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Knowledge and attitudes about HIV-AIDS in a pregnant women population in Southwestern Madagascar

Abstract

This work reports the knowledge and attitudes of a sample of pregnant women from Tulear, Madagascar. While 91.3% of the 396 women recruited reported experiencing HIV-AIDS, 62.1% could express knowledge of at least one appropriate mode of protection against the disease. Radio and other mass media represented the most frequent source of information. 31.3% of women strongly discriminated against patients with HIV/AIDS. There was no significant relationship between knowledge of the means of protection against HIV-AIDS and the different biomarkers of STIs obtained. 81.7% of women were condom users, but only 5.4% used it as a method of contraception outside the desired period of pregnancy. Low-educated women from the South West appeared to be particularly at risk of not knowing about HIV, and would require the implementation of appropriate information programs.

Keywords: Madagascar, epidemiology, HIV, knowledge, attitudes, condom

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Introduction

Madagascar is one of the only countries in Africa to be very little affected by the HIV/AIDS pandemic,[1] while syphilis and other sexually transmitted infections (STIs) are widespread.[2–4] The South West Province is the most disadvantaged region of the country and has many determinants to promote the spread of HIV and STIs. Most of the country's national indicators of human development are the lowest on the island, whether in terms of income, education or access to health services, and the highest national levels of polygamy are found and multi-partnership.[5] But because of the scarcity of appropriate resources, there are few specific monitoring data available. Local health authorities lack information to pilot HIV and STI programs, such as those conducted in antenatal care clinics to provide pregnant women with information on HIV and STIs. The purpose of this work was to explore the level of knowledge and attitudes related to HIV/AIDS and STIs in a sample of pregnant women attending antenatal clinics in Tulear, the capital of the South West Province. This work completed the one concerning bio-markers and associated risk factors.[6]

Methodologie

A cross-sectional survey was conducted using a participatory methodology involving public health authorities and clinicians in the city. A sampling of convenience allowed proposing this study to the pregnant women visiting for prenatal consultation (CPN), [5] dispensaries of the city and its close relatives. Consecutive sampling was thus composed of pregnant women of all gestational ages, knowing that our first estimates required a number of more than 384 patients ("prevalence" estimated at 50%, precision of +/-5% and risk α5%). A structured questionnaire, including closed and open questions, collected information related to women's knowledge and attitudes about HIV/AIDS. Serological tests for HIV, syphilis, Chlamydia trachomatis and viral hepatitis B and C were performed according to the methodology described in our previous article.[6] Statistical analyzes, including Chi Two, t-Student, Anova, Kruskal-Wallis and univariate and multivariate logistic regression analyzes, were conducted using Epi-Info and SPSS 11.0. This study, conducted under the authority of the Inter Regional Directorate of Health Development of the province of Tulear, received the ethical authorizations of the National Program of Fight against AIDS.

Results

Sociodemographic characteristics

396 pregnant women agreed to participate in the survey, out of a total of 403 women contacted. Their characteristics are reported in Table 1. The average age was 25.3 years old. The majority (85.7%) lived in the city of Tulear or nearby, while 14.3% lived in suburban areas (more than 5 km from the city center). Nearly 3 in 4 women (75.5%) belonged to one of the 5 majority ethnic groups of the Southwest. The median age of first intercourse was 16 (min.10, max.27), and 1.92 the average number of children alive. 56.7% of women had never attended school or had a primary class level, while 43.3% had a basic degree or more. 62.7% lived in a family earning less than the equivalent of estimated average Malagasy income (300,000 Malagasy francs or FMG, or about fifty euros). Single and common-law women were significantly more at risk of being below the average income threshold than married women (p<10-3).55.5% had traveled in the past year. 5.3% reported having obtained money against sexual intercourse in the past year: the only sociodemographic variables associated with this concept of paid sex were celibacy (p<10-3), income below average income Malagasy being almost statistically significant (adjusted OR=3.13, IdC95:[0.89-11.0], p=0.080).

Table 1 sociodemographic characteristics, recruited 396 pregnant women attending antenatal clinics, Tulear, Madagascar, 2000

Recruitment Dispensary	not	%	**Profession**	not	%
	392			378	
Betania	84	21.4	No occupation	235	62.2
Besakoa	111	28.3	Rural (or farmer sinner)	17	4.5
Tanambao	74	18.9	Urban and fixed (grocer or domestic)	23	6.1
Tsimenatse	53	13.5	Superior or student	11	2.9
Salfa	70	17.9	Prostitute	9	2.4
Age	387		street market	83	22
14-19	87	22.5	**Income (FMG)**	367	
20-24	111	28.7	<100,000	55	15
25-30	103	26.6	100000-300000	175	47.7
31-49	86	22.2	300000-500000	90	24.5
Marital status	388		> 500,000	47	12.8
Married	117	30.2	**Travel in the past year**	389	
Single	82	21.1	Out of Province	68	17.5
marriage without marriage	189	48.7	Abroad	5	1.3
Age of sexual initiation	384		In the province	143	36.8
Before 15	42	10.9	No trip	173	44.5
Between 15 and 17	236	61.5			
After 17 years	106	27.6			
Number of living children	389				
0	111	28.5			
1	108	27.8			
2	46	11.8			
3	56	14.4			
4 and more	68	17.5			

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Knowledge and attitudes about STIs and the male condom

53.3% could name a STI, with syphilis and HIV/AIDS being the two most frequently named. 88.9% knew the potential of STIs to induce fertility disorders. In case of past or potential STI involvement, 89.6% reported informing their partner, only 4.9% said they would hide this infection. 81.7% of pregnant women said they knew about condoms. 19.4% had already used it outside desired periods of pregnancy, as reported in Table 2. Knowing the condom was significantly related to reporting its use (p<10-3). Table 3 shows the trends related to previous condom use (constant or occasional) versus no use: low educational level, young age, peri-urban habitat, and marital status (common-law marriage).) were significantly related to a lack of use. Moreover, having obtained money against sexual intercourse in the past year and knowing places where to buy it were strongly related to a statement of prior condom use. These statistical relations are not modified by the educational level. In multivariate analysis, only the low educational level and living in peri-urban areas are independently linked to this lack of prior condom use (ORa=2.00, IdC95:[1.12-3.57], p=0.019 and ORa=5.03, IdC95:[1.18-21.6], p=0.030). 41.7% reported having problems using condoms. Among those who explained this discomfort, lack of habit was reported most frequently (29.6%), while partner refusal accounted for 12.0% of cases. 58.6% could report two places to buy it. 21.5% said they would use it more often if it was free. Those who used it were more likely to say that price was a problem, especially for women with lower educational levels (ORa=3.48, IdC95: [2.00-6.04], p<10-3). Price was perceived as a problem for women with the lowest incomes (ORa=2.33, IdC95:[1.27-4.17], p=0.011). Of the 111 women who used contraception outside desired periods of pregnancy, only 5.4%,[6] used condoms for this purpose.

Table 2 Knowledge and Attitudes about condoms, 396 pregnant women recruited at antenatalclinics, Tulear, Madagascar, 2000

Prior use of the condom	not	%
	388	
absent	312	80.4
occasional	70	18
constant	6	1.6
Condom use	387	
only contraceptive	34	8.7
Protection against STIs alone	82	21
Contraceptive and protection against STIs	200	51.3
Other or Know nothing	74	19

Knowledge and attitudes about HIV/AIDS

91.3% of pregnant women answered yes to the question "Do you know about AIDS?". 46.6% thought that one could be affected by AIDS and still be in good health. 89.5% said they feared the disease, and 32.1% felt exposed, knowing that 72.0% of them had this feeling because of the infidelity of their spouse. While the majority of women (56.8%) who spoke on this topic thought that AIDS patients should be treated, 25.1% would lock them up and 6.2% said they needed to be killed. Table 4 reports that 79.8% expressed in the open mode at least one appropriate mode of transmission. The indicator "knowledge of at least one appropriate mode of protection against HIV/AIDS" is positive for 62.1% of women. Table 5 describes statistically significant relationships in univariate analyzes between knowledge of at least one appropriate mode of protection against HIV/AIDS and the clinic of origin, the age of the woman, the place of urban residence, or peri-urban, ethnicity, educational level, the notion of travel in the past year, the age of sexual initiation, and the source of information on HIV/AIDS. However, the 'educational level' variable is a modifying factor for all these statistically significant relationships, except for those with the variables 'clinic of origin' and 'source of origin of information on HIV/AIDS': a model multivariate, integrating the variable of interest "educational level", as well as the,[7] other independent variables mentioned above, was carried out Table 6. The education level, ethnicity, travel in the past year, original clinic and source of HIV/AIDS information remain significantly and independently associated with knowledge of at least one mode of care. Appropriate protection against HIV/AIDS. The educational level appears to be a key determinant in the interpretation of the results of this study. Pregnant women who have never attended school and those with primary education have thus been grouped into a subpopulation, which has been reported to differ from the group of pregnant women holding one or more elementary patents. As reported in Table 7, it appears that the least educated women were less frequently married, that they lived more out of the city, that they were more frequently of one of the majority ethnicities of the Southwest, that they had lower incomes, traveled less frequently and had their first sexual intercourse earlier. Significant differences also existed with regard to the recruitment clinic and the main source of access to information on HIV/AIDS. The search for meaningful links between knowledge of at least one appropriate mode of protection against HIV/AIDS and different variables of knowledge and attitudes towards HIV-AIDS, stratified by educational level, is reported in the Table 8. It appears that knowledge of at least one appropriate mode of protection against HIV/AIDS is significantly related to the knowledge that HIV-AIDS and good health can be compatible. The educational level is not a modifying factor for this statistical relationship. On the other hand, if we consider the statistically significant relationship between knowing at least one appropriate mode of protection against HIV/AIDS and the variables being afraid of AIDS, feeling exposed to this disease and knowing at least one pathway transmission of the virus, it appears that the educational level is a modifying factor for these three statistical relationships, as reported in Table 8 which reflects this interaction effect. Statistical relationships only last for the stratum of the least educated pregnant women. Finally, there is no statistically significant relationship between knowledge of at least one appropriate mode of protection against HIV/AIDS and tolerance to patients with this infection. The search for significant links between knowledge of at least one appropriate mode of protection against HIV/AIDS and different biological variables (Syphilitic serologies. RPR and TPHA; Hepatitis B serology: HBsAg; Chlamydia trachomatis serology) shows that there is no statistically significant relationship between this knowledge of at least one mode of protection against HIV-AIDS and these STI biomarkers. Based on the notion that the implementation of preventive practices is linked not only to knowledge but also to awareness of the risks of exposure,[8] the neo-indicator combining the knowledge variables can be created. At least one appropriate mode of protection against HIV/AIDS and the feeling of being exposed to HIV-AIDS: a neo-indicator known as "appropriate knowledge and sensation of exposure" indicates that 37.1% of pregnant women were aware of at least one mode of protection and felt exposed to AIDS. There is no statistically significant relationship between this neo-indicator and the biomarkers mentioned above.

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Table 3 Features based on the prior use of the condom out of the desired periods of pregnancy, univariate analyzes, recruited 396 pregnant women attending antenatal clinics, Tulear, Madagascar, 2000

Recruitment Dispensary	**Condom use**				**Univariate analyze***		
Characteristics	**Constant or occasional**		**absent**				
	not	%	not	%	GOLD	95% IdC	p
							0.11
Age	75	19.4	312	80.6			0,042
14-19	9	10.3	78	89.7	1		
20-24	22	19.8	89	80.2	2.14	0.93 to 4.93	
25-30	28	27.2	75	72.8	3.24	1.43 to 7.31	
31-49	16	18.6	70	81.4	1.98	0.92 to 4.77	
Marital status							<10-3
Married	31	26.5	86	73.5	1		
Single	24	29.3	58	70.7	1.15	0.61 to 2.15	
marriage without	20	10.6	169	89.4	0.33	0.18 to 0.61	
wedding							
Location	62	20.6	239	79.4			
Urban	60	23.3	198	76.7	1		
Peri-urban	2	4.7	41	95.3	0.16	0.038 to 0.69	0,004
Ethnicity	75	19.3	313	80.7			
Ethnic not of the region	23	24.2	72	75.8	1		
Southwest Ethnic	52	17.7	241	82.3	0.68	0.39 to 1.18	0.17
Educational level	76	19.6	312	80.4			
None or Primary	31	14.1	189	85.9	0.45	0.27 to 0.75	0,002
basic patent and	45	26.8	123	73.2	1		
Number of living children							0.34
Family income	74	20.2	293	79.8			
<Average income Malagasy	42	18.3	188	81.7	1		
> Average income Malagasy	32	23.4	105	76.6	1.36	0.81 to 2.29	0.24
Travel in the past year							0.3
Age of sexual initiation	76	19.8	308	80.2			
> 16 years	35	17.5	165	82.5	1		
≤ 16 years	41	22.3	143	77.7	0.74	0.45 to 1.22	0.24
Know at least two places where to buy condoms	76	19.5	313	80.5			
Ignoring	6	3.7	155	96.3			
Knowledge	70	30.7	158	69.3	11.5	4.83 to 27.1	<10-3
Having received money against sex during the past year							
No	57	16.7	284	83.3	1		
Yes	15	78.9	4	21.1	18.7	5.98 to 58.4	<10-3

*Results are expressed univariate analyzes for the modality "constant or occasional" Variable Condom use, compared to the modality "Absent"

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Table 4 Knowledge and attitudes about HIV/AIDS, 396 pregnant women recruited at antenatal clinics, Tulear, Madagascar, 2000

Initial source of information on HIV/AIDS	not	%
	352	
Media (radio, TV, newspapers and posters)	176	44.9
only radio	114	32.4
Family and friends	57	16.2
Health system	48	13.6
school	39	11.1
Knowledge of different transmission channels	391	
sexual	306	78.2
Mother and Child	6	1.5
intravenous	73	18.7
two good combination responses	65	16.6
The three correct answers	4	1
absurd answers	16	4.1
Know nothing	63	16.1
Ways to protect yourself	391	
condom	218	55.8
mutual fidelity	196	50.1
Abstinence	5	1.3
Fidelity and condom	171	43.7
absurd answers	12	3.1
Know nothing	136	34.8

Table 5 Characteristics based on the knowledge of at least one appropriate mode of protection against HIV, univariate analyzes, 396 pregnant women recruited at antenatal clinics, Tulear, Madagascar, 2000

Recruitment Dispensary	**Knowledge of at least one type of protection appropriate against HIV/AIDS**				**Univariateanalyz***		
Characteristics	**Knowledge**		**Ignoring**				
	not	%	not	%	GOLD	95% IdC	p
	243	62.1	148	37.9			<10-3
Betania	49	58.3	35	41.7	1		
Besakoa	47	42.7	63	57.3	0.53	0.30 to 0.94	
Tanambao	66	89.2	8	10.8	5.89	2.51 to 13.8	
Salfa	36	51.4	34	48.6	0.76	0.40 to 1.43	
Tsimenatse	45	84.9	8	15.1	4.02	1.69 to 9.58	
Age	242	62.5	145	37.5			<10-3
14-19	40	46	47	54	1		
20-24	69	62.2	42	37.8	1.93	1.09 to 3.41	
25-30	79	76.7	24	23.3	3.87	2.08 to 7.21	
31-49	54	62.8	32	37.2	1.98	1.08 to 3.64	

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Table continued...

Recruitment Dispensary	Knowledge of at least one type of protection appropriate against HIV/AIDS				Univariateanalyz*		
Characteristics	**Knowledge**		**Ignoring**				
Marital status							0.18
Location	200	66.4	101	33.6			
Urban	179	69.4	79	30.6	1		
Peri-urban	21	48.8	22	51.2	0.42	0.22 to 0.81	0,008
Ethnicity	241	62.1	147	37.9			
Ethnic not of the region	71	74.7	24	25.3	1		
Southwest Ethnic	170	58	123	42	0.47	0.28 to 0.78	0,004
Educational level	241	62.1	147	37.9			
None or Primary	105	47.7	115	52.3	1		
basic patent and	136	81	32	19	0.22	0.14 to 0.34	<10-3
Number of living children							0.53
Family income	237	64.6	130	35.4			
<Average income Malagasy	144	62.6	86	37.4	1		
> Average income Malagasy	93	67.9	44	32.1	1.27	0.81 to 1.97	0.31
Travel in the past year	242	62.2	147	37.8			0,045
No trip	107	61.8	66	38.2	1		
In the province	80	55.9	63	44.1	0.78	0.50 to 1.23	
Out of Province	52	76.5	16	23.5	2.01	1.06 to 3.80	
Abroad	3	60	2	40	0.93	0.15 to 5.69	
Age of sexual initiation	242	63	142	37			
> 16 years	115	57.5	85	42.5	1		
≤ 16 years	127	69	57	31	0.61	0.40 to 0.92	0,019
Initial source of information on HIV / AIDS	228	64.8	124	35.2			<10-3
Media (radio, TV, newspapers and posters)	124	70.5	52	29.5	1		
Health system	41	85.4	7	14.6	2.46	1.03 to 5.83	
Family and friends	27	47.4	30	52.6	0.38	0.20 to 0.70	
school	36	92.3	3	7.7	5.03	1.48 to 17.1	
Having received money against sex during the past year							
No	201	58.9	140	41.1	1		
Yes	16	84.2	3	15.8	3.71	1.06 to 13.0	0.031

*The results of univariate analyzes are expressed for the modality "Knowledge" variable Knowledge of at least one appropriate mode of protection against HIV/AIDS, compared to the modality "Ignorance"

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Table 6 Description of the statistical relationships of the terminal model obtained by multivariate analysis with the dependent variable variable "knowledge of at least one suitable protection against HIV" 396 pregnant women recruited at antenatal clinics, Tulear, Madagascar, 2000

Characteristics	ORa	IdC95% Adjusted	p
Recruitment Dispensary			<10-3
Betania	1		
Besakoa	0.33	0.13,0.82	0,017
Tanambao	9.01	2.44 to 33.3	10-Mar
Salfa	0.24	0.10 to 0.61	0.0027
Tsimenatse	5.71	1.54 to 21.2	0.0093
Ethnicity			
Ethnic not of the region	1		
Southwest Ethnic	0.32	0.14 to 0.74	0,072
Educational level			
None or Primary	1		
basic patent and	0.3	0.15 to 0.60	<10-3
Travel in the past year			0.0065
No trip	1		
In the province	0.27	0.12 to 0.58	<10-3
Out of Province	0.58	0.22 to 1.54	0.28
Abroad	0.18	0.024 to 1.34	0.094
Initial source of information on HIV/AIDS			0.0034
Media (radio, TV, newspapers and posters)	1		
Health system	2.15	0.79 to 5.86	0.13
Family and friends	0.38	0.17 to 0.87	0,023
school	3.97	1.00 to 15.7	0.049

ORa, Odd adjusted ratio; Model features, 2 Log Likelihood-261.313; Value of two Chi, 114.286; 12 ddl, p <10-3

Table 7 Features based on the educational level, 396 pregnant women recruited at antenatal clinics, Tulear, Madagascar, 2000

Recruitment Dispensary	**Educational level**				**Univariate analyzes ***		
	No schooling or elementary		**Elementary or higher certificate**				
	not	%	not	%	GOLD	95% IdC	p
	220	56.7	168	43.3			0.01
Betania	41	48.8	43	51.2	1		
Besakoa	74	67.9	35	32.1	2.22	1.24 to 3.99	
Tanambao	40	54.1	34	45.9	1.24	0.66 to 2.31	
Salfa	31	44.9	38	55.1	0.86	0.45 to 1.62	
Tsimenatse	34	65.4	18	34.6	1.98	0.97 to 4.04	

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Table continued...

Recruitment Dispensary	Educational level				Univariate analyzes *		
	No schooling or elementary		Elementary or higher certificate				
Marital status	220	56.7	168	43.3			0.006
Married	57	69.5	25	30.5	1		
Single	54	46.6	62	53.4	2.62	1.44 to 4.75	
marriage without marriage	108	57.8	79	42.2	1.57	0.98 to 2.50	
Location	169	56.5	130	43.5			
Urban	135	52.5	122	47.5	1		
Peri-urban	34	81	8	19	3.84	1.71 to 8.62	<10-3
Ethnicity	219	56.9	166	43.1			
Ethnic not of the region	41	43.6	53	56.4	1		
Southwest Ethnic	178	61.2	113	38.8	2.03	1.27 to 3.26	0,003
Family income	204	56	160	44			
<Average income Malagasy	146	63.8	83	36.2	1		
> Average income Malagasy	58	43	77	57	0.43	0.28 to 0.66	<10-3
Travel in the past year	219	56.7	167	43.3			
No trip	113	66.5	57	33.5			
Has traveled	106	49.1	110	50.9	0.49	0.32 to 0.74	0,001
Age of sexual initiation	215	56.4	166	43.6			
> 16 years	132	66.7	66	33.3	1		
≤ 16 years	83	45.4	100	54.6	2.41	1.59 to 3.65	<10-3
Initial source of information on HIV/AIDS	156	49.2	161	50.8			<10-3
Media (radio, TV, newspapers and posters)	89	51.1	85	48.9	1		
Health system	22	45.8	26	54.2	0.81	0.43 to 1.53	
Family and friends	41	73.2	15	26.8	2.61	1.35 to 5.06	
school	4	10.3	35	89.7	0.11	0.037 to 0.32	

*The results of univariate analyzes are expressed for the "No schooling or elementary" modality of the variable educational level, compared to the modality "elementary or greater Patent"

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Table 8 Relationship between knowledge of at least one type of protection appropriate against HIV and other variables knowledge and attitudes vis-à-vis HIV-AIDS 396 pregnant women recruited at antenatal clinics, Tulear, Madagascar, 2000

	Knowledge of at least one type of protection appropriate against HIV/AIDS									
	No education or primary level					**BE or higher level**				
	not	%	GOLD	IdC95%	p	not	%	GOLD	IdC95%	p
Fear of HIV-AIDS?										
no	1	12.5				3	60			
Yes	104	56.2	8.99	1.08 to 74.5	0,024	132	82	3.03	0.49 to 19.0	0.23
AIDS and good health are they compatible?										
no	52	45.2				54	75			
Yes	53	74.6	3.57	1.87 to 6.82	<10-3	80	87.9	2.42	1.06 to 5.54	0,032
Do you feel exposed?										
no	56	49.1				87	81.3			
Yes	47	74.6	3.04	1.55 to 5.98	0,001	48	88.9	1.84	0.69 to 4.89	0.22
Knowledge of at least one Correct way transmission										
no	5	7				6	75			
Yes	100	67.1	26.9	10.2 to 71.2	<10-3	130	81.3	1.44	0.28 to 7.51	0.65
Vis-à-vis tolerance of AIDS patients										
no	28	49.1				53	86.9			
Yes	73	60.8	1.61	0.85 to 3.04	0.14	78	79.6	0.59	0.24 to 1.44	0.24

Discussion

The pregnant women recruited in this study were a particular group, living mainly in urban areas, originating from one of the majority ethnic groups of the South West, poor and having few children. Compared with the characteristics of the latest national demographic survey,[5] pregnant women were generally more educated than women in the South West Province and had a later age of sexual initiation. The results obtained in this work should not be generalized to all pregnant women in the province. Other limitations inherent to this work stem from the nature of the epidemiological strategy used: in a cross-sectional study, certain temporal relationships between exposure and "disease" cannot be explored.[9] In addition, the lack of probability sampling could also bias the statistical results of this study. Condom data should be interpreted with the proviso that these women were pregnant (this is the concept of "condom conundrum": "how to protect oneself from illness when one wants to become pregnant?".[10] While most women knew condoms, few women had ever used condoms (compared to 52.8% of pregnant women in Brazil).[11] It appears that the least educated use it the least, as was demonstrated elsewhere.[12] This study would also highlight that women living in peri-urban areas would use it less than those living in cities, knowing that there is a significant relationship between living in peri-urban areas and not knowing where to buy a condom (OR=4.65, IdC95:[2.30-9.35], p<10-3). It would be worrying that the trend towards younger people using condoms less is confirmed by other studies. On the other hand, it is encouraging to suggest that women who have received money for sex use condoms, although only 4 out of 19 use it consistently. Very few women used it as a means of contraception outside desired periods of pregnancy, but such use could be more systematic and thus more effective in controlling HIV and STIs as was observed in Ethiopia with female sex workers.[13] The relatively high price (on average 100 FMG, or 7 euro cents, for 3 condoms) could also be an obstacle to its use, especially for women with less income. Health Authorities could focus on increasing the level of condom use, especially for the youngest, to develop condom uptake and appropriation as a means of contraception, while reducing its price and making it more affordable. no longer available in peri-urban areas. A very high proportion of pregnant women had already heard of AIDS, far more than in other countries.[14] This is promising in a country hitherto relatively spared by this scourge. On the other hand, there is a difference between declaring one's knowledge of AIDS and having potentially useful knowledge to avoid contracting the disease. The use in this study of the indicator "knowledge of at least one appropriate means of protection against HIV-AIDS", built in an open mode, even if it does not correspond exactly to the standard

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recognized since 2000 in the studies Behavioral behavior,[15] has undoubtedly made it possible to get closer to the level of 'effective' knowledge of these pregnant women. AIDS was feared by most of the women interviewed, and nearly a third felt exposed. Most knew the route of sexual transmission and few expressed inaccurate pathways such as mosquito bites or sharing a meal. On the other hand, few were aware of mother-to-child transmission, as had already been observed in other countries,[16–17] But we can report that these pregnant women seemed to have a better knowledge of HIV-AIDS than relatives of hospital patients who were interviewed in a study conducted in the Malagasy capital Antananarivo.[18] Nearly one in three women did not know how to potentially protect themselves from this disease, which is much more encouraging than in other countries more severely affected by the pandemic.[19] Abstinence was not part of the protection provided by this population of sexually active women.

One-third of women had a high level of intolerance for HIV-AIDS patients, knowing that it is likely that none of them have encountered such patients. As observed in other countries,[14–20] educational attainment is a modifying effect of most relationships between demographic or socio-behavioral variables and knowledge about HIV/ AIDS. This trend differs from that reported by the other study conducted in Antananarivo.[18] After mastering this effect, the pregnant woman's original recruitment clinic, her ethnicity, the notion of trips in the past year and the initial source of information on HIV-AIDS are independently related to the knowledge of at least one mode of protection, as well as the educational level. It is common to suggest that a lower grade level is related to less knowledge about HIV/AIDS: an additional analysis (not reported here) reports that it is the poorest women, living in the bush, and a ethnic groups who would have the least access to education. They also have a potentially higher risk of contracting an STI, including HIV, because of their earlier sexual lives. This squaring of the relationships between poverty, low schooling, precociousness of sex life and low knowledge would reinforce the idea that HIV is preferentially a disease of the poor in this region of the world. The specific orientation of prevention programs for these disadvantaged populations in southwestern Madagascar could be considered by the health authorities. The appearance of the original clinic in the multivariate model assumes that there is a heterogeneity in the recruitment and populations covered by the different clinics, and or in the knowledge and resources available to health professionals and social workers one of whose roles is to inform about HIV-AIDS. If this result is confirmed, the health authorities could focus on strengthening the homogeneity of some of the services offered by the various health centers. Ethnicity is potentially indicative of lower knowledge, and although this is independent of educational level in the multivariate model, other determinants such as poverty and or habitat may interact in this relationship: thus, after control of the educational level effect, there is a relationship for the stratum of women with low educational level indicating that those of one of the local ethnic groups would have a lower income (ORstrate: 2.75, IdC95% [1.33-5,68], p=0.009) and would live more frequently more than 5 km from the city center than those belonging to other ethnic groups (ORstrate: 3.85, IdC95% [0.87-17.1], p=0.072). Data on the initial source of HIV-AIDS information would indicate that women who had initial access to information through the media would have as much knowledge as those initially informed through the health system, more knowledge than women informed by family and friends but much less than those who were through school. We can note that radio is the most frequent source of information on HIV-AIDS, as suggested at the capital Antananarivo and in many other developing countries,[21–23] Recognizing that prevention campaigns using this media reach a wide audience and that success has been reported in other countries such as Mozambique,[21] health partners in this region could reinforce the messages conveyed by radio and television. by other mass media, while expanding the coverage of prevention programs provided by the health system and the school. The fact that women who have received money for sex would experience more at least one means of protection against HIV-AIDS, that they would use condoms more and that they would feel more exposed to HIV-AIDS. That the others (OR=2.72, IdC95: [0.98-7.52], p=0.046) would report encouraging trends, as well as the fact that few women declared concealing a possible STI to their spouse. To know at least one means of protection is, at least in the stratum of women who were the least educated, related to other variables such as the knowledge of the transmission routes, the fact that one can be in good health despite infection, to be exposed to HIV-AIDS or to be afraid of it. On the other hand, there is no link between awareness of a means of protection and the notion of tolerance towards people with HIV/AIDS. This information, coupled with data that nearly one in three women expresses strong intolerance towards people living with HIV, would indicate the need to reinforce messages of acceptance and leniency. Otherwise, discrimination and stigmatization of those affected could become stronger and pose a major challenge to the implementation of appropriate responses to the epidemic.[24] The knowledge of at least one appropriate means of protection against HIV-AIDS, even when aggregated with the sensation of being exposed to this infection, is not significantly related to the different STI biomarkers analyzed. Ideally, a relationship stating that women reporting appropriate knowledge would have been less infected might have suggested that knowledge was accompanied by an effective awareness of putting preventive attitudes into practice. It has been observed that the relationship between knowledge and the practice of less risky behavior, which is the goal of information programs on AIDS and STIs, is in general rarely observed,[13,20,23,25] it is possible that this study abounds in this direction. However, it should first be validated that knowledge about HIV/AIDS can be used as indirect indicators of knowledge about other STIs. It is also possible that pregnant women who were previously infected and treated were the most aware of STIs. On the other hand, some of the markers used might have lacked specificity for STIs (anti-Chlamydia trachomatis serology and Australia antigen). Or finally, as was the case in Africa or on other continents, it is possible that this study testifies to the fact that knowledge, even when it is coupled with the awareness of risk,[17] does not easily lead to the implementation of preventive practices.

This work, conceptualized and carried out in collaboration with Malagasy partners, provides information on the knowledge and attitudes of pregnant women about HIV in a very disadvantaged area far from the rest of the country. These data have allowed and will allow the Health Authorities to have basic information; they are necessary to build or strengthen any system for monitoring and evaluating prevention programs against HIV and STIs, particularly those set up in antenatal clinics in the peri-urban region of Tulear, with the aim of being able to improve them. According to international recommendations for establishing a second-generation HIV surveillance system,[26] and given the situation of the epidemic in Madagascar, it would be appropriate to complete this survey with a set of studies investigating knowledge, attitudes and group behaviors identified as high risk, such as sex workers, as well as subpopulations that can serve as an HIV transmission link between these high-risk groups and the general population.

Conclusion

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Conflict of interest

The author declares there is no conflict of interest.

References

1. Joint United Nation Programme on HIV/AIDS (UNAIDS). Madagascar: Epidemiological fact sheet on HIV/AIDS and sexually transmitted infections, 2002.
2. Harms G, Matull R, Randrianasolo D, et al. Pattern of sexually transmitted diseases in a malagasy population Sex. *Trans Dis*. 1994;21(6):315–320.
3. Xueref S, Holianjavony J, Daniel R, et al. The absence of HIV seropositivity contrasts with a high prevalence of markers for sexually transmitted infections among registered female sex workers in Toliary, Madagascar. *Trop Med Int Health*. 2000;8(1):60–66.
4. Behets F, Andriamiadana J, Rasamilalao D, et al. Sexually transmitted infections and associated socio-demographic and behavioural factors in women seeking primary care suggest Madagascar's vulnerability to rapid HIV spread. *Trop Med Int Health*. 2001;6(3):202–211.
5. Enquête démographique et de santé Demographic and health surveys/ Macro International INC. Antananarivo: Institut National de la Statistique de Madagascar. 1997;264.
6. Xueref S, Holianjavony J, Capart H, et al. Prévalences et facteurs de risques de la syphilis, de chlamydiose génitale et d'hépatites virales B et C et absence de cas de séropositivité au VIH-SIDA dans une population de femmes enceintes du Sud-Ouest de Madagascar En cours de révision (Santé Publique).
7. Joint United Nation Programme on HIV/AIDS (UNAIDS). Guidelines for conducting HIV sentinel serosurveys among pregnant women and other groups. Geneva. 2003;66.
8. Larivee C, Lamptey P, Zeitz P. Technical strategies. In: Strategies for an expanded and comprehensive response (ECR): a handbook for designing and implementing HIV/AIDS programs. 2001.
9. Hennekens CH, Buring JE. Descriptive study. In: Mayrent SL, editor. Epidemiology in medicine, Boston/Toronto: Little, Brown and company, 1987;5(1):108–112.
10. Preston Whyte. Reproductive health and the condom dilemma in South-Africa. Canberra: Australian National University, Health Transition Center. *National Center for Epidemiology and Population Health*. 1999.
11. Miranda AE, Alves MC, Neto RL, et al. Seroprevalence of HIV, Hepatitis B virus, and syphilis in women at their first visit to public antenatal clinics in Vitoria. *Brazil Sex Transm*. 2001;28(12):710–713.
12. Lagarde E, Carael M, Glynn JR, et al. Educational level is associated with condom use within non-spousal partnerships in four cities of sub-Saharan Africa. *AIDS*. 2001;15(11):1399–1408.
13. Aklilu M, Messele T, Tsegaye A, et al. Factors associated with HIV-1 infection among sex workers of Addis Ababa, Ethiopia. *AIDS*. 2001;15(1):87–96.
14. Singh S, Fukuda H, Ingle GK, et al. Knowledge, attitude, the perceived risks of infection and sources of information about HIV/AIDS among pregnant women in an urban population of Delhi. *J Commun Dis*. 2002;34(1):23–34.
15. The BSS development and Implementation Group. Behavioural surveillance surveys: guidelines for repeated behavioural sureys in populations at risk of HIV. Arlington, VA: *Family Health International*. 2000.
16. Ho CF, Loke AY. HIV/AIDS knowledge and risk behaviour in Hong Kong Chinese pregnant women. *J Adv Nurs*. 2003;43(3):238–245.
17. Meda N, Sangaré L, Lankoandé S, et al. L'épidémie VIH au Burkina Faso: situation actuelle et niveau des connaissances de la population sur le sida. *Épidém.*1998;46:14–23.
18. Lanouette NM, Noelson R, Ramamonjisoa A, et al. HIV and AIDS related knowledge, awareness, and practices in Madagascar. *American Journal of Public Health*. 2003;93(6):917–919.
19. Shrotri A, Shankar AV, Sutar S, et al. Awareness of HIV/AIDS and household environment of pregnant women in Pune, India. *Int J STD AIDS*. 2003;14(12):835–839.
20. Lindan C, Allen S, Carael M, et al. Knowledge, attitudes, and perceived risk of AIDS among urban Rwandan women: relationship to HIV infection and behavior change. *AIDS*. 1991;5(8):993–1002.
21. Karlyn AS. The impact of a targeted radio campaign to prevent STIs and HIV/AIDS in Mozambique. *AIDS Educ Prev*. 2001;13:(5)438–451.
22. Bertrand JT, Brown LF, Kinzonzi M, et al. AIDS Knowledge in three sites in Bas-Zaire. *AIDS Educ Prev*. 1992;4(3):251–266.
23. Colvin M, Sharp B. Sexually transmitted infections and HIV in a rural community of the Lesotho highlands. *Sex Transm Infect*. 2000;76(1):39–42.
24. Piot P. Global AIDS Epidemic: time to turn the tide. *Science*. 2000;288(5474):2176–2178.
25. Mitchell CM, Kaufman CE. Pathways of choice and healthy ways project team. Structure of HIV knowledge, attitudes, and behaviors among American Indian young adults. *AIDS Educ Prev*. 2002;14(5):401–418.
26. Joint United Nation Programme on HIV/AIDS (UNAIDS). Guidelines for second generation HIV surveillance Geneva: WHO and UNAIDS. 2000.