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GLOBAL PERSPECTIVES: A SUPPLEMENT TO THE THEME ISSUE

An Exploratory Study of HPV, Cervical Cancer, and HIV Knowledge: Key Findings on Risk Behaviors and Access to Medical Screenings among Amerindian Adolescents in Guyana, South America

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Abstract

Due to the lack of systematic cervical cancer screening programs, high poverty levels, and lack of access to basic health care, cervical cancer is one of the leading causes of death in Guyana, South America. This cross sectional pilot study was conducted among Amerindian adolescents in Guyana. We examined adolescent risk taking behavior with a focus on cervical cancer, HPV knowledge, and HIV knowledge. Adolescents' reported engaging in multiple risk behaviors. About half of the sample heard of HPV and cervical cancer, while most had not heard of the vaccine. Regarding HIV knowledge, almost three-fourths of the adolescents reported they could protect themselves against HIV or AIDS by always using a condom. Fifty percent of adolescents reported having had vaginal sex, and of those who were sexually active (had vaginal sex), more than half reported no condom use during coitus. These and other findings will aid in the development of strategies to improve adolescent and women's health in Guyana, particularly around access to pap smears and population-based screening programs, as well for strategies to promote behavior change.

Cervical cancer is a significant public health issue, as it is the second most common cancer in women worldwide after breast cancer. Cervical cancer is the leading cause of cancer-related deaths among women in developing countries, with the highest incidence and mortality occurring among the world's poorest populations. In developing countries, women face many barriers to early detection and treatment of the disease and in many of these countries, cervical cancer is the leading cancer among women. Since cervical cancer is caused by the genital human papillomavirus (HPV), the most common sexually transmitted infection (STI), the risk of developing cervical cancer is closely linked with unsafe sexual practices

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(Walboomers et al., 1999). A vaccine is now available to prevent cervical cancer caused by the oncogenic subtypes 16 and 18, said to be responsible for approximately 70% of all cervical cancers worldwide (Bosch et al. 2002). It is estimated that each year there are as many as 500,000 new cases of cervical cancer; 80% of these cases occur in developing countries, such as Guyana. According to the Pan American Health Organization (PAHO), in 2002 the incidence of cervical cancer in Guyana was 47.3/100,000, and the mortality rate was 22.2/100,000 (Parkin et al., 2001). By contrast, the incidence and mortality rates for cervical cancer in the U.S. were 7 and 2.3/100,000 respectively.

Guyana, a former British territory, is the only English-speaking country in South America. Having gained independence in 1970, it is now a republic with a democratic government. The country is divided into ten regions that are managed by Regional Democratic Councils. Each Regional Democratic Council is administratively responsible for delivering public services within its boundaries (Draft National Health Plan of Guyana, 1994).

The regional system of administration has several constraints; however, new mechanisms are being considered for improving the delivery of health services. Guyana, although rich in natural resources, is the second poorest country in South America and the Caribbean, with a per capita Gross Domestic Product (GDP) of US $800 in 1999. The country has a high debt burden and is categorized as a Highly Indebted Poor Country (Draft National Health Plan of Guyana 1994).

According to the 1999 Guyana Survey of Living Conditions (GSLC), 36.3% of the population lives in absolute poverty (US $510 per year or US $1.40 per day) and 19.1% live in critical poverty (US $364/ year or US $1/ day). Of those living in absolute poverty in Guyana, 78.4% were from the rural interior and 39.8% were from the rural coastal areas. However to change Guyana's economic and social picture, the government of Guyana embarked on an economic recovery program with support from the International Monetary Fund and the World Bank which aid in a more market-oriented Guyana.

Amerindian is the collective name for the Amazonian indigenous ethnic groups living in the forests of Guyana and Suriname. Amerindians are the predominant population throughout much of Guyana's interior. Compared to other populations in the country, their economic resources are especially scarce and they exhibit some of the poorest health indicators (PAHO Country Health Profile, 1998). Guyana's Amerindian Communities are widely scattered across a vast savannah or are tucked away in the hard-to-reach mountain rainforests. Despite intensive efforts by the Ministry of Health and the Ministry of Amerindian Affairs, certain unavoidable factors, such as remote location and lack of electricity, impede the provision of health care to people in Guyana's interior.

In developing countries, approximately 60% of women who are diagnosed with cervical cancer either have never been screened or have not been screened in the five years preceding their diagnosis (Womack & Warren, 1998). Despite the epidemiological evidence that invasive cervical cancer is highly preventable through regular screening, Guyana's indigenous women have never had systematic cervical cancer screening. As a result of the extensive outward migration of trained personnel, coupled with insufficient funding and equipment for cervical cytology, large-scale cervical cancer screening has not yet been available in Guyana. The objectives of this pilot study will be 1) to describe the socio-demographic characteristics of Amerindian adolescents; 2) to describe and assess adolescent's knowledge of the genital human Papillomavirus (HPV), cervical cancer, and HIV; and 3) to describe the prevalence of risky behaviors that may place this population at increased risk for HPV and HIV. Findings from this study will aid in the development of strategies to improve adolescent and women's health and to

promote equality and a high quality of care through prevention education.

Method

Study design and sample

The Guyana Adolescent Study was a cross-sectional study of approximately 30 adolescents who presented at a medical clinic in an interior town in Guyana in the summer of 2007. The study questionnaire was designed to examine the determinants of adolescent sexual health and risk behaviors, with a particular focus on knowledge of cervical cancer and genital human papillomavirus. Survey questions were based on previous studies that examined issues around HPV and cervical cancer risk among adolescents (Baer, Allen, & Braun, 2000; Dell, Chen, Ahmad, & Stewart, 2000; Gerhardt, Pong, Kollar, Hilliard, & Rosenthal, , 2000; Ingledue, Cottrell, & Bernard, 2004).

The survey assessed the following domains: demographics, sexual risk behavior, availability and accessibility of alcohol, tobacco, and other drugs (ATOD), medical screenings, HPV information, HIV knowledge and perception of risk, and religiosity. Parental consent was obtained, and IRB approval was granted by the Regional Democratic Council.

Measures

Demographics

The following data were collected to assess the demographic characteristics of the youth participating in the study: adolescents' gender, age, highest educational level, and residential information (such as with whom the adolescent resides and who works outside of the home).

Sexual Risk Behavior

Sexual risk behavior was assessed using self report of individual risk behaviors along with peer and maternal attitudes regarding sexual risk taking. Individual behaviors were assessed by reporting of having had vaginal sex (sexual intercourse), the age when the participants first had sexual intercourse, the average number of sex partners, and condom use. The study also examined peer attitudes on sexual risk behaviors (e.g., friends believe it is permissible to have sex, number of friends who have sex and have had sex without a condom). Maternal attitudes about engaging in sexual behaviors were also evaluated. Adolescents were assessed on whether they believed that if they were to have sex now their mother would approve, maternal approval for having sex without a condom, their comfort level speaking with their mother about sex and HIV prevention, how often they talk to their mother about sex, age at which they first spoke to their mother about sex, and their mother's influence on their decision to have sex.

Availability and Accessibility of ATOD

The assessment of the availability and accessibility of alcohol, tobacco, and other drugs (ATOD) included places to obtain ATOD and the level of difficulty in obtaining them.

Medical Screenings

Adolescents were asked about their awareness of cervical cancer, if they had ever had a Papanicolaou (Pap) test, when they had their first Pap, and when their next test would be. Adolescents were also asked some general knowledge questions about Pap tests and their perception of risk for cervical cancer.

HPV Knowledge

Participants were asked eight true/false or yes/no questions about their knowledge of HPV

- Have you ever heard of HPV infection?
- Is HPV a sexually transmitted disease?
- Is HPV a risk factor for the development of cervical cancer?
- Does HPV only affect women?
- Is HPV spread through sexual contact?
- Do condoms offer some protection from HPV?
- Are genital warts a symptom of HPV?
- Have you ever heard of Gardasil, the vaccine for HPV?

HIV Knowledge and Perception Risk

HIV knowledge and perception of risk was assessed by five questions (true/false or yes/no)

- Likelihood of contracting HIV/AIDS by having unprotected sex once or twice
- Condom use protects them from HIV/AIDS
- HIV/AIDS is spread by kissing someone
- You can tell that someone has HIV by looking at them
- Do you know someone who has died from complications due to HIV/AIDS?

Religiosity

Religiosity was assessed by the following questions:

- Adolescents' belief in a higher power
- Frequency of attendance at religious services
- Importance of religion
- Frequency of prayer
- Frequency of attendance at youth activities provided by their religious centers, and
- Who influences their decisions

Results

Table 1 describes the study participants' demographic characteristics. The average age of the adolescents was 17.4 years ($SD \pm 3.1$), and 59% (n = 16) were female. A majority of the adolescents indicated that their highest level of education completed was secondary school (60% (n = 16)). Sixty-seven percent (n = 16) reside with both their parents and siblings, and 42% (n = 10) of the fathers work outside of the home.

Sexual Risk Behaviors — Individual

Fifty percent of adolescents reported having had vaginal sex. Of those who were sexually active (had vaginal sex), more than half (55% (n = 6), see Table 2) reported no condom use during coitus. The average age for adolescents' first sexual experience was 16 years while the average number of sex partners 3.38($\pm$ 2.72). Table 2 describes the sexual risk behaviors and adolescent attitudes about sexual risk behaviors.

Sexual Risk Behaviors — Peer attitudes

Twenty-six percent (n = 7) of adolescents reported that less than half of their friends are sexually active. Fifty-seven percent (n = 12) of adolescents indicated not knowing how many of their friends who are sexually active have had sex without a condom. Thirty-seven (n = 10) percent of adolescents believed that less than half of their friends would approve of people their age having sex without a condom.

Sexual Risk Behaviors – Maternal attitudes

Three-fourths of adolescents (75%, n = 18; Table 2) indicated that their mother would definitely not or probably not approve of

them having sex now and 96% (n = 23) believed that having sex now without a condom would definitely not or probably not

Table 1. **Demographic Characteristics of Amerindian Adolescents from Guyana, South America**

Categories	**(N)**	
Mean Age (SD)	27	17.4 ($\pm$ 3.1) years
	(N)	**% (n)**
Gender		
Female	27	59% (16)
Highest Level of Education Completed	27	
Secondary		60% (16)
Primary		22% (6)
University/College		7% (2)
Trade School		4% (1)
Other		7% (2)
With whom do you currently live?	24	
Mom/Dad/Siblings		67% (16)
Mom only		17% (4)
Dad only		4% (1)
Extended Family – Aunt/Grandmother/etc		8% (2)
Do not know/Unsure		4% (1)
Who works outside of the home among the people you live with?	24	
Mother and Father, Mother and Foster Father		17% (4)
Father Only		42% (10)
Mother Only		8% (2)
Brother/Sister		17% (4)
Other – Uncle, Father of child, None		12% (3)
Do not know/Unsure		4% (1)

Table 2. **Amerindian Adolescents' Sexual Risk-Taking Behaviors and Attitudes about Sexual Risk Taking**

Categories	**(N)**	**% (n)**
Individual		
Ever had vaginal sex?	24	
Yes		50% (12)
Average age at first sexual (vaginal) intercourse (SD)	3	
		16 ($\pm$ 2)
Average number sexual partners (SD)	8	
		3.38 ($\pm$ 2.72)
Use of condom at first sexual (vaginal) experience	11	
Yes		36% (4)
No		55% (6)
Do not know/Unsure		9% (1)
I will say no to sex with my partner if he or she will not allow us to use a condom	26	
Strongly disagree		8% (2)
Disagree		8% (2)
Agree		38% (10)
Strongly agree		42% (11)
Do not know/Unsure		4% (1)
Peer attitudes		
Friends think it is permissible for people their age to have sex without a condom	27	
None		37% (10)
Less than half		37% (10)
Half		7% (2)
More than half		7% (2)
All		7% (2)
Do not know/Unsure		5% (1)
How many of your friends have had sex?	27	
None		15% (4)
Less than half		26% (7)
Half		18% (5)
More than half		18% (5)
All		15% (4)
Do not know/Unsure		8% (2)
How many of your friends have had sex without a condom?	21	
None		19% (4)
Less than half		14% (3)
All		10% (2)
Do not know/Unsure		57% (12)

Table continues on next page

talked with their mother about sex, and the average age at which they first did so was 15 years. In addition, 42% (n = 10) of adoles-

Table 2 Continued

Maternal attitudes		
If you were to have sex now, would your mother approve?	24	
Definitely not		50% (12)
Probably not		25% (6)
Maybe		13% (3)
Probably yes		8% (2)
Definitely yes		4% (1)
If you were to have sex without a condom, would your mother approve?	24	
Definitely not		79% (19)
Probably not		17% (4)
Definitely yes		4% (1)
How comfortable would you feel talking with your mother about sex and HIV prevention?	26	
Very comfortable		35% (9)
Somewhat comfortable		19% (5)
Somewhat uncomfortable		15% (4)
Very Uncomfortable		31% (8)
Have you ever talked with your mother about sex?	26	
Yes		50% (13)
Average age when adolescents talked to their mother about sex (SD)	11	
		14.91 ($\pm$ 3.11)
How much influence does your mother have on your decision to have sex?	24	
No Influence		12% (3)
Not much influence		30% (7)
Some influence		12% (3)
A lot of influence		34% (8)
Do not know/Unsure		12% (3)

be accepted by their mother. Approximately half of the participants indicated that they were very comfortable or somewhat comfortable talking with their mother about sex and HIV prevention (54% (*n* = 14), Table 2). Fifty percent (*n* = 13) of adolescents have

cents indicated that their mother had no influence or not much influence on their decision to have sex. Eighty percent (*n* = 21) of the adolescents indicated they would agree or strongly agree with the statement "I will

say no to sex with my partner if he or she will not allow us to use a condom."

Table 3 outlines the availability and accessibility of ATOD; 57% (*n* = 13) of adolescents reported it would be very easy to obtain alcohol, and 62% (*n* = 13) indicated it would be very difficult or fairly difficult to obtain drugs. Sixty percent (*n* = 9) of adolescents reported that they get or would be able to get alcohol and/or other drugs at places like a shop, drug sellers, rum shop, friends or homes.

Forty-eight percent (*n* = 13) indicated that they had heard about cervical cancer. Of the 16 female participants, only one had had a Pap smear within the past two years. Of the nine females who responded to the question regarding a Pap smear in correctly identifying changes to the cervix, one hundred percent indicated that this was a true statement. Table 4 describes the frequency and knowledge of medical screenings among adolescents.

Table 5 examines adolescents' knowledge about cervical cancer and HPV. There was greater awareness of HPV (52% (*n* = 14), Table 5) than of cervical cancer. When assessed on their knowledge about HPV, 78% (*n* = 21) correctly identified that HPV is a sexually transmitted disease, and 90% (*n* = 18) recognized that it is spread through sexual contact. 76% (*n* = 13) knew that HPV caused genital warts, and 73% (*n* = 11) acknowledged that HPV is a risk factor for cervical cancer. A majority of adolescents (88% (*n* = 21)) had not heard about the HPV vaccine, Gardasil. When adolescents were asked about their chances of contracting HPV or genital warts, most indicated a low chance 48% (*n* = 9) and 72% (*n* = 10) respectively, Table 5). When asked how concerned are you that you will get HPV, 54% (*n* = 12) were very concerned.

HIV Knowledge

Regarding knowledge and risk perceptions, eighty-nine percent (*n* = 24) of the adolescents agreed that it is possible to contract HIV or AIDS by having intercourse once or twice without a condom. All 27 adolescents agreed that you cannot tell if an individual has HIV or AIDS from the person's appearance, and 54% (*n* = 14) acknowledged that it was not possible to contract HIV or AIDS through kissing. Almost three-fourths of the adolescents feel they can protect themselves against HIV or AIDS by always using a condom, while 47% (*n* = 12) disagree or strongly disagree that by using a condom, they will not get HIV or AIDS. However, 71% (*n* = 19) indicated that condoms work pretty well or very well in preventing HIV. A majority of the adolescents (81% (*n* = 22)) knew someone living with HIV or someone who had died from complications related to AIDS. Equal percentages of the participants believed that sexual activity alone or both drugs and sexual activity affect an individual's chances of getting AIDS (44% (*n* = 12) and 44% (*n* = 12) respectively). Table 6 presents adolescents' knowledge about HIV and their perception of risk.

Religiosity

A majority of the adolescents 92% (*n* = 24)) reported that religion was somewhat important or very important to them, and 85% (*n* = 22) reported that they pray at least once a day (not presented in Table). However, only 56% (*n* = 14) attend religious services once a week or more, although 87% (*n* = 20) believe in a higher power. Forty percent (*n* = 10) of adolescents had not participated in a youth activity offered by their religious center within the past 12 months, while 24% (*n* = 6) indicated that they had once a week or more. Forty-six percent (*n* = 12) of adolescents indicated that their parents influenced them the most regarding the decisions they make.

Discussion

This study sought to assess and describe Amerindian adolescents' knowledge of HPV, cervical cancer and HIV, and to describe the prevalence of risk behaviors that may put them at risk. We found that almost half of the

Amerindian youth sample reported engaging in vaginal sex, but only half reported condom

Table 3. **Amerindian Adolescents' Perception of Accessibility and Availability to Alcohol, Tobacco, and Other Drugs (ATOD)**

Categories	**(N)**	
How difficult or easy would it be for you to get alcohol?	23	
Very difficult		26% (6)
Fairly difficult		4% (1)
Fairly easy		9% (2)
Very easy		57% (13)
Do not know/Unsure		4% (1)
How difficult or easy would it be for you to get drugs?	21	
Very difficult		38% (8)
Fairly difficult		24% (5)
Fairly easy		14% (3)
Very Easy		14% (3)
Do not know/Unsure		10% (2)
Where do you or would you be able to get alcohol and/or other drugs?	15	
**Other*		60% (9)
Do not know/Unsure		40% (6)

*Other represents the following: *(Shop, Drug Sellers, Rum Shop, Friends, or Homes)*

Table 4. **Amerindian Adolescents' Knowledge and Frequency of Medical Screenings**

Categories	**(N)**	**% (n)**
Have you ever heard of cervical cancer?	27	
Yes		48% (13)
◊Have you had a Pap smear?	16	
Yes		6% (1)
When did you have your most recent Pap smear?	1	
1-2 years ago		100% (1)
*◊A Pap smear can see if there are changes in the cervix?	9	
True		100% (9)
◊When will you get your next Pap smear?	5	
Less than a year from now		60% (3)
2+ years		20% (1)
Do not know/Unsure		20% (1)

*Only 1 individual in the entire sample has had a Pap smear.
◊This question only applied to female individuals

Table 5. **Amerindian Adolescents' Knowledge about HPV**

Categories	**(N)**	**% (n)**
Have you ever heard of HPV infection?	27	
Yes		52% (14)
Is HPV a sexually transmitted disease?	27	
Yes		78% (21)
Is HPV a risk factor for the development of cervical cancer?	15	
Yes		73% (11)
No		20% (3)
Do not know/Unsure		7% (1)
HPV is an infection that only affects women?	20	
True		25% (5)
Is HPV spread through sexual contact?	20	
True		90% (18)
Condoms offer some protection from HPV	20	
True		55% (11)
Genital warts are a symptom of HPV	17	
Yes		76% (13)
Have you heard of Gardasil	24	
No		88% (21)
What is your chance of getting HPV?	19	
Low		48% (9)
Moderate		26% (5)
High		26% (5)
How concerned are you that you will get HPV?	22	
Not at all concerned		14% (3)
Somewhat concerned		32% (7)
Very concerned		54% (12)
What is your chance of getting genital warts?	14	
Low		72% (10)
Moderate		14% (2)
High		14% (2)

Table 6. **Amerindian Adolescents' HIV Knowledge and Perception of Risk**

Categories	**(N)**	**% (n)**
Can you get HIV or AIDS if you only have sex once or twice without a condom?	27	
Yes		89% (24)
No		7% (2)
Do not know/Unsure		4% (1)
Do you feel like you can protect yourself against HIV or AIDS by always using a condom during sex?	27	
Yes		74% (20)
If I use a condom, I will not get HIV/AIDS	26	
Strongly Disagree		11% (3)
Disagree		36% (9)
Agree		42% (11)
Strongly Agree		11% (3)
How well do you think condoms work in preventing HIV?	27	
Not well		22% (6)
Pretty well		52% (14)
Very well		19% (5)
Do not know/Unsure		7% (2)
Can you tell if a person has HIV or AIDS just by looking at them?	27	
No		100.00% (27)
Can you get HIV or AIDS from kissing someone who has it?	26	
Yes		38% (10)
No		54% (14)
Do not know/Unsure		8% (2)
Do you know anyone living with HIV or anyone who has died from complications relating to AIDS?	27	
Yes		81% (22)
Which behaviors do you feel affect someone's chances of getting HIV?	27	
Sexual activity only		44% (12)
Both (Drugs and Sexual Activity)		44% (12)
Neither (Drugs or Sexual Activity)		4% (1)
Do not know/Unsure		8% (2)

about sexual activity, about a quarter of youth reported that less than half of their friends were sexually active. Our findings indicate that a majority of teens believe their mother would not approve of them having sex right now and that they are comfortable talking to their mother about sex and HIV prevention. However, our findings emphasize that many of the teens' sexual practices could place them at risk for STDs including HIV and HPV. For example, more than half of youth stated that they would not say no to sex with their partner if the partner did not want to use a condom. Findings on substance use indicate that at least half of youth report easy access to alcohol and tobacco. However, almost half of the youth sample indicated that it would be fairly difficult to obtain drugs, which is encouraging. The current study did not assess current and lifetime substance use.

Our study findings are somewhat different from findings from the 2004 Guyana Ministry of Health's Global School-based Health Survey, (GSHS) in that our Amerindian population appears to exhibit engaging in more risky behaviors. Given the limited data and published empirical studies on Guyana youth especially Amerindian youth, we compared our study results to findings from the GSHS study. The GSHS includes students in both primary and secondary schools (roughly ages 5 to 15). In that study, 25% of students reported engaging in sexual intercourse, with 23% having their first sexual experience between ages 13 and 15; 39% had done so by age 16 or older. Of those who reported sexual intercourse, 16% reported multiple partners — half of the females and three-fourths of the males surveyed had had more than one partner. Condoms were the most common form of contraception (74%). Overall contraception use was 76% among adolescents under age 15 and 71% among those 16 and older. Other methods of birth control were used and available but rates were relatively small (5.4%). Other forms of contraception were more likely to be used by younger students (Draft National Health Plan of Guyana, 1994). Although the rate of condom use was relatively high, one in twenty-six female students became pregnant, while one in ten males students claimed they had impregnated their partner (Draft National Health Plan of Guyana, 1994).

In assessing adolescents' knowledge of HPV, cervical cancer and HIV, we did not expect very high rates of knowledge about HPV and cervical cancer. However, we found that more than three-fourths of youth correctly identified HPV as a sexually transmitted disease (spread through sexual contact) and as a risk factor for cervical cancer. Adolescents' perception of their own risk for HPV was low with the majority of youth having never heard of the HPV vaccine. The latter finding implies that there may be no information availability about the vaccine and/or participants may not have access to it. Next, in an attempt to assess the accessibility of reproductive health screenings, we assessed knowledge and frequency of screening among participants. Almost half of the youth reported they had heard about cervical cancer. Of the females in the study (n = 16), only one had received a Pap test within the past two years. However, more than half of the females understood that Pap tests can identify changes in the cervix. These findings indicate that there may be limited access to Pap screenings as well as limited knowledge about reproductive health and the utility of preventive screenings. In assessing HIV knowledge, we found that most participants had a high level of knowledge about HIV/AIDS. Most participants knew that it was possible to contract HIV/AIDS by having unprotected sex, 89% (n = 24), 74% (n = 20) felt they could protect themselves from HIV/AIDS by using condoms, 71% reported that condoms work pretty well/very well to prevent HIV/AIDS, and 100% correctly identified that you cannot tell if a person has HIV/AIDS by just looking at them. However, almost 40% reported that you can get HIV or AIDS from kissing someone who has HIV or AIDS. Overall, adolescents seem

to have a high level of knowledge of HIV/AIDS prevention. However, we should continue HIV and STD prevention education and expand it to include information on reproductive health as well.

Limitations and Strengths

This study has several limitations. Due to the study's exploratory nature, reported findings are only descriptive. In addition, the relatively small sample size and sampling technique (e.g., convenience sample) limit the generalizability of the findings. Despite these limitations, this study has numerous strengths. To our knowledge, this is the first study to assess knowledge and risk behaviors among a sample of Guyanese Amerindian adolescents. The survey elucidates what these youth know about HIV, HPV, and cervical cancer and identifies the behaviors they may participate in that place them at risk for STDs. The study findings provide relevant information for designing and refining current public health prevention messages and curricula in Guyana.

Implications and recommendations

In Guyana, cervical cancer contributes to 13% of the total cancer incidence rate, while HIV is the leading cause of death among women and males ages 20-59 (Draft National Health Plan of Guyana, 1994). Women, especially those in the 15 to 24 year-old age group, are more likely to be HIV positive than men (Draft National Health Plan of Guyana, 1994). Given Guyana's limited financial resources and its fragmented infrastructure, more emphasis should be placed on sexual and reproductive disease prevention. Although adolescents receive prevention messages in school-based settings, there seems to be some gaps in the knowledge regarding the importance of reproductive health screenings and we should continue to reinforce and build upon the existing HIV/AIDS prevention messages. Current school based curricula may need to be updated and/or expanded to ensure the accuracy and relevance of information that is being transmitted to adolescents.

In terms of HPV Prevention, HPV is a STD that negatively impacts millions of people, particularly those under age 25. Given that numerous adolescents in this study reported being sexually active, only half reported condom use at last coitus, and few females have received screenings for cervical anomalies, we recommend continued education and improved access to medical screenings; we suggest that the focus be geared toward prevention through education in school-based settings; and we support the development of social marketing campaigns for HPV, cervical cancer and HIV prevention. Since Guyana has a very successful vaccine immunization program, with more than 80% of children receiving the recommended vaccinations during the first 12 months of life, there may be opportunities to partner with The Ministry of Health, Guyana's vaccine immunization program, pharmaceutical companies, and NGOs to provide HPV education and vaccines access to adolescents and young women.

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