



Published in final edited form as:

*J Low Genit Tract Dis.* 2017 January ; 21(1): 37–41. doi:10.1097/LGT.0000000000000281.

## Awareness of Cervical Cancer Causes and Pre-determinants of Likelihood to Screen among Women in Haiti:

### Understanding Cervical Screening–Haiti

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### Abstract

**Objectives**—Cervical cancer is the leading cause of cancer deaths among women in Haiti. Given this high disease burden, we sought to better understand women’s knowledge of its causes and the socio-demographic and health correlates of cervical cancer screening.

**Methods**—Participants were 410 adult women presenting at clinics in Léogâne and Port-au-Prince, Haiti. We used bivariate and multivariate logic regression to identify correlates of Pap smear receipt.

**Results**—Only 29% of respondents had heard of human papillomavirus (HPV), while 98% were aware of cervical cancer. Of those aware of cervical cancer, 12% believed sexually transmitted infections (STIs) cause it, and only 4% identified HPV infection as the cause. Women with a previous STI were more likely to have had Pap smear (34% vs. 71%, OR=3.45; 95% CI: 1.57–7.59). Screening was also more likely among women who were older than age 39, better educated

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#### Disclosure of Potential Conflicts of Interest

The other authors of this paper have no financial disclosures or potential conflicts of interest to report.

**Ethical approval:** “All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.”

and employed (all  $p < .05$ ). Almost all women (97%) were willing to undergo cervical cancer screening.

**Conclusions**—This sample of Haitian women had limited awareness of HPV and cervical cancer causes; but when provided with health information, they saw the benefits of cancer screening. Future initiatives should provide health education messages, with efforts targeting young and at-risk women.

### Keywords

Haiti; cervical cancer screening; Pap smear; human papillomavirus; prevention; awareness

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## INTRODUCTION

Worldwide, invasive cervical cancer is the most common cancer in women ages 15–44 years and is caused by chronic infection with human papillomavirus (HPV) [1]. Developing nations makeup 87% of the global burden of cervical cancer [2]. Countries in Latin America and the Caribbean have age-adjusted incidence rates of cervical cancer ranging from 11 to 47 per 100,000 women per year which are considered high [3–5]. The most recent estimate of cervical cancer incidence in Haiti is 20.3 per 100,000 women, which is about 2 ½ times higher than the US [1, 6, 7]. The prevalence of oncogenic strains of HPV in Haiti may be as high as 19% among semi-urban and urban populations [8, 9].

Invasive cervical cancer can be prevented via early detection, diagnosis and treatment of dysplastic cervical lesions [10]. Currently, cytology screening using Papanicolaou (Pap) smears is the standard for cervical cancer prevention in both the US and Haiti [9–13], but HPV DNA testing as primary screening may increase accuracy while reducing requirements for trained clinicians to screen in low-resource settings [14–20].

As there is little published data on cervical cancer screening in Haiti, we wanted to better understand how Haitian women think about cervical cancer to identify possible opportunities and challenges facing future programs. First, we sought to ascertain the opinions of Haitian women regarding the causes of cervical cancer and socio-demographic and health correlates of a cervical cancer screening. Additionally, we sought to understand factors that may influence a woman's likelihood to screen for cervical cancer in the future.

## METHODS

### Institutional Review Board Approvals

Institutional review boards at Duke University (Durham, North Carolina, US: protocol number CO162) and Misyon Sante Fanme Ayisyen (Port-au-Prince, Haiti; protocol number 17\_03\_2014) approved our study on February 22, 2014 and March 14, 2014 respectively. Participants provided consent orally through a Haitian Creole translator. This method of consent was necessary due to the high rate of illiteracy among the Haitian population. Afterwards, participants signed their name or mark to confirm consent to participate or consented for a designee to sign on their behalf, and forms were maintained by study

researchers. Participants received no monetary reward or incentives to participate in the study.

### Participants and Procedures

Between April and July 2014, we conducted a cross-sectional survey of patients presenting at two health clinics in Haiti. One clinic that primarily focused on cervical cancer screening was located in Terre Noire district, a low-income neighborhood of Port-au-Prince. The second clinic that provided patients with general health care services was located in Léogâne, a port community about 20 miles west of Port-au-Prince of approximately 90,000 residents. All patients were screened and consented for participation as part of regular clinic visits.

All participants were surveyed privately by teams of US university students and local Haitian translators in separate clinic rooms after consenting to participate. All surveys were conducted orally, with all questions read to the participant in Creole and translated into English by the local Haitian translator for recording. The survey took an average of 30 minutes to complete.

The survey tool was a modification of one previously used to explore awareness and use of cervical cancer screening in Botswana [21]. An independent contractor, CreoleTrans, translated the modified survey into Haitian Creole. Local clinical research staff reviewed and corrected the translated survey tool for clarity.

### Measures

The primary outcome was previous screening for cervical cancer, assessed by a question that asked women whether they have ever had a Pap smear. The response options were “yes” or “no.” Women who were aware of cervical cancer were asked to list up to 3 beliefs of causes of cervical cancer and 3 beliefs about health consequences or results of having cervical cancer. The survey also asked participants about their willingness to be screened for cervical cancer in the future and their reasons for such decisions. The survey assessed the following socio-demographic and health characteristics: age, marital status, education, employment status, religious background, parental status, history of STIs, contraceptive use, and awareness of HPV, genital warts, and someone with cervical cancer. Open-ended questions were coded using an iterative process. Two authors (MG, WC) read through responses, created categories based on main themes, and met to resolve discrepancies.

### Data Analysis

We used bivariate and multivariate regression models to examine correlates of ever having received cervical cancer screening. Analyses were conducted using Stata version 14 (College Station, TX). Statistical tests were two-tailed and used a standard of  $p < 0.05$  for statistical significance.

## RESULTS

Four hundred and ten female respondents completed the interview. The majority of respondents were younger than age 40, employed, married or living with a partner, had at least one child, and had completed primary education (Table 1). Women visiting the clinic in Léogâne were younger and less likely to be currently employed, to have had children, to have had a STI, or to use contraception than women at the Terre Noire clinic ( $p<0.05$  for all). Women in the Léogâne clinic were also less likely to be aware of HPV or genital warts (both  $p<0.05$ ).

Overall, only 29% of women stated they had heard of HPV, while almost all women (98%) were aware of cervical cancer (Table 1). Of women who had heard of cervical cancer, 51% said the cause was either vaginal infection or gynecological problems (Table 2). Other causal beliefs included sexual behavior (41%) such as unprotected sex or multiple sex partners, poor general hygiene (21%), and abortion (17%). Only 12% said that STIs may cause cervical cancer, and just 4% identified HPV infection as the cause of cervical cancer. When asked what they believed would happen to a woman with cervical cancer, most respondents stated that she would have vaginal issues (51%) and frequent periods or bleeding (44%) (Table 3). As many as 36% of respondents believed death is imminent once a woman has cervical cancer. Few women identified an infection or STI as an outcome of cervical lesions or cancer.

Of the 410 women respondents, 153 (37%) had previously undergone cervical cancer screening (Table 4). In multivariable analysis, women older than 40 years were more likely to have had a Pap smear than younger women (OR = 3.09; 95 CI: 1.77–5.41). Additionally, women with a history of STI diagnosis were three times more likely to have had a Pap smear (OR= 3.45; 95% CI: 1.57–7.59). In bivariate models but not multivariable analysis, other noteworthy factors which correlate with a woman's likelihood to have ever been screened include employment status (OR = 4.77; 95 CI: 2.68–8.50), whether a woman ever had children (OR = 3.97; 95 CI: 2.33–6.76) and awareness of HPV (OR=2.39; 95 CI: 1.54–3.70).

Overall, this sample of Haitian women had limited awareness of HPV and cervical cancer causes; but when provided with health information, they saw the benefits of cancer screening. Almost all women (97%) were willing to undergo cervical cancer screening if given the opportunity. Among those women desiring cervical cancer screening (Table 5), the primary reason noted was prevention (89%). Other reasons noted include medical recommendation (14%), early treatment (9%), and to check for cancer (8%).

## DISCUSSION

### Main finding of this study

Our study highlights the need for increased public awareness in order to effectively reduce the burden of cervical disease among women in Haiti. Even Haitian women previously screened for cervical cancer may have limited awareness of cervical cancer causes.

Additionally, age and having a history of STI diagnosis were strong correlates of having had a cervical cancer screening.

Regardless of low awareness of HPV, almost all women were aware of cervical cancer as a disease, and one-third personally knew someone who had had cervical cancer. Women in this study clearly understood the benefits of screening to prevent cervical cancer progression after receiving basic health information and were very willing to be screened if given an opportunity to do so. As cervical cancer has become an increasing priority for the Ministry of Health due to the high disease burden [(Cornerly, Jean Ronald, MD. “Letter of Invitation to Collaborate in National Cervical Cancer Screening Program.” Letter to Dr. David Walmer. 20 April 2015. MS. Ministère de la Santé Publique et de la Population, Port-au-Prince, Haiti.), (Thimothe, Gabriel, MD. “Human Papilloma Virus Screening Support Letter.” Letter to Family Health Ministries. 02 Sept. 2011. MS. Ministère de la Santé Publique et de la Population, Port-au-Prince, Haiti.)], efforts to rapidly increase screening across Haiti would likely be favored by the majority of women with a small adjunctive education effort.

### **What is already known**

Health care infrastructure in Haiti has historically reached only about 60% of the population [22]; so, additional efforts around infrastructure strengthening are critical. Accessibility challenges were exacerbated with the massive destruction caused by the 2010 earthquake [23]. Several aid programs are making important strides in the re-establishment and the building of healthcare infrastructure throughout Haiti [23]. All the same, in the absence of effective cervical cancer treatment facilities [9, 22], little advancement can be gained from diagnosis without treatment. As such, the Haitian Ministry of Health is aggressively working with collaborative partners to fill this large healthcare gap [(Cornerly 2015), (Thimothe 2011), 10, 22]. Additional research is needed to determine how best to integrate sustainable cervical screening services within existing healthcare settings [9].

Within the Latin America and Caribbean region where cervical cancer screening rates tend to be low [4], predictors of screening uptake include marriage, age, parity, provider recommendation and knowing someone with cervical cancer [24, 25]. These factors can even outweigh cost, as cervical cancer incidence and mortality rates in Jamaica are relatively high despite the availability of free screening services throughout the country [24, 26]. In this Haitian population, women who were more likely to have a higher income (those with higher educational levels and current employment) and those likely to have had genitourinary symptoms in the past (those having been diagnosed with STIs) were more likely to have been screened for cervical cancer in the past. These correlates should prove beneficial to policy makers and program planners, as they identify a large population in which to increase awareness efforts.

### **What this study adds**

Our findings provide substantial insight into Haitian women’s low understanding related to cervical cancer prevention. Within this population of women, many of whom were presenting for cervical cancer screening, only 4% were aware of HPV as the cause of cervical cancer. Low awareness of HPV is not unique to this population, as Haitian

immigrants in Miami also report limited knowledge of HPV (as low as 22%) [27, 28]. Cervical cancer prevention efforts in Haiti should focus on raising awareness about HPV infection and its role in cervical cancer.

One potential strategy for future cervical cancer screening efforts would be to spread public education messages throughout the general population via radio broadcast to increase overall awareness of the need and availability of screening. Alternatively, more targeted efforts could be directed toward younger, asymptomatic women less likely to be screened via school and clinic-based awareness efforts. For primary healthcare workers, educational messages about the etiology of cervical cancer and screening practices should be embedded into health training curricula. Likewise, healthcare workers should be encouraged to share these messages as standard of care procedures. Additionally, research efforts should work to identify women who are most at-risk for developing cervical cancer to further direct outreach efforts.

### Limitations

Limitations of this research study include the small sample size and need for replication before extrapolating our results to the wider population. Likewise, because we recruited both cohorts of women in medical settings, participants may be more likely to have access to and seek health care. It is also noteworthy that the reasons for presenting at the clinic vary between the Port-au-Prince and Leogane cohorts of women. Those presenting in Port-au-Prince are seeking cervical cancer screening while those in Leogane require general health services. As the cervical screening clinic in Port-au-Prince has been in operation since 2009 while that in Leogane is general practice, the demographic differences between these cohorts of women are likely impacted by their need for reproductive health services.

### CONCLUSION

We report novel findings on understanding of cervical cancer prevention among a convenience sample of Haitian women. Only one in three women had been screened for cervical cancer previously, one reason for high incidence and mortality from this disease in this setting. We also found large gaps in understanding of the causes and prevention of cervical cancer, even among the population most likely to have been screened. Given the almost universal interest in preventive methods, national screening programs linked to treatment would likely be well received.

### Acknowledgments

We would like to acknowledge the contributions of the following Duke Global Health Institute (DGHI) and University of North Carolina (UNC) students in the collection of data for this research: Garland Austin (DGHI), Elle Gault (DGHI), Zachary Morrow (DGHI), Lillian Zerihun (DGHI), Olukemi Ogundipe, MD (Duke) and Morgan Salmon (UNC).

#### Sources of Funding

Calo was supported by the NCI-sponsored Cancer Care Quality Training Program (R25 CA116339). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute.

Brewer has received HPV vaccine-related grants from or been on paid advisory boards for Merck Sharp & Dohme, GlaxoSmithKline, and Pfizer; he served on the National Vaccine Advisory Committee Working Group on HPV Vaccine and is chair of the National HPV Vaccination Roundtable.

## LIST OF ABBREVIATIONS AND ACRONYMS

|             |  |
|-------------|--|
| <b>DNA</b>  | Deoxyribonucleic acid                    |
| <b>DGHI</b> | Duke Global Health Institute             |
| <b>HPV</b>  | Human papillomavirus                     |
| <b>NCI</b>  | National Cancer Institute                |
| <b>STIs</b> | Sexually Transmitted Infections          |
| <b>UNC</b>  | University of North Carolina-Chapel Hill |

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**PRÉCIS**

Among Haitian women, there are large gaps in understanding of cervical cancer causes and prevention strategies, highlighting the need for increased public health information.

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**Table 1**Characteristics of the respondents (n= 410)<sup>I</sup>

|  | Blanchard<br>n (%) | Léogâne<br>n (%) | Overall<br>n (%) |
|--|--------------------|------------------|------------------|
| <i>Demographic characteristics</i>             |                    |                  |                  |
| Age **   |                    |                  |                  |
| 18– 39 y                                       | 67 (41)            | 186 (74)         | 253 (62)         |
| 40 y   | 93 (59)            | 64 (26)          | 157 (38)         |
| Marital status                                 |                    |                  |                  |
| Not married                                    | 59 (37)            | 111(44)          | 170 (41)         |
| Married or living together                     | 101 (63)           | 139 (56)         | 240 (59)         |
| Education                                      |                    |                  |                  |
| Primary education or less                      | 66 (41)            | 82 (33)          | 148 (36)         |
| More than primary education                    | 94 (59)            | 168 (67)         | 262 (64)         |
| Employment status **                           |                    |                  |                  |
| Unemployed or student                          | 17 (11)            | 91 (36)          | 108 (26)         |
| Employed                                       | 143 (89)           | 159 (63)         | 302 (73)         |
| Religious background *                         |                    |                  |                  |
| Catholic                                       | 24 (15)            | 71 (28)          | 95(23)           |
| Other Christian/Protestant                     | 128 (80)           | 159 (64)         | 287(70)          |
| Other/ No religion                             | 8 (5)              | 20 (8)           | 28 (7)           |
| Have children **                               |                    |                  |                  |
| No   | 26 (16)            | 90 (36)          | 116 (28)         |
| Yes  | 134 (84)           | 160(64)          | 294 (72)         |
| <i>Personal health &amp; disease awareness</i> |                    |                  |                  |
| Had sexually transmitted infection **          |                    |                  |                  |
| No   | 133 (83)           | 236 (94)         | 369 (90)         |
| Yes  | 27 (17)            | 14 (6)           | 41 (10)          |
| Contraceptive use **                           |                    |                  |                  |
| No   | 105 (66)           | 204 (82)         | 309 (75)         |
| Yes  | 55 (34)            | 46 (18)          | 101 (25)         |
| Heard of HPV **                                |                    |                  |                  |
| No   | 65 (41)            | 226 (90)         | 291 (71)         |
| Yes  | 95 (59)            | 24 (10)          | 119 (29)         |
| Heard of genital warts **                      |                    |                  |                  |
| No   | 90 (56)            | 217 (87)         | 307 (75)         |
| Yes  | 70 (44)            | 33 (13)          | 103 (25)         |
| Known someone with cervical cancer             |                    |                  |                  |
| No   | 116 (73)           | 160 (64)         | 276 (67)         |
| Yes  | 44 (27)            | 90 (36)          | 134 (33)         |

<sup>I</sup> \* P<.05,

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 $P < .01$

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**Table 2**Beliefs about causes of cervical cancer ( $N=400$ )<sup>*I*</sup>

| Responses                                 | %  |
|---|----|
| Vaginal infection/ gynecological problems | 51 |
| Sexual behavior                           | 41 |
| Poor hygiene                              | 21 |
| Abortion                                  | 17 |
| STI                                       | 12 |
| Drinking unclean water                    | 7  |
| HPV                                       | 4  |
| Birth control                             | 3  |
| Other                                     | 11 |

<sup>*I*</sup> Only women who were aware of cervical cancer answered this question.

Participants could list up to 3 answers. Responses in the “other” category included domestic violence, having many children, and inserting foreign matter into vagina.

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**Table 3**Symptoms and outcomes of cervical cancer (N=400)<sup>1</sup>

| Responses                  | %  |
|----------------------------|----|
| Vaginal issues             | 51 |
| Frequent periods/bleeding  | 44 |
| Death                      | 36 |
| General pain               | 17 |
| Stomachache/abdominal pain | 15 |
| Treatment                  | 12 |
| Sickness/Illnesses         | 8  |
| Infection                  | 8  |
| Sterile                    | 6  |
| STI                        | 3  |
| Weight loss                | 3  |
| Other                      | 7  |

<sup>1</sup> Only women who were aware of cervical cancer answered this question.

Participants could list up to 3 answers. Responses in the “other” category included stress/anxiety, inability to have sex, and miracles.

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**Table 4**

Correlates of Pap smear receipt (*N*= 410)<sup>1</sup>

|                                    | No. of women who have ever had a pap smear/total (%) | Bivariate OR (95% CI) | Multivariable OR (95% CI) |
|------------------------------------|--|-----------------------|---------------------------|
| Overall                            | 153/410 (37)   | N/A                   | N/A                       |
| Demographic characteristics        |  |                       |                           |
| Age                                |  |                       |                           |
| 18–39 y                            | 60/253 (24)  | Ref                   | Ref                       |
| 40 y                               | 93/187 (50)  | 4.67 (3.04– 7.19) **  | 3.09 (1.77– 5.41) **      |
| Marital status                     |  |                       |                           |
| Not married                        | 103/240 (43)   | Ref                   | –                         |
| Married or living together         | 50/170 (29)  | 0.55 (0.37–0.84) **   | –                         |
| Education                          |  |                       |                           |
| Primary education or less          | 61/148 (41)  | Ref                   | Ref                       |
| More than primary education        | 92/262 (35)  | 0.77 (0.51– 1.17)     | 1.77(1.01–3.10) *         |
| Employment status                  |  |                       |                           |
| Unemployed or student              | 16/108 (15)  | Ref                   | Ref                       |
| Employed                           | 137/302 (45)   | 4.77 (2.68– 8.50) **  | 2.18 (1.09– 4.33) *       |
| Religious background               |  |                       |                           |
| Catholic                           | 24/95 (25)   | Ref                   | –                         |
| Other Christian/Protestant         | 119/287 (41)   | 2.10 (1.25– 3.52) **  | –                         |
| Other/ No religion                 | 10/28 (36)   | 1.64 (0.67– 4.04)     | –                         |
| Have children                      |  |                       |                           |
| No                                 | 20/116 (17)  | Ref                   | –                         |
| Yes                                | 133/294 (45)   | 3.97 (2.33– 6.76) **  | –                         |
| Personal health and health beliefs |  |                       |                           |
| Had sexually transmitted infection |  |                       |                           |
| No                                 | 124/369 (34)   | Ref                   | Ref                       |
| Yes                                | 29/41 (71)   | 4.77 (2.36– 9.68) **  | 3.45 (1.57– 7.59) **      |
| Contraceptive use                  |  |                       |                           |
| No                                 | 104/309 (34)   | Ref                   | –                         |
| Yes                                | 49/101 (49)  | 1.86 (1.18– 2.93) **  | –                         |
| Heard of HPV                       |  |                       |                           |
| No                                 | 91/291 (31)  | Ref                   | –                         |
| Yes                                | 62/119 (52)  | 2.39 (1.54–3.70) **   | –                         |
| Heard of genital warts             |  |                       |                           |
| No                                 | 104/307 (34)   | Ref                   | –                         |
| Yes                                | 49/103 (48)  | 1.77 (1.13– 2.79) *   | –                         |
| Knew someone with cervical cancer  |  |                       |                           |
| No                                 | 101/276 (37)   | Ref                   | –                         |
| Yes                                | 52/134 (38)  | 1.10 (0.72– 1.68)     | –                         |

<sup>1</sup>OR = Odds ratio; CI = confidence interval; Ref = Referent group; N/A = Not applicable. Dashes (–) indicate the variable was not included in the multivariable model because it was not statistically significant using a forward stepwise procedure. Multivariable model was also adjusted for clinic site.

\*  $P < .05$ ;

\*\*  $P < .01$

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**Table 5**Reasons for desiring a Pap smear ( $N=399$ )<sup>1</sup>

| Responses                                       | %  |
|---|----|
| Prevention                                      | 89 |
| Adherence to guidelines/ medical recommendation | 14 |
| Early treatment                                 | 9  |
| Check for cancer                                | 8  |
| Symptoms  | 4  |
| To know if I can have children                  | 3  |
| Other   | 11 |

<sup>1</sup> Only women who said they were willing to get a Pap smear answered this question.

Participants could list up to 3 answers. Responses in the “other” category included husband’s infidelity, a friend/sibling already got the test, and continued sexual activity.

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