

TRAC

**EVOLUTION OF KNOWLEDGE AND BEHAVIOR RELATED TO HIV/AIDS AMONG
YOUTH, SEX WORKERS AND TRUCK DRIVERS IN RWANDA (2000 & 2006)**

SURVEY REPORT

Kigali 2007

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ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrom
BSS	Behavioral Surveillance Survey
CNLS	National AIDS Control Commission
CZ	Census zone
DHS	Demographic and Health Survey
FHI	Family Health International
HIV	Human Immunodeficiency Virus
PNLS	National AIDS Control Programme
STI	Sexually Transmitted Infection
SW	Sex Worker
TRAC	Treatment and Research Aids Center
UNAIDS	Joined United Nations Programme on AIDS

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Dr. ASIIMWE Anita

Director of TRAC

SUMMARY

Rwanda is a country highly affected by HIV/AIDS epidemic, with an estimated prevalence rate of 3% among the general population in the 15-49 age bracket` (INSR/macro 2005). In the Rwandan context where almost all cases of HIV transmission are known to occur through sexual contact, it was deemed important to conduct behavioural surveillance surveys (BSS) to identify and understand risky behaviours that need to be changed and highlight behavioural change trends.

METHODOLOGY

The present report presents comparative data of two survey phases of which the first was carried out in 2000 and the second in 2006. The data were collected from three distinct target groups including youth aged between 15 and 19 years, sex workers and truck drivers. All the five Provinces in Rwanda were covered in these surveys. In 2000, the survey among the youth was carried out among 8255 girls and boys. Out of 7546 young people aged between 15 and 24 years interviewed in 2006, 4409 were aged between 15 and 19 years. In both phases (2000 and 2006) a randomized representative sampling at each province was done. The sample of sex workers targeted 699 individuals in 2000 and 1041 in 2006. The survey proper was preceded by a mapping of prostitution sites in main towns of the country which constituted the survey sites. The survey among truck drivers constituted of truck drivers as well as conductors. In total, 481 and 680 truck drivers in 2000 and 2006 respectively were surveyed at their stops in the country.

For each target group, data were collected using a standardized and pre-coded questionnaire, pre-tested among a limited number of people. Bivariate analysis was carried out in order to determine the extent of changes observed between indicators of phase 1 of the survey (2000) and those of phase 2 (2006). Multivariate analysis was used to determine the effect of certain socio-demographic variables on the various observed changes. Of the statistical tests of square test two was used to assess the level of statistical significance of the results obtained. The significance threshold for these statistical tests was set at maximum 10% ($P < 0.1$).

Main findings:

Characteristics of respondents

Samples of the two surveys among youth (2000 and 2006) differ in various aspects. In 2006, more boys were interviewed than it was the case in 2000 (48% vs. 40%). A considerable high number of the youth were interviewed in various areas of Kigali city in 2006. On the contrary, youth interviewed in Southern Province in 2006 represent 19% of the sample compared to 36% in 2000. The level of education also varied from one survey to another but the difference was not statistically significant. The majority of the youth interviewed in 2006 had at least reached the secondary level of education (10% in 2006 compared to 7% in 2000).

The structure of the two samples of sex workers also differs in the two phases in relation to age, level of education, religion and, to a lesser extent, marital status. The 2006 sample targeted a small number of the youth: 17% are aged below 20 years compared to 28% in 2000 in addition to people aged 30 years and above. These were 13% in 2006 compared to 22% in 2000. On the contrary, the Sex Workers of the intermediate age groups formed a bigger proportion in 2006 than they did 6 years earlier (44% vs. 30% for those aged 20-24 in 2000 and 2006 respectively, 20% vs. 26% for those aged 25-29 for these respective years too). The 2006 sample presents an educational level higher than that of 2000. Respondents with secondary education level are 16% compared to 10% in 2000. As regards religion, Catholic and Protestant women formed a bigger number in 2006 than they did in

2000. The proportion of Muslim women remained practically unchanged while sex workers belonging to other religions other than those three mentioned above, increased from 4% in 2000 to 13% in 2006.

As for truck drivers, the age structure does not differ from one survey to another. On the contrary, it varies according to nationality where the proportion of Rwandans present in the survey considerably increased from 26% to 41% between the first and the second survey. It was also observed that in 2006 truck drivers were more educated than it was the case in 2000. In the first survey, 32% had reached the secondary education level and six years later, this proportion increased to 47%.

Knowledge of AIDS

In each of the three brackets of the population targeted by the survey, almost all the respondents reported having heard of HIV/AIDS. The knowledge of at least one of the three main AIDS prevention methods which are sexual abstinence, faithfulness to one uninfected partner and condom use increased among the youth from 71% in 2000 to 83% in 2006. However, it has remained constant among Sex workers (91% vs. 92%) and has even somewhat decreased in the group of truck drivers, from 99% in 2000 to 96% in 2006. Comprehensive knowledge of HIV/AIDS which takes into account of both knowledge of the major prevention methods and identification of erroneous modes of transmission remains low. Nevertheless, it should be noted that between the two survey phases, the comprehensive knowledge of HIV significantly increased in each of the three brackets of the target population, increasing from 9% to 15% among the youth, from 27% to 36% among sex workers and from 32% to 39% among truck drivers.

Sexual behaviors

The proportion of the youth who reported having already had sexual intercourse in their life remained constant between the two surveys (19% in 2000 and 18% in 2006). On the contrary, it decreased among truck drivers from 98% in 2000 to 94% in 2006. The entry into active sexual life also remained constant among the youth. In 2000, 11% reported having had their first sexual intercourse when they were at least 15 years of age. Six years later, this proportion did not change. On the contrary, the age for entry into prostitution among sex workers seems to have been delayed between the two surveys. Thus, in 2000, half of Sex workers reported having had their first commercial sex at the age of 18 years. In 2006, half of respondents reported having had first remunerated sex at the age of 19 years.

The proportion of the youth having had sexual relations during the last 12 months before the survey decreased between 2000 and 2006, from 5% to 4%. During the last 12 months, among this sub population of sexually active youth, it was noted that the proportion of those who reported having multiple sexual partners during the same period dropped (but not significantly), from 37% in 2000 to 34% in 2006. Among truck drivers, the proportion of those who reported having had sexual intercourse during the last 12 months dropped by 8 percent between 2000 (89%) and 2006 (81%). Out of those who reported having had sexual relations during the last 12 months before the survey, 53% affirmed in 2000 to have had sexual relations with Sex workers. In 2006, this proportion dropped by more than half to 23%.

Unfortunately, sexual relations with paying partners are not always protected. Thus, of all young people interviewed the proportion that report having used a condom at least once in their life practically doubled to six but was only 23% in 2006. A small number of young people report having had sexual relations with occasional and paying partners during the last 12 months, which limits

analyses on the use of condom with this type of partner. However, it appears that regardless of this type of partners, an unimportant proportion of young people systematically report having used condom during the last 12 months (1% in 2000 and 2006). Among Sex workers, the level of use of condoms increased with passing of years. The proportion of those who report having used condom during the last sexual relations with a client increased from 82% in 2000 to 87% in 2006. However, the systematic condom use which should be the rule among this population dropped. In 2000, 59% reported having used condom during each relation with a client in the last 7 days preceding the survey. In 2006, not more than 47% reported it. As for truck drivers, the level of the use of a condom during the last sexual relations with a paying partner remained constant between the two surveys (81% in 2000 vs. 82% in 2006). On the contrary, the systematic level of use increased. Thus, out of the truck drivers, 47% in 2000 compared to 60% in 2006 reported having systematically used condom during sexual relations with paying partners over the last 12 months.

STI antecedents and HIV testing

The exposure to STI seems to have decreased among the various groups targeted in this survey. Thus, the proportion of people who reported at least a symptom of STI during the last 12 months before the survey dropped by half among the young population and truck drivers. In each of the two category of the population, it decreased from 10% in 2000 to 5% in 2006. Among Sex workers, this proportion also considerably dropped from 33% in 2000 to 25% in 2006.

The level of acceptance to test for HIV/AIDS considerably increased between the two periods of survey. In 2000, 1% of youth, 36% of Sex workers and 27% of truck drivers reported having taken HIV test and received related results. In 2006, these proportions had significantly changed among each of the three target category of the populations and were respectively 12%, 65% and 56%.

INTRODUCTION

0.1 Overview of HIV/AIDS situation in Rwanda

With a population estimated to more than 8 million inhabitants, Rwanda is faced with various public health problems including HIV/AIDS infection. The crisis point was derived after the first national HIV seroprevalence survey in 1986. This survey (Bizimungu, 1989) showed an extremely high prevalence rate (17.8%) in the urban area and a less worrying rate in the rural areas (1.3%). Other seroprevalence data collected in subsequent years constantly showed that the prevalence level was increasing. However, those seroprevalence surveys conducted in the first years of the epidemic have the disadvantage of not always being sufficiently representative and have sometimes overestimated the level of the prevalence of the epidemic in various countries. In 2005, the Demographic and Health Survey collected both behavioural and serologic data and showed a seroprevalence rate of 3% in the general population aged between 15-49 years (3.6% among women and 2.3% among men). The most affected age groups are those of 40-44 years (6.6%), 30-34 years (5.2%) and 35-39 years (4.8%). However, other age groups especially the youth are not at all spared. This kind of the survey is more representative of the general population and provides a more correct image of the epidemic in the country.

Since many years ago, Rwanda has got a good sentinel surveillance system which provides data on HIV prevalence on a regular basis. But the behavioural surveillance is still a point to be developed. TRAC which supervises and coordinates epidemiological and behavioural surveillance efforts at the national level intends to strengthen that second surveillance part considering its importance in the monitoring and the comprehension of HIV risk behaviours.

0.2 Justification of the behavioural surveillance

The behavioural surveillance is a component of the **second generation surveillance** that consists in alternate and repetitive surveys in population groups whose habits can account for the spreading of HIV/AIDS and determine necessary prevention actions at both national and regional level.

The second generation surveillance systems aim at monitoring the trends of behaviours as well as HIV infection. They provide information that helps to identify people with infection risk and shows behaviours that put them at risk. The behavioural surveillance includes repetitive crosscutting surveys in the general population as well as in the defined sub-populations. Thus, the behavioural surveillance surveys are characterised by a similarity throughout years. In fact, to be able to follow up the evolution of behaviour, it is always necessary to resort to the same sampling modes, to the same data collection methods and to maintain a set of key indicators through different survey phases. To ensure that observed trends are real, the surveys pay much attention to sampling strategies by selecting probabilistic samples. This precaution is accounted for by the willingness to obtain reliable and exploitable data that are equal to the invested resources.

The behavioural surveillance surveys target practices and sub-populations that most further the spread of HIV. They bear a host of advantages and are undeniably useful:

- Quality behavioural data make it possible to identify the risk subpopulations and help target (human and financial) resources that are necessary to the sero-surveillance where they will provide an enormous amount of information on the epidemic;
- The information on the behaviours gives the possibility to better adjust the prevention efforts but also gives a context for the interpretation of serological data of HIV infection;

- The behavioural data can reveal the sub-populations that are at risk in the surveyed environment and what channels the virus might follow if nothing is done to curb down its spreading;
- The same data also provide information on the risk levels in the general population and show if there exists «sexual opportunities» connecting high-risk groups to those who are generally at less risk;
- The behavioural surveillance also helps to conceive prevention programmes. In fact, when a country decides to control HIV epidemic, it does so because it intends to slow down the spreading of the virus with the help of efficient prevention programmes. A good prevention is the one that encourages people to adopt less risk behaviours and to protect themselves against possible danger that their partners represent;
- The behavioural surveillance is an instrument which is also used for evaluating prevention programmes. It will record the improvement and persistence of various risk behaviours as well as modifications of risk types. Those changes reflect the possible success of efforts made to promote less risk behaviours and limit the spreading of the virus in the general population within high risk groups;
- The behavioural data that highlight risk behaviours in the general population can be a useful supplement to HIV prevalence data to prompt initiatives;
- There is a relationship between behavioural evolution and HIV prevalence. A behavioural change followed by a drop in number of new contaminations is one of possible causes of improving HIV prevalence. This is of course a very encouraging evolution for those who endeavour to curb down the virus spread. However, without constant behavioural surveillance that allows knowing their real trends, it is not possible to assert if a habit change can influence prevalence changes.

In Rwanda, efforts to set up a behavioural surveillance system were initiated by FHI/Impact and PNLS which undertook the first phase of the behavioural surveillance survey in 2000. TRAC would like to carry on this effort and perpetuate the initiative by seeing to the regular organisation (every two years) of such surveys within the high-risk groups in addition to other surveys like the DHS in the general population which is organised after every 5 years or PLACE study carried out in 2005 by CNLS in partnership with MEASURE EVALUATION project whose purpose was to identify the high transmission sites and HIV risk behaviours of the populations who frequent those sites.

0.3 Choice of the target groups

The first behavioural surveillance survey in Rwanda (FHI/Impact and PNLS 2000) was carried out in the three target groups which are the unmarried teenagers of the age group of 15 - 19 years, truck drivers and sex workers or prostitutes.

For this second phase of behavioural surveillance surveys, the same target groups were retained following a consensus meeting between TRAC and its partners. The population of teenagers was however increased to people aged from 15 to 24 years thus including teenagers and youngsters. Several reasons account for the priority choice of those groups.

Youth

Several surveys reveal the existence within the youth population of a number of behaviours that are likely to put them at risk of HIV infection. Two national level surveys carried out in 2000 show that the first sexual intercourse occur relatively early among some teenagers. One of them shows that 29% of unmarried boys and 12% of unmarried girls aged between 15 and 19 years are sexually active (FHI/Impact & PNLS 2000a) while the other reveals that 14% of the group of girls and 21% of the group of boys aged between 15 and 19 years as well as 68% of women aged between 20 and 24 years and 66% of men of the same age group are sexually active (DHS 2000). Finally and for this latter study, 36% of girls and 37% of boys aged between 15 and 24 years are sexually active. The behavioural surveys in Rwanda show particularly an extremely low level of condom use. Thus from the 2005 DHS, it ensues that only 16% of girls aged between 15 and 19 years and 4% of those aged between 20-24 years used the condom at the last sexual intercourse. Those rates are 36% and 15% for boys of all those respective age groups.

Sex Workers (SW)

Unlike what is observed in several countries in Central and Western Africa, prostitution in Rwanda is less visible. However, this phenomenon well and truly exists and it is estimated that it plays a major role in spreading HIV epidemic in Rwanda. It is even estimated that prostitution has an increasing trend throughout the years in the Rwandan society. The high number of widows due to the 1994 genocide and the economic difficulties encountered by many women might result to the expansion of the phenomenon. Few studies on prostitution and AIDS have been carried out in Rwanda. However, those that exist reveal very worrying facts:

- A study undertaken in 1984 (Van de Perre et al. 1985) among sex workers of Butare showed an HIV prevalence of 88%.
- Another study (Kibiriti et al. 1998) reveals an HIV prevalence of 76% out of 882 sex workers from 5 provinces of Rwanda.
- A more recent study (FHI/Impact & PNLS 2000b) shows that despite the vast number of their sexual partners, many sex workers have unprotected sexual intercourse. Thus less than a half (46%) of those women declare to have used a condom at each sexual intercourse with a paying partner during the last 7 days preceding this survey.

Truck drivers

A number of studies have showed the major role played by migrant populations including drivers in spreading HIV/AIDS. Drivers and more specifically truck drivers and their conductors are by their profession, vulnerable to HIV infection and can contribute to spreading the epidemic throughout the country (Bwayo et al., 1994). In Rwanda, major roads cross Rwanda and allow exchanges of populations goods with other countries of the sub region.

Those roads are frequented by truck drivers who are obliged to spend several nights away from their habitual residence. A study (CCISD 1999) on the main roads of the Great Lakes Region (including Rwanda) highlighted that "along the major roads, sexual relations with several partners are part of daily life". This highly mobile population is regularly in contact with sex workers. A study carried out in Rwanda among that target population (FHI/Impact 2000c) reveals that 68% of truck drivers admit having had sexual intercourse with sexual workers during the 12 months preceding the survey.

Although almost all those truck drivers have heard of the condom and are aware of where to find it in case they need it, only 47% declared to systematically use it with sex workers and 31% to systematically use it with casual partners. Yet, the majority of truck drivers (87%) are married and have unprotected sex with their spouses. This target population constitutes therefore an important bridge likely to spread the HIV epidemic among the general population.

I. OBJECTIVES AND METHODOLOGY

1.1 Objectives

- a) Set up a data collection system to follow up the evolution of behaviours of vulnerable and high risk groups that influence the HIV/AIDS epidemic in Rwanda;
- b) Provide information to direct the planning of HIV/AIDS control programmes;
- c) Show the success of the combination of efforts made in the context of HIV prevention within selected sites.

1.2 Methodology

TRAC objective is to obtain in each of those populations data that are representative of each target group. For the group of the youth the survey of 2006 was conducted in all five regions that resulted from 2005 to decentralization i.e., the Southern, Eastern, Northern, and Eastern Provinces and Kigali City. In 2000, the administrative delimitation of the country was different and the survey was conducted in 6 provinces out of the existing twelve provinces at that time i.e, Butare, Byumba, Gitarama, Kibungo, Kibuye and Kigali Ngali. Furthermore, the survey of 2000 targeted the youth aged 15-19 years while the one of 2006 targeted the youth aged 15-24 years. During the analysis, only the sample of the youth aged 15-19 years in 2006 were considered and compared with that of people of the same group interviewed in 2000¹. The survey among sex workers conducted in 2000 as well as in 2006 was also held especially in main urban centres where there is relatively strong concentration of sex workers. The survey of 2006 among drivers was conducted in main stops and on the whole territory of Rwanda as it was the case in 2000.

1.2.1. Size of the sample, sampling and survey procedures

For the two phases of the survey, the following formula was used to determine the size of the sample for each target group:

$$n = D \frac{\left[\sqrt{2P(1-P)}Z_{1-\alpha} + \sqrt{P_1(1-P_1) + P_2(1-P_2)}Z_{1-\beta} \right]^2}{\Delta^2}$$

Where:

D = clustering effect

P₁ = ratio estimated during the first survey

P₂ = ratio expected at a future period such as the quantity (P₂-P₁) and the size of the change to be detected.

P = P₁ + P₂/2

Δ = P₂ - P₁

Z_{1-α} = Z score corresponding to the probability that is wished for to be able to assert that an observed change of (P₂ - P₁) size is not obtained by chance.

And

Z_{1-β} = Z score corresponding to the confidence degree which is wished for to be able to detect a change of (P₂ - P₁) size if such change has occurred.

¹ A specific report of the 2006 survey was also produced and presents detailed data for the whole group of the youth aged 15-24 years. There are also specific reports of the 2006 survey in the group of truck drivers and that of SW

$$\alpha = 0.05 (Z_1 - \alpha = 1.65) \quad \beta = 0.20 (Z_1 - \beta = 0.84)$$

The size of the sample was calculated in such a way that it allows to detect all changes of at least 15% points of the percentage between two phases of the survey for different indicators.

The group of youth: In 2000, the sample included 4929 girls and 3326 boys aged 15-19 years. In 2006, the sample was composed of 3370 girls and 3615 boys among whom 2281 girls and 2128 boys aged 15-19 years. As it has been mentioned, the analysis concerns only the youth aged between 15-19 years in two phases of the survey. As it happened in 2000, in the year 2006 a three degree random sample was constituted: the first step of selection consisted in randomly selecting CZ; the second step consisted in selecting households within CZ and the third step was the random selection of individuals to be interviewed within a household that was selected at the preceding step.

The group of sex workers: The sample was made up of 699 individuals in 2000 and 1041 in 2006. In this group, it was first preceded to identify prostitution sites, determine the categories of places (bars, night clubs, hotel, street, etc.) where sex workers are found and estimate the sample size of SW per each category of prostitution site. For all prostitution sites identified and included in the sample, the similar duration of data collection in the sites was determined. In each site, the pollsters stayed for two hours of time and during this period, they interviewed all the SW present at the site.

Truck drivers: In 2000, 481 drivers were interviewed while in 2006, they were 680. The truck drivers were interviewed in a continuous way as they pass by the survey sites while they are lining up for customs formalities. Conductors were also interviewed while they were waiting for the drivers to fulfil customs formalities.

All the truck drivers and conductors passing by different sites at the time of the survey were invited to participate. For those who consented, the pollster will identify a secluded place offering an acceptable level of confidentiality to administer the interview.

1.3 Data analysis

Data were recorded using the Epi info software. A data base including merged data of the phases of the survey was included in each data base. Some variables were encoded again with a bid to make a comparison between the two phases. Two types of analysis were done.

1.3.1 Bivariate analysis according to the phase

In each target group, calculated indicators focused on the following five themes:

- Knowledge of HIV/AIDS
- Sexual behaviors
- Knowledge of and condom use
- Knowledge of and STI antecedents
- HIV testing.

Tables provide the level of each indicator in 2000 and 2006 for respondents of each sex. They also provide comparative elements between two phases (2000 and 2006). This comparison was done using the equality test of two averages (in the case of species, they are essentially proportions). It is a test of which the null hypothesis states that the level of the obtained indicator in the phase 2 (2006) is statistically equal to that found in the first phase (2000). Another hypothesis is that the two averages (proportions) are statistically different. This comparison test of two proportions is accompanied with

the Student statistics and a probability that permits to provide information on significance of the test represented by*** if the probability associated to Student statistics (t) is less than 0.01 ($p < .01$), by** if the probability is $p < .05$ and finally represented by* if the probability is $p < .10$. Wherever those probabilities are not mentioned, it means that those are non-significant tests having probabilities exceeding 0.10.

1.3.2 Multivariate analysis

This analysis aims at controlling the observed effects still at the raw level. In fact, each examined indicator in this report is accompanied by comparison between the two phases. The fact that samples of the two phases of the survey are not the same and respondents' socio-demographic profiles vary according to the surveys, it is very important to verify if the existence or not of a significant difference of an indicator between 2000 and 2006 observed at the raw level is confirmed or disappears after verification by respondents' socio-demographic characteristics. The variable of time represented by "PHASE" in this survey is the main independent variable which, in all target groups will provide information on a positive or negative effect or resistance to change as the obtained raw effect at the bivariate level change when control variables will be introduced. The variables are namely age, religion, educational level and province of residence for the survey in the youth. For the survey in sex workers, the variables are age, religion, educational level, and province of residence. Finally for the group of drivers, the variables are the age, nationality, educational level, marital status, and absence at home for at least one month on a continuous basis. In the group of the youth, multivariate models of analysis are segmented by sex as it is done at the bivariate level.

The method used in this analysis is the logistic regression. This method was chosen because of its dichotomous nature of each variable² that permits to calculate an indicator; dependent variables (retained indicators). Independent variables that intervene in the model are all qualitative.

We have two approaches to introduce independent variables identified in the regression model: introduce them at the same time, **enter** method or introduce them one after another (or a group after another group), this is called **step-by-step** method. The choice of this step-by-step method was due to the fact that it can analyze variation of the raw effect of a key independent variation (for this study, it is the PHASE variable) as successive independent variables.

² Each of those variables that can be represented by T takes the value of 1 if the respondent realizes the studied aspect and 0 if not. Example: comprehensive knowledge of HIV/AIDS? The answer is yes (1) or No (0).

RESULTS

PART A: YOUTH

II - SAMPLE DESCRIPTION

It would be recalled that in 2006, the survey focused on youth aged between 15 and 24 years while in 2000, the survey had targeted the age bracket between 15 and 19 years. For the purpose of homogeneity of age groups, only the youth aged 15-19, that is 4,409 individuals were taken into account in this analysis. Thus and as shown in Table 1 on sample characteristics, the proportion of the youth aged 15-19 in 2000 was twice as high as the proportion in 2006.

Table 1: Sample characteristics in each phase of the survey

Features	2000	2006	X ² (ddl), p
Sex			X ² (1)=74,53, p=0,000
Girls	59,7	51,7	
Boys	40,3	48,3	
Province			X ² (4)=2395,86, p=0,000
Kigali City	-	19,6	
South	35,5	19,0	
West	16,4	20,4	
North	17,1	20,0	
East	31,0	21,0	
Education level			X ² (3)=31,61, p=0,000
Has never been at school	14,2	12,9	
Primary	78,9	77,6	
Secondary and more	6,9	9,5	
N	8.255	4.409	

The sex structure of the total number of respondents varies according to the year of survey. In 2000, three out of five respondents (60%) were girls. In 2006, even though the number of girls is bigger than the number of boys, this predominance is less marked (52%). The probability associated with X²- statistics between the sex and phase variables has a significant threshold of 1%, illustrating the difference in sex structure.

The same trend has been observed with the variable of the province of residence. First of all, it would be recalled that the 2000 survey did not focus on the youth from Kigali City. For the four Provinces, the relative weight for the youth from Southern Province (36%) and Eastern Province (31%) is relatively higher in the 2000 survey, compared to the findings of the 2006 survey (respectively 19% and 21%). Conversely, although in the 2000 survey the proportions of the youth from Western and Northern Provinces were lower than those of 2006, variations are less marked (16% compared to 20% in Western Province and 17% compared to 20% in Northern Province respectively in 2000 and 2006). This difference is confirmed with a significance threshold of 1% by X²- statistics.

Although the proportion of those with primary education level is practically identical (79% in 2000 and 78% in 2006), it was noted that between the two phases of the survey, the proportion of those who have never been to school slightly decreased from 14% to 13% while the proportion of those who had reached secondary education level increased from 7% to 10%. This difference observed in the educational level from one phase to another is significant at the threshold of 1%.

III- BIVARIATE ANALYSIS

3.1 Knowledge of HIV/AIDS

The results of Table 2 on indicators of knowledge of HIV/AIDS among the youth indicate that in general the level of knowledge among young people improved between 2000 and 2006 among both girls and boys. Almost all indicators present comparative tests of proportions between 2000 and 2006 very significant at the threshold of 1%.

Table 2: Knowledge of HIV/AIDS

Indicators	Girls			Boys			Total		
	2000	2006	Level of significance	2000	2006	Level of significance	2000	2006	Level of significance
	%	%		%	%		%	%	
have already heard of HIV and/or AIDS	72.0	85.5	0.000***	75.0	84.2	0.000***	73.2	84.9	0.000***
Correct methods									
Show the correct use of a condom as a means of HIV prevention	48.4	54.2	0.000***	57.8	66.4	0.12	52.2	60.1	0.000***
Faithfulness to one uninfected partner as HIV prevention method	42.5	49.5	0.000***	45.9	53.7	0.000***	43.8	51.5	0.000***
Show abstinence as a means of HIV prevention	64.4	69.0	0.000***	60.5	68.4	0.000***	62.8	68.7	0.000***
Quote at least one of three prevention methods	70.0	83.0	0.000***	71.6	82.5	0.000***	70.6	82.8	0.000***
Recognize that a person who appears to be in good health can be HIV+ and transmit it to another person	45.7	61.0	0.000***	47.2	65.0	0.000***	46.3	63.0	0.000***
Recognize that an HIV positive pregnant woman can transmit the virus to her child.	64.0	71.6	0.000***	67.4	70.3	0.000***	65.3	71.0	0.000***
Recognize that an HIV positive woman can transmit the virus to her new born through breastfeeding	52.8	70.0	0.000***	56.2	66.6	0.000***	54.2	68.3	0.000***
Erraneous methods									
Quote that a mosquito can transmit HIV	21.1	26.1	0.000***	25.5	26.6	0.378	22.9	26.3	0.000***
Assume that HIV can be contracted by sharing meals with an HIV positive person	17.8	17.3	0.607	18.3	13.4	0.000***	18.0	15.4	0.000***
Show at least a wrong method	31.1	34.3	0.007***	34.9	31.8	0.021**	32.6	33.1	0.584
Have comprehensive knowledge³ on HIV/AIDS	9.1	12.9	0.000***	9.7	16.8	0.000***	9.4	14.8	0.000***
Total	4,929	2,281		3,326	2,128		8,255	4,409	

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

³ Are considered as having comprehensive knowledge of HIV all persons that mention simultaneously that the use of condom, sexual abstinence, and faithfulness to an uninfected sexual partner can prevent HIV and recognize that a person who appears to be in good life can transmit the AIDS virus and who can reject two erroneous methods (transmission of HIV through mosquito bites or by sharing meals with an infected person) of HIV transmission

The fact of having heard of HIV/AIDS, which was 72% in 2000 among girls, increased to 86% in 2006. Among boys, the situation was almost identical and increased from 75% to 84% from one year to another.

If each of the three main HIV/AIDS prevention methods is considered, which are correct use of condom, faithfulness to one uninfected partner and the use of condom and sexual abstinence, the proportion of the youth who know each of these methods shot up from 5 to 8 percent between 2000 and 2006. Progress observed at the level of knowledge of the prevention methods are more marked among boys than among girls. The proportion of young people who know at least one of these three methods increased in a spectacular way (70% in 2000 vs. 83% in 2006 among girls; 72% in 2000 vs. 83% in 2006 among boys).

The level of knowledge about other aspects of HIV/AIDS among the youth also improved between 2000 and 2006. The number of people who recognize that a person who appears to be in good health may be infected with HIV increased among the youth between 2000 and 2006, from 46% to 61% among girls and from 48% to 62% among boys.

Seven out of ten young people (72% among girls and 70% among boys) in 2006 knew that an HIV positive pregnant woman can transmit the virus to her baby. This proportion is statistically different from that observed in the 2000 survey where these proportions were 64% and 67% among girls and boys respectively.

Among girls, the fact of knowing that a mother can transmit the HIV to her child during the breast-feeding significantly shot up, increasing from 53% to 70% between 2000 and 2006. Among boys, this level also increased but at a lower rate (56% to 67%).

Despite of this considerable level of knowledge about the three major prevention methods and other aspects of HIV/AIDS among the youth, approximately one out of four young people mentions modes of transmission which have not been scientifically proven (erroneous methods). It was therefore observed that between girls and boys, the proportion of young people who affirm that a mosquito transmits HIV is 26% in 2006. Compared to 2000, this proportion seems to have increased among girls whereas among boys, it remained constant. Nearly 18% of the youth, both in 2000 and in 2006, estimate that by sharing meal with an HIV-infected person, one can be infected with the virus. Among boys, this proportion decreased significantly from 18% in 2000 to 13% in 2006. Approximately one out of three young persons quotes at least one of these erroneous methods. Among girls, this proportion increased during the same period whereas on the contrary the proportion among boys decreased. Therefore in general, efforts must be made to educate and sensitize the youth so as to make them understand that the HIV is not transmitted through mosquito bites and that by sharing a meal with an infected person, one does not run any risk of being infected with HIV/AIDS.

By combining all these prevention methods with other aspects of knowledge about HIV/AIDS, composite indicator is obtained that takes into consideration comprehensive knowledge about HIV/AIDS. From Table 2, it appears that in 2000, nearly one out of ten young people (girl or boy) had comprehensive knowledge about the pandemic. Six years later, this proportion increased more significantly among boys (where the proportion increased from 10% to 17%) than in girls (9% to 13%).

3.2 Sexual behavior

Table 3 shows that a little more than one out of ten girls aged between 15 and 19 is sexually active both in 2000 and in 2006 (12% and 13%). Among boys, this proportion is approximately 2 times more important (29% in 2000 compared to 24% in 2006). It was observed that sexuality among girls is more relatively delayed than among boys, as opposed to what is observed in several Sub-Saharan African countries.

Table 3 : Sexual behaviors

Indicators	Girls			Boys			Total		
	2000	2006	Level of significance	2000	2006	Level of significance	2000	2006	Level of significance
	%	%		%	%		%	%	
Have already had sex in their life	12.4	13.1	0.399	29.0	23.7	0.000***	19.1	18.2	0.228
Had sexual intercourse in the last 12 months	3.7	3.4	0.563	6.2	4.4	0.004***	4.7	3.9	0.034**
Had at least 2 sexual partners in the last 12 months	1.2	0.8	0.081*	2.5	1.9	0.149	1.7	1.3	0.074*
Had their first sex late at the age of 15 years	6.6	7.0	0.466	17.5	16.0	0.144	11.0	11.3	0.519
Size (a)	4 929	2 281		3 326	2 128		8255	4409	
Had sex in the last 12 months	29.9	26.2	0.246	21.2	18.4	0.207	24.6	21.3	0.076*
Had the first sexual intercourse with an older partner of at least 10 years of age	7.1	12.1	0.012**	0.5	1.4	0.078*	3.1	5.4	0.005***
Size (b)	609	298		965	504		1,574	802	
Had at least 2 sexual partners in the last 12 months	32.4	21.8	0.084*	40.5	44.1	0.614	36.7	33.9	0.491
Total (c)	182	78		205	93		387	171	

Note: (a) Entire number of all respondents
 (b) Entire number of all sexually active people
 (c) Entire number of sexually active people in the last 12 months

Sexual activity during twelve months prior to each of the two surveys remains low. If respondents in the two surveys are considered as a whole (including the sexually inactive ones), it appears that a very small number of respondents had sexual relations during the last 12 months and that their number was still very low (1 to 3%) for those who had several sexual partners over this period. However, when the denominator is restricted only to the sexually active people, the youth who had sexual relations slightly decreased. But the difference is not significant neither among girls where the proportions decreased from 30% neither to 26%, nor among boys where the proportion decreased from 21% to 18%. It was also observed that between the two periods, the proportion of young people who had trans-generational sexual relations (i.e. with an older partner at least 10 years older) increased slightly. But this phenomenon concerns mainly girls. Between the two periods, there is no difference observed at the level of who had their first sexual relations at latest at 15 years of age did not change from one year to another. Both during 2000 and 2006, it was noted that at this age, the proportion of sexually active boys is twice as high as that of girls.

3.3 Knowledge and use of condom

The proportion of young boys who reported having heard of a condom remained constant between 2000 and 2006 (Table 4). On the contrary, this proportion among girls increased significantly. In 2006, three out of five girls (61%) reported having already heard of condom whereas six years before, this ratio was one out of two girls (49%).

Table 4: Knowledge of and condom use

Indicators	Girls			Boys			combination		
	2000	2006	Level of significance	2000	2006	Level of significance	2000	2006	Level of significance
	%	%		%	%		%	%	
Have already heard of male condom	49.0	61.1	0.000***	68.4	69.0	0.633	56.8	64.9	0.000***
Know a place where to get a condom	18.9	31.3	0.000***	41.4	54.8	0.000***	28.0	42.6	0.000***
Total number (a)	4929	2281		3326	2128		8,255	4,409	
Have used the condom at least once in life	10.0	23.2	0.000***	10.4	22.4	0.000**	10.5	22.7	0.000***
Total number (b)	609	298		965	504		1574	802	
Have systematically used condoms in the last twelve months	0.6	1.3	0.536	1.0	1.1	0.936	0.8	1.2	0.649
Total number (c)	182	78		205	93		387	171	
Have used a condom in the last sexual intercourse with a paying partner	31.9	(14.3)	0.341	(28.6)	(30.0)	0.932	30.7	(23.5)	0.560
Report having used the condom “each time” with paying partners in the last 12 months	10.6	(14.3)	0.775	(17.8)	(20.0)	0.881	13.3	(17.7)	0.645
Total number (d)	47	7		28	10		75	17	
Have used a condom in the last sexual intercourse with a non paying partner	11.4	24.3	0.010**	19.5	40.7	0.000***	15.8	33.1	0.000***
Report having used the condom always with non paying partners in the last 12 months	3.0	14.9	0.001***	13.9	20.9	0.136	8.8	18.1	0.002***
Total number (e)	167	74		195	86		362	160	

(a) All the respondents

(b) Total number of those who are sexually active

(c) Total number of sexually active people in the last 12 months

(d) Total number of respondents having at least one paying partner in the last 12 months

(e) Total number of respondents having at least 1 non commercial partner in the last 12 months

The results of the same Table 4 indicate that the proportion of young people who know a place where one can get a condom considerably increased particularly among girls, from 19% in 2000 to 31% in 2006. Among boys, this proportion also increased but in a less significant way, 55% in 2006 compared to 41% in 2000. It is probable that this result shows the decrease in selling outlets for condoms in the country.

The systematic use of condom during the last 12 months remains extremely low. It concerned only one out of hundred people for each sex and in each phase of the survey.

The level of the use of a condom during the last sexual relations with a non-commercial partner increased considerably between 2000 and 2006 by doubling among girls (11 to 24%) and among boys (20% to 41%). The proportion of those who systematically used condom with this type of partner during this period also increased significantly among girls from 3% in 2000 to 15% in 2006.

Among boys, this increase is less visible and not significant (14% to 21%). Very few young people report having had sexual relations with commercial partners during the last 12 months. Consequently, statistics obtained do not truly enable the assessment of behavioral changes as far as the level of the use of a condom with this type of partner between the two phases of survey.

3.4. Knowledge of STI antecedents

As shown in Table 5, the proportion of young people who reported having already heard of STI remained almost constant with an error threshold of 5% during the period 2000-2006 (78% compared to 76% among girls and 83% compared to 81% among boys). The slight decrease observed is only significant at the threshold of 10%. But true knowledge cannot be measured by the mere fact of having heard people talk about it. It is still necessary to know the symptoms of STI and/or to know how to avoid it.

Table 5: Knowledge and STI antecedents

Indicators	Girls			Boys			combination		
	2000	2006	Level of significance	2000	2006	Level of significance	2000	2006	Level of significance
	%	%		%	%		%	%	
Have already heard of STI	77.9	76.0	0.066*	82.7	80.7	0.062*	79.8	78.3	0.035**
Knows at least 1 sign of STI in men	12.5	34.3	0.000***	23.3	46.7	0.000***	16.8	40.3	0.000***
Knows at least 1 sign of STI in women	14.3	36.6	0.000***	16.6	36.6	0.000***	15.2	36.6	0.000***
Total number (a)	4 929	2 281		3 326	2 128		8,255	4,409	
Had at least 1 sign of STI in the last 12 months	12.2	7.4	0.000***	9.2	3.2	0.000***	10.4	4.7	0.000***
Total number (b)	609	298		965	504		1,574	802	

a) All the respondents

b) All those who are sexually active

Between 2000 and 2006, knowledge of symptoms of STI's in a man and in a woman increased considerably. Therefore, in 2000, 13% of girls and 23% of boys were able to mention at least one symptom of STI in a man. In 2006, these proportions increased to 34% and 47% respectively. In both cases, it was a highly significant increase. As for those who know at least a symptom of STI in a woman, they were 14% of the girls and 17% of the boys in 2000. A few years later, they represent 37% of boys and girls.

Between the two survey phases, a net decrease in STI cases reported was observed. Therefore between 2000 and 2006, the proportion of respondents who report having had symptoms of STI during the last 12 months decreased significantly, especially among boys where it was divided almost by 3 in a period of six years. Thus, the proportion decreased from 12% to 7% among girls and from 9% to 3% among boys. Girls seem to be more exposed to STI than men.

3.5. Proximity with respect to the infection and HIV test

Though in 2000, less than half of girls and boys knew someone infected with AIDS virus, they were two thirds in 2006 (see Table 6). The fact that more and more infected people accept to

acknowledge publicly their HIV status undoubtedly contributed to the improvement of this proximity with respect to the disease.

Table 6: Proximity with respect to the infection and HIV test

Indicators	Girls			Boys			combination		
	2000	2006	Level of significance	2000	2006	Level of significance	2000	2006	Level of significance
	%	%		%	%		%	%	
Know someone infected with HIV or died of AIDS	44.6	66.8	0.000***	43.6	65.3	0.000***	44.2	66.1	0.000***
Have already undergone an HIV test	1.0	13.6	0.000***	1.3	12.6	0.000***	1.0	13.1	0.000***
Have undergone HIV voluntary testing	0.6	12.4	0.000***	1.1	11.8	0.000***	0.6	12.4	0.000***
Have undergone HIV testing and came back to take a result	0.8	12.6	0.000***	0.9	11.3	0.000***	0.8	12.0	0.000***
Total number (the whole respondents)	4929	2281		3326	2128		8,255	4,409	

In absolute terms, the proportion of young people who reported having taken an HIV test in previous years remains relatively low. However, it has been noticed that this behavior has reached considerable progress. Thus, the proportion of young people who state to have already had a voluntary HIV test, which was less than 1 % in 2000, multiplied by 20 among girls. Among boys, it multiplied by 10. Almost all young people who were screened for HIV are informed of the results of their test.

IV. MULTIVARIATE ANALYSIS

For this section focused on the analysis of group of youth, model 1 only takes into account the time hvariable (variable PHASE). The 2000 method is the group of reference based on the 2006 chance ratios (odd ratio) will be compared. In model 2, age and religion variables are introduced. Age is a quantitative variable. As for the religion, Catholics represent the group of reference. When the educational level variable is introduced, Model 3 is obtained. Here, the reference modality is the group of respondents with secondary education level and higher education level. Model 4 (or general model) is that where one introduces the last variable, i.e. the Province of residence in order to control the specialization of the phenomenon studied among the youth. The last line of Table provides some statistics for the specification of the logistic regression model.

4.1. Knowledge about HIV/AIDS

Indicator: Comprehensive knowledge of HIV/AIDS

In this first topic of analysis on the knowledge about HIV/AIDS, we selected the indicator which takes into account the level of knowledge about prevention methods. A composite indicator was formed to measure this knowledge. It is about comprehensive knowledge of HIV. Young people who concurrently mention that the use of condom, sexual abstinence and faithfulness to one uninfected partner can prevent HIV are regarded as having comprehensive knowledge of AIDS. At the same time, these people must recognize that a person who appears to be in good health can transmit the virus and must in addition reject the two erroneous methods of HIV transmission which are mosquito bites and sharing meal with an infected person.

The results in Tables 7 and 8 provide net effects of this indicator between 2000 and 2006, by controlling age, religion, educational level and the Province of residence.

Model 1: Time Variable (Phase) only in the logistic regression equation

The comparative analysis of the proportion of young girls aged between 15 and 19 years with comprehensive knowledge of HIV between the basic survey carried out in 2000 and that of 2006 shows that the level of knowledge among the youth improved clearly 6 years later. Indeed, in 2006 girls had 48% better chances of having more comprehensive knowledge on AIDS pandemic than the youth of the same age had 6 years ago. This difference is significant at the threshold of 1%.

Model 2: Introduction of variables Age and Religion

When the control of this difference is by age and religion of young girls, it appears that their advantage observed in 2006 compared to 2000 on their level of comprehensive knowledge of HIV/AIDS remains almost constant. However, the level of knowledge increases with age, because the chance ratio is higher than 1 and significant at the threshold of 1%. It can be thought that as the age of girls increases from the age between 15 and 19 years, they become more and more sexually active, and in fact, are exposed to information on sexuality and its risks, *inter alia* STI and HIV/AIDS. Therefore, prevention methods and other aspects of the infection have more chances to be raised during discussions among themselves or with their sexual partners. In addition, it may be thought that those who are in secondary schools, due to their age, have more chances to be exposed to information on sexuality in general and on HIV/AIDS in particular.

Table 7: Net effects of independent variables on comprehensive knowledge of HIV/AIDS among girls

Explanatory variables	Model 1	Model 2	Model3	Model 4
Year of the survey(Phase)				
2000	®	®	®	®
2006	1.478***	1.474***	1.462***	1.446***
Age (quantitative)		1.122***	1.099***	1.099***
Religion				
Catholic		®	®	®
Protestant		0.709**	0.747	0.822**
Moslim		0.976	0.723	0.699
Other		0.678	0.754	0.777
Education level				
No level of education			0.116***	0.119***
Primary			0.302***	0.313***
Secondary and more			®	®
Province of residence				
South				®
West				0.426***
North				1.134
East				0.698***
Khi2 of probability	23,53***	59,81**	224.56***	283.87***
Reference model is represented by ®				

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

Concerning religion, results show that young Protestant women have nearly 29% less chances of acquiring comprehensive knowledge about HIV than their Catholic peers. On the contrary, the level of comprehensive knowledge of HIV among young Moslem women and people of other religions (or those who have no religion) is not statistically different from that of young Catholics that are considered as reference groups. It should be noted that the introduction of these two variables multiplied the share of variance in the dependent variable explained by Model 2.

Model 3: Introduction of the variable educational level

It is the major variable which explains for more than 70% the probability of the model, because the variance explained increases from 59.8 to 224.6. This variable slightly reduced the advantage of the level of comprehensive knowledge about since they have 46% more chances, rather than 47% in the preceding model. The introduction of this variable leads to the significant decrease of the influence of the age of young girls.

In this regard, religion does not discriminate girls as to level of knowledge since the difference observed between Protestant and catholic girls disappeared. That means that Protestant women are underprivileged as regards to educational level. As soon as the effect of the educational level is controlled, their disadvantage compared to Catholic young people does not exist any more.

This actually showed that the level of knowledge about HIV/AIDS among the youth is not related to their religion but rather to their level of education. With the threshold of 1%, it appears that illiterate girls have 88% less chances of acquiring comprehensive knowledge of HIV/AIDS than those who attended secondary level or higher. It is the same for girls who attended primary education. Their level of knowledge rises varies depending on whether the girls are well educated or have not gone to school. They have 70% less chances to have comprehensive knowledge of HIV than those who are more learned.

Model 4 (overall model): Introduction of the Province variable

The ultimate objective of introducing this variable is to control the effect of the specialization of sensitization campaigns against the pandemic. It should be noted that the variance in the level of knowledge of HIV/AIDS among girls between 2006 and 2000 still decreased, falling from 46% to 45%. This shows that the level of comprehensive knowledge of HIV/AIDS varies very significantly according to the Province of residence. Young girls from Eastern Province and Western Province have 30% and 57% respectively less chances of acquiring adequate knowledge than those from the Southern Province.

The effect of religion is the same as that observed in the gross model that is poor knowledge among young Protestants (18% less chances) but relatively less than that observed in Model 2 (30% less chances).

The trend observed in Model 3 for the educational level is almost the same: illiterate girls and those with primary education level have respectively 88% and 69% less chance to have comprehensive knowledge of HIV/AIDS than the most educated ones. The fact that the disadvantage of the less educated girls increased slightly compared to the preceding model indicates that chances of schooling are not the same in all the Provinces. Girls from Western and Eastern Provinces seem to be underprivileged compared to those from Southern Province.

It is concluded from this that the improvement of the level of comprehensive knowledge about HIV/AIDS among girls between 2000 and 2006 depends on the, religion, the educational level and the Province of residence. The level of education is the major variable that mainly explains this positive variance.

Model 1 of Table 8 that highlights the impact of the time variable (phase) about comprehensive knowledge of HIV/AIDS among boys shows that in 2006 the level of comprehensive knowledge about the AIDS pandemic was approximately 1.9 times higher than that of the young boys interviewed in 2000. This variation in the level of knowledge between the two surveys is significant at the threshold of 1% and is definitely more marked than that observed among girls.

The test of this model by age and religion (model 2) decreases the advantage of the level of comprehensive knowledge about HIV observed in 2006 among young boys compared to 2000. These young boys have 1.85 times more chances of accessing comprehensive knowledge of HIV/AIDS. This slight decrease is primarily explained by the age of the youth, who through their propensity to be sexually active, explains why the age is a factor which contributes to this improvement in the level of knowledge. Indeed, it should be noted that the level of comprehensive knowledge about AIDS among boys increases with age since the chance ratio is higher than 1, but drops after the introduction of such variables as educational level and the Province of residence.

As for religion, results show that the level of knowledge among young boys varied significantly. Young Protestants and those classified in the modality “others” (primarily those with no religion) have fewer chances of acquiring comprehensive knowledge than the Catholics.

As in the analysis model for girls, the educational level was an important variable which contributed to the improvement of the level of comprehensive knowledge about HIV/AIDS among young boys between 2000 and 2006. The positive relation between the educational level and the level of knowledge was also observed here (see Model 3). Illiterate boys have 90% fewer chances of accessing to comprehensive knowledge compared to those who have reached the level of secondary education. This disadvantage is reduced when young people attend primary education because they only have less than 64% chances of acquiring comprehensive knowledge about HIV/AIDS than the more educated ones. The introduction of this variable contributes to very significant decrease in the influence of the age of young boys, because the chance ratio is not more than 19% as in the preceding model, but 17.6%.

Table8: Net effects of independent variables on comprehensive knowledge about HIV/AIDS among boys

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Level of education (Phase)				
2000	®	®	®	®
2006	1.887***	1.849***	1.751***	1.806***
Age (quantitative)		1.190***	1.176***	1.173***
Religion				
Catholic		®	®	®
Protestant		0.751***	0.802**	0.829**
Moslim		1.390	1.206	1.167
Other		0.378***	0.465**	0.458**
Level of education				
No level			0.104***	0.107***
Primary			0.357***	0.358***
Secondary and more			®	®
Province of residence				
South				®
West				1.065
North				0.923
East				0.643***
Khi2 of probability	59.22***	116.52***	256.55***	271.47***
Reference modality is represented by ®				

Note : *** p<.01 ; **p<.05 ; *p<.10

In the last model (Model 4) obtained after the introduction of the variable of the Province of residence which accounts for the spatial variation in the level of knowledge about HIV/AIDS, it should be noted that the effect of the variable "Phase" increases up to 1.81, translating the negative effect of certain Provinces. The variation induced by the age and the educational level in the preceding model has the same trend. The level of comprehensive knowledge about HIV/AIDS among boys from Eastern Province differs at the threshold of 5% with that of young people from Southern Province, which is the reference modality. On the other hand, the youth from Northern Province and Western Province are not statistically different from those from Southern Province as regards to knowledge about HIV/AIDS.

Taken as a whole, results confirm that communication campaigns implemented between 2000 and 2006 by all partners in the fight against AIDS in Rwanda contributed significantly to the improvement of the level of comprehensive knowledge about the AIDS pandemic among the youth.

4.2. Sexual behavior

Three indicators were selected in this paragraph to evaluate changes observed among the youth in the area of sexual behavior. It is about having had at least two sexual partners during the last twelve months and sexual precocity (specifically because of the fact of having had his or her first sexual relations at the age of 15 years). The results of Tables 9 to 12 present these three indicators.

Indicator 1: Had at least two sexual partners during the last twelve months

From Table 9, it was noted that between 2000 and 2006, the proportion of girls who had multiple sexual partners decreased markedly. Indeed, in 2006 girls have 53% fewer chances of having more than one sexual partner than in 2006 (Model 1). It was a positive change observed in the behavior of girls and which was undoubtedly the result of combined campaigns by various actors in the fight against the AIDS and which would have enabled the youth to become aware of the dangers of having multiple sexual partners.

Table 9: Net effects of independent variables on the fact of having had at least two sexual partners in the last 12 months among girls

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.473**	0.419***	0.415***	0.460**
Age (quantitative)		1.369***	1.370***	1.373***
Religion				
Catholic		®	®	®
Protestant		0.821	0.851	0.790
Moslim		4.662**	4.635**	4.610**
Other		2.378	2.574	2.371
Level of education				
No level			0.564	0.501
Primary			0.895	0.805
Secondary and more			®	®
Province of residence				
South				®

West				1.430
North				1.100
East				2.447***
Khi2 of probability				
The reference model is represented by ®	6.86***	26.37***	27.99***	38.84***

Note: *** p<.01 ; **p<.05 ; *p<.10

This decline was confirmed even after having tested the age fact of young girls, their religion, educational level and the Province of residence; even if their advantage was 54% fewer chances of having multiple sexual partners. By examining net effects of each and every variable introduced in the model, it was noted that the age variable rather increased the risk of having more than one sexual partner. This fact can be explained by the fact that older girls, through their experience in active sexuality, would be more experienced to manage more than one sexual partner than younger girls who are still at the beginning of their sexual life. Moslem girls seem more exposed to having more sexual partners than Catholic girls. Indeed as shown in Table 9, Moslem girls have approximately 4.6 times more probability than their catholic peers to have had more than one sexual partner during the last twelve months. Would this result from the fact that social control and prohibitions may be less strict among Moslem women than among Christian girls? The survey does not provide an answer to this question.

It would be revealed that the educational level does not discriminate young girls as regards having multiple partners because no group presents any situation statistically different from that of young people having reached secondary school or higher.

As regards localization of this behavior in young girls, it was noted that respondents from Eastern Province are exposed to the practice of having multiple partners compared to girls from Southern Province. Indeed, they have almost 2.5 times higher probability of having such a sexual behavior.

Concerning sexual behavior in young boys, the results of Table 10 which shows related data show the similar trends as those among girls. But the change in behavior, in terms of decrease of the proportion of young people with more than one sexual partner, seems to have been less marked here since young boys have 33% less chances than those of 2000, whereas this chance ratio was 53% among girls.

Here the chance ratio in phase 2 changed markedly after the introduction of control variables, because all things being equal, in 2006 young boys had 41% fewer chances of having at least 2 sexual partners than in 2000.

Table10: Net effects of independent variables on the fact of having had at least two sexual partners in the last 12 months among boys

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.672**	0.635**	0.629**	0.590**
Age (quantitative)		1.310***	1.307***	1.317***
Religion				
Catholic		®	®	®
Protestant		0.614**	0.619**	0.628**
Moslim		2.581**	2.538**	3.262***
Other		1.315	1.339	1.283
Level of education				
No level			0.812	0.724

Primary			0.841	0.734
Secondary and more			®	®
Province of residence				
South				®
West				1.699*
North				3.191***
East				1.285
Khi2 of probability	4.06**	30.92***	31.27***	54.91***
The reference model is represented by ®	-			

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

In Model 4 (or overall model), Moslem boys have approximately 3.3 times more chances of having at least two sexual partners than their catholic peers. Conversely, young Protestants have 37% fewer chances of having such a sexual behavior than Catholics during the last twelve months. As observed in girls, the fact of having more than one sexual partner does not vary with educational level.

Indicator 2: Had his or her first sexual relations at the age of 15 years

Concerning the age of entry into sexual life, it appears that the proportion of girls who became sexually active at the age of 15 years does not seem to have significantly changed at the threshold of 5% between 2000 and 2006 and this, at the bivariate level only after the control by independent variables (Table 11).

Table 11: Net effects of independent variables on the fact of having had her first sex at the age of 15 years among girls

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®j
2006	0.741*	0.874	0.876	0.943
Age (quantitative)		0.376***	0.380***	0.371***
Religion				
Catholic		®	®	®
Protestant		1.211	1.223	1.291
Moslim		1.533	1.745	1.771
Other		0.459	0.448	0.416
Level of education				
No level			1.308	1.291
Primary			1.504	1.541
Secondary and more			®	®
Province of residence				
South				®
West				0.552**
North				1.112
East				1.518
Khi2 of probability	3.53*	203.5***	205.37***	218.84***
Reference model is represented by ®				

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

The variable which determines the entry into sexual life is age during the survey whose relations with the indicator is negative. That means that chances to have an age of the first sexual relations equal to or lower than 15 years of age among girls decrease as the age increases. That is well understood because many young people have already had their first sexual experience before the age of 17 years. As for the Province, girls who reside in Western Province seem to enter into sexual

life at a later age compared to those from Southern Province because they have 45% fewer chances of having their first sexual relations at the age of 15 years at the latest.

The results of the analysis of this indicator among boys (Table 12) show the same trends. With the threshold of 5%, the difference between the proportion of young boys who entered into sexual life at the age of 15 years latest in 2000 and 2006 is not significant, even after the control of other variables.

The age effect is negative on the entry into active sexual life. Young boys belonging to the modality "other religion" enter a little later than young Catholics and finally the Northern Province seems to be the area where sexuality in young boys does not occur earlier compared to the situation in the Southern Province.

Table 12: Net effects of independent variables on the fact of having had his first sex at the age of 15 years among boys

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.754*	0.861	0.894	0.949
Age (quantitative)		0.478***	0.477***	0.479***
Religion				
Catholic		®	®	®
Protestant		1.153	1.127	1.172
Moslim		0.815	0.831	0.868
Other		0.474	0.460*	0.420**
Level of education				
No level			1.560	1.517
Primary			1.222	1.152
Secondary and more			®	®
Province of residence				
South				®
West				0.907
North				1.724**
East				1.081
Khi2 of probability	3.69*	141.83***	143.71***	151.04***
Reference model is represented by ®				

Note: *** p<.01; **p<.05; *p<.10

4.3. Use of Condom

Table 13 shows changes in major modes of behavior among girls between 2000 and 2006 as regards to the use of condoms. Indeed, in 6 years, the proportion of girls who used a condom during sexual relations in the last 12 months was approximately 3.9 times higher than it was in 2000. This chance ratio among the youth in the 2006 survey is reduced as other intersecting variables are increased up to 3.6 times more (Model 3) at the threshold of 10%.

Table 13: Net effects of independent variables on the fact of having used the condom in her last sexual intercourse among girls

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	3.882**	3.504*	3.564*	2.147
Age (quantitative)		1.296	1.371	1.274
Religion				
Catholic		®	®	®
Protestant		1.529	1.209	1.467
Moslim		0.454	0.343	1.721
Other		1.471	1.239	0.630
Level of education				
No level			1.042	0.748
Primary			0.390	0.390
Secondary and more			®	®
Province of residence				
South				®
West				0.801
North				0.627
East				0.187*
Khi ² of probability	4.70**	7.16	9.21	14.89
Reference model is represented by ®				

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

Age, religion and educational level did not result to different behaviors among young women with respect to the use of condom during the last sexual relations.

Table 14: Net effects of independent variables on the fact of having used condom during the last sexual relation among boys

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	1.907	1.940	1.719	0.673
Age (quantitative)		1.683**	1.882**	1.769**
Religion				
Catholic		®	®	®
Protestant		0.684	0.867	0.889
Moslim		0.693	0.494	0.331
Other		-	-	-
Level of education				
No level			-	0.190***
Primary			19.1***	0.184***
Secondary and more			®	®
Province of residence				
South				®
West				2.833
North				0.347
East				0.389
Khi ² of probability	1.29	6.61	17.73***	21.96***

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

Among boys, the time variable does not present any significant difference between 2000 and 2006, even after the introduction of control variables. As the age increases, chances to use a condom during the last sexual relations among boys increase significantly. It should also be noted that the least educated boys (illiterate or primary education level) had less chances of using a condom during the last sexual relations than the more educated boys.

4.4. Knowledge of and STI antecedents

As regards STI, two indicators were analyzed: the level of knowledge of at least an STI symptom in the man and woman as well as the fact of having had a symptom of an STI during the last twelve months.

Indicator 1: Knowledge of at least an STI symptom in men and women

The effects of information campaigns on this indicator between 2000 and 2006 are perceptible through the results of Tables 15 and 16. Indeed, at the significance threshold of 1%, in 2001 girls have 4.1 times more chances to know at least an STI symptom both in men and women (see Table 15). After having controlled this effect with the variables of age, religion, educational level and the Province of residence, it was noted that the age always has a positive influence on this knowledge. Religion does not discriminate the level of knowledge about STI symptoms in men and women among girls. However, the educational level influences in the other way round. It was less educated girls (illiterate and with primary education level) who seem to be the least informed about STI symptoms.

The effect of the educational level and the Province increases the chance ratio of the time variable up to approximately 4.3.

Table 15: Net effects of independent variables on the fact of knowing at least a sign of STI in a man and in a woman (girls)

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	4.091***	3.983***	4.075***	4.287***
Age (quantitative)		1.126***	1.106***	1.111***
Religion				
Catholic		®	®	®
Protestant		0.992	1.026	1.077
Moslim		1.443	1.130	1.236
Other		0.695	0.723	0.719
Level of education				
No level			0.198***	0.164***
Primary			0.311***	0.271***
Secondary and more			®	®
Province of residence				
South				®
West				1.055
North				2.186***
East				1.726***
Khi2 of probability	466.56***	494.27***	641.70***	731.93***

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

Girls from Eastern Province and Northern Province have higher knowledge of STI than those from Southern Province. They respectively have 2.2 times and 1.7 times more chances to know at least a STI symptom in men or women than girls from Southern Province. The situation of the youth from Western Province is not statistically different from that of girls from Southern Province.

Among boys (Table 16), almost the same trends are observed. In 2006 and compared to the year 2000, boys seem to have 3.16 times more chances to identify at least one STI symptom in women and men. This ratio drops very slightly up to 3.12 times more chances than in Model 4.

Table 16: Net effects of independent variables on the fact of knowing at least a symptom of STI in women (girls)

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	3.167***	3.144***	3.069***	3.120***
Age (quantitative)		1.135***	1.116***	1.115***
Religion				
Catholic		®	®	®
Protestant		0.773***	0.799***	0.833**
Moslim		1.346	1.183	1.251
Other		0.604**	0.644**	0.625**
Level of education				
No level			0.270***	0.258***
Primary			0.328***	0.310***
Secondary and more			®	®
Province of residence				
South				®
West				0.793**
North				1.524***
East				1.188*
Khi2 of probability	294.16***	340.93***	457.82***	494.52***

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

Knowledge about STI symptoms in men and women increases with age. Whereas no difference is observed between the level of knowledge among Moslems and Catholics, the situation is different for young Protestants and those with no religion, who have 17% and 38% respectively less chance to know at least one STI symptom in men and women than the Catholics.

Educational level is undoubtedly a factor that determines the level of knowledge of STI symptoms because the illiterate and those with only the primary education level have 74% and 69% respectively less chances to know at least one STI symptom in men and women than young people with secondary level or higher. This result can be explained by the fact that the more educated youth are also older. Their experience in sexuality and eventually the sexual life education courses they take at school significantly improve their level of knowledge.

As for the Province of residence, it was noted that the level of knowledge of STI symptoms in men and women varies very significantly on the national territory. Two groups of provinces can be distinguished by comparing them with Southern Province regarded as a reference. Western Province has a low level of knowledge (21% less chances) while Northern Provinces and Western Province have a high level of knowledge (respectively 52% and 19% more chance) than Southern Province.

Indicator 2: Having had at least one STI symptom during the last 12 months

As shown in Table 17, between 2000 and 2006, the declared prevalence of STI symptoms observed in girls was reduced because girls have 66% less chances to have suffered from STI than in 2000. This ratio decreased to 64% in the last model (Model 4). This drop can be associated with sexual behavioral change in youth who are more and more responsible (more frequent use of the condom for example).

Table 17: Net effects of independent variables on the fact of having had a sign of STI symptoms in women (girls) during the last 12 months

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.336***	0.343***	0.344***	0.363***
Age (quantitative)		0.993	0.996	0.997***
Religion				
Catholic		®	®	®
Protestant		0.889	0.893	0.876
Moslim		-	-	-
Other		0.990	0.999	0.965
Level of education				
No level			1.178	1.153
Primary			1.259	1.235
Secondary and more			®	®
Province of residence				
South				®
West				0.849**
North				0.827
East				1.489
Khi ² of probability	28.50***	28.33***	28.81***	37.81**

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

At the threshold of 1%, it was noted that the age acts inversely proportionally to the prevalence of STI symptoms in girls. In other words, the older girls had less previous records of STI than others during the last 12 months.

Neither religion nor educational level discriminate the declared prevalence of STI in girls between 2000 and 2006. On the other hand, girls from Western Province markedly showed less symptoms of STI than those from Southern Province.

Among boys, the decrease in the declared prevalence of STI seems to have been more marked between 2000 and 2006 since the 2006 survey shows that young boys have 86% less chances to report at least one STI symptom (Table 18) compared to 66% observed among them in the previous Table.

The probability of presenting STI symptoms increases with age. This result corroborates one of the results which have previously been presented where it was noted that older among them tend to have had more than one sexual partner during the last 12 months. If these sexual relations are not protected, it may be concluded that boys run greater risk of being infected with STI's. Thus, their advanced age constitutes a factor of risk. As it was the case in girls, religion and educational level

of young people are not determinants of the decrease in the level of STI prevalence in the course of time.

Table18: Net effects of independent variables on the fact of having had at least a STI symptom in men (boys)

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.176***	0.171***	0.172***	0.178***
Age (quantitative)				
		1.117**	1.120**	1.112**
Religion				
Catholic		®	®	®
Protestant		0.927	0.935	0.873
Moslim		1.659	1.662	1.493
Other		0.649	0.684	0.680
Level of education				
No level			0.957	0.883
Primary			1.160	1.093
Secondary and more			®	®
Province of residence				
South				®
West				1.414*
North				0.996
East				1.581***
Khi2 of probability	102.87***	111.04***	112.15***	122.21***
Reference model is represented by ®				

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

On the other hand, young boys from Northern Province had the same behaviour as those from Southern Province. Contrary to this, there are far more people from the two other Provinces (Eastern and Western) having suffered from STI symptoms (58% and 41% more chances respectively).

In spite of the control carried out, the decrease in the declared prevalence of STI symptoms observed in girls and boys between 2000 and 2006 is real and can be attributed to field campaigns meant to sensitize the youth on risks run if sexual relations are not protected.

4.5. Proximity with respect to the disease and HIV test

The analysis of the problem related to the proximity of the youth interviewed with respect to the pandemic of the century (HIV/AIDS) and behaviour expected of them for better health are based on the following two indicators:

- Knowledge of a person who is infected with HIV or has died of AIDS;
- The fact of having taken an HIV test and informed about the results of the test.

Indicator 1: Knowing someone who is infected with HIV or has died of AIDS

Between 2000 and 2006, the proportion of girls who knew at least a person who was infected with HIV or had died of AIDS increased. This depicts the reality on the ground, which proves that AIDS is today more visible in the community than it was before. This ratio remained almost constant between the gross level and the net level obtained after control, i.e. 2.5 times more chances in 2006 than in 2000.

The age and the educational level influence positively the knowledge about an infected person. In other words, a relative big number of older youth or those who are more educated know a person infected with HIV or who died of AIDS. Moslem girls have 1.9 times more chances to know somebody who is infected with HIV or has died of AIDS than Catholic girls (Table 19).

Table19: Net effects of independent variables on the fact of knowing someone who is infected by HIV or died of AIDS among girls

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	2.503***	2.477***	2.520***	2.531***
Age (quantitative)		1.091***	1.079***	1.084***
Religion				
Catholic		®	®	®
Protestant		0.848***	0.902**	1.000
Moslim		2.086***	1.851**	1.931**
Other		0.678*	0.760	0.778
Level of education				
No level			0.116***	0.111***
Primary			0.235***	0.233***
Secondary and more			®	®
Province of residence				
South				®
West				0.572***
North				1.538***
East				0.807***
Khi2 of probability	313.72***	362.56***	671.96***	819.23***
Reference model is represented by ®				

Note: *** p<.01; **p<.05; *p<.10

Contrary to the youth from Northern Province who have 54% more chances than those from Southern Province to know at least a person who is infected with HIV or has died of AIDS, girls from Western Province and Eastern Province have less chances: respectively 43% and 19% (Table 19).

Among the population of boys, the trend is almost similar to that observed among girls.

Table 20: Net effects of independent variables on the fact of knowing someone infected by HIV or died of AIDS among boys

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	2.434***	2.392***	2.337***	2.387***
Age (quantitative)		1.146***	1.143***	1.140***
Religion				
Catholic		®	®	®
Protestant		0.911	0.979	1.038
Moslim		1.621**	1.520*	1.559*
Other		0.764*	0.968	0.939
Level of education				
No level			0.138***	0.136***
Primary			0.287***	0.278***
Secondary and more			®	®
Province of residence				
South				®
West				0.673***
North				1.341***
East				1.115
Khi2 of probability	247.94***	304.74***	521.26***	578.41***
Reference model is represented by ®				

Note: *** p<.01; **p<.05; *p<.10

Between 2000 and 2006, the proportion of boys knowing a person infected with HIV or who has died of AIDS increased significantly (see Table 20). In 2006, they had 2.4 times more chances to know a person infected with HIV or who has died of AIDS than in 2000. After control, this chance ratio varied only slightly and stabilized to be 2.38.

Older ages correspond to better levels of knowledge about people infected with HIV. Moslem boys are more informed (56% more chances) than those from catholic religion whereas Protestants and the youth from other religions do not have a level that is different from that of Catholics.

The effect of schooling is such that the least educated people are also the least informed. The illiterate have 86% less chances and those with primary education level have 72% fewer chances to know a person infected with HIV or who has died of AIDS. It was finally noted that the level of knowledge about people infected with HIV or who have died of AIDS among the youth varied with the Province of residence. Compared to Southern Province regarded as a reference, boys from Western Province have 32% fewer chances to acquire this information whereas contrary to this, their peers from Northern Province and Eastern Province have 34% and 11% more chances respectively to know an infected person.

Ultimately, it thus appears that the improvement in the level of knowledge about AIDS patients or those who have died of it among young people is real, whatever the characteristics of the youth considered.

Indicator 2: He/she has undergone an HIV test and having gone to receive a test result

Table 21: Net effects of independent variables on the fact of having done an HIV test and having received results (among girls)

Explanatory variables	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	18.526***	17.226***	17.211***	16.893***
Age (quantitative)		1.286***	1.267***	1.262***
Religion				
Catholic		®	®	®
Protestant		1.272**	1.284**	1.300**
Moslim		1.950*	1.543	1.525
Other		1.322	1.344	1.355
Level of education				
No level			0.349***	0.357***
Primary			0.437***	0.447***
Secondary and more			®	®
Province of residence				
South				®
West				0.903
North				0.977
East				0.798
Khi2 of probability	478.16***	515.87***	541.77***	552.88***
Reference model is represented by ®				

Note: *** $p < .01$; ** $p < .05$; * $p < .10$

One of the areas involving the fight against HIV in Rwanda where a very significant difference between the basic survey and that of 2006 is observed is to resort to HIV testing. The proportion of young girls who took a screening test and who went for results of the test in 2006 was 18.5 times higher than in 2000. In 6 years, the behavior in the youth improved significantly.

As shown in Table 21, this urge by girls to undergo an HIV screening test in 2006 decreased slightly from 18.5 times more to 16.9 times after control by the four independent variables (age, religion, educational level and province of residence).

The results show that this urge by girls to go for HIV testing and withdrawal of results increases significantly with age at the threshold of 1%. If behavior in girls belonging to religions other than Christianity is not different from those of Catholics as regards testing and withdrawal of results of the test, it is not the case for Protestant women. Indeed, between 2000 and 2006, girls from Protestant confession had 30% more chances of undergoing the test than Catholics.

Like other indicators, the educational level is the main socio-demographic characteristic of girls which was determining in the improvement in the level of testing observed in 2006. Illiterate girls have 66% less chance to take test than the more educated young people (those with secondary level and more). In the same way, young girls with primary education level have 55% less chance than the most educated girls.

The difference observed at the bivariate level is confirmed after control.

Table 22: Net effects of independent variables on the fact of having undergone HIV test and having come back for test results (among boys)

Variables explicatives	Model 1	Model 2	Model 3	Model 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	14.032***	13.368***	12.541***	13.210***
Age (quantitative)		1.298***	1.256***	1.259***
Religion				
Catholic		®	®	®
Protestant		1.166	1.199	1.187
Moslim		2.401***	1.904*	1.939*
Other		1.672	1.789*	1.855*
Level of education				
No level			0.174***	0.161***
Primary			0.291***	0.274***
Secondary and more			®	®
Province of residence				
South				®
West				1.041
North				1.100
East				1.535**
Chi2 of probability	309.68***	348.36***	412.44***	419.10***
Reference model is represented by ®				

Note: *** p<.01; **p<.05; *p<.10

Table 22 shows that the proportion of boys who took the screening test and were informed of results of the test in 2006 improved but in a way less significant compared to girls, because boys in 2006 had 14 times more chances of undergoing the test than it was the case in 2000. The same trend was observed among girls where this advantage for boys dropped slightly from 14 times to 13.2 times more chances after having controlled the effect of age, religion, educational level and the Province of residence.

Also, as shown in Table 22, the craze among boys interviewed for taking the screening test and willing to pick the results of the test increased significantly with age at the threshold of 1%. Young Protestants have approximately 2 times more chances to take the test and to pick the results of the screening test than their catholic peers during the period 2000-2006. Those from "other religions" had 86% more chances to show this behavior than Catholics. On the contrary, Moslems do not show the behaviour that is different from those of Catholics as regards HIV testing.

There is a positive relation between the educational level and urge for HIV testing and picking the results of the test. Indeed, it was noted that the illiterate and the youth with primary education level had 84% and 73% fewer chance respectively than boys who reached the secondary level of education to take this test.

If among girls, the Province of residence does not discriminate behaviour in the youth among boys, it was noted that in Eastern Province, the youth had 54% more chances than those from Southern Province to go for the HIV screening test. The results of Table 22 do not show a significant difference between behaviour in young boys from Northern and Western Provinces and those from Eastern Province.

It may be concluded that the difference observed at the bivariate level between the proportion of young boys who took the HIV screening test and picked the results between 2000 and 2006 was confirmed after controlling various variables.

PART B:

SEX WORKERS

V - DESCRIPTION OF THE SAMPLE OF SEX WORKERS

The 2000 survey focused on 699 sex workers. The size of the sample of the second phase of the survey carried out 6 years later increased by almost 50% to include 1041 individuals.

Table 23: Sample characteristics in 2000 and 2006

Characteristics	2000	2006	X ² (ddl), p
Age group			X ² (3)=72.14, p=0.000
19 years and more	27.5	16.5	
20 – 24 years	30.3	44.0	
25 – 29 years	20.0	26.4	
30 years and +	22.2	13.1	
Nationality			X ² (1)=1.24, p=0.265
Rwandan	95.7	96.7	
Other	4.3	3.3	
Level of education			X ² (2)=22.26, p=0.000
Has never been to school	21.2	25.5	
Primary	69.0	58.5	
Secondary and more	9.9	16.0	
Religion			X ² (3)=61.25, p=0.000
Catholic	52.6	39.5	
Protestant	29.2	34.0	
Moslim	14.7	13.5	
Other	3.5	13.0	
Current marital status			X ² (1)=29.44, p=0.000
In union	59.9	46.7	
Not in union	40.1	53.3	
N	699	1041	

The two age structures of sex workers interviewed were different as shown in Table 23. Indeed, in 2000, girls less than 20 years of age were 28% of the sample of sex workers interviewed. In 2006, they were not more than 17%; that is an absolute variance of 11 points. Conversely, even though women aged between 20 and 24 years constituted the majority among the prostitutes in the two surveys; their size in 2006 is much higher than a few years before (44% compared to 30% in 2000). This profession becomes less and less practiced by women aged 30 years and above, compared to 2000; their weight in the 2006 sample is almost divided by 2, decreasing from 22% in 2000 to 13% in 2006. These differences result in X²-statistics significant at the threshold of 1%.

The sample structure as regards nationality did not change between 2000 and 2006. There are less than 5% of women of the nationality other than Rwandan in the sample of female respondents. This absence of difference is confirmed by the probability associated with the X²-statistics which is 0.265.

The educational level of female respondents highlighted a change of profiles of sex workers. Indeed, if the weight of those who are illiterate did not change much between 2000 and 2006 (21% compared to 25% respectively), it was noted that Sex workers with "primary" education level decreased for the benefit of those with secondary or higher level of education. Indeed, Table 23 shows that in 2000, Sex workers (with primary education level were 69% of the sample and those with secondary level 10%. In 2006, these proportions evolved considerably. Those with primary

educational level decreased to 58% whereas female respondents with secondary level of education and higher increased to 16%.

The sample structure according to religion is much differentiated between the two surveys. In 2000, more than one out of two sex workers (53%) were catholic women. In 2006, this category was not more than 40%. If the proportion of sex workers from Islamic religion did not evolve much during the two surveys (14 to 15%), that of Protestant women as well as that of other religions increased from 30% to 34% for the Protestant women and from 4% to 13% for the category of "other religions".

Three out of five sex workers (60%) lived in union at the time of the 2000 survey. This proportion dropped significantly to 47% six years later. In other words, the prostitution was more practiced by women living in union in 2000, but in 2006, it was those who did not live in union who seem to have taken the lead because they account for 53% of the sample, compared to 40% in 2000.

VI – BIVARIATE ANALYSIS

6.1. Knowledge about HIV/AIDS

The large majority of sex workers interviewed report having heard of HIV. The proportion of those who heard of it remained constant in time (92% and 93% in 2000 and 2006 respectively) as shown in Table 24.

The correct use of condom is the most known HIV/AIDS prevention method. However, the proportion of those who mentioned it dropped slightly by time from 86% in 2000 to 83% in 2006. Sexual abstinence ranks the second among the most known prevention methods. More people mentioned it between the two phases (75% in 2000 vs. 79% in 2006). Faithfulness to one uninfected partner is the less known HIV/AIDS prevention means. Nevertheless, it was noted that there was a significant progression in the proportion of those who mentioned this last method, which increased from 56% to 70% between the two phases of survey.

The proportion of sex workers who mention at least one of these three methods remained constant between 2000 and 2006 (91% and 92% respectively). The proportion of those who mention the three main methods simultaneously is relatively low. However, it increased significantly at the threshold of 1% between 2000 and 2006 from 47% to 55%.

The level of knowledge about other aspects of HIV/AIDS among sex workers was high, but this level generally remained unchanged between 2000 and 2006. Thus, there is a rise in the proportion of prostitutes who recognized that a person who appears to be in good health may be carrying HIV and transmit it to another person, increased from 81% in 2000 to 85% in 2006. As for the knowledge about mother-to-child transmission, there are 83% of sex workers compared to 81% in 2006 that recognized that an HIV infected pregnant woman can transmit the virus to her infant. In addition, both in 2000 and in 2006, four out of five sex workers (80%) recognized that an HIV infected pregnant woman can transmit the virus to her infant during breast-feeding.

Table 24: Knowledge about HIV/AIDS

Indicators	2000 %	2006 %	Level of significance
Have already heard of HIV and/or AIDS	92.7	92.3	0.763
Correct methods			
Quote the correct use of condom as a means of HIV prevention	86.1	83.0	0.079*
Knows faithfulness to one uninfected partner as a method of HIV prevention	56.4	70.4	0.000** *
Mention abstinence as a means of HIV prevention	74.5	78.5	0.055*
Say at least 1 of 3 prevention methods	90.6	91.9	0.317
Say simultaneously 3 prevention methods	47.1	54.7	0.002** *
Recognize that a person who appears to be in good health can be HIV positive and transmit it to someone else	80.5	84.5	0.030**
Recognize that a pregnant woman infected by HIV can transmit the virus to her child.	83.0	81.3	0.364
Recognize that a woman infected by HIV can transmit the virus to the new born baby through breast-feeding.	79.8	79.7	0.96
Erroneous methods			
Estimate HIV can be transmitted through mosquito bites	22.3	18.3	0.042**
Estimate HIV can be contracted by sharing meal with an infected person	14.9	11.4	0.035**
Mention at least one erroneous method	30.5	25.2	0.015**
Number of methods known ³	3.67	3.91	0.000** *
Have complete knowledge of HIV/AIDS⁴	26.8	36.2	0.000** *
Total size	699	1.041	

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

Erroneous beliefs in casual modes of HIV transmission still persists among the population of sex workers. However, it should be admitted that between 2000 and 2006, the proportion of people who believe in the transmission of HIV through these methods dropped. Thus, the proportion of those who report that the HIV/AIDS can be transmitted through mosquito bites dropped from 22% to 18%. Sex workers who estimate that an individual can be infected with HIV/AIDS by sharing a meal with an infected person also dropped significantly from 15% in 2000 to 11% in 2006. Thus,

³ 1 point for “yes” to each of the following answers: (a) use of condom, (b) sexual abstinence, (c) faithfulness to one uninfected partner, (d) a person who appears to be in good health can transmit HIV and 1 point for « no » to each of 2 erroneous methods. (the number of total possible methods known is thus 6).

⁴ Are regarded as having comprehensive knowledge of HIV people who simultaneously show that condom use, sexual abstinence and faithfulness to one non infected partner can prevent HIV and recognize that a person who appears in good health can transmit HIV and then reject two erroneous methods of HIV transmission.

whereas in 2000 nearly a third of people quoted at least one of the two erroneous methods of HIV transmission, they were not more than a quarter six years later.

By combining all these prevention means and other aspects of HIV, a composite indicator enabled the measuring of comprehensive knowledge about HIV (see footnote 5 for the definition of "comprehensive knowledge"). Thus and as shown in Table 24, in 2000 a little more than one out of four sex workers (27%) had comprehensive knowledge about HIV. This proportion clearly increased to 36% six years later. In terms of points on a scale of 6, it was noted that the average number of methods of correct contamination and prevention known by sex workers was 3.6 in 2000, compared to 3.9 in 2006. This rise is significant at the threshold of 1%. In other words, the number of methods of contamination and other aspects of knowledge about HIV/AIDS remained markedly high.

6.2. Sexual behaviour and use of condom

As shown in Table 25, the first commercial sexual relations were reported by half of the sex workers at the age of 19 years in 2006. Six years before, this median age was 18 years. Thus, with age and the course of time, the entry into the prostitution practice is relatively delayed.

In 2000, the entry into sexual life among sex workers interviewed was reported at the age of 15 years latest in one out of five prostitutes (21%). This proportion increased significantly six years later. Nearly two out of five sex workers interviewed (39%) became sexually active before the age of 16 years. This difference is significant at the threshold of 1% and demonstrated sexual precocity among young girls who engage late in prostitution.

Table 25: Sexual behaviors and use of condom

	2000 (%)	2006 (%)	Level of significance _____
Median age of the first paying sexual intercourse (in years)	18.0	19.0	0.012**
had the first sexual relation at 15 years of age at the latest	20.8	39.4	0.000***
have heard of a male condom	69.0	97.0	0.000***
Know a place where to obtain the condom	91.7	93.9	0.085**
Have condoms at the time of the survey	58.5	97.3	0.000***
Size (a)	699	1,041	
used a condom during the last sexual intercourse with a client	81.8	86.6	0.013**
report having used the condom « each time » with clients during the last 7 days	59.3	55.6	0.000***
Size (b)	543	919	
Used the condom during the last sexual intercourse	55	66	0.0

with a non paying partner	3.8	6.4	01***
report having used the condom « each time » with non paying partners during the last 7 days.	3	2	0.0
	6.1	8.0	29***
Size (c)	2	3	
	66	72	

(a) Total number of respondents

(b) Total number of respondents having at least 1 client during the last 7 days

(c) Total number of respondents having at least 1 non paying partner during the last 7 days

The knowledge of condom and in particular the fact of having heard of it increased considerably between 2000 and 2006 from 69% to 97%. In the same way, the proportion of women who know where to obtain a condom when necessary was also significantly increased between these two periods (92% in 2000 vs. 94% in 2006).

Prevention behaviors were measured through the level of use of condom with various types of partners and at various times. Thus, the use of condom during the last sexual relations with a client increased significantly from 82% to 87%. Concerning the use of condom during the last sexual relations with a non-paying partner, it also increased in a more remarkable way (12 points of percentage); even though the level of the use with this type of partner is lower than with clients. As such, the systematic use of a condom declined, depending on the type of partner. Thus, 59% in 2000 reported having used a condom during each sexual relations with clients in the last 7 days preceding the survey. In 2006, this proportion dropped by 13 points of percentage to 46%.

6.3. Knowledge and STI antecedents

Nine out of ten sex workers reported having heard of STI's. This proportion seems to have dropped between 2000 and 2006 from 93% to 90% as shown in Table 26. But the knowledge about STI is mostly measured by knowledge about infection symptoms other than by the only fact of having heard of it. The knowledge about STI symptoms was therefore a more relevant indicator for the measuring the level of the knowledge about STI. From Table 26, it was noted that between 2000 and 2006, the proportion of sex workers who know at least one STI symptom in men increased from 60 to 70% and that of the people who know at least one STI symptom in women from 59% to 81%. In either case, the knowledge about symptoms increased significantly. It is the same for the number of STI symptoms known both in men and women. On the contrary, a decline in STI antecedents was observed during the same period. Thus, whereas in 2000 a third (33%) reported having had at least one STI symptom during the last 12 months preceding the survey, they were not more than a quarter (25%) in 2006.

Table 26 : Knowledge and STI antecedents

Indicators	2000 (%)	2006 (%)	Level of significance
have already heard of STI	93.0	90.4	0.058*
know at least 1 sign of STI in a man	59.8	69.9	0.000** *
Average number of signs of STI known in a man (n)	1.0	1.6	0.000** *
know at least 1 sign of STI in a man	58.9	80.5	0.000** *
Average number of signs of STI known in a woman	1.2	2.2	0.000** *

had at least 1 sign of STI in the last 12 months	32.9	24.7	0.000** *
Size (total number of respondents)	699	1,041	

6.4. Proximity with respect to the infection and HIV test

Table 27 including data on the proximity with respect to the disease shows that the majority of respondents (81% in 2000 and 89% in 2006) know at least an HIV infected person. When it comes to know a close person (friend and/or relative), the proportions are less important. Half of the sex workers (50%) thus reported to know a close person infected by HIV or died of AIDS in 2000. Six years later, this proportion increased to 66%.

Table27: Proximity with respect to the disease and HIV test

Indicators	2000 %	2006 %	Level of significance
have heard of HIV/AIDS	92.7	92.3	0.763
know someone infected by HIV or died of AIDS	80.7	89.0	0.000***
have a close relative or a friend infected by HIV or died of AIDS	50.1	66.5	0.000***
have already undergone an HIV test	40.5	68.5	0.000***
have undergone an HIV voluntary testing	36.3	65.9	0.000***
have undergone an HIV testing and received the result	35.9	65.3	0.000***
Total number (all the respondents)	699	1,041	

Having recourse to the HIV screening test is also relatively important. In 2000, 40% reported having taken an HIV screening test and been informed about the results of the test. In 2006, a more proportion (65%) reported having taken the test and been informed about of the results.

VII – MULTIVARIATE ANALYSIS

7.1. Knowledge about HIV/AIDS

Table 28 presents the analysis of the evolution of comprehensive knowledge of HIV/AIDS. It shows an improvement of the level of knowledge among sex workers between 2000 and 2006, even after the control based on the age, religion, educational level and marital status. Sex workers interviewed in 2006 had 55% more chances of acquiring comprehensive knowledge about HIV/AIDS than those interviewed in 2000.

Table 28: Net effects of independent variables on comprehensive knowledge about HIV/AIDS by sex workers

Explanatory variables	M odel 1	M odel 2	M odel 3	Mo del4
-----------------------	-------------	-------------	-------------	------------

Year of the survey (Phase)				
2000	®	®	®	®
2006	1.	1.	1.	1.5
	555***	528***	558***	77***
Age (quantitative)		1.	1.	1.0
		024***	032***	30***
Religion				
Catholic		®	®	®
Protestant		1.	1.	1.0
Moslim		095	071	68
Other		1.	1.	1.1
		081	121	24
		1.	1.	1.2
		264	291	89
Level of education				
No level			0.	0.1
Primary			185***	86***
Secondary and more			0.	0.5
			543***	41***
			®	®
Marital status				
He/she is in union				®
He/she is not in union				0.9
				10
Khi2 of probability	1	2	1	12
Reference model is represented by ®	7.32***	6.36**	20.94***	1.66***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

When this difference is controlled on the basis of the age and religion of female respondents (Model 2), it appears that their advantage observed in 2006, compared to 2000, as regards to comprehensive knowledge of HIV decreases a little since they have not more than 53% more chances than in 2000. It should be noted that the level of knowledge increases with age, because the chance ratio is higher than 1 and significant at the threshold of 1%.

As for the religion, results show that sex workers from religions other than Catholicism did not possess more significant knowledge than Catholics as regards comprehensive knowledge of HIV. With the model 3 which takes into account the educational level, it was noted that it was the variable that contributed very significantly to increase the probability of the model, because the variance explained increases from 26.4 to 120.9. This variable increased the variance of the level of comprehensive knowledge about HIV among respondents (56% more chances). This difference is due to the differentiated structure of the samples of the two surveys. As it could be expected, the illiterate sex workers had 81.5% less chances of acquiring adequate knowledge than those who are more educated (those with at least secondary level of education). The variation was also significant with those with primary education level but it is less marked. The latter have 46% less chances of acquiring comprehensive knowledge about HIV/AIDS than their peers with secondary level or higher.

The fact of being in union is not a factor which discriminates the level of knowledge of HIV. Indeed, the chance ratio among prostitutes who are not in union is not significantly different from that of sex workers who live in union (Table 28).

7.2. The Use of condom

The indicator selected in this paragraph to appraise the change observed among sex workers is the use of condoms in each relation with clients during the last 7 days preceding the survey. As shown in Table 29, the systematic use of condom with clients in the last 7 days varies significantly in time.

Table 29: Net effects of independent variables on the fact of having used the condom every time with clients during the last 7 days before the survey

Explanatory variables	M	M	M	Mo
	odel 1	odel 2	odel 3	del4
	—	—	—	—
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.	0.	0.	0.5
	630***	599***	596***	91***
Age (quantitative)		0.	0.	0.9
		972**	974*	75*
Religion				
Catholic		®	®	®
Protestant		0.	0.	0.9
Moslim		998	996	99
Other		0.	0.	0.7
		721	724	24
		1.	1.	1.4
		432	433	35
Level of education				
No level			0.	0.7
Primary			795	92
Secondary and more			0.	0.8
			877	79
			®	®
Marital status				
He/she id in union				®
He/she is not in union				1.0
				65
Khi ² of probability	8.	1	1	17.
Reference model is represented by ®	64***	7.03***	7.77**	92**

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

In 2006, sex workers had 37% less chances of having systematically used a condom with various clients than those interviewed in 2000 during the last 7 days. This disadvantage of sex workers interviewed in 2006 compared to those who were interviewed in 2000 on the use of condom dropped further as controls based on age, religion, educational level and marital status are measured.

In Model 4, sex workers interviewed in 2006 had finally 41% less chances of having used the condom every time they have sexual relations with clients than those of 2000 in the last week preceding the survey, compared to 37% observed in the first model. Only the age is significant and varies conversely with the urge for using a condom. In other words, there fewer older sex workers who had systematically used a condom with clients in the last week, compared to the younger ones.

7.3. Knowledge and STI antecedents

In this section, two indicators are analysed: the level of knowledge of at least one STI symptom in men and women by respondents and the fact of having had one STI symptom during the last twelve months.

Indicator 1: Knowing at least one symptom of STI in men and women

The results of Table 30 show that actions in the area of sensitization and information campaigns between 2000 and 2006 on the knowledge of STI symptoms in men and women are perceptible. Indeed, if only the variable phase was considered, it was noted that women interviewed in 2006 had approximately 73% more chances of knowing concurrently at least one STI symptom in men and women, compared to those interviewed in 2000. After control using the four intersecting variables, this advantage increased up to 81% more chances.

Table 30: Net effects of independent variables on the fact of knowing at least one IST symptom in men and women

Explanatory variables	M	M	Mo	Mo
	odel 1	odel 2	del 3	del 4
	—	—	—	—
Year of the survey (Phase)				
2000	®	®	®	®
2006	1.725**	1.787***	1.81***	1.805***
Age (quantitative)		1.069***	1.73***	1.71***
Religion				
Catholic		®	®	®
Protestant		1.239*	1.30*	1.24*
Moslim		1.211	1.36	1.39
Other		0.824	0.821	0.819
Level of education				
No level			0.3	0.3
Primary			60***	62***
Secondary and more			0.529***	0.525***
Marital status			®	®
is in union				®
is not in union				0.901
Khi ² of probability	2	9	12	12
Reference model is represented by ®	8.99***	1.36***	2.81	3.74***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

The level of knowledge of STI symptoms in men and women increased with the age of sex workers, probably following their long experience in sexual life. With the threshold of 10%, sex workers from Protestant religion seem to have 22% more chances of knowing at least one STI symptom in men and women than Catholics. The illiterate and individuals with primary education level had only 64% and 47% respectively less chances to have adequate knowledge about STI symptoms than those with secondary level of education.

The fact of living in union is not a discriminating factor as far as the knowledge of STI symptoms in men and women is concerned.

Indicator 2: Having had at least a symptom of STI

With sensitization campaigns on the risks of an unprotected sexuality, it was noted that in comparison to 2000, sex workers interviewed in 2006 had 32% less chances to report having had at least one STI symptom (a wound on the sexual organ and/or the flow of vaginal fluids). As previously, it is the older respondents who are most exposed because the chance ratio is higher than 1. It is at least what is shown in Table 31.

Protestant women had approximately 56% more chances to have had a STI symptom in twelve months preceding the survey than the Catholics. The education level proves the opposite with the risk of contracting a STI. Indeed, less-educated sex workers have 42% more chances of having STI antecedents than the more-educated sex workers. It can be concluded that the latter are more sensitized and take more necessary precaution of less risky sexuality against STI.

Table 31: Net effects of independent variables on the fact of having had at least one STI symptoms during the last twelve months before the survey

Explanatory variables	Mo	M	Mo	M
	del 1	odel 2	del 3	odel 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	0.6	0.	0.6	0.
	68***	651***	67***	683***
Age (quantitative)		1.	1.0	1.
		046***	46***	041***
Religion				
Catholic		®	®	®
Protestant		1.	1.5	1.
Moslim		566***	69***	555***
Other		1.	1.2	1.
		217	20	225
		164	63	157
Educational level				
No level			1.4	1.
Primary			19*	434***
Secondary and more			1.4	1.
			78**	463***
			®	®
Marital status				
He/she lives in union				0.
He/she does not live in union				831
				®
Chi2 of probability	13.	5	56.	5
Reference model is represented by ®	88***	1586***	76***	9.32***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

As one could expect it, the fact of living in union has not a significant relation with STI antecedents in the previous year to the survey.

7.4 HIV testing

Compared to 2000, sex workers interviewed in 2006 had 3.3 times more chances of having not only taken the test but also gone for the results of the test. This advantage increased model after model to reach approximately 4 times more at the last model (Table 32).

Table 32: Net effects of independent variables on the fact of having gone to receive HIV test results

Explanatory variables	M odel 1	M odel 2	M odel 3	Mo del 4
Year of the survey (Phase)				
2000	®	®	®	®
2006	3.362***	3.412***	3.481***	3.706***
Age (quantitative)		1.023***	1.026***	1.017*
Religion				
Catholic		®	®	®
Protestant		1.379***	1.367***	1.48**
Moslim		1.199	1.220	1.237
Other		0.892	0.893	0.885
Educational level				
No level			0.542***	0.554***
Primary			0.830	0.812
Secondary and more			®	®
Marital status				
live in union				0.663***
do not live in union				®
Khi2 of probability	1	1	1	19
Reference model is represented by ®	47.06***	62.99***	79.28***	3.82***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

The results of this Table 32 also reveal that as the age increases, the urge for taking an HIV test and going for picking the results of the test increases too. The religion discriminates Protestant respondents who have 38% more chances of showing this behaviour, compared to Catholics. With model 2, this advantage of Protestant sex workers compared to the Catholics was 38%. Those from other religions are not statistically different from the Catholics as regards to HIV test. The illiterate sex workers had 56% less chances of going for an HIV test and for the withdrawal of the results of the test. It may be concluded that the level of education responsible with respect to HIV and in particular the need to accept to go for HIV screening test. It was also observed that sex workers living in union had 33% less chances of going for the test and picking results than their peers who do not live in union.

Following the control of intersecting variables, it was noted that the difference observed at the gross level (Model 1) even increased.

PART C:

TRUCK DRIVERS

VIII – DESCRIPTION OF THE SAMPLE OF TRUCK DRIVERS

The 2000 survey targeted 481 truck drivers, compared to 680 in the survey carried out six years later in 2006.

Table 33 : Sample Characteristics

Characteristics	2000	2006	X ² (ddl), p
Age group			X²(4)=3.114, p=0.539
Below the age of 25 years	18.7	16.6	
25 - 29 years	20.5	24.4	
30 - 34 years	22.0	20.0	
35 - 39 years	17.1	17.5	
40 years and +	21.6	21.5	
Nationality			X²(3)=38.371, p=0.000
Rwandan	26.0	41.3	
Tanzanian	40.5	30.9	
Ugandan	16.0	17.7	
Other	17.5	10.1	
Educational level			X²(2)=30.812, p=0.000
He/she has never been to school	4.6	5.4	
Primary	63.8	47.5	
Secondary and more	31.6	47.1	
Current marital status			X²(1)=6.351, p=0.012
In union	74.2	67.4	
Not in union	25.8	32.6	
Absent at home+ 1 month during the last 12 months?			X²(1)=49.320, p=0.000
Yes	74.6	54.4	
No	25.4	45.6	
Size	481	680	

The two age structures of truck drivers almost did not vary from one survey to another, except some insignificant differences observed in truck drivers aged less than 30 years. Indeed, there were relatively as many truck drivers aged 35-39 years as those aged 40 or more interviewed during the two surveys (Table 33).

On the contrary, among young truck drivers (less than 25 years of age), their demographic weight as of 2000 (approximately 19%) relatively decreased to 17%. It is the same for those in the age group of 30-34 where the variance is 2 points in favour of the survey of phase 1. This small proportion of truck drivers from these two age-groups in 2006 is compensated for by a stronger representation of truck drivers aged 25-29 in 2006: 21% in 2000 compared to 24% in 2006. This quasi-stability of the age structure of truck drivers in 2000 and 2006 is confirmed by the probability associated with the statistics of χ^2 which is insignificant at the threshold of 5%.

The structure of truck drivers according to nationality varied significantly between 2000 and 2006. In 2000, the weight of Rwandan truck drivers was a little more than one out of four respondents (26%), that of Tanzanians being two out of five respondents (41%). Ugandan truck drivers and truck drivers classified in the "other" modality were 17% respectively. This structure markedly changed 6 years later. Since then Rwandans constituted the majority group (41% compared to 26% in 2006). The weight of Tanzanians decreased (a little less than one out of three respondents: 31%).

If the proportion of Ugandans did not change significantly, it is not the case for truck drivers classified in the "other" modality whose weight was 10%.

This difference of the structure of truck drivers according to nationality between the two dates is significant according to the statistics of χ^2 and this was at the threshold of 1%.

If the proportion of illiterate truck drivers was not very different in 2000 and 2006 (4.6% compared to 5.4% respectively), it is not the case for those with primary or secondary level of education and higher where the differences are important. Indeed, in 2000, 64% of truck drivers were with primary education level compared to 32% with secondary level or higher. This structure was reversed in 2006, because the proportion of truck drivers with primary education level was 48% compared to 47% with secondary education level. With the error threshold of 1%, the structure of truck drivers according to educational level is statistically different between 2000 and 2006 (Table 33).

The structure of truck drivers according to the marital status shows a difference at the threshold of 5%. Even if truck drivers who are in union represent the majority group in both 2000 and 2006, it was noted that their relative weight is higher in 2000 than in 2006: 74% vs. 67%.

Three out of four truck drivers (75%) were absent from their residence for more than one month on a continuous basis during the last 12 months preceding the 2000 survey. In 2006, this proportion was still very high but remained less important than in 2000 since it was not more than one out of two truck drivers (54%). That proves the statistics of χ^2 to be significant at the threshold of 1% which translates a quite clear difference between the two phases of the survey.

IX – BIVARIATE ANALYSIS

9.1. Knowledge about HIV/AIDS

Almost all truck drivers interviewed during the two surveys (100% in 2000 and 97% in 2006) reported having heard of HIV/AIDS (Table 34). It was noted that in 2006, this proportion dropped because approximately 3% of truck drivers interviewed reported not having heard of the AIDS pandemic. With the error threshold of 1%, this decrease is significant.

By analyzing the three major HIV/AIDS prevention methods i.e. the correct use of the condom, faithfulness to one uninfected partner and sexual abstinence, it appears from Table 34 that the prevention method that was in most cases mentioned by truck drivers in 2000 was sexual abstinence (89%, i.e. nearly 9 out of 10 truck drivers). This method was followed indifferently by the correct use of the condom and faithfulness to one uninfected partner (82%). In 2006, this structure completely changed since faithfulness to one uninfected partner was by far the major method of prevention mentioned by 9 out of 10 truck drivers (Table 34).

The increase in this proportion between 2000 and 2006 is very significant at the threshold of 1%. Conversely, the proportion of truck drivers who mentioned the two other prevention methods dropped significantly at the threshold of 1%. Thus, there are a little less than 3 out of 4 truck drivers (73%) who quoted the correct use of the condom as the method for the prevention of HIV/AIDS whereas in 2000, this proportion was 82%. In the same way, it was noted that the ratio of truck drivers having mentioned sexual abstinence as prevention mode decreased from 9 out of 10 truck drivers in 2000 to 8 out of 10 truck drivers in 2006.

Ultimately, it appears that in 2000, 99% of truck drivers knew at least one of these three prevention methods. In 2006, this proportion dropped significantly at the threshold of 1% and was 96%. On the contrary, the proportion of truck drivers who simultaneously mentioned the three methods was

62% in 2000, compared to 60% in 2006. This small difference is not statistically different. In other words, between 2000 and 2006, the proportion of truck drivers who quoted the three prevention methods simultaneously remained constant.

Table 34: Knowledge about HIV/AIDS

	2000	2006	Level of significance
They have already heard of HIV and/or AIDS	00.0	7.1	0.000**
Correct methods			
quote the correct use of the condom as means of HIV prevention	2.3	3.2	0.000**
know the faithfulness to one uninfected partner as a method of HIV prevention	1.7	0.3	0.000**
quote the abstinence as a means of HIV prevention	8.8	9.9	0.000**
quote at least 1 of 3 prevention methods	9.0	6.2	0.004**
quote simultaneously 3 prevention methods	2.0	0.4	0.602
recognize that a person who appears to be in good health can be HIV positive and transmit it	4.0	5.9	0.000**
Recognize that an HIV infected pregnant woman can transmit the virus to her infant through breast-feeding.	0.2	8.4	0.000**
Recognize that an HIV infected pregnant woman can transmit the virus to her new born through breast-feeding.	7.6	5.4	0.450
Erroneous methods			
estimate the virus of AIDS can be transmitted through mosquito bites	2.9	3.2	0.000**
estimate that HIV can be transmitted by sharing meals with an infected person	2.1	.3	0.125
show at least an erroneous method	0.4	9.4	0.000**
Number of means known methods ⁵	.77	.48	0.000**
have comprehensive knowledge⁶ of HIV/AIDS	2.0	9.1	0.013*
Total number (all the respondents)			6

⁵ 1 point for “yes” to each of the following answers : (a) use of a condom, (b) sexual abstinence, (c) faithfulness to one uninfected partner, (d) a person who appears to be in good health can transmit HIV and 1 point for « no » to each of 2 erroneous methods (the number of the total known answers varies between 0 and 6)

⁶ Are considered as having complete knowledge of HIV, people who simultaneously show that the use of the condom, sexual abstinence and faithfulness to an uninfected partner, can prevent HIV and they recognize that a person who appears to be in good health can transmit HIV and who moreover reject erroneous methods of HIV transmission (2 erroneous methods are those presented in table 2).

*Note : *** $p < .01$; ** $p < .05$; * $p < .10$*

The knowledge about other aspects of HIV among truck drivers was relatively important, but this level generally significantly dropped between 2000 and 2006 at the threshold of 1%. Indeed, the proportion of truck drivers who recognized that a person who appears to be in good health can be carrying HIV and transmit it to another person, dropped: from 94% in 2000 to 85% in 2006. As regards to, the knowledge about mother-to-child transmission, the decrease is more important because a little less than 7 out of 10 truck drivers (68%) declared knowing this fact in 2006 whereas six years before, this ratio was 9 out of 10 truck drivers (Table 34).

In addition, both in 2000 and 2006, approximately two out of three truck drivers (68% and 65% respectively) recognized that an HIV infected pregnant woman can transmit the virus to her infant through breast-feeding. Statistically speaking, this level of knowledge remained constant between 2000 and 2006.

Despite high level of knowledge about the three main prevention methods and other aspects of HIV, some of people, however, still cited erroneous transmission methods. However, it should be recalled that this proportion showed a significant decline between 2000 and 2006. Thus, the proportion of truck drivers who declared that mosquitoes transmit HIV/AIDS was 23% in 2000 while it was almost halved to 13% in six years. In the same way in 2006, it was more than 9% of truck drivers (compared to 12% in 2000) who declared that one can be infected with HIV/AIDS by sharing a meal with an infected person. Ultimately, the proportion of truck drivers who cited at least an erroneous method of transmission showed a net decrease: from 30% in 2000 to 19% in 2006.

By combining all these prevention methods and other aspects of HIV, a composite indicator enabled the measurement of the comprehensive knowledge about HIV/AIDS. Indeed, Table 34 shows that in 2000, nearly one out of three truck drivers (32%) had comprehensive knowledge of HIV. This proportion improved significantly in 6 years to be approximately two out of five truck drivers (39%).

9.2. Sexual behaviour

As it could be expected on the basis of their age structure (less than 3% are less than 20 years old), more than 9 out of 10 truck drivers are already sexually active (98% in 2000 and 94% in 2006).

If nearly one out of two truck drivers (47%) had sexual relations with commercial partners during the last 12 months preceding the 2000 survey, this behaviour clearly declined in the course of time. Indeed, not more than 19% reported having had sexual relations with commercial partners in 2006. This change in sexual behaviour was also accompanied by the decrease in the number of commercial sexual partners. A little more than one third of truck drivers (35%) reported having had more than one commercial partner in the 12 months preceding the 2000 survey.

Table 35 : Sexual behaviors

	2 000	2 006	Level of significance
	—	—	—
	%	%	
have already had sexual intercourse	9 7.5	9 3.5	0.002* **
have already had sexual intercourse with commercial partners during the last 12 months	4 7.0	1 8.5	0.000* **
had more than one commercial partner during the last 12 months	3 4.9	1 2.8	0.000* **
Average number of commercial partners during the last 12 months (n)	2 .33	0 .81	0.000* **
Entire number (a)	4 81	6 80	
had sex with commercial partners in the last 12 months	5 2.7	2 2.7	0.000* **
had more than one commercial partner in the last 12 months	3 9.2	1 5.7	0.000* **
Average number of commercial partners in the last 12 months (n)	2 .62	1 .02	0.000* **
Size (b)	4 29	5 54	

Note : *** p<.01 ; **p<.05 ; *p<.10

(a) Entire number of respondents

(b) Truck drivers who are sexually active during the last 12 months

9.3. Knowledge and the use of condom

As shown in Table 36, in 2000, practically all the truck drivers (99%) already reported having heard of a condom. With this level of knowledge, it is difficult to expect for an improvement in the course of time. Six years later, this level remained very high though it declined to (94%). It is the same for the proportion of those who reported knowing a place where they could obtain condoms in case of need.

The use of a condom varied with the type of partner, regardless of the year of survey. It tended to increase when moving from stable relations to looser relations. Thus, in 2000, 9% of truck drivers reported having used a condom during the last sexual relations with their regular partner while when it came to an occasional partner (non-paying), this level increased to 63%. It increased to 81% in the case of the last sexual relations with a paying partner. In 2006, the same trend was observed with respective proportions of 17%, 62% and 82%. Thus, the level of the use of a condom during the last sexual relation with occasional partners and paying partners remained constant. On the contrary, it increased considerably with regular partners. In general, it is noted that the systematic use of the condom increased considerably. Thus, the proportion of truck drivers who report having used the condom during sexual with regular partner in the last 12 months preceding the survey increased from 4 to 10%. The proportion increased from 47 to 60% in the case of sexual intercourse with commercial partners while with the occasional partners, the proportion remained stable (31% in 2000 vs. 31% in 2006).

Thus, whatever the type of sexual partner, the systematic use of the condom among the population of truck drivers was not very frequent and in 2006, only one out of hundred truck drivers reported having used a condom during each sexual relations in the last 12 months (whatever their sexual partner).

Table 36: Knowledge and the use of condom

	2000 (%)	2006 (%)	Level of significance (_____)
have already heard of a male condom	9.2	3.6	9 0.00 0***
know a place where to obtain a condom	8.1	9.0	8 0.00 0***
Entire number (a)	81	80	6
used a condom in the last sexual intercourse with a regular partner?	.9	7.4	1 0.01 9**
report having used a condom « each time » with regular partners in the last 12 months	.7	0.4	1 0.00 0***
Entire number (b)	78	83	4
used a condom in the last sexual intercourse with a commercial partner	1.0	2.1	8 0.68 2
report having used the condom « each time » with commercial partners during the last 12 months.	6.5	9.5	5 0.01 9**
Entire number (c)	26	26	1
used the condom in the last sexual intercourse with a non commercial/ non regular partner	2.8	1.9	6 0.87 1
report having used the condom « each time » with non commercial/non regular partners in the last 12 months	0.7	2.1	3 0.78 4
Entire number (d)	92	40	1
had at least sexual intercourses once without condom in the last twelve months	7.7	9.1	9 0.07 0*
Entire number (e)	29	54	5

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

(a) Entire number of respondents

(b) Respondents having had at least one regular partner during the last 12 months

(c) Respondents having had at least one commercial partner in the last 12 months

(d) Respondents having had at least one non commercial/non regular partner in the last 12 months

(e) Respondents having had at least one sexual relation in the last 12 months

9.4. Knowledge and STI antecedents

From Table 37, it was noted that STI symptoms seem to be less known today among truck drivers than they were 6 years ago. Thus, as regards STI symptoms known in both men and women, a net decline was observed between the two phases of survey. Could it have been due to the profile of truck drivers the majority of whom were of Rwandan nationality in 2006 compared to the majority

of Tanzanians in 2000? Could it rather be due to messages disseminated with the intention of improving the knowledge about STI symptoms?

If that were the case, it would be meant that persons in charge of Behavioral change communication (BCC) do not limit their messages to the knowledge about HIV, but to lay a particular emphasis on STI and the knowledge about their symptoms because one of the relevant strategies in the fight against HIV/AIDS is the early treatment of STI. It is thus essential that truck drivers know the symptoms which could indicate the presence of STI. This should lead them to the use of an appropriate structure designed for taking care of STI cases.

Table37: Knowledge and STI antecedents

	000	006	2	Level of significance
Have already heard of STI (%)	9.2	5.3	9	0.000 ***
Know at least 1 sign of STI in a man (%)	4.2	3.2	7	0.000 ***
Average number of signs of STI known in a man (n)	.85	.78	1	0.407
know at least 1 sign of STI in a woman (%)	5.5	0.9	4	0.000 ***
Average number of signs of STI known in a woman (n)	.19	.98	0	0.018 **
Average number of known signs of STI in a man or in a woman (n)	.03	.77	2	0.067 *
Entire number (a)	81	80	6	
had at least one sign of STI in the last twelve months (%)	0.3	.7	4	0.001 ***
Entire number (b)	29	54	5	

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

(a) Entire number of respondents

(b) Respondents who are sexually active during the last 12 months

The proportion of truck drivers who had at least one STI symptom during 12 months before the survey was low and decreased between 2000 and 2006. Indeed, the proportion of the population who reported having had at least sexual relations during the last 12 months was nearly 10% in 2000, compared to 5% in 2006. However, it is difficult to assess whether in 2006, there was poor or under declaration related to the decline in knowledge of the STI symptoms or a real decline in sexually transmissible infections, which is itself related to an improvement in the level of use of the condom and/or to a decline in the recourse to paying sexual relations.

9.5. Proximity with respect to the disease and HIV testing

Table 38: Proximity with respect to the disease and HIV testing

	000	006	2	Lev el of significance
know somebody infected by HIV or died of AIDS	1.7	2.5	9	0.61 0
have a close relative of theirs infected with the virus or died of AIDS	7.1	3.1	6	0.00 0***
have taken the HIV test	8.9	6.5	5	0.00 0***

have taken the HIV test and been informed about the results	6.8	5.6	5	0.00
Entire number (entire number of respondents)	81	80	6	0***

Note : *** p<.01 ; **p<.05 ; *p<.10

The majority of the truck drivers reported knowing somebody infected with HIV or who had died of AIDS in their close or remote surroundings. However, in 2006, fewer respondents than in 2000 reported knowing a close relative of theirs infected with the virus or who had died of AIDS. As such, the practice for HIV/AIDS testing did not decline. On the contrary, it increased considerably from 27% of truck drivers who in 2000 affirmed to have taken the HIV test and been informed about the results compared to 57% in 2006.

X – MULTIVARIATE ANALYSIS

10.1. The Knowledge of HIV/AIDS

The analysis of the evolution of comprehensive knowledge about HIV/AIDS among truck drivers showed an improvement in the proportion of this category of the population between 2000 and 2006, even after control by age, nationality, educational level, marital status and the fact of being absent from home for more than one month during 12 months preceding each survey. Taken separately, truck drivers interviewed in 2006 had 36% more chances of having comprehensive knowledge of HIV than those interviewed in 2000. This confirms the results of Table 34.

Table 39: Net effects of independent variables on comprehensive knowledge of HIV/AIDS by truck drivers

Explanatory variables	M odel 1	M odel 2	M odel 3	M odel 4	Mo del5
Year of the survey(Phase)					
2000	®	®	®	®	®
2006	1	1	1.	1.	1.3
	.364*	.393**	377**	387**	86**
Age (quantitative)		0	0.	0.	0.9
		.991	992	989	89
Nationality		®	®	®	®
Rwandan		1	1.	1.	1.1
Tanzanian		.129	130	111	13
Ugandan		1	1.	1.	1.3
Other		.322	344	326	26
		1	1.	1.	1.0
		.078	106	092	94
Educational level			0.	0.	0.3
No level			392***	398***	98***
Primary			0.	0.	0.8
Secondary and more			876	877	77
			®	®	®
Marital status				®	®
Lives in union				0.	0.8

Does not live in union				891	91
Was absent in more than one month					0.9
Yes					94
No					®
Khi2 probability	6	1	19	20	20.
Reference model is represented by	.19**	0.92*	.75***	.32***	32**

®

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

When one controls this difference by the whole of variables, this advantage increases to 39% and then stabilizes at about 38.6%. This relative increase in the variance showed that truck drivers interviewed in 2000 are disadvantaged vis-à-vis a key variable which determines the level of comprehensive knowledge about HIV. As noted in Table 39, this variable is the educational level. Indeed, the illiterate have at least 60% less chances of acquiring comprehensive knowledge about HIV than truck drivers with at least secondary level of education.

That is well justified since the structure of truck drivers according to the educational level (Table 33) showed that in 2006, the proportion of respondents with secondary educational level or higher was relatively more important than in 2000.

All other variables introduced in the regression model did not show significant effects. These results prove that prevention campaigns implemented between 2000 and 2006 had indeed improved the level of comprehensive knowledge about the AIDS pandemic among truck drivers in a significant manner, but that the people who have never been to school do not adapt adequately to the change observed.

10.2. Sexual behaviour

The indicator selected to measure changes observed in truck drivers as regards sexual behaviour was the fact of having had sexual relations with at least one commercial partner in the last twelve months preceding the survey.

Results of Table 40 showed that truck drivers interviewed in 2006 had 75% less chances of having had sexual relations with commercial partners than those interviewed in 2000, which confirms the results of Table 35. This decline subsided at the level of the last model since the advantage is not more than 68%.

Contrary to the preceding model, here nationality, marital status and the fact of being absent from the domicile for more than one month are the variables which discriminate sexual behaviour in truck drivers.

Table 40: Net effects of independent variables on having had sexual relations with at least one commercial partner during the last 12 months before the survey

Explanatory variables	M	M	M	M	Mo
	odel1	odel 2	odel3	odel 4	del 5
	—	—	—	—	—
Year of the survey(Phase)					
2000	®	®	®	®	®
2006	0.	0.	0.	0.	0.3
	257***	277***	281***	287***	17***

Age (quantitative)		0.	0.	0.	0.9
		988	988	978**	78**
Nationality		®	®	®	®
Rwandan		1.	1.	1.	1.3
Tanzanian		675**	668***	570***	98**
Ugandan		1.	1.	1.	1.0
Other		162	191	133	77
		1.	1.	1.	1.4
		732**	777***	712**	84**
Educational level			0.	0.	0.9
No level			870	907	93
Primary			1.	1.	1.1
Secondary and more			075	094	05
			®	®	®
Marital status				®	®
Lives in union				0.	0.6
Does not live in union				655**	43**
Was absent in more than one month					2.1
Yes					52***
No					®
Khi2 probability	1	1	1	1	15
	07.70***	22.58***	23.13***	29.13***	4.44***
Reference model is represented by ®					

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

Compared to Rwandan truck drivers, Tanzanians and truck drivers found in the group « other » had more chances of having had sexual relations with commercial partners. This disadvantage for truck drivers interviewed in 2000 (or the advantage of those of 2000), decreased as the effect of the variables was controlled. However, it was after introducing the last variable of the model of “has been absent from the residence for more than one month” that those variations substantially decreased and remained important at the threshold of 5%. Thus, the Tanzanian truck drivers who had 67% more chances of having had sexual relations with commercial partners than their Rwandan peers had only 40% more chances. Likewise, as the truck drivers found in the group “other nationality” who had 73% more chances have 48% more chances.

This explains that what makes the difference among truck drivers as regards to sexual behaviour with respect to commercial partners was not the fact that they are Rwandans or Tanzanians but rather the period of absence from home for more or less long time due to professional reasons. It was therefore noticed that those who, during the last 12 months, were absent from their home for more than one month had 2.15 times more chances of having sexual relations with commercial partners than their peers who have not been absent from home or who were absent from home for a shorter period. The fact of being absent from home for a relatively long period was a factor of risk of having sexual relations with commercial partners. Another factor is the marital status of the truck driver. The results of Table 40 show that the truck drivers not living in union are less exposed to have sex with commercial sexual partners than those who are married.

Finally, it is important to point out that the age becomes significant at the threshold of 5 % starting from the introduction of the variable “marital status”. Actually, it is a strong correlation between the age and the marital status that explains this situation since in general people living in union are older or more mature.

10.3. Knowledge and condom use

The multivariate analysis focuses on two separate indicators according to whether the condom was used during the last sexual relations with a regular sexual partner or a commercial partner.

Indicator 1: He/she used the condom in the last sexual relations with a regular partner in the last 12 months preceding the survey

As in Table 36, Model 1 of the Table 41 shows that the use of the condom during the last sexual relations with a regular partner does not vary significantly between 2000 and 2006. That remains true whatever independent variable introduced.

The marital status and the age are the two variables which discriminate truck drivers. The truck drivers who do not live in union have 7 times more chances of having used the condom in the last sexual relations with a regular partner than people living in union, which is reasonable.

Table 41: Net effects of independent variables on having used a condom during the last sexual relations with a regular partner in the last twelve months preceding the survey

Explanatory variables	Mo del 1	Mo del 2	Mo del3	Mo del 4	Mo del5
Year of the survey (Phase)					
2000	®	®	®	®	®
2006	0.9	0.9	0.9	0.9	0.96
	67	72	79	60	8
Age (quantitative)		0.9	0.9	0.9	0.97
		44***	44***	74**	4**
Nationality		®	®	®	®
Rwandan		0.8	0.8	1.0	1.01
Tanzanian		33	38	26	6
Ugandan		1.3	1.3	1.6	1.62
Other		18	12	28*	4*
		1.0	1.0	1.2	1.26
		44	33	81	8
Educational level			1.3	1.4	1.48
No level			77	74	1
Primary			23	43	3
Secondary and more			®	®	®
Marital status				®	®
Live in union				7.0	6.98
Do not live in union				20***	3***
Was absent in more than one month					1.05
Yes					3
No					®
					85.5
Khi2 probability	0.0	30.	31.	85.	
	4	99***	56***	43***	0***

Reference model is represented by ®

Indicator 2: He/she used the condom in the last sexual intercourse with a commercial partner in the last 12 months

For this indicator, results obtained on the level of Table 36 are confirmed here given that the proportion of the truck drivers having used a condom during the last sexual relations with a commercial partner considerably increased. As it can be observed (Model 1, Table 42), the truck drivers interviewed in 2006 had 2.8 times more chances of having used a condom in the last sexual relations with this type of a partner than their peers interviewed in 2000. This advantage is maintained after control of the independent variables.

The only significant variable is the age of the interviewees. The value of the comparison of chance indicates that the young truck drivers used the condom more than others in the last sexual relations with commercial sexual partners.

Table 42: Net effects of independent variables on the fact of having used a condom during the last sexual relations with a commercial partner in the last twelve months preceding the survey

Explanatory variables	Mo del 1	Mo del 2	Mo del3	Mo del 4	Mo del 5
Year of the survey (Phase)					
2000	®	®	®	®	®
2006	2.8	2.7	2.6	2.6	2.74
	20***	73***	83***	21***	8***
Age (quantitative)		0.9	0.9	0.9	0.95
		45***	44***	57**	8**
Nationality		®	®	®	®
Rwandan		0.7	0.7	0.7	0.74
Tanzanian		42	33	83	7
Ugandan		0.9	0.9	0.9	0.96
Other		46	02	74	9
		47	56	15	0
Educational level			0.2	0.2	0.24
No level			33	23	0
Primary			0.7	0.7	0.73
Secondary and more			25	26	3
			®	®	®
Marital status				®	®
Lives in union				1.5	1.56
Does not live in union				77	3
Was absent in more than one month					1.36
Yes					7
No					®
Khi2 probability	13.	28.	32.	34.	36.2
Reference model is represented by ®	40***	64***	57***	93***	5***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

10.4. Knowledge and antecedents of STI

In this part, two indicators were analysed: the level of knowledge of at least one STI symptom in a men, and the fact of having had one STI symptom during the last twelve months having preceded the survey.

Indicator 1: knows at least one STI symptom in men

The results of Table 43 confirm the findings obtained earlier and which show that information and sensitization campaigns for this category of the population on the STI symptoms in men between 2000 and 2006 did not provide the expected results because the proportion of the truck drivers who know at least one STI symptom in men decreased during this period. A regression logistic model concerning this indicator supports that situation because Model 1 of Table 43 below indicated that truck drivers interviewed in 2006 had 49% less chances to have mentioned at least one symptom compared to their peers interviewed six years earlier. Even if this disadvantage persisted after the control of some variables, its level was reduced to the last model where it was only 41%.

This level of knowledge of STI symptoms in men considerably varied according to nationality, educational level, marital status and the fact of having been absent from home for more than one month.

Table 43: Net effects of independent variables on the fact that truck drivers know at least a STI symptom in a man

Explanatory variables	Mo del 1	Mo del 2	Mo del3	Mo del 4	Mo del 5
Year of the survey (Phase)					
2000	®	®	®	®	®
2006	0.5	0.5	0.5	0.5	0.58
	13***	24***	19***	30***	6***
Age (quantitative)		1.0	1.0	1.0	1.00
		13*	14*	06	7
Nationality		®	®	®	®
Rwandan		1.5	1.5	1.4	1.33
Tanzanian		55**	55**	81**	9**
Ugandan		0.9	0.9	0.9	0.91
Other		66	82	39	6
		0.9	0.9	0.9	0.80
		24	53	12	3
Educational level			0.5	0.5	0.59
No level			31**	57*	8*
Primary			0.9	0.9	0.92
Secondary and more			12	17	9
			®	®	®
Marital status				®	®
Live in union				0.7	0.68
Do not live in union				04**	6**
Was absent in more than one month					1.82
Yes					0***
No					®
Khi2 probability	20.	31.	36.	40.	56.1
Reference model is represented by ®	18***	94***	07***	29***	7***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

Tanzanian truck drivers had 34% more chances to know at least one STI symptom in men than their Rwandan peers. This advantage was 55% in Model 2 and significantly decreased after the introduction of the marital status and the variable “absence from home for more than one month”.

The low educational level is a factor that explained the low level of knowledge of STI symptoms in men because illiterate truck drivers had 40% less chances to know a STI symptom in men than those who reached at least the secondary school education (Table 43).

Truck drivers who do not live in union had 29% less chances to know the STI symptoms in men than their peers in union. Lastly, it should be noted that truck drivers who were absent from their home for more than one month in the last 12 months prior to the survey had approximately 2 times more chances than those who were not absent from their home to know STI symptoms. It is their level of exposure to sexual relations with the commercial partners that could partly explain this improved knowledge.

Indicator 2: had at least one STI symptom

Even if the level of knowledge of STI symptoms in men or women decreased in the population of truck drivers, it should however be noted that there was a decline of the proportion of this category of the population that had a STI symptom in the same period (Table 44). The truck drivers interviewed in 2006 had 56% less chances of having had a STI symptom, compared to those interviewed in 2000. This proportion of chances was even higher with the gross model (Model 1) which did not take into account effects of other individual characteristics. Indeed, taken separately, Model 1 indicated that the truck drivers interviewed in 2006 had 66% less chances of having had an STI symptom than those interviewed six years earlier.

It was after introducing the variable “nationality” and “absence from home for more than one month” that this proportion of chances decreased.

The main variable that explains the difference of the antecedents of STI was the absence from home for at least one month since these truck drivers had 2 times more chances of having had STI than others.

Table 44: Net effects of independent variables on the fact of having had a STI symptom during the last 12 months preceding the survey

Explanatory variables	Mo del 1	Mo del 2	Mo del3	Mo del 4	Mo del 5
Year of the survey (Phase)					
2000	® 0.3	® 0.4	® 0.3	® 0.3	® 0.44
2006	76***	06***	93***	94***	0***
Age (quantitative)		0.9 92	0.9 91	0.9 90	0.98 9
Nationality		® 1.4	® 1.4	® 1.4	® 1.30
Rwandan		49	69	60	9
Tanzanian		1.5	1.4	1.4	1.35
Ugandan		10	31	24	3
Other		1.9 15*	1.8 16*	1.8 08	1.59 8
Educational level			1.3 47	1.3 53	1.46 7
No level			0.8 58	0.8 60	0.86 6
Primary			®	®	®
Secondary and more				® 0.9	® 0.95
Marital status				58	3
Lives in union					
Does not live in union					
Was absent in more than one month					2.08 3***

Yes					®
No					
Khi2 probability	15.	19.	19.	19.	25.9
Reference model is represented by ®	69***	03***	87***	89***	8***

Note : *** $p < .01$; ** $p < .05$; * $p < .10$

10.5 HIV Testing

Considering the data of Table 45, it can be estimated that the public awareness campaigns that sensitize the population on HIV screening test so as to enable them to know their HIV status produced a real impact on truck drivers. Consequently, in 2006 truck drivers had 3.2 times more chances of having had an HIV test than those interviewed in 2000.

The nationality, the educational level and marital status differentiated the behaviour of truck drivers. Tanzanian and Ugandan truck drivers had less chances of having had the HIV testing than their Rwandan peers. The illiterate truck drivers and of those with primary educational level also had less chances, compared to truck drivers with secondary level of education or higher who had more chances to have had an HIV test. Lastly, truck drivers who do not live in union and who had had an HIV testing were fewer compared to truck drivers living in union.

Table 45: Net effects of independent variables on the fact having had the HIV test at any moment in life

Explanatory variables	Mo del 1	Mo del 2	Mo del 3	Mo del 4	Mo del 5
Year of the survey (Phase)					
2000	®	®	®	®	®
2006	3.1 92***	3.0 92***	2.9 20***	3.1 96***	3.22 6***
Age (quantitative)		1.0 11	1.0 11*	0.9 93	0.99 3
Nationality		®	®	®	®
Rwandan		0.7	0.7	0.6	0.62
Tanzanian		17**	22**	29***	4***
Ugandan		0.6	0.5	0.4	0.48
Other		03*** 66	52*** 00	87*** 12	6*** 4*
Educational level			0.6	0.7	0.78
No level			82	77	2
Primary			0.6	0.6	0.66
Secondary and more			64*** ®	67*** ®	7*** ®
Marital status				®	®
Live in union				0.4	0.40
Do not live in union				07***	6***
Was absent in more than one month					1.05
Yes					3
No					®
Khi2 probability	88. 43***	10 0.97***	11 0.91***	14 4.17***	144. 32***
Reference model is represented by ®					

Note : *** p<.01 ; **p<.05 ; *p<.10

CONCLUSIONS

The data presented in the present report show that as years pass by, the level of knowledge as regards HIV/AIDS has significantly increased. Thus, the known methods of HIV prevention namely abstinence, faithfulness to an uninfected partner and the use of condoms were more known in 2006 than they were in 2000 more particularly among the youth population. An improvement of the level of knowledge was observed only on two of the 3 methods among sex workers and on one of the 3 methods among truck drivers. These data also indicate the persistence of erroneous methods in the various studied populations.

As a result, between the two phases of surveys, proportions of youth who thought that the AIDS virus can be transmitted through mosquito bites and/or who report that HIV can be transmitted by sharing a meal with an infected person decreased among sex workers and truck drivers, but not in the youth population. The 2006 health and demographic survey also showed that a higher number of youth aged between 15 and 19 years cited these erroneous HIV/AIDS prevention methods, i.e. transmission of HIV through mosquito bites (10%) or by sharing a meal with an infected person (13%). However, by establishing a composite indicator on comprehensive knowledge of HIV/AIDS, it seems that in each of the three target populations in this survey, the level of knowledge has significantly increased between 2000 and 2006.

As it was confirmed in behavioral change theories, significant improvement of the level of knowledge of the methods of HIV prevention does not necessarily imply the adoption of less risky behaviour. The proportion of the youth aged between 15 and 19 years of age who had had sex at a certain time in their life remained almost unchanged between these two surveys. On the other hand, the proportion of the youth who had had sexual relations during the last 12 months preceding the survey slightly decreased, while there was recrudescence in trans-generational sexual relations.

Consequently, more girls in 2006 than in 2000 (boys also to a small extent) reported having had their first sexual relations with an older sexual partner at least ten years older. However, the use of multiple sexual partners slightly decreased in the population of girls but its level did not change in that of boys. However, the habit of using multiple partners was not relatively very common compared to levels observed in several other African countries. In the population of truck drivers, there was also a decrease of practice of having multiple partners and paying sexual relations. The decline in the use of multiple partners has been invariable in the surveys conducted in Rwanda for several years.

One of the main prevention methods disseminated among the youth population as an HIV prevention strategy was sexual abstinence and delaying the age of the first sexual relation. These surveys indicate that between 2000 and 2006, proportion of the youth who had abstained from any sexual relations had shifted from 80.9% to 81.8%. Although the difference is not significant (it is however among boys where the proportions passed from 71% to 76%). These data show that various prevention programmes have been successful to contain the increase of sexual relations before marriage among the youth. It was also noted that the youth indulge in active sexual life at later age than they did it in the past. Therefore, the proportion of the youth who had their first sexual relation at the age 15 remained unchanged at 11% between 2000 and 2006. Among sex workers, the age for entering into prostitution seems to have decreased. Today, the sex workers start prostitution a bit at a later age than they did it in 2000. Thus, in 2006, half of sex workers had had their first paying sexual relation at the age of 19. In 2000, this median age of the first paying sexual relations was 18 years.

The second method of prevention adapted to sexually active people is the use of a condom. There is an apparent increase in the proportion of boys and girls who report having heard of it and know where to obtain it. However, more efforts need to be made since in general, less than half of youth

know where they could obtain a condom in case of need. Ignorance of girls in this area is considerable since only less than one third know where they could get condoms. On the other hand, almost all truck drivers and sex workers declare having heard of condoms and know where to obtain them. The level of its use is quite low.

Although the proportion of the youth who declares having used the condom at least once doubled between the two periods of the survey, both in girls and in boys (passing from 11% to 23% in general), it was noticed that in 2006, 77% of sexually active young people had never used a condom. The systematic use of condoms, which should be a rule in these young people who are not in union, concerns only a small proportion of individuals (one person out of hundred). A small number of sexually active people report having had sexual relations with the commercial partners limits the analysis that could have been made on the level of use of condoms in the risky situations⁷.

In the population of sex workers, the level of the use of condoms in risky situations is particularly catastrophic. In 2006, 85% declared having used it in the last sexual relations with a client but only 10% declared having used it in each sexual relations with their clients in the last 7 days. This indicates to what extent these women are at risk of being infected with HIV. Indeed, the occasional use is quite as ineffective as not using the condom at all because only one unprotected sexual relation is sufficient for one to be infected. Truck drivers are also particularly at risk of HIV. Although a higher number of them, compared to sex workers, declared having systematically used the condom in the sexual relations with paying partners (47% in 2000 and 60% in 2006), it was obvious that an important proportion of truck drivers are not protected in each sexual relation with sex workers.

Thus, in spite of efforts made in recent years to make the condom more available, which doubled the proportion of the youth who know where to obtain a condom for example, more efforts need to be made not only by multiplying condom selling points, but also by providing information to the population and particularly to the youth on the existence of these selling points. It is indeed advisable to identify sites that are most accessible to the youth and where they feel most comfortable to obtain a condom and to supply these selling points with adequate condoms. Equally important, it is necessary to intensify communication in order to increase the level of the use of condoms. It is important to explain to the population that condom is only worth if it is correctly and systematically used and more particularly outside stable retaliations. Complementary studies need to be carried out in order to understand obstacles hindering the use of condoms in certain groups like truck drivers and sex workers. Indeed, due action can be taken only if it is understood why some people are systematically reluctant to use the condom with paying partners with whom the links are rather loose.

Knowledge of STI symptoms in both men and women considerably increased between 2000 and 2006 in the youth population and that of sex workers. During the same period, the number of young people and truck drivers who declared having had STI symptoms during the last 12 months preceding the survey decreased by half. Reported cases of STI also decreased considerably among sex workers. But these are the reported cases of STI prevalence and this does not prove that there was a real decrease of sexually transmitted infections.

Data analysis of the two phases of surveys also showed greater proximity of individuals of each of three groups studied with respect to the disease. In concrete terms, from one survey to another,

⁷ In a series of surveys conducted in 2000, 2002 and 2003 among young people aged between 15-24, (cf. PSI & IRESCO, *Projet de Santé de reproduction des adolescents de Butare au Rwanda : Rapport comparatif des phases 1, 2, 3 dans la population des jeunes de Butare*, Kigali, décembre 2003), such a comparison was not done and for the same reasons.

more people stated to know a close relative or friend infected by HIV or who had died of AIDS. Likewise, given this greater visibility of the disease, more people reported to have undergone an HIV test and got test results. This indicator permitted to get most significant changes. Whereas only 1% of the youth declared in 2000 to have had the HIV test and got the results, this proportion reached 12% in 2005.

A similar tendency was observed in other groups of the population where the proportions doubled both among sex workers and truck drivers. This strong desire of population to have the HIV test can be explained by a greater accessibility to Voluntary Counselling and Testing services whose sites have been increased in the country between the two periods and better perception of the individual risk to be infected with HIV and as well as better sensitization on necessity to have the HIV test. Although the rate of progress of this indicator is very important, intensification of sensitizing the population on HIV testing combined with the increase of Voluntary Counselling and testing centres may contribute to the increase of the number of people having the HIV test.

Multivariate analysis demonstrated that the factor of time was not the only factor that led to improvement registered at the level of different indicators. Some socio-demographic factors have also played an important role as regards to some significant changes. Thus, numerous positive changes have been noticed in more educated people. This showed that people who are more educated are more likely to adopt positive behaviour that prevents them from being infected with HIV.

Equally important, changes that have been noticed vary from one region to another and this suggested, on one hand that more efforts need to be deployed in some regions so that the adoption of positive behaviour with respect to HIV become the same in all Provinces of the country. On the other hand, it is necessary, in regions where positive changes have been more noticeable, to identify the best practices in the area of prevention and related services and to replicate them in other regions.

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