Frequency of Human Papilomavirus and associated factors in gypsy and quilombola women

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Abstract

Background: The prevalence of Human Papillomavirus (HPV) infection in the general population is widely known, however, there are still few studies related to this infection in minority groups, Thus, the objective is to analyze the frequency of human papillomavirus and associated factors in quilombola and gypsy women.

Methods: Cross-sectional study with 145 quilombola and gypsy women from Caxias, Maranhão. Two Pap smear collections were performed and a questionnaire with 46 questions was applied between January, 2020 and March, 2021. Descriptive analysis and Odds Ratio, with confidence interval of 95%. The research was approved by the ethics committee.

Results: There were 09 cases of atypia. The frequency of human papillomavirus was 41.37%, with a higher risk in quilombolas 55(91.70%). Multiple infections were prevalent (53%) with high risk genotypes 21(35%). Types 16 and 18 together accounted for 42.85% of cases.

Conclusions: The frequency of human papillomavirus infection was higher than those recorded in the Northeast and Brazil, and therefore type 16 predominated. Due to limitations, the virus lineages and sublineages were not evaluated. Quilombola women had a higher rate of infection than gypsies.

Introduction

The prevalence of Human Papillomavirus (HPV) infection in the general population is widely known, however, there are still few studies related to this infection in minority groups, especially in quilombola and gypsy peoples. In most of the surveys there is invisibility for the quilombola, gypsy, indigenous and riverine peoples, etc., thus perpetuating a process of exclusion by the researches. There are few data related to the tracking of cervical health, especially in gypsy and quilombola peoples. In a search conducted in Google Scholar, Virtual Health Library (VHL) and PubMed, we identified scarce studies related to HPV especially in gypsy women. At the Brazilian level these studies are absent. This screening for HPV is, therefore, characterized as pioneer in gypsy women in Brazil[1].

Incidence and mortality data place uterine cervical neoplasia as one of the main ones in the female public around the globe. The less developed countries are the ones that present the greatest burden, with 80% of all cancers in the world. Even though a reduction in its rates has been observed worldwide in recent years, this cancer continues to victimize women disproportionately in poorer regions, such as Latin America and the Caribbean, ranking 3rd among the most common type of cancer in women in these regions[2-4].

In the year 2018, on a global scale, considering a total of 8.6 million cases of the 10 most common types of cancers among women, cervical cancer comprised 6.6% and uterine body cancer 4.4%. Of the total of 4.3 million deaths caused by the 10 most common types of cancer, deaths from cervical cancer comprised 7.5%[5].

In Brazil, for the triennium 2020, 2021, and 2022, 16,590 new cases of cervical cancer were estimated, with an estimated risk rate of 16.35% per 100,000 women. In the country, this disease occupies the 3rd position among female cancers, with 7.5% of all cases. In the northeast, it is the 2nd most incident type of cancer with 10.9% cases/100,000 women. In Maranhão, 890 cases were estimated in 2020, with a crude rate of 24.74 cases/100,000. This state occupies the 2nd position in the ranking with a rate of 12.46 cases/100,000 women[6] and 70% of the disease cases occur in areas with lower human development indexes[7].

The quilombola population in Brazil, even with the implantation of social/citizenship rights with the 1988 Constitution, has not been able to strongly change the way of accessing and availability of services, remaining on the margins of the Unified Health System and other public policies inclusions[8].

In general, gypsy women have strong resistance to undergo cervical cancer screening, even with the support of information about it. In this sense, it is necessary that health professionals know their way of being, habits, values and culture. On the other hand, gypsy women need to be better informed about accessibility, dynamics of services, and examination routines. Therefore, there is a need to develop links for the construction of motivating dialogues for this invisible group[9].

Considering the relationship of cervical cancer in neglected ethnic groups, we realize that it is exactly in these invisibilized groups that there are major barriers of accessibility to health services, arising from economic and geographical difficulties, insufficient services and cultural issues[10]. In a cross-sectional study conducted in Maranhão's quilombos in the region of Itapecuru and Litoral do Maranhão, the HPV frequency identified was 7.09%.[11].

This research aims to analyze the frequency of human papillomavirus and associated factors in quilombola and gypsy women.

Methods

A cross-sectional study, in which exposure and outcome are assessed concurrently at a point in time. Like a snapshot, it produces a prevalence of the offense and raises questions related to the presence of an association and its significance[12]. The research was carried out in the city of Caxias, state of Maranhão. It is a medium-sized municipality located in the east of the state, in the western part of the Northeast, a transition area between the northern and northeastern regions.

In this study we selected women from 5 quilombola communities and women from 1 gypsy area, in the age range of 10 to 64 years. Women under 25 were included in order to facilitate their recruitment in these groups that have sparse populations, besides considering the fact that in these communities women initiate sexual activity early. The sample consisted of a population of 331 women. Statistica 8.0 software in Power Analysis and Sample Size Estimation mode was used to estimate the sample size. The z-score was 1.96 (corresponding to 95% Confidence Interval), so their total sample n was 145 women.

Quilombola and gypsy women with a history of active sexual life, belonging to families in the areas registered by community health agents and eligible for the exam were included. Quilombola and gypsy women who were virgins, had cognitive deficits, and had conditions that contraindicated the collection of the exam were excluded. To ensure the women's anonymity, the questionnaires were coded with a number and, added to it, the initial letter of their locality. The women who agreed to participate in the study signed the Informed Consent Form (ICF).

A questionnaire containing 46 questions related to sociodemographic information, risk factors, and behavioral factors was applied. The collection was carried out in the period from January 18, 2020 to March 16, 2021.

The participants were submitted to speculum examination that included 2 Pap smear collections: 1 conventional and 1 in liquid medium through the Kiagen kit. The samples were examined in the laboratory of the tumor bank of Maranhão, Federal University of Maranhão, for cytological abnormalities and tested by Polymerase Chain Reaction (PCR). To the sequencing of Deoxyribonucleic Acid (DNA) were submitted all PCR products of positive women (n= 60), for determination of HPV genotypes that was performed in the Laboratory of Molecular Genetics of the State University of Maranhão - Campus Caxias.

The data were generated in the statistical software Redcap that provided Excel spreadsheets for data tabulation and from these the statistical software Statistical Package for the Social Sciences (SPSS), version 22 was used. To confirm or deny the hypothesis that quilombola and gypsy women have a frequency of HPV infection similar to women in the general population, the following variables were used: sociodemographic and behavioral data, conventional cytology results, HPV frequency, types of infections, HPV genotypes.

Confidence interval, 95%, 5% level of statistical significance ($p < 0.05$) was calculated. For all significant p-values Odds Ratio (OR) were calculated to observe the magnitude of the relationship between HPV infection and associated factors.

The research was self-financed and all authors declare that they had no personal, commercial, political, academic or financial conflict of interest that might have influenced the preparation of this work. The research was approved by the Research Ethics Committee of the Maranhão State University, according to opinion number 2.867.682.

The analyses of the variables were descriptive and presented in tables and graphs of absolute and relative frequencies. The results were discussed in the light of the theoretical framework and considering the main scientific publications in the area.

Results

A total of 145 women were included in the study, of which 123(84.83%) were quilombolas and 22(15.17%) gypsies. The age groups were grouped according to the highest prevalence of infection in

these women. Thus, the age group that had the highest number of women was 30 to 50 years, accounting for 56 women (38.62%), followed by the age group of women < 30 years, 49 women (33.79%). Overall, the majority of women were characterized as young and adult, with a frequency of 105 (72.41%). Regarding education, 55 (37.93%) were non-literate and 60 (41.37%) had up to elementary school. As for marital status, 50 (34.48%) were married and 55 (37.93%) were in a stable union.

It was observed that of the 13 variables analyzed, only menopause was significant as a risk factor, as menopausal women were 4.326 more likely to develop atypia than non-menopausal women (Confidence Interval: 1.033-18.116; p value: 0.045) (Table 1).

(INSERT TABLE 1)

Analyzing the variable positivity for HPV, it was observed that most cases were aged > 30 years, 37 women (61.66%), history of oral contraceptive use 17 (28.33%), smoking 5 (8.33%) and multiparity 4 (33.3%).

In the sample, 09 (100%) of the cervical cytological atypia cases were HPV infected. Among the cytological atypia, the following stood out: undetermined significance in squamous cells related to infection (6 cases); atypia results, not to exclude high-grade lesion (2 cases); and high-grade squamous lesion (1 case). Analyzing the relationship positivity for cytological cervical atypia and Pap smear, the frequency of risk was higher in Quilombola women with 8 (88.88%), while in Roma women it was only 1 (11.11%) (p-value 0.591). Of the 09 cases of cytological atypia: 05 presented high-risk HPV, 03 cases were of coinfection and 01 case presented low-risk HPV. Regarding the age range, most cases of cytological atypia occurred between 30 and 64 years in 77.77% (7) cases, and 44.44 of these originated between 50 and 64 years of age. The community where there was a higher frequency of cytological expressions was Lagoa dos Pretos, followed by Cana Brava. The community where there were fewer cytological expressions was Soledade.

As seen in Table 2, there were more cases of HPV infection in the quilombola group than in the gypsy group. The quilombola community where there was a higher frequency of HPV was Lagoa dos Pretos 7(70%), followed by Cana Brava 10(52.6%). The lowest frequency of HPV among the quilombola women was observed in the Soledade community 7(35%). In isolation, gypsy women among all minority groups had the lowest frequency of HPV infection 5(22.7%).

In Graphic1, we present the overall frequency in all the findings in the 6 communities together, presented in Table 2. Thus, as for the indicator of Human Papillomavirus infectivity in the sample of women from minority groups in both groups (quilombolas and gypsies), a frequency of 41.37% (60 cases) was observed, which characterizes it as high frequency.

In the total group of women, our findings revealed that most of the HPVs identified were high risk, with 10 (35.71%), and low risk, 18 (64.28%). In the isolated groups, this frequency of high-risk HPV in the quilombola group was 7 (70%) and for the gypsy group 3 (30 %) (Table 3).

When analyzing the frequency alone in the quilombola group and no longer in the total sample of women, it had a greater range of positivity for HPV in the quilombola population, with 44.71%(55) cases. In the gypsy women, this frequency was 22.72% (5) cases. Thus, in our findings, the relative risk for HPV positivity in quilombola women was 14.6%, higher than that of gypsy women (p 0.043). In this research, only the cases of simple infection, 28(47%), had their genotypes defined, while the multiple infections did not have their genotypes defined.

In the overall sample of women surveyed, the majority 53%(32) had multiple HPV infections, followed by 47%(28 cases) with single infections. The phenomenon multiple infections present was higher in the quilombola women than in the gypsy women, in a proportion 93.8%(30) and 6.3%(2) cases, respectively.

In the overall sample, of the 28 women who had simple infections, 21(75%) was by high-risk HPV and 07(25%) by low-risk HPV. Analyzing the phenomenon of infection by high-risk HPV in isolation in the quilombola and gypsy groups, it was found that in the quilombola women the frequency of infection by high-risk HPV was 7(70%), followed by the gypsies who presented an index of 30%(3) cases with (p 0.406). In this same sample there were no cases of women with cytological atypia of the cervix without HPV infection.

In the overall sample, the cases of multiple HPV infections identified comprised a frequency of 32(53%), representing, in this study, the cases not genotyped as to HPV type. On the other hand, the types that were revealed by genetic sequencing showed that the highest frequency was for HPV-16, with 11 cases (39.28%). Characterizing the identified high-risk HPVs, the following stood out: HPV-16, HPV-18, HPV-35, HPV-45, HPV-53 HPV-58, HPV-59, HPV-66; and the low-risk ones stood out: HPV-11, HPV-39-, HPV-54, HPV-62, HPV-83. HPV-16 and HPV-18 infection together comprised 12(42.85%) of the defined cases. The other HPVs had a frequency ranging from 1(3.57%) to 2(7.14%).

In the quilombola group we observed a greater diversity of genotypes (12 types), as well as a higher proportion of coinfected cases, 54.54% (30 cases). Also in the quilombola group there was a greater variety of HPV types (16, 18, 35, 45, 53, 58, 59 and 66). In the gypsy group there were only 2 genotypes (HPV 16 and 45), 2 cases of HPV-16 and 1 case of HPV-45. Co-infection represented 40%(2) of cases in the Roma group (Graphic 2).

Discussion

Women of African descent commonly present cervical cancer in more advanced forms. This fact is more observed due to their greater exposure to adverse social living conditions, as well as precarious accessibility conditions and low supply to health services[13].

The data cited above corroborate our findings, where the quilombola and gypsy women surveyed were mostly characterized as low socioeconomic status, elderly, black, married, with early sexual activity and with sexual exposure to risk by not using the condom, thus being more vulnerable to HPV infection and the development of cervical cancer.

The incidence of cervical cancer has a strong tendency to be concentrated with a burden of 80% in the poorest countries with a low Human Development Index (HDI). In these areas, this burden is four times higher when compared to more developed areas. Another aspect that shows that cervical cancer is a problem in poor countries is related to the time of diagnosis, because in poor women it occurs late, usually between 44 and 68 years of age. As for mortality, 88% of deaths occur in these less developed regions, around 45 to 76 years of age[14].

The overall frequency of cytological alterations in quilombola and gypsy women was low (<6.5%). The positivity of cervical cytology samples varies between 3 and 10%, revealing good quality in their analysis. Therefore, the frequency identified in our study was similar to the parameters reported at national and international levels[15].

Regarding the frequency of atypia, our survey found significance with the menopausal phenomenon. Therefore, there is no direct relationship between menopause and the occurrence of atypia. This variable is not related specifically in terms of menopause, but because of the age range in which it occurs[16]. The risks of CIN II and CIN III progression for single and multiple infections are 71.2% and 28.8%, respectively. The mean age for ASC-US and LSIL HPV lesions has been shown to be 34.5 years for women progressing to CIN[17].

In a study conducted in tribal women a higher trend of coinfection for HPV-high risk with HPV-low risk was observed. The prevalent HR-HPV subtypes among tribal women in south India were HPV-18 (28.3%), HPV-45 (22.8%) and HPV-16 (10.7%). Infections with single HPV subtypes were observed in 14.4% and multiple HPV subtypes in 24.7%. Viral co-infections with HR-HPV subtypes were predominant in these, with 59.7% of cases[18].

In an international study of 165 Gypsy women aged 25 to 64 years, 6% (10) of the cases of atypia occurred, and HPV was present in only 4 cases19. Thus, in comparison with our findings, we observed a similar frequency, (6% versus 4.54%), where in these results all cases of atypia were infected with HPV.

A relevant systematic review with meta-analysis on the prevalence of HPV in Brazil showed that the overall prevalence of cervical HPV was 25.41 and in the northeastern region (32.82%)[20]. In comparison to these data, in our findings a higher frequency of HPV(41%) was observed in relation to Brazil and the northeastern region, cited above.

In a nationwide study conducted in 26 state capitals and the Federal District with 5,569 women, black women accounted for 16.77% (1,200). For women belonging to the D/E class, the overall prevalence of high-risk HPV was 37.96%. HPV 16 was the most prevalent in this same group. These findings signal the phenomenon of pauperization of HPV[21], pattern also observed in quilombola women, where the occurrence of oncogenic HPV was 18 (85.7% - p value 0.406) with a higher frequency for HPV 16, with 39.28% cases[12].

We compared our results with studies conducted in quilombola communities in a state of the southeastern region, we found a higher frequency of HPV with 41.37%. The study conducted in two cities in Espírito Santo (São Mateus and Conceição da Barra) with 352 quilombola women points out that the overall frequency of HPV was only 11.1%[22].

The study conducted in Maranhão, with 353 women in 04 quilombos in the cities (Alcântara, Bequimão, Central do Maranhão and Mirinzal), contrasted the main findings of this study with the research evidenced here. The prevalence of HPV identified (13.03%) was also lower than our findings 60 (41%). The single infection was more frequent than multiple infections in quilombola women. In this aspect, regarding the number of infections, the opposite occurred in our findings, where multiple infections were more frequent with 93.75%. As for the high-risk HPVs, there was a higher frequency of these, with 10.2%, followed by low-risk HPV with 2.8%. Regarding the oncogenicity of HPV, in our findings there was a higher frequency of low-risk HPV 18(64.28%) cases[23].

Regarding the variable high-risk HPV genotypes, another robust study was conducted in 34 quilombos in 06 cities in MA (São José de Ribamar, Presidente Vargas, Viana, São Luís Gonzaga, Central do Maranhão and Alcântara), the most prevalent types were: HPV68 (26%); HPV58 and HPV52 (20%); HPV31 (10%) and HPV62 (8%); types: 16, 18, 33, 39, 45, 51, 53, 54, 55, 56, 59, 61, 66, 70, 71, 72, 73, 84 were identified[(11)]. Unlike our findings, HPV-16 was the most frequent with 11(39.28%). The identified HPVs were common with our study: 16, 18, 39, 45, 53, 54 and 66.

Given this evidence, it is considered that there was a high prevalence of HPV infection in the ethnic groups analyzed, being higher than the frequencies recorded in other studies published in Brazil and the Northeast. All cases of minor cytological alterations(atypia) were HPV infected. Most women infected with HPV had multiple infections with a predominance of high-risk HPV genotypes, the most frequent being HPV-16. Quilombola women had a higher risk of HPV infection and development of cytological atypia than gypsy women.

HPV strains and sublineages, especially HPV-16 and HPV-18, were not investigated in this study due to the limitations of the molecular methods used. This fact presents itself as a future need for investigation, as well as the follow-up of these women regarding new outcomes.

This study shows that the HPV virus is circulating among quilombola and gypsy women in this region. These minority groups are invisibilized and have great difficulty in accessing health services. On the other hand, the results point to a need for greater reflection on the model of care practiced as well as the approach of the family health strategy with integration of teaching and service in the development of actions and interventions to minimize the chain of transmission of HPV, as well as the follow-up of positive cases of high risk demonstrated. The information revealed about the high frequency of HPV can provide data to support decision makers at the local level in the development of planning for the provision of health policies to these neglected groups.

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Tables

Table 1. Characterization of sociodemographic and clinical variables, according to positivity and negativity of the HPV test with association by the chi square test significant at 5% in the general population. Maranhão, Brazil, 2021.

Feature	Total (n)	HPV-	HPV+	P- value
Age				
>30 years	49	26 (53.1)	23 (46.9)	0.201
30 to 50 years	56	38 (67.9)	18 (32.1)	
50 to 64 years	40	21 (52.5)	19 (47.5)	
Color				
Black	112	61 (54.5)	51 (45.5)	0.191
Brown	25	18 (72.0)	7 (28.0)	
White	8	6 (75.0)	2 (25.0)	
Education				
Non-literate	54	30 (55.6)	24 (44.4)	0.594
Up to elementary school	61	35 (57.4)	26 (42.6)	
Up to High School	30	20 (66.7)	10 (33.3)	
Marital State				
Singles	34	20 (58.8)	14 (41.2)	0.908
Married/Consensual Union	105	62 (59.0)	43 (41.0)	
Widow	6	3 (50.0)	3 (50.0)	
Menarche				
10 to 11 years	57	34 (59.6)	23 (40.4)	0.968
12 to 14 years	79	46 (58.2)	33 (41.8)	
>15 years	9	5 (55.6)	4 (44.4)	
1st coitus				
10 to 11 years	14	7 (50.0)	7 (50.0)	0.754
12 to 14 years	63	37 (58.7)	26 (41.3)	
>15 years	68	41 (60.3)	27 (39.7)	
Oral contraceptive				
Yes	48	31 (64.6)	17 (35.4)	0.305
No	97	54 (55.7)	43 (44.3)	
Menopause				

Years	49	26 (53.1)	23 (46.9)	0.332
No	96	59 (61.5)	37 (38.5)	
Smoking				
Yes	12	7 (58.3)	5 (41.7)	0.606
No	133	78 (58.6)	55 (41.4)	
No. of normal births				
1	5	3 (60.0)	2 (40.0)	0.591
2 to 3	10	4 (40.0)	6 (60.0)	
4 to 5	12	8 (66.7)	4 (33.3)	
Above 6	4	3 (75.0)	1 (25.0)	
Condom use				
Yes	49	30 (61.2)	19 (38.8)	0.764
No	82	46 (56.1)	36 (43.9)	
At times	14	9 (64.3)	5 (35.7)	
Sexually Transmitted Infection				0.574
Yes	24	14 (58.3)	10 (41.7)	
No	121	71 (58.7)	50 (41.3)	
Alcoholism				
Yes	72	43 (59.7)	29 (40.3)	0.461
No	73	42 (57.5)	31 (42.5)	

Source: Research data, 2021.

Table 2. Distribution of positive and negative HPV cases in quilombola and gypsy communities. Maranhão, Brazil, 2021.

Communities	Total	HPV-	HPV+
		n %	n %
Cana Brava	19	9 (47.4)	10 (52.6)
Jenipapo	19	10 (52.6)	9 (47.4)
Lagoa Pretos	10	3 (30.0)	7 (70.0)
Lavras	55	33 (60.0)	22 (40.0)
Soledade	20	13 (65.0)	7 (35.0)
Ciganos	22	17 (77.3)	5 (22.7)
Total	145	85	60

Source: Research data, 2021.

Table 3. Frequency, type of risks, number of HPV infections and cytological alterations in quilombola and gypsy women. Maranhão, Brazil, 2021.

Status	Quilombolas	Gypsy	P-Value
	n (%)	n (%)	
HPV+	55 (91.7)	5 (8.3)	**0.043**
HPV-	68 (80)	17 (20)	
Total	123 (84.8)	22 (15.2)	
HPV high risk	7 (70)	3 (30)	0.290
HPV Low risk	18 (100)	0 (0)	
Not identified risk	30 (93.7)	2 (6.3)	
Total	55 (91.7)	5 (8.3)	
Single Infection	25 (89.3)	3 (10.7)	0.435
Multiple Infection	30 (93.8)	2 (6.3)	
Total	55 (91.7)	5 (8.3)	
Cytological atypia	8 (88.9)	1 (11.1)	0.591
Normal cytology	115 (84.6)	21 (15.4)	
Total	123 (84.8)	22 (15.2)	

Source: Research data, 2021.

Figures

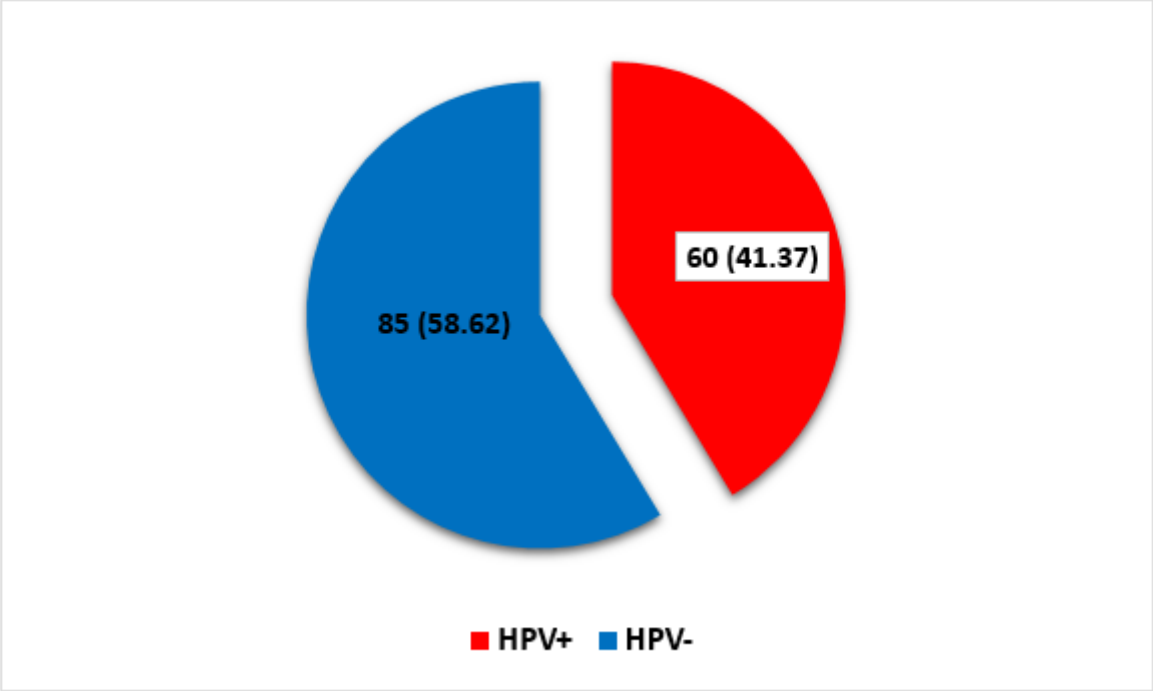

Figure 1

Distribution of the overall frequency of positive and negative HPV cases in the evaluated population. Maranhão, Brazil, 2021.

Source: Research data, 2021.

Legend: HPV + correspond to HPV positive; HPV – correspond to HPV negative.

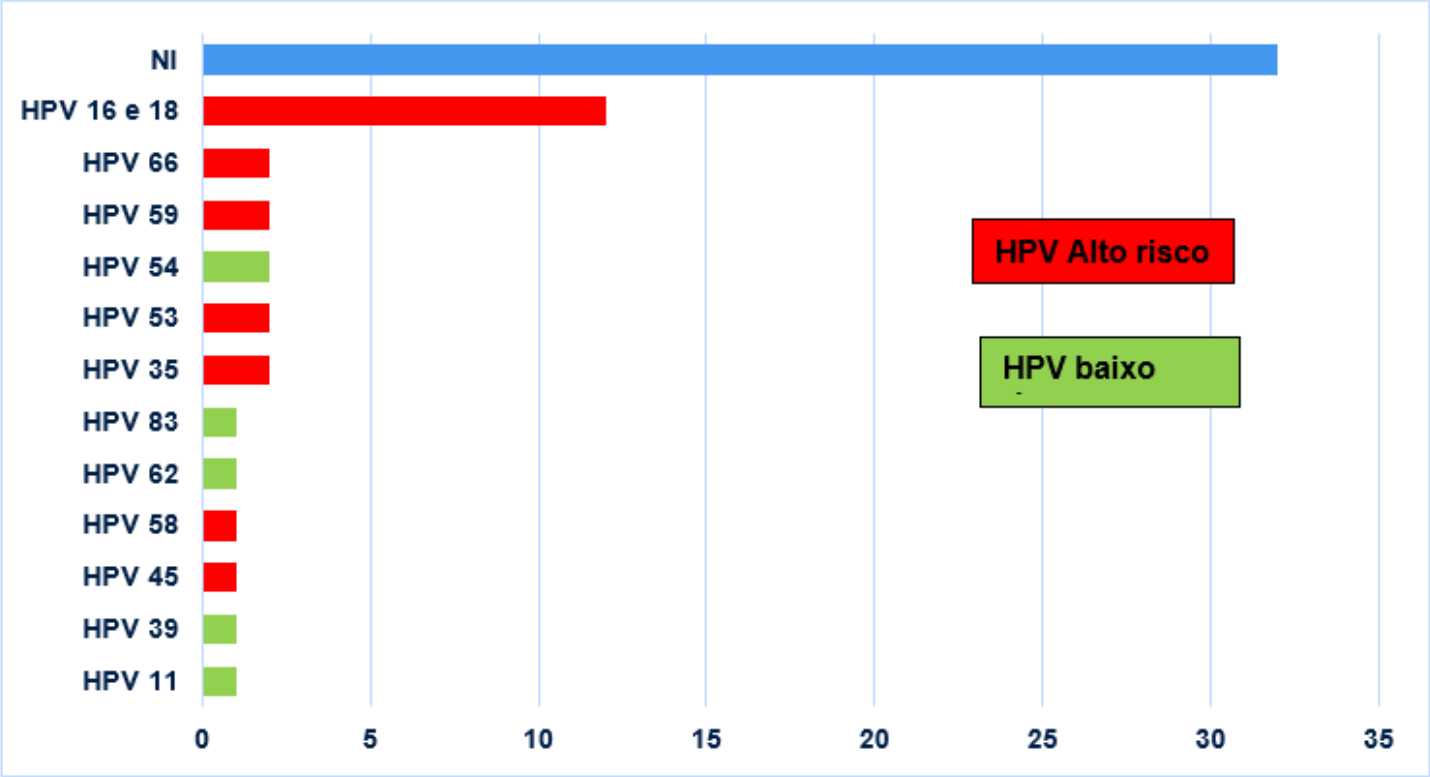

Figure 2

Distribution of identified and unidentified HPV types and distribution by risk in quilombola and gypsy women. Maranhão, Brazil, 2021.

Source: Research data, 2021.

Legend: HPV Alto risco correspond to High risk; HPV baixo correspond to HPV low risk