Condom use and vulnerabilities to sexually transmitted infections in *quilombola* communities: a descriptive study, Sergipe, Brazil, 2016-2017*

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Abstract

Objective: To analyze frequency of condom use according to vulnerability factors for sexually transmitted infections in *quilombola* communities in Sergipe state, Brazil. **Methods:** This was a descriptive cross-sectional study carried out in 2016-2017. A structured questionnaire with sociodemographic and behavioral questions was used; rapid HIV and syphilis tests were performed. Comparisons between categorical variables were performed using Fisher's exact test. **Results:** Among the 367 individuals from 14 communities, the majority had low levels of education (72.8%), were not working (59.7%) and had a stable sex partner (90.7%). Lack of access to prevention supplies and information accounted for respondent programmatic vulnerability. There was a higher proportion of inconsistent condom use with a stable partner (90.1%) among individuals who reported lack of access to information (p=0.001) and inconsistent use with a casual partner (p<0.001). **Conclusion:** Frequency of condom use with a stable partner was significantly proportional to condom use with a casual partner and access to information on prevention.

Keywords: HIV; Syphilis; Condoms; Health Vulnerability; African Continental Ancestry Group; Epidemiology, Descriptive.

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Introduction

Every day, globally, there are more than 1 million new cases of curable sexually transmitted infections (STIs) among people aged 15 to 49 years old, according to data published by the World Health Organization in 2019.[1] Correct and consistent condom use is an efficacious method for reducing STIs transmission, although effective adoption of this method depends on the person's willingness, motivation and capability, as well as that of their partner.[2] In some traditional settings, such as *quilombola* (maroon) communities, the subject can be a cause of embarrassment and often be seen as taboo.[3]

Low adherence to consistent condom use can be found in *quilombola* communities in different regional contexts, including in the states of Pará,[3] Maranhão,[4] Goiás and Mato Grosso do Sul.[5] Standing out among the reasons for not using this prevention method is lack of perception of the risk of contracting STIs.

> *Low adherence to consistent condom use can be found in* quilombola *communities in different regional contexts*

In addition to the set of individual vulnerabilities related to sexual risk behaviors, social factors act as strong predictors.[6] With regard to ethnic and racial inequalities in Brazil, the situation of the *quilombola*s deserves special attention, in view of the historic vulnerability of these communities.[7]

The results of studies on sexual behavior and vulnerability to STIs among Brazilians of African descent should serve to inform the design and implementation of public policies, both general and specific. However, such results are scarce regarding STIs in *quilombola* communities in the state of Sergipe.[3-5,8] As such, this study aims to contribute to increasing knowledge and the situation of vulnerability (individual, social and programmatic) of this population, commonly underrepresented in epidemiological studies on the theme of sexual health.

From this point of view, the objective of this study was to analyze frequency of condom use according to vulnerability factors for sexually transmitted infections in *quilombola* communities in Sergipe state, Brazil.

Methods

This is a descriptive cross-sectional study conducted in *quilombola* communities in the state of Sergipe, Northeast region of Brazil, between 2016 and 2017.

According to the Palmares Cultural Foundation, as at September 2017, 2,526 certificates had been issued for 3,010 *quilombola* communities in Brazil, 35 of which are located in Sergipe and distributed over 11 municipalities.[9]

The selected *quilombola* communities are located in the basins of the Japaratuba, São Francisco, Costeiro do Sapucaia and Sergipe rivers, and in the Médio Sertão Sergipano, Grande Aracaju, Baixo São Francisco Sergipano and Leste Sergipano territories.

Adults aged 18 years old or over, living in *quilombola* communities in the state were eligible to take part in the study. Individuals with clinical diagnosis of severe mental impairment, recorded on medical records held at the primary health care center linked to their community, and those who had never had sexual intercourse, were excluded.

The study sample was stratified between the *quilombola* communities, identified from the data recorded by the National Institute for Colonization and Agrarian Reform in Sergipe: families in registered territories, registered as descendents of *quilombola* communities. After having set up the database of the territories and the registered individuals, the random sampling without replacement procedure was used.

The study outcome was condom use (always; frequently; sometimes; never) with dichotomized alternatives (inconsistent use; consistent use), where 'consistent use' was considered to be only when individuals chose the alternative 'always'. Interviewees were also asked about condom use depending on the type of relationship they were involved in: stable partners or casual partners.

The other variables studied included the dimensions of vulnerability proposed by Jonathan Mann et al. and also by Ayres (the latter in Brazil):[10-11]

a) Social vulnerability
  - Sex (male; female);
  - Self-reported race/skin color (white; brown; black);
  - Level of schooling (no schooling or incomplete elementary education; complete elementary education/incomplete high school education;

complete high school education/incomplete higher education; complete higher education);

- Economic classification, categorized according to the 2016 Brazilian Economic Classification Criterion, as per the Brazilian Association of Survey Companies (ABEP) (categories: A; B1; B2; C1; C2; D/E);[12]

- Family income (dichotomized according to median income: up to BRL 600; above BRL 600); and

- Current work situation (not working; working).

b) Individual vulnerability

- Age (years: 18-39; 40-59; 60-101), the cut-off points of which were defined based on the median of the sample distribution;

- Use of drugs (occasional or low-risk user; risk or harmful use; high chance of dependency), based on the Brazilian version of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) instrument;[13]

- Partner uses drugs (yes; no);

- Interviewee and partner history of STIs (presence; absence);

- Types of sexual activity (oral [yes; no]; vaginal [yes; no]; anal [yes; no]);

- Number of sex partners in the last 12 months (up to five; more than five); and

- Age at first sexual intercourse (under 15 years old; 15 years old or more).

c) Programmatic vulnerability

- Access to information on STIs prevention in the last 12 months (yes; no);

- Receipt of prevention supplies – condoms and lubricant gel – in the last 12 months (yes; no);

- Place where health checkups are had (primary health care center; private health service; does not have checkups);

- Treatment in case of STIs (yes; no);

- Health service where treatment was obtained (primary health care center; pharmacy; did not treat);

- Presence of governmental social STIs prevention programs that include people from where you live (yes; no);

- Institutional racism (discrimination: absent or low; medium; high), assessed using a Likert scale with five points, ranging from 1 (never) to 5 (always), based on the cut-off point of the scale of perception of racial discrimination in health services, validated and adapted to Brazilian reality.[14]

The data were collected between September 2016 and June 2017. The team of researchers presented the project to each *quilombola* leader and scheduled the most convenient date for a data collection event, respecting the chronological order of each leader's request and confirmation of availability of a public space in the community: primary health care center, schools, community centers etc.

The interviews involved administering a questionnaire structured according to items related to social, individual and programmatic vulnerability; the interviews were conducted individually in previously scheduled public places or at the interviewee's home when it was impossible for them to get to the place scheduled for the interviews.

After the interview, the participants were invited to take a rapid test for HIV and syphilis. Those who consented underwent individual counseling (pre-test counseling) and then the serological material was collected from them in a private room. The test results were given during further individual counseling (post-test counseling), which also included health education and recommendations for prevention based on each diagnosis.

HIV infection was identified by the BioManguinhos HIV-1&2 and Abon rapid tests. The Alere test was performed when *Treponema pallidum* antibodies were detected, thus enabling identification of occurrence syphilis, regardless of whether it was early, diagnosed at two years old, or late, i.e. more than two years after effective contact with the bacteria. The tests were performed in accordance with Ministry of Health Ordinance No. 34, dated July 28th 2005, and Ordinance No. 3242, dated December 30th 2011.

All participants with positive test results were referred to the primary health care center responsible for coverage of their territory, where they presented the appropriate forms: HIV and Syphilis Referral Form; one copy of the clinical form; and the Fique Sabendo (Find Out testing campaign) form, of the Sergipe STI, AIDS and Viral Hepatitis Department.

The sample size calculation was based on statistical power of 80%, a two-tailed alpha level of 0.05 and minimum detectable difference between groups of 15%, totaling at least 333 individuals to be interviewed.

A further 10% was added to compensate for any missing data and losses.

Before being administered by the researchers, the questionnaire underwent a process of contents validation by five acknowledged experts in interdisciplinary matters relating to Health and Environment, Public Health and Sexual Health, as well as being used to train the interviewers who were 20 undergraduate and postgraduate students taking Health-related courses. These strategies sought to reduce measurement bias.

Statistical analysis was performed using Stata version 15.0. The continuous variables were described in means and standard deviations (SD); while the categorical variables were described in absolute and percentage values, together with a 95% confidence interval (95%CI), estimated using the "exact" binomial method. Fisher's exact test was used to compare condom use distribution among the other variables comprising vulnerability to STIs. The two-tailed p-value <0.050 was taken to be the criterion for statistical significance. Sexual intercourse with a stable partner was used as the reference, since it represented the greater part of the population.

The study project was approved by the Tiradentes University Research Ethics Committee as per its Opinion No. 1.685.357, dated August 18th 2016. It was also approved by the Sergipe State Health Department and Municipal Health Departments covering communities that would be involved in the study. All participants signed a Free and Informed Consent form.

Results

The sample was comprised of 367 individuals from 14 *quilombola* communities in Sergipe, aged between 18 and 101 years old (mean 44.81 – SD=17.46). Among the 333 individuals (90.7%) who had sexual intercourse with a stable partner, 9.9% consistently used condoms in this exclusive form of relationship. With regard to the 191 (52.1%) who had sex with casual partners, 15.7% consistently used condoms. Within this same group, 42.7% had sexual intercourse with their stable partner and also with casual partners, and among these individuals who had two kinds of partners, 90.6% had unprotected sex with both kinds of partner – stable and casual.

The participants' profile, in terms of social vulnerability, is described in Table 1. There was a predominance of Black people – of brown and black skin color (93.2%) –, economic class D/E (75.4%), females (73.0%), individuals with no schooling or incomplete elementary education (72.8%), with family income up to BRL 600 (66.5%) – equivalent to approximately US$ 190 at the time of the interview – and those who were not working (59.7%).

Alcohol consumption was reported by 61.1% of the population and, according to the ASSIST classification, 17.2% of the interviewees had risk or harmful use or high chance of dependency (Table 1). Use of other psychoactive drugs at some time in life – e.g., cannabis, cocaine, hypnotics and inhalants – was mentioned by around 10% of the population.

Syphilis prevalence was found to be 3.3%, there were no positive HIV test results and 6.8% reported previous STIs. With regard to individual vulnerability factors according to sexual behavior, 28.9% began their sex life before they were 15 years old and 3.3% reported having had more than five partners (Table 2).

In relation to programmatic vulnerability to STIs, the following percentages of participants had had HIV and syphilis detection tests at some time in their lives: 41.1% had tested for HIV and 35.4% had tested for syphilis. Lack of access to some sort of information about STIs prevention was reported by 41.1% of the interviewees, and 82.8% had not received prevention supplies in the last 12 months. With regard to government social STIs prevention programs that included people in the vicinity, 79.6% reported that they did not have this resource in their community and 83.9% used the local primary health care center for health checkups. The majority – 95.4% – reported low perception or never having perceived acts of racism in health services (Table 3).

Higher proportions of inconsistent condom use with stable partners were found among individuals who reported lack of access to information (p=0.001), as well as among individuals with casual partners (p<0.001) (Table 4). Consistent condom use with stable partners was found among females (78.8% – 95%CI 61.3;89.6) and those who were not working (69.7% – 95%CI 51.9;83.0), although the differences were not significant.

Discussion

Inconsistent condom use was reported by approximately one in ten inhabitants of *quilombola*

Table 1 – Absolute and relative frequencies of the variables that comprise factors of social vulnerability to sexually transmitted infections in *quilombola* communities in Sergipe, 2016-2017

Variable	N	%
Sex		
Female	268	73.0
Male	99	27.0
Self-reported race/skin color		
Black (brown and black)	342	93.2
White	25	6.8
Schooling		
No schooling or incomplete elementary education	214	72.8
Complete elementary education, or complete or incomplete high school/higher education	53	27.2
Family income		
Up to BRL 600	244	66.5
More than BRL 600	123	33.5
Economic classification[a]		
Class B1-C2	90	24.6
Class D/E	277	75.4
Current work situation		
Not working	219	59.7
Working	148	40.3
Alcohol consumption		
No	143	38.9
Occasional or low-risk consumption	161	43.9
Risk or harmful consumption/high chance of dependency	63	17.2

a) 2016 Brazilian Economic Classification Criterion, as per the Brazilian Association of Survey Companies (ABEP) (categories: A; B1; B2; C1; C2; D/E).

communities in Sergipe. Just over half the respondents also had casual partners and had sex without condoms in both situations. There was higher proportion of consistent condom use with stable partners among individuals who also used them consistently with casual partners, and also, as expected, among those who had more access to information on prevention. Low levels of schooling and poor socioeconomic conditions were the main factors of their social vulnerability and, it should be recalled and highlighted, this is the same reality present in many communities in Brazil. This requires more in-depth reflection on matters concerning equal access to health.

The results presented need to be interpreted taking certain limitations into account. One of them is the scarcity of national studies on this theme, principally with regard to *quilombola* populations.

This resulted in the need to include studies with different methodological approaches when discussing the results of this study. In turn, the study's descriptive cross-sectional design makes it impossible to establish temporality for the analyses. It should be noted that the respondents were asked about their practices prior to the interview, and as such it is possible that their answers may have suffered memory bias. There is also the possibility of some answers corresponding to the "socially acceptable" standard.

A significant proportion of consistent condom use with casual partners and stable partners was to be expected. Theoretically, people who consistently use condoms with a stable partner would have less risk of contracting STIs,[6] because they would also protect themselves in the same way with casual partners. As for inconsistent condom use with stable partners and

Table 2 – Absolute and relative frequencies of the variables that comprise factors of individual vulnerability to sexually transmitted infections in *quilombola* communities in Sergipe, 2016-2017

Individual vulnerability factors	N	%
Age group (years)		
18-39	148	40.3
40-59	139	37.9
60-101	80	21.8
History of STI (interviewee)		
Yes	25	6.8
No	342	93.2
History of STI (partner)		
Yes	4	1.1
No	363	98.9
Partner uses drugs		
Yes	20	5.4
No	347	94.6
Age at first sexual intercourse		
15 years old or over	261	71.1
Under 15 years old	106	28.9
Number of sex partners in the last 12 months		
Up to 5	64	96.7
More than 5	256	3.3
Type of sexual intercourse		
Vaginal		
Yes	346	94.3
No	21	5.7
Anal		
Yes	28	7.6
No	339	92.4
Oral		
Yes	12	3.3
No	355	96.7

casual partners, other studies published between 2009 and 2017 conducted with *quilombola* communities in North, Northeast and Midwest Brazil, also mentioned this characteristic, including in situations involving multiple partners.[3-5]

Insufficient information can aggravate the risk of infection, due to lack of knowledge about prevention methods and, consequently, the spreading of a variety of false beliefs about condoms.[15-16] This situation is even more serious in the context of *quilombola* communities, often a long way from health centers, the majority facing adverse socioeconomic conditions, with fewer resources for their education, health and transport.

The participants' sociodemographic profile was similar to that found in other studies conducted in *quilombola* communities: a predominantly Black population, with no schooling or incomplete elementary education, and not working. Families of

Table 3 – Absolute and relative frequencies of the variables that comprise factors of programmatic vulnerability to sexually transmitted infections in *quilombola* communities in Sergipe, 2016-2017

Programmatic vulnerability factors	N	%
Tested for HIV in lifetime		
Yes	151	41.1
No	216	58.9
Tested for syphilis in lifetime		
Yes	130	35.4
No	237	64.6
Access to information on STI prevention in the last 12 months		
Yes	216	58.9
No	151	41.1
Receipt of prevention supplies – condoms and lubricant gel – in the last 12 months		
No	304	82.8
Yes	63	17.2
Place where you have health checkups		
Primary health care center	308	83.9
Private health service	39	10,6
Does not have checkups	20	5.5
Treatment in case of STI		
Health service	16	66.7
Pharmacy	3	12.5
Did not treat	5	20.8
Governmental social STI prevention programs that include people from where you live		
No	292	79.6
Yes	75	20.4
Perception of racial discrimination in health services		
None or low	110	95.4
Medium	16	4.3
High	1	0.3

poorer economic status can be seen to be predominant, this being a situation reported by studies published between 2009 and 2020 about *quilombola* populations in the states of Bahia,[17-19] Pará,[3] Maranhão,[4] Goiás and Mato Grosso do Sul.[5]

North American studies conducted in the 1990s[20] and during the last decade,[6] concluded that people of a high socioeconomic level tend to have much lower risk of contracting an STI. Level of education plays a fundamental role in the ability acquired to understand information that is provided, such as by prevention programs, and to respond to it. According to the above mentioned studies, populations that have at least complete elementary education are less susceptible to contracting an STI. These findings corroborate the situation of vulnerability to ISTs we identified in the *quilombola* communities of Sergipe.

The higher proportion of women using condoms with their stable partners may be a reflection of their insecurity about their partners being faithful, preventing pregnancy or greater concern about their health. It is known that for many couples, unprotected

Table 4 – Analysis of condom use with stable partner according to sexually transmitted infection vulnerability factors in quilombola communities in Sergipe, 2016-2017

Vulnerability factors	Result as to condom use				Total N (%)	p-value[b]
	Inconsistent use		Consistent use			
	N (%)	95%CI[a]	N (%)	95%CI[a]		
Sex						0.077
Female	215 (71.7)	66.2;76.5	26 (78.8)	61.3;89.6	241 (72.4)	
Male	85 (28.3)	23.4;33.7	7 (21.2)	10.3;38.6	92 (27.6)	
Able to read and write						0.383
Yes	175 (58.3)	52.6;63.8	24 (72.7)	54.9;85.3	199 (59.8)	
No	125 (41.7)	36.1;47.3	9 (27.3)	14.6;45.0	134 (40.2)	
Not working						0.059
Yes	175 (58.3)	52.6;63.8	23 (69.7)	51.9;83.0	198 (59.5)	
No	125 (41.7)	36.1;47.3	10 (30.3)	16.9;48.0	135 (40.5)	
Alcohol consumption						0.791
No	115 (38.3)	32.9;43.9	9 (27.3)	14.6;45.0	124 (37.2)	
Occasional or low risk user	131 (43.7)	38.1;49.3	19 (57.6)	40.1;73.2	150 (45.1)	
Risk/harmful use	45 (15.0)	11.3;19.5	5 (15.1)	6.3;3.2	50 (15.0)	
High risk use	9 (3.0)	1.5;5.6	–	–	9 (2.7)	
Age group (years)						0.825
18-39	118 (39.3)	33.9;45.0	18 (54.5)	37.3;70.6	136 (40.8)	
40-59	116 (38.7)	33.2;44.3	13 (39.4)	24.1;56.9	129 (38.8)	
60-101	66 (22.0)	17.6;27.0	2 (6.1)	1.47;21.6	68 (20.4)	
Previous STIs						0.396
Yes	23 (7.7)	5.1;11.2	–	–	23 (6.9)	
No	277 (92.3)	88.7;94.8	33 (100.0)	–	310 (93.1)	
Condom with casual partner						<0.001
Inconsistent use	154 (90.6)	85.2;94.2	3 (20.0)	6.3;48.3	157 (84.9)	
Consistent use	16 (9.4)	5.8;14.8	12 (80.0)	51.7;93.7	28 (15.1)	
Receipt of prevention supplies						0.185
Yes	47 (51.4)	11.9;20.2	10 (5.6)	16.9;48.0	57 (17.1)	
No	253 (84.3)	79.7;88.0	23 (69.7)	51.9;83.0	276 (82.9)	
Access to information on sexual health						0.001
Yes	177 (59.0)	49.2;68.1	29 (87.9)	80.0;92.9	206 (61.9)	
No	123 (41.0)	31.8;50.8	4 (12.1)	7.1;19.9	127 (38.1)	

a) 95%CI: 95% confidence interval; b) Fisher's exact test.

sex can be interpreted as a sign of intimacy and trust, resulting in a psychological barrier, not just against condom use but also to communication about safe sex in general.[2] However, the authors of a study dating from 2016, conducted with *quilombola* women in the state of Amazonas, found low condom use among the sexually active population, regardless of their marital status. Even so, the majority of women interviewed recognized that condoms are a safe method of preventing sexually transmitted infections.[3]

The percentage of participants reporting high-risk alcohol consumption was higher than that found by a study conducted in 2011 in *quilombola* communities in Bahia (11%),[17] although it must be taken into consideration that that study did not use ASSIST as its basis but rather a classification according to the number of measures of alcohol consumed weekly. Excessive consumption of alcoholic beverages is associated with increased probability of being diagnosed as having an STI. Some researchers have associated alcohol consumption with having multiple sex partners and, as a consequence, inconsistent condom use, thus resulting in greater risk of HIV transmission.[21,22]

Although syphilis prevalence was below 10%, it was three times higher than the rate found by a population-based study conducted with parturient women in Brazil,[23] taken as a proxy for the general population (0.89%). It should be highlighted that syphilis is a marker of unprotected sex and can potentialize HIV infection.[24,25]

Factors related to difficulty in accessing HIV and syphilis tests, prevention and health care supplies, information and activities form part of the dimension of *quilombola* community programmatic vulnerability. Further to these findings are those of a study conducted in 2010 in *quilombola* communities throughout the national territory, which revealed the same difficulties in accessing STI prevention services.[8] These are important conditions for the success of prevention actions. It is therefore expected that contact with information about reducing risk of STIs, availability of prevention supplies and diagnostic tests will leave individuals more prepared for practicing safer sex.[26,27]

In parallel to testing for HIV and syphilis, using public health services can reduce programmatic vulnerability. The actions of social programs are also

of extreme importance: according to a study conducted in 2017 in Coimbra, Portugal, following intervention via an education program to reduce risky sexual behavior, the people reached by the intervention were more likely to have used a condom the last time they had sex with their stable partner (odds ratio = 4.61 – 95%CI 1.31;16.20) and to test for HIV (odds ratio = 7.59 – 95%CI 3.33;17.35).[28]

The majority of interviewees had health checkups at their local primary health care centers. Another study, focusing on *quilombola* communities in the southwest region of the state of Bahia in 2013, revealed difficulty in accessing and underuse of public health services, which only 57.1% of the community inhabitants used.[18] Although on the formal level, the communities have access to the Family Health Strategy, it has not come into effect in everyday *quilombola* life due to barriers to access.[8,19] In the *quilombola* communities in Sergipe we found that access to primary health care centers is made difficult due to distance and shortage of health workers. Moreover, for some of these communities the service was only an itinerant one.

The perception of the majority of the respondents was that racial discrimination was absent or slight in health services, which, theoretically, would reduce the possibility of staying away from the health service because of being discriminated. However, it is important to note that some individuals reported medium to high perception of institutional racism in health services. We highlight that the consolidation of the idea of structural racism in the formation of Brazilian social inequality occurred, and occurs, in a non-linear manner, suffering strong contestations, inflections and various obstacles along the way.[29] Moreover, the hypothesis of distorted understanding of concepts about racism, racial prejudice and discrimination among the general population cannot be ruled out. In addition, difficulty in access may in itself represent yet another barrier to people providing an answer on this aspect.

The results presented here trace a profile of individual, social and programmatic vulnerabilities in relation to IST prevention in the *quilombola* communities of Sergipe. Frequency of condom use with stable partners was directly proportional to their use with casual partners and to access to information on prevention. The results reinforce the need to strengthen strategies that enable the consolidation

of sexual education practices, through more effective individual and collective policies, expanding the services provided by the health system to the *quilombola* communities of Sergipe.

Authors' contributions

Passos TS and Hora AB contributed to the study concept and design, interpreting the results and drafting the contents of the manuscript. Almeida-Santos JP contributed to the study concept and design, statistical analysis of the results and critically reviewing the contents of the manuscript. Oliveira CCC contributed to the study concept and design, interpreting the data and critically reviewing the contents of the manuscript. All the authors have approved the final version of the manuscript and are responsible for all aspects thereof, including the guarantee of its accuracy and integrity.

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