

# Factors Affecting Uptake of Cervical Cancer Screening Among Clinic Attendees in Trelawny, Jamaica

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**Background:** Use of the Pap test has resulted in a decline in cervical cancer mortality in developed countries. Yet, despite established cervical cancer screening programs, a significant portion of Jamaican women are not undergoing screening for cervical cancer. This study was carried out to identify factors that affect Jamaican women's decisions to screen for cervical cancer.

**Methods:** A population survey was administered to 367 clinic-attending women 25 to 54 years of age in the Parish of Trelawny from May to July of 2005. An interviewer-administered questionnaire assessed the women's knowledge, attitudes, and practices regarding cervical cancer and cervical cancer screening.

**Results:** Overall, 11% of the women had never had a Pap smear and only 38% had a Pap test within the last year. Annual visits to a health provider have a strong influence on women's decisions to regularly screen for cervical cancer. Provider recommendation also positively affected initial receipt of a Pap smear as well as continued regular screening.

**Conclusions:** Programs that promote annual health checkups, encourage consistent provider recommendations, and emphasize screening as a preventive measure might positively influence women's decisions to screen for cervical cancer.

## Introduction

Chronic diseases such as cancer are no longer conditions confined to developed countries. The World Health Organization (WHO) predicts that by 2020, the global incidence of cancer will increase to 16 million annually.<sup>1</sup> Moreover, nearly three quarters of all cancer cases will occur in developing countries.<sup>2</sup> The impact of the increasing global incidence of cancer is apparent in middle-income countries like Jamaica; in 2000, cancer alone accounted for 17% of all deaths in Jamaica.<sup>3</sup>

Among Jamaican women, cervical cancer is the second-leading cause of cancer mortality.<sup>4,5</sup> The incidence of cervical cancer is more than 4 times greater in Jamaica than in the United States.<sup>6</sup> Moreover, the cervical cancer

mortality rate in Jamaica is almost 6 times greater than the mortality rate in the United States.<sup>6</sup> This trend will likely continue unless effective prevention and screening programs are implemented. Moreover, given the large number of female-headed households and a growing female workforce in Jamaica, increasing rates of morbidity and mortality due to cervical and other cancers will negatively impact Jamaican families as well as the broader economic community.<sup>2</sup> The excess morbidity due to cervical cancer also contributes to increasing healthcare costs. This is particularly important in Jamaica where there is a projected deficit of about 30% of the total resources necessary to supply health services.<sup>7</sup>

Given the enormous cost of acute and supportive care for chronic conditions such as late-stage cervical cancer, effective screening programs offer a significantly better return on a country's health investment. Yet, despite the established benefits of cervical cancer screening programs, this available resource is not being accessed by Jamaican women. According to an internal report created by Trelawny Public Health Services (unpublished data, 2005), only 6.3% of the total population of women 25 to 54 years of age in the Parish had a Pap smear within the last year. Moreover, 1 in 10 women in the Parish has never had a Pap smear. These statistics indicate that a significant portion of Jamaican women are not choosing to screen for cervical cancer.

Prior research has shown that numerous factors can be associated with the failure to screen for cervical cancer. In the United States, failure to screen has

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been associated with race and ethnicity, lower income status, limited education, non-English-speaking immigrants, and lack of health insurance.<sup>8</sup> In the United Kingdom, non-attendance at cervical cancer screening clinics has been associated with low perceived risk of disease, a lack of knowledge about cervical screening and the determinants of cervical cancer, fear of detection of cervical cancer, fear of pain, and embarrassment.<sup>9</sup> A recent review of cancer screening utilization that cited studies from Europe, Iceland, Italy, and Australia also found that cervical screening could be affected by marital status and age.<sup>10</sup> However, there was conflicting evidence regarding which marital status and which age group was associated with cervical screening uptake.

Research in less developed countries in Latin America and the Caribbean has also identified several factors that are thought to affect the uptake of cervical cancer screening. After research and review, the Pan American Health Organization concluded that shame, lower socioeconomic status, limited education, and fear of cervical cancer diagnosis were all associated with a failure to screen.<sup>6,11</sup> Organizational factors such as lack of access and negative perceptions about quality of services, poor physical conditions of health facilities, and delays in receiving test results were also reported to be associated with poor screening rates.<sup>6,11</sup>

International research has revealed numerous factors that can affect the uptake of cervical cancer screening. This study was conducted to identify factors that affect Jamaican women's decisions to begin screening and to continue to regularly screen for cervical cancer. In particular, we sought to determine the characteristics that affect cervical cancer screening uptake among female clinic-attendees ages 25 to 54 years in the Parish of Trelawny, Jamaica, and to provide meaningful information to health authorities in the Parish in order that cervical cancer screening services can be evaluated and improved. We hypothesized that the factors influencing women's decisions to screen would fall under three major categories: demographic, psychosocial, and organizational. The demographic category includes such factors as income level, education level, and marital status. The psychosocial category includes beliefs about susceptibility to and the severity of cervical cancer, general knowledge about cervical cancer and cervical cancer screening, and barriers to screening including fear of pain and embarrassment. The organizational category includes barriers such as limited access to testing facilities and limitations in services.

## Design and Methods

A population survey study design was used. Participants underwent an assessment of knowledge, atti-

tudes, and perceptions concerning cervical cancer and cervical cancer screening. The data collection instrument was an interviewer-administered questionnaire. The questionnaire was developed using the Health Belief Model as a loose framework. There were two outcome variables of interest: (1) ever having a Pap smear, and (2) receipt of a Pap smear within the last year. Predictive variables of interest for both outcomes included (1) marital status, (2) education, (3) income, (4) average number of visits to a health provider each year, (5) health provider recommendation for a Pap smear, (6) knowledge about cervical cancer screening recommendations and risk factors for developing cervical cancer, (7) personal beliefs about prevention, risk, severity, and the cure rates of cervical cancer, and (8) barriers to screening including fear, cost, and embarrassment.

The study was conducted in the Parish of Trelawny in the north-western part of the island of Jamaica from May through July of 2005. As of 2001, the Parish had an estimated population of 72,500. The Parish is divided into three Health Districts: Falmouth, Duncans, and Albert Town. The proportion of the sample recruited from each of the three Trelawny Health Districts reflected the true proportion of the overall population in each of the Districts: Falmouth, 30%; Duncans, 41%; Albert Town, 29%.<sup>12</sup> Trelawny Health Centers were chosen as the sampling unit for this project. The selection of the Health Centers was based on the facility's capability to offer cervical cancer screening. Of the Parish's 20 Health Centers, 16 participated in the survey: five Centers from each of the three Districts in addition to the principal Health Center located in Falmouth. The sample was further divided among the individual Health Centers to capture urban and rural residents in proportions representative of each Health District. Interviews were not conducted during Pap smear clinics.

Potential participants were identified as adult women 25 to 54 years of age who attended Trelawny Health Centers. Potential participants were asked if they would like to participate in the study when they visited the Health Centers. No personal identifying information was collected in the anonymous questionnaire. All participants were given a full explanation of the methodology and purpose of the project and an assurance of confidentiality. Participants were also assured that their participation in the study was voluntary and that they could refuse to participate at any time during the interview. The study protocol was approved prior to the implementation of the study by the Institutional Review Board (IRB) of the University of Alabama at Birmingham, the Advisory Panel of Ethics and Medico-Legal Affairs in the Jamaican Ministry of Health, the Western Regional Health Authority of Jamaica, and Trelawny Public Health Services.

## Data Analysis

In Tables 1–4, absolute and relative frequencies (N and %) were obtained for the distributions of the selected variables by “ever had Pap” and “had Pap in the last year.” The General Association Statistic was used to determine differences in the distributions of the selected variables by ever had Pap and annual screening status. In Tables 5 and 6, odds ratio (OR) and 95% confidence interval (CI) were generated as measures of association for all variables by Pap status and time of last screening. Both crude and adjusted measures of association were generated for all variables. All ORs and 95% CIs were calculated from logistic regression equations. Missing values were excluded from the analysis. Analysis was conducted with SAS software, version 9.0 (SAS Institute, Inc, Cary, NC). All reported *P* values are two-tailed.

## Results

### Demographics

**Ever Had Pap Smear:** Table 1 shows that 11% of the study population had never had a Pap smear. There were significant differences ( $P<.05$ ) in the distributions of women in the age 25–29 category and in the age 30–34 category. Almost one half (47%) of the women who had never had a Pap smear were in the youngest age group (25–29) compared to one quarter of women (26%) who had ever had a Pap smear. There were also significant differences in the distributions of married women ( $P<.05$ ). Slightly more than one third (35%) of the women who had ever received a Pap smear were married compared with 17% of women who had never had a Pap smear. There were also significant differences in the distributions of women with a secondary school education ( $P<.05$ ). Of the women who had ever received a Pap smear, 64% had a secondary school education compared with 41.5% of women who had never had a Pap smear.

**Had Pap Within the Last Year:** Table 1 shows that a little more than one third (38%) of the sample received a Pap smear within the last year. There were no significant differences in the distributions of the women by age, marital status, race or income categories. There was a significant difference in the distributions of women in the primary school or less category of education level ( $P<.05$ ). A significantly greater proportion of the women who had not been screened in the last year reported having a primary school education or less (29% vs 17%).

### Knowledge, Attitudes, and Practices

**Ever Had Pap Smear:** Table 2 shows significant differences in the distributions of visits to a health provider (both  $P<.05$ ). Of the women who had ever received a

Pap smear, 60% visited their health provider more than once a year compared with 30% of women who had never had a Pap smear. There were also significant differences among the women who had received a health provider recommendation for a Pap smear ( $P<.05$ ). Two out of three women (67%) who had ever had a Pap smear reported receiving provider recommendation for a Pap smear during their last visit. Only 1 out of 5 women (20%) who had never had a Pap smear reported receiving a provider recommendation for a Pap test at her last visit. Compared with women who had ever had a Pap smear (5%), a significantly greater proportion of women who had never had a Pap smear (17%) reported that a woman should have a Pap smear every 2 or more years ( $P<.05$ ). A greater proportion of women who had never had a Pap (18%) responded that cervical cancer was rarely or never severe compared with women who had ever had a Pap smear ( $P<.05$ ). Among women who had ever had a Pap smear, 60% reported that cervical cancer was “sometimes” cured compared with only 42% of women who had never had a Pap smear ( $P<.05$ ).

**Had Pap Within the Last Year:** Table 2 shows significant differences ( $P<.05$ ) in the average number of visits made to a health provider. A greater proportion of women who had been screened in the last year reported visiting their health provider more than once a year, while a greater proportion of women who were not

Table 1. — Distribution of Study Population According to Pap Screening Status

	Ever Had a Pap Smear?		Had a Pap Smear Within the Last Year?		Total* N %
	Yes n %	No n %	Yes n %	No n %	
<b>Total</b>	326 88.8	41 11.2	120 37.7	198 62.3	367 100
<b>Age</b>					
25–29 yrs	<b>84 25.8</b>	<b>19 46.3</b>	37 30.8	45 22.7	103 28.1
30–34 yrs	<b>81 24.9</b>	<b>2 4.9</b>	32 26.7	46 23.2	83 22.6
35–39 yrs	62 19.0	5 12.2	21 17.5	41 20.7	67 18.3
40–44 yrs	51 15.6	4 9.8	16 13.3	32 16.2	55 15.0
45–49 yrs	19 5.8	5 12.2	6 5.0	13 6.6	24 6.5
50–54 yrs	29 8.9	6 14.6	8 6.7	21 10.6	35 9.5
<b>Marital status</b>					
Married	<b>112 34.8</b>	<b>7 17.1</b>	44 37.6	66 33.5	119 32.7
Single	201 62.4	31 75.6	71 60.7	124 62.9	233 64.0
Other	9 2.8	3 7.3	2 1.7	7 3.6	12 3.3
<b>Race</b>					
Black	306 93.9	36 87.8	112 93.3	188 94.9	342 93.0
Other race	20 6.1	5 12.2	8 6.7	10 5.1	25 7.0
<b>Weekly income</b>					
J\$2000 or less	135 45.6	22 57.9	51 46.8	81 45.0	157 46.9
J\$2001–J\$4000	112 37.8	11 29.0	38 34.9	70 38.9	124 37.0
J\$4001–J\$6000	33 11.2	4 10.5	11 10.1	22 12.2	37 11.0
J\$6001 or more	16 5.4	1 2.6	9 8.3	7 3.9	17 5.1
<b>Education</b>					
Primary or less	80 24.7	16 39.0	<b>20 16.8</b>	<b>57 28.9</b>	97 26.5
Secondary	<b>206 63.6</b>	<b>17 41.5</b>	82 68.9	120 60.9	223 60.9
Tertiary	38 11.7	8 19.5	17 14.3	20 10.2	46 12.6

**Bold:** Significant at alpha 0.05.

\* Some totals reflect missing information or nonresponses by the participants.

screened in the last year reported visiting their provider only once every 2 or more years. Three quarters of the women who had screened within the last year had received a physician recommendation for screening, while only 62% of women who were not screened received a physician recommendation ( $P<.05$ ). A significantly greater proportion of women who had not been screened in the last year reported that women should get a Pap smear once every 2 or more years. Compared with 62% of the women who did not have a Pap within the last year, nearly three quarters (73%) of the women who had received a Pap smear within the last year reported that women should get a Pap smear once a year ( $P<.05$ ).

### Perceived Barriers

**Ever Had Pap Smear:** When barriers to screening were investigated, 42% of the total study population reported that they feared their health provider would find cervical cancer as the result of a Pap smear, and nearly half (46%) revealed that they feared the pain of a Pap test (Table 3). Nearly one quarter (24%) of the total study population reported never receiving Pap test results. There were significant differences in the distributions of women who found it too far to travel to get a Pap smear ( $P<.05$ ), among women who felt they needed more information about Pap smears, and among the women who said they had difficulty talking to a health provider about Pap smears and cervical cancer.

**Had Pap Within the Last Year:** Table 3 shows significant differences in the distributions of women who reported the Pap test was either too expensive or too embarrassing ( $P<.05$ ). A greater proportion of the women who had not received a Pap smear within the last year reported that the test was too expensive and that the test was too embarrassing.

### Knowledge About Risk Factors

**Ever Had Pap Smear:** With regard to knowledge about risk factors for cervical cancer, there was a significant difference ( $P<.05$ ) in the distributions of women who said that having multiple sex partners could result in cervical cancer (Table 4).

**Had Pap Within the Last Year:** There were no significant differences in the distributions of any of the cervical cancer risk factor categories (Table 4). However, 75% of the total sample reported sex at a young age to be a risk factor for cervical cancer, and more than three quarters (80%) reported that

multiple sex partners were a risk factor for cervical cancer. Less than half of the sample recognized smoking (46%), human papillomavirus (39%), and oral contraceptive use (21%) as risk factors for cervical cancer.

### Adjusted Models

**Ever Had Pap Smear:** For the final adjusted model for Pap smear status in Table 5, all statistically significant variables from the primary analysis were entered into a logistic regression model. Backward stepwise logistic regression was performed. Variables with a statistical significance of  $P<.05$  were retained. Variables that appeared to act as confounders were also retained. In the final model, women in the 35-to-44 age group were 5.3 times more likely to have ever had a Pap smear compared with women in the 45-to-54 age group (95% CI: 1.25, 22.66). Data-based confounding appears to be present as the adjusted ORs are meaningfully different from the crude measures (5.33 vs 2.88).

Women who had a secondary school education were 4.5 times more likely to have ever had a Pap smear compared with women with a primary school education

Table 2. — Distribution of Study Population According to Pap Smear Status by Knowledge, Attitudes and Practices

	Ever Had a Pap Smear?		Had a Pap Smear Within the Last Year?		Total* N %
	Yes	No	Yes	No	
	n %	n %	n %	n %	
<b>Total</b>	326 88.8	41 11.2	120 37.7	198 62.3	367 100
<b>Average number of visits to health provider</b>					
More than once a year	<b>194 59.7</b>	<b>12 30.0</b>	<b>82 68.3</b>	<b>107 54.3</b>	207 56.5
Once a year	99 30.5	14 35.3	34 28.3	62 31.5	113 30.9
Once every 2 or more years	<b>32 9.9</b>	<b>14 35.0</b>	<b>4 3.3</b>	<b>28 14.2</b>	46 12.6
<b>On your last visit, did your health provider speak to you about a Pap smear?</b>					
Yes	<b>218 67.3</b>	<b>8 20.0</b>	<b>90 75.0</b>	<b>121 61.7</b>	226 62.1
No	<b>106 32.7</b>	<b>32 80.0</b>	<b>30 25.0</b>	<b>75 38.3</b>	138 37.9
<b>How often should a woman get a Pap smear?</b>					
More than once a year	83 28.1	6 25.0	29 25.9	52 29.6	89 27.8
Once a year	196 66.4	14 58.3	<b>82 73.2</b>	<b>109 61.9</b>	211 65.9
Once every 2 or more years	<b>16 5.4</b>	<b>4 16.7</b>	<b>1 0.9</b>	<b>15 8.5</b>	20 6.3
<b>Cervical cancer is a preventable disease:</b>					
Agree	212 65.8	25 61.0	96 80.7	165 83.8	237 65.1
Undecided	67 20.8	14 34.2	9 7.6	8 4.1	81 22.3
Disagree	43 13.4	2 4.9	14 11.8	24 12.2	46 12.6
<b>What do you feel your chances of getting cervical cancer are?</b>					
Unlikely	179 57.0	20 52.6	60 52.6	115 59.6	199 56.4
Somewhat likely	76 24.2	11 29.0	30 26.3	45 23.3	87 24.6
Likely	59 18.8	7 18.4	24 21.1	33 17.1	67 19.0
<b>How severe a disease is cervical cancer?</b>					
Always or often severe	212 65.6	21 53.8	77 64.2	131 66.8	233 64.2
Sometimes severe	92 28.5	11 28.2	36 30.0	54 27.6	103 28.4
Rarely or never severe	<b>19 5.9</b>	<b>7 18.0</b>	<b>7 5.8</b>	<b>11 5.6</b>	27 7.4
<b>How often is cervical cancer cured?</b>					
Always cured	15 4.6	4 9.8	7 5.8	8 4.0	19 5.2
Often cured	35 10.8	3 7.3	18 15.0	17 8.6	38 10.4
Sometimes cured	<b>195 60.0</b>	<b>17 41.5</b>	71 59.2	119 60.1	213 58.0
Rarely cured	38 11.7	8 19.5	11 9.2	26 13.1	46 12.5
Never cured	42 12.9	9 22.0	13 10.8	28 14.1	51 13.9

**Bold:** Significant at alpha 0.05.

\* Some totals reflect missing information or nonresponses by the participants.

(95% CI: 1.26, 15.90). Data-based confounding appears to be present for education. Women who received a recommendation to get a Pap smear from their health provider during their last visit were 8 times more likely to have ever had a Pap smear (95% CI: 2.44, 26.16). Women who reported that it was necessary to have a Pap smear once a year were 3.4 times more likely to have ever had a Pap smear compared with women who reported that they should be screened more than once a year or less than once a year (95% CI: 1.14, 10.12).

Women who perceived an increased threat of cervical cancer were actually less likely to have ever had a Pap smear. Compared with women who believed it was unlikely that they would ever get cervical cancer, those who believed their chances of having cervical cancer were “somewhat likely” were 81% less likely to have ever had a Pap smear (95% CI: 0.03, 0.66). Women who responded that having multiple sex partners was a risk factor for cervical cancer were 7 times more likely to have ever had a Pap smear (95% CI: 1.34, 34.39). Data-based confounding appears to be present for both perceived threat of cervical cancer and certain risk factors for cervical cancer as the final adjusted ORs are meaningfully different from the crude measures.

**Had Pap Within the Last Year:** For the final adjusted model in Table 6 all statistically significant variables from the primary analysis were entered into a logistic regression model. Backward stepwise logistic regression was performed. Variables with a statistical

significance of  $P < .05$  were retained. Variables that appeared to act as confounders were also retained.

Table 6 shows that women who visited their health provider once a year or more were 5.8 times more likely to have been screened for cervical cancer in the last year compared with women who visited their provider once every 2 or more years (95% CI: 1.59, 21.12). Data-based confounding appears to be present for the health provider visit variables as the adjusted ORs were significantly different from the crude ORs (4.8 vs 5.8). Women who had received a recommendation from their physician were also more likely to have been screened for cervical cancer in the last year (prevalence odds ratio [POR]: 2.08, 95% CI: 1.11, 3.92).

There was an inverse association between embarrassment and yearly screening uptake. Women who said Pap tests were too embarrassing were 76% less likely to have screened for cervical cancer in the last year compared with women who reported no embarrassment (95% CI: 0.08, 0.72).

### Reasons to Not Undergo Pap Testing

Fig 1 describes the distribution of the population according to reasons for not having a Pap smear. The primary reason (41%) given by women for never having a Pap smear was that they believed they did not need it. The same women who indicated that they did not need a Pap smear frequently reported a lack of symptoms (eg, “never had problem,” “no pains”) as justification.

### Perceptions of Pap Smears

Fig 2 describes the distribution of the study population

**Table 3. — Distribution of Study Population According to Pap Smear Screening Status and Perceived Barriers to Screening**

	Ever Had a Pap Smear?		Had a Pap Smear Within the Last Year?				Total*			
	Yes		Yes		No		Total*			
	n	%	n	%	n	%	N	%		
<b>Total</b>	326	88.8	41	11.2	120	37.7	198	62.3	367	100
<b>Barriers to screening</b>										
Fear Pap test (includes pain)	140	45.2	18	56.3	43	38.0	93	49.2	159	46.4
Fear test will reveal cancer	131	42.1	13	40.6	41	36.0	85	44.7	145	42.2
Test is too expensive	29	9.4	6	18.8	<b>5</b>	<b>4.4</b>	<b>22</b>	<b>11.6</b>	35	10.2
Test is too embarrassing	45	14.5	7	21.9	<b>7</b>	<b>6.1</b>	<b>36</b>	<b>18.9</b>	53	15.4
Too long to wait for test result	122	39.5	—	—	49	43.0	68	36.2	126	37.0
Never received test results	79	25.6	—	—	25	21.9	53	28.2	80	23.5
Need more information	<b>94</b>	<b>30.4</b>	<b>21</b>	<b>65.6</b>	37	32.5	57	30.2	115	33.6
Too far to travel	<b>14</b>	<b>4.5</b>	<b>6</b>	<b>18.8</b>	4	3.5	10	5.3	20	5.8
Need more time with provider	75	24.3	13	40.6	25	22.1	46	24.3	88	25.7
Difficulty talking to provider	<b>16</b>	<b>5.2</b>	<b>5</b>	<b>15.6</b>	4	3.5	11	5.8	21	6.2

**Bold:** Significant at alpha 0.05.  
\* Some totals reflect missing information or nonresponses by the participants.

**Table 4. — Distribution of Study Population According to Pap Screening Status and Knowledge About Risk Factors for Cervical Cancer**

	Ever Had a Pap Smear?		Had a Pap Smear Within the Last Year?				Total*			
	Yes		Yes		No		Total*			
	n	%	n	%	n	%	N	%		
<b>Total</b>	326	88.8	41	11.2	120	37.7	198	62.3	367	100
<b>Do any of the following cause cervical cancer?</b>										
Smoking	146	46.5	15	37.5	52	44.1	91	48.2	162	45.6
Genital herpes	162	51.8	22	56.4	62	53.0	97	51.6	184	52.1
Chronic chlamydia infections	172	54.8	17	43.6	67	57.3	101	53.4	189	53.4
Human papillomavirus infection	123	39.2	15	39.5	38	32.5	81	42.9	138	39.1
Sex before age 16	238	76.0	27	69.2	91	78.5	140	74.1	265	75.1
Multiple sex partners	<b>260</b>	<b>83.1</b>	<b>26</b>	<b>66.7</b>	101	86.3	153	81.4	286	81.0
HIV infection	165	52.7	19	48.7	70	59.8	92	48.9	184	52.1
Use of oral contraceptives	64	20.5	9	23.7	23	19.8	39	20.6	73	20.7

**Bold:** Significant at alpha 0.05.  
\* Some totals reflect missing information or nonresponses by the participants.

according to responses to the question, “What is a Pap smear?” The majority of women reported that a Pap smear was a test to diagnose cancer (eg, “a test to find cancer”). An additional 14% reported that a Pap smear was used to diagnose cancer and other illnesses including sexually transmitted diseases.

## Discussion

This study found a positive association between secondary school education and receipt of a Pap smear. Several US studies have found that education has a strong influence on screening uptake.<sup>13,14</sup> The correla-

**Table 5. — Crude and Adjusted Prevalence Odds Ratios (PORs) With 95% Confidence Intervals (CIs) for the Study Population According to Pap Smear Status (Ever vs Never Had Pap Smear)**

	Crude POR	Adjusted <sup>a</sup> POR (95% CI)	Adjusted <sup>b</sup> POR (95% CI)
<b>Age</b>			
25–34 yrs	1.8	3.24 (0.75, 14.13)	3.01 (0.77, 11.79)
35–44 yrs	<b>2.88</b>	<b>6.20 (1.36, 28.34)</b>	<b>5.33 (1.25, 22.66)</b>
45–54 yrs	Ref.	Ref.	Ref.
<b>Marital status</b>			
Single	<b>2.59</b>	3.11 (0.76, 12.75)	3.79 (0.98, 14.60)
Other	Ref.	Ref.	Ref.
<b>Weekly income</b>			
Less than J\$2000	0.63	1.45 (0.23, 8.98)	1.14 (0.19, 6.64)
J\$2000–J\$4000	1.04	1.17 (0.19, 7.05)	1.13 (0.19, 6.69)
J\$4001 or more	Ref.	Ref.	Ref.
<b>Education completed</b>			
Primary school	Ref.	Ref.	Ref.
Secondary school	<b>2.33</b>	<b>4.03 (1.07, 15.11)</b>	<b>4.48 (1.26, 15.90)</b>
Tertiary	0.91	1.08 (0.17, 6.75)	1.20 (0.21, 6.81)
<b>How often do you visit your health provider?</b>			
Once a year or more	<b>4.93</b>	2.15 (0.58, 8.00)	1.95 (0.56, 6.86)
Less than once a year	Ref.	Ref.	Ref.
<b>On your last visit, did your health provider speak to you about a Pap smear?</b>			
Yes	<b>8.23</b>	<b>8.81 (2.57, 30.19)</b>	<b>7.99 (2.44, 26.16)</b>
No	Ref.	Ref.	Ref.
<b>How often should a woman get a Pap smear?</b>			
Once a year	<b>3.06</b>	<b>3.88 (1.23, 12.30)</b>	<b>3.39 (1.14, 10.12)</b>
Other response	Ref.	Ref.	Ref.
<b>Cervical cancer is a preventable disease</b>			
Agree	1.23	0.47 (0.14, 1.58)	0.56 (0.18, 1.71)
Undecided/Disagree	Ref.	Ref.	Ref.
<b>What do you feel your chances of getting cervical cancer are?</b>			
Unlikely	Ref.	Ref.	Ref.
Somewhat likely	0.77	<b>0.20 (0.05, 0.75)</b>	<b>0.19 (0.05, 0.66)</b>
Likely	0.94	0.77 (0.19, 3.17)	0.82 (0.22, 3.09)
<b>How severe a disease is cervical cancer?</b>			
Always or often severe	<b>3.72</b>	1.30 (0.18, 9.19)	1.76 (0.29, 10.75)
Sometimes severe	<b>3.08</b>	0.56 (0.07, 4.71)	0.81 (0.11, 5.94)
Rarely or never severe	Ref.	Ref.	Ref.
<b>How often is cervical cancer cured?</b>			
Always or often cured	Ref.	Ref.	Ref.
Sometimes cured	1.61	1.85 (0.15, 23.40)	2.51 (0.21, 29.43)
Rarely or never cured	0.66	2.05 (0.58, 7.22)	2.27 (0.69, 7.47)
<b>Barriers to screening</b>			
Fear test will reveal cancer	1.06	0.93 (0.30, 2.89)	
Test is too expensive	0.45	1.97 (0.36, 10.79)	1.34 (0.26, 6.91)
Test is too embarrassing	0.60	0.28 (0.06, 1.38)	0.39 (0.08, 1.80)
Need more information	<b>0.23</b>	0.29 (0.07, 1.24)	
Need more time with provider	<b>0.47</b>	1.09 (0.26, 4.48)	0.50 (0.17, 1.53)
Difficulty talking to provider	<b>0.30</b>	0.31	(0.04, 2.48)
<b>The following are risk factors for cervical cancer:</b>			
Smoking	1.45	1.24 (0.41, 3.80)	
Sex before age 16	1.41	0.22 (0.04, 1.28)	0.24 (0.05, 1.27)
Multiple sex partners	<b>2.45</b>	<b>8.20 (1.49, 45.29)</b>	<b>6.79 (1.34, 34.39)</b>

Ref. = Reference, the standard used to make comparisons.

<sup>a</sup> Adjusted for all variables in the table.

<sup>b</sup> Adjusted for age, marital status, income, education, visits to health provider, provider recommendation, screening recommendations, Pap test too expensive, Pap test embarrassing, need more time with health provider, prevention, susceptibility, severity, cure, sex at a young age, and multiple sex partners risk.

**Bold:** Significant at alpha 0.05.

**Table 6. — Crude and Adjusted Prevalence Odds Ratios (PORs) With 95% Confidence Intervals (CIs) for the Study Population According to Annual Pap Screening Status**

	Crude POR	Adjusted <sup>a</sup> POR (95% CI)	Adjusted <sup>b</sup> POR (95% CI)
<b>Age</b>			
25–34 yrs	1.84	3.09 (0.93, 10.29)	1.41 (0.57, 3.44)
35–44 yrs	1.23	2.88 (0.84, 9.89)	1.17 (0.45, 3.03)
45–54 yrs	Ref.	Ref.	Ref.
<b>Marital status</b>			
Married	Ref.	Ref.	
Single	0.86	1.04 (0.51, 2.12)	
Other (divorced, widowed)	0.43	0.28 (0.02, 3.94)	
<b>Race</b>			
Black	0.75	0.87 (0.21, 3.58)	
Other race	Ref.	Ref.	
<b>Weekly income</b>			
J\$2000 or less	0.49	1.34 (0.30, 5.97)	0.76 (0.21, 2.73)
J\$2001–J\$4000	0.42	0.74 (0.17, 3.25)	0.48 (0.14, 1.72)
J\$4001–J\$6000	0.39	0.83 (0.16, 4.38)	0.48 (0.11, 1.97)
J\$6001 or more	Ref.	Ref.	Ref.
<b>Education</b>			
Primary or less	<b>0.41</b>	<b>0.19 (0.05, 0.72)</b>	0.34 (0.11, 1.03)
Secondary	0.80	<b>0.27 (0.08, 0.91)</b>	0.56 (0.22, 1.46)
Tertiary	Ref.	Ref.	Ref.
<b>How often do you visit your health provider?</b>			
Once a year or more	<b>4.80</b>	<b>6.87 (1.65, 28.62)</b>	<b>5.80 (1.59, 21.12)</b>
Once every 2 or more years	Ref.	Ref.	Ref.
<b>On your last visit, did your health provider speak to you about a Pap smear?</b>			
Yes	<b>1.86</b>	<b>2.89 (1.34, 6.22)</b>	<b>2.08 (1.11, 3.92)</b>
No/Don't remember	Ref.	Ref.	Ref.
<b>How often should a woman get a Pap smear?</b>			
Once a year	<b>1.76</b>	1.54 (0.76, 3.15)	
Other response	Ref.	Ref.	
<b>Barriers to screening</b>			
Fear Pap test (includes pain)	0.63	0.89 (0.41, 1.90)	
Fear test will reveal cancer	0.69	0.61 (0.27, 1.41)	
Test is too expensive	<b>0.35</b>	0.78 (0.17, 3.57)	0.56 (0.16, 1.92)
Test is too embarrassing	<b>0.28</b>	<b>0.18 (0.05, 0.66)</b>	<b>0.24 (0.08, 0.72)</b>
Never received test results	0.72	0.64 (0.28, 1.44)	
Need more information	1.11	0.99 (0.46, 2.16)	
<b>Is cervical cancer a preventable disease?</b>			
Agree	1.50	1.37 (0.46, 4.08)	1.19 (0.50, 2.86)
Undecided	1.89	2.40 (0.71, 8.12)	1.96 (0.71, 5.44)
Disagree	Ref.	Ref.	Ref.
<b>What do you feel your chances of getting cervical cancer are?</b>			
Unlikely	0.72	0.54 (0.21, 1.38)	
Somewhat likely	0.92	0.75 (0.26, 2.18)	
Likely	Ref.	Ref.	
<b>How severe a disease is cervical cancer?</b>			
Always or often severe	0.92	0.49 (0.10, 2.30)	0.75 (0.22, 2.49)
Sometimes severe	1.05	0.64 (0.12, 3.24)	0.96 (0.27, 3.46)
Rarely or never severe	Ref.	Ref.	Ref.
<b>Cervical cancer is</b>			
Always or often cured	<b>2.25</b>	1.29 (0.40, 4.12)	1.27 (0.49, 3.30)
Sometimes cured	1.34	1.71 (0.70, 4.20)	1.21 (0.59, 2.46)
Rarely or never cured	Ref.	Ref.	Ref.
<b>The following are risk factors for cervical cancer:</b>			
Smoking	0.85	0.84 (0.42, 1.69)	
Genital herpes	1.06	1.26 (0.61, 2.63)	
Sex before age 16	1.27	1.21 (0.47, 3.11)	
Having more than one sex partner	1.44	1.62 (0.57, 4.58)	
Use of birth control pills	0.95	0.96 (0.41, 2.28)	

Ref. = Reference, the standard used to make comparisons.

<sup>a</sup> Adjusted for all variables in the table.

<sup>b</sup> Adjusted for age, income, education, visits to health provider, provider recommendation, Pap test embarrassing, Pap test expensive, preventable disease, cervical cancer cure and severity.

**Bold:** Significant at alpha 0.05.

tion between higher education level and increased cervical cancer screening attendance is also supported by studies in Mexico and Jamaica.<sup>15,16</sup>

This study also found that women age 35 to 44 years were more likely to have ever had a Pap smear compared with those age 45 to 54 years. As noted elsewhere in this paper, a recent review reported that age was found to be a significant factor in 78% of the studies reviewed.<sup>10</sup>

This study found a strong inverse association between embarrassment and uptake of annual screening. The relationship between embarrassment and non-attendance has been well documented in studies conducted in the United States.<sup>10,17,18</sup> However, recent studies have found that feelings of embarrassment or shame also have significant influence on the screening decisions of women in Latin American countries.<sup>6,11,15</sup>

Annual visits to a healthcare provider were found to influence the regular uptake of cervical cancer screening. Prior studies have indicated the importance of healthcare utilization patterns in cervical cancer screening attendance. One case-control study among older women in the United States found that women who had never had a gynecological, internist, or any outpatient visit were less likely to have ever had a Pap test or to have regularly screened for cervical cancer.<sup>18</sup> A cross-sectional study in Singapore found that women who attended regular health checkup visits were more likely to be consistent screeners.<sup>19</sup> Additional results from Singapore found that women reported postnatal care or family planning visits to be the main reason for having their first Pap test.<sup>20</sup> Our results might also be influenced by the fact that Pap smears are regularly offered as a part of postnatal care in Jamaican Health Centers.

This study found a strong association between health provider recommendation and first-time screen-

ing as well as regular uptake of cervical cancer screening. Based on information from the National Cancer Institute, Mandelblatt and Yabroff<sup>21</sup> acknowledged physician recommendation to be “one of the most powerful predictors of screening across all age, socioeconomic, and ethnic groups.” The positive influence of physician recommendation on cancer screening uptake has been well documented in numerous studies in the United States.<sup>22-26</sup>

Qualitative analysis revealed that 54% of this study population believed that the Pap test was used to diagnose rather than prevent cervical cancer (eg, “a test to find cancer”). Prior research from the Pan American Health Organization in Latin America and the Caribbean and studies from Trinidad and Jamaica have reported similar results.<sup>11,16,27</sup> Qualitative results from this study also found that the primary reason for never having a Pap smear was a lack of disease symptoms (41%). The belief that obvious symptoms such as pain indicate the presence of cervical cancer and the belief that a Pap test is used only to diagnose existing cancer may work in concert to negatively influence a woman’s decision to screen. Studies from Latin America confirm that the lack of knowledge that cancer is a preventable disease and a poor understanding of the symptoms of cervical cancer are correlated with a failure to screen.<sup>6,11</sup>

Attitudes regarding personal susceptibility to cervical cancer were also found to be associated with screening uptake in this study. Other studies have found significant associations between a low perceived risk of cervical cancer and limited uptake of screening.<sup>20,28</sup> Here we found that, compared with women who felt a low perceived risk of cervical cancer, women who felt they were somewhat more at risk were less likely to have ever been screened.

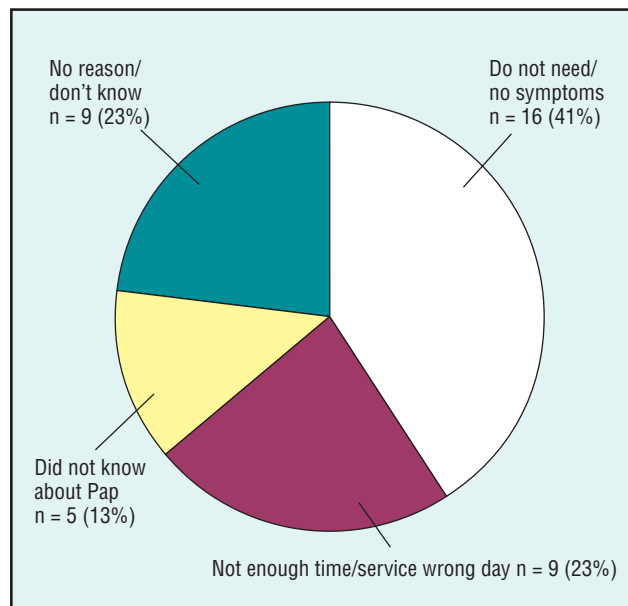


Fig 1. — Reasons for never having a Pap smear.

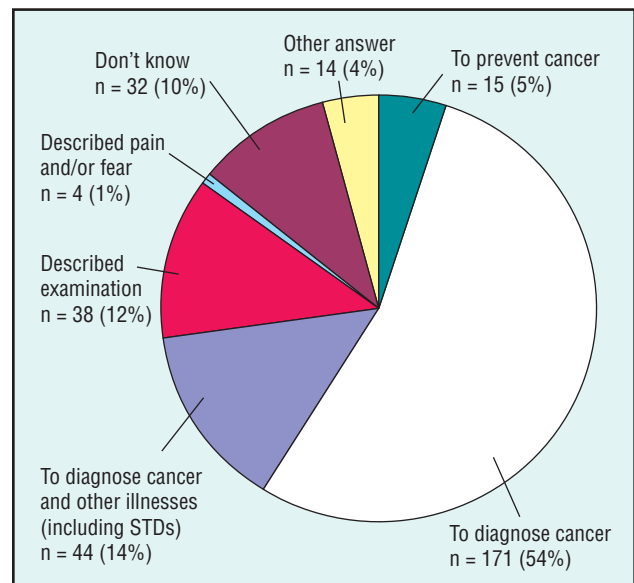


Fig 2. — Distribution of the study population according to description of a Pap smear.

When interpreting the overall results of this study, certain limitations should be recognized. First, this study relied solely on participant self-report. Rates of adherence to screening programs and rates of provider recommendation may therefore differ from results found in medical records. In addition, in 2004, the Jamaican Ministry of Health implemented new cervical cancer screening guidelines that specified 3-year interval screenings for women who have had three consecutive annual Pap smears with normal results. Consequently, it is possible some women may have not received a provider recommendation for cervical cancer screening due to the new standards. On the other hand, it is unclear how many Jamaican health providers have actually adopted the new guidelines. Also, the sample for this study was limited to the public clinic-attending population; therefore, this study may not be generalizable to the overall population. Recent statistics indicate that only 68.4% of Jamaican women attended primary healthcare facilities in 2001.<sup>3</sup> Although attendance statistics from the Parish of Trelawny were not available, it is more than likely that a significant proportion of the population is not represented by this study. Finally, problems with missing data and a limited sample size restricted the extent of the statistical analysis and final results lacked precision in the point estimates.

## Conclusions

This study provided much-needed data about the factors that influence cervical cancer screening attendance in a previously unstudied population. Overall, this study suggests the need for Trelawny health planners to emphasize two specific issues in cervical cancer programs: health education and organizational efficiency. Regarding health education and promotion, the results of this study call attention to three areas: (1) the preventive benefits of screening, (2) the asymptomatic nature of early-stage cervical cancer, and (3) the promotion of annual health checkups. Regarding organizational efficiency, this study suggests that consistent provider recommendations should be strongly promoted to improve initial screening rates as well as regular screening attendance.

This original study was conducted among the public clinic-attending population in a discrete region of Jamaica; therefore, further study is necessary to validate these findings and to determine if these recommendations may be beneficial to the broader Jamaican population. Overall, this study has clarified the need for further research on the factors that affect cervical cancer screening uptake. In particular, future investigation is needed on organizational issues such as provider knowledge, attitudes and practices, and program follow-up of screened clientele.

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