Title: Trends in HIV sexual prevention: attitudinal beliefs and behavioral intention in Spanish young people over the past two decades (1999-2020).

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Abstract:

Despite preventive efforts, HIV exposure is still a concern for public health. The current prevalence is related to unsafe sex, which is based on socio-cognitive variables. Therefore, information about these variables is required to verify whether the past preventive strategies have been effective and improve the future ones. However, there is not updated information to adjust future preventive interventions. For this reason, this study analyzes trends by gender in Spanish young people over the past two decades in perceived susceptibility to HIV, severity perceived to HIV, condom confidence and the intention of condom use, from 1999 to 2020. For this purpose, 11665 Spanish young people (from 17 to 40 years old) completed the AIDS Prevention Questionnaire in each year. Following our results, in general, the socio-cognitive variables have revealed an unsatisfactory trend: a low perceived susceptibility to HIV and a behavioral intention that have remained stable or even declined slightly over the past years. Particularly, men are more likely to report a riskier level in socio-cognitive

variables although, in the latest evaluations, women would decrease condom use intention largely than men. In general, regarding age, young adult would report better levels of condom confidence, but early youth would get higher results in perceived severity, as well as better scores in the latest evaluations of condom use intention. Considering these results, policies should make an effort in HIV prevention programs, and emphasize the attention to attitudinal beliefs and behavioral intention to improve their effectiveness.

Keywords: HIV, attitudinal beliefs, condom use intention, young people, gender.

INTRODUCTION

HIV-AIDS remains a great concern for public health among young people. Despite important medical advances and improvements in life expectancy, tendencies in HIV new infections are still worrying[1]. During the last decade, unsafe sexual behavior has been the main transmission route of HIV among European young people[2]. Spain is not an exception and exceeds the average mean of European rates in HIV infection: early young and young adult show 62.6% of new diagnosis and 88.9% of them are by unsafe sex behavior[3].

In order to reverse this trend, dealing with condom use and the underlying factors is required. For this purpose, many socio-cognitive theories such as the Theory of Planned Behavior, the Information-Motivation-Behavioral Skills model and the Health Belief Model have associated key variables with condom use focusing on the active role of people and the relevance of belief and motivational factors[4-7]. In this context, attitudinal beliefs about susceptibility perceived to HIV-AIDS, perception of severity to HIV-AIDS, condom reliability, and intention of condom use, have received a greater support in comparison to others such as subjective norms[8,9]. In particular, the attitudinal beliefs about susceptibility perceived to HIV-AIDS means the perceived probability of becoming infected by HIV, while

the perception of severity to HIV-AIDS means the attributed seriousness to HIV-AIDS infection. Moreover, when referring to condom reliability, it is meant the perceived confidence to condoms as a method of HIV prevention. Finally, the intention of condom use is related to the perceived probability of using a condom at their next sexual intercourse. Altogether, people who perceive more probability of being infected by HIV, consider HIV-AIDS as a serious disease and trust more on condom are more likely to be healthy and use condoms[10,11]. Moreover, those people who report more intention of using condom would use it more consistently[12-14].

In this context, some studies support how traditional gender roles may affect safe sex behavior and, particularly, condom-related beliefs[15] and the intention of using condoms[16]. Following these studies, those people socialized in androcentric norms and the double sexual standard would show worse attitudes towards condom use and lower intention to use it, particularly women. Accordingly, those societies as Spanish-speaking countries where sexual scripts may lead to the underestimation of women's active role in sexuality and overestimate the invulnerability of men would promote lower sexual health[17] and higher exposure to HIV[18-20]. Particularly, men have reported a lower perception of susceptibility to HIV than women would[19]. At the same time, Spanish young men have revealed a stronger relation between behavioral intention and condom use in their sexual intercourses than women would[11,21]. Similarly, Spanish adolescent women would show a lower use of condom in a stable relationship than adolescent men would[22].

Considering the gendered high exposure to HIV among young people and the relevance of socio-cognitive factors in prevention efforts[23,24], some studies have made an effort to analyze tendencies in socio-cognitive variables to adjust the preventive behavioral strategies. For example, past results[25] reported a systematic decreasing trend in terms of adequate

knowledge and attitudes among Portuguese adolescents between 2002 and 2010. According to this, a comparison of two cohorts of Spanish adolescents[22], between 2006 (n=1222) and 2012 (n=910), revealing worse knowledge and unfavorable attitudes about HIV-AIDS among the recent generation. This study supported the maintenance of lower perception of HIV risk observed, between 1996 and 2001[26], in stable partner among 1057 Spanish young people. Similarly, past results [27] revealed a decreasing tendency of HIV risk perception among Spanish young people between 1999 and 2004, as well as higher unsafe sex intention in casual partners. Thus, these studies have revealed a disturbing trend regarding knowledge, attitudes and safe sex behaviors that is unstable or even worse, is getting riskier. However, most of them were only based on two cohorts that may facilitate the interference of confounding variables and complicate the estimation of stability data. At the same time, because of having explored HIV trend for a maximum of six years, the evaluation of a possible trend becomes more difficult. In addition, some studies were focused on one specific component and on adolescent population, conditions that make difficult generalizing them across other populations and variables. Considering the relevance of gendered sexual transmission and the active role of socio-cognitive variables, this study describes trends by gender, from 1999 to 2020, two decades, in attitudinal beliefs (perceived susceptibility and severity to HIV, confidence in condom) and condom use intention among Spanish young people. Based on the literature, the following four hypotheses were formulated:

1. Spanish young people will have diminished scores for attitudinal beliefs (perceived susceptibility and severity to HIV, and confidence in condom) and condom use intention over the years.

2. In general, perceived susceptibility to HIV will have shown lower scores than perceived severity to HIV, confidence in condom and condom use intention over the years.

3. Both Spanish men and women will have diminished scores similarly for attitudinal beliefs (perceived susceptibility and severity to HIV, and confidence in condom) and condom use intention over the years.

4. In general, Spanish women will have reported higher scores than men will do for attitudinal beliefs (perceived susceptibility and severity to HIV, and confidence in condom) and condom use intention.

We also elaborated a research question: Could age have played an important role for attitudinal beliefs (perceived susceptibility and severity to HIV, and confidence in condom) and condom use intention in these Spanish young people?

METHODS

Participants

In this study, 11665 people were involved (see Figure 1), being 63.5% women and 36.5% men. The age ranged from 17 to 40 years old, and its average was 20.89 (SD=3.08): 20.73 years old (SD=2.96) for women and 21.18 years old (SD=3.25) for men.

Insert figure 1 around here

Regarding sexual orientation, 90.8% self-identified as heterosexual (90.8% of men and 90.8% of women), 6.8% as bisexual (4.7% of men and 7.9% of women) and 2.4% as homosexual (4.5% of men and 1.3% of women). In addition, 92.1% had past sexual experience (92.7% of men and 91.8% of women) and 79.4% were having sexual practices at the evaluation moment (76.7% of men and 81% of women).

Instrument

The AIDS Prevention Questionnaire[28] contains 44 items that evaluate socio-cognitive variables related to HIV sexual prevention[5,6,29]. This questionnaire includes five factors with adequate internal consistency (between .67 and .74): information, attitudinal beliefs and self-efficacy, condom use intention, safe sexual behavior and discrimination towards people living with HIV. For this study, we have analyzed four variables that have revealed an important influence on safe sex behavior[30]: perceived susceptibility and severity to HIV-AIDS, condom confidence and intention of condom use. The first ones, perceived susceptibility and severity to HIV-AIDS were measured on a Likert scale ranging from 0-nothing- to 100-a lot. The second one was measured on a Likert scale from 0-none confidence- to 3- a lot confidence. Finally, the intention of using condom in a future relation was measured by a yes/no question.

Procedure

This study was developed from 1999 to 2020. After obtaining the approval by the Ethic Committee of Research at the university, the procedure for obtaining data each year was identical, except for 2020 due to the COVID-19 pandemic. For this purpose, in the University Campus, the information was disseminated during outreach activities about HIV prevention concerning the World AIDS Day. After previous informed consent, participants completed the written questionnaire in 20–30 min, individually, anonymously, and voluntarily. To ensure data accuracy and solve any possible doubt, trained psychologists provided appropriate instructions and were present during this process. In 2020, we disseminated the study by the university online social networks where we adapted the outreach activities about HIV prevention concerning the World AIDS Day.

In the beginning, 11725 people were interested in this study but only 11665 (99.48% of them) were involved due to eligibility criteria: being from 17 to 40 years old and native-Spanish speaker. The recruitment over the years maintained similar rates of participation concerning gender and age.

Analyses

Firstly, we did descriptive and differential analyses (Analyses of variance and the Bonferroni correction or Chi square and Phi) to examine differences over the years for all participants and by gender, as well as the Effect size by the G*Power software. In order to examine differences between men and women in dependent variables each year, we carried differential analyses: the Student's t and the Cohen's d or Chi square and Phi. Additionally, we carried out the linear or logistic regression to analyze if gender and age were relevant for these variables in each year or in the global trend over the years. For the last one, we added the interaction analyses between sex*year and age*year.

RESULTS

Differential analyses for perceived susceptibility and severity to HIV-AIDS, condom confidence and intention of condom use per year.

Firstly, regarding general trends, beliefs and behavioral intention reveal statistically significant differences based on the analysis of variance and Chi^2, although the effect sizes are small for all of them (see table 1). Regarding perceived susceptibility to HIV-AIDS, the highest score has been in 2013 (M=23.75) while the lowest has been in 2018 (M=14.78), obtaining statistically significant differences by Bonferroni. In any case, scores do not reach a quarter of the maximum scored (=100) (see also figure 2).

Concerning perceived severity to HIV-AIDS symptoms and disease, the higher values have been in 2007 (M=81.62) and the lowest have been in 2020 (M=65.25). In line with Bonferroni, the lower scores would be in the latest evaluations in 2018 and 2020, as well as in 2002 and 2003 (see also figure 3).

Insert figures 2-5 around here.

In relation to condom confidence, ranging from 0 to 3 (see also figure 4), participants have reported the highest score in 2019 (M=2.65) and the lowest in 2003 and 2008 (M=2.54), showing statistical differences by Bonferroni correction for the first ones.

Insert table 1 around here.

Regarding the intention of using condom, the highest percentages have been in 2000 (94.2%) while the lowest in 2018 and 2019 (88%). Since 2008, percentages have been lower than in the previous evaluations (see also figure 5).

Differential analyses for perceived susceptibility and severity to HIV-AIDS, condom confidence and intention of condom use per year by gender.

Regarding dependent variables per year by gender, table 2 reveals some statistically significant differences. Concerning perceived susceptibility to HIV, both men and women show statistically significant differences over the years, even though the effect sizes are small. Men have revealed the higher score in 2013 (M=24.47) and the lowest score in 2018 (M=12.20). Women have shown the highest score in 2013 (M=24.51) and the lowest in 2018 (M=16.86). Except for 2007 and 2020 women have exceeded men's scores, showing statistically significant differences in 2003, 2004, 2008, 2018 and 2019 with low effect sizes. In relation to perceived severity to HIV-AIDS, men and women reveal statistically significant differences over the years with small effect sizes. For men, the highest score has been located

in 2007 (M=75.90) and the lowest in 2018 (M=58.64). For women, the highest score was in 2007 (M=84.04) and the lowest was in 2020 (M=66.44). For both, the lower values indicated by Bonferroni are in 2003 and 2020. In gender comparison, women have exceeded men's scores revealing statistically significant differences, except for 1999, 2001 and 2020.

Insert table 2 here.

In relation to condom confidence, only women report statistical differences over the years with small effect sizes, being the higher scores by Bonferroni in 2019. For men, the highest score was in 2002 (M=2.66) and the lowest was in 2008 (M=2.51) and, for women, the highest score was in 2019 (M=2.66) and the lowest in 2003 (M=2.52). In general, men have exceeded women's scores in most of evaluations although there are only statistically significant differences in 2002.

About the intention of using condom, both men and women have shown statistically significant differences over the years, being small the value of Phi. In case of men, the percentages of participants who have reported the intention of using condoms have ranged between 84.8% (in 2008) and 93.8% (in 2018). In case of women, the percentages have ranged from 83.3% (in 2018) to 95.7% (in 2000), being their lower values in the latest evaluations. In terms of gender comparison, women have exceeded men's percentages except for 2018 in which more men have reported the intention of using condoms. In addition, 2019 and 2020 have not revealed differences between both.

Linear regression for perceived susceptibility and severity to HIV-AIDS and condom confidence and logistic regression for condom use intention by sex and age in each year.

Following the analyses of regression in each year (see table 3), sex and age play an important role in some years of evaluation, although the explained variances are small. Particularly, in

line with the significant regression models of susceptibility and severity perceived to HIV, women were more likely to show higher scores in these moments of evaluations. Moreover, women had been more likely to report the intention of condom use from 2001 to 2008. However, being men would be associated with more condom confidence in 2002 and the latest evaluations of condom use intention (in 2018 and 2019).

Regarding age, in line with significant models, older people were more likely to report higher susceptibility perceived to HIV (in 2008), but younger people were in perceived severity to HIV in 2004, 2005 and 2018. About condom confidence, being older is related to a better perception of reliability in 2004, 2005, 2008 and 2019. Similarly, being older is related to behavioral intention until 2008. Contrarily, at the latest evaluations (in 2018 and 2019), younger people would be associated with the intention of condom use.

Linear regression for perceived susceptibility and severity to HIV-AIDS and condom confidence and logistic regression for condom use intention by sex, age, and time of evaluation.

Firstly, gender seems to moderate the scores for perceived susceptibility and severity, as well as the intention of condom use, being women who are more likely to report them. In addition, age seems to moderate the scores for condom confidence and perceived severity to HIV-AIDS, being young adult more likely to report condom confidence while early young people are more associated with perceived severity to HIV/AIDS. Finally, time of evaluation would be associated with perceived severity to HIV/AIDS and the intention of using condoms. For both, the earlier years would be associated with higher results than the latest evaluations. For attitudinal beliefs and behavioral intention, the explained variances are small.

Insert table 4 around here.

DISCUSSION

Firstly, our findings support past studies that intent to draw attention about sexual HIV risk among European young people[25], particularly, among Spanish youth[31,32]. According to past results[26,30], the main socio-cognitive variables that influence on condom use, such as attitudinal beliefs and behavioral intention have shown an unsatisfactory trend among these young people.

In line with past findings[22,27], over the two past decades, perceived susceptibility to HIV-AIDS has shown a low score and the level of condom use intention seems to have decrease slightly. This result is important based on the relevance of behavioral intention for condom use, as well as the major role of perceived severity to HIV-AIDS among the socio-cognitive variables in the HIV behavioral prevention[7,9]. Moreover, as some authors supported[22,26] and in line with our hypothesis, perceived susceptibility to HIV infection continue to be inconsistent with the epidemiological surveillance data that emphasize sexual behaviors and young people as the most prevalent focus on new HIV infections[3]. Thus, although the trend of socio-cognitive variables has not worsened as much as we had anticipated, given the implication of these results for HIV prevention[10], preventive campaigns should increase their effectiveness at long-term to reinforce these specific variables, which are not sufficient but necessary[24,33,34].

Secondly, among these Spanish people, our findings support the relevance of gender on the socio-cognitive variables associated with HIV risk level[19,35]. Within the risk framework, in line with part of our hypothesis, women seem to report a healthier level of perceived susceptibility and severity to HIV-AIDS symptoms and disease, as well as more level of condom use intention. Regarding trends by gender over the two past decades, even if contrary

to our predictions, the worsening in socio-cognitive variables has not been statistically significant. Men and women would show resistance to improve them, being perceived susceptibility particularly low. Especially for women, condom use intention would reveal a worse trend. According to past results[36] women may consider higher obstacles of condom use than men may. These last results would support some studies that also described a riskier behavior for women, despite of some positive advances[20]. In line with some studies[15-17], the double sexual standard could be still present and, according to its influence on gender, women would be less active in their self-care, paying less attention to the method of HIV prevention (condom) in comparison to feared event (HIV). In this sense, their own intention to use condom might diminish in the recent years. In any case, men would also be exposed to sociocultural influences: the bravery and invulnerability that characterizes them would facilitate an underestimation of the HIV perceived severity and susceptibility. Thus, gender dissimilarities in HIV prevention should be considered in Hispanic contexts that, based on conservative norms, machismo and power imbalance, maintain the riskier profile for both, men and women[18,37].

Regarding age, our findings support a different risk level in socio-cognitive variables. First, young adults seem to report a better confidence in condom use. In line with past results[38] being older might be associated with lifetime sexual experience and some healthier socio-cognitive variables such as a positive perceived efficacy in coping preventive behavior, which might be related to the perceived condom effectiveness[6,39]. On the other hand, the early young people seem to report a higher perceived severity, as well as higher intention to use condom in the latest years. Accordingly past studies[40-41], this result may be related to a lower possibility of being in steady relationships; these would make difficult an adjusted perception of HIV risk and safe behavioral intention. Therefore, improving preventive efforts among

adolescents should be necessary but also among adult people that have already reveal a risk level of socio-cognitive variables for HIV exposure[42-43].

These findings should be analyzed in light of some limitations, such as the self-reported measure that may increase social desirability. Moreover, regardless of the large number of participants, different sexual orientations are under-represented making it difficult to generalize our findings. In order to achieve a global profile, it would be also interesting to analyze more predictors of unsafe sex.

CONCLUSIONS

Beyond these aspects, these results illustrate the need to continue reinforcing preventive efforts among young Spanish people, given the low perceived susceptibility, the slight decrease in the intention to use condoms, and the stability of other variables such as condom confidence, which despite showing acceptable values over the two past decades, could be improved. In line with our findings, this effort should consider gender differences that have been revealed in these socio-cognitive variables, as well as include the different stages of youth and not only the earliest ones. In fact, in variables such as perceived severity, the risk seems to be higher among young adults. Therefore, it would be necessary to analyze what is happening and detail some research questions. In particular, it should be analyzed what role are playing the new online scenarios of sexual socialization such as apps in the configuration of the socio-cognitive variables, as well as other social changes related to the new types of sexual and affective relationships which may modulate an optimistic perception of susceptibility. Moreover, it is necessary to analyze what role are playing other psychological factors, such as responsibility or psychoticism, in the development of socio-cognitive

variables. As regards prevention, it should be examined whether preventive programs are not effective or whether there are not enough in the formal education of Spanish adolescents. In this sense, firstly, research should include new psychosocial variables to understand risk behavior at different evolutionary stages and, secondly, preventive campaigns and policies should review their bases, methodologies, and coverage to improve their effectiveness in the long term, considering differences by age and gender.

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TABLES

Table 1. Differential analyses of socio-cognitive variables per year.

Variable	1999 M(SD)	2000 M(SD)	2001 M(SD)	2002 M(SD)	2003 M(SD)	2004 M(SD)	2005 M(SD)	2006 M(SD)	2007 M(SD)	2008 M(SD)	2013 M(SD)	2018 M(SD)	2019 M(SD)	2020 M(SD)	Total	F(p)	Bonf
Condom confidence (0-3)	2.58 (0.55)	2.60 (0.56)	2.63 (0.53)	2.59 (0.54)	2.54 (0.60)	2.60 (0.53)	2.63 (0.54)	2.60 (0.58)	2.58 (0.55)	2.54 (0.59)	2.60 (0.54)	2.57 (0.54)	2.65 (0.52)	2.62 (0.55)	2.59 (0.55)	3.06 (.000)	2003<2005, 2019 2008<2005, 2019
Perceived susceptibility (0 – 100)	20.92 (31.61)	20.42 (31.27)	19.71 (30.65)	18.28 (29.29)	18.13 (29.24)	20.76 (31.33)	19.74 (30.59)	19.53 (30.06)	21.64 (32.22)	21.46 (31.48)	23.75 (34.70)	14.78 (20.74)	18.93 (23.77)	22.36 (23.59)	20.07 (29.55)	4.39 (.000)	2013>2002, 2003, 2019 2018<1999, 2004,2005, 2007,2008, 2013,2020
Perceived severity (0 – 100)	76.44 (36.80)	74.23 (37.45)	76.27 (37.90)	70.51 (41.77)	69.54 (41.89)	77.93 (35.93)	75.85 (37.26)	75.08 (37.50)	81.62 (33.78)	78.40 (35.65)	78.40 (36.01)	67.18 (36.98)	73.95 (34.42)	65.25 (34.17)	74.51 (37.11)	12.38 (.000)	2002<2004, 2007- 2013 2003<1999, 2004,2005, 2007-2013 2018<1999, 2001,2004-2019 2019<2007 2020<1999, 2001,2004-2013, 2019

	1999 M(SD)	2000 M(SD)	2001 M(SD)	2002 M(SD)	2003 M(SD)	2004 M(SD)	2005 M(SD)	2006 M(SD)	2007 M(SD)	2008 M(SD)	2013 M(SD)	2018 M(SD)	2019 M(SD)	2020 M(SD)	Total	Chi^2 (p)	Phi
Intention of condom use (0 – 1)	91.8	94.2	93.3	94	93	92.4	92.9	92	90.2	89.9	89.8	88	88	88.5	91.1	58.89 (.000)	.072

Table 2. Differential analyses of socio-cognitive variables per year by gender.

Variable	Sex	1999 M(SD)	2000 M(SD)	2001 M(SD)	2002 M(SD)	2003 M(SD)	2004 M(SD)	2005 M(SD)	2006 M(SD)	2007 M(SD)	2008 M(SD)	2013 M(SD)	2018 M(SD)	2019 M(SD)	2020 M(SD)	F(p)	Bonferroni
Condom confidence (0 – 3)	Men	2.63 (0.53)	2.62 (0.55)	2.64 (0.57)	2.66 (0.52)	2.56 (0.60)	2.60 (0.55)	2.64 (0.56)	2.61 (0.57)	2.55 (0.57)	2.51 (0.63)	2.61 (0.55)	2.58 (0.54)	2.63 (0.58)	2.60 (0.58)	1.64 (.066)	
	Women	2.55 (0.56)	2.59 (0.57)	2.62 (0.50)	2.54 (0.55)	2.52 (0.60)	2.60 (0.51)	2.62 (0.53)	2.60 (0.59)	2.60 (0.54)	2.56 (0.54)	2.59 (0.54)	2.57 (0.55)	2.66 (0.50)	2.63 (0.53)	2.53 (.002)	2019>2003
	t (p)	1.80 (.072)	0.33 (.736)	0.43 (.662)	2.69 (.007)	0.80 (.422)	0.02 (.978)	0.56 (.574)	0.11 (.908)	-0.91 (.358)	-1.31 (.191)	0.47 (.633)	0.42 (.675)	-.84 (.413)	-0.57 (568)		
	d(CI)				0.22 (0.06; 0.37)												
Perceived susceptibility (0 – 100)	Men	20.17 (30.17)	16.07 (28.48)	17.66 (28.85)	16.75 (27.06)	15.08 (26.10)	17.09 (27.50)	18.15 (28.36)	17.74 (27.29)	21.95 (31.87)	17.58 (28.84)	22.47 (32.59)	12.20 (18.98)	15.88 (22.48)	24.37 (26.03)	3.57 (.000)	2018<1999,2007,2013 2020>2003,2018
	Women	21.33 (32.39)	22.55 (32.43)	20.99 (31.72)	19.26 (30.63)	19.83 (30.74)	23.47 (33.65)	20.68 (31.80)	20.64 (31.67)	21.51 (32.41)	23.53 (32.64)	24.51 (35.90)	16.86 (21.87)	20.53 (24.39)	21.71 (22.78)	2.05 (.014)	2018<2004,2013
	t (p)	-0.46 (.640)	-1.42 (.156)	-1.23 (.216)	-1.05 (.292)	-2.33 (.020)	-3.57 (.000)	-1.55 (.121)	-0.97 (.333)	0.14 (.887)	-3.04 (.002)	-0.87 (.381)	-3.20 (.001)	-2.97 (.003)	-1.73 (.083)		
	d(CI)					-0.16 (-0.30; -0.02)	-0.20 (-0.32; -0.08)				-0.19 (-0.32; -0.06)		-0.22 (-0.36; -0.08)	-.019 (-0.32; -0.06)			
Perceived severity (0 – 100)	Men	75.66 (36.43)	66.66 (41.15)	72.41 (39.77)	64.54 (43.85)	63.53 (43.98)	73.36 (37.76)	73.13 (38.30)	67.88 (40.01)	75.90 (36.95)	74.46 (37.90)	74.13 (38.18)	58.64 (38.40)	65.30 (37.60)	61.29 (36.20)	6.45 (.000)	2003<1999, 2008 2018<1999,2001,2004,2005,2007-2013 2020<1999, 2004,2005,2007-2013 2020<1999-2001,2004-2013,2019 2007>2002, 2003, 2018 2003<2004,2008,2013
	Women	76.84 (37.03)	77.80 (35.16)	78.72 (36.51)	74.27 (40.01)	72.79 (40.38)	81.27 (34.16)	77.44 (36.56)	79.37 (35.31)	84.04 (32.09)	80.53 (34.23)	80.91 (34.46)	74.09 (34.31)	78.35 (31.80)	66.44 (33.46)	8.23 (.000)	
	t (p)	-0.40 (.685)	-2.08 (.038)	-1.90 (.057)	-2.82 (.005)	-2.95 (.003)	-3.74 (.000)	-2.10 (.036)	-2.91 (.004)	-2.41 (.016)	-2.59 (.010)	-2.70 (.007)	-5.91 (.000)	-5.45 (.000)	-1.26 (.208)		
	d (CI)		-0.30 (-0.58; -0.02)		-0.23 (-0.39; -0.07)	-0.22 (-0.36; -0.08)	-0.22 (-0.33; -0.10)	-0.11 (-0.22; -0.01)	-0.40 (-0.60; -0.19)	-0.24 (-0.42; -0.05)	-0.17 (-0.29; -0.04)	-0.18 (-0.32; -0.05)	-0.42 (-0.56; -0.28)	-0.38 (-0.51; -0.25)			
Intention of condom use (0 – 1)		%	%	%	%	%	%	%	%	%	%	%	%	%	%	Chi² (p)	Phi
	Men	90	91.1	89.9	92.6	89.2	89.5	88.8	87.8	84.9	84.8	87.3	93.8	87.8	86.3	25.52 (.000)	.078
	Women	92.8	95.7	95.5	94.9	95.1	94.6	95.3	94.5	92.4	92.7	91.3	83.3	87.8	89.3	115.5 (.000)	.126
	Chi²(p)	1.79 (.181)	2.00 (.157)	7.16 (.007)	1.49 (.222)	10.51 (.001)	11.36 (.001)	22.06 (.000)	5.80 (.016)	7.20 (.007)	17.28 (.000)	3.91 (.048)	20.71 (.000)	.000 (.998)	1.26 (.260)		
	Phi			.111	.048	.111	.096	.123	.119	.115	.125	.064	-.162				

Table 3. Linear and logistic regression: significant coefficients of socio-cognitive variables per year by gender and age.

Variable		1999 B;e (CI)	2000 B;e (CI)	2001 B;e (CI)	2002 B;e (CI)	2003 B;e (CI)	2004 B;e (CI)	2005 B;e (CI)	2006 B;e (CI)	2007 B;e (CI)	2008 B;e (CI)	2013 B;e (CI)	2018 B;e (CI)	2019 B;e (CI)	2020 B;e (CI)
Condom confidence	Age	0;.009 (-.01;.01)	0.02;0.01 (-0.01;0.04)	-0.01;0.01 (-0.02;0.01)	.002;.01 (-.001;0.01)	0.01;0.01 (-.003;.025)	0.01;0.005 (0.00;0.02)	0.01;0.004 (0.002;0.01)	-0.03;0.01 (-0.19;0.01)	0.01;0.01 (-0.03;0.02)	0.01;0.01 (0.01;0.02)	.008;.005 (-0.02;0.01)	-0.01;0.01 (-0..01;0.01)	0.01;.007 (0.00;0.03)	-0.02;0.05 (-0.01; 0.01)
	Gender	-0.07;0.04 (-0.15;0.01)	-0.003;0.07 (-0.15;0.15)	-0.02;0.04 (-0.11;0.06)	-0.11;0.04 (-0.19;-0.03)	-0.03;0.04 (-0.11;0.05)	0.01;0.03 (-0.05;0.06)	-0.01;0.02 (-0.06;0.04)	-0.01;0.05 (-0.12;0.10)	0.06;0.05 (-0.04;0.16)	0.05;0.03 (-0.01;0.13)	-0.01;0.03 (-0.08;0.05)	-0.01; 0.03 (-0.09;0.06)	0.03;0.03 (-0.03;0.10)	0.02;0.04 (-0.06;0.11)
		r^2=.004	r^2=.009	r^2=.003	r^2=.004	r^2=.011	r^2=.007	r^2=.004	r^2=.000	r^2=.006	r^2=.011	r^2=.003	r^2=.000	r^2=.008	r^2=.001
		F(p)=1.57 (.208)	F(p)=1.14 (.321)	F(p)=0.85 (.427)	F(p)=3.65 (.026)	F(p)=1.48 (.227)	F(p)=4.46 (.012)	F(p)=3.22 (.040)	F(p)=.083 (.921)	F(p)=1.67 (.188)	F(p)=6.08 (.002)	F(p)=1.29 (.273)	F(p)=0.09 (.913)	F(p)=4.14 (.016)	F(p)=0.22 (.795)
Perceived susceptibility	Age	0.15;0.51 (-0.85;1.15)	0.27;0.85 (-1.41;1.95)	-0.70;0.53 (-1.75;0.33)	0.19;0.47 (-0.74;1.13)	-0.24;0.36 (-0.96;0.47)	-0.24;0.31 (-0.85;0.36)	-0.28;0.23 (-0.74;0.18)	0.16;0.41 (-0.65;0.99)	-0.57;0.42 (-1.40;0.25)	0.86;0.30 (0.26;1.46)	0.30;0.33 (-0.34;0.96)	0.17;0.28 (-0.37;0.72)	0.21;0.31 (-0.40;0.83)	-0.46;0.33 (-1.12;0.20)
	Gender	1.23;2.51 (-3.63;6.16)	6.75;4.64 (-2.39;15.91)	3.02;2.69 (-2.27;8.32)	2.57;2.39 (-2.12;7.26)	4.67;2.31 (0.49;8.85)	6.23;1.84 (2.61;9.85)	2.37;1.68 (-0.92;5.67)	2.95; 3.10 (-3.14;9.05)	-1.06;3.11 (-7.19;5.05)	6.23;2.02 (2.26;10.20)	2.13;2.38 (-2.53;6.80)	4.67;1.47 (1.77;7.56)	4.72;1.60 (1.58;7.88)	4.68;2.86 (-0.95;10.31)
		r^2=.000	r^2=.010	r^2=.006	r^2=.002	r^2=.007	r^2=.011	r^2=.003	r^2=.003	r^2=.004	r^2=.016	r^2=.0002	r^2=.013	r^2=.009	r^2=.007
		F(p)=0.153 (.858)	F(p)=1.06 (.348)	F(p)=1.65 (.193)	F(p)=0.63 (.530)	F(p)=2.72 (.066)	F(p)=6.34 (.002)	F(p)=1.85 (.157)	F(p)=0.51 (.596)	F(p)=0.95 (.387)	F(p)=8.37 (.000)	F(p)=0.79 (.451)	F(p)=5.18 (.012)	F(p)=4.46 (.012)	F(p)=2.56 (.077)
Perceived severity	Age	-1.24;0.62 (-2.46;-0.01)	-0.09;1.00 (-2.06;1.87)	0.13;0.66 (-1.17;1.44)	0.05;0.72 (-1.35;1.47)	-0.81;0.51 (-1.82;0.19)	-0.96;0.34 (-1.64;-0.27)	-1.07;0.28 (-1.36;-0.52)	-0.21;0.53 (-1.25;0.82)	-0.61;0.43 (-1.47;0.25)	-0.38;0.33 (-1.04;0.26)	-0.16;0.34 (-0.84; 0.50)	-1.36;0.50 (-2.35;-0.38)	-0.75;0.44 (-1.64;0.12)	-0.86;.235 (-0.54;0.37)
	Gender	0.68;2.92 (-5.06;6.42)	11.04;5.45 (0.29;21.79)	6.38;3.32 (-0.16;12.92)	9.75;3.45 (2.96;16.53)	8.94;3.05 (2.95;14.93)	7.32;2.08 (3.32;11.41)	3.71;2.02 (-0.24;7.68)	11.45;3.82 (3.93;18.96)	7.48;3.21 (1.17;13.78)	5.92;2.27 (1.46;10.38)	6.71;2.45 (1.90;11.52)	15.43;2.56 (10.39;20.48)	12.77;2.28 (8.29;17.25)	-2.74;1.98 (-6.64;1.15)
		r^2=.006	r^2=.019	r^2=.007	r^2=.013	r^2=.014	r^2=.018	r^2=.013	r^2=.022	r^2=.016	r^2=.008	r^2=.009	r^2=.052	r^2=.036	r^2=.003
		F(p)=2.07 (.127)	F(p)=2.16 (.117)	F(p)=1.83 (.161)	F(p)=3.99 (.019)	F(p)=5.88 (.003)	F(p)=11.05 (.000)	F(p)=9.49 (.000)	F(p)=4.60 (.011)	F(p)=4.25 (.015)	F(p)=4.25 (.014)	F(p)=3.96 (.019)	F(p)=21.82 (.000)	F(p)=17.86 (.000)	F(p)=0.97 (.377)
Intention of condom use	Age	0.01;0.05 (0.90;1.12)	0.09;0.11 (0.86;1.38)	0.01;0.06 (0.88;1.15)	-0.10; 0.05 (0.80;1.01)	0.06;0.05 (0.95;1.18)	0.08;0.04 (1.00;1.17)	0.03;0.03 (0.96;1.09)	0.16;0.07 (1.01;1.38)	0.03;0.04 (0.94;1.13)	0.04;0.03 (0.97;1.11)	-0.01;0.03 (0.93;1.05)	-0.16;0.03 (0.79;0.91)	-0.92;.035 (0.85;0.97)	-0.19;0.03 (0.92;1.04)
	Gender	0.36;0.27 (0.84;2.44)	0.85;0.56 (0.78;7.04)	0.88;0.33 (1.24;4.71)	0.35;0.33 (0.74;2.74)	0.87;0.27 (1.41;4.07)	0.77;0.22 (1.40;3.32)	0.96;0.20 (1.74;3.93)	0.93;0.37 (1.22;2.52)	0.80;0.29 (1.25;4.02)	0.83;0.20 (1.55;3.43)	0.41;0.21 (0.99;2.32)	-1.18;0.26 (0.18;0.51)	-0.03;0.20 (0.64;1.45)	.261;.252 (0.79;2.12)
		r^2=.002	r^2=.010	r^2=.012	r^2=.007	r^2=.013	r^2=.013	r^2=.015	r^2=.028	r^2=.013	r^2=.016	r^2=.004	r^2=.050	r^2=.006	r^2=.004
		χ^2(p)=1.77 (.413)	χ^2(p)=2.53 (.281)	χ^2(p)=6.97 (.031)	χ^2(p)=4.30 (.116)	χ^2(p)=11.48 (.003)	χ^2(p)=15.71 (.000)	χ^2(p)=22.23 (.000)	χ^2(p)=11.50 (.003)	χ^2(p)=7.17 (.028)	χ^2(p)=18.08 (.000)	χ^2(p)=3.91 (.141)	χ^2(p)=40.96 (.000)	χ^2(p)= 6.24 (.044)	χ^2(p)=1.61 (.446)

Table 4. Linear and logistic regression: significant coefficients of socio-cognitive variables by gender, age, year and interactions

Variables		B	e	CI	F/ Chi^2 (p)	r^2
Condom confidence	Age	.008	0.02	.005; .012	F=9.40 (.000)	.002
Perceived susceptibility	Gender	3.62	0.58	2.47; 4.78	F=12.81 (.000)	.003
Perceived severity	Age	-0.67	0.11	-0.90;-0.45	F=60.21 (.000)	.016
	Gender	7.51	0.73	6.08;8.94		
	Year	-0.30	0.05	-0.40;-0.20		
Intention of condom use	Gender	0.43	.067	1.35; 1.75	Chi^2=89.62 (.000)	.008
	Year	-0.03	.005	0.95; 0.97		

FIGURE

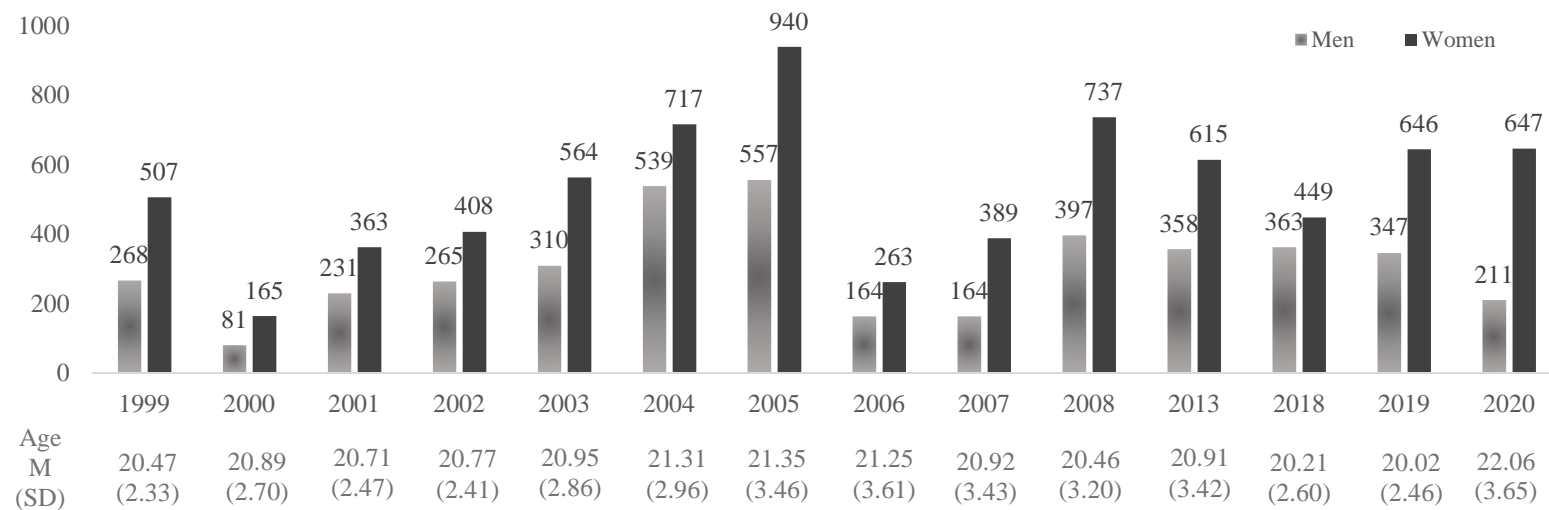Figure 1. Number of participants by gender and age per year of recruitment

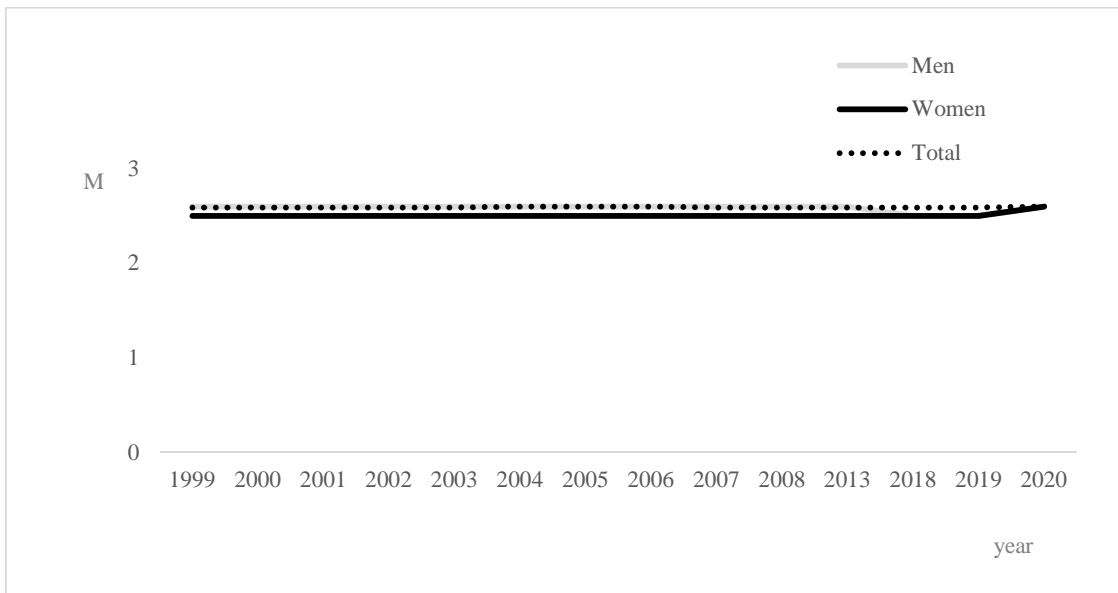|	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2013	2018	2019	2020
Men	268	81	231	265	310	539	557	164	164	397	358	363	347	211
Women	507	165	363	408	564	717	940	263	389	737	615	449	646	647
Age M (SD)	20.47 (2.33)	20.89 (2.70)	20.71 (2.47)	20.77 (2.41)	20.95 (2.86)	21.31 (2.96)	21.35 (3.46)	21.25 (3.61)	20.92 (3.43)	20.46 (3.20)	20.91 (3.42)	20.21 (2.60)	20.02 (2.46)	22.06 (3.65)

Figure 2 Condom confidence by year and gender

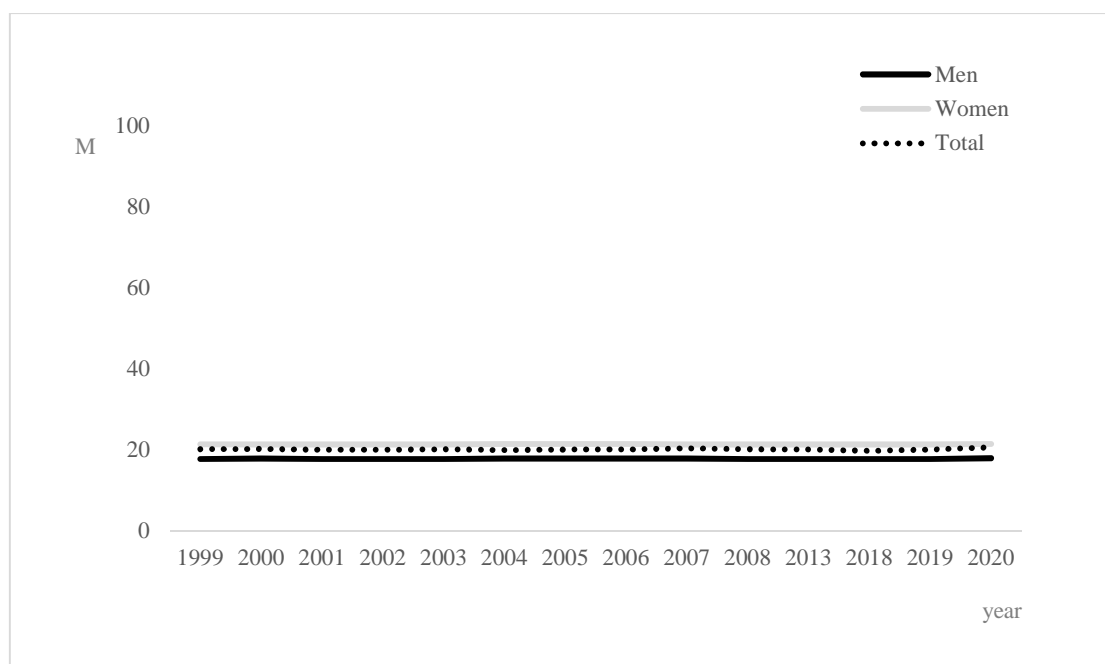Figure 3. Perceived susceptibility by year and gender
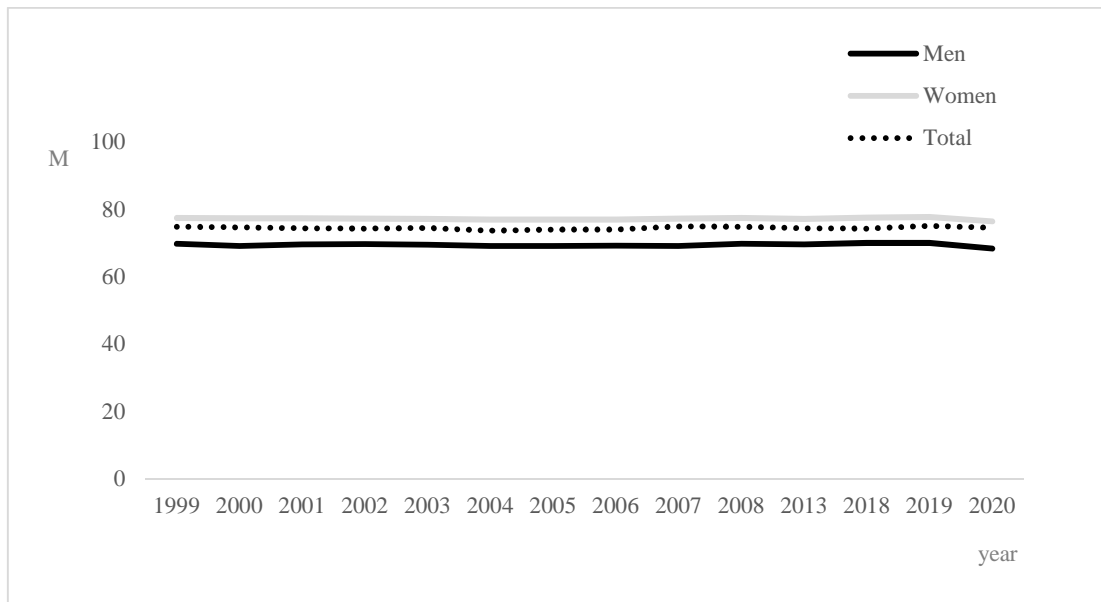
Figure 4. Perceived severity to HIV-AIDS by year and gender

Figure 5. Intention of condom use by year and gender