RWANDA FURTHER ANALYSIS

# Recent Trends in HIV-Related Knowledge and Behaviors in Rwanda, 2005–2010

## Further Analysis of the Rwanda Demographic and Health Surveys

# Republic of Rwanda

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Additional information about the RDHS can be obtained from the National Institute of Statistics of Rwanda, P.O. Box 6139, Kigali, Rwanda; Telephone: (250) 571-037, E-mail: info@statistics.gov.rw, Internet: www.statistics.gov.rw. Additional information about the DHS project may be obtained from ICF International, 11785 Beltsville Drive, Calverton, MD 20705, USA; Telephone: 301-572-0200, Fax: 301-572-0999, Email: reports@measuredhs.com, Internet: http://www.measuredhs.com.

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## ABSTRACT

The 2010 Rwanda Demographic and Health Survey shows that 3 percent of Rwandan adults age 15-49 have been infected with HIV. The prevalence was much higher in urban areas, among women, and among adults who had multiple lifetime sexual partners and used a condom at last sexual intercourse. The level of and differences in HIV prevalence in Rwanda in 2010 are very similar to those observed in 2005. Using data from the two recent Rwanda Demographic and Health Surveys, implemented in 2005 and 2010, this study examined changes in key HIV-related knowledge, attitudes, and sexual behavior indicators. Significant changes in selected indicators during 2005 and 2010 were determined by Student t-test with p-values less than 0.05.

The study revealed that there is some improvement in HIV/AIDS-related knowledge, attitudes, and sexual behavior, indicating that HIV/AIDS prevention programs in Rwanda are in fact having the desirable effects. Knowledge of using condoms as an HIV prevention method has increased in recent years. At the same time there has been a considerable increase in condom use during last sex and during last non-spousal sex; nevertheless, the level of condom use has remained low. There has also been an increase in the proportion of men and women who know that HIV can be transmitted from mother to child, and that transmission can be reduced increased significantly.

The initiation of sexual debut of youth under age 15 remained low, and declined among men. The proportion of young adults practicing sexual abstinence (six out of ten) remained unchanged. However, there has been some deterioration in other indicators, such as an increase in the proportion of adults with multiple sex partners, the proportion of men who ever paid for sex, and the proportion of adults with STIs and STI symptoms. Changes in HIV-related knowledge, attitudes, and sexual behavior indicators in Rwanda between 2005 and 2010 are bidirectional. They indicate a need for intensified efforts from HIV programs to target certain sexual behaviors.

# 1. INTRODUCTION

Rwanda is situated in central Africa, immediately south of the equator between latitude 1°4' and 2°51' South and longitude 28°63' and 30°54' East. It has a surface area of 26,338 square kilometers and is bordered by Uganda to the north, Tanzania to the east, the Democratic Republic of the Congo to the west, and Burundi to the south. Landlocked, Rwanda lies 1,200 kilometers from the Indian Ocean and 2,000 kilometers from the Atlantic Ocean. Nearly all Rwandans speak Kinyarwanda, the country's official first language, followed by English and French. Kiswahili, the third most common foreign language, is generally spoken in urban areas and in the provinces bordering other countries where this language is widely spoken, such as the Democratic Republic of the Congo and Tanzania.

HIV infection is a major public health concern in Rwanda, where it is one of the main causes of mortality, and carries negative social and economic consequences that affect everyone in the country. Results from the 2010 Rwanda Demographic and Health Survey show that 3 percent of Rwandan adults age 15-49 are infected with HIV. The prevalence iss much higher in urban areas, among women, and among adults who have had multiple lifetime sexual partners and used a condom at last sexual intercourse. The level of and differences in HIV prevalence in Rwanda in 2010 are very similar to those observed in 2005 (National Institute of Statistics of Rwanda [NISR] and ORC Macro 2006; National Institute of Statistics of Rwanda [NISR] et al. 2012).

At the very early stage of the epidemic, the government of Rwanda demonstrated a strong commitment to lead in HIV prevention and treatment. It promptly recognized the negative impact of the AIDS epidemic on the country's social and economic development. The government adopted a multi-sectoral approach, and developed a national HIV/AIDS strategic plan. Rwanda received assistance and support from the international community for its pledge to develop a comprehensive program to fight HIV/AIDS. The program includes a full range of preventive, medical, and support services for those living with HIV/AIDS. Most activities have had a nationwide focus, and the important beneficiaries include but are not limited to civil society organizations, faith-based groups, and grassroots associations.

Since the initiation of the 2005-2009 National Multi-sector Strategic Plan (NMSP), Rwanda has made significant progress in the provision of universal access to HIV and AIDS services (National AIDS Commission [Rwanda] 2005). To continue this progress, Rwanda has developed and implemented a 2009-2012 National Strategic Plan (NSP) against HIV and AIDS (National AIDS Commission [Rwanda] 2009). The NSP set out its ambitious goals for the country's response to HIV and AIDS and affirmed Rwanda's commitment to a multi-sector response. It is based on the most available understanding of the epidemic and the strengths and weaknesses of the response systems and mechanisms.

The objective of this study is to describe trends in key HIV/AIDS-related knowledge and attitudes, and sexual behavior indicators using data from the two recent Rwanda Demographic and Health Surveys (RDHS), conducted in 2005 and 2010 (NISR and ORC Macro 2006; NISRet al. 2012). To address the concern of young adults' vulnerability to HIV/AIDS infection, this study also examines several indicators among participants age 15-24.

# 2. METHODOLOGY

## 2.1. Study Subjects and Sampling Design

The analysis is based on data collected in the two most recent rounds of Rwanda Demographic and Health Surveys (RDHS), which were carried out in 2005 and 2010. The RDHS surveys are nationally representative household-based surveys implemented to obtain detailed information related to the various health indicators, including knowledge, attitudes, and behaviors related to HIV/AIDS. They use a two-stage cluster sampling method. In the first stage, clusters were selected from the list of census or pre-censual enumeration areas. In the second stage, a complete listing of households in each selected cluster was carried out. The sample households were selected systematically from the list of households in each cluster for participation in the survey. All de facto adults, women and men who are the usual residents or the visitors that slept in the household the night before the survey, in their reproductive ages of 15-49 and 15-59, respectively, were interviewed. The 2005 RDHS collected information from 11,321 women and 4,413 men, and the 2010 survey collected information from 13,671 women and 5,687 men.

## 2.2. Measurements

Variables examined in the analysis include those that were measured in both the 2005 and 2010 surveys. Indicators included in the analysis are described below.

***HIV/AIDS-related knowledge***

- Heard of HIV/AIDS: Percentage of respondents who responded affirmatively to the question, "Have you ever heard of an illness called AIDS?"
- Knowledge of HIV/AIDS prevention methods:
    1. Percentage of respondents who, in response to a prompted question, said that people can reduce their chances of getting HIV/AIDS by having just one partner who is not infected and who had no other partners
    2. Percentage of respondents who, in response to a prompted question, said that people can reduce their chances of getting HIV/AIDS by using a condom every time they have sex
- Knowledge of mother-to-child transmission (MTCT):
    1. Percentage of respondents who knew that HIV can be transmitted from mother to child by breastfeeding
    2. Percentage of respondents who knew that the risk of HIV transmission from mother to child can be reduced by the mother taking special drugs during pregnancy

***Misconceptions***

- Percentage of respondents who knew that a healthy-looking person can have HIV
- Percentage of respondents who knew that HIV cannot be transmitted by mosquito bites
- Percentage of respondents who knew that HIV cannot be transmitted by supernatural means
- Percentage of respondents who knew that a person cannot become infected by sharing food with a person who has AIDS

***Accepting attitudes toward HIV***

- Percentage of respondents who said they are willing to care for a relative who is sick with AIDS in their own households
- Percentage of respondents who said they are willing to buy vegetables from a vendor with HIV
- Percentage of respondents who said they are willing to allow a female teacher with HIV, but who is not sick, to teach
- Percentage of respondents who would not want to keep the HIV-positive status of a family member secret

***Program coverage***

- Ever tested for HIV: Percentage of respondents age 15-49 who ever had an HIV test

***Sexual behavior among young people***

- Sexual debut: Percentage of respondents age 15-24 who had sex before age 15
- Primary abstinence:
    1. Percentage of never-married respondents aged 15-24 who have ever had sex
    2. Percentage of respondents age 15-24 who have never had sex
- Secondary abstinence: Percentage of respondents age 15-24 who ever had sex but did not have sex in the past 12 months

***Sexual behavior among respondents age 15-49 who had sex in the last 12 months***

- Percentage of respondents by their number of sexual partners in the last 12 months (1, 2, 3+)
- Percentage of respondents who had multiple sexual partners (2+)
- Non-spousal sex: Percentage of respondents who engaged in sex with a non-marital, non-cohabiting partner in the last 12 months, among those who had sex in the last 12 months
- Condom use at last sex: Percentage of respondents who used a condom at last sex, among those who had sex in the last 12 months
- Condom use with last non-spousal sex partner in the last 12 months: Percentage of respondents who used a condom during the last non-spousal sex, among those who had sex with a non-spousal partner in the last 12 months
- Consistent condom use: Percentage of respondents who used condoms with each sexual partner in the last 12 months (checked for up to three partners)

We also examined reported prevalence of sexually transmitted infections (STIs) or STI symptoms, including abnormal genital discharge or genital sore or ulcer in the last 12 months, among those who have ever had sex.

## 2.3. Statistical Analysis

We compared the figures obtained in 2005 and 2010 surveys using t-tests to assess whether there were significant changes during the five-year period. Temporal changes in indicators were considered significant at a *p*-value of <0.05. Each variable was examined first for the total sample, then separately by rural and urban samples, and finally by age groups where appropriate.

# 3. RESULTS

## 3.1. Socioeconomic and Demographic Characteristics

Table 3.1 shows the sample distribution of women and men age 15-49 separately in the two rounds of the RDHS survey by selected background characteristics. With the exception of men and women in 25-29 age groups, age distribution was very similar in both survey waves. The percentage of women age 25-29 slightly increased from 15 to 18 percent. Similarly, the percentage of men age 25-29 increased from 14 to 18 percent. Correlatively, the percentage of married women and men increased from 29 to 35 percent and from 31 to 34 percent, respectively, while the percentage of those living together decreased from 20 to 15 percent among women and from 18 to 13 percent among men.

Overall, between 2005 and 2010 there was an increase in the level of education among both women and men. The proportion of women who had no education decreased from 23 to 16 percent, while the proportion of women with secondary education increased from 9 to 15 percent. Similarly, the proportion of men who had no education decreased from 16 to 10 percent, as the proportion of men with secondary education increased from 11 to 19 percent.

Furthermore, the proportion of men and women who are regularly exposed to mass media increased substantially between the two survey waves. Regular media exposure was defined as listening to radio, watching television, or reading a newspaper or magazine at least once a week. Seventy percent of women reported having been regularly exposed to mass media in 2010 compared with 57 percent in 2005. Eighty-nine percent of men reported having been regularly exposed to mass media in 2010 compared with 81 percent in 2005.

**Table 3.1. Sample distribution of interviewed women and men age 15-49 by background characteristics, Rwanda 2005-2010**

| | Women | | Men | |
|---|---|---|---|---|
| **Variable** | **2005** | **2010** | **2005** | **2010** |
| **Age** | | | | |
| 15-19 | 22.8 | 21.5 | 25.0 | 25.5 |
| 20-24 | 20.8 | 19.6 | 21.4 | 20.4 |
| 25-29 | 15.4 | 18.2 | 14.3 | 18.3 |
| 30-34 | 13.0 | 13.3 | 11.5 | 12.5 |
| 35-39 | 10.0 | 10.6 | 10.0 | 8.6 |
| 40-44 | 10.0 | 8.5 | 9.2 | 7.6 |
| 45-49 | 8.0 | 8.1 | 8.6 | 7.2 |
| **Marital status** | | | | |
| Never married | 37.7 | 38.7 | 49.7 | 50.5 |
| Married | 28.6 | 35.1 | 30.6 | 34.1 |
| Living together | 20.1 | 15.4 | 17.6 | 13.4 |
| Divorced/separated | 9.3 | 5.5 | 1.7 | 1.6 |
| Widowed | 4.3 | 5.4 | 0.5 | 0.4 |
| **Education** | | | | |
| No education | 23.4 | 15.5 | 16.3 | 10.3 |
| Primary | 67.1 | 68.3 | 71.0 | 68.9 |
| Secondary | 9.0 | 14.7 | 11.3 | 18.7 |
| Higher | 0.6 | 1.5 | 1.4 | 2.2 |
| **Exposed to mass media[1] at least once per week** | | | | |
| No | 43.3 | 30.4 | 18.9 | 11.5 |
| Yes | 56.7 | 69.6 | 81.1 | 88.5 |
| **Wealth quintile** | | | | |
| Lowest | 21.4 | 19.2 | 18.1 | 15.0 |
| Lower | 20.5 | 19.5 | 18.0 | 17.3 |
| Middle | 18.5 | 20.0 | 20.2 | 20.0 |
| Higher | 18.8 | 19.6 | 20.4 | 21.7 |
| Highest | 20.7 | 21.8 | 23.3 | 25.9 |
| **Residence** | | | | |
| Urban | 17.0 | 15.0 | 17.8 | 16.5 |
| Rural | 83.0 | 85.0 | 82.2 | 83.5 |
| **Number** | 11,321 | 13,671 | 4,413 | 5,687 |

[1] Reading newspaper or magazine, listening to the radio, or watching television at least once per week.

## 3.2. Knowledge, Misconception, and Attitude

Table 3.2 presents changes in awareness of HIV/AIDS, knowledge of HIV prevention methods, misconceptions about HIV transmission, and attitude indicators among women and men. Data on coverage of HIV testing services are also shown in Table 3.2.

***Knowledge of HIV Prevention Methods***

Data in Table 3.2, also displayed in Figure 3.1, show that the proportion of women who knew that limiting sex to one faithful partner reduces chances of getting HIV did not change significantly from 2005 to 2010 (87 and 85 percent, respectively), while it declined among men (from 87 percent to 79 percent). However, knowledge of condom use to prevent HIV infection increased among both women (from 80 to 91 percent) and men (from 90 to 92 percent). As a result, knowledge of both HIV prevention methods increased among women (from 73 to 79 percent) while it declined among men (from 80 to 74 percent). It is worth noting that the decline was observed among men living in rural areas but not among those living in urban areas.

Furthermore, the proportion of women who reported knowing where to get condoms increased dramatically from 38 percent in 2005 to 89 percent in 2010. A corresponding increase was observed among men (from 76 to 94 percent).

**Figure 3.1. Knowledge of HIV prevention methods, Rwanda 2005 and 2010**

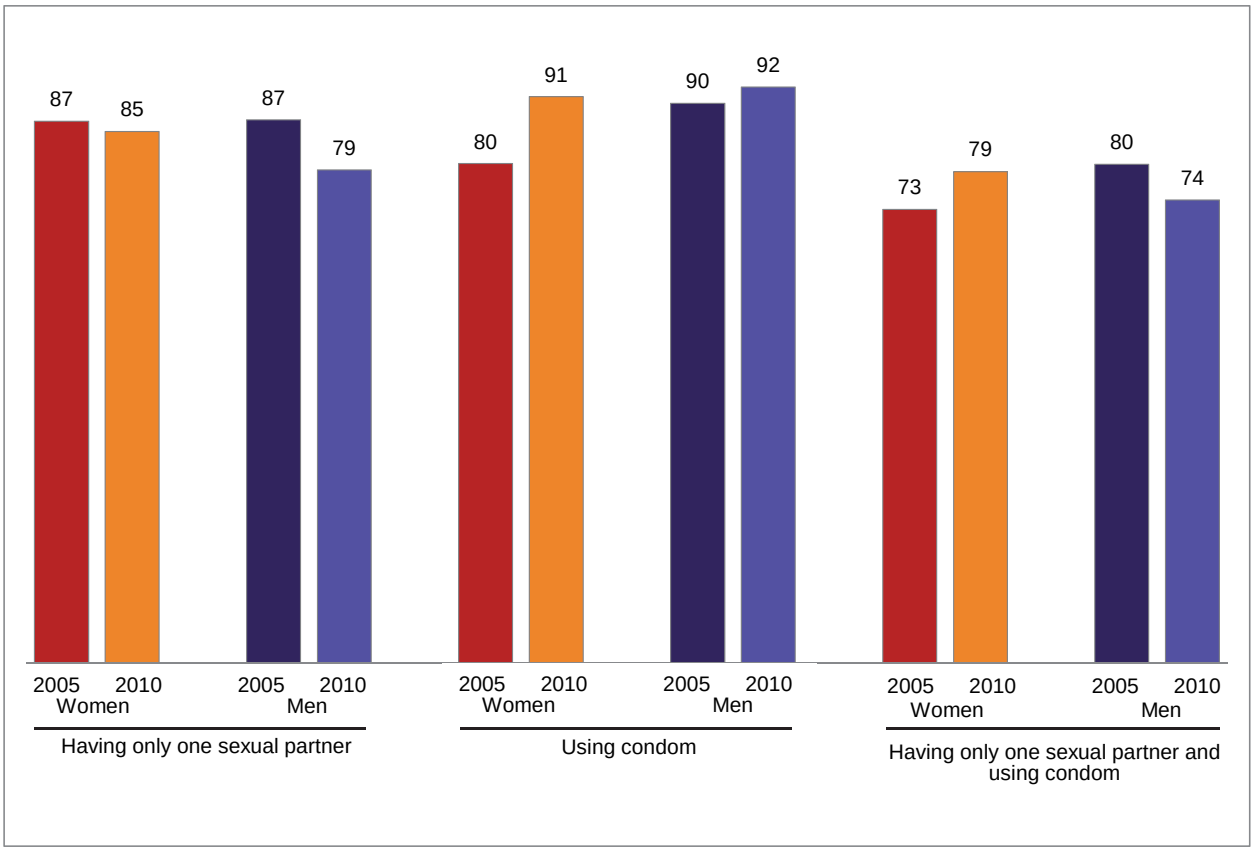
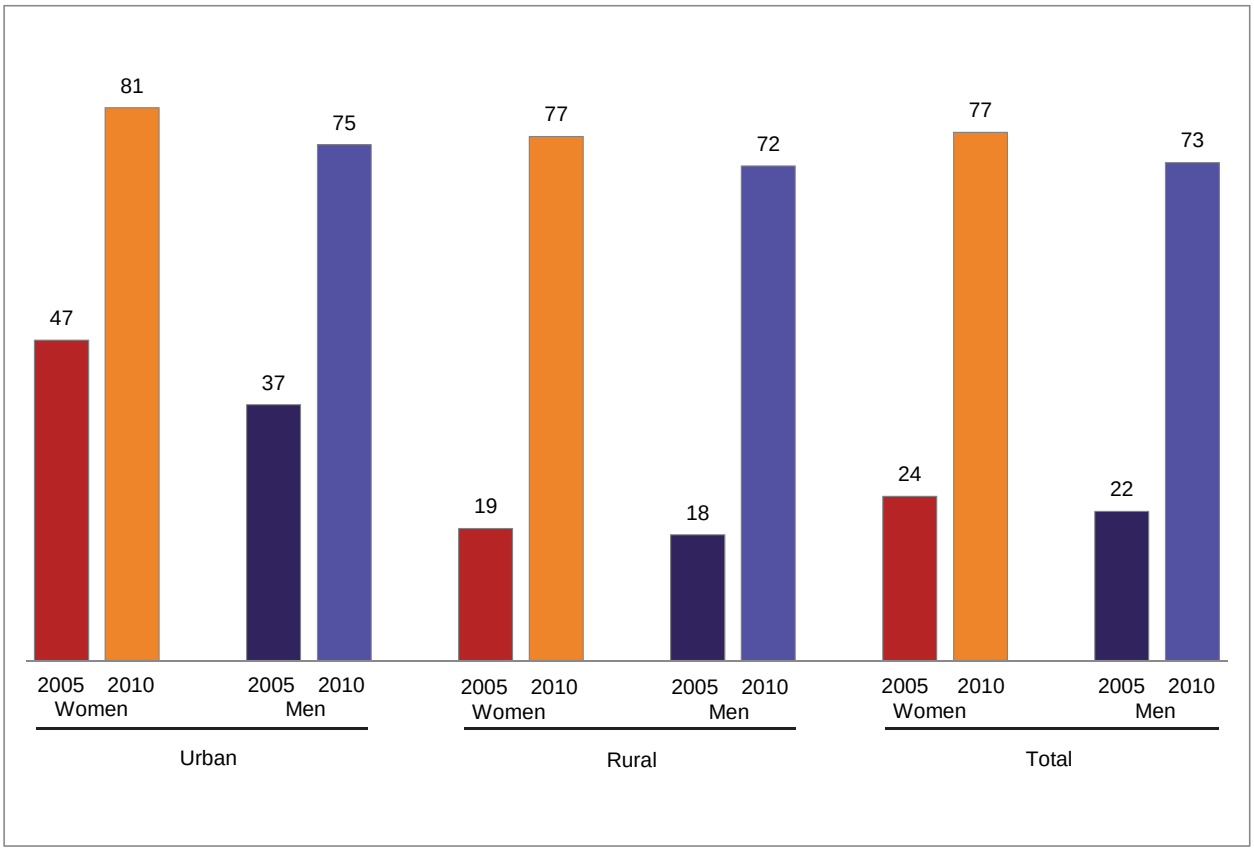


**Figure 3.2. Ever tested for HIV, Rwanda 2005 and 2010**



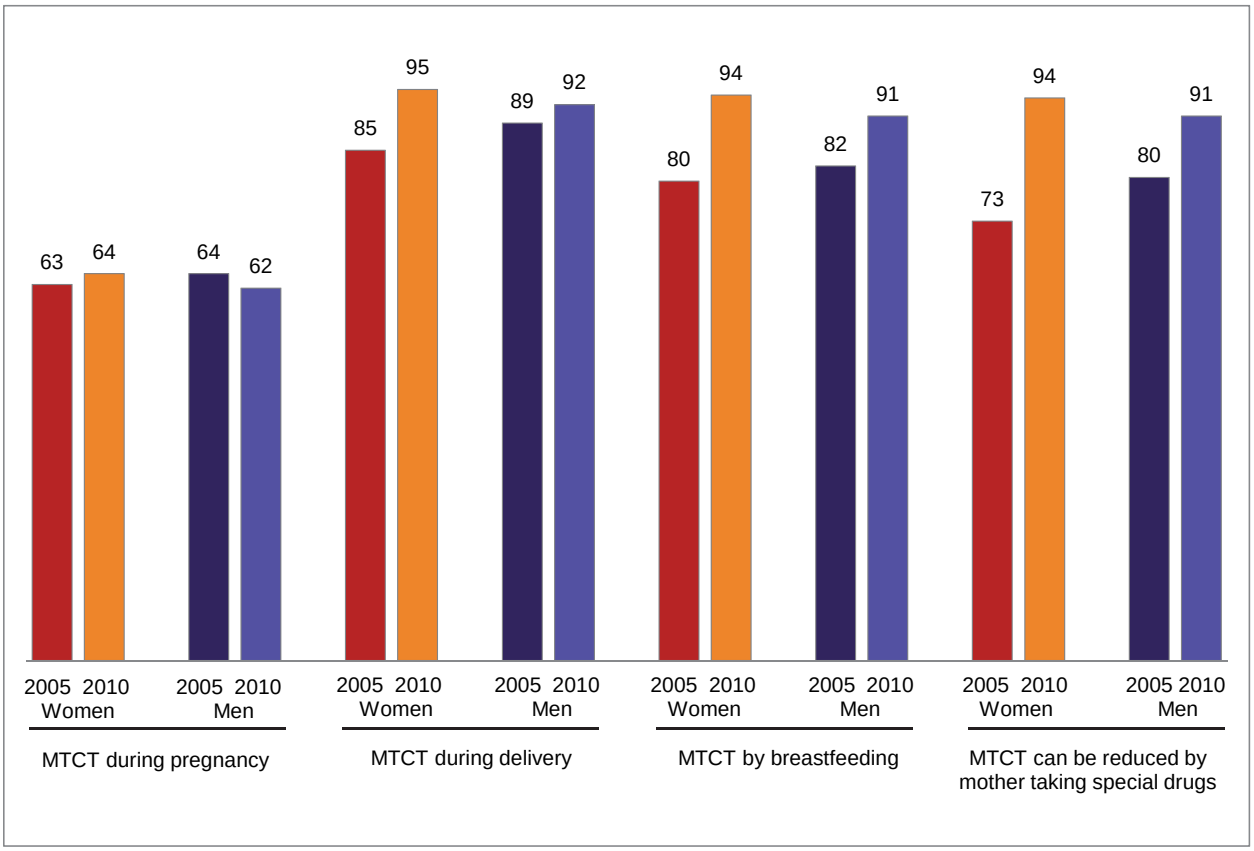

***Knowledge about Prevention of Mother-to-Child Transmission of HIV***

Table 3.2 and Figure 3.3 also present the percentages of women and men who knew that HIV can be transmitted from mother to child during pregnancy, childbirth, or breastfeeding, and who knew that there is a special drug that can prevent HIV transmission from mother to child.

Among women, knowledge about HIV transmission from mother to child during delivery increased from 85 to 96 percent. Also, knowledge about HIV transmission from mother to child through breastfeeding increased from 80 to 94 percent. Moreover, knowledge about special drugs to prevent mother-to-child transmission increased from 73 to 94 percent.

Similarly, a corresponding increase was observed among men, but to a lesser extent. Knowledge about HIV transmission from mother to child during delivery increased from 89 to 92 percent. Also, knowledge about HIV transmission from mother to child through breastfeeding increased from 82 to 91 percent. Moreover, knowledge about special drugs to prevent mother-to-child transmission increased from 80 to 91 percent.

**Figure 3.3. Knowledge of mother-to-child transmission, Rwanda 2005 and 2010**



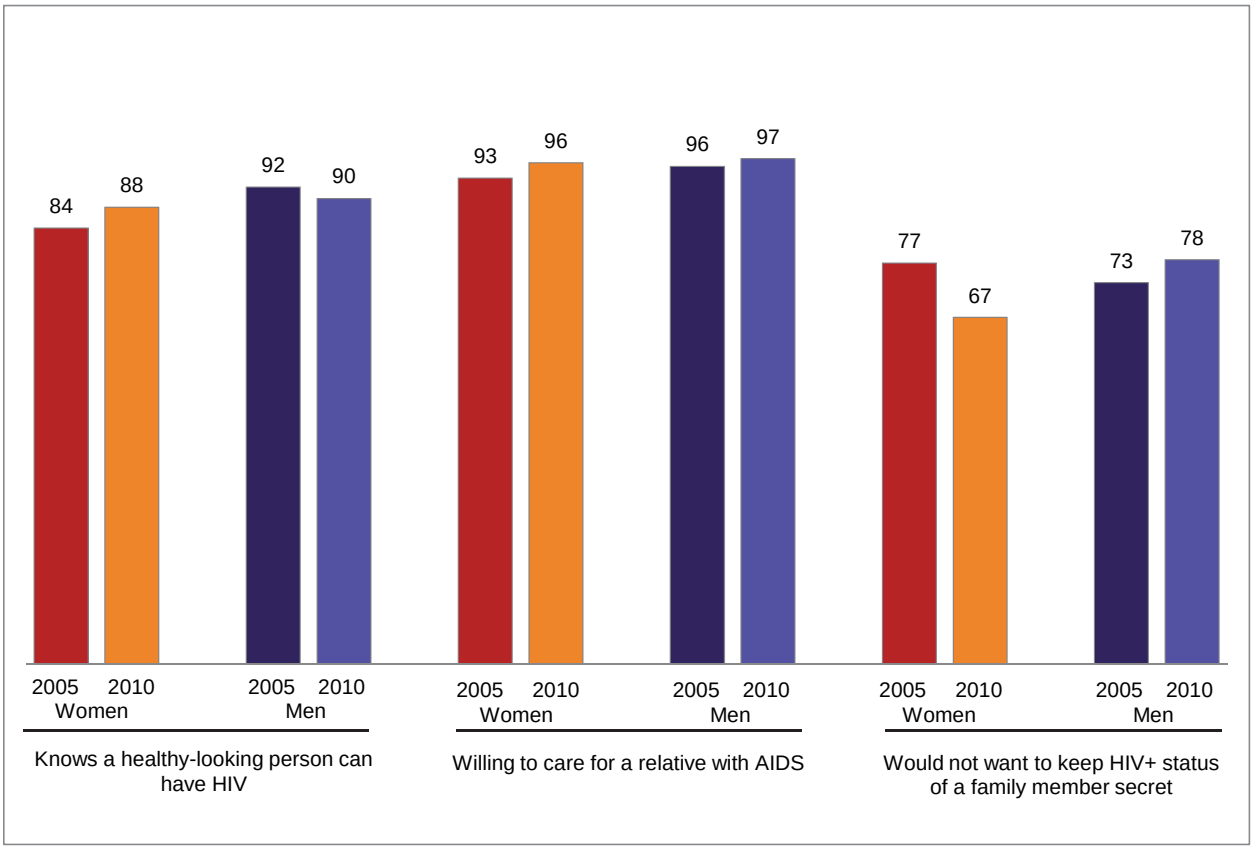

***Misconceptions about HIV/AIDS***

Table 3.2 present several misconceptions about HIV/AIDS among women and men age 15-49. The proportion of women living in rural areas who knew that a healthy-looking person can have HIV increased from 82 to 87 percent. However, although very high in both survey waves, the proportion of women living in urban areas who knew that a healthy-looking person can have HIV remained steady. There was no significant change in the proportion of men who knew that a healthy-looking person can have HIV. Similarly, there was no significant change in proportions of men and women who knew that HIV cannot be transmitted by mosquito bites, or who knew that HIV cannot be transmitted by supernatural means.

***Attitudes towards People Living with HIV/AIDS***

The data in Table 3.2 show a generally upward trend in accepting attitudes towards those living with HIV. The proportion of women living in rural areas who expressed their willingness to care for a relative who is sick of AIDS in their own households increased slightly, from 93 to 96 percent. However, a corresponding increase was not observed among women living in urban areas or among men.

**Figure 3.4. Misconceptions and attitudes, Rwanda 2005 and 2010**




The proportion of women who would be willing to buy fresh vegetables from a vendor with HIV increased from 69 percent to 84 percent. This proportion increased from 80 to 90 percent among men. Similarly, the proportion of women and men who believe that a female teacher living with HIV should be allowed to continue teaching increased between 2005 and 2010 (from 74 to 87 percent for women and from 80 to 89 percent for men).

The only decline in accepting attitudes relates to disclosure of a family member's positive status among women (Figure 3.4). The proportion of women who would not want the HIV-positive status of a family member to remain secret declined among women from 77 to 67 percent. However, this proportion increased among men (from 73 to 78 percent), particularly among men living in urban areas (from 54 to 79 percent).

***Attitudes toward Sex Education***

Table 3.2 presents the percentages of women and men age 15–49 who believe that children age 12–14 years should be taught about condom use to prevent HIV infection. The percentage of those who believe that children age 12–14 should be taught about condom use to prevent HIV infection increased from 80 to 89 percent among women, and from 81 to 90 percent among men.

### *HIV Testing*

Table 3.2 and Figure 3.2 also present the percentages of women and men age 15–49 who ever got tested for HIV. The data show that the percentage of respondents who were ever tested for HIV increased substantially among both women and men. This proportion increased from 24 to 77 percent among women and from 22 to 73 percent among men.

**Table 3.2. Trends in HIV-related knowledge, misconceptions, and stigma attitudes indicators among women and men age 15-49, Rwanda 2005-2010**

| | Women | | | Men | | |
|---|---|---|---|---|---|---|
| **Variable** | **2005** | **2010** | ***p*-value** | **2005** | **2010** | ***p*-value** |
| **Heard of HIV/AIDS** | | | | | | |
| Urban | 99.9 | 100.0 | | 100.0 | 100.0 | |
| Rural | 99.9 | 100.0 | | 99.9 | 100.0 | |
| Total | 99.9 | 100.0 | | 99.9 | 100.0 | |
| **Knowledge of HIV prevention methods** | | | | | | |
| Having only one sexual partner | | | | | | |
| Urban | 88.4 | 89.9 | | 83.1 | 78.1 | * |
| Rural | 86.4 | 84.3 | | 87.8 | 79.1 | * |
| Total | 86.8 | 85.1 | | 87.0 | 79.0 | * |
| Using condoms when having sex | | | | | | |
| Urban | 84.3 | 93.7 | * | 88.6 | 95.4 | * |
| Rural | 79.1 | 90.2 | * | 89.9 | 91.6 | * |
| Total | 80.0 | 90.7 | * | 89.7 | 92.3 | * |
| Knowledge on both methods | | | | | | |
| Urban | 76.4 | 85.0 | * | 75.4 | 75.6 | |
| Rural | 71.9 | 77.6 | * | 80.9 | 73.9 | * |
| Total | 72.7 | 78.7 | * | 79.9 | 74.2 | * |
| **Know where to get condoms** | | | | | | |
| Urban | 62.1 | 94.5 | * | 89.0 | 97.6 | * |
| Rural | 33.2 | 87.6 | * | 72.8 | 92.9 | * |
| Total | 38.1 | 88.6 | * | 75.7 | 93.7 | * |
| **Knowledge on prevention of mother-to-child transmission (PMTCT)** | | | | | | |
| Knows that HIV can be transmitted during pregnancy | | | | | | |
| Urban | 62.7 | 66.5 | | 61.8 | 62.0 | |
| Rural | 62.4 | 63.9 | | 64.8 | 61.9 | |
| Total | 62.5 | 64.3 | | 64.3 | 61.9 | |
| Knows that HIV can be transmitted during delivery | | | | | | |
| Urban | 89.9 | 96.5 | * | 91.2 | 93.9 | |
| Rural | 83.8 | 94.6 | * | 88.9 | 92.1 | |
| Total | 84.8 | 94.9 | * | 89.3 | 92.4 | |

**(Continued...)**

**Table 3.2. – *Continued***

| Variable | Women | | | Men | | |
|---|---|---|---|---|---|---|
| | 2005 | 2010 | *p*-value | 2005 | 2010 | *p*-value |
| Knows that HIV can be transmitted by breastfeeding | | | | | | |
| Urban | 86.5 | 95.9 | * | 85.8 | 90.9 | * |
| Rural | 78.3 | 93.6 | * | 81.4 | 90.4 | * |
| Total | 79.7 | 94.0 | * | 82.2 | 90.5 | * |
| Knows that MTCT can be reduced by mother taking special drugs during pregnancy | | | | | | |
| Urban | 87.3 | 95.6 | * | 88.3 | 92.8 | * |
| Rural | 70.1 | 93.1 | * | 78.6 | 90.1 | * |
| Total | 73.0 | 93.5 | * | 80.3 | 90.5 | * |
| **Misconceptions** | | | | | | |
| Knows that a healthy-looking person can have HIV | | | | | | |
| Urban | 94.0 | 93.0 | | 96.2 | 93.4 | |
| Rural | 81.7 | 86.9 | * | 90.7 | 88.7 | |
| Total | 83.8 | 87.8 | * | 91.7 | 89.5 | |
| Knows that HIV cannot be transmitted by mosquito bites | | | | | | |
| Urban | 88.3 | 86.2 | | 87.0 | 86.3 | |
| Rural | 79.8 | 77.7 | | 75.5 | 76.1 | |
| Total | 81.2 | 79.0 | | 77.6 | 77.8 | |
| Knows that HIV cannot be transmitted by supernatural means | | | | | | |
| Urban | 94.7 | 95.3 | | 95.4 | 96.6 | |
| Rural | 91.4 | 91.5 | | 91.3 | 91.9 | |
| Total | 92.0 | 92.1 | | 92.0 | 92.7 | |
| Knows that a person cannot become infected by sharing food with a person who has AIDS | | | | | | |
| Urban | 95.3 | 92.9 | | 96.0 | 94.0 | |
| Rural | 88.1 | 89.2 | * | 90.8 | 89.7 | |
| Total | 89.4 | 89.8 | | 91.7 | 90.4 | |
| **Stigma attitudes against PLHIV** | | | | | | |
| Willing to care for relative with AIDS | | | | | | |
| Urban | 97.8 | 98.0 | | 96.4 | 98.3 | * |
| Rural | 92.5 | 96.1 | * | 95.6 | 97.0 | * |
| Total | 93.4 | 96.4 | * | 95.7 | 97.2 | * |
| Would buy vegetables from a vendor with HIV | | | | | | |
| Urban | 86.4 | 90.4 | * | 90.3 | 94.0 | * |
| Rural | 65.2 | 82.3 | * | 77.5 | 89.0 | * |
| Total | 68.8 | 83.5 | * | 79.8 | 89.9 | * |

**(Continued...)**

**Table 3.2. – *Continued***

| | Women | | | Men | | |
|---|---|---|---|---|---|---|
| **Variable** | **2005** | **2010** | ***p*-value** | **2005** | **2010** | ***p*-value** |
| Would allow a female teacher with HIV but not sick to teach | | | | | | |
| Urban | 88.8 | 92.9 | * | 90.3 | 93.2 | * |
| Rural | 71.3 | 86.4 | * | 77.5 | 87.5 | * |
| Total | 74.3 | 87.4 | * | 79.8 | 88.5 | * |
| Would not want to keep HIV-positive status of family member secret | | | | | | |
| Urban | 77.7 | 64.9 | | 53.6 | 79.1 | * |
| Rural | 76.9 | 66.9 | | 77.6 | 77.5 | |
| Total | 77.1 | 66.6 | | 73.3 | 77.7 | * |
| **Should children be taught about using condoms** | | | | | | |
| Urban | 85.5 | 91.6 | * | 82.5 | 92.2 | * |
| Rural | 78.3 | 87.9 | * | 80.5 | 89.2 | * |
| Total | 79.5 | 88.5 | * | 80.8 | 89.7 | * |
| **Ever tested for HIV** | | | | | | |
| Urban | 46.8 | 80.8 | * | 37.4 | 75.4 | * |
| Rural | 19.3 | 76.6 | * | 18.4 | 72.3 | * |
| Total | 24.0 | 77.2 | * | 21.8 | 72.8 | * |
| **Number** | 11,321 | 13,671 | | 4,413 | 5,687 | |

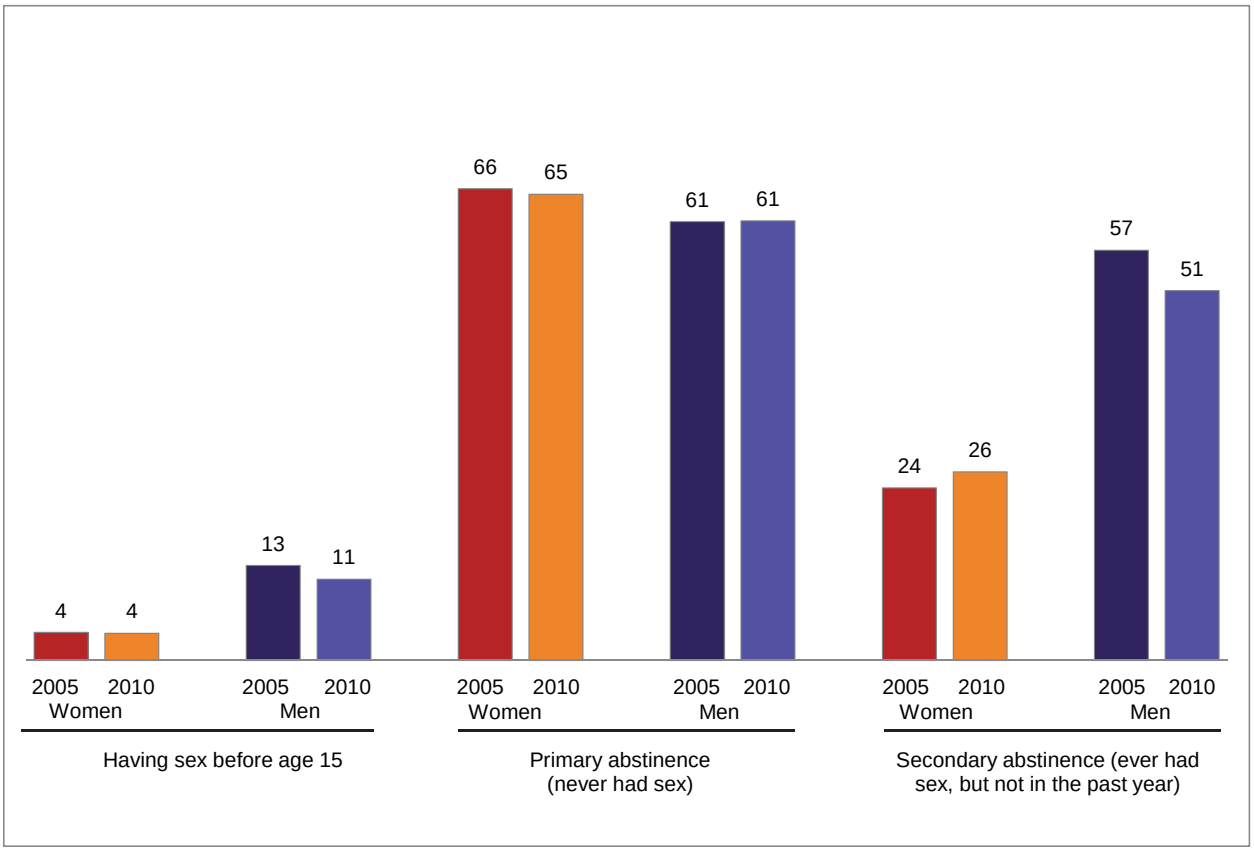
Note: An asterisk denotes the *p*-value < 0.050 for the t-statistics comparing the proportions between 2005 and 2010 surveys.

## 3.3. Sexual Behaviors of Youth

Table 3.3 present changes in HIV-related behavior indicators among young women and men (age 15-24). The data show no significant change in the proportion of youth who had sex before age 15 (Figure 3.5). The proportion of never-married women age 15–24 who reported having had sex was slightly higher in 2010 than 2005 (17 percent vs. 14 percent), particularly among women living in rural areas (16 percent vs. 12 percent) and among women age 20-24 (28 percent vs. 23 percent). However, the proportion of never-married men age 15-24 who had sex did not significantly change between the two surveys.

Table 3.3 also presents the percentage of never-married women and men age 15–24 who never had sex (primary abstinence), and the percentage who ever had sex but not in the last 12 months (secondary abstinence). The proportion of young women reporting primary abstinence declined slightly among women living in urban areas (from 66 to 62 percent) and among women age 15-19 (from 88 to 85 percent). However, no significant change was observed among women living in rural areas, among older women age 20-24, or among men.

**Figure 3.5. Sexual behavior of youth 15-24, Rwanda 2005 and 2010**




Among young women, secondary abstinence declined significantly in urban areas (from 38 to 28 percent) while it increased in rural areas (from 21 percent to 26 percent). It declined among women age 15-19 but increased among those age 20-24 (from 18 percent to 21 percent). Among young men, secondary abstinence declined significantly in urban areas (from 60 to 46 percent) and among men age 20-24 years (from 49 percent to 41 percent). However, changes in secondary abstinence observe among men living in rural areas were small (from 56 percent to 53 percent), and among younger men aged 15-19 years (from 76 percent to 75 percent).

**Table 3.3. Trends in HIV-related behavior indicators among women and men age 15-24 who have been sexually active in the last 12 months, Rwanda 2005-2010**

| | Women | | | Men | | |
|---|---|---|---|---|---|---|
| **Variable** | **2005** | **2010** | ***p*-value** | **2005** | **2010** | ***p*-value** |
| **All respondents 15-24** | | | | | | |
| *Proportion of respondents who had sex before age 15* | | | | | | |
| Urban | 5.8 | 4.2 | | 12.2 | 8.4 | |
| Rural | 3.5 | 3.7 | | 13.4 | 11.8 | |
| 15-19 years old | 5.1 | 4.6 | | 15.3 | 13.3 | |
| 20-24 years old | 2.6 | 2.8 | | 10.8 | 8.8 | |
| Total | 3.9 | 3.8 | | 13.2 | 11.3 | |
| Number | 4,938 | 5,628 | | 2,048 | 2,607 | |
| *Proportion of never-married respondents who have had sex* | | | | | | |
| Urban | 22.4 | 23.0 | | 42.7 | 38.6 | |
| Rural | 11.6 | 16.0 | * | 30.9 | 31.2 | |
| 15-19 years old | 9.4 | 11.2 | * | 22.5 | 20.9 | |
| 20-24 years old | 22.6 | 27.9 | * | 48.1 | 50.1 | |
| Total | 13.8 | 17.2 | * | 33.0 | 32.3 | |
| Number | 3,762 | 4,416 | | 1,863 | 2,371 | |
| *Proportion of respondents who have never had sex* | | | | | | |
| Urban | 65.8 | 61.6 | * | 54.3 | 58.2 | |
| Rural | 65.6 | 65.4 | | 62.3 | 61.6 | |
| 15-19 years old | 88.0 | 85.3 | * | 77.4 | 78.5 | |
| 20-24 years old | 41.1 | 42.2 | | 41.8 | 39.4 | |
| Total | 65.6 | 64.8 | | 61.0 | 61.1 | |
| Number | 4,938 | 5,628 | | 2,048 | 2,607 | |
| **Sexually experienced respondents age 15-24** | | | | | | |
| *Proportion of respondents who ever had sex but did not have sex in the past 12 months* | | | | | | |
| Urban | 37.9 | 27.7 | * | 59.5 | 45.5 | * |
| Rural | 20.9 | 25.9 | * | 56.4 | 52.5 | |
| 15-19 years old | 51.6 | 46.9 | | 75.6 | 75.0 | |
| 20-24 years old | 17.8 | 20.5 | * | 48.6 | 40.9 | * |
| Total | 24.0 | 26.2 | | 57.0 | 51.4 | * |
| Number | 1,694 | 1,980 | | 798 | 1,013 | |

* Statistically significant with p<.05

## 3.4. Sexual Behaviors of Adults

Table 3.4 presents percentage distributions of women and men age 15–49 who had sex in past 12 months by selected sexual behaviors. The proportion of women and men who reported having two or more partners in the 12 months preceding the survey increased slightly (from 0.6 to 1 percent and from 5 to 7 percent, respectively), with much of the increase occurring among unmarried adults (from 4 to 6 percent among women and from 8 to 14 percent among men). Moreover, there was a slight increase in men reporting to have had paid sex (from 6 to 8 percent).

The percentage of women and men who reported using a condom in the last 12 months increased significantly between 2005 and 2010 (from 3 to 8 percent among women and from 6 to 15 percent among men) (Figure 3.6). Similarly, the percentage of women and men who reported using a condom during last non-spousal sex in the last 12 months increased significantly (from 20 to 27 percent among women and from 37 to 63 percent among men). However, among women, the increase in condom use during last non-spousal sex was only significant among women living in rural areas (from 15 to 24 percent) and among unmarried women (from 21 to 36 percent). The data also show that consistent condom use increased significantly for both women (from 3 to 8 percent) and men (from 6 to 14 percent).

**Figure 3.6. Condom use, Rwanda 2005 and 2010**

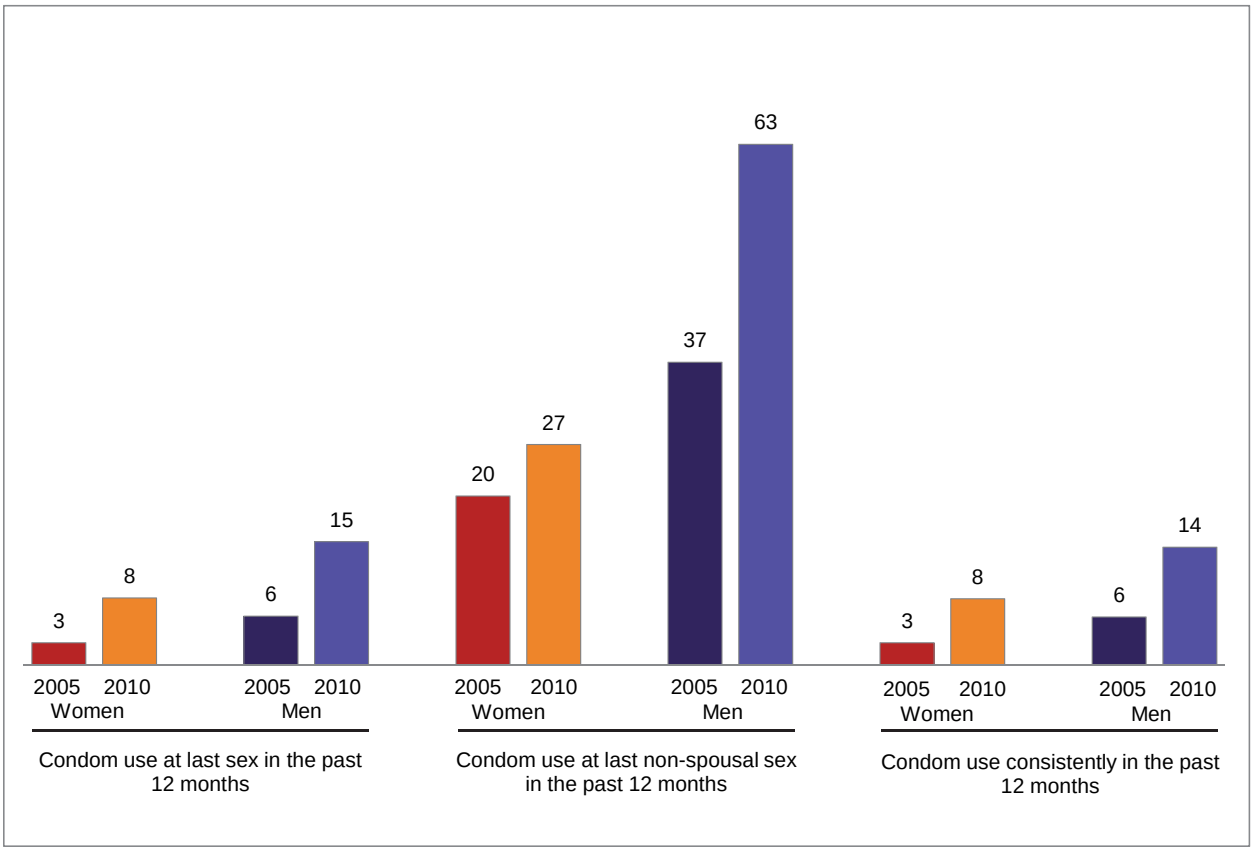


**Table 3.4. Trends in HIV-related behavior indicators among women and men age 15-49 who have been sexually active in the last 12 months, Rwanda 2005-2010**

| | Women | | | Men | | |
|---|---|---|---|---|---|---|
| **Variable** | **2005** | **2010** | ***p*-value** | **2005** | **2010** | ***p*-value** |
| Number of sexual partners in the past 12 months | | | | | | |
| 1 | 99.4 | 99.0 | * | 96.0 | 93.0 | * |
| 2 | 0.6 | 1.0 | * | 5.1 | 6.2 | |
| 3+ | na | 0.1 | | na | 0.8 | |
| Number | 5,887 | 7,611 | | 2,399 | 3,185 | |
| Proportion of respondents with multiple sexual partners in the past 12 months | | | | | | |
| Urban | 1.5 | 1.7 | | 5.2 | 9.7 | |
| Rural | 0.5 | 1.0 | * | 5.0 | 6.5 | * |
| Not married | 3.6 | 6.2 | * | 7.8 | 14.3 | * |
| Married | 0.3 | 0.4 | | 4.7 | 5.7 | * |
| Total | 0.6 | 1.1 | * | 5.1 | 7.0 | * |
| Number | 5,887 | 7,611 | | 2,399 | 3,185 | |
| Proportion of respondents who ever paid for sex | | | | | | |
| Urban | na | na | | 10.7 | 15.5 | * |
| Rural | na | na | | 4.8 | 6.6 | * |
| Not married | na | na | | 6.9 | 19.0 | * |
| Married | na | na | | 5.6 | 6.7 | |
| Total | na | na | | 5.8 | 7.7 | * |
| Number | | | | 2,399 | 3,185 | |
| Proportion of respondents who used a condom at last sex in the last 12 months | | | | | | |
| Urban | 9.6 | 14.7 | * | 20.2 | 28.1 | * |
| Rural | 1.5 | 7.0 | * | 3.0 | 12.2 | * |
| Not married | 16.1 | 30.3 | * | 38.8 | 61.9 | * |
| Married | 1.2 | 5.1 | * | 1.4 | 6.3 | * |
| Total | 2.7 | 8.1 | * | 5.9 | 14.9 | * |
| Number | 5,887 | 7,611 | | 2,399 | 3,185 | |
| Proportion of respondents who used condoms during last non-spousal sex in the last 12 months | | | | | | |
| Urban | 34.8 | 33.4 | | 58.0 | 74.0 | * |
| Rural | 14.8 | 24.3 | * | 25.9 | 58.0 | * |
| Not married | 21.1 | 35.9 | * | 43.8 | 65.8 | * |
| Married | 10.1 | 8.2 | | 21.0 | 50.3 | * |
| Total | 20.4 | 26.6 | * | 36.5 | 62.8 | * |
| Number | 482 | 1,093 | | 388 | 572 | |

**(Continued...)**

**Table 3.4. – *Continued***

| Variable | Women | | | Men | | |
|---|---|---|---|---|---|---|
| | 2005 | 2010 | *p*-value | 2005 | 2010 | *p*-value |
| Proportion of respondents who used condoms consistently in the last 12 months | | | | | | |
| Urban | 9.5 | 14.6 | * | 20.2 | 26.2 | * |
| Rural | 1.5 | 6.9 | * | 3.0 | 11.7 | * |
| Not married | 16.1 | 29.5 | * | 38.4 | 58.7 | * |
| Married | 1.1 | 5.1 | * | 1.4 | 6.1 | * |
| Total | 2.7 | 8.0 | * | 5.8 | 14.2 | * |
| Number | 5,887 | 7,611 | | 2,399 | 3,185 | |

* Statistically significant with p<.05

### *Prevalence of STIs or STI Symptoms*

Table 3.5 presents the percentage of women and men age 15–49 who had STIs or symptoms of STIs (genital sore or ulcer or abnormal genital discharge) in the last 12 months, among those who ever had sex. The proportions of women and men who had STIs or STI symptoms remained low in both surveys but increased over time, from 5 to 8 percent among women and from 3 to 8 percent among men (Figure 3.7).

**Figure 3.7. Reported STIs and STI symptoms, Rwanda 2005 and 2010**

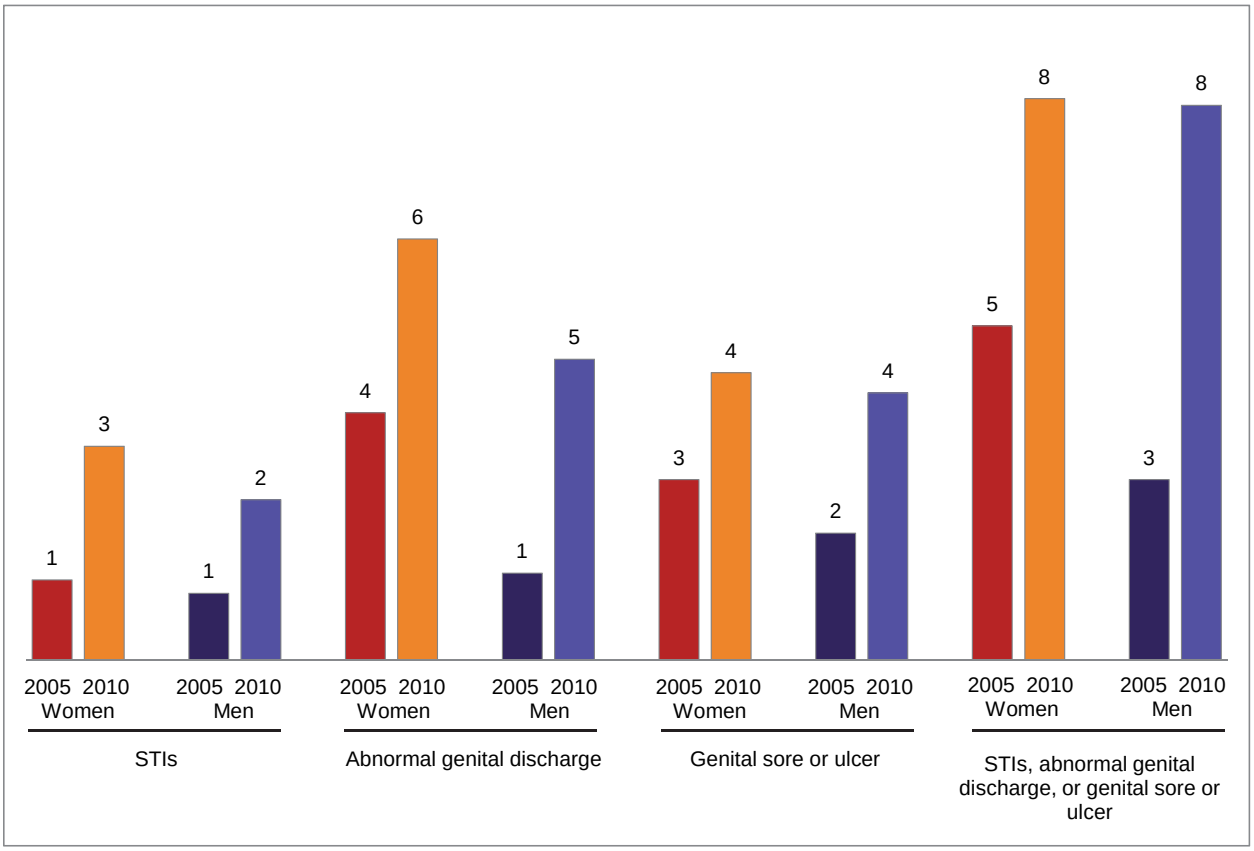


**Table 3.5. Trends in self-reported prevalence of sexually transmitted infections (STIs) and STI symptoms during the last 12 months, among sexually experienced women and men age 15-49, Rwanda 2005-2010**

| | Women | | | Men | | |
|---|---|---|---|---|---|---|
| **Variable** | **2005** | **2010** | ***p*-value** | **2005** | **2010** | ***p*-value** |
| Proportion of respondents who had STIs | | | | | | |
| Urban | 1.9 | 4.2 | * | 1.9 | 3.8 | * |
| Rural | 1.1 | 3.0 | * | 0.8 | 2.1 | * |
| Total | 1.2 | 3.2 | * | 1.0 | 2.4 | * |
| Proportion of respondents who had abnormal genital discharge | | | | | | |
| Urban | 5.4 | 7.3 | * | 1.5 | 5.8 | * |
| Rural | 3.4 | 6.1 | * | 1.3 | 4.3 | * |
| Total | 3.7 | 6.3 | * | 1.3 | 4.5 | * |
| Proportion of respondents who had genital sore or ulcer | | | | | | |
| Urban | 3.3 | 4.3 | | 2.3 | 5.4 | * |
| Rural | 2.5 | 4.3 | * | 1.3 | 3.7 | * |
| Total | 2.7 | 4.3 | * | 1.5 | 4.0 | * |
| Proportion of respondents who had STI, genital discharge, sore or ulcer | | | | | | |
| Urban | 7.3 | 10.0 | * | 3.4 | 10.6 | * |
| Rural | 4.6 | 8.1 | * | 2.6 | 7.9 | * |
| Total | 5.0 | 8.4 | * | 2.7 | 8.3 | * |
| **Number** | 7,816 | 9,568 | | 3,053 | 3,950 | |

* Statistically significant with p<.05

## DISCUSSION

This study analyzed data sets from two rounds of the nationally representative population-based surveys implemented in Rwanda in 2005 and 2010 to describe changes in key indicators related to knowledge, attitudes, and behavior in HIV/AIDS. The analysis found a number of encouraging signs that there are positive improvements of those indicators and that HIV/AIDS prevention programs in Rwanda are having the intended effects.

Practically all men and women in Rwanda have heard of HIV/AIDS. The analysis indicated that an increasing proportion of men and women recognized condom use as an HIV prevention method. It is also encouraging that a significantly increased proportion of men and women know where to get a condom if needed. However, it is alarming that in 2010, fewer men and women acknowledged that having only one sexual partner could help prevent HIV transmission than in 2005, indicating a need for intensified HIV education program efforts on this method of prevention. The knowledge of MTCT of HIV improved over the five-year period, particularly knowledge of the transmission during delivery and by breastfeeding. Furthermore, the proportion familiar with the special drug that can reduce MTCT also increased very significantly, indicating that the PMTCT program is working well in Rwanda.

Even though misconceptions about HIV infection and its mode of transmission have been somewhat low (10-20 percent) in Rwanda since 2005, there was little change over the study period. The program should look into this small population more closely to develop new strategies to help them improve their understanding of the disease. In terms of stigma against PLHIV, significantly more men and women are willing to care for a relative with HIV/AIDS, buy vegetables from a vendor with HIV, and allow a female teacher with HIV to teach. The proportion of respondents who had ever tested for HIV increased more than threefold between the two surveys. This may be due to the scaling-up of voluntary counseling and testing (VCT) programs, particularly in rural areas. The proportions of women and men in the rural areas who have ever tested for HIV increased from 19 percent to 77 percent for women and 18 percent to 72 percent in men. Thus, the VCT program has improved its services and made them available in both urban and rural areas equally.

With regard to HIV-related behaviors among young people, the study revealed that the proportion of young men who initiated sexual intercourse before age 15 decreased in the past five years. However, the proportion of young women who had premarital sexual intercourse increased. These changes show mixed results of HIV prevention efforts.

There is some evidence of increasing risky sexual behavior among adults. The proportions of women and men having multiple sexual partners and the proportion of men who had ever paid for sex increased. During the same period, the study found evidence of increasing use of condoms. While the overall level of condom use remains low, use at last sexual intercourse in the past 12 months, use during last non-spousal sex in the last 12 months, and consistent condom use increased significantly during the past 5 years.

Even though there is an increase in the use of condoms, the proportions of women and men reporting that they had STIs or symptoms of an STI increased significantly from 2005 to 2010. This information, coupled with an increase in certain risk behaviors, raises the question of whether using condoms alone would sufficiently protect from STIs, including HIV/AIDS.

There are a number of limitations to consider when interpreting the findings from this study. First, this analysis lacks longitudinal data on HIV/AIDS-related knowledge and associated factors in Rwanda for a more in-depth analysis of trends. Instead, it is based on two cross-sectional data sets with samples that were drawn independently and implemented five years apart. It is assumed throughout the

analysis that the changes are gradual and the trends are linear, while in fact they may not. Second, the data related to the HIV/AIDS program were not collected during the survey and were not available for the analysis. Therefore, it is not possible to ascertain causal effects of the changes, and whether changes in knowledge, attitudes, and behaviors are associated with the level of effort and coverage of the program. Moreover, the study does not examine the association between knowledge and behavior (i.e., an association between the increase observed in the level of HIV-related knowledge and the increase observed in the level of HIV-related behaviors). Finally, this analysis is based on reported information on sexual behavior. The results may be biased to the extent of misreported sexual behaviors (Mensch et al. 2003). In a given social context, the extent of such misreporting could vary by sex, educational level, economic status, and area of residence (Hewett et al. 2004).

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