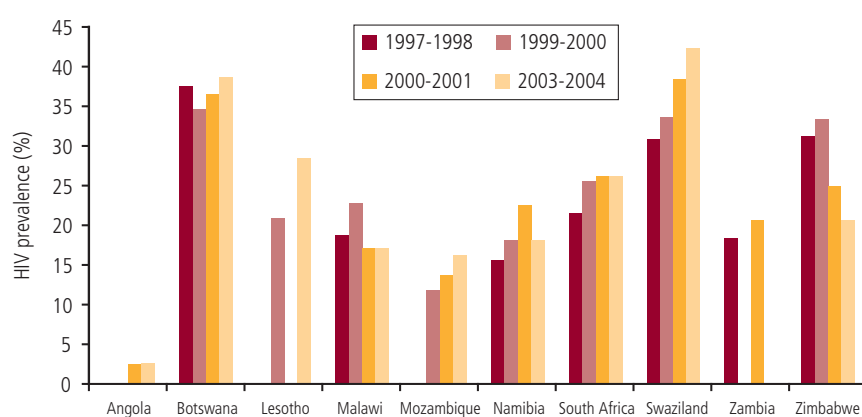
**Median HIV prevalence among pregnant women aged 15–49 years attending ANC in southern African countries by country, 2003–2004**



HIV trends in southern African countries show that the epidemic is stabilizing at high levels in Malawi, Namibia and South Africa, while in Botswana, Lesotho and Swaziland it is still growing, though at a much slower rate than in the 1990s. Zimbabwe, on the other hand, has demonstrated consistent declining trends for the past four years.

Fig. 18

**Trends in median HIV prevalence among women aged 15–49 years attending ANC in southern Africa by country, 1997–2004**



HIV prevalence among young people aged 15–24 years reflects more new infections than old. Young pregnant women aged 15–24 years attending ANC in southern Africa have high HIV prevalence rates, varying from 17.4% in Zimbabwe to 39.4% in Swaziland, suggesting high incidence rates of HIV infection. Angola, the only country in southern Africa with a low prevalence of <5% has no data on HIV prevalence among ANC attendees aged 15–24 years. Analysis of the trends shows that in most of the countries, the HIV epidemic is still growing; but in Botswana and South Africa the HIV prevalence rates are stabilizing at high rates, at around 25% for South Africa and over 30% for Botswana. Those rates among young ANC attendees in Swaziland, on the other hand, show an upward trend. In Zimbabwe, young ANC attendees aged 15–24 years have shown declining trends from 32.2% in 2000 to 17.4% in 2004.

Fig. 19

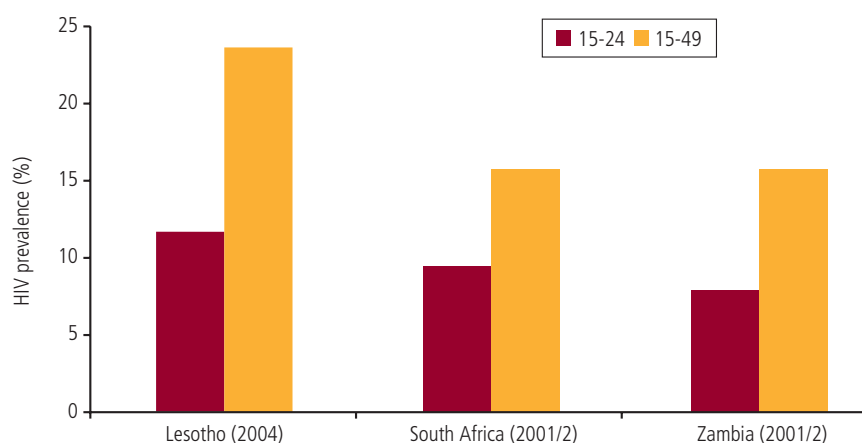
**HIV prevalence (%) among young people aged 15–24 years in population-based surveys in selected southern Africa countries**



The national population-based surveys conducted in South Africa, Zambia and Zimbabwe in 2001–2002, and Lesotho in 2004 provided HIV prevalence on men and women. All four population-based surveys showed relatively high HIV prevalence among young people aged 15–24 years, corroborating the ANC-based sentinel surveillance data (Fig. 20). Results from all the population-based surveys show that women are more HIV-infected than men and that the differences were more marked in the young age group of 15–24 years (Fig. 19).

Fig. 20

**Comparison of HIV prevalence between adults aged 15–49 years and young people aged 15–24 years in the general population in selected countries in southern Africa**



\* Young adult survey involving only the 15- to 29-year-olds, figures are rates among the 15- to 29-year-olds

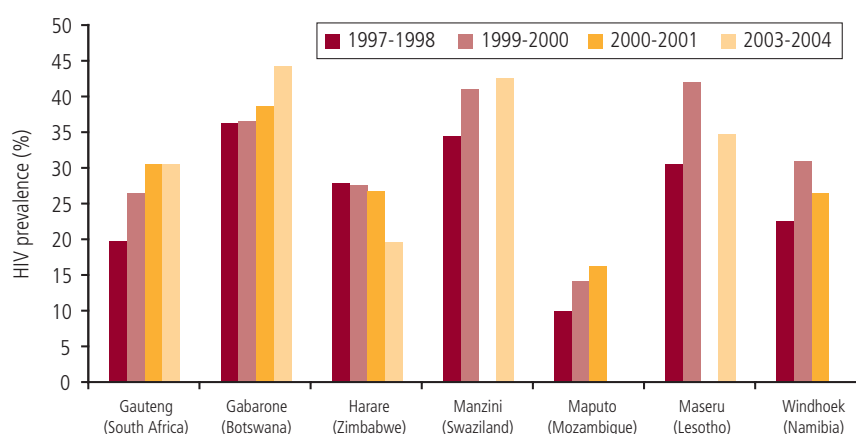
\*\* Survey conducted in 2004, while the others were conducted in 2001–2002

\*\*\* Love life survey among young 15- to 24-year-olds

Data show increasing trends in HIV prevalence among ANC attendees in most capital cities in southern Africa (Johannesburg (Gauteng province) Luanda, Manzini, Maseru, Maputo and Windhoek). A modest decline in HIV prevalence has been observed in Harare (Fig. 21).

Fig. 21

**Trends in median HIV prevalence among pregnant women aged 15–49 years attending ANCs in selected cities in southern African countries, 1997–2004**



## Eastern Africa

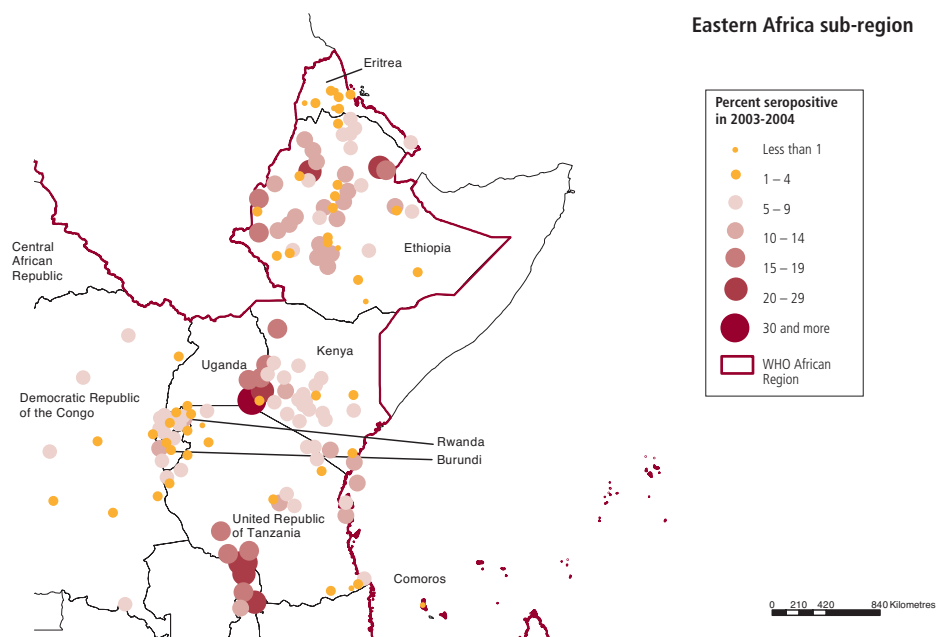
According to the 2004 United Nations Population estimates, the eastern subregion, consisting of the seven countries of Burundi, Eritrea, Ethiopia, Kenya, Rwanda, Uganda and the United Republic of Tanzania, had a population of 189 million, of which 72 million lived in Ethiopia. In eastern Africa, 22% of the population lives in rural areas. ANC surveillance is key to monitoring HIV prevalence trends in the subregion and remains a major component of HIV surveillance in all these countries. Most of the pregnant women in these countries attend ANCs but in Ethiopia and Eritrea, ANC attendance rates are below 50%. Since HIV sentinel surveillance relies on the number of women attending ANCs, low attendance may affect the number of women recruited into ANC HIV sentinel surveillance samples and therefore affect the HIV prevalence rates.

To minimize the effects of low attendance rates in Eritrea and Ethiopia, the sampling period has been prolonged to 12 weeks, instead of the recommended 6 to 8 weeks in the *WHO/UNAIDS Guidelines for HIV sentinel surveillance among pregnant women and other populations (2003)*

Six out of the seven countries in the subregion had ANC surveillance data for the period 2003–2004. Four countries, Burundi, Kenya, Uganda and the United Republic of Tanzania conducted national population-based HIV serosurveys in the period 2003–2004.

Fig. 22

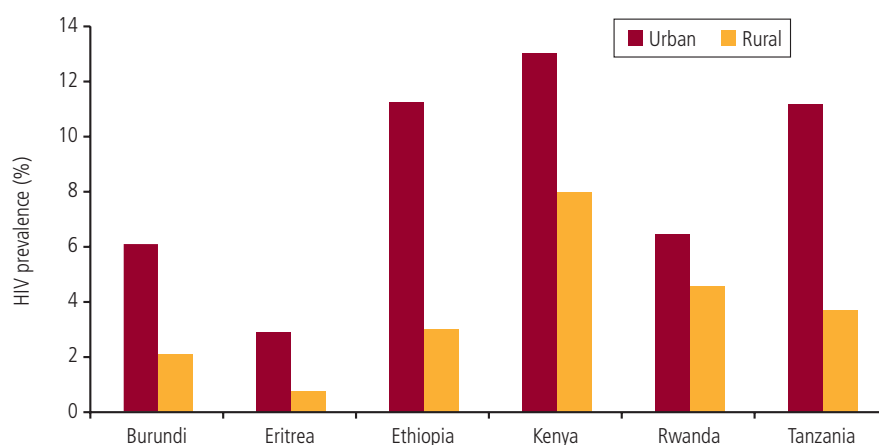
**HIV prevalence among pregnant women aged 15–49 years in eastern Africa countries by site, 2003–2004**



Available data on HIV prevalence among pregnant women attending ANCs in eastern Africa countries indicate an overall decline in HIV prevalence in the subregion. Current country median HIV prevalence rates among pregnant women attending ANCs in all these countries are below 10%. HIV prevalence rates show a variation from 1.8% in Eritrea to 8.5% in Ethiopia (Fig. 22).

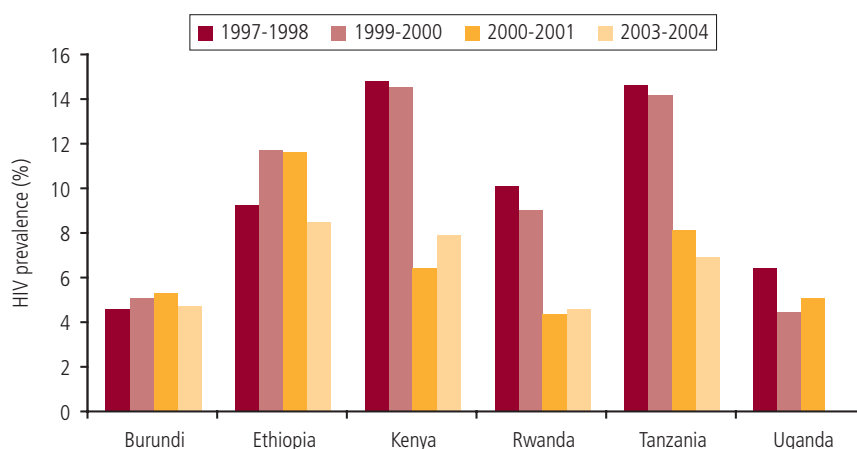
Overall, the epidemic's current level in the large countries of Ethiopia, Kenya and the United Republic of Tanzania appears to be uniform, with prevalence rates of 8.5%, 8.0 and 7.0% respectively in 2003–2004. In 2002, HIV prevalence among ANC attendees in Uganda was 5.6%.

Fig. 23

**Median HIV prevalence among pregnant women aged 15–49 years attending ANC in eastern Africa countries by location, 2003–2004**

Huge differences in HIV prevalence exist between ANC attendees in rural and urban areas in most of the eastern Africa countries. ANC attendees in urban areas have much higher HIV prevalence rates than those in rural areas (Fig. 23), a pattern that is different from what is seen in most of the countries in southern Africa, where rural and urban HIV prevalence rates are close. In 2003, HIV prevalence among ANC attendees in rural areas (2.1%) in Burundi was almost three times less than that for women in urban areas (6.1%). This is consistent with Burundi's national population-based HIV serosurvey, which found that women in rural areas were about five times less likely to be HIV-infected than their counterparts in urban areas. In Eritrea and Ethiopia, HIV prevalence rates among ANC attendees in rural areas were also three times lower than those in urban areas. HIV prevalence among ANC attendees in rural areas in Ethiopia was 3.0% as compared to 11.3% in urban areas in 2003. In Eritrea, ANC attendees in rural areas had an HIV prevalence of 0.7% vis-à-vis 2.9% among their counterparts in urban areas.

Fig. 24

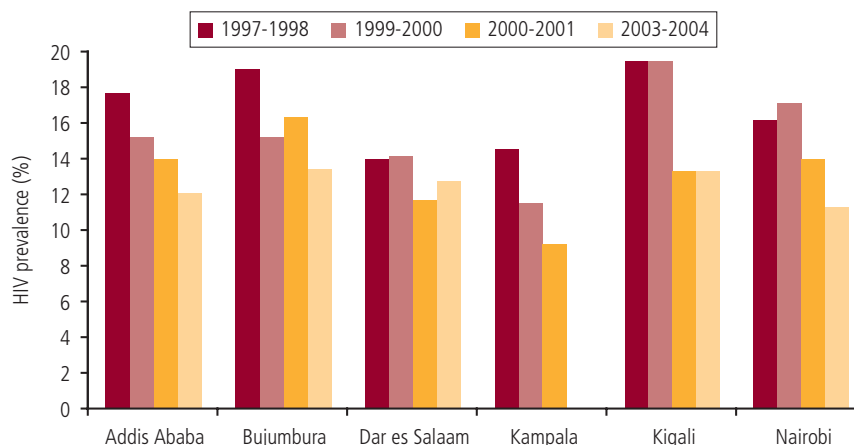
**Trends in median HIV prevalence among pregnant women aged 15–49 years attending ANC in eastern Africa by country, 1997–2004**

Assessment of recent trends in HIV prevalence using national median HIV prevalence shows declining HIV infection trends in Kenya from 14.7% in 1997–1998 to 8.0% in 2003–2004; in the United Republic of Tanzania from 14% in 1997–1998 to 7.0% in 2003–2004; and in Rwanda from 10% in 1997 to 7% in 2003–2004. In Uganda and

Burundi the HIV prevalence rates seem to have stabilized at around 5% after huge declines that occurred in the early 1990s. HIV prevalence rates in Uganda dropped from about 30% in 1992 to 6.3% in 1997 while those in Burundi declined from 16.6% in 1995 to 4.5% in 1997–1998 (Fig. 24).

Fig. 25

**Trends in median HIV prevalence among pregnant women (15–49) attending ANC in selected cities in eastern African countries, 1997–2004**

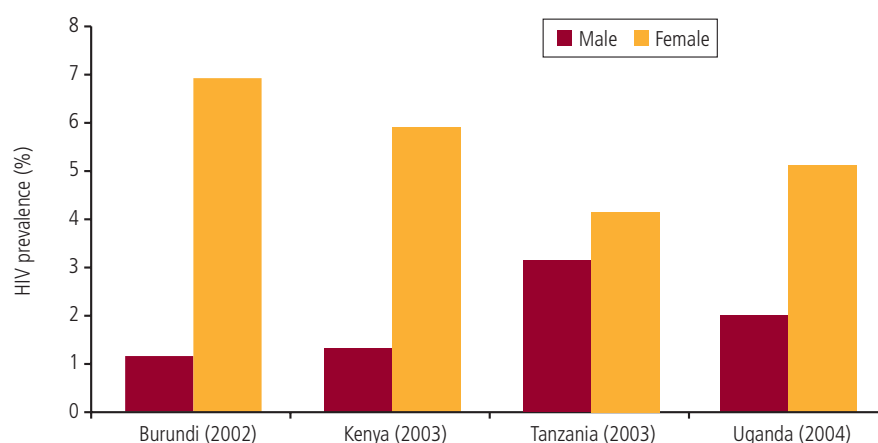


Data on HIV prevalence among ANC attendees in major cities in eastern African countries indicate a decline of almost 50% in the capital cities of Bujumbura (Burundi), Addis Ababa (Ethiopia), Kigali (Rwanda) and Kampala (Uganda). Rates of HIV prevalence among pregnant women have declined from 27.9% in the early 1990s in Kigali and Bujumbura to 13.2% in 2003–2004. In Addis Ababa, HIV prevalence rates have decreased from 16.7% in 1997–1998 to 7.9% in 2003–2004. In Kampala, HIV prevalence rates among ANC attendees decreased from 28.5% in 1992 to 9.0% in 2001–2002. Nairobi (Kenya) and Dar es Salaam (the United Republic of Tanzania) have also had modest declines (Fig. 25). No sufficient data exist to analyse trends among pregnant women attending ANCs in Eritrea's capital city Asmara. HIV prevalence among ANC attendees in Asmara had an HIV prevalence rate of 4% in 2003.

Data from population-based surveys in Burundi, Kenya, the United Republic of Tanzania and Uganda indicate national prevalence rates of 3.9%, 6.7%, 7.0% and 7.1% respectively. These surveys showed that women are more affected than men, with the differences being more marked in the young age groups. In Burundi, young women aged 15–24 years were about six times more likely to be HIV-infected than men of the same age (1.1% for men vis-à-vis 6.9% for women) (Fig. 26).

Fig. 26

**HIV prevalence among young people aged 15–24 years: data from national population-based surveys in selected eastern Africa countries, 2002–2004**



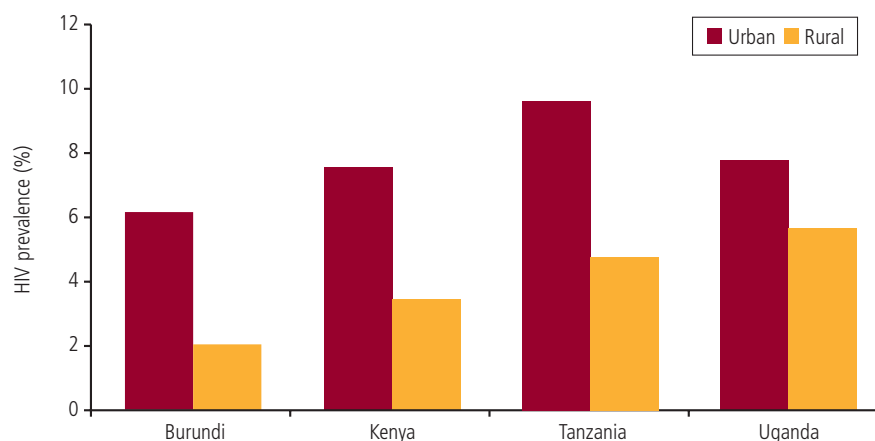
Analysis of population-based HIV prevalence data by location shows marked urban–rural differences, a finding that is consistent with HIV prevalence data among ANC attendees in this subregion. Overall HIV prevalence among both men and women living in urban areas is higher than that for men and women living in rural areas (Fig. 27).

The surveys also showed that men living in urban areas have higher HIV prevalence rates than those living in rural areas. Similarly, women living in urban areas have higher HIV prevalence rates than those women living in rural areas. In Burundi, men in rural areas were three times less infected than those living in urban areas.

In the other countries, the likelihood of men living in urban areas being more infected than men living in rural areas varied from 1.3 to 2.2 times. Across all countries, women living in urban areas were about two to five times more infected with HIV than those living in rural areas.

Fig. 27

**HIV prevalence among women living in urban areas compared to HIV prevalence among women living in rural areas in selected countries in eastern Africa: data from population-based surveys, 2003–2004**



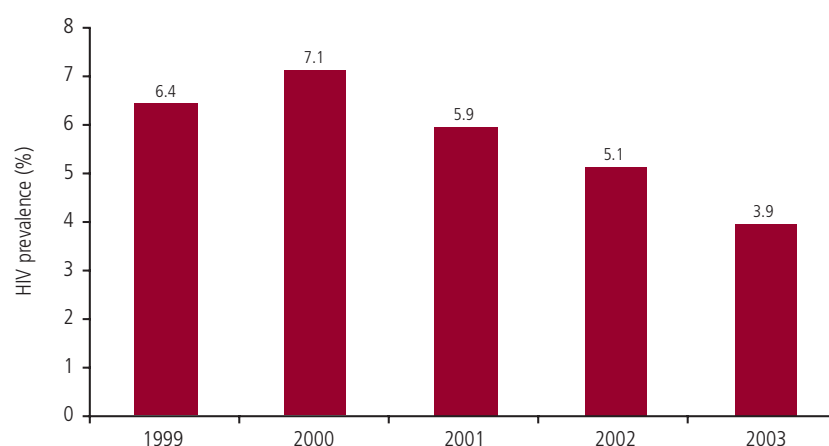


As previously stated, monitoring HIV prevalence among 15- to 24-year-old pregnant women in HIV sentinel surveillance provides a proxy indicator for new HIV infections. (Few countries in this subregion are consistently reporting age on the pregnant women recruited into ANC HIV sentinel surveillance surveys).

HIV prevalence among 15- to 24-year-old ANC attendees in Burundi shows a declining trend (Fig. 28), with median prevalence decreasing from 6.4% in 1999 to 3.9% in 2003. Young women of the same age in Addis Ababa and Uganda showed similar declines. In Addis Ababa, trends in median HIV prevalence among 15- to 24-year-old women attending ANCs declined from 13.7% in 1997–1998 to 15.1% in 1999–2000 to 11.4% in 2001–2002. Similar declines were exhibited by 15- to 24-year-old pregnant women in Uganda, where HIV prevalence decreased from 11% in 1997–1998 to 7% in 2002.

Fig. 28

**Trends in median HIV prevalence among women aged 15–24 years attending ANCs in Burundi, 1999–2003**



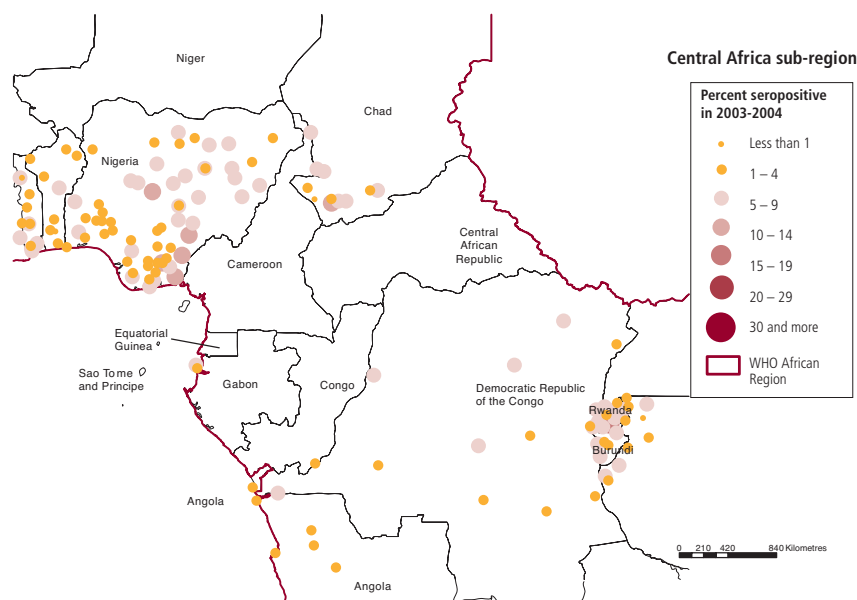
## Central Africa

There are nearly 90 million people (United Nations, 2004) living in the eight central African countries of Cameroon, Central African Republic, Chad, Congo, the Democratic Republic of the Congo, Equatorial Guinea, Gabon and Sao Tome & Principe, of which 37% live in urban areas. ANC attendance rates vary from 37% in Equatorial Guinea to 94% in Gabon. ANC-based surveillance is key for monitoring the epidemic's progress, although countries in this subregion only have ANC HIV surveillance data for the period 2003–2004. The Democratic Republic of the Congo, which recently emerged from political conflict, has re-established its surveillance system. Most of the countries in the Region do not conduct ANC sentinel surveillance consistently, nor are sentinel sites being used consistently, making it impossible to monitor the actual situation and trends. In 2004, Cameroon conducted a demographic and health survey with an HIV testing component but did not conduct ANC surveillance, while in previous years, ANC surveillance had been conducted regularly.

In 2003–2004, HIV prevalence rates among ANC attendees were 5.9% in Gabon (all three sites used were located in the capital city Libreville), 4.6% in Chad and 4.2% in the Democratic Republic of the Congo. Available ANC-based HIV prevalence data show that the Central African Republic had the highest HIV prevalence rates at 14.8% in 2002 (Fig. 29).

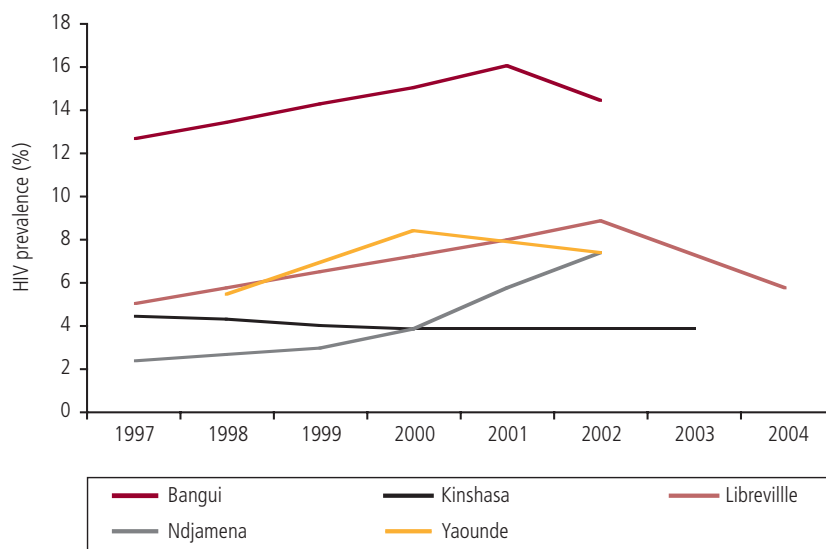
Data from the 2004 population-based serosurvey in Cameroon found 5.5% of the adult general population aged 15–49 years HIV-infected. Women were more infected than men. HIV prevalence among women was 6.8% and 5.5% among men.

Fig. 29

**HIV prevalence among pregnant women aged 15–49 years attending ANCs in central Africa by site, 2003–2004**

ANC HIV surveillance data show slight differences between HIV prevalence among ANC attendees in urban areas and those in rural areas. In 2003–2004, in Chad, HIV prevalence among ANC attendees in urban areas was 5.3%, compared to 3.0% in rural areas. In the Democratic Republic of the Congo, HIV prevalence among ANC attendees in urban areas was 5.4% compared to 3.0% for those in rural areas. In Cameroon’s capital city, Yaoundé, median HIV prevalence among women attending ANCs in 2000–2002 was 11% as compared to 10% among those in rural areas, while for Central African Republic the rates were 15% in its capital city, Bangui, and 16.5% in rural areas.

Fig. 30

**Trends in median HIV prevalence among women aged 15–49 years attending ANCs in capital cities in selected countries in central Africa, 1997–2004**

HIV prevalence trends among ANC attendees in selected cities in central Africa show a mix of trends. Data from Kinshasa (the Democratic Republic of the Congo) and Bangui (Central Africa Republic) indicate a stable trend from 1997–2003 at an estimated HIV prevalence of 4% and 15% respectively. On the other hand, in N'djamena, (Chad), HIV infection prevalence rates have increased from 2.5% in 1997 to 7.5% in 2002 and remain at around 7% in 2003. HIV prevalence rates among pregnant women in Gabon's capital city Libreville and Yaoundé in Cameroon have been fluctuating but generally suggest an increasing trend (Fig. 30).

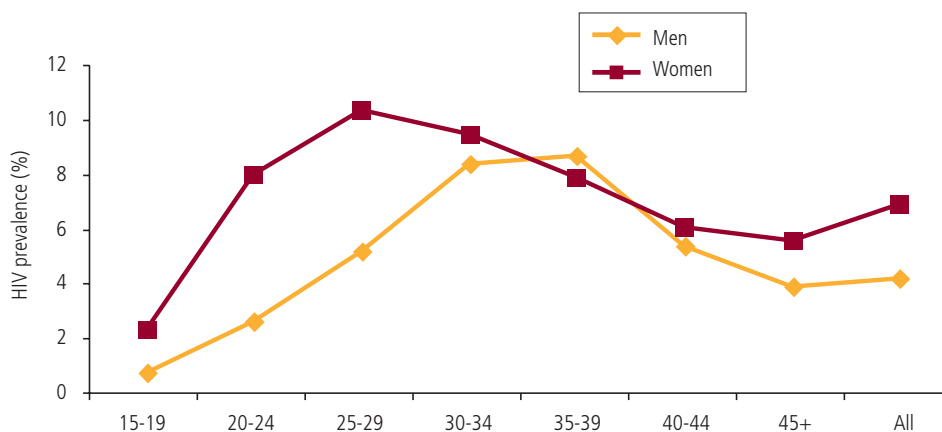
Surveillance data have been limited on HIV prevalence among 15- to 24-year-old pregnant women attending ANC in central Africa in the last two years, although efforts are underway and Cameroon has conducted a DHS +. In 2003, HIV prevalence among ANC attendees in Chad was 5%.

In 2000, HIV prevalence among ANC attendees in Cameroon varied from 0.6% in Littoral province to 7.2% in North province. HIV prevalence rates among young ANC attendees in central Africa are relatively high, indicating a high incidence of HIV infection in the subregion

The population-based survey conducted in Cameroon in 2004 showed that more women than men were HIV-infected. This pattern is consistent with other population-based survey findings conducted in several countries in the WHO African Region. Overall HIV prevalence in the general population among adult women aged 15–49 years was 6.8% as compared to 4.1% among men of the same age. Young women aged 15–24 years had an infection rate more than twice as high as men of the same age (Fig. 31).

Fig. 31

**Comparison of HIV prevalence among men and women by age in Cameroon: data from population-based survey, 2004**



### Western Africa

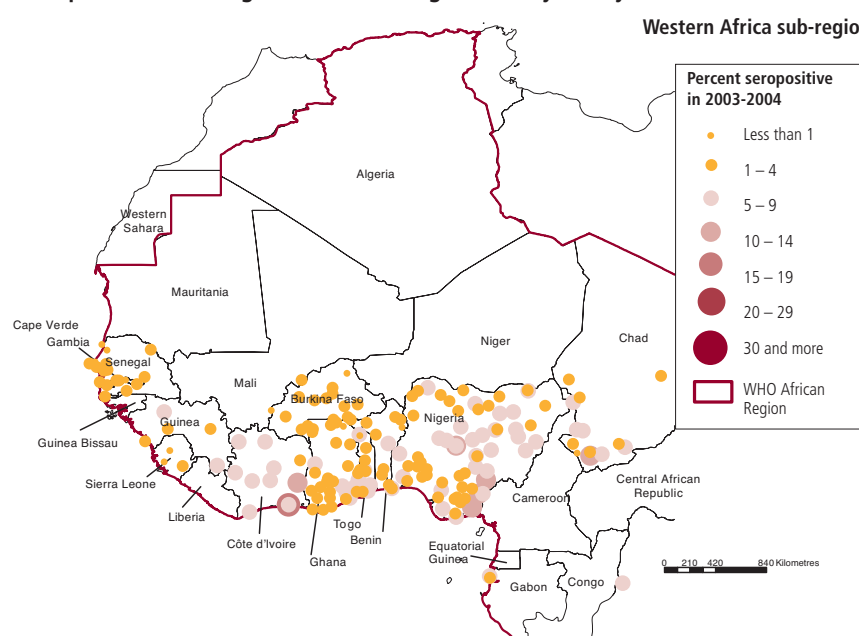
By 2004, the subregion's 17 countries had an estimated population of 284 million, including some 127 million living in Nigeria (United Nations, 2004). The subregion also includes Algeria. About 43% of the population lives in urban areas. HIV surveillance among ANC attendees is the backbone for monitoring HIV infection trends in most western African countries, since most of them have a generalized epidemic. A few countries in the Region such as Algeria, Cape Verde and Mauritania have a low-level epidemic (HIV prevalence <1% in the ANC attendees). This implies that HIV surveillance among populations at higher risk (e.g. sex workers) for HIV infection should be a component of the surveillance systems in these countries with a low-level epidemic.

In 2003–2004, 11 out of 17 countries in the subregion had data on HIV prevalence among pregnant women attending ANC. Six countries (Burkina Faso, Guinea, Mali, Niger, Senegal and Sierra Leone) conducted national population-based HIV serosurveys in the period 2002–2004. Guinea conducted a national survey among populations considered at low and higher risk for HIV infection in 2001 as well.

Data from HIV surveillance among ANC attendees demonstrate considerable variations in the level of HIV prevalence among those attendees, ranging from < 1% in Cape Verde to 8.3% in Côte d'Ivoire (Table 3). In 2003–2004, with the exception of Côte d'Ivoire, which had a median HIV prevalence rate of 8.3% among ANC attendees, all the other countries in western Africa had a national median HIV prevalence of < 5% among that population. Côte d'Ivoire has had the highest HIV prevalence rate among ANC attendees since the onset of the HIV epidemic in the subregion. Nigeria and Guinea had the next highest HIV prevalence rates of 4.3% and 4.2% respectively. Sierra Leone, which recently emerged from political conflict, had an HIV prevalence of 3.0% among ANC attendees in 2003 (Fig. 32).

Fig. 32

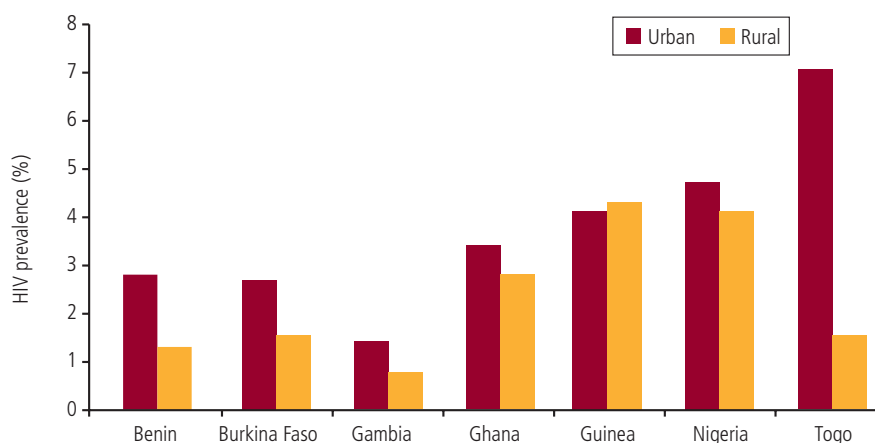
#### HIV prevalence among ANC attendees aged 15–49 years by site in western Africa, 2003–2004



With the exception of Benin, Burkina Faso and Togo, differences between HIV prevalence rates among ANC attendees living in urban and rural areas were slight in most western Africa countries (Fig. 33), a pattern that approaches that of central Africa.

Fig. 33

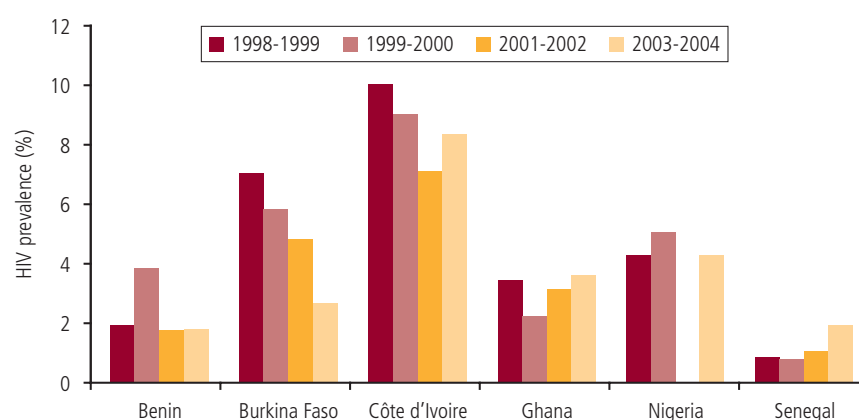
**Median HIV prevalence among pregnant women aged 15–49 years attending ANC in western Africa in selected countries by location, 2003–2004**



Comparison of the national median HIV prevalence in six countries with sufficient data in the period 1998–1999 to 2003–2004 indicates a mix of declines and increases in HIV trends in the western countries (Fig. 34). Ghana and Senegal are experiencing a gradual increasing HIV trend. Senegal has crossed the line from having a concentrated epidemic to having a generalized epidemic. HIV prevalence rates among ANC attendees have doubled from 0.9% in 1997–1998 to 1.9% in 2003. In Ghana, HIV prevalence rates among ANC attendees have also increased from 2.3% in 1997–1998 to 1.9% in 2003. In Ghana, HIV prevalence rates among ANC attendees have also increased from 2.3% in 1999–2000 to 3.2% in 2001–2002 to 3.6% in 2003–2005. Nigeria has recently expanded its sentinel surveillance to include more rural sites, which may have caused a ‘distortion’ in the HIV trend; HIV prevalence rates rose from 4.3% in 1997–1998 to 5.0% in 1999–2000. In 2003, HIV prevalence among ANC attendees in Nigeria was 4.3%. Modest declines have occurred in Côte d’Ivoire but are more marked in Burkina Faso, while the data suggest a stable HIV prevalence trend for Benin at slightly below 2%.

Fig. 34

**Trends in median HIV prevalence among ANC attendees aged 15–49 years in selected countries in western Africa, 1997–2004**

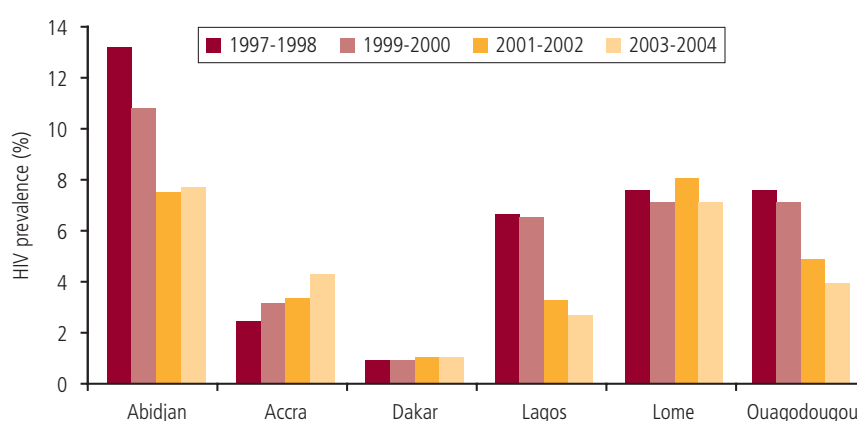


Data on HIV prevalence among ANC attendees indicate a mix of small increases and declines in HIV prevalence among ANC attendees in the capital cities of western Africa (Fig. 35). In Accra, HIV prevalence rates among ANC attendees have been increasing gradually from 1.4% in 1994 to 2.5% in 1997–1998 to 4.3% in 2004. Similarly,

in Dakar, rates have increased from 0.3% in 1995–1996 to 0.8% in 1997–1998 to 1.1% in 2003. Modest declines have appeared in the cities of Lagos (Nigeria), Ouagadougou (Burkina Faso), Abidjan (Côte d'Ivoire) while the highest HIV prevalence rates among the cities are found in Abidjan and Lome (Togo). Recent data on ANC attendees in Lome indicate a stable trend at around 7% in the period 1997–1998 to 2003–2004, which followed a declining trend, occurring in the early to mid-1990s from 11.5% in 1993 down to 7.4% in 1997–1998.

Fig. 35

**Trends in median HIV prevalence among pregnant women aged 15–49 years attending ANC in selected capital cities in western Africa, 1997–2004**

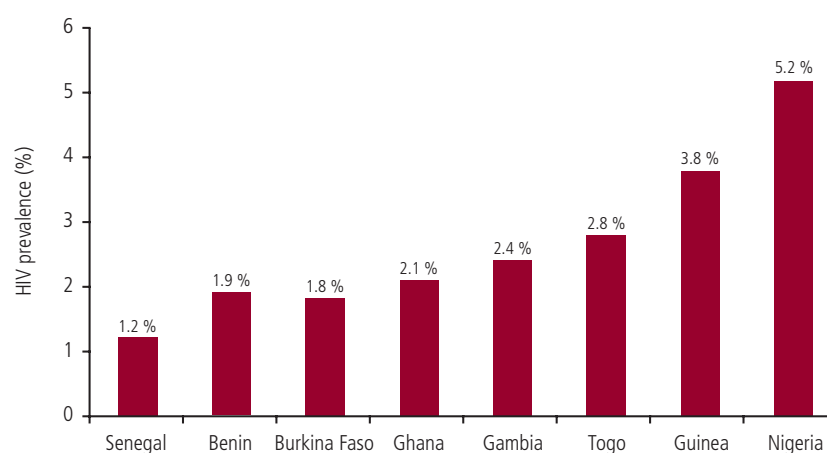


Most of the countries in western Africa (9 out of 13) reported age on ANC attendees recruited for the ANC sentinel surveillance surveys. In 2003–2004, HIV prevalence among ANC attendees in nine countries varied from 1.2% in Senegal to 5.2% in Nigeria (Fig. 36). Information was not available on ANC attendees in Cape Verde.

While no data existed for the 15- to 24-year-old ANC attendees in Côte d'Ivoire in 2003–2004, in 2002, 15- to 24-year-old ANC attendees in Côte d'Ivoire had an HIV prevalence rate of 5.8%. HIV prevalence rates among 15- to 24-year-old ANC attendees in Nigeria and Côte d'Ivoire of over 5% indicate a relatively high incidence (new) of HIV infections.

Fig. 36

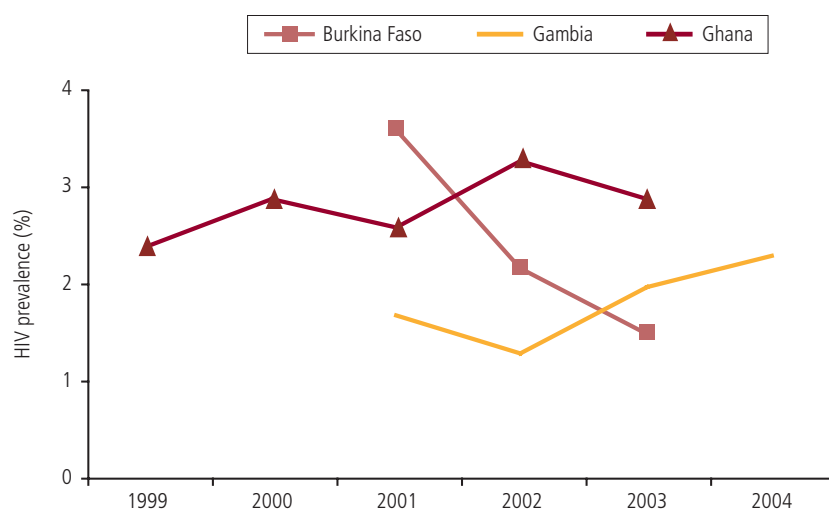
**Median HIV prevalence among young pregnant women aged 15–24 years attending ANC in selected countries in western Africa, 2003–2004**



Sufficient data to monitor trends in HIV infections among 15- to 24-year-old ANC attendees are available in a few countries in the subregion. They indicate gradually increasing HIV trends among young ANC attendees in Accra, Gambia and Senegal. In Senegal, median HIV prevalence rates among young ANC attendees have increased from 0.8% in 2000 to 1.2% in 2003. Similarly, in Gambia, HIV prevalence rates among young pregnant women have increased from 1.8% in 2000–2001 to 2.4% in 2004 and in Ghana, HIV prevalence rates have remained more or less stable from 2.5% in 1999 to 3.0% in 2003 to 2.4% in 2004 (Fig. 37).

Fig. 37

**Trends in median HIV prevalence among young pregnant women 15–24 years attending ANC in selected countries in western Africa, 1999–2004**

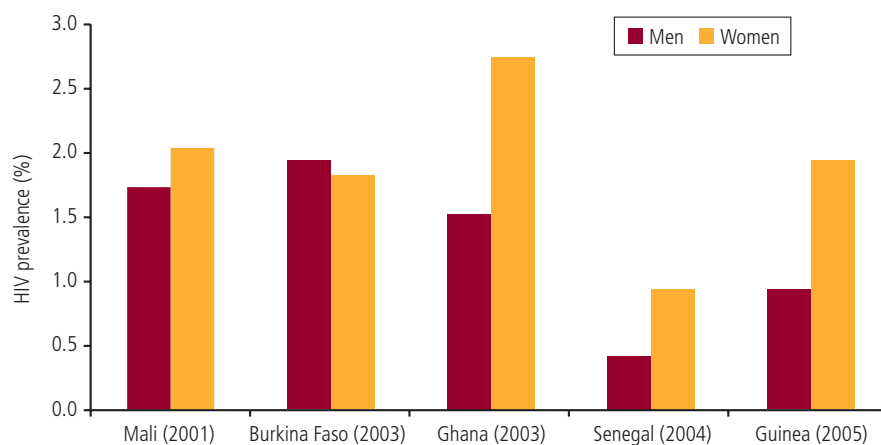


Data from the seven countries (Table 2) in western Africa that have conducted population-based surveys show huge differences in the HIV prevalence levels among the general population aged 15–49 years in the subregion's various countries. However, all of the countries had prevalence rates among this population of below 3%. Senegal had the lowest HIV prevalence rate (0.7%) among this population, while Ghana, at 2.2%, had the highest rate. Women were more HIV-infected than men (Fig. 38). In Senegal and Ghana, there were almost no or slight differences in the HIV prevalence rates among the adult general population in urban and rural areas. In Senegal, the HIV prevalence rate in both rural and urban areas was 0.7%, while in Ghana the HIV prevalence in rural areas was 2.0% versus 2.3% in urban areas. In contrast, there were significant differences in the rural and urban HIV prevalence rates in Guinea and Niger. In Guinea, the HIV prevalence rate in rural areas was less than half that in the urban areas (1.0% versus 2.4%) and in Niger, the rural HIV prevalence rate was 0.6% as compared to 2.1% in urban areas.

In Ghana and Senegal, differences in HIV prevalence rates between men and women living in urban versus rural areas were negligible. However, differences were observed in Niger and Guinea in HIV prevalence rates between men and women living in urban areas and those living in rural areas.

Fig. 38

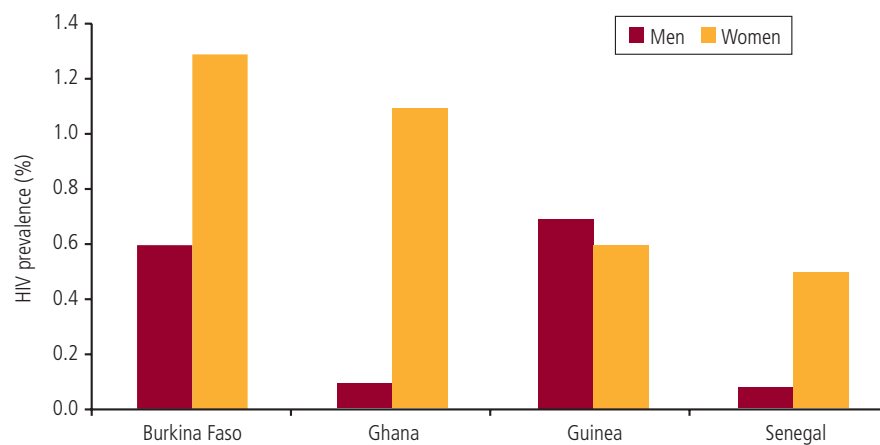
**HIV prevalence among men and women aged 15–49 years by sex in selected countries in western Africa: data from population-based surveys, 2001–2005**



Data from population-based surveys in western Africa also show differential HIV prevalence rates between 15- to 24-year-old women and men of the same age, with the women being more infected than the men (Fig. 39).

Fig. 39

**HIV prevalence among young men and women aged 15–24 years in selected countries in western Africa: data from population-based surveys, 2003–2004**







## 5 STIs: current situation and trends

A number of countries are now reporting on syphilis seroprevalence among pregnant women attending antenatal care at selected clinics. This reporting is carried out simultaneously with surveillance of HIV among the pregnant women. Prevalence of STIs is an important proxy for risky sexual behaviours and a co-factor for HIV transmission. Therefore, incidence or prevalence of STIs provides early warning signs for action. In 2003–2004, 13 countries in the WHO African Region reported results of syphilis testing among pregnant women attending ANC in their HIV sentinel surveillance reports.

Few countries in the WHO African Region have institutionalized and well-functioning STI surveillance systems, which makes it difficult to assess the current burden and trends of STIs. To improve STI surveillance, many countries are now embarking on monitoring STIs in selected 'sentinel' sites, rather than relying primarily on universal case reporting, which is affected by incomplete reporting. Some countries, such as Uganda and Zambia, have added a component of syphilis testing into the Demographic and Health surveys and HIV/AIDS population-based surveys. In 2002 and 2003, Senegal conducted a syphilis prevalence survey among sex workers in three sites (Dakar, Thies and Ziguinchor).

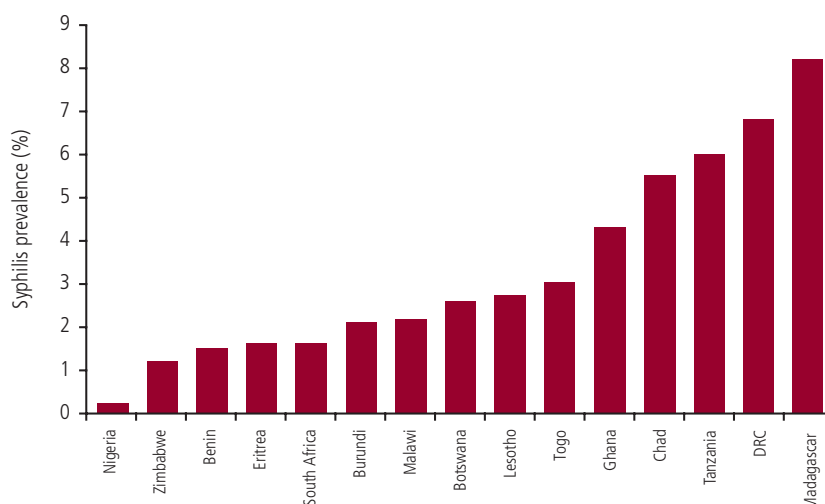
No country in the Region has an established system in place to assess the situation of herpes simplex-2 (HSV-2) genital infections, which facilitate the transmission of HIV. Studies have shown that people with HSV-2 are twice as likely to contract HIV as those who are not infected with HSV-2 (Neary, 2001). Uganda added an HSV-2 testing component in its recently conducted national HIV population-based survey.

Data generated from testing pregnant women attending ANCs indicate that STIs are widespread across the whole of the WHO African Region. Syphilis prevalence data do not show clear regional and subregional patterns, but they indicate wide variations in prevalence between countries and even within the same countries. In 2003–2004, the median prevalence of syphilis (proportion of pregnant women testing positive for syphilis) ranged from <1% in Chad and Ghana to 8.2% in Madagascar (Fig. 40). It is worth noting that the high levels of syphilis in Madagascar are a proxy indicator for higher-risk sexual behaviours; an early warning sign for action against the HIV/AIDS epidemic, despite the country's low prevalence of 0.18%.

Differences in testing strategies, health-seeking behaviours, strength of STI control programmes in countries and self medication practices need to be considered when interpreting syphilis prevalence data.

Fig. 40

**Median seroprevalence of syphilis among pregnant women aged 15–49 years attending ANCs in selected countries, 2003–2004**



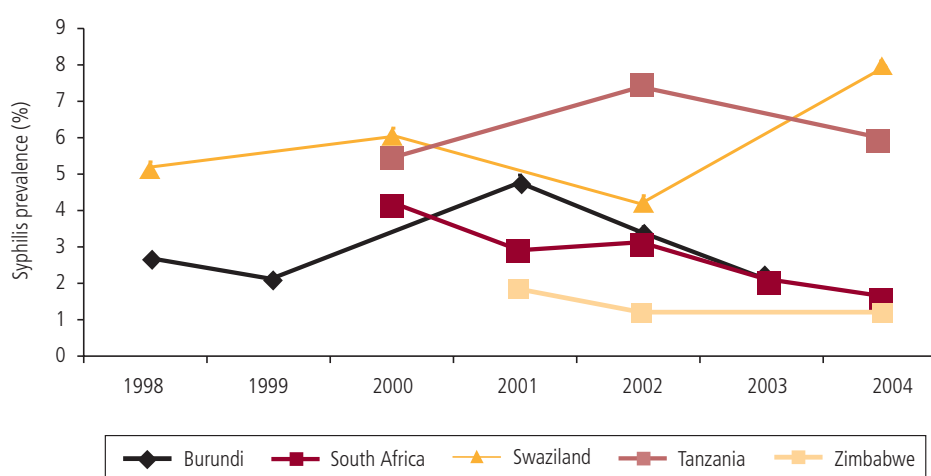
Despite generally low national median prevalence rates of syphilis, data within some countries underscore some 'hot spots' that each country needs to consider in their efforts to control STIs, determine the reasons behind these high prevalence rates and institute appropriate STI management and control interventions. For instance, in Madagascar, syphilis prevalence in Toamasna was 16.8%, doubling the national median. Similarly, in Rwanda, one site had a rate of 13.7% despite the national median HIV prevalence being 6.9%. In Eritrea, the Red Sea zone, Assab/Trio and Hycota all had syphilis prevalence rates exceeding 4% while the national median syphilis prevalence was 1.6%.

Zambia incorporated a component of both HIV and syphilis testing in the demographic and health survey conducted in 2001–2002. The data on syphilis prevalence indicate that women were more infected with syphilis than men (syphilis prevalence of 8.3% among women vis-à-vis 7.6% among men). Young women aged 15–24 years were about 1.8 times more infected with syphilis than men of the same age. This pattern of women being more infected with syphilis and young women more infected than men of the same age is similar to the pattern observed with HIV prevalence. This is a proxy indicator of women being at a higher risk for both STDs, including HIV in this country.

Adding a syphilis testing component to a population-based survey such as the demographic and health survey is an innovative and complementary approach to the existing STI surveillance systems. It improves the availability of information – currently limited – on STIs' magnitude in the Region and is all the more important considering that many countries in the Region plan to conduct DHS+.

Fig. 41

**Trends in median prevalence of syphilis among pregnant women aged 15–49 years attending ANCs in selected countries, 1998–2004**



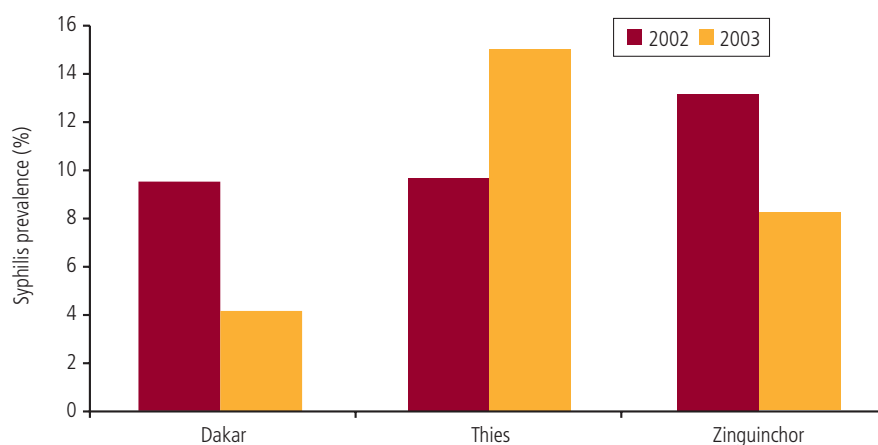
Syphilis prevalence rates have been declining in South Africa and Zimbabwe, while the trend in Burundi appears to be stable. Such declines may provide evidence of a decrease in unprotected sex, but the declines in syphilis prevalence trends do not seem to be directly associated with HIV prevalence trends (Fig. 41). Improved efforts to control STIs in these countries may explain the reduced prevalence of STIs. Studies have shown decreases in HIV prevalence following declines in STI prevalence. Between 1991 and 1998 among sex workers in Abidjan, Côte d'Ivoire, the following prevalence rates were observed to decline: HIV prevalence from 89% to 32%; gonorrhoea from 33% to 11%; genital ulcers from 21% to 4%; and syphilis from 21% to 2%.

Data on syphilis prevalence among sex workers in Senegal show that they have higher rates than ANC attendees, an indicator of the increased high-risk behaviours among sex workers. In 2002, the median syphilis prevalence among sex workers in Senegal in five sites was 9.5%, with a range of 5.6% in Mbour to 13.2% in Ziguinchor. In Dakar, the

capital city, sex workers had a syphilis prevalence of 9.5%. In 2003, the median prevalence of syphilis among sex workers in Senegal was 8.3%, with a range of 4.2% to 15% (Fig. 42).

Fig. 42

Prevalence of syphilis among sex workers in Senegal, 2002–2003



Recent data are not available on the prevalence of herpes simplex-2 (HSV-2) in the Region, but studies conducted in a number of countries have shown that HSV-2 is highly prevalent in sub-Saharan Africa. A study done in Rakai, a rural district in the south-west of Uganda in 1999–2000 found HSV-2 to be highly prevalent. HSV-2 antibodies were detected in 61% and 31% of 15- to 29-year-old women and men respectively (Corey L et al., 2004). A baseline for a cohort study involving 20 000 adults in 18 rural communities in Kyamulibwa, Masaka district in Uganda in 1994–2000 found 30% of the people tested infected with HSV-2 (Medical Research Council of South Africa, 2000). HSV was detected in 87% of ulcers with confirmed aetiology (Corey et al., 2004). A study in South Africa carried out among gold miners showed an increasing trend in HSV-2 as the cause for genital ulcer disease from 1.3% in 1986 to 10% in 1994 to 24% in 1998. Similar trends were observed in Harare, Zimbabwe, where the proportion of genital ulcer diseases (GUD) diagnosed as herpes increased from <25% in the 1980s to 73% in 1999.



## 6 Monitoring sexual behaviour

Behavioural data serve as an early warning system, provide information to guide programme design and evaluation, and assist in contributing information to explain HIV prevalence trends. In the past decade, considerable efforts have been made to collect behavioural data in several WHO African Region countries. Consensus has also been reached on key questions to ask and on key indicators.

Table 6 indicates sexual behaviour on some of the key indicators among adults and young people aged 15–24 years in selected countries. Higher-risk sex was relatively common in all countries in the Region, with proportions varying between countries of those reporting having had higher-risk sex. More men than women in all countries reported having higher-risk sex in the past 12 months. There were no clear subregional patterns as regards the proportions of persons reporting higher-risk sex in the last 12 months.

The results from these surveys indicate that premarital sex is significantly common among young men and women aged 15–24 years in the Region's countries with both relatively low and high HIV prevalence. Over 50% of the young men aged 15–24 years in Benin and Zambia reported having premarital sex, while 30% and 42% of the young women in Ghana and Malawi respectively also reported having premarital sex. Recent surveys indicate that sexual activity for both men and women in most countries starts between ages 17 and 18 years; this is a positive change from survey findings conducted in the early to mid-1990s, which showed that sexual activity in most countries was starting between ages 16 and 17 years. Sexual activity before 15 years old is rare (2–3% of the regional population) and is more common among women than men (WHO/AFRO, 2002).

Table 6

**Selected indicators of sexual behaviour among adults aged 15–49 years and young people aged 15–24 years: data from demographic and health surveys, 1999–2004**

Country and year of survey	ADULTS AGED 15–49 YEARS				YOUNG PEOPLE AGED 15–24 YEARS					
	Higher-risk sex in the last year (%)		Condom use at last higher-risk sex (%)		Median age at first sex in years		Premarital sex		Condom use at last premarital sex	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Benin (2001)	-	-	-	-	-	-	53	42	-	-
Botswana (2001)	65	54	70	80	-	-	-	-	-	-
Burkina Faso (2003)	39	10	69	53	19.5	17.5	32	26	66	55
Ghana (2003)	21	35	44	28	20.2	18.3	24	30	52	35
Kenya (2003)	40	18	47	24	17.5	18.1	41	21	47	27
Malawi (2000)	33	9	39	29	16.5	17	-	38	-	3
Mozambique (2003)	51	21	-	-	-	-	-	-	-	-
Rwanda (2000)	12	6	51	15	20.4	20.8	9	4	55	25
Uganda (2001)	29	14	60	59	18.3	17.3	31	27	58	50
The United Republic of Tanzania (2003–2004)	46	23	50	50	18.1	17.7	39	33	47	44
Zambia (2001–2002)	-	-	44	33	17	17	53	32	41	32
Zimbabwe (1999)	41	14	70	43	19	18.8	34	15	68	39

\*Indicators for the recently conducted DHS in Lesotho, Cameroon, Malawi, Senegal and Guinea not readily available since the DHS reports have not yet been finalized.

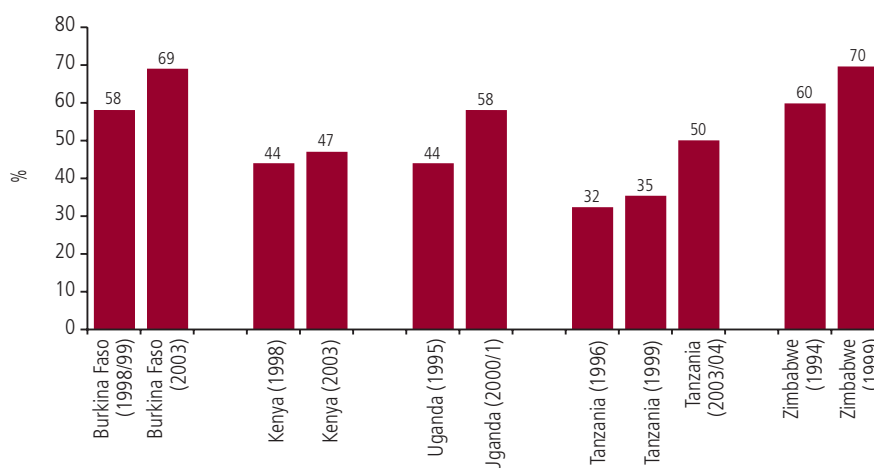
Some countries now have sufficient information on sexual behaviour from multiple national surveys, which makes it possible to assess trends on some key indicators such as higher-risk sex, condom use and median age at first sex, as well as premarital sex and condom use in premarital sex among young people aged 15–24 years.

Results from the repeated surveys conducted in some countries (Fig. 43) indicate an increasing trend in the use of condoms during higher-risk sex among both men and women. In the WHO African Region no country has yet reported condom-use rates of 70% or more, suggesting that condoms are not always and consistently used in higher-risk sex.

Almost all surveys conducted in the Region show that women are far less likely to access condoms than men at all ages.

Fig. 43

**Condom use by men at last higher-risk sex (with non-married, non-cohabiting sexual partner) in selected countries**

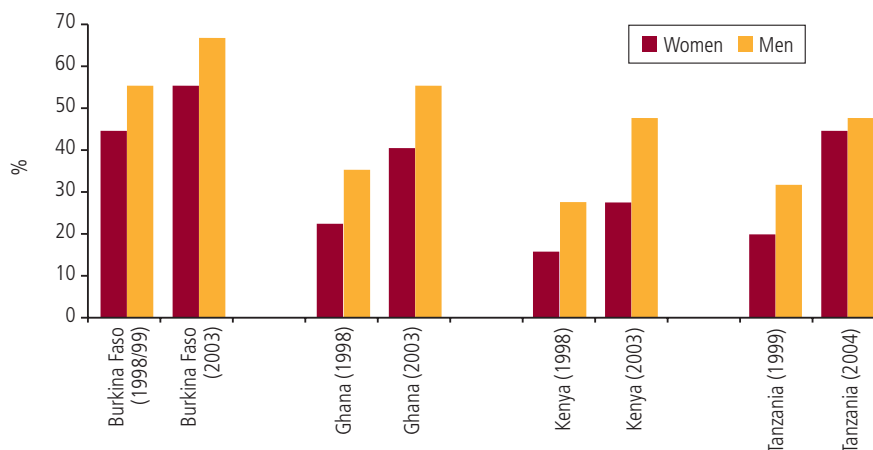


Several countries now have results from national surveys that have been repeated, which enables trends on sexual behaviour to be assessed, including condom-use among young people aged 15–24 years. Overall, there are almost no differences in the age at first sex, with only a few countries such as Ghana and Uganda showing an increase.

Survey results show that premarital sex is significantly common in all countries, with the proportion varying greatly between countries of young men and women reporting premarital sex. Overall, there is a decline in proportion of young women reporting having premarital sex. In Burkina Faso, however, there is an increase in the proportion of young people who report having premarital sex. The survey findings indicate increasing trends in condom use by both men and women aged 15–24 years during premarital sex (Fig. 44). However, as the results show, condoms are not always used in premarital sex and women are at higher risk.

Fig. 44

**Condom use by young people aged 15–24 years during premarital sex in selected countries**



## 7 Morbidity and mortality from HIV/AIDS

Few countries in the WHO African Region have established systems to track and report morbidity and mortality data on HIV/AIDS. Consequently, the actual impact of HIV/AIDS on morbidity and mortality in the Region, subregions and within most of the countries cannot be assessed.

Available empirical data are limited on morbidity and mortality; most of the information on AIDS morbidity estimates is gleaned from HIV prevalence data drawn from HIV surveillance among ANC attendees. Some data on mortality are available from DHS, conducted in selected countries as well as selected special studies and research.

AIDS case reports serve as an indicator of morbidity. However, the Region's AIDS case data have been grossly affected by under-reporting in recent years, making it impossible to determine the burden and trends in AIDS cases in countries, subregions and the Region.

A few studies conducted in the Region show that the impact of AIDS on adult and child mortality is becoming increasingly felt, especially in countries in eastern and southern Africa with high HIV prevalence. While most of western and central Africa may not yet have experienced the impact of HIV/AIDS on mortality, in certain areas it is registering.

In South Africa, a recently published study of death registration data has shown that deaths among people 15 years of age and older increased by 62% in 1997–2002, with deaths among South Africans aged 25–44 years more than doubling. A revision of all the vital registration system based on almost 2.9 million death certificates showed that more than 33% of all deaths were among young adults (Statistics SA, 2005).<sup>1</sup> <sup>2</sup> AIDS is doubtless causing the bulk of this trend shift.<sup>3</sup> This pattern is very close to the results of modelling based on ANC HIV surveillance data. Most deaths documented in the research reflect the very high HIV infection rates in the early- to mid-1990s.

A recently conducted DHS in Lesotho in 2004, a country with a high HIV prevalence of 28.4% among ANC attendees, indicated an upward trend in early childhood mortality overtime. Infant mortality rates increased from 75 deaths per 1000 live births in the 5 to 9-year period preceding the survey (1995–1999) to 91 deaths per 1000 live births during the 2000–2004 period. An increase has also been observed with the under 5 years of age mortality from 90 deaths to 113 deaths per 1000 live births over the same period. These deaths are largely attributed to the AIDS epidemic (Lesotho DHS, 2004, preliminary draft report).

Botswana, a country with a median HIV prevalence of 37.4% among ANC attendees, has experienced a rise in crude death rates from 301 per 100 000 people in 1995 to 486 per 100 000 people in 2000 (Botswana Surveillance Report, 2003). Life expectancy in Botswana has dropped from 65 years in 1990–1995 to 53.3 years in 1995–2000 (United Nations Population Division, 2003). Most of the deaths in Botswana are in the age group 25–49 years (United Nations Population Division, 2003). Botswana, which used to have one of the lowest child mortality rates in sub-Saharan Africa, has seen an increase in the under-5 mortality rates from 63 deaths per 1000 in 1990–1995 to 104 deaths per 1000 births in 2003 (United Nations Population Division, 2003).

Swaziland, a country with a high HIV prevalence (42.2% among ANC attendees), has also seen a rise in crude death rates from 9.9 to 22.7 deaths per 1000 people (MoH&SW HIV Surveillance Report, 2005). A study on mortality conducted from 1994–1999 using bereavement notices in *The Times of Swaziland* revealed a marked increasing trend in deaths among people aged 26–40 years from 1995–1999, with most of the deaths largely being attributed to HIV/AIDS (Fig. 45). An impact study on the effect of AIDS on the health sector conducted in selected hospitals in Swaziland in 1998 showed that 49.5% of the patients were HIV-positive. The highest HIV prevalence levels were

<sup>1</sup> Statistics SA (2005). *Mortality and causes of death in South Africa, 1997–2003*. Statistics SA. Pretoria.

<sup>2</sup> The proportion of total deaths occurring in the 25- to 44-year age group increased as follows: 23.2% (1997), 25% (1998), 27.7% (1999), 29.9% (2000), 31.7 (2001), 33.6% (2002).

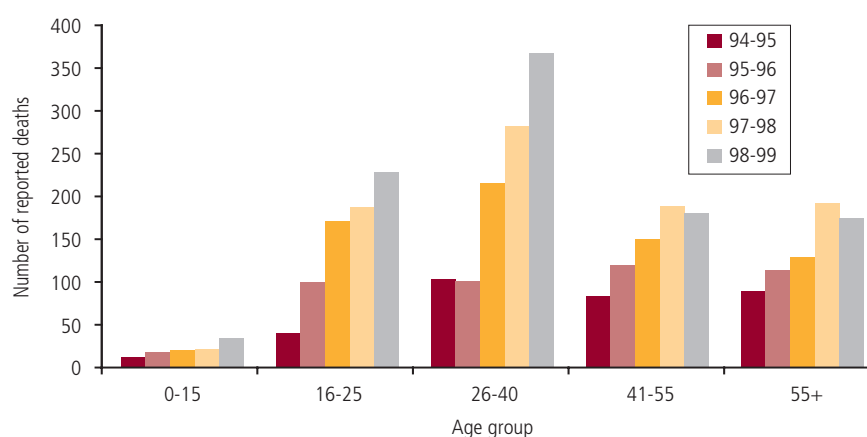
<sup>3</sup> There has been a pronounced decline in deaths attributed to 'non-natural' causes. These declined in absolute number in 1997–2002, and as a percentage of total deaths (down from 17% in 1997 to 11% in 2001) and of deaths among 15- to 24-year-olds (from roughly 55% in 1997 to 38% in 2001). See Figures 4.4–4.6 in Statistics SA (2005:25–26). Improvements in the recording of deaths have meant that death registration was 90% complete by 1999. Those improvements probably accounted for a very small part of the increase in total deaths observed over the study period. Population growth (which has been running at approximately 12% and appears to be slowing) accounts for a part of the increase in total deaths, but cannot explain shifts in the distribution of deaths between various age groups.



detected in patients in the age group of 20–39 years (NERCHA, 2003). The study illustrates the impact on both the demand for health care and the ability of the Government to provide it. In Zimbabwe, data from the demographic and health surveys conducted in 1994 and 1998 indicated increasing mortality among men and women in the period 1994–1998 as compared to 1984–1993 (Fig. 46). There was a marked increase in deaths among both women and men, especially in the age group 30–39 years. These deaths were largely attributable to AIDS. Increasing deaths have resulted in a drop in the life expectancy in Zimbabwe to 41 years in 1995–2000.

Fig. 45

Number of reported deaths by age in Swaziland, 1994–1999

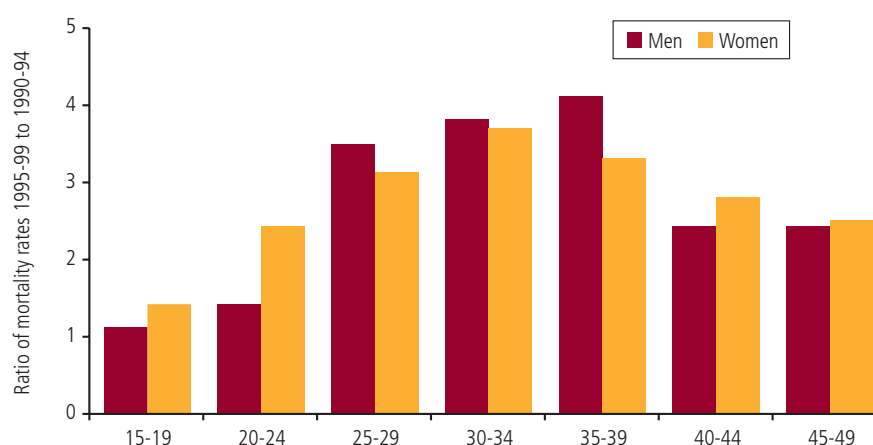


Source: NERCHA, April 2003.

The impact of AIDS is beginning to be experienced even in some countries with low HIV prevalence, as illustrated by this study from the Congo, a country that had a prevalence of 4.3% among the ANC attendees in 2002. An autopsy study conducted from June to October in 2001 in the Congo (central Africa) on the causes of deaths among the 1674 people who had died in selected hospitals (Fig. 47) revealed that 44.2% had died of HIV/AIDS-related conditions and the rate was higher (64.4%) among the age group 15–44 years. HIV/AIDS-related deaths among men and women were 55.8% and 72.6% respectively. (MoH & Population, unpublished).

Fig. 46

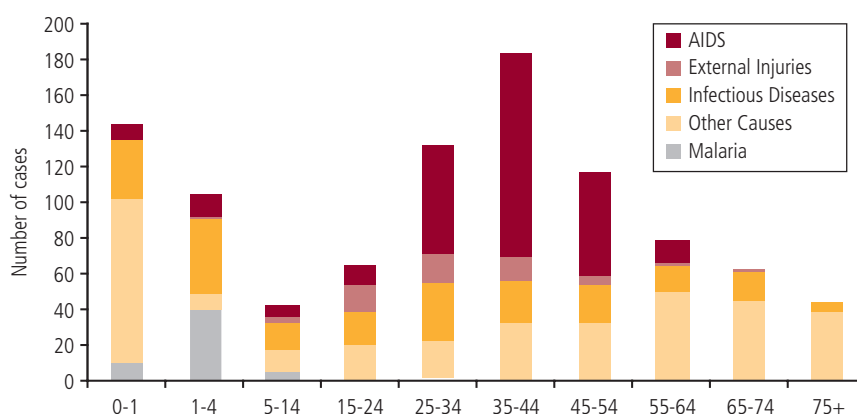
Relative increase in age-specific mortality rates by age in Zimbabwe, 1995–1999 to 1990–1994



Source: WHO/AFRO Epid. Update 2002 data derived from Zimbabwe DHS surveys

The data from health sector studies in the Congo and Swaziland are consistent with findings observed in some other countries in the Region. For instance, the Namibia surveillance system reported that AIDS had become the leading cause of hospital admission and deaths during the 1990s. In Kenyatta hospital, Nairobi, Kenya, 40% of adult medical patients were infected with HIV (Arthur et al., 2000).

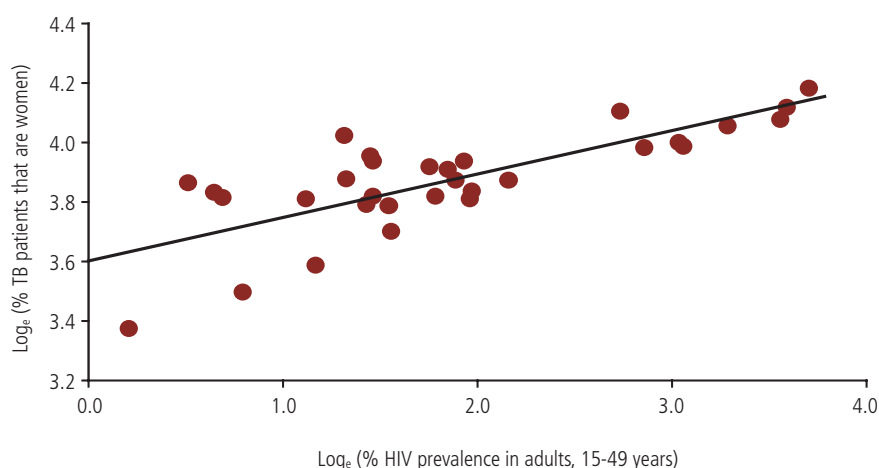
Fig. 47

**Causes of death among men by age in selected hospitals in Congo, 2001**

Source: Ministère de la Santé et de la Population, Congo, 2003

The effect of the HIV/AIDS epidemic on the TB epidemic in the Region and vice versa cannot be ignored. HIV is the most potent known risk factor for progression to active TB in people with recently acquired infection and those with latent mycobacterium tuberculosis (MTB). HIV fuels the TB epidemic and the extent to which it does depends on the degree of overlap between the population infected with HIV and that infected with (MTB). Countries with high HIV prevalence rates in Africa are experiencing high numbers of people with TB (WHO, 2005). Women aged 15–24 years make up the higher proportion of TB cases in countries with high prevalence rates of HIV infection (Fig. 48). This is consistent with the observation that HIV prevalence tends to be higher in women in this age group and the difference between the sexes is greater where HIV prevalence rates are higher, especially for women.

Fig. 48

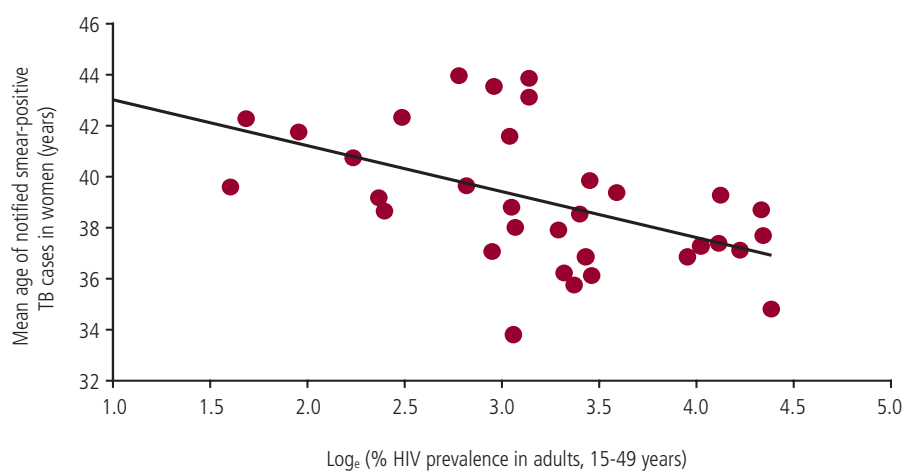
**The proportion of notified TB patients aged 15–24 years that were women, in relation to HIV prevalence in adults 15–49 years**

Source: WHO Report 2005. Global Tuberculosis Control

The proportion of smear negative cases among all pulmonary TB cases tends to be higher in African countries with high prevalence rates as shown in Figure 49.

Fig. 49

**Average age of women with smear-positive TB, in relation to HIV prevalence in adults aged 15–49 years**



Source: WHO Report 2005. Global Tuberculosis Control

## 8 Conclusions and next steps

Over the last four to five years in the Region, HIV surveillance among ANC attendees has greatly improved, with most countries expanding their system to increase geographical coverage and rural representation. However, few countries analyse and report the age of pregnant women recruited into ANC surveillance. This makes it difficult to monitor trends among young women aged 15–24 years, whose infections reflect more of new infections (incidence).

- **Countries need to collect, analyse and report the age of pregnant women attending ANCs, in particular young pregnant women aged 15–24 years. This will help them assess whether the epidemic is growing and provide them with information to evaluate their intervention programmes.**

Several countries in the Region have made considerable progress in conducting national population-based HIV sero-surveys as part of second-generation surveillance. This has been achieved by incorporating the HIV testing component into the already-planned DHS+ or special HIV/AIDS surveys, which have complemented HIV prevalence data accruing from surveillance of HIV among ANC attendees. These population-based surveys have provided information on HIV infection levels for both sexes as well as on the remote rural areas, which are not usually captured by ANC HIV surveillance systems.

- **Countries need to standardize their methodology for conducting population-based surveys, using WHO's recently published guidelines to ensure high-quality data (WHO/UNAIDS, 2005). These tools can also assist countries in reconciling the population-based survey results with sentinel surveillance data among ANC attendees.**

National population-based surveys are not ideal for monitoring HIV infection trends because they are usually only done every five years. Thus, countries must wait for 15 years or more to obtain enough data points to assess trends. Therefore, countries in the Region, especially those with generalized epidemics, need to sustain and consolidate surveillance of HIV among ANC attendees, since it is key to tracking the epidemic's progress.

Most countries in the Region, especially those with low and concentrated epidemics, are not including biological HIV surveillance in special populations like sex workers. These populations remain important in the dynamics of the HIV epidemic. Few countries have conducted biological behavioural surveillance surveys (BBSS) in special groups.

- **Countries need to institutionalize the conduct of biological and behavioural HIV surveillance in special groups into their national HIV surveillance systems to obtain crucial information that can guide the design and implementation of appropriate interventions for HIV prevention and control in these populations.**

Several countries have generated valuable information on sexual behaviours among the general adult population and young people, primarily using DHS. This has helped them monitor trends in sexual behaviour and contribute to a better understanding of HIV infection trends in these countries.

- **Countries should continue using DHS and other behaviour surveys to generate information on sexual behaviour that is useful for planning and programming of interventions as well monitoring trends in sexual behaviour.**

New tools to measure new HIV infections are being developed and tested in African settings. Measuring incidence remains one of the key tools for monitoring epidemics. Since new techniques are being tested and capacity increased in the Region, standard HIV incidence tests will be available in the near future.

- **Countries should develop capacity to apply these new techniques as they become available. Countries are also encouraged to monitor new infections within the existing HIV surveillance systems when they start using these techniques.**

Concerns have been expressed about the risk that HIV drug resistance may develop, as ART is being scaled up. WHO has launched a global resistance network to monitor resistance to ARV. This information is critical for programming and clinical care in treated and untreated patients. More information is needed in this field. Both HIV surveillance and HIV drug resistance (HDR) surveillance and monitoring are key elements for decision-making.

- **Countries should coordinate efforts between both surveillance activities – HDR and HIV surveillance – since these activities can be complementary. HIV surveillance systems collect blood specimens regularly among different populations.**

Data are limited on STI magnitude and trends in the Region; surveillance of STIs in most countries is weak. However, a number of countries are beginning to report on the seroprevalence of syphilis among ANC attendees and a few are incorporating syphilis testing into the population-based HIV serosurveys.

- **In addition to reporting seroprevalence rates among ANC attendees, countries need to establish mechanisms to collect data on STIs, other than syphilis.**

The HIV/AIDS epidemic in the Region, subregions and within countries shows great heterogeneity. Generally, southern African countries with the exception of Angola, are the most affected, followed by the eastern Africa countries, central Africa and western Africa. Marked differences also exist between HIV prevalence rates in urban and rural areas in most of the countries in the Region, especially in the eastern countries, while in most of the southern countries HIV prevalence rates in urban and rural areas are close. In most of the central and western African countries, the differences between urban and rural HIV prevalence rates are slight.

- **Because of the great heterogeneity in the HIV/AIDS epidemics, there is need to take into account the epidemiological situation within countries, between countries and in the subregions when planning and programming HIV/AIDS interventions.**

More women than men are HIV-infected, and this difference between HIV prevalence between sexes is even larger among young people aged 15–24 years. Young women aged 15–24 years are about 2–5 times more affected than men of the same age. HIV prevalence rates among young people in most of the southern African countries are alarmingly high, with rates exceeding 25%. In Botswana and Swaziland about 1 out of 3 young pregnant women aged 15–24 years is HIV-infected.

- **Gender and age differences among young people in HIV prevalence rates need to be seriously considered when designing, programming and implementing HIV/AIDS interventions. The HIV situation in southern Africa, especially among young people, deserves increased and more concerted efforts to reverse the current HIV infection levels.**

Declining HIV infection trends among ANC attendees have been observed in other countries in eastern Africa, specifically, Ethiopia, Kenya and the United Republic of Tanzania in addition to Burundi and Uganda, where declines occurred in the early 1990s. However, in the last four to five years, Burundi and Uganda appear to be experiencing stable trends at varying HIV infection levels.

HIV prevalence has significantly declined among ANC attendees in Burkina Faso (western Africa) and Zimbabwe (southern Africa). On the other hand, some countries in southern Africa (Lesotho, Mozambique and Swaziland) are experiencing increasing HIV trends, while many others in the Region show trends that are approaching stabilization but at varying levels. For example, in Botswana the rates are stabilizing at nearly 40% and in Benin at 2%. Senegal,

which still has a relatively low HIV-prevalence rate of less than 2%, is experiencing a gradual upward HIV infection trend.

- **The declining HIV prevalence rates are encouraging, indicating that with increased and concerted efforts, the HIV/AIDS epidemic can be reversed. This calls for greater coordination effort to address HIV/AIDS in the Region.**

A high degree of HIV-1 genetic variability exists, which has implications for vaccine development and effectiveness.

- **Tracking of such patterns is important in the countries within the Region, since it will enable vaccine development in the future.**

With the scaling up of ARVs, drug resistance has become a public health issue as countries with more advanced ARV programmes have shown some degree of HDR among treated and untreated patients. To address this issue, WHO has been coordinating the HIVResNet, a network of experts collaborating on HDR issues.

- **HIV surveillance systems in countries should coordinate efforts with partners and experts that are implementing HDR surveillance systems. In most cases, these surveillance systems will use blood collected within existing HIV surveillance systems to monitor HDR trends. Coordination of these kinds of efforts will maximize investment and produce better information.**

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