HIV PREVALENCE AND ASSOCIATED FACTORS $\quad$ **13**

This chapter presents information on the coverage of HIV testing, the prevalence of HIV, and the factors associated with HIV infection among eligible women and men. The 2003 GDHS is the sixth survey (the others being Dominican Republic, Mali, Zambia, Kenya and Burkina Faso) in the international DHS programme to include HIV testing, and the third only (after Kenya and Burkina Faso) to anonymously link the HIV results with key behavioural, social, and demographic factors. The HIV prevalence data provide important information to plan the national response, to evaluate programme impact, and to measure progress on the Ghana HIV/AIDS Strategic Framework: 2001-2005. The understanding of the prevalence of HIV in the population and the analysis of social, biological, and behavioural factors associated with HIV infection provide new insights into the HIV epidemic in Ghana that may enable more precisely targeted messages and interventions.

In Ghana, as in most of sub-Saharan Africa, national HIV prevalence estimates have been derived primarily from HIV sentinel surveillance (HSS) in pregnant women attending antenatal clinics. Currently, the national sentinel surveillance system consists of 30 sites of which 23 are urban and 7 are rural sites strategically located in 28 of the 110 districts, and covering all 10 regions of the country. Since 1992, for 12 weeks each year, pregnant women seeking antenatal care (ANC) for the first time and patients newly diagnosed with sexually transmitted infections (STIs) attending STI clinics in the sentinel sites were tested for HIV using an anonymously unlinked method and the results entered into a database, analysed, and reported by the National AIDS Control Programme (NACP) (Ghana Health Service, 2003d). The latest round of sentinel surveillance was conducted between September and November 2003, and overlapped two of the three months of the GDHS fieldwork.

The rate of HIV infection in pregnant women has been shown to be a reasonable proxy for the prevalance level in the combined male and female adult population (WHO and UNAIDS, 2000). However, there are a number of challenges in using sentinel surveillance estimates derived exclusively from pregnant women attending select antenatal clinics for estimating the HIV rate in the general adult population. The ANC data do not capture information on HIV prevalence in non-pregnant women, nor in women who either do not attend a clinic for pregnancy care or receive ANC at facilities not represented in the surveillance system. Pregnant women are also at a higher risk for HIV infection than women who may be avoiding both HIV and pregnancy through the use of condoms or women who are not sexually active and are therefore less likely to become pregnant or expose themselves to HIV. The rates among pregnant women have also been found to be much higher than male HIV prevalence rates. For example, a World Health Organisation study of four cities in sub-Saharan Africa shows higher risk overall in women compared with men (Buve et al., 2001).

Although the information from the ANC surveillance system has been very useful for monitoring trends in HIV levels, the inclusion of HIV testing in the GDHS offers the opportunity to better understand the magnitude and patterns of infection levels in the general reproductive-age population. The GDHS results are in turn expected to improve the calibration of annual sentinel surveillance data, so that trends in HIV infection can be more accurately measured in the intervals between general population surveys. In addition, the DHS data have the added advantage of providing behavioural data linked to HIV prevalence, which can be used to guide HIV prevention programmes.

13.1 COVERAGE OF HIV TESTING

Table 13.1 shows the percent distribution of women and men eligible for HIV testing by testing status, according to urban-rural residence and region. HIV tests were conducted for 89 percent of the 5,949 eligible women and 80 percent of the 5,345 eligible men. For both sexes combined, coverage was 85 percent, with rural residents more likely to be tested than their urban counterparts (87 and 81 percent, respectively). There were marked differences in HIV testing coverage by region. Coverage was highest in the Central Region where 93 percent of women and men were tested, and lowest in Greater Accra, where 76 percent of eligible women and men were tested. Coverage was higher among women than among men in every region, with the difference between women and men tested being widest in Greater Accra (84 and 65 percent, respectively) and narrowest in the Northern Region (86 and 85 percent, respectively).

Table 13.1 Coverage of HIV testing

Percent distribution of women age 15-49 and men age 15-59 eligible for HIV testing by testing status, according to residence and region (unweighted), Ghana 2003

	Residence		Region										
	Urban	Rural	Western	Central	Greater Accra	Volta	Eastern	Ashanti	Brong Ahafo	Northern	Upper East	Upper West	Total
Testing status													
WOMEN													
Tested	87.6	90.5	94.4	94.2	84.4	91.0	85.1	93.4	93.1	85.7	87.6	84.8	89.3
Refused	6.8	4.9	3.0	2.5	7.1	4.3	10.9	4.0	4.2	5.6	5.3	10.1	5.7
Absent for testing	3.8	3.0	2.0	2.5	5.7	3.2	1.9	2.0	1.7	5.0	6.0	3.1	3.3
Interviewed in survey	1.3	0.8	0.0	0.8	0.9	0.9	0.2	1.0	1.1	3.0	2.2	0.2	1.0
Not interviewed	2.6	2.1	2.0	1.7	4.8	2.4	1.7	1.1	0.6	2.0	3.8	2.9	2.3
Other/missing	1.8	1.6	0.6	0.8	2.7	1.5	2.1	0.5	1.1	3.6	1.2	2.1	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	2,500	3,449	540	361	913	468	530	946	649	638	418	486	5,949
MEN													
Tested	73.7	83.9	82.4	91.1	65.3	82.2	71.5	85.7	85.0	84.7	80.4	74.9	80.0
Refused	15.1	7.9	12.0	2.5	16.6	7.1	19.2	9.6	7.8	5.2	7.6	17.0	10.7
Absent for testing	8.8	6.2	4.6	5.4	14.1	8.3	7.3	4.4	5.1	6.3	11.1	4.5	7.2
Interviewed in survey	4.2	2.6	1.3	1.3	6.0	3.6	4.0	1.1	4.1	3.1	5.9	0.7	3.2
Not interviewed	4.7	3.7	3.4	4.1	8.2	4.6	3.3	3.3	1.0	3.2	5.2	3.8	4.0
Other/missing	2.4	2.0	1.1	1.0	3.9	2.4	1.9	0.2	2.1	3.8	0.9	3.6	2.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	2,063	3,282	476	315	721	411	478	819	606	678	423	418	5,345
TOTAL													
Tested	81.3	87.3	88.8	92.8	76.0	86.9	78.7	89.9	89.2	85.2	83.9	80.2	84.9
Refused	10.6	6.3	7.2	2.5	11.3	5.6	14.9	6.6	5.9	5.4	6.4	13.3	8.1
Absent for testing	6.1	4.6	3.2	3.8	9.4	5.6	4.5	3.1	3.3	5.7	8.6	3.8	5.2
Interviewed in survey	2.6	1.7	0.6	1.0	3.1	2.2	2.0	1.0	2.5	3.0	4.0	0.4	2.0
Not interviewed	3.5	2.9	2.7	2.8	6.3	3.4	2.5	2.1	0.8	2.7	4.5	3.3	3.1
Other/missing	2.0	1.8	0.8	0.9	3.2	1.9	2.0	0.4	1.6	3.7	1.1	2.8	1.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	4,563	6,731	1,016	676	1,634	879	1,008	1,765	1,255	1,316	841	904	11,294

Individuals who were not tested can be categorized into four groups based on the reason for nonresponse. Eight percent of eligible women and men refused testing when asked for informed consent by the health worker (Table 13.1). Five percent were absent for testing: 2 percent were interviewed in the survey, but were not at home when the health worker arrived for testing and were not found on callbacks; 3 percent were not at home for both the interview and testing. Two percent were missing test results for

some other reason, such as they were incapable of giving consent for testing, there was a mismatch between the questionnaire and the blood sample, or there was a technical problem in taking blood.

Refusal is the most important reason for non-response on the HIV testing component, with men nearly twice as likely to refuse testing as women (11 and 6 percent, respectively). Seven percent of men were absent for testing compared with 3 percent of women, with both women and men more likely to be absent for testing and never interviewed, than to have been interviewed but not tested.

The proportions falling into the four non-response categories vary by urban-rural residence, with urban coverage below rural coverage among both women and men in every category. The urban-rural differentials in coverage are most marked for refusal rates, which are 7 percent and 15 percent among urban women and men, respectively, and 5 percent and 8 percent for rural women and men, respectively.

Regionally, refusal is highest in the Eastern Region among both women (11 percent) and men (19 percent). Variation in refusal rates again accounts for much of the regional disparities. Refusal is also higher among both women and men in the Upper West Region (10 and 17 percent, respectively) and in Greater Accra (7 and 17 percent, respectively). For both women and men, absence is relatively high in Greater Accra and the Upper East.

Table 13.2 shows coverage rates for HIV testing by background characteristics. If knowledge of HIV status influenced participation in the testing, coverage would be expected to rise with age because HIV levels increase sharply with age before leveling off or declining at the older ages. In fact, the coverage rate for testing among women is consistent across all age groups (88 to 91 percent). Response rates are somewhat more variable by age among men (77 to 83 percent), but again they do not rise with age as would be expected if they were influenced by HIV status.

To further explore whether non-response might have had an impact on the HIV seroprevalence results, additional analysis was undertaken on the relationships between participation in the HIV testing and a number of other characteristics related to HIV risk. The descriptive tables examined in this analysis are included in Appendix A.

The variation in response rates with these measures indicate that coverage rates are not uniformly lower among those groups considered to be at higher risk for HIV (Tables A.3-A.6). However, there is some indication that some higher-risk groups may have lower response rates. Where response rates are lower for higher-risk groups, the pattern is more obvious for men than women. For example, response rates are slightly lower among divorced or separated men than among those currently in union, and among those who have ever had sex than among those who have never had sex. Similarly, men who sleep away from home—a characteristic assumed to be related to higher HIV risk—is not strongly related to lower coverage, with the exception of men who slept away more than five times in the past year, who have a slightly lower coverage.

The initial descriptive examination of HIV testing coverage levels provided little evidence of a consistent relationship between non-response rate and variables associated with higher HIV risk. Although further analysis is required, this analysis supports the conclusion that the GDHS prevalence rates are a reasonable measure of the actual levels of HIV prevalence in the population.

Table 13.2 Coverage of HIV testing, by background characteristics

Percent distribution of women age 15-49 and men age 15-59 eligible for testing by testing status, according to background characteristics (unweighted), Ghana 2003

| | Testing status | | | | | | | | | |
| | Tested | | Refused | | Absent | | Other/missing | | | |
Background characteristic	Inter-viewed	Not inter-viewed	Inter-viewed	Not inter-viewed	Inter-viewed	Not inter-viewed	Inter-viewed	Not inter-viewed	Total	Number
WOMEN										
Age										
15-19	88.6	0.3	3.9	0.8	1.6	2.4	0.8	1.7	100.0	1,173
20-24	89.8	0.4	3.4	1.1	1.1	2.4	1.1	0.8	100.0	1,045
25-29	89.8	0.2	4.7	1.3	0.9	2.2	0.8	0.2	100.0	1,005
30-34	89.0	0.2	6.4	0.6	0.8	1.5	0.7	0.7	100.0	844
35-39	87.5	0.1	5.6	1.3	0.5	3.0	0.7	1.3	100.0	768
40-44	87.5	0.2	7.3	0.5	1.4	2.5	0.5	0.2	100.0	592
45-49	91.4	0.2	2.9	1.0	0.6	2.3	1.1	0.6	100.0	522
Education										
No education	87.4	0.5	5.1	0.9	1.2	2.7	1.1	1.0	100.0	2,022
Primary	91.6	0.1	3.8	0.7	0.8	1.7	0.7	0.7	100.0	1,148
Middle/JSS	90.9	0.0	4.3	1.0	0.9	1.7	0.6	0.6	100.0	2,115
Secondary+	83.9	0.2	7.1	1.2	1.1	4.4	1.1	1.2	100.0	664
Wealth quintile										
Lowest	88.3	0.4	5.0	0.4	1.0	2.5	1.4	0.9	100.0	1,398
Second	91.0	0.1	3.7	0.9	0.9	1.9	0.6	1.1	100.0	1,040
Middle	92.2	0.0	3.4	0.7	0.8	1.8	0.4	0.8	100.0	1,023
Fourth	88.9	0.5	5.1	1.1	1.0	2.2	0.5	0.7	100.0	1,131
Highest	86.1	0.1	6.1	1.6	1.4	2.9	1.0	0.7	100.0	1,357
Total	89.0	0.2	4.8	0.9	1.0	2.3	0.8	0.8	100.0	5,949
MEN										
Age										
15-19	83.3	0.3	6.0	0.9	3.5	4.5	0.3	1.0	100.0	1,175
20-24	78.4	0.1	10.7	1.3	2.7	4.5	0.5	1.7	100.0	750
25-29	78.7	0.1	9.4	0.6	3.8	5.0	1.3	1.0	100.0	780
30-34	80.0	0.0	11.0	0.6	2.9	3.0	1.8	0.6	100.0	661
35-39	77.7	0.0	12.3	1.5	2.9	3.3	1.1	1.3	100.0	551
40-44	78.5	0.2	12.7	1.4	2.5	2.8	1.2	0.7	100.0	433
45-49	81.9	0.0	8.2	0.2	3.7	4.7	1.1	0.2	100.0	465
50-54	76.6	0.0	11.9	0.9	3.1	4.1	2.2	1.3	100.0	320
55-59	77.6	0.0	11.0	1.4	2.9	2.4	2.9	1.9	100.0	210
Education										
No education	79.2	0.2	8.5	0.7	3.4	4.1	1.6	2.3	100.0	1,207
Primary	82.4	0.2	7.9	0.9	3.1	2.6	1.8	1.1	100.0	900
Middle/JSS	81.3	0.0	9.2	0.8	2.9	4.6	0.7	0.5	100.0	2,092
Secondary+	76.2	0.1	13.5	1.5	3.6	3.6	0.8	0.7	100.0	1,140
Wealth quintile										
Lowest	84.6	0.1	6.2	0.4	2.8	3.0	1.6	1.5	100.0	1,284
Second	84.8	0.2	6.7	0.5	2.5	3.5	0.9	1.0	100.0	1,005
Middle	81.9	0.1	9.3	0.6	3.0	3.3	0.9	0.9	100.0	929
Fourth	77.1	0.3	11.6	0.7	3.1	5.3	0.9	1.0	100.0	978
Highest	70.8	0.0	15.1	2.4	4.4	5.2	1.1	0.8	100.0	1,149
Total	79.8	0.1	9.7	1.0	3.2	4.0	1.1	1.0	100.0	5,345

13.2   HIV PREVALENCE

13.2.1 HIV Prevalence by Socioeconomic Characteristics

Results from the 2003 GDHS indicate that 2 percent of Ghanaian adults are infected with HIV (Table 13.3).[1] HIV prevalence in women age 15-49 is nearly 3 percent, while for men 15-59, it is under 2 percent. This female-to-male ratio of 1.8 to 1 is higher than that found in most population-based studies in Africa. The high female-to-male ratio implies that young women are particularly vulnerable to HIV infection compared with young men. Prevalence among females is consistently higher than among males at all age groups except at age 40-44, where male prevalence is higher (Figure 13.1). The female-male gap is particularly large among women and men age 25-29, where women are nearly three and a half times as likely to be HIV positive as men. The peak prevalence among women is at age 35-39 (5 percent), while prevalence rises gradually with age among men to peak at age 40-44 (4 percent). These results compare favourably with the HSS and AIDS data available for Ghana.

Table 13.3 HIV prevalence by age

Percentage HIV positive among women 15-49 and men 15-59 who were tested, by age, Ghana 2003

Age	Women		Men		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
15-19	0.5	1,035	0.2	1,035	0.3	2,070
20-24	1.9	912	0.0	616	1.2	1,528
25-29	3.4	855	1.0	663	2.3	1,518
30-34	4.2	706	2.8	548	3.6	1,253
35-39	4.7	648	3.1	433	4.0	1,082
40-44	3.0	504	4.1	351	3.5	855
45-49	2.5	437	1.9	401	2.2	838
50-54	na	na	3.6	254	na	na
55-59	na	na	2.8	167	na	na
Total age 15-49	2.7	5,097	1.5	4,047	2.2	9,144
Total age 15-59	na	na	1.6	4,469	na	na

na = Not applicable

Few HIV-infected children survive into their teenage years. As such, infected youth represent more recent cases of HIV infection and serve as an indicator of trends in both prevalence and incidence. The majority of HIV positive persons in the age group 15-24 are women, with less than half a percent among HIV positive men in the same age group. The overall prevalence in youth is under 2 percent. These prevalence levels will provide a baseline for measuring progress toward the goals underlined in the Ghana HIV/AIDS Strategic Framework in future surveys.

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[1] The prevalence of HIV 2 was found to be 0.4 percent among women age 15-49 and 0.1 percent among men age 15-59, with an overall prevalence of 0.3. Prevalence in this chapter refers to the overall prevalence of HIV 1, HIV 2, and HIV 1/2.

Figure 13.1 HIV Prevalence by Age Group and Sex
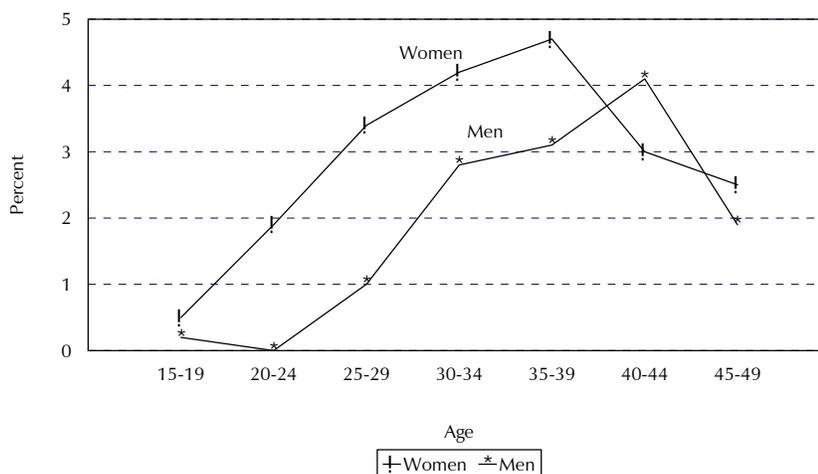
GDHS 2003

As Table 13.4 shows, urban residents are only slightly more likely to be HIV positive than rural residents with the urban-rural difference among women slightly greater than among men.

The HIV epidemic shows regional variations. Prevalence is highest in the Eastern Region (4 percent), followed by the Western and Brong Ahafo regions (3 percent each). Prevalence is lowest in the Northern, Central, and Volta regions (1 percent each). Gender differences are apparent in all the regions.

Those who have completed primary and middle/JSS education have higher infection levels than those with either no education or at least secondary education. Work status is related to the HIV rate among both women and men, with prevalence twice as high among those currently working than those not currently working. Prevalence is highest among both women and men in the middle wealth quintile.

Table 13.4 HIV prevalence by background characteristics

Percentage HIV positive among women and men age 15-49 who were tested for HIV, by background characteristics, Ghana 2003

Background characteristic	Women		Men		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Residence						
Urban	2.9	2,466	1.5	1,826	2.3	4,292
Rural	2.5	2,630	1.4	2,222	2.0	4,852
Region						
Western	3.9	497	1.8	382	3.0	879
Central	1.7	386	0.3	294	1.1	680
Greater Accra	2.6	842	1.6	585	2.2	1,427
Volta	1.7	440	0.3	346	1.1	786
Eastern	4.4	535	2.9	437	3.7	972
Ashanti	3.0	1,023	1.3	762	2.3	1,784
Brong Ahafo	3.8	512	1.3	440	2.7	952
Northern	0.9	449	1.0	435	1.0	884
Upper East	0.8	277	2.2	259	1.5	535
Upper West	2.0	136	1.6	108	1.8	245
Education						
No education	2.2	1,438	1.2	653	1.9	2,090
Primary	3.3	1,029	1.5	660	2.6	1,689
Middle/JSS	3.1	2,046	1.9	1,794	2.5	3,839
Secondary+	1.6	585	0.7	941	1.0	1,525
Employment						
Currently working	3.0	3,826	1.8	2,920	2.5	6,746
Not currently working	1.8	1,270	0.5	1,127	1.2	2,398
Wealth quintile						
Lowest	1.4	867	1.4	700	1.4	1,567
Second	2.7	853	1.5	729	2.2	1,582
Middle	4.0	977	2.0	786	3.1	1,764
Fourth	2.9	1,117	1.3	884	2.2	2,001
Highest	2.4	1,283	1.1	947	1.9	2,230
Ethnicity						
Akan	2.9	2,592	1.0	1,882	2.1	4,473
Ga/Dangme	6.5	401	4.2	303	5.5	705
Ewe	1.3	665	1.4	539	1.3	1,204
Guan	0.0	133	0.8	146	0.4	279
Mole-Dagbani	1.8	648	1.3	714	1.5	1,362
Grussi	2.6	118	3.8	100	3.2	218
Gruma	0.8	127	0.0	125	0.4	251
Hausa	4.6	71	4.9	(39)	4.7	109
Other	2.4	334	1.7	198	2.2	532
Religion						
Roman Catholic	3.1	701	1.2	571	2.3	1,271
Anglican	1.8	69	0.0	49	1.1	118
Methodist	3.4	382	1.5	255	2.6	637
Presbyterian	3.5	452	3.5	315	3.5	767
Other Christian	2.6	2,322	1.1	1,669	2.0	3,991
Moslem	2.4	816	1.3	772	1.9	1,588
Traditional/spiritualist	1.1	130	2.0	171	1.6	301
No religion	1.7	224	2.4	245	2.0	469
Total	2.7	5,097	1.5	4,047	2.2	9,144

Note: Figures in parentheses are based on 25-49 unweighted cases. Total includes 6 women and 2 men for whom information on ethnicity is missing and 1 woman and 2 men for whom information on religion is missing.

13.2.2 HIV Prevalence by Other Socio-demographic Characteristics

Marital status is related to HIV prevalence (Table 13.5). Prevalence is higher among widowed women (7 percent), followed closely by divorced or separated women (6 percent). Among men, prevalence is higher among divorced or separated men (6 percent). Women who report they have had sex but have never been in a union have a higher risk than men in the same category (3 percent and less than 1 percent, respectively). HIV infection among women and men who have never been in a union and have never had sex is almost non-existent, suggesting that non-sexual transmission of HIV is negligible.

Table 13.5 HIV prevalence by selected socio-demographic characteristics

Percentage HIV positive among women and men age 15-49 who were tested for HIV, by socio-demographic characteristics (marital status, pregnancy status for women, and mobility status for men), Ghana 2003

Socio-demographic characteristic	Women		Men		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Marital status						
Currently in union	2.9	3,192	2.3	1,981	2.7	5,173
Widowed	6.7	95	na	14	6.8	109
Divorced/separated	6.2	368	3.3	96	5.2	564
Never in union	1.1	1,442	0.3	1,856	0.6	3,298
Ever had sex	2.5	651	0.3	787	1.3	1,439
Never had sex	0.0	791	0.2	1,068	0.1	1,859
Type of union						
In polygynous union	3.3	724	1.6	222	2.9	946
Not in polygynous union	2.8	2,468	2.4	1,759	2.6	4,227
Not currently in union	2.4	1,905	0.6	2,066	1.4	3,971
Currently pregnant						
Pregnant	3.6	385	na	na	na	na
Not pregnant/not sure	2.6	4,712	na	na	na	na
Numbers of times slept away						
None	na	na	1.4	1,662	na	na
1-2	na	na	1.3	911	na	na
3-5	na	na	1.2	847	na	na
5+	na	na	2.2	612	na	na
Whether away for more than 1 month in the past 12 months						
Away for more than 1 month	na	na	1.3	813	na	na
Away always less than 1 month	na	na	1.5	1,544	na	na
Never away	na	na	1.4	1,662	na	na
Total	2.7	5,097	1.5	4,047	2.2	9,144

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed. Total includes cases missing data on number of times slept away and whether away for more than one month.
na = Not applicable

Prevalence is slightly higher among women in a polygynous union than among women not in a polygynous union or not currently in union. Among men, prevalence is higher among those not in a polygynous union.

HIV prevalence among women who are pregnant is 4 percent, providing a useful benchmark to compare with rates for pregnant women tested during sentinel surveillance.

The survey results show that men who have slept away from home more than five times in the 12 months prior to the survey have higher HIV prevalence than men who have not slept away from home or have slept away from home less often. There is little difference in prevalence among men by length of time away from home.

13.2.3 HIV Prevalence by Sexual Risk Behaviour

Table 13.6 examines the prevalence of HIV infection by sexual behaviour indicators among respondents who have ever had sexual intercourse. In reviewing these results, it is important to remember that responses regarding sexual behaviour may be subject to reporting bias. Also, sexual behaviour in the 12 months preceding the survey may not adequately reflect lifetime sexual risk.

There is no clear relationship between age at sexual debut and HIV prevalence. Prevalence is highest among women who first had sexual intercourse before age 16 (5 percent). Prevalence is also relatively high among women whose age at sexual debut is 18-19 (4 percent). Among men, prevalence is highest among those whose age at sexual debut is 18-19 (3 percent).

There is no clear relationship between HIV prevalence and higher-risk sex, that is, sex with a non-marital or non-cohabiting partner. Women who have had higher-risk sex in the past 12 months are only slightly more likely to be HIV positive than women who have had no sex in the past 12 months. Men who have had sex but not higher-risk sex in the past 12 months are slightly more likely to be HIV positive than men who were not sexually active during the period.

Women who report having had sex with two partners and those who have had two higher-risk partners in the past 12 months are three times as likely to be HIV positive as women who have had only one partner or one higher-risk partner. Among men, no significant difference in prevalence can be detected by number of partners in the past 12 months, but those with one higher-risk partner are somewhat more likely to be HIV positive than men with two higher-risk partners.

HIV prevalence is substantially higher among men who paid for sex in the 12 months preceding the survey (7 percent) than among men who paid for sex prior to the past 12 months (3 percent) or who never paid for sex (2 percent).

There is little difference in HIV prevalence among those who used a condom at any time and those who used a condom at last sexual contact, in the 12 months preceding to the survey. However, women who did not use condom at last higher-risk sex in the 12 months preceding the survey are twice as likely to be HIV as women who used a condom. On the other hand, among men, prevalence is slightly lower among the former category of condom users than the latter category. Among men, those who used a condom at last paid sex are more likely to be HIV positive (5 percent) than those who did not use a condom at last paid sex (3 percent).

The discussion above suggests that there is no consistent relationship between HIV prevalence and sexual behavioural risk, particularly among men. However, more sophisticated analysis that is outside the scope of this report will be necessary to fully understand these relationships because they may be complicated by other factors such as age, residence, and educational status that are associated both with behavioural measures and HIV prevalence.

Table 13.6 HIV prevalence by sexual behaviour characteristics

Percentage HIV positive among women and men age 15-49 who ever had sex and were tested for HIV, by sexual behaviour characteristics, Ghana 2003

Sexual behaviour characteristic	Women		Men		Total	
	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Age at first sex						
<16	4.5	1,103	1.6	431	3.7	1,534
16-17	2.3	1,234	0.6	510	1.8	1,743
18-19	3.6	1,105	2.6	775	3.2	1,880
20+	2.2	859	2.1	1,257	2.1	2,116
Higher-risk sex in past 12						
months						
Had higher risk sex	3.8	707	1.2	960	2.3	1,667
Had sex, not higher risk	3.0	2,759	2.4	1,604	2.7	4,363
No sex in past 12 months	3.5	839	1.8	414	2.9	1,253
Number of partners in past 12 months						
1	3.1	3,412	2.0	2,177	2.6	5,589
2	9.4	50	2.0	321	3.0	371
3+	*	5	0.0	66	0.0	70
Number of higher-risk partners in past 12 months						
1	3.4	659	1.4	798	2.3	1,457
2	10.6	44	0.0	122	2.8	167
3+	*	4	(0.0)	40	(0.0)	43
Paid for sex						
In past 12 months	na	na	6.9	62	na	na
Prior to past 12 months	na	na	2.6	181	na	na
Never	na	na	1.7	2,733	na	na
Any condom use						
Used condom at any time	3.5	981	1.9	1,616	2.5	2,596
Never used condom	3.1	3,325	2.0	1,361	2.8	4,686
Condom use at last sex in past 12 months						
Used condom last sex	3.4	285	2.0	526	2.5	811
No condom last sex	3.1	3,181	1.9	2,038	2.6	5,219
Condom use at last higher-risk sex in past 12 months						
Used condom last higher-risk encounter	2.2	190	1.4	444	1.6	634
No condom last higher-risk encounter	4.4	517	1.0	515	2.7	1,032
Condom use first sex[1]						
Used at first sexual encounter	2.1	235	0.0	202	1.1	437
Did not use at first encounter	1.7	803	0.0	339	1.2	1,142
Condom use at last paid sex						
Used	na	na	4.5	108	na	na
Did not use	na	na	3.0	136	na	na
Total	3.2	4,306	1.9	2,977	2.7	7,283

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed. Figures in parentheses are based on 25-49 unweighted cases.
[1]Refers to those age 15-24 only
na = Not available

13.2.4 HIV Prevalence by Other Characteristics Related to HIV Risk

Table 13.7 shows the variation in HIV prevalence by various characteristics related to HIV risk among men and women who have ever had sex. As expected, women and men with history of a sexually transmitted infection (STI) or STI symptoms have higher rates of HIV infection than those with none.

Table 13.7 HIV prevalence by other indicators

Percentage HIV positive among women and men age 15-49 who ever had sex, by whether they had a sexually transmitted infection (STI), whether they had an HIV test, and reason for HIV test, Ghana 2003

	Women		Men		Total	
Characteristic	Percentage HIV positive	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Sexually transmitted infection						
Had STI or STI symptoms	4.9	360	2.2	137	4.2	496
No STI, no symptoms	3.0	3,946	1.9	2,840	2.6	6,786
HIV testing status						
Ever tested	4.6	487	1.4	337	3.3	824
Never tested	3.1	3,746	2.0	2,626	2.6	6,372
Reason for HIV testing						
Asked for test	6.4	150	2.0	149	4.2	299
Offered and accepted	5.2	201	0.0	96	3.5	297
Test required	3.7	68	0.0	87	1.6	155
Total	3.2	4,306	1.9	2,977	2.7	7,283

Note: Total includes 106 women and 17 men with missing information on HIV testing status, and 66 women and 4 men missing information on reason for HIV testing.

Women who have been tested for HIV in the past are more likely to be HIV positive than those who have never been tested. Among women who have ever had sex, the level of HIV infection is 5 percent among those who have ever been tested for HIV in the past and who know their status, compared with 3 percent among those who have never been tested. There is little difference in HIV prevalence and testing status among men.

HIV prevalence varies by reason for HIV testing, increasing from less than 2 percent among those who stated that the test was required, to more than 4 percent among those who asked for the test. The difference is more obvious among women than men, increasing from 4 percent among women for whom the test was required, to 5 percent among women who were offered the test and accepted, to more than 6 percent among women who asked for the test.

Although the individual's HIV status is associated with prior HIV testing, the above results indicate that many individuals who are HIV positive have not been tested. Nine out of ten of those infected with HIV (88 percent of infected women and 92 percent of infected men) do not know their HIV status, either because they were never tested or because they were tested and did not receive their results (Table 13.8). For women, 12 percent of those who are HIV positive have been tested and know the results for their last test, compared with 7 percent of those who are HIV negative. For men, 8 percent of those who are HIV positive know the results for their last test, compared with 7 percent of those who are HIV negative. It should be noted that testing for HIV may depend on a number of factors including access to testing facilities. Since HIV testing is not available universally in the country, where a person lives may influence the likelihood of being tested for HIV.

Table 13.8 HIV prevalence by prior HIV testing				
Percent distribution of women and men age 15-49 by HIV testing status prior to the survey, according to whether positive or negative for HIV, Ghana 2003				
	Women		Men	
HIV testing status	HIV positive	HIV negative	HIV positive	HIV negative
Ever tested and know results of last test	12.4	7.3	8.2	7.2
Ever tested, does not know results	3.9	2.5	0.0	1.8
Never tested	83.7	90.2	91.8	90.9
Total	100.0	100.0	100.0	100.0
Number	138	4,959	59	3,989

13.2.5 HIV Prevalence and Male Circumcision

Lack of circumcision is considered a risk factor for HIV infection, in part because of physiological differences that increase the susceptibility to HIV infection among uncircumcised men. The 2003 GDHS obtained information on male circumcision status, and these results can be used to examine the relationship between HIV prevalence and male circumcision.

As Table 13.9 shows, the vast majority of Ghanaian men (95 percent) are circumcised. However, the proportions circumcised vary by region, being markedly lower among men in the three northern regions and especially low in the Upper West Region (68 percent). The percent circumcised is also relatively lower among men who have no education (84 percent), among men in the lowest wealth quintile (82 percent), and among men who adhere to traditional or spiritualist religion (68 percent).

The number of men who are not circumcised in the population is rather small and therefore it is difficult to interpret the difference in prevalence between circumcised and uncircumcised men by background characteristics. Caution needs to be exercised when interpreting this table because both the numerators and the denominators on which these percentages are based are quite small. There is little difference in the HIV prevalence by circumcision status; however, some differences by background characteristics are noted.

Table 13.9 HIV prevalence among men by circumcision status

Among men age 15-59 who were tested for HIV, percentage who are circumcised and percentage HIV positive among circumcised and uncircumcised men, according to background characteristics, Ghana 2003

Background characteristic	All men tested for HIV		Circumcised men		Uncircumcised men	
	Percentage circumcised	Number	Percentage HIV positive	Number	Percentage HIV positive	Number
Age						
15-19	95.1	1,035	0.2	985	0.0	50
20-24	96.7	616	0.0	596	(0.0)	20
25-29	97.4	663	0.9	645	(3.1)	17
30-34	95.9	548	2.8	525	(1.8)	23
35-39	93.8	433	3.2	407	1.1	27
40-44	93.7	351	4.4	329	(0.0)	22
45-49	94.5	401	1.5	379	(8.1)	22
50-54	93.9	254	3.9	239	(0.0)	16
55-59	92.0	167	3.0	154	(0.0)	13
Residence						
Urban	98.6	2,006	1.6	1,978	(0.0)	28
Rural	92.6	2,463	1.7	2,280	1.6	183
Region						
Western	99.3	421	1.6	419	*	3
Central	99.2	333	1.5	330	*	3
Greater Accra	99.2	645	1.7	640	*	5
Volta	98.3	390	0.9	384	*	7
Eastern	97.5	476	3.1	464	*	12
Ashanti	98.6	855	1.4	843	*	12
Brong Ahafo	96.3	474	1.8	456	*	17
Northern	85.4	470	1.0	401	0.0	69
Upper East	84.1	285	1.4	240	4.9	45
Upper West	68.2	119	1.5	81	2.1	38
Education						
No education	84.1	774	1.2	651	1.5	123
Primary	94.8	709	1.8	672	3.2	37
Middle/JSS	98.1	1,965	2.1	1,928	0.0	36
Secondary+	98.6	1,022	0.9	1,008	*	14
Wealth quintile						
Lowest	81.7	780	1.2	637	1.6	143
Second	96.4	821	1.9	792	0.0	29
Middle	98.8	872	2.1	861	*	11
Fourth	98.4	966	1.5	951	*	16
Highest	98.9	1,030	1.5	1,018	*	12
Religion						
Roman Catholic	93.9	646	1.2	607	0.0	39
Anglican	92.4	59	2.4	54	0.0	4
Methodist	99.6	292	2.1	291	0.0	1
Presbyterian	97.1	345	3.3	335	0.0	10
Other Christian	97.5	1,800	1.4	1,755	0.9	44
Moslem	98.0	836	1.3	819	*	17
Traditional/spiritualist	67.7	206	2.0	140	3.9	67
No religion	90.3	282	2.3	255	0.0	27
Total	95.3	4,469	1.6	4,258	1.4	210

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed. Figures in parentheses are based on 25-49 unweighted cases. Total includes 3 men for whom information on ethnicity is missing and 5 men with other religion or missing information on religion.

13.2.6 Prevalence among Couples

About 1,800 cohabiting couples were tested for HIV in the 2003 GDHS. Results shown in Table 13.10 indicate that, for the vast majority (96 percent) of cohabiting couples, both partners are HIV negative, while in only 1 percent of couples are both partners HIV positive. There is discordance in the

Table 13.10 HIV prevalence among couples

Among cohabiting couples both of whom were tested, percent distribution by HIV results, according to back-ground characteristics, Ghana 2003

Background characteristic	Both partners HIV positive	Male partner positive, female partner negative	Female partner positive, male partner negative	Both partners HIV negative	Total	Number
Age of woman						
15-19	1.7	0.0	0.0	98.3	100.0	57
20-29	0.5	1.7	1.8	96.1	100.0	666
30-39	1.3	2.4	1.8	94.5	100.0	686
40-49	1.1	0.6	0.9	97.5	100.0	383
Age of man						
15-19	*	*	*	*	100.0	3
20-29	0.0	0.4	1.6	98.0	100.0	304
30-39	0.8	2.4	1.9	95.0	100.0	653
40-59	1.5	1.5	1.3	95.7	100.0	832
Marital status						
Married	1.0	1.6	1.5	95.8	100.0	1,792
Living together	1.5	3.0	4.1	91.4	100.0	103
Type of union						
Monogamous	0.8	1.7	1.5	96.0	100.0	1,483
Polygynous	1.9	1.2	1.8	95.1	100.0	309
Residence						
Urban	1.1	1.7	2.3	94.9	100.0	626
Rural	0.9	1.6	1.2	96.3	100.0	1,166
Region						
Western	1.5	1.1	2.8	94.7	100.0	171
Central	1.4	2.6	0.6	95.4	100.0	124
Greater Accra	2.3	2.2	2.3	93.2	100.0	214
Volta	0.0	0.0	3.5	96.5	100.0	137
Eastern	1.4	3.3	1.2	94.1	100.0	191
Ashanti	1.4	0.7	1.7	96.3	100.0	299
Brong Ahafo	0.3	2.0	1.4	96.3	100.0	196
Northern	0.4	1.3	0.9	97.4	100.0	258
Upper East	0.0	1.9	0.0	98.1	100.0	144
Upper West	0.0	2.5	0.0	97.5	100.0	58
Woman's education						
No education	0.9	1.5	1.2	96.4	100.0	760
Primary	1.6	1.7	1.6	95.0	100.0	360
Middle/JSS	0.9	1.5	2.0	95.6	100.0	558
Secondary+	0.0	3.2	1.2	95.6	100.0	115
Man's education						
No education	0.2	0.9	0.6	98.3	100.0	523
Primary	1.9	2.2	3.0	92.9	100.0	215
Middle/JSS	1.5	1.8	2.0	94.7	100.0	696
Secondary+	0.5	2.1	1.2	96.2	100.0	357
Wealth quintile						
Lowest	0.2	1.7	0.9	97.2	100.0	424
Second	1.2	1.3	0.9	96.6	100.0	374
Middle	1.8	1.4	2.2	94.6	100.0	353
Fourth	0.5	1.6	2.5	95.4	100.0	316
Highest	1.4	2.3	1.5	94.9	100.0	325
Total	1.0	1.6	1.5	95.8	100.0	1,792

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

HIV positive status in under 2 percent of couples, where one partner is infected and the other is not. Couples where the woman is in the youngest age group (15-19), couples where the man is in the oldest age group (15-49), couples in a polygynous union, urban couples, couples living in Greater Accra, couples with primary education, and couples in the middle wealth quintile have slightly higher HIV prevalence than their counterparts in the other categories.

Discordance whereby the man is positive and the woman is not is more common than situations in which the woman is positive and the man is not. The fact that there are more couples that are discordant for HIV than couples that are both infected points to an unmet need for HIV prevention because the majority of these couples do not mutually know their HIV status. Couple-oriented voluntary counselling and testing (VCT) services, where partners (including those in polygynous marriages) go together and receive results together should be advocated for all VCT centers in Ghana.

13.3 DISTRIBUTION OF THE HIV BURDEN IN GHANA

An accurate estimation of HIV prevalence is necessary to assess the scope of the AIDS epidemic in Ghana and to track trends over time. Sentinel surveillance data from ANC clinics and from individuals seeking medical treatment for STIs have been the principal source of information on HIV prevalence in Ghana.

With the inclusion of HIV testing in the 2003 GDHS, Ghana has joined the first few countries in sub-Saharan Africa to expand the tools employed in monitoring the scope of the AIDS epidemic to include a nationally representative population-based survey. Ideally, the seroprevalence data from the GDHS survey will be examined and used to create a more accurate set of assumptions to use in estimating prevalence rates from future sentinel surveillance data. Indeed, UNAIDS and WHO suggest that population-based surveys "should definitely be used to calibrate the results of routine surveillance systems" (WHO and UNAIDS, 2000). The availability of population-based seroprevalence data from the 2003 GDHS clearly enhances the body of information available on the HIV/AIDS epidemic in Ghana.