



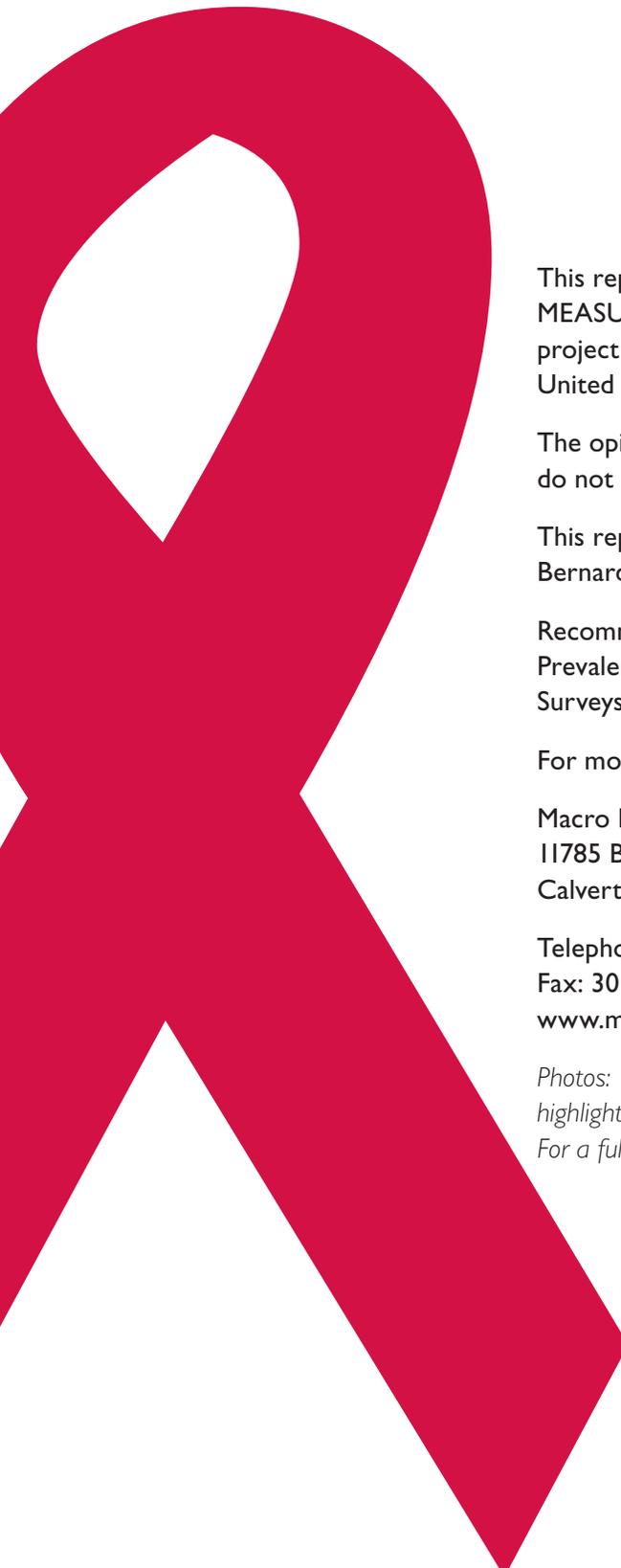
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FROM THE AMERICAN PEOPLE



# HIV Prevalence Estimates

from the Demographic and Health Surveys





This report summarizes the HIV prevalence estimates provided in MEASURE Demographic and Health Surveys. The MEASURE DHS project is implemented by Macro International, Inc. and funded by the United States Agency for International Development (USAID).

The opinions expressed herein are those of the authors and do not necessarily reflect the views of the USAID.

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Recommended citation: Macro International, Inc. 2008. HIV Prevalence Estimates from the Demographic and Health Surveys. Calverton, Maryland: Macro International, Inc.

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*Photos: Photos used in this report are representative of the countries highlighted, but are not necessarily of individuals living with HIV/AIDS. For a full list of photo credits and captions, see inside back cover.*

# Introduction

## Demographic and Health Surveys

The Demographic and Health Surveys project (MEASURE DHS) has been conducting surveys in Africa, Asia, Latin America, and Eastern Europe since 1984. DHS has earned a worldwide reputation for collecting and disseminating accurate, nationally representative data on fertility, family planning, maternal and child health, child survival, malaria, nutrition, and HIV/AIDS.

DHS household surveys typically interview a nationally representative sample of over 10,000 women and men age 15-49. In recent years, blood tests have been added to the verbal interview to test for various health conditions, including anemia, and more recently, malaria and HIV.

MEASURE DHS is implemented by Macro International, Inc. based in Calverton, Maryland, and is funded by the United States Agency for International Development (USAID) and the President's Emergency Plan for AIDS Relief (PEPFAR). Individual surveys also receive funding from national governments, as well as multilateral and bilateral donors.

## HIV Estimates from the Demographic and Health Surveys

The MEASURE DHS project has changed the way the world measures HIV prevalence. Prior to 2001, HIV prevalence was estimated largely from sentinel surveillance systems that monitored HIV rates in pregnant women attending antenatal care. This was, at the time, the best available proxy measure for national prevalence. In 2001, DHS included testing for HIV in the Mali Demographic and Health Survey, providing for the first time ever HIV prevalence estimates from a nationally representative, population-based sample. Population-level testing allows for the inclusion of men, nonpregnant women, and those without access to health facilities, thereby providing a representative sample of a national population. UNAIDS and national governments have adjusted their official HIV prevalence estimates in response to the nationally representative HIV prevalence data provided through DHS surveys.

In addition to improving the accuracy of HIV prevalence estimates, inclusion of HIV testing in the DHS also improves understanding of the HIV pandemic, because HIV test results are connected to the full DHS survey data. This allows for a more comprehensive examination of the sociodemographic and behavioral factors associated with HIV infection, such as age, education, residence, wealth, marital status, and higher-risk sexual behaviors than is possible with sentinel surveillance data.

Between 2001 and 2008, DHS has included population-based HIV testing as part of 32 surveys in 28 countries, resulting in revised HIV estimates for these countries and a new understanding of the global HIV epidemic.

## Data included in this report

This report includes data from MEASURE DHS surveys. The data are cross-sectional and provide a snapshot of the current situation in the 28 countries that included HIV testing in their surveys. The Dominican Republic, Mali, and Zambia have had two surveys with HIV testing done since 2001. However, HIV testing was not connected to the entire survey record in earlier surveys for these three countries, preventing analysis across background characteristics. Tanzania surveys included fully-linked testing in both 2003-04 and in 2007-08. For the Dominican Republic and Mali, only the most recent survey findings are presented. At the time of this publication, final results of the 2007 Zambia and 2007-08 Tanzania surveys were not yet available. Therefore, findings from the first surveys are presented for these two countries.

## For more information

For more information on MEASURE DHS surveys, methodology, and results, visit:  
[www.measuredhs.com](http://www.measuredhs.com)

To build your own tables using MEASURE DHS data, visit:  
STATcompiler ([www.statcompiler.com](http://www.statcompiler.com)) and the  
HIV/AIDS Survey Indicators Database ([www.measuredhs.com/hivdata](http://www.measuredhs.com/hivdata))

For interactive mapping tools, visit  
STATmapper ([www.statmapper.com](http://www.statmapper.com)) and  
HIVmapper ([www.hivmapper.com](http://www.hivmapper.com))



# Summary of Surveys with HIV Prevalence

Country	Type of survey	Year	Total number tested- all ages	Number of women 15-49 tested	Number of men 15-49 tested	Type of specimen
<b>Asia</b>						
Cambodia	DHS	2005	14,703 <sup>1</sup>	8,047	6,656	DBS
India	DHS	2005-06	102,946 <sup>2</sup>	53,332	46,506	DBS
Vietnam (Hai Phong Prov.)	AIS	2005	1,675 <sup>1</sup>	921	754	DBS
<b>Caribbean</b>						
Dominican Republic*	DHS	2002	22,725 <sup>3</sup>	10,732	10,707	Oral fluids
Dominican Republic	DHS	2007	51,109 <sup>3</sup>	24,564	23,513	DBS
Haiti	DHS	2005	10,062 <sup>3</sup>	5,230	4,321	DBS
<b>West/Central Africa</b>						
Benin	DHS	2006	9,599 <sup>4</sup>	5,025	3,949	DBS
Burkina Faso	DHS	2003	7,515 <sup>3</sup>	4,086	3,065	DBS
Cameroon	DHS	2004	10,352 <sup>1</sup>	5,227	4,672	DBS
Cape Verde**	DHS	2005	5,596 <sup>3</sup>	2,863	2,601	DBS
Central African Republic**	MICS	2006	10,592 <sup>3</sup>	5,413	4,657	DBS
Cote d'Ivoire	AIS	2005	8,436 <sup>1</sup>	4,413	4,023	DBS
DR Congo	DHS	2007	8,504 <sup>3</sup>	4,492	4,012	DBS
Ghana	DHS	2003	9,566 <sup>3</sup>	5,097	4,047	DBS
Guinea	DHS	2005	6,836 <sup>3</sup>	3,772	2,616	DBS
Liberia	DHS	2007	11,733 <sup>1</sup>	6,382	5,351	DBS
Mali*	DHS	2001	6,846 <sup>3</sup>	3,854	2,978	DBS
Mali	DHS	2006	8,629 <sup>3</sup>	4,528	3,614	DBS
Niger	DHS	2006	7,673 <sup>3</sup>	4,406	2,856	DBS
Senegal	DHS	2005	7,823 <sup>3</sup>	4,278	3,226	DBS
<b>East Africa</b>						
Ethiopia	DHS	2005	11,042 <sup>3</sup>	5,736	4,804	DBS
Kenya	DHS	2003	6,194 <sup>2</sup>	3,151	2,851	DBS
Rwanda	DHS	2005	10,419 <sup>3</sup>	5,656	4,361	DBS
Tanzania	AIS	2003-04	10,747 <sup>1</sup>	5,753	4,994	DBS
Tanzania	AIS/MIS	2007-08	Not yet released <sup>1</sup>			DBS
Uganda	AIS	2004-05	18,525 <sup>5</sup>	9,391	7,515	Venous & DBS
			Children 0-4: 8,374	4,226	4,148	DBS
<b>Southern Africa</b>						
Lesotho	DHS	2004-05	5,286 <sup>3</sup>	3,031	2,012	DBS
Malawi	DHS	2004	5,266 <sup>2</sup>	2,686	2,465	DBS
Swaziland	DHS	2006-07	9,177 <sup>6</sup>	4,424	3,763	DBS
			Children 2-14: 3,589	1,841	1,747	DBS
Zambia*	DHS	2001-02	3,950 <sup>3</sup>	2,073	1,734	DBS from venous
Zambia	DHS	2007	Not yet released <sup>3</sup>			DBS
Zimbabwe	DHS	2005-06	13,049 <sup>2</sup>	6,947	5,848	DBS

DHS: Demographic and Health Survey; AIS: AIDS Indicator Survey; MICS: Multiple Indicator Cluster Survey (UNICEF); MIS: Malaria Indicator Survey; DBS: dried blood spots

\*HIV prevalence not linked to full DHS survey; \*\*Non-MEASURE surveys;

<sup>1</sup>women 15-49 and men 15-49; <sup>2</sup>women 15-49 and men 15-54; <sup>3</sup>women 15-49 and men 15-59; <sup>4</sup>women 15-49 and men 15-64; <sup>5</sup>women and men 15-59, children 0-5;

<sup>6</sup>women 15+, men 15+ and children 2-14.

## Summary of HIV Testing

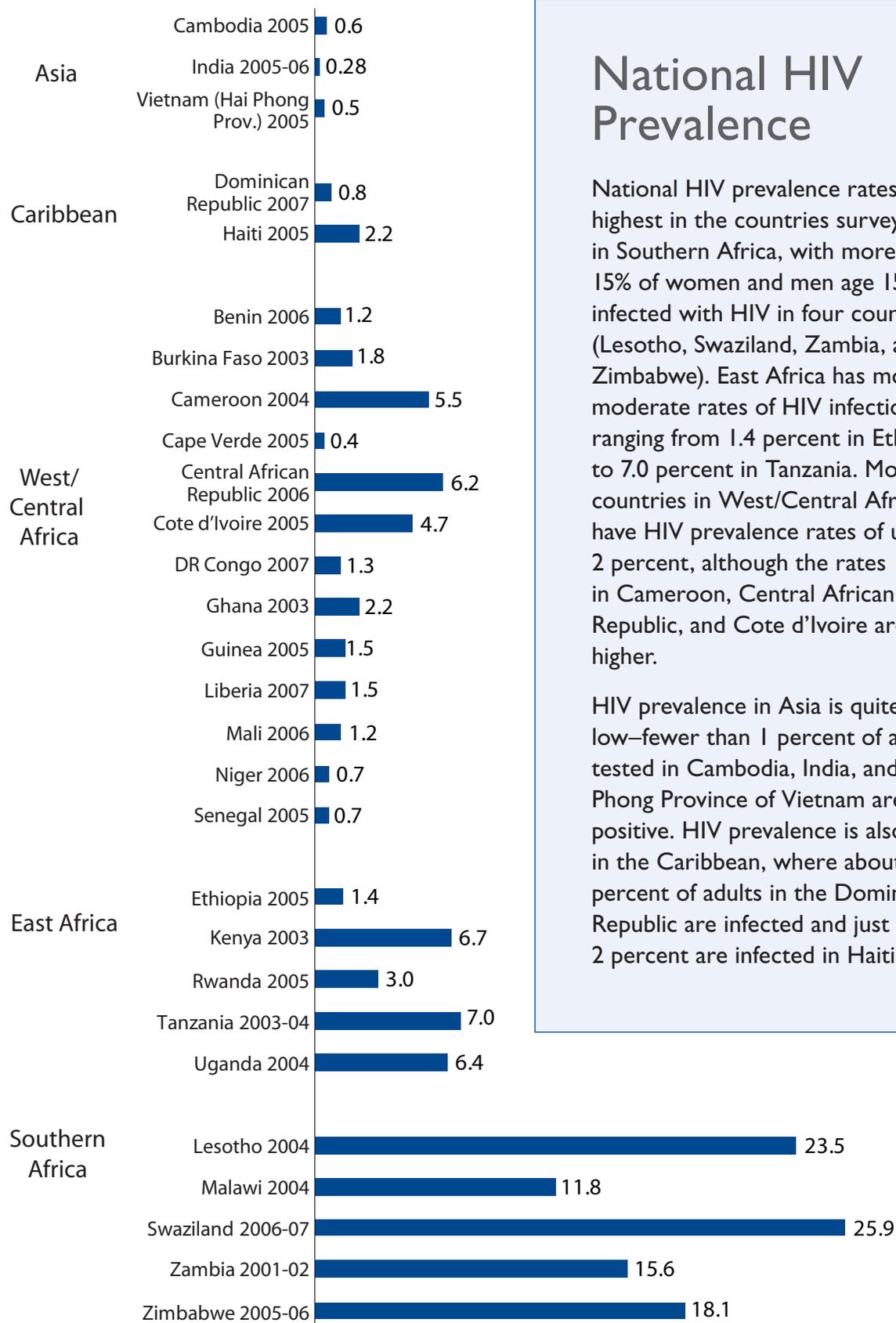
Since 2001, more than 400,000 women and men worldwide have been tested for HIV through the MEASURE DHS project's Demographic and Health Surveys and AIDS Indicator Surveys. HIV testing is usually conducted on women and men age 15-49, although some countries have tested children, and others have tested older adults. The sample size for testing ranges from 1,675 in Hai Phong Province, Vietnam, to over 102,000 in India.

### Testing Protocol

The DHS HIV testing protocol provides for informed, anonymous, and voluntary testing of women and men interviewed. The testing protocol undergoes a host country ethical review as well as an ethical review at Macro International, Inc. (In countries with CDC involvement, the testing protocol is also reviewed by CDC.) The testing is simple; in most cases, the interviewer collects dried blood spots (DBS) on filter paper from a finger prick and the filter paper is transported to a laboratory for testing. The laboratory protocol includes an initial ELISA test, and then retesting of all positive tests and 5 to 10 percent of the negative tests with a second ELISA. For those tests with discordant results on the two ELISA tests, another test, usually a Western blot, is used as the tie-breaker.



## HIV Prevalence: Adults Age 15-49



### National HIV Prevalence

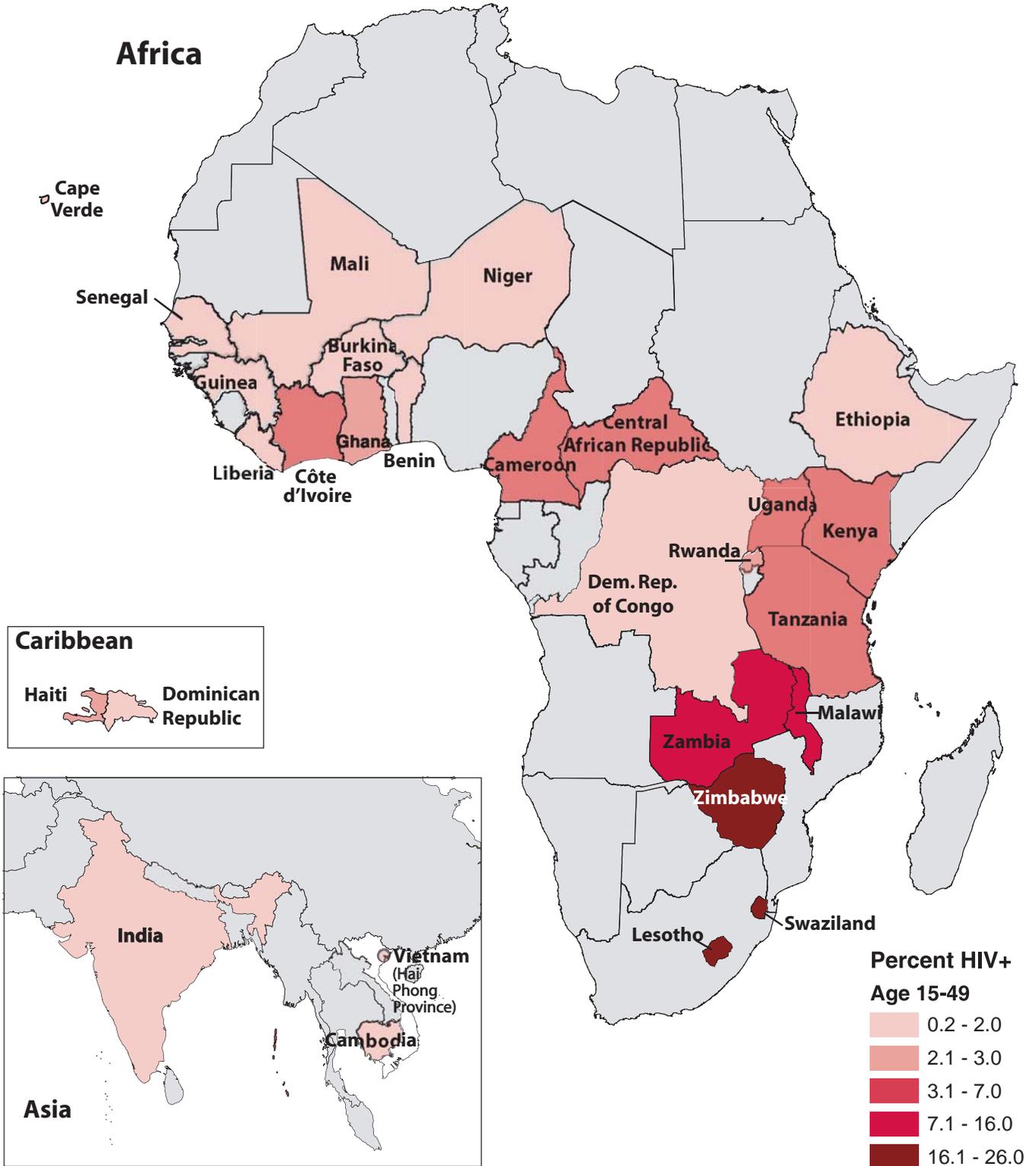
National HIV prevalence rates are highest in the countries surveyed in Southern Africa, with more than 15% of women and men age 15-49 infected with HIV in four countries (Lesotho, Swaziland, Zambia, and Zimbabwe). East Africa has more moderate rates of HIV infection, ranging from 1.4 percent in Ethiopia to 7.0 percent in Tanzania. Most countries in West/Central Africa have HIV prevalence rates of under 2 percent, although the rates in Cameroon, Central African Republic, and Cote d'Ivoire are higher.

HIV prevalence in Asia is quite low—fewer than 1 percent of adults tested in Cambodia, India, and Hai Phong Province of Vietnam are HIV-positive. HIV prevalence is also low in the Caribbean, where about 1 percent of adults in the Dominican Republic are infected and just over 2 percent are infected in Haiti.

*Percent of women and men 15-49*

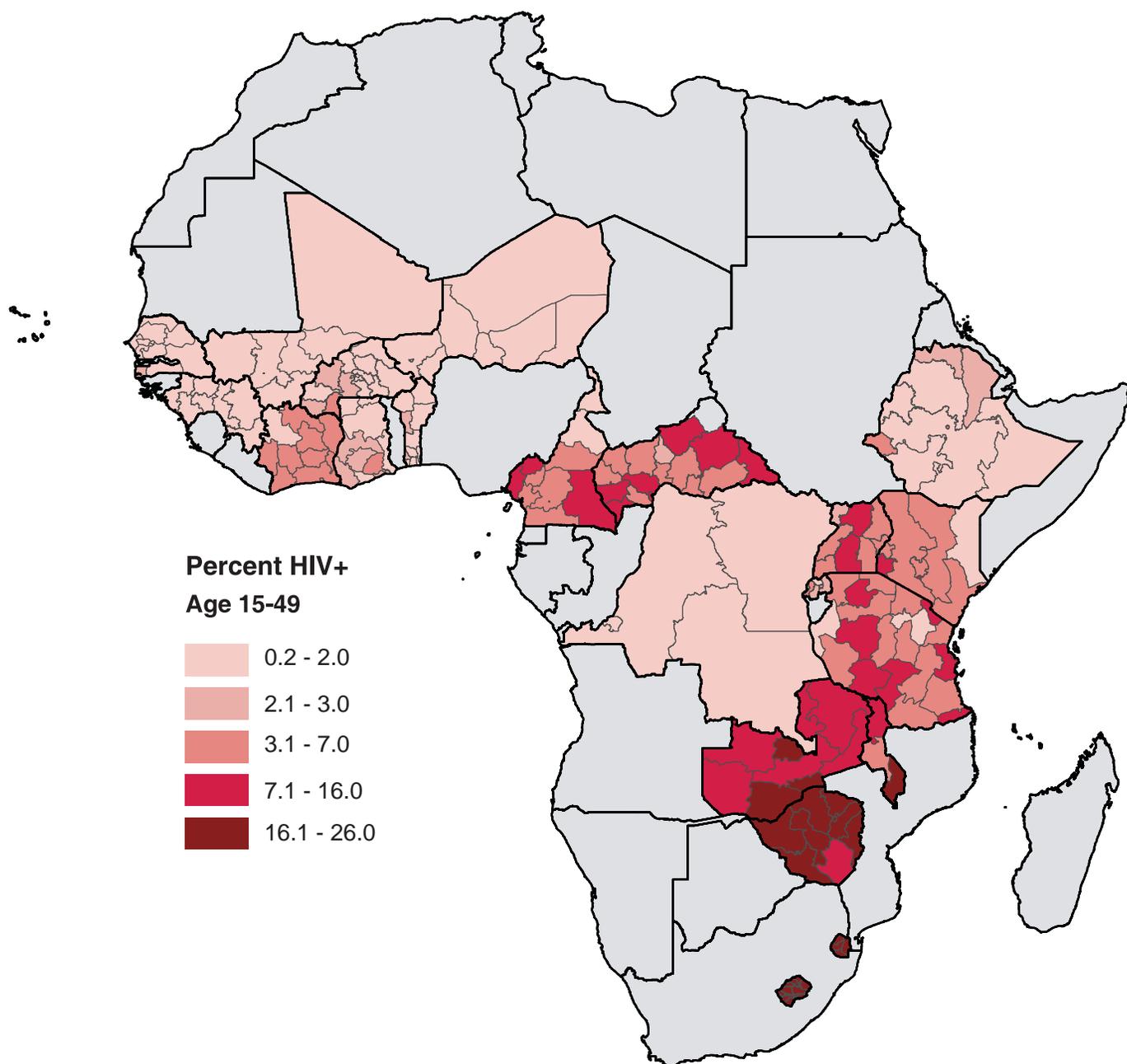
# National HIV Prevalence

Percent of women and men age 15-49 who are HIV-Positive

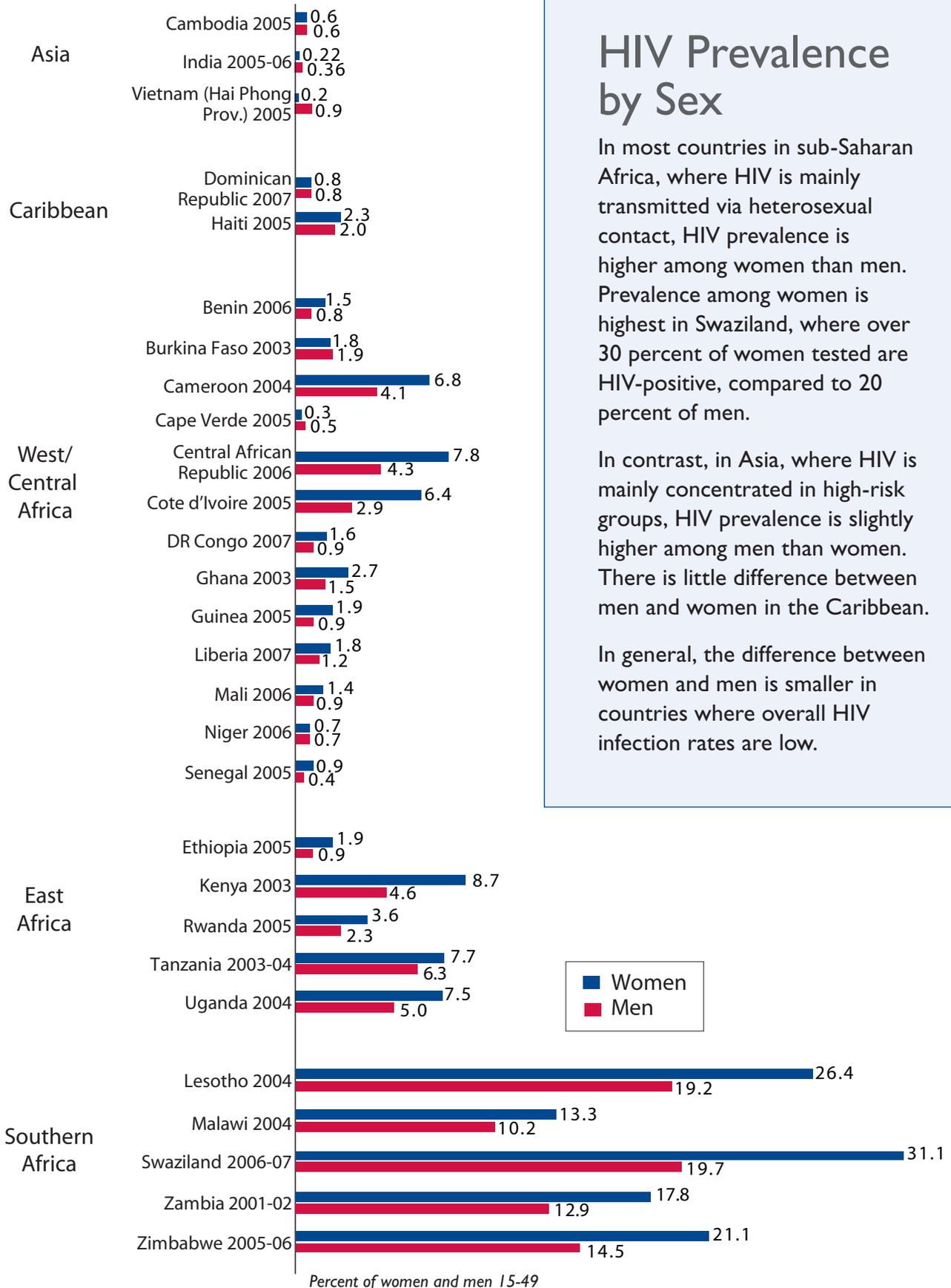


## HIV Prevalence in Africa at the Subnational Level

In most cases, DHS data provide HIV prevalence estimates at the regional (subnational) level. Some countries have fairly uniform prevalence; Lesotho, Swaziland, Zambia, and Zimbabwe have relatively high HIV prevalence across all regions, while much of West Africa is consistently low. There is greater regional variation in Cameroon, Central African Republic, Cote d'Ivoire, Ethiopia, Ghana, Kenya, Rwanda, Tanzania, and Uganda.



### HIV Prevalence by Sex



## HIV Prevalence by Sex

In most countries in sub-Saharan Africa, where HIV is mainly transmitted via heterosexual contact, HIV prevalence is higher among women than men. Prevalence among women is highest in Swaziland, where over 30 percent of women tested are HIV-positive, compared to 20 percent of men.

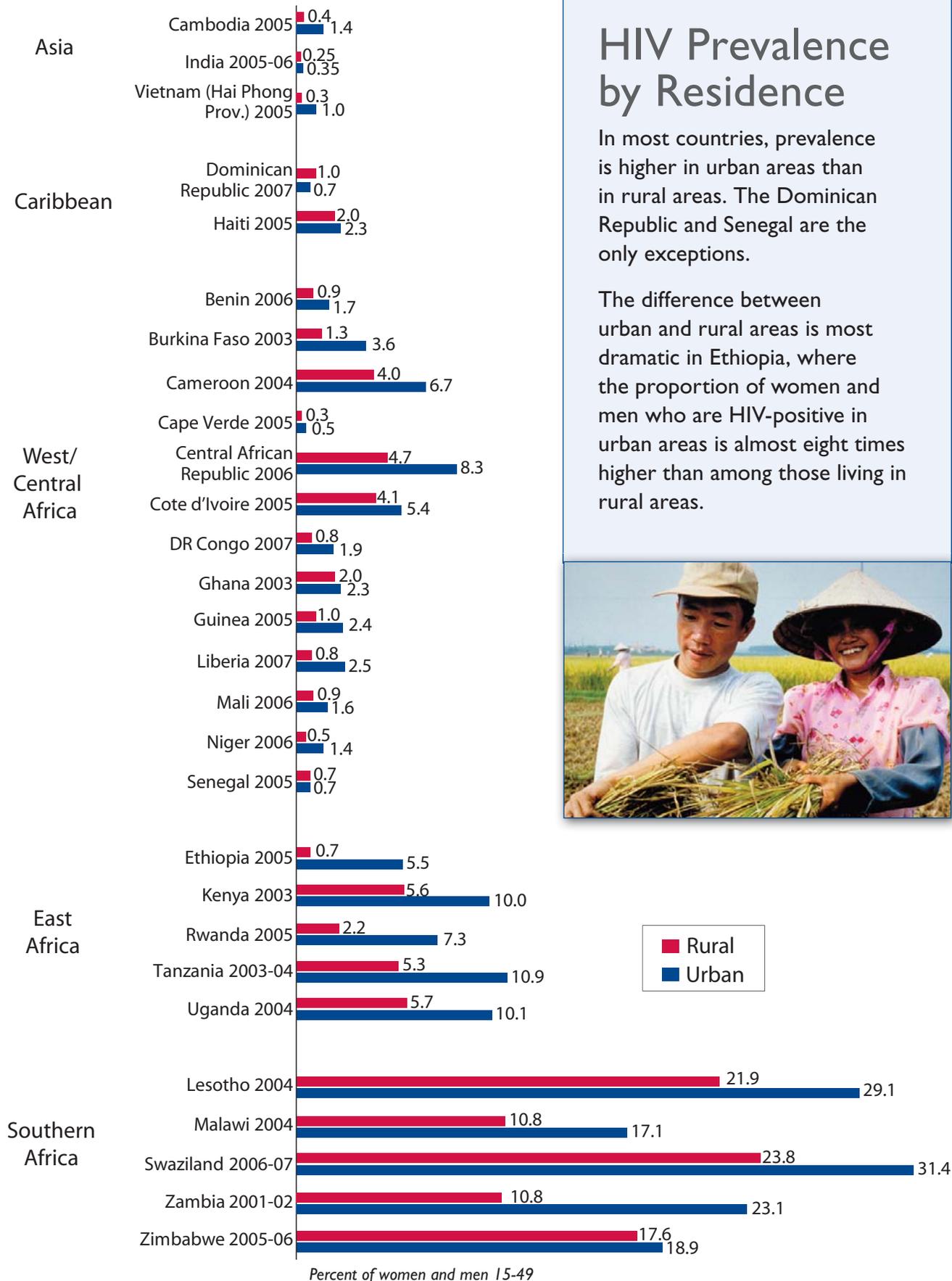
In contrast, in Asia, where HIV is mainly concentrated in high-risk groups, HIV prevalence is slightly higher among men than women. There is little difference between men and women in the Caribbean.

In general, the difference between women and men is smaller in countries where overall HIV infection rates are low.

■ Women  
■ Men

Percent of women and men 15-49

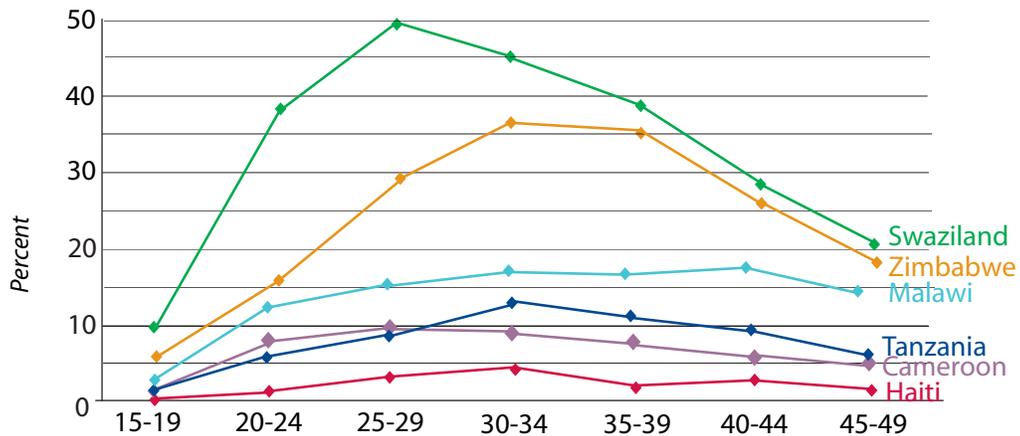
## HIV Prevalence by Residence



# HIV Prevalence by Age

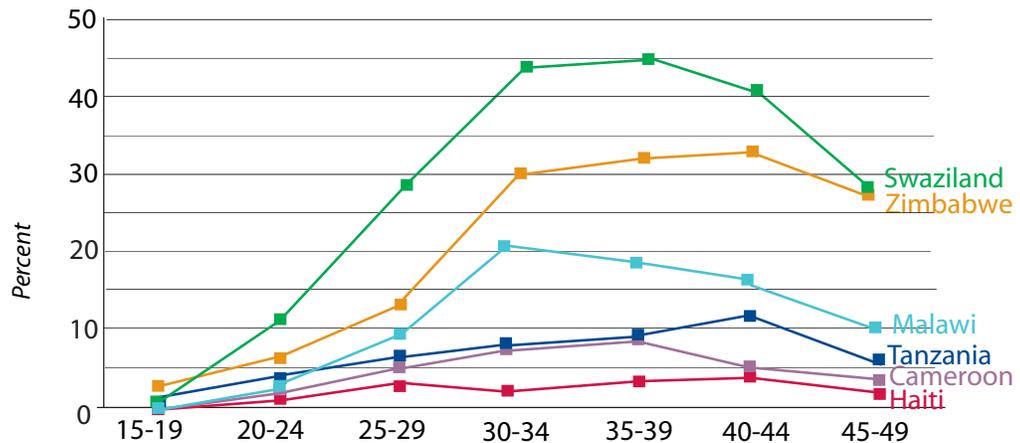
In general, HIV prevalence increases until about age 30-34 for women, and then declines. Among men, prevalence is lower than women in the early years and then hits its peak in the late 30s or early 40s. In some countries HIV prevalence is quite high among older adults; more than 10 percent of adults age 45-49 in Swaziland, Zimbabwe, and Malawi are HIV-positive.

## HIV Prevalence by Age: Women



*In Zimbabwe, for example, HIV prevalence among women peaks at age 30-34, while men are infected later, with a peak at age 40-44.*

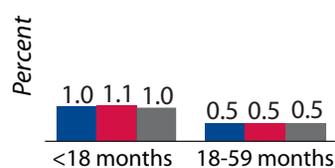
## HIV Prevalence by Age: Men



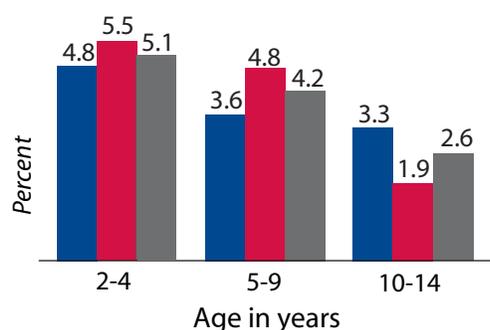
## Uganda and Swaziland: HIV Prevalence among Children

■ Girls ■ Boys ■ Total

### Uganda 2004-05



### Swaziland 2006-07



## Testing of Children

Some countries also choose to test younger children. Uganda tested children under age 5, while in Swaziland, children age 2-14 were tested.

Prevalence among children under five in Uganda is less than 1 percent. Younger children have a higher rate of infection than older children.

In Swaziland, 5 percent of the youngest children are HIV-positive. Prevalence decreases with age among children, as those who are born with HIV have usually died before their early teen years, and have not yet been exposed to HIV through sexual activity.

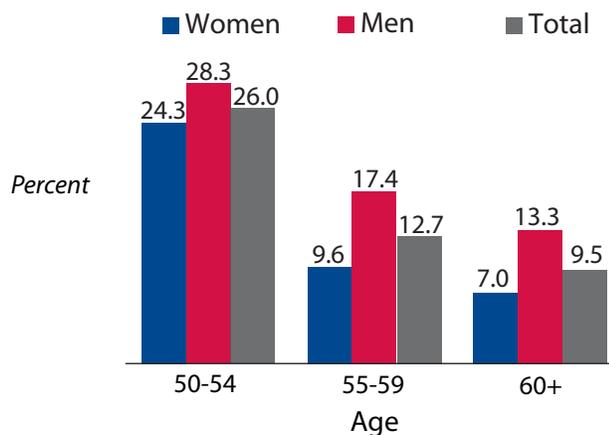


## Testing of Older Adults

While many countries test women up to age 49 and men up to age 55 or 59, the 2006-07 Swaziland DHS included testing of all women and men in the household, including those older than 49.

In Swaziland, one in four adults age 50-54 and one in ten adults 60 and over is infected with HIV.

## Swaziland: HIV Prevalence among Older Adults



## HIV Prevalence among Youth 15-24



## HIV Prevalence among Youth

HIV prevalence among youth is an important indicator of the future of the epidemic. In most countries, HIV prevalence among youth is quite low. In high-prevalence countries such as Lesotho, Swaziland, and Zimbabwe, however, more than 10 percent of young women are already infected with HIV. The difference between young women and men is especially striking in Cameroon, the Central African Republic, and Kenya.

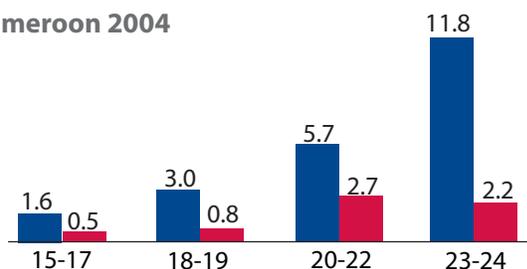
It is important to note that in almost all countries, young women are far more likely to be infected than young men. This is related to the fact that women marry and have sex earlier than men in most countries.

Percent of women and men 15-24

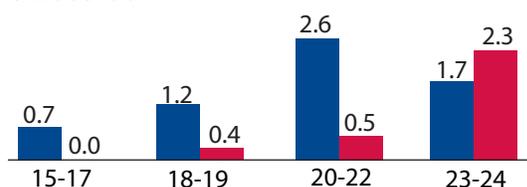
## HIV Prevalence among Youth by Age

■ Women ■ Men

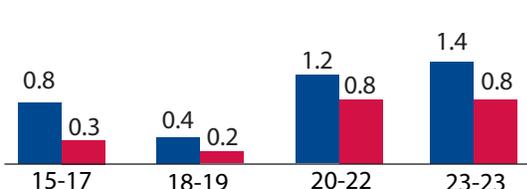
Cameroon 2004



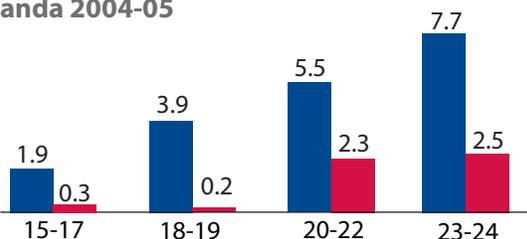
Haiti 2005-06



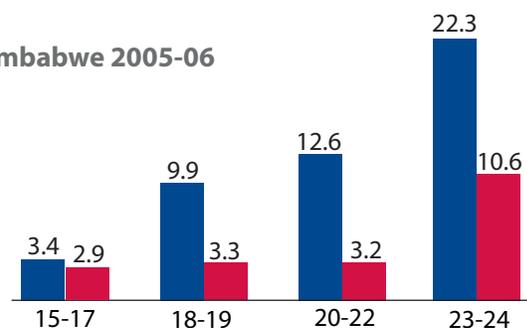
Mali 2006



Uganda 2004-05



Zimbabwe 2005-06



## Older Youth at Increased Risk

HIV prevalence is much lower among the youngest youth (those age 15-17) than the oldest youth (age 23-24) in most countries and among both women and men. This indicates that HIV prevalence increases quickly with age. This increase in prevalence mirrors the increased exposure to risk. As young people become sexually active and have more sexual partners they are more likely to be exposed to HIV.

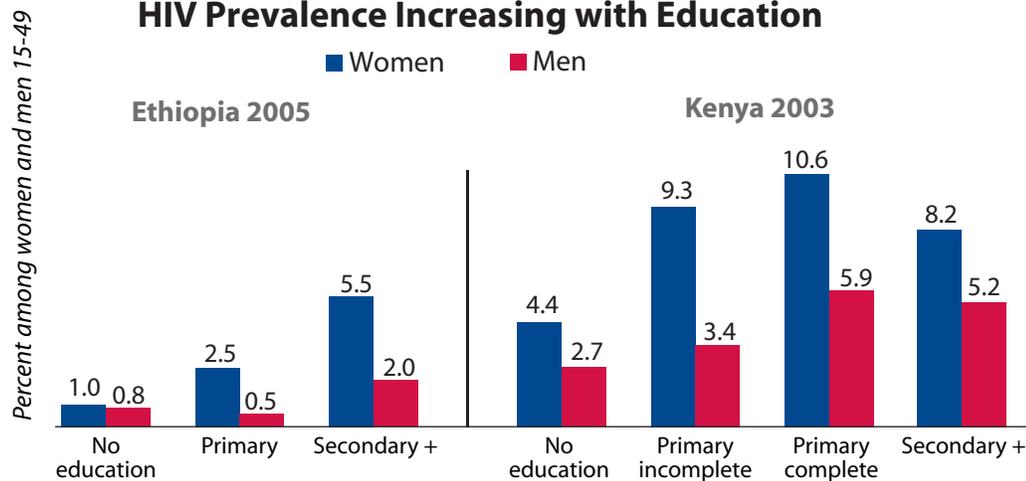
Young women are especially vulnerable to HIV due to their early age of marriage and sexual debut. Young women age 23-24 in Cameroon, for example, are 7 times as likely to be HIV-positive as young women age 15-17.



## HIV Prevalence by Education

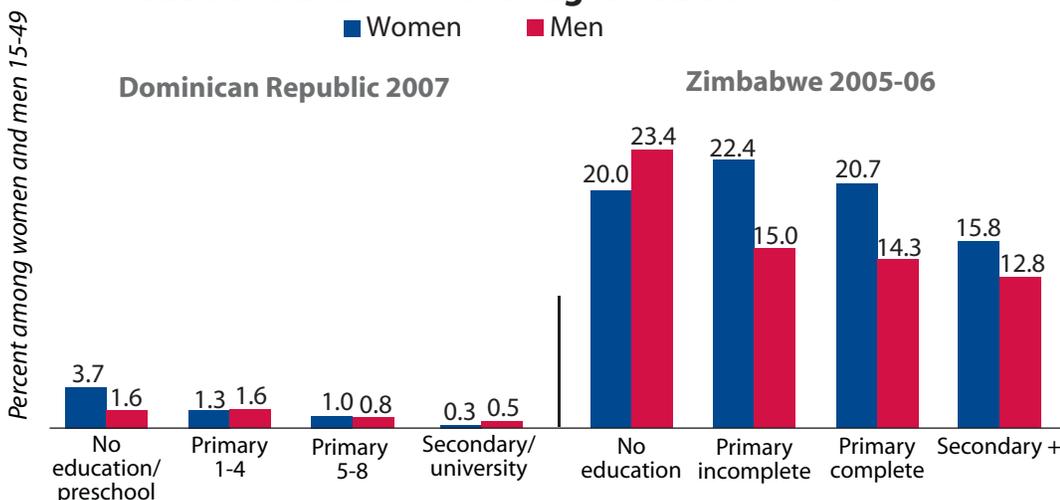
There is no consistent pattern in HIV prevalence by education. In Ethiopia and Kenya as well as Burkina Faso, Cameroon, the Central African Republic, Rwanda, Tanzania, and Uganda, HIV prevalence generally increases with education for both men and women. In other countries this association with education is seen only for men (Malawi) or only for women (the Democratic Republic of the Congo and Guinea). In contrast, HIV prevalence decreases with education in the Dominican Republic, Haiti, India, Senegal, and Zimbabwe, although in these cases, the pattern is more evident for men than for women. In some countries, there is no pattern at all (Cambodia, Cote d'Ivoire, Ghana, Lesotho, Mali, Niger, and Swaziland).

### Ethiopia and Kenya: HIV Prevalence Increasing with Education



*In both Ethiopia and Kenya, HIV prevalence among women with secondary or more education is about twice as high as prevalence among those with no education.*

### Dominican Republic and Zimbabwe: HIV Prevalence Decreasing with Education



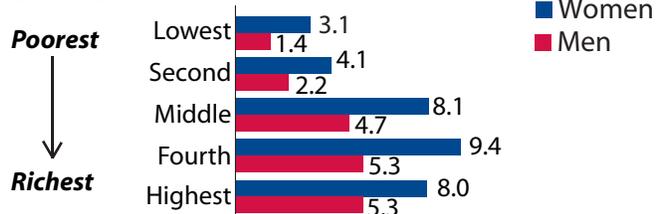
*In Zimbabwe, HIV prevalence among men with no education is twice as high as prevalence among those with secondary or more education.*

## HIV Prevalence by Wealth

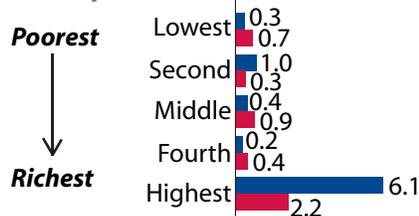
For most countries, prevalence is higher among women and men in the wealthiest households than among those in the poorest households. The relationship between wealth and HIV prevalence is generally stronger among women than among men. There are some exceptions to this pattern, however. In the Dominican Republic, Haiti, Benin, Ghana, and Zimbabwe there is no clear relationship between wealth and HIV infection.

### HIV Prevalence by Household Wealth Quintile

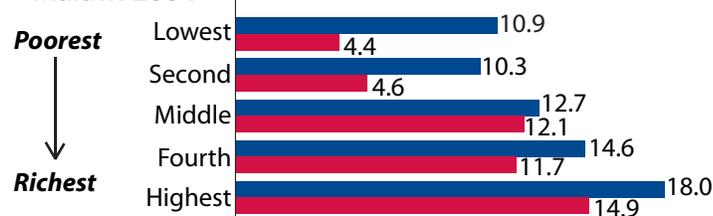
#### Cameroon 2004



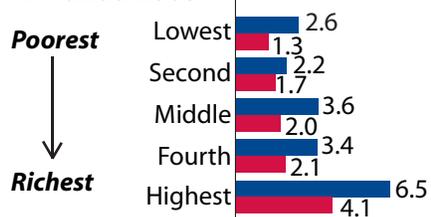
#### Ethiopia 2005



#### Malawi 2004

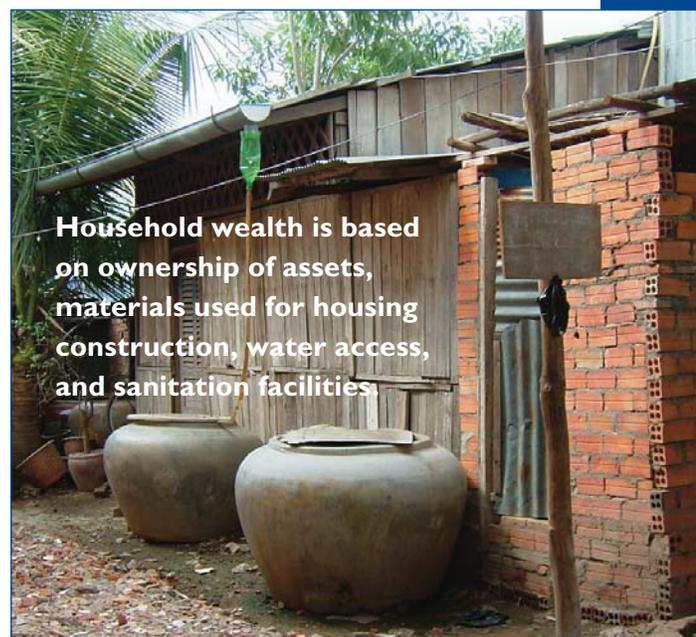


#### Rwanda 2005



Percent of women and men 15-49

*HIV prevalence tends to increase as household wealth increases. In some countries, prevalence increases incrementally with wealth, while in others, like Ethiopia, only the wealthiest have a markedly higher rate of HIV-infection.*



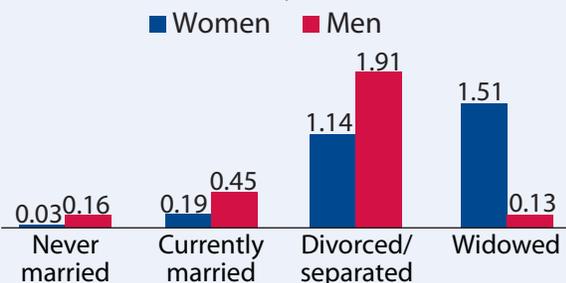
**Household wealth is based on ownership of assets, materials used for housing construction, water access, and sanitation facilities.**

## HIV Prevalence by Marital Status

The relationship between marital status and HIV prevalence is consistent across almost all DHS countries: women and men who are divorced/separated or widowed are far more likely to be HIV-positive than those who are currently married. And women and men who have never been married are least likely to be infected.

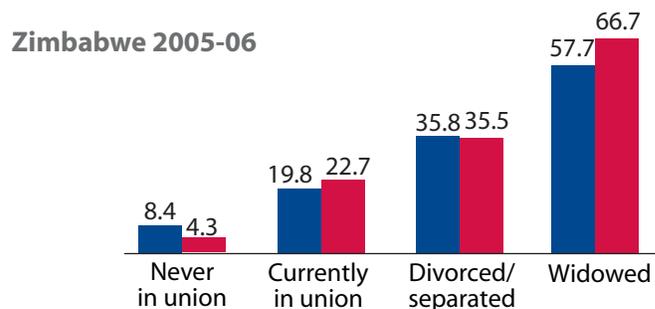
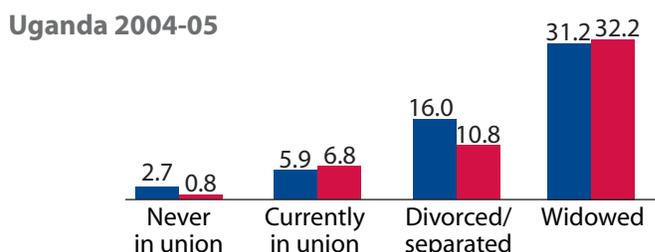
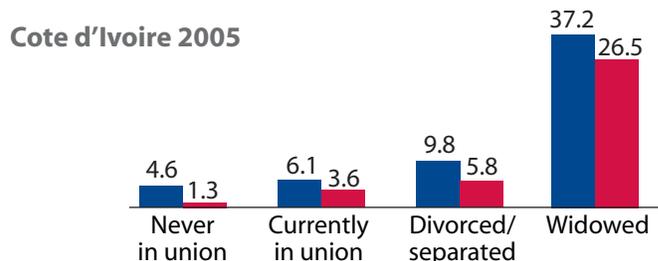
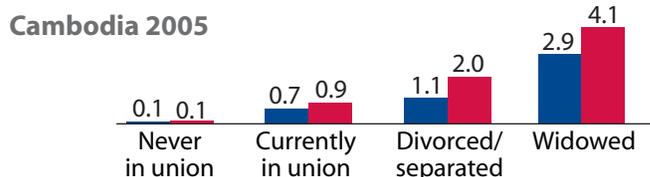
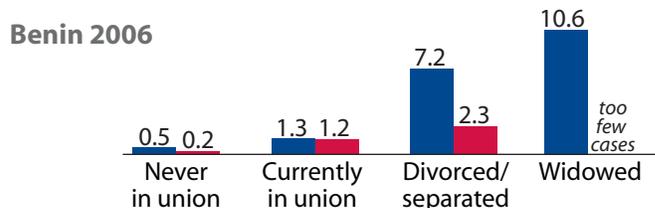
Despite low national prevalence, the relationship between HIV infection and marital status in India is still strong. Widowed women are more than six times as likely to be HIV-positive as currently married women. Men who are separated or divorced are four times as likely to be HIV-infected as married men.

**India 2005-06:  
HIV Prevalence by Marital Status**



## HIV Prevalence by Marital Status

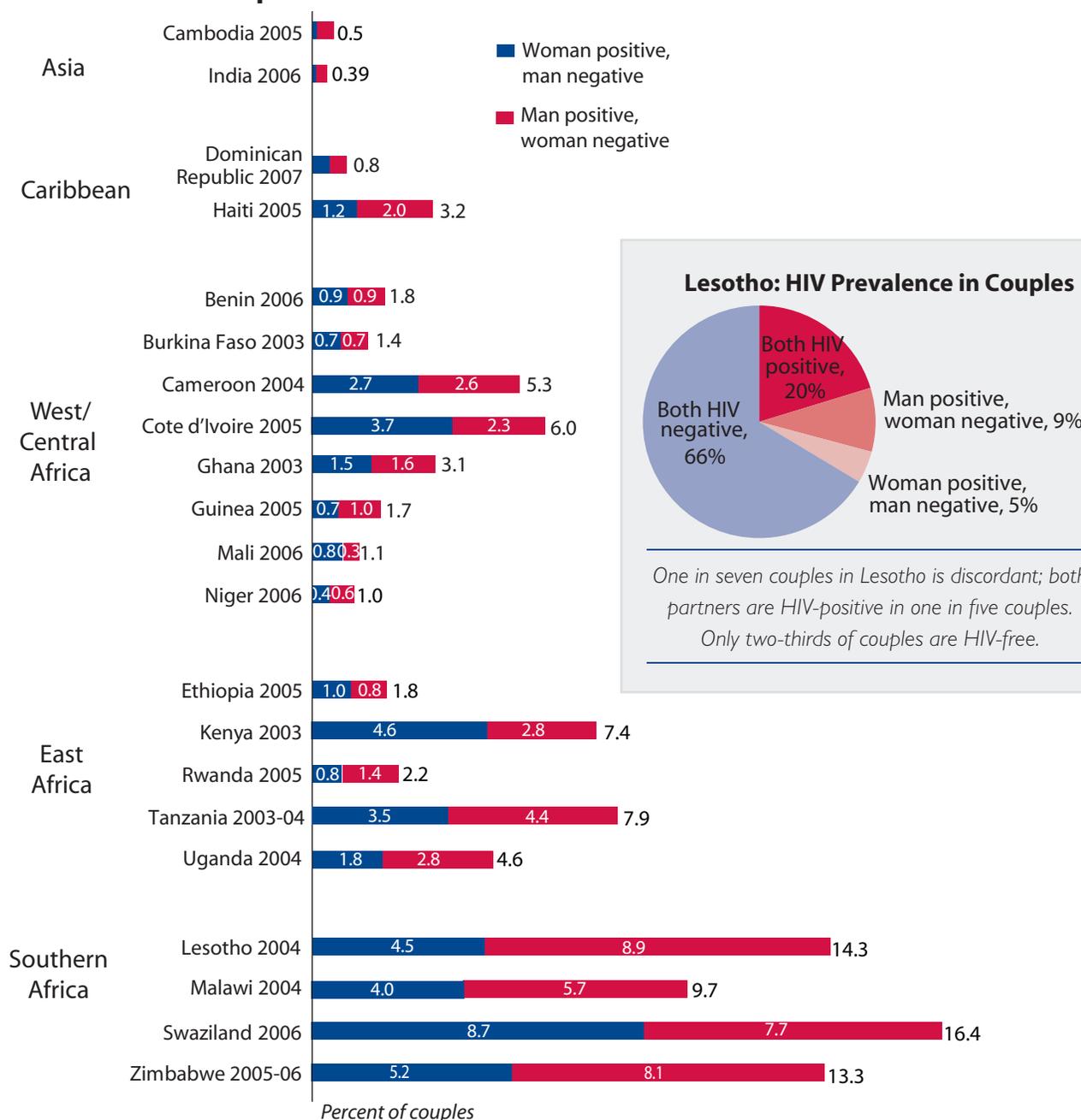
■ Women ■ Men



## HIV Prevalence among Couples

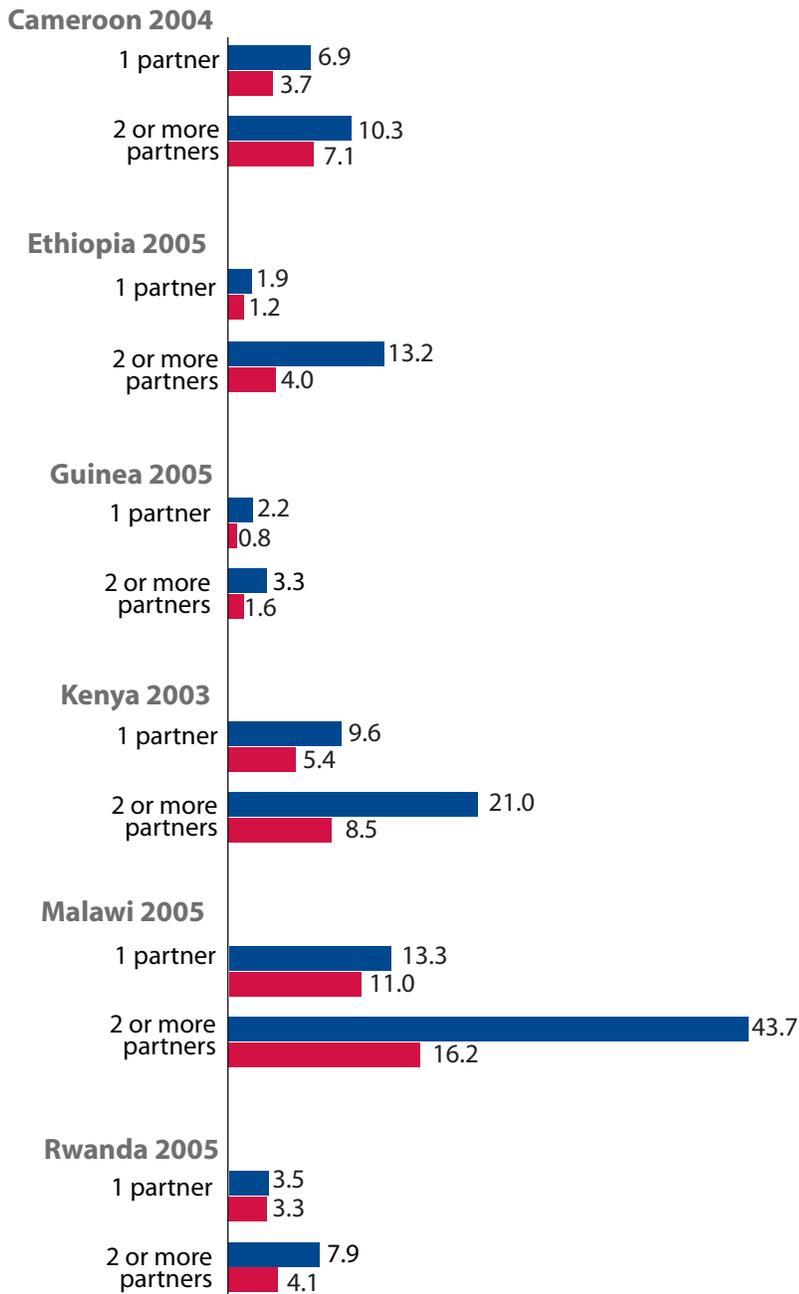
The best way to avoid contracting HIV is to avoid having sexual intercourse with a partner who is HIV-positive. However, in many married and cohabiting couples, one partner is positive. These couples are called “discordant” because one partner is HIV-positive and the other is negative. Identifying discordant couples is an essential step in reducing the spread of HIV. These couples must take extra steps to avoid transmission.

### Discordant Couples in Selected Countries



### HIV Prevalence by Number of Sexual Partners in Past Year

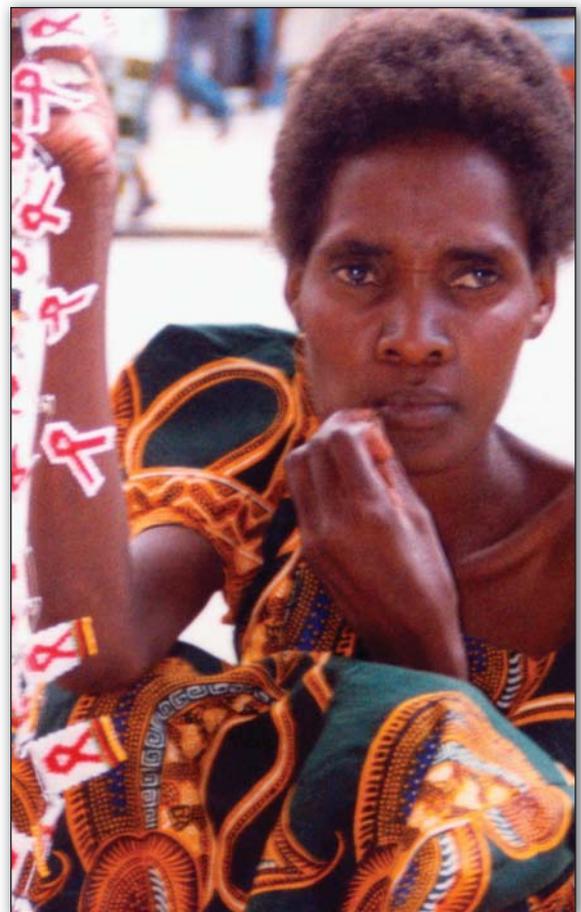
■ Women ■ Men



Percent of women and men 15-49

## HIV Prevalence by Sexual Behavior

Sex with multiple partners is associated with higher levels of HIV prevalence among women and men in Cameroon, Ethiopia, Guinea, India, Kenya, Lesotho, Malawi, Rwanda, and Uganda. This relationship also holds true for women, but not men, in Burkina Faso, Cote d'Ivoire, Ghana, Haiti, Tanzania, and Zimbabwe.

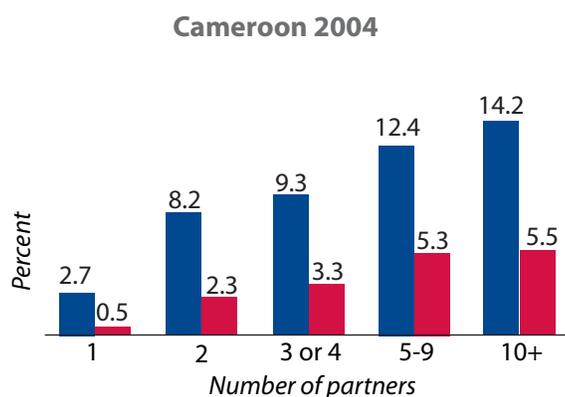


## HIV Prevalence by Number of Lifetime Partners

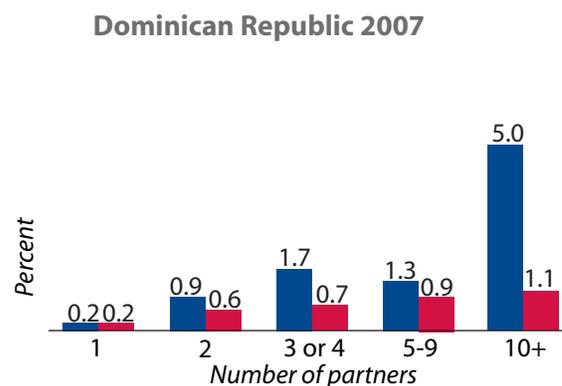
Women and men with more lifetime sexual partners are more likely to have been exposed to HIV. DHS data confirm the association between number of lifetime partners and HIV prevalence in almost all of the surveys for which this information was collected (Cambodia, Cameroon, Cote d'Ivoire, the Dominican Republic, Ethiopia, Guinea, Mali, Niger, Rwanda, Swaziland, and Zimbabwe).

### HIV Prevalence by Lifetime Number of Sexual Partners

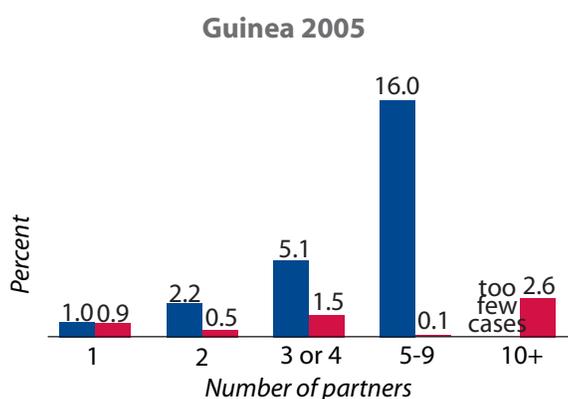
■ Women ■ Men



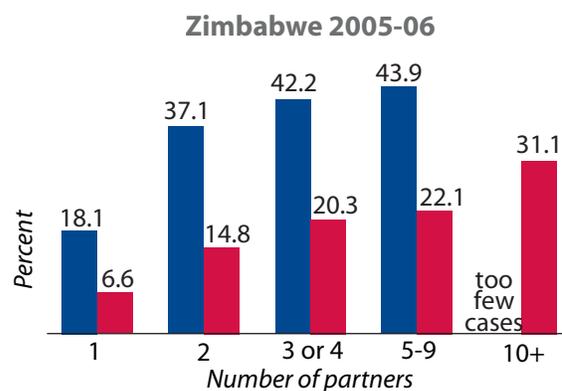
*In Cameroon, risk of HIV infection increases incrementally as women and men have more sexual partners.*



*As in most countries, the association between number of partners and HIV prevalence is especially strong for women in the Dominican Republic.*



*In Guinea, 16 percent of women with 5 to 9 lifetime sexual partners are HIV-positive, compared to only 1 percent of those with only 1 lifetime sexual partner.*



*Prevalence is high even among those with only one partner in Zimbabwe, and yet HIV-infection rates more than double as women and men have more lifetime partners.*



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## Photo credits

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Page 2: © 2006 Felix Masi/Voiceless Children, Courtesy of Photoshare. An HIV-positive person stands near an audience of children at the HIV/AIDS candle memorial in Kibera, Africa’s largest slum in Nairobi, Kenya. The ceremony, organized by the African Medical and Research Foundation (AMREF), was part of the International AIDS Candlelight Memorial Campaign.

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Page 18: © 2004 Abel Mambwe Chibu, Courtesy of Photoshare. A woman sells red ribbons along Chacha Cha road in Lusaka, Zambia, promoting a campaign to fight stigmatization of HIV/AIDS. “If you are not infected, then you are affected,” is a common slogan for HIV/AIDS.

Back cover: © 2007 Fotodan, Courtesy of Photoshare. Miners in Chingola, Zambia, receive HIV/AIDS counseling at work.



**Go for  
HIV testing  
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