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A Statistical Study on Awareness and Attitude of Students of Assam, India towards HIV/AIDS

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Abstract

HIV/AIDS has become a serious problem in India with one of the highest rates of spread in the world. Program managers and policy makers have often recommended that School / College can act at the centre point for disseminating information and education on HIV/AIDS. This paper seeks to examine the existence of a relationship between various socio-economic, demographic factors and the level of awareness as well as the attitude and behavior of college students of Assam about HIV/AIDS. Total of 1650 students from 35 different colleges cutting across 15 different districts of the state of Assam were interviewed.

Key Words: HIV/AIDS, Awareness, attitude, logistic regression, odds ratio.

1. Introduction

HIV and AIDS confront the world with many challenges. Humanitarian organizations have worked hard to meet them and to make up for a lack of action in the first few years of the epidemic. But far, far more needs to be done, in partnership with governments but also, above all, with communities whose wisdom and resilience offer so much to the HIV response. That is why HIV-AIDS has been selected as the theme for the *World Disasters Report* in the year 2008. In 1993, the first *World Disasters Report* characterized the AIDS pandemic as a chronic, expanding disaster. At that time, an estimated 12.9 million people were living with HIV, 2.6 million people had developed AIDS-related illnesses and of those, 90 per cent had died. Some 15 years later, at the end of 2007, it was estimated that around 33 million people were living with HIV. The latest revised data on HIV and AIDS show that AIDS is the fifth major cause of death in middle-income countries, the third in low-income countries and the leading cause in sub-Saharan Africa (UNAIDS, 2007). More than 25 years since the first cases of AIDS were reported, there is no cure, no vaccine and not much optimism that these will be found in the near future, if at all. (World Disaster Report, 2008)

HIV/AIDS has become a serious problem in India with one of the highest rates of spread in the world. Many features contribute to India's vulnerability concerning the transmission of HIV; poverty, illiteracy, a large and young population and an increasing level of urbanization. Soon after the first HIV/AIDS cases been reported in India in 1986, the Government of India initiated important measures to attack the epidemic. Pilot screening of high risk population started and a National AIDS Committee was immediately constituted by the Ministry of Health and Family Welfare. In 1987 a National AIDS Control Programme was started. The National AIDS Committee was formed to bring together different ministers, private institutions and non-Government organizations for effective collaboration in accomplishing the programme. To strengthen the AIDS programme at the state level, the state governments have own organizations and committees. They take the policy decisions for implementation of the HIV/AIDS control programme and make guidelines and plans in the respective states. Nevertheless the efforts put by the Government, even in most of the urban population, the awareness about this dreaded disease is very low. As the possibility of development of a vaccine for prevention of AIDS appears remote in near future, alternate strategies must be formulated and implemented on urgent basis. The most viable and acceptable step would be to increase the education and awareness about this disease in the general population. Sensing the seriousness of the matter, scholars around the world started to focus on awareness and behavior towards HIV/AIDS. Boler and Jellema (2005) carried out a survey on cross-country study of educational responses to HIV/AIDS. Rwenge (2000) studied about sexual risk behaviors among young people in Bamenda, Cameroon. Egger et al (1993) conducted a study on HIV/AIDS related knowledge, attitudes and practices among Managuan Secondary school students. Lal *et al* (2008) studied about awareness on HIV/AIDS among Senior Secondary School Children of Delhi. A total of 2592 students belonging to Classes IX to XI in selected schools participated in the study. The findings in the study reiterated the need for re-enforcing school AIDS education. There was a strong need school education must directly address stigmatizing attitudes about HIV/AIDS, gaps in HIV/AIDS knowledge and awareness of HIV- related health resources. Bhalla *et al* (2005)

conducted a similar study on knowledge and attitude about HIV/AIDS among school children in Jamnagar, Gujarat. They observed that although a significant proportion of students heard about HIV/AIDS, still they were carrying lot of misconceptions regarding HIV/AIDS. Hazarika and Mahanta (2005) carried out a study to assess the knowledge and attitudes of young unmarried women regarding sexually transmitted diseases, including HIV in three residential regional institutes of Northeastern India. A representative sample of 574 female students, 16-25 years of age, were interviewed by a pre-tested questionnaire to assess their knowledge on HIV. Ganguli *et al* (2002) studied about AIDS awareness among undergraduate students in Maharashtra. Chatterjee *et al* (2001) also carried out a similar study on awareness of HIV/AIDS among school students and teachers of higher secondary schools in North Calcutta.

School/ College students of today are exposed to the risk of being victims of HIV/AIDS – which was quite unknown to their predecessors a few decades ago. The epidemic of HIV/AIDS is now progressing at a rapid pace among young people. Studies have reported that young people form a significant segment of those attending sexually transmitted infection clinics and those infected by HIV (Urmil *et al*, 1999). Programme managers and policy makers have often recommended that School / College can act at the centre point for disseminating information and education on HIV/AIDS. Hence School / College education has been described as a 'social vaccine', and it can serve as a powerful preventive tool (Boler and Jellema, 2005). Keeping the above discussion in mind, the aim of the present study is to assess current status of knowledge and awareness among the college students about HIV/AIDS and their attitude towards the dreaded disease. This paper looks into the following aspects

- To examine the existence of a relationship between various socio-economic, demographic factors and the level of awareness among college students and to quantify the relationship vis-à-vis different socio-economic and demographic factors.
- To examine and analyse the attitude and behavior of college students towards HIV infected patients.

2. **Methods**

The study was conducted over a period of 3 months. Total of 1650 students from 35 different colleges situated in the Brahmaputra valley cutting across 15 different districts of the state of Assam were interviewed during data collection. Assam is a province towards the North-Eastern part of India. The students of the selected colleges were administered a pre-designed questionnaire, which included multiple choice questions. Data were entered and analyzed using SPSS version 11.5. Here we propose to carry out logistic regression analysis to examine a possible relationship between various socio-economic and demographic factors with the dichotomous dependent variate – awareness of the respondents. An advantage with logistic regression analysis is that it enables us to carry out multivariate analysis taking all the explanatory variables together. Additionally, unlike the univariate tests, where presence / absence of a relationship could alone be tested, the technique of logistic regression facilitates us to form an opinion of the strength of relationship, if present. Furthermore, we propose to carry out logistic regression analysis to examine the attitude and behavior of students towards HIV/AIDS.

Let us briefly describe the procedure of logistic regression analysis. For this purpose, let us define Y as the dichotomous variable and $x_1, x_2, x_3,\ldots,x_k$ be a set of independent variables called covariates. Then the form of the logistic regression model is

$$\pi_x = \frac{1}{1+e^{-Z}} \qquad (1)$$

where

$$z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k$$

A transformation of π_x that will be central to our study of logistic regression is the logit transformation. This transformation is defined, in terms of π_x, as follows (Hosmer and Lemeshow, 2000) :

$$g(x) = \log_e \left[\frac{\pi_x}{1-\pi_x} \right]$$

$$= \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k \quad (2)$$

3. Results and Discussion

Altogether, 1650 respondent students were interviewed during data collection, out of which 850 were females and 800 were males. The average age of the respondents is 19.79 ± 1.52 with minimum age of 17 and maximum of 24 years. Although all the respondents heard of HIV/AIDS, 16.7% don't know any modes of transmission and 22.7% don't know any method of prevention of the disease. However, 92.4% of the respondents feel sex education should be included in the school/college curriculum. As mentioned earlier, we have used logistic regression technique to examine and quantify the association between socio-economic and demographic factors and level of awareness about HIV/AIDS among college students. We have considered the dichotomous variable – aware of HIV/AIDS as the dependent variable and a set of variables as the covariates. Furthermore, we have considered separate logistic regression analysis for the attitude of the respondents and its possible association with the covariates. We present below a brief description of the different categories of the covariates considered in the study.

1. *Age*: We classified age into two categories viz. below 20 years and 20 years and above.
2. *Gender*: Categories are males and females.
3. *Class*: we have categorized class into two categories viz. Intermediate and Under graduate.
4. *Place of residence*: Two categories viz. rural and urban have been considered.
5. *Caste*: We have categorized caste into two groups – the advantaged groups comprising of General and Other Backward Castes and the disadvantaged group (i.e. Scheduled Caste and Scheduled Tribes as defined in the Constitution of India).
6. *Religion*: Four different categories have been considered viz. Christianity, Hinduism, Islam and Others.
7. *Mother tongue*: Mother tongue or race or communities of the respondents have been categorized as Assamese, Bengali, Hindi and others, the major linguistic groups of this region in that order.
8. *Education of father*: We have categorized into- high, moderate and low education level.
9. *Education of mother*: The categories are - high, moderate and low education level.
10. *Occupation of father*: We have categorized into – service, self-employed and others.
11. *Occupation of mother*: We have categorized occupation of mothers into – house wife and others.
12. *Income groups*: The categories are low, middle income and high income groups. This categorization is done in accordance with criterion used by the Organization for Economic Cooperation and Development (OECD).
13. *Source of information*: Different sources considered here are – electronic media, print media and others.

These variables were considered due to the fact that these variables are expected to have some influences on awareness and attitude towards HIV/AIDS. Number of respondents for different categories of the variables under study are presented in Table 1.

We observe from table 1 that 51.5% of the total respondents are female and 59.1% are of age 20 years and above. Further, 84.8% of the respondents study in Under graduate courses and 73.8% of the respondents are *Hindu*, 42.6% belong to *Assamese* community and 58.6% belong to low income group. More than 80% of the students mentioned electronic media as the main source of information.

Table 1: Number of respondents for each variable under study

Variables	Frequency (Percentage)	Variables	Frequency (Percentage)
Age groups		**Education of mother**	
< 20 years	675 (40.9)	High education	50 (3.0)
>= 20 years	975 (59.1)	Moderate education	763 (46.3)
Gender		Low education	787 (47.7)
Female	850 (51.5)	No education	50 (3.0)
Male	800 (48.5)	**Occupation of father**	
Class		Service	875 (53)
Intermediate	250 (15.2)	Self-employed	750 (45.5)
Under Graduate	1400 (84.8)	Others	25 (1.5)
Place of Residence		**Occupation of mother**	
Rural	768 (46.5)	House wife	1563 (94.7)
Urban	882 (53.5)	Others	87 (5.3)
Caste		**Income groups**	
Socially advantaged	1097 (66.5)	Low income	967 (58.6)
Socially disadvantaged	553 (33.5)	Middle income	475 (28.8)
Religion		High income	208 (12.6)
Christianity	30 (1.8)	**Source of information**	
Hinduism	1218 (73.8)	Electronic media	1325 (80.3)
Islam	366 (22.2)	Print media	250 (15.2)
Others	36 (2.2)	Others	75 (4.5)
Mother Tongue			
Assamese	703 (42.6)		
Bengali	436 (26.4)		
Hindi	257 (15.6)		
Others	254 (15.4)		
Education of father			
High education	650 (39.4)		
Moderate education	525 (31.8)		
Low education	475 (28.8)		

As far as analysis is concerned, first of all we considered logistic regression to check the awareness of the respondents- both boys and girls taken together and the result is presented in table 2. The corresponding overall predicted correct percentage of 85.9% is considered highly satisfactory which signifies good fitting of the regression model. The cut off value for determining the predicted outcome has been arrived at using the procedure outlined by Crammer (1999). Moreover, we were interested on the variable gender and we decided to run separate regression analyses for male and female and the results are presented in tables 3 and 4 respectively. Furthermore, we conducted another logistic regression analysis to have an idea of different covariates affecting the attitude of the students towards HIV/AIDS and the results are presented in Table 5. In Table 2 different characteristics are presented with their corresponding p-values. The odds ratio for different categories with corresponding 95% confidence intervals have also been tabulated.

Table 2: Results of Logistic Regression regarding awareness of respondents

Variables	P-value	Odds Ratio	95% Class Interval for Odds Ratio	
			Lower	Upper
AGE_GROUP				
Less than 20 years	.000**	5.155	2.039	10.462
20 years and above ®				
GENDER				
Female	.009**	.439	.269	.905
Male®				
CLASS				
Intermediate	.000**	.017	.007	.043
Under Graduate ®				
PLACE OF RESIDENCE				
Rural	.019*	.583	.371	.916
Urban ®				
CASTE				
Advantaged groups	.002**	2.633	1.419	4.886
Disadvantaged groups ®				
RELIGION				
Christianity	0.468	.601	.152	2.374
Hinduism	0.080	.018	.002	.151
Islam	0.116	.360	.136	.713
Others ®				
MOTHER_TONGUE				
Assamese	.708	.261	.155	.440
Bengali	1.003	.361	.183	.711
Hindi	.306	.578	.343	.737
Others ®				
EDUCATION_FATHER				
High education	.198	1.09	.960	1.367
Moderate education	.392	.870	.680	1.619
Low education ®				
EDUCATION_MOTHER				
High education	.000**	7.532	4.487	14.59
Moderate education	.045*	3.840	1.037	9.82
Low education	.268	2.196	.537	4.30
No education ®				
OCCUPATION_FATHER				
Service	.298	.980	.890	1.793
Self-employed	.156	.854	.690	1.381
Others ®				
OCCUPATION_MOTHERS	.997	23.224	21.900	38.915
House wife				
Others ®				
INCOME GROUPS				
Low income groups	.008**	.585	.393	.872
Middle income groups	.012*	.469	.295	.783
High income groups				
SOURCE OF INFORMATION				
Electronic media	.000**	3.01	2.93	4.13
Print media	.000**	2.83	1.56	3.08
Others ®				

Note: ® denotes reference category. * indicates significance ** indicates highly significance

Here we discuss possible association of each independent variable with level of awareness, the dependent variable of interest vide table 2. It is clear that there is significant relationship between age and awareness. We have categorized age into two categories viz. less than 20 years and 20 years and above with latter as the reference category. We observe vide table 2 that students in the age group less than 20 years are more aware (odds ratio being 5.155>1) as compared to their senior counterpart. Similarly girl students are found to be less aware than boys; the fact is reflected by the odds ratio of 0.439<1. The p-value of 0.019 for place of residence indicates significance at 5% probability level, which states that students living in rural areas are less aware (odds ratio being .583<1) than the students who reside in urban places. Further, students from advantaged groups have greater degree of awareness as compared to students of disadvantaged groups. We observe however that Religion, and Mother tongue do not have any significant effect on level of awareness of students.

Another significant factor is the education of mother. We observe vide table 2 that children of mothers with higher level of education are more aware (odds ratio being 7.532>1) about HIV/AIDS as compared to the children of mothers having lower level of education. Moreover, those students whose mothers are of moderate education are more aware (odds ratio being 3.840>1) than the students whose mothers are having no education. This is perhaps due to the fact that mother with higher level of education can teach their child about the dreaded disease as compared to mothers with lesser level of education. We observe however that education of father does not have any significant effect on the awareness of their children. Similarly occupations of father and mother do not show any significant effect on the awareness level of their wards. Further, the same table reveals that families with low income level have lesser degree of awareness as compared to the children of more affluent families. Additionally, it has been observed vide table 2 that students having access to electronic and print media are more aware of HIV/AIDS as compared to the students having access to some other sources of information such as from school/college, friends and relatives etc.

Table 2 also indicates that gender have significant effect on the awareness of the students, which create some interest on the variable gender and we decided to run separate regression analyses for male and female and the results are presented in tables 3 and 4 respectively. The overall correct prediction for male (88%) and female (78.5%) are highly satisfactory.

Table 3: Results of Logistic Regression regarding awareness of respondents- Male

Variables	P-value	Odds Ratio	95% Class Interval for Odds Ratio	
			Lower	Upper
AGE_GROUP				
Less than 20 years	.796	.000	.000	.000
20 years and above ®				
CLASS				
Intermediate	.295	.000	.000	.000
Under Graduate ®				
PLACE OF RESIDENCE				
Rural	.008**	.436	.269	.687
Urban ®				
CASTE				
Advantaged groups	.000**	3.309	2.175	6.845
Disadvantaged groups ®				
RELIGION				
Christianity	.113	.081	.009	.064
Hinduism	.995	.000	.000	.000
Islam	.216	.066	.014	.092
Others ®				
MOTHER_TONGUE				
Assamese	.324	.690	.330	1.442
Bengali	.170	.092	.035	.239

Hindi Others ®	.529	1.458	.450	4.724
EDUCATION_FATHER				
High education	.438	.060	.047	.107
Moderate education	.998	.109	.085	.152
Low education ®				
EDUCATION_MOTHER				
High education	.009**	3.629	2.892	4.391
Moderate education	.039*	1.840	1.037	2.02
Low education	.388	1.496	.887	2.981
No education ®				
OCCUPATION_FATHER				
Service	.199	.000	.000	.000
Self-employed	.691	.076	.029	1.246
Others ®				
OCCUPATION_MOTHERS				
House wife	.937	14.612	.000	.000
Others ®				
INCOME GROUPS				
Low income groups	.006**	4.745	1.006	12.372
Middle income groups	.017*	1.400	.931	1.713
High income groups				
SOURCE OF INFORMATION				
Electronic media	.093	1.03	.830	1.130
Print media	.015*	1.206	.906	1.616
Others ®				

Note: ® denotes reference category. * indicates significance ** indicates highly significance

We observe from the above table that attributes like place of residence, caste, education of mother, per capita annual income and source of information have significant effect on awareness of male respondents about HIV/AIDS. We further observe that male students hailing from rural background are less aware (odds ratio being 0.436<1) than those who live in urban areas. Moreover, students belonging to advantaged group are more aware about HIV/AIDS (odds ratio being 3.309) than students from disadvantaged group. Likewise, education of mother has a significant effect on the awareness of their wards. We have seen that higher education of mother have positive impact (odds ratio 3.629) on awareness of their sons as compared to those students whose mothers have no education or low level of education. Further, male students belonging to low or middle income group are more aware about the dreaded disease as compared to students belonging to well to do families. Table 3 also indicates that source of information has a significant effect on the awareness of male students about HIV/AIDS. The odds ratio for print media (1.206) signifies that male students consider print media as an important source of information in comparison to other sources of information.

The results of logistic regression analysis done for female respondents separately have been presented in the following table 4.

Table 4: Results of Logistic Regression regarding awareness of students-female

Variables	P-value	Odds Ratio	95% Class Interval for Odds Ratio	
			Lower	Upper
AGE_GROUP				
Less than 20 years	.036*	.760	.498	1.250
20 years and above ®				
CLASS				
Intermediate	.155	.397	.901	1.030
Under Graduate ®				
PLACE OF RESIDENCE				
Rural	.028*	.831	.662	1.087
Urban ®				
CASTE				
Advantaged groups	.081	1.022	.905	2.096
Disadvantaged groups ®				
RELIGION				
Christianity	.091	.081	.019	.346
Hinduism	.895	.000	.000	.000
Islam	.307	.069	.034	.219
Others ®				
MOTHER_TONGUE				
Assamese	.134	.490	.230	.942
Bengali	.060	1.092	.995	1.239
Hindi				1.234
Others ®	.429	1.051	.989	
EDUCATION_FATHER				
High education	.571	.000	.000	.000
Moderate education	.292	.000	.000	.000
Low education ®				
EDUCATION_MOTHER				
High education	.013*	2.381	1.892	3.598
Moderate education	.039*	1.591	1.219	1.946
Low education	.398	1.315	1.092	2.783
No education ®				
OCCUPATION_FATHER				
Service	.360	.000	.000	.000
Self-employed	.191	.066	.037	1.249
Others ®				
OCCUPATION_MOTHERS				

House wife	.908	1.839	.000	.000
Others ®				
INCOME GROUPS	.049*	3.345	1.206	7.976
Low income groups	.000**	4.100	3.131	7.917
Middle income groups				
High income groups				
SOURCE OF INFORMATION				
Electronic media	.023*	1.404	1.257	2.013
Print media	.045*	1.210	.996	1.734
Others ®				

Note: ® denotes reference category. * indicates significance ** indicates highly significance

We observe from the above table that attributes like age, place of residence, education of mother per capita annual income and source of information have significant effect on awareness of female respondents about HIV/AIDS. We also note that female students of age less than 20 years are less aware (odds ratio being .760<1) about the killer disease as compared to girl students of age 20 years and above. We further observe that female students hailing from rural background are less aware (odds ratio being 0.831<1) than those who live in urban areas. Moreover, education of mother have a significant effect on the awareness of their wards. We have seen that higher education of mother have positive impact (odds ratio 2.381>1) on awareness of their daughters as compared to those students whose mothers have no education or low level of education. Further, female students belonging to low or middle income group are more aware about the dreaded disease as compared to students belonging to well to do families. Table 4 also reveals that female students consider electronic media as the most important source of information about HIV/AIDS. The odds ratio for electronic media (1.404) indicates that they get the information more from electronic media as compared to other sources of information.

We were also interested to check the behavior and attitude of the students towards the HIV infected persons with the help of logistic regression technique and the results are presented in table 5. We considered the attribute, attitude having two values-positive or negative, as the dependent variable. The correct prediction percentage of 77.5 for this model is considered to be satisfactory.

Table 5: Results of Logistic Regression regarding attitude of students towards HIV/AIDS

Variables	P-value	Odds Ratio	95% Class Interval For Odds Ratio	
			Lower	Upper
AGE_GROUP				
Less than 20 years	.000**	.162	.119	.220
20 years and above ®				
GENDER				
Female	.000**	2.288	1.656	3.163
Male®				
CLASS	.000**	.017	.007	.043
Intermediate				
Under Graduate ®				
PLACE OF RESIDENCE				
Rural	.110	.775	.567	1.059
Urban ®				
CASTE				
Advantaged groups	.003**	1.924	1.244	2.976
Disadvantaged groups ®				
RELIGION				
Christianity	.074	2.767	.907	8.437
Hinduism	.012*	.107	.020	.582

Islam	.103	2.634	.822	8.442
Others ®				
MOTHER_TONGUE				
Assamese	.581	1.117	.754	1.653
Bengali	.023*	.589	.373	.929
Hindi	.000**	.171	.096	.304
Others ®				
EDUCATION_FATHER				
High education	.915	1869.471	.000	.000
Moderate education	.997	4066.734	.000	.000
Low education ®				
EDUCATION_MOTHER				
High education	.000**	1.313	.901	1.613
Moderate education	.000**	1.404	.920	1.720
Low education	.998	262.876	158.60	300.09
No education ®				
FAMILY_INCOME				
Low income group	.000**	5.280	3.865	7.452
Middle income group	.000**	3.934	2.317	4.468
High income group ®				

Note: ® denotes reference category. * indicates significance ** indicates highly significance.

We observe vide table 5 that variables like age, gender, class in which they read, caste, education of mother, family income are having significant effect on the attitude of the students towards HIV infected persons. We further observe vide the same table that students of more than 20 years of age show positive attitude towards HIV/AIDS as compared to students of less than 20 years of age (odds ratio being 0.162<1). Moreover, female students (odds ratio being 2.288>1) are exhibiting positive attitude as compared to their male counterparts. Furthermore, undergraduate students are showing positive attitude as compared to intermediate students. However, students whose mothers are having higher education or moderate education (odds ratio being 1.313>1 and 1.404>1 respectively) are showing positive attitude towards HIV/AIDS against those students whose mothers are either having low education or no education. Table 5 also reveals that students whose family income are low or middle income group are more positive in their approach towards HIV/AIDS infected as compared to students who come from well to do families. The other variables do not show any significant effect.

4. Conclusion

Prevalence and incidence of HIV/AIDS is rapidly increasing in India. Unfortunately at present, even though the Government agencies are putting serious effort in this regard, lot is still to be achieved. Twenty years into the HIV/AIDS pandemic, social and behavioral research on HIV/AIDS remains limited. Data on sexual behavior and AIDS-related knowledge and attitudes are sparse and difficult to compare.

However, our study has identified some of the socio-economic, demographic factors which have significant effect on the awareness of HIV/AIDS. The factors having significant effect include age, gender, stream of their study, place of residence, caste, religion and source of information. Policy makers may target such groups and necessary arrangement can be made for increasing the level of awareness among the students as they are the backbone of the society. Our findings also identified some socio-economic and demographic factors responsible for unfavorable attitude of students towards HIV/AIDS.

Based on the findings of the study, we should concentrate on the following:

- The knowledge about how HIV is transmitted is incomplete among students. Although 100% students had heard about HIV/AIDS but there are still many misconceptions about the disease.

- The majority of the students first heard about HIV/AIDS from media. Media is an effective way of spreading information but the school/college also plays an important role.
- The awareness of protection against HIV is insufficient among the students and there are misunderstandings about it.
- The most important way to prevent the rapid spread of HIV is to raise the level of knowledge about the transmission of and the protection against HIV.

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