Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

HEALTHY CARIBBEAN COALITION
"a civil society alliance for combating chronic diseases"

SITUATIONAL ANALYSIS OF CERVICAL CANCER PREVENTION AND CONTROL IN THE CARIBBEAN

Results from a 2013 assessment of country policies and services for HPV vaccination, cervical cancer screening, diagnosis and treatment

December, 2013

SITUATIONAL ANALYSIS OF CERVICAL CANCER PREVENTION AND CONTROL IN THE CARIBBEAN
Table of Contents

ACKNOWLEDGEMENTS

This report was prepared by Damali Martin[1], Silvana Luciani and Elisa Prieto, with input from Maisha Hutton and Tomo Kanda. The authors wish to thank the following individuals who provided information used in this report: Grüngberg Antoon, Marie Louise Baker, Natalia Largaespada Beer, Homer Bloomfield, Vikash Chatrani, Tamu Davidson, Angela C Desabaye, Hilda Dunsmmore, Petrinella Edwards, Maria Henry, Laura Tucker Longsworth, Fiona llegall, Naomi D Prince, Gerty Surena, Rhonda Simmons, and Sook Lee Yin. The Ministries of Health of non-Latin Caribbean countries were an active partner in providing data relevant for this report. The Healthy Caribbean Coalition was a major partner in the data collection process working in concert with their Caribbean Cancer NGO membership, who were fully engaged and worked with the Ministry of Health partners.

[1] while on assignment to the Pan American Health Organization from the National Cancer Institute's Center for Global Health and Division for Cancer Control and Population Sciences.

EXECUTIVE SUMMARY

Cervical cancer remains a significant public health concern in the Caribbean where it is the second leading cause of cancer deaths among women. This report synthesizes the available information on cervical cancer incidence, mortality and HPV prevalence in the non-Latin Caribbean countries, as well as summarizes the results of a survey of national cervical cancer program managers regarding the current capacity and status of cervical cancer programs.

Among the countries in the non-Latin Caribbean, all have established cervical cancer screening, based on cytology as part of public health programs, and 3 countries have already introduced HPV vaccines into their national immunization programs. Information is lacking in most countries, however on the screening coverage and proportion of women with abnormal screening test results receiving follow up diagnosis and treatment, which are key indicators for program effectiveness. Furthermore, limitations in health human resources and infrastructure, especially for radiotherapy, present challenges to improving program effectiveness. Despite these limitations, cervical cancer program managers from Ministries of Health report that there exists a high political interest in addressing cervical cancer and that it was feasible their government will provide funding to strengthen screening services and introduce HPV vaccines in the near future. Civil society organizations, including the Healthy Caribbean Coalition, are playing an important role in the Caribbean to raise public awareness and participation in screening programs and advocate for more government investments for cervical cancer prevention and control.

BACKGROUND

Cervical cancer is a major cause of morbidity and mortality among women worldwide. Among Caribbean women of all ages, cervical cancer is the second most common cancer in terms of incidence and mortality and accounts for 13% of all cancer cases and 10.4% of all cancer deaths [1].

Cervical cancer, caused by persistent infection with human papillomavirus (HPV), is a highly preventable disease. Vaccines against HPV are available to prevent infections. Screening women for precancerous cervical lesions can detect early stages of the disease, and when treated, will prevent progression to invasive cervical cancer. Despite this fact, cervical cancer prevention and control is a challenge and remains a significant public health concern in the Caribbean.

To address this problem, the Pan American Health Organization/World Health Organization (PAHO/WHO) developed the Caribbean Cervical Cancer Prevention and Control Project in 2001. The project supported the countries of the non-Latin Caribbean to enhance their capacity to implement organized, targeted and sustained programs for cervical cancer prevention and control[2]. A number of initiatives were undertaken through the project, including development of screening and treatment policies and guidelines, evaluating screening programs, training cytologists to improve quality of cytology testing, and a social communication and advocacy campaign to raise awareness of the cervical cancer problem among women. Building on this work, PAHO/WHO created the Regional Strategy and Plan of Action for Cervical Cancer Prevention and Control in Latin America and the Caribbean which was endorsed by Ministers of Health throughout the Americas in 2008. It aims to strengthen cervical cancer program effectiveness, through a seven point plan of action, across the continuum of care from primary prevention, screening, treatment, palliative care and including cancer registration[3].

This report presents the results of the situation assessment of the current capacities for cervical cancer prevention and control in the non-Latin Caribbean countries. It was prepared, in part to fulfill one point of the Cervical Cancer Regional Strategy, namely the conduction of a situation assessment; and to further assist the non-Latin Caribbean countries with better understanding the strengths, needs and gaps in their national cervical cancer programs. The Healthy Caribbean Coalition, HCC, was a major partner in the data collection process for this report, working in concert with their Caribbean Cancer NGO membership.

INTRODUCTION

This situational analysis of cervical cancer prevention and control in the non-Latin Caribbean provides an overview of the current policies, programs and services in place. The objective is to synthesize individual country information to support strengthening programs.

This report presents information on the cervical cancer incidence and mortality from 2000 to latest year available, as well as a snapshot of HPV vaccine introduction, cervical cancer screening, diagnosis, treatment, palliative care, program monitoring and cancer registration. A total of 18 countries are included in this report. Table 1 summarizes the country and data reported in this analysis.

TABLE 1: OVERVIEW OF COUNTRY INFORMATION

Country	Cervical cancer incidence data (Year)	Cervical cancer mortality data (Year)	HPV prevalence studies (Year)	Cervical cancer program assessment (Year)	Program screening coverage (Year)
Antigua and Barbuda		(2000 - 2008)			
Aruba		(2000 - 2004; 2006 - 2008)			(2007)
Bahamas	(1988 - 2002)	(2000 - 2003; 2006 - 2008)			
Barbados		(2000 - 2004; 2006 - 2008)	(1993)	(2013)	(2008)
Belize	(2011)	(2000 - 2008)	(2007)	(2013)	
Bermuda	(2012)	(2000 - 2002; 2004; 2006 -2008)		(2012)	
Cayman Islands	(2005 - 2012)			(2013)	(2012)
Dominica	(2007 - 2011)	(2003 - 2008)		(2013)	(2008)
Grenada		(2000 - 2004; 2006 - 2008)			
Guyana	(2000 - 2007)	(2000 - 2008)	(2004 - 2008)	(2013)	
Haiti				(2013)	
Jamaica	(2003 - 2007)	(2006)	(1990, 1993, 2006, 2010)	(2012)	
St. Kitts and Nevis	(2011)	(2000 - 2008)		(2013)	(2008)
St. Lucia		(2000 - 2005; 2008)			(2012)
St. Maarten				(2013)	
St. Vincent and the Grenadines		(2000 - 2008)		(2012)	
Suriname		(2000 - 2008)	(1992-1995)	(2012)	
Trinidad and Tobago	(2000 - 2002)	(2000 - 2008)	(2004; 2007; 2012)	(2013)	(2011)

METHODS

Cervical cancer incidence and mortality

Incidence data from the non-Latin Caribbean countries were obtained from an extensive literature search using Pub Med and Google Scholar, with the search terms cervical cancer, cervical cancer incidence, cancer and Caribbean, cancer registries, cancer registration and cervical cancer. Scientific articles and reports published from 2003-2012 were reviewed.

Mortality data were extracted from the PAHO/WHO mortality database for 14 countries from the non-Latin Caribbean which routinely provide data from their national vital registration systems, available for 2000-2012. These countries include: Antigua and Barbuda, Aruba, The Bahamas, Barbados, Belize, Bermuda, Dominica, Grenada, Guyana, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. ICD-10 coding for deaths from uterine cervix (ICD-10 C53) was used to identify cervical cancer mortality cases in each country. All countries did not have complete data for the time period of this analysis, and Table 1 indicates the years of data available. Age-standardized cervical cancer mortality rates were calculated using female population specific age groups for women aged 15-75+ years, and calculated weights of the world standard population [6]. Given the small population size in these countries, and thus low number of annual deaths from cervical cancer, age-standardized mortality rates were calculated using 3 year periods 2000-2002, 2003-2005, 2006-2008.

HPV prevalence

An extensive literature search was performed on HPV prevalence in the non-Latin Caribbean using Pub Med and Google Scholar with the search terms human papillomavirus in Caribbean, human papillomavirus prevalence in the Caribbean, human papillomavirus genotypes and Caribbean, high-risk human papillomavirus in Caribbean. Studies published in 1993-2013 were reviewed.

Caribbean cervical cancer program assessment

Information was gathered from cervical cancer program managers in Ministries of Health, and in some countries, from the civil society organization as well. Information on demographics and burden of disease, cervical cancer prevention and control policies and programs, HPV vaccination, screening, cervical cancer treatment and palliative care, cervical cancer monitoring and evaluation, and human resources was collected using a structured questionnaire. The questionnaire was sent to Ministries fo Health in January, 2012 and for those who did not complete the 2012 survey, were sent the same questionnaire in February, 2013.

The Healthy Caribbean Coalition, HCC, was a major partner in the data collection process for the 2013 questionnaires, working in concert with their Caribbean Cancer NGO membership. Information was gathered by Cancer NGOs (see Annex 1) in preparation for a 2013 Caribbean regional meeting aimed at building capacity of civil society organizations (CSO) for evidence informed advocacy on cervical cancer. Data was collected using participatory approaches in which the CSOs were fully engaged and worked with local PAHO representatives and Ministry of Health partners to complete the questionnaires as part of a larger process of generating evidence to inform advocacy. The process: built cervical cancer policy and programming awareness among CSOs; created and strengthened relationships between CSOs and national governments working together to achieve a shared objective, in particular in those settings where cancer NGOs play a significant role in the provision of cervical cancer related prevention, treatment and care; and highlighted priority gaps and needs for advocacy.

RESULTS

The detailed results to the cervical cancer program assessment, by each responding country are provided in this section and Table 2 provides the highlights of the main results.

Demographic data

The relevant demographic data needed to plan cervical cancer prevention and control programs, are described in Table 3. Women account for roughly half of the total populations for all responding countries and women age 25 – 64, the target population for cervical cancer screening are indicated in Table 3 below. Girls aged 9 – 12 years; an age group of interest for HPV vaccination is also included.

TABLE 3: RELEVANT DEMOGRAPHIC INFORMATION FOR CERVICAL CANCER PROGRAMS

Country	Total Population	Number of women aged 25-64 years	Number of girls aged 9-12 years
Barbados	286,705	83,688	18, 000
Belize	324,300	64,749	15,431
Bermuda	69,100	19,685	1,469
Cayman Islands	52,600	18,379	1,201
Dominica	72,969	NR	8,188
Guyana	756,040	168,727	90, 000
Haiti	10,123,787	2,020,638	1,149,000
Jamaica	2,761,300	653,992	299, 000
St Kitts & Nevis	50,314	22,135	4,430
St. Maarten	38,486	17,280	1385
St Vincent & Grenadines	103,500	22,440	10,000
Suriname	534,200	125,090	19,740
Trinidad & Tobago	1,351,000	357,364	41,300

TABLE 2: OVERVIEW OF CERVICAL CANCER IN SELECTED NON-LATIN CARIBBEAN COUNTRIES

Country	Population size	HPV Prevalence (reference)	Number of new cervical cancer cases (Year)	Number of cervical cancer deaths (Year)	HPV vaccine introduction	Screening services	Pre-cancer treatment services	Cancer registry
Antigua and Barbuda	88,000	n/a	n/a	25 (2000 - 2008)	n/a	n/a	n/a	n/a
Aruba	106, 000	n/a	n/a	38 (2000-2004; 2006-2008)	n/a	n/a	n/a	n/a
Bahamas	347,000	n/a	n/a	91 (2000-2003; 2006-2008)	n/a	n/a	n/a	Hospital-based
Barbados	286,705	HPV DNA was identified in 90% of the samples of histologically confirmed carcinoma (n = 20). HPV 16 was present in 65% samples, HPV 33 and 45 were present in 5%. (11)	n/a	121 (2000 - 2004; 2006 - 2008)	September 2013	Pap smear, HPV DNA test	Colposcopy, Cryotherapy, LEEP and Cold Knife Conization	Population-based
Belize	324,300	The prevalence of high-risk genotypes was 15.6% in a sample of 463 women from general population, 10.1% in those women with normal cytology, 93% in women with HSIL. (12)	38 (2011)	109 (2000 - 2008)	n/a	Pap smear, VIA	Colposcopy, LEEP,Cold Knife Conization	n/a
Bermuda	69,100	n/a	15 (2012)	10 (2000 - 2002; 2004; 2006 - 2008)	n/a	Pap smear, HPV DNA test	Colposcopy, LEEP, Cold Knife Conization	Population-based
Cayman Islands	52,600	n/a	12 (2005 - 2012)	n/a	2012	Pap smear, VIA, HPV DNA test	Colposcopy, Cryotherapy, LEEP, Cold Knife Conization, Single visit VIA followed by cryotherapy	Population-based
Dominica	72,969	n/a	81 (2007 - 2011)	31 (2003 - 2008)	n/a	Pap Smear	Colposcopy, Cryotherapy, Cold Knife Conization, Single visit VIA followed by cryotherapy	n/a
Grenada	108,000	n/a	n/a	34 (2000 - 2004; 2006 - 2008)	n/a	n/a	n/a	n/a

Guyana	756,040	Among study sample of Amerinidian women, prevalence of HPV was 19.5% for all women, 11% in women with normal cytology. (13)	573 (2000 - 2007)	327 (2000 - 2008)	2012	Pap smear, VIA	Colposcopy, Cryotherapy, LEEP, Single visit VIA followed by cryotherapy	Population-based
Haiti	10,123,787	n/a	n/a	n/a	n/a	VIA	Cryotherapy, Single visit VIA followed by cryotherapy	n/a
Jamaica	2,761,300	HPV prevalence for any genotype was 54%. Oncogenic HPV genotypes were found in 34.9% of the total study population. (17)	302 (2003 - 2007)	133 (2006)	n/a	Pap Smear	Colposcopy, Cryotherapy, LEEP, Cold Knife Conization, Single visit VIA followed by cryotherapy	Population-based
St. Kitts and Nevis	50,314	n/a	14 (2011)	14 (2000 - 2008)	n/a	Pap smear, VIA	Colposcopy, CKC	n/a
St. Lucia	162, 000	n/a	n/a	118 (2000 - 2005; 2008)	n/a	n/a	n/a	n/a
St. Maarten	38,486	n/a	n/a	n/a	n/a	Pap Smear	n/a	n/a
St. Vincent and the Grenadines	103,500	n/a	n/a	70 (2000 - 2008)	n/a	Pap smear, VIA	Colposcopy, Cryotherapy, LEEP, Cold Knife Conization, Single visit VIA followed by cryotherapy	n/a
Suriname	534,200	HPV prevalence was 82% in 258 women with malignant cervical lesions (n=130). HPV 16 and 18 were the most common genotypes. (18)	1138 (1980 - 2004)	235 (2000 - 2008)	n/a	Pap smear, VIA	Colposcopy, Cryotherapy, LEEP, Single visit VIA followed by cryotherapy	Hospital-based
Trinidad and Tobago	1,351,000	HPV prevalence was 40.6% for both low-risk and high-risk HPV. In addition, 65.9% of HPV positive women were infected with high-risk HPV. (20)	324 (2000 - 2002)	598 (2000 - 2008)	January 2013	Pap smear, VIA, HPV DNA test	Colposcopy, LEEP	Population-based

n/a= information not available

CERVICAL CANCER INCIDENCE

Data on cervical cancer incidence from the non-Latin Caribbean are scarce, but the literature review yielded several studies summarized in Table 4 below.

TABLE 4: SUMMARY OF CERVICAL CANCER INCIDENCE DATA AVAILABLE FROM NON-LATIN CARIBBEAN

Country (reference)	Year(s)	Number of new cervical cancer cases (age group)	Cervical cancer incidence rates (age group)
Grand Bahama, The Bahamas[4]	1988 - 2002	58 (27 – 77 years)	60/100,000 (27 – 77 years)
Belize (survey)	2011	38 (21-55 years)	54.9/100,000 (21 to 55 years)
Bermuda[5]	1991 - 2003, 2012	15	Caucasian 5.8/100,000 (n/a) Black 7.6/100,000 (n/a)
Cayman Islands (survey)	2005-2012	12 (n/a)	n/a
Dominica (survey)	2007-2011	81 (21 - 70+ years)	n/a
Guyana[6]	2000 - 2007	573 (< 70 years)	n/a
Jamaica (Kingston & St. Andrews area)[7]	2003 - 2007	302	17.4/100,000 (20 - 85+ years)
St. Kitts and Nevis (survey)	2011	14 (n/a)	n/a
Suriname[8, 9]	1980 - 2004	1138 (all ages)	Urban 12/100,000 (all ages) Rural 10/100,000 (all ages)
Trinidad and Tobago[10]	2000-2002	324 (25 - 85+ years)	16.5/100,000 (25 - 85+ years)

CERVICAL CANCER MORTALITY

Cervical cancer mortality rates differ among the countries included in this analysis (Table 5). From 2000 to 2002 and from 2003 to 2005, Belize, St. Lucia and St. Vincent and the Grenadines reported the highest burden for cervical cancer mortality. Dominica also reported high cervical cancer mortality (23.6/100,000) from 2003 to 2005. From 2006 to 2008, Dominica, Guyana and St. Vincent and the Grenadines reported the highest cervical cancer mortality rates for the region. For all three time periods, Bermuda reported the lowest mortality rate for cervical cancer.

TABLE 5: CERVICAL CANCER MORTALITY IN SELECTED NON-LATIN CARIBBEAN COUNTRIES

Country	Cervical cancer mortality among women aged 15 years and older					
	2000 - 2002		2003 - 2005		2006 - 2008	
	No.	ASMR	No.	ASMR	No.	ASMR
Antigua and Barbuda	6	7.6	10	11.6	9	9.3
Aruba	14	10.7	[a]12	[a]12.4	12	7.2
Bahamas	44	14.5	[b]14	[b]13.8	33	8.9
Barbados	56	16.2	[c]34	[c]12.8	31	7.3
Belize	39	25.4	35	20.5	35	17.0
Bermuda	5	4.7	[d]1	[d]3.2	4	2.8
Dominica	n/a	n/a	14	23.6	17	21.7
Grenada	8	11.0	[e]8	[e]9.6	18	17.7
Guyana	108	19.5	112	20.8	107	19.0
St. Kitts and Nevis	4	8.4	6	10.0	4	7.4
St. Lucia	52	34.2	56	34.6	[f]10	[f]12.5
St. Vincent and the Grenadines	27	30.0	22	20.2	21	19.4
Suriname	70	16.3	76	16.7	89	17.7
Trinidad and Tobago	181	13.6	201	14.0	216	14.1

Notes: a Aruba is missing data for 2005; b. Bahamas is missing data for 2004 – 2005; c. Barbados is missing data for 2005; d. Bermuda is missing data for 2003 and for 2005; e. Grenada is missing data for 2005; f. St Lucia is missing data for 2006 - 2007.

HPV PREVALENCE

The following countries have conducted HPV prevalence studies in various populations over the past 10-15 years: Barbados, Belize, Guyana, Jamaica, Suriname and Trinidad and Tobago. A synthesis of the results of these various studies is presented below and summarized in Table 2**.** Note that the results are not comparable across countries, given the differences in study populations and/or sample size of study population, changes in specimen collection over time, and differences in HPV DNA testing methods. Appendix 1 contains a detailed summary of these HPV prevalence studies.

Barbados

HPV prevalence study was performed in 1993 in paraffinized tissue from twenty Barbadian women with genital carcinoma that was verified histologically. HPV DNA was identified in 90% of the samples. HPV 16 was present in 65% samples, HPV 33 and 45 were present in 5%[11].

Belize

HPV prevalence study was performed in 2007 on 463 women as part of a campaign on cervical cancer prevention. Hybrid Capture 2 (HC2) testing was performed and samples that tested positive were then processed further for low and high risk HPV genotypes. The prevalence of high-risk genotypes was 15.6% in total population and 10.1% in those women with normal cytology. Approximately 93% of women diagnosed with high grade cervical squamous intraepithelial lesion (HSIL) had high-risk HPV present in their cervical samples. The most frequent HPV genotypes present in the study population was 16, 18, 56 and 52. In addition, HPV 16 and 18 were the most common genotypes for women with normal cytology and 47% of women with HSIL were positive for HPV 16[12].

Guyana

One HPV prevalence study was performed on the indigenous or Amerindian women in Guyana from 2004 to 2008[13]. For this study, over 2200 Amerindian women between 13 and 84 years were screened for cervical cancer and over 1400 women between 13 and 80 years were screened for HPV prevalence. The mean age for the women tested for HPV prevalence was 36.9 years. Approximately 19.5% of the women tested were HPV positive. HPV prevalence was 11% among women with normal cytology results, in agreement with the global prevalence of HPV among women with normal cytology. A nested study of HPV genotyping was performed on 44 women with cervical intraepithelial neoplasia (CIN) II/III or invasive cancer. The predominant genotypes were HPV 31, 16 and 52 among women with CINII/III (n=35), whereas HPV 18, 16, 31 and 39 were the predominant genotypes among the women with invasive cervical cancer (n=9).

Jamaica

Four various HPV prevalence studies have been conducted in Jamaica[14-17]. The most recent HPV prevalence study is described here17. This study was performed on 852 sexually active women, age 16 – 49 years, who attended a selected public or private primary health clinic in one of the four health authority regions. HPV prevalence for any genotype was 54%. HPV prevalence was highest among the women who were younger (71.9% in women 16 – 19 years) compared to the older study subjects (42.6% in women 40 – 49 years). Oncogenic HPV genotypes were found in 34.9% of the total study population,

and HPV 16 was the predominant genotype. Oncogenic HPV were found in30.6% of women who had a normal cytology test . Furthermore, 84% of women with abnormal cytology test were HPV positive. The prevalence of HPV 16 and d 18 was higher in the subgroup of women with HSIL compared to those with lower severity of abnormality (LSIL, ASCUS or normal).

Suriname

One study examined the prevalence and distribution of HPV genotype in a population of 258 women with malignant cervical lesions, from Suriname and the Netherland[18]. Data from the Surinamese population was collected from 1992 to 1994, and from the Netherland population from 1992 to 1995. HPV prevalence was found in 82% of samples from Suriname (n = 130) compared to 87% of samples from the Netherlands (n = 128). HPV 16 (49% and 68% in Suriname and the Netherlands, respectively) and 18 (15% and 16% in Suriname and the Netherlands, respectively) were the predominant subtypes in both populations. No significant differences for the prevalence of HPV 16 and 18 distribution were observed among Creoles, Hindustani and Javanese patients.

Trinidad and Tobago

Three various HPV prevalence studies have been conducted in Trinidad & Tobago[19-21]. One study in 2007 investigated HPV prevalence in 310 women who attended three primary health care centers in the northern part of Trinidad. HPV prevalence was 40.6% for both low-risk and high-risk HPV. In addition, 65.9% of HPV positive women were infected with high-risk HPV. HPV 52, 66 and 16 were the predominant genotypes (12.7%, 10.3% and 9.5%, respectively). In addition, approximately 30% of HPV positive subjects had multiple HPV infections. HPV prevalence was higher in the younger age group compared to the oldest age groups[20].

STATUS OF NATIONAL CERVICAL CANCER PROGRAMS

Policies and programs

Table 6 presents a summary of cervical cancer policies and programs available in each of the 13 countries who responded to the program assessment questionnaire.

TABLE 6: CERVICAL CANCER POLICIES, PROGRAMS AND GUIDELINES IN SELECTED NON-LATIN CARIBBEAN

Country	Policy for cervical cancer	Program for cervical cancer	Program manager for cervical cancer	Work plan to implement cervical cancer program	Budget for cervical cancer program	Clinical guidelines/protocols for cervical cancer	Treatment capacity		
							Treatment for precancerous lesions	Treatment of invasive cancer	Palliative care
Barbados	No	No	No	No	No	No	Yes	Yes	NR
Belize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
Bermuda	No	No	No	No	No	Yes	Yes	Yes	Yes
Cayman Islands	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes
Dominica	NR	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Guyana	Yes	Yes	No	Yes	NR	Yes	Yes	Yes	Yes
Haiti	No	No	No	No	No	Yes	Yes	NR	NR
Jamaica	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
St Kitts & Nevis	No	No	No	No	No	No	Yes	NR	NR
St. Maarten	No	No	No	No	No	No	Yes	Yes	NR
St Vincent & Grenadines	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Suriname	Yes	No	No	No	Yes	Yes	Yes	Yes	No
Trinidad & Tobago	NR	Yes	No	Yes	No	Yes	Yes	Yes	Yes

NR=no response

Five countries responded as having a cervical cancer policy in place: Belize, the Cayman Islands, Guyana, St. Vincent and the Grenadines and Suriname. Seven countries reported having an organized cervical cancer screening program: Belize, the Cayman Islands, Dominica, Guyana, Jamaica, St. Vincent and the Grenadines and Trinidad and Tobago. Suriname reported that, while there is no program, a draft national strategic plan exists which includes instituting a national program and integrating cervical cancer screening into the basic health care services.

All countries, with the exception of the Cayman Islands and St. Kitts and Nevis, reported having clinical guidelines and protocols in place. In addition, all countries reported having a referral system for women who need follow up treatment for precancerous lesions; whereas eleven countries reported that they have a referral system for women who need treatment for invasive cancer. However, only seven countries reported a referral system for women who need palliative care.

Only Belize and Suriname reported having a budget specifically for cervical cancer; and 4 countries [Belize, Dominica, Jamaica and St. Vincent and the Grenadines] reported having a cervical cancer

program manager. However, it is not clear if these program managers are involved in other aspects of women's health, cancer or non-communicable disease programs in general.

Barbados, Belize, Dominica and St. Kitts and Nevis reported that they are considering a change or reviewing the current cervical cancer policies and programs. Barbados reported that future plans include decreasing the frequency of screening and increasing screening intervals, whereas St. Kitts and Nevis reported that they are considering an integrated approach to screening (additional details was not provided). Belize reported that they plan to strengthen the current program in order to increase coverage of its target population.

HPV vaccination

Table 7 summarizes countries' status of HPV vaccine introduction. Of the countries responding to the survey, 3 noted they had already introduced HPV vaccines into their national immunization programs [Cayman Islands, Guyana, Trinidad & Tobago]. The Cayman Islands and Guyana reported that HPV vaccines were introduced in 2012, while Trinidad and Tobago reported they introduced HPV vaccines in January, 2013. All 3 countries reported that they administer HPV vaccines to females ages 10-13 years. However, the Cayman Islands reported that HPV vaccination is administered to girls up to age 18 years. In addition, all 3 countries indicated using schools or district health clinics to deliver the HPV vaccines.

Several countries indicated that they plan to introduce HPV vaccines into their national immunization program in the near future. Barbados reported planning to begin in September, 2013.Belize, Dominica and Suriname provided plans for pre-introduction of the HPV vaccine. Belize indicated that they plan to perform a cost-effectiveness study for the introduction of the vaccine. Dominica reported plans to investigate HPV prevalence within its population and to include HPV genotyping as part of its study. Two countries, St. Kitts and Nevis and Haiti, reported that at present there are no plans for HPV vaccination.

TABLE 7: STATUS OF HPV VACCINATION IN NATIONAL IMMUNIZATION PROGRAMS

Countries	HPV vaccination part of national immunization program	Information on HPV vaccination program			If no, are there plans to include HPV vaccination into national immunization program?
		Year started	Target sex and age group	Vaccination setting	
Barbados	Yes	Scheduled to start 2013	11 years of age	Entry into secondary school	NA
Belize	No	NA	NA	NA	Yes
Bermuda	No	NA	NA	NA	Yes
Cayman Islands	Yes	2012	Females 11-18 years of age	High schools and district clinics	NA
Dominica	No	NA	NA	NA	Yes
Guyana	Yes	2012	Females 10-13 years of age	Schools and health clinics	NA
Haiti	No	NA	NA	NA	No
Jamaica	No	NA	NA	NA	Yes
St Kitts & Nevis	No	NA	NA	NA	No
***St. Maarten**	No	NA	NA	NA	Yes
St Vincent & Grenadines	No	NA	NA	NA	Yes
Suriname	No	NA	NA	NA	Yes
Trinidad & Tobago	Yes	2013	Females 11-12 years of age	Clinics and school	NA

NA=information not available

Screening

Table 8 summarizes the reported cervical cancer screening services for each of the 13 country who responded to the survey. With regards to available screening tests, all countries reported that they offer Pap smears, except Haiti. VIA screening (visual inspection with acetic acid) is reported in eight countries [Belize, Cayman Islands, Guyana, Haiti, St Kitts & Nevis, St Vincent & the Grenadines, Suriname and Trinidad & Tobago]. HPV testing within the public health system was reported in four countries [Barbados, Bermuda, Cayman Islands, Trinidad & Tobago]. Suriname, St. Vincent and the Grenadines, Jamaica and Belize reported that HPV DNA testing is not offered within their public health sector. However, Suriname reported having the technology to perform HPV testing and current testing performed as part of studies are not included as part of the routine screening practices. Jamaica reported that HPV DNA testing is available from the private health services.

Public health education programs that promote and educate women about the importance of cervical cancer screening were noted as being in place in almost all responding countries, except Barbados, St. Kitts and Nevis, and Suriname. These programs are mostly led by the Ministries of Health or other government entities, health or family planning clinics and other non-governmental organizations (NGOs), such as cancer societies. It is important to note that respondents indicated that private sector also participates in cervical cancer screening education and promotion in Bermuda, Dominica, Jamaica and Trinidad and Tobago. For example, Bermuda reported that pharmaceutical companies have been involved in ongoing social mobilization and education efforts in their country. Belize noted that cervical cancer education and screening promotion is limited due to budget constraints and under-staffing.

TABLE 8: CERVICAL CANCER SCREENING SERVICES AVAILABLE IN THE PUBLIC SECTOR

Country	Screening tests are available in primary care services			Screening frequency			Target population			Cost of screening for patient			Programs to promote cervical cancer screening
	Pap	VIA	HPV	Pap	VIA	HPV	Pap	VIA	HPV	Pap	VIA	HPV	
Barbados	Yes	NR	Yes	Every 3 years, 21-49 years Every 5 years, 50-65 years	NR	NR	Women 21 - 65 years	NR	NR	Full/Partial /Free	NR	Full	No
Belize	Yes	Yes	No	Yearly until 3 consecutive negative test, then every three years	NR	NA	Women 21 - 55 years	Women 21-55 years	NA	Free	Free	NA	Yes by MOH, Belize Family Life, private sector
Bermuda	Yes	No	Yes	Every 2 years for women 20-30 years Every 3 years for women > 30 years	NA	Repeat after 12 months if monitoring ASCUS	> 20 years	NA	Women with ASCUS diagnosis	Full/partial	NA	Full/partial	Yes by the Department of Health, Bermuda Cancer and Health Centre, Government TV, public radio broadcasts, Merck and GSK
Cayman Islands	Yes	Yes	Yes	Every 2 years	Evaluate abnormal pap	NR	NR	15 years and older	NR	Partial	Partial	Partial	Yes by Health Services Authority, Cayman Islands Cancer Society, other civil society
Dominica	Yes	NR	NR	NR	NR	NR	Women 15 to 59 years	NR	NR	Free	NR	NR	Yes by MOH, Cancer Society, physicians, planned parenthood,

													faith-based organizations
Guyana	Yes	Yes	NR	NR	NR	NR	Women who are sexually active	Women age 25-49 years	NR	Full	Free	NA	Yes by MOH/ Cancer Institute, Local organization
Haiti	NR	Yes	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Yes by MOH, Family Health Ministries and GSCC
Jamaica	Yes	No	No	Once every 3 years once two consecutive pap smears are normal	NA	NA	Women 25-54 years	NA	NA	Free	NA	NA	Yes
St Kitts & Nevis	Yes	Yes	NR	Annually for 1st two tests, then once every 3 years with normal results	NR	NR	All sexually active females	NR	NR	Free	NR	NR	No
***St. Maarten**	Yes	NR	NR	NR	NR	NR	NR	NR	NR	Full/partial	NR	NR	Yes by Ministry of Public Health, Social Development and Labour with Ministry of General Affairs, NGO
St Vincent & Grenadines	Yes	Yes	No	Two intial negative tests, one year apart then every 3 years	NR	NR	Women 20-65 years	NR	NR	Full	Full	NA	Yes by MOH, Cancer society and Agency for Public Information
Suriname	Yes	Yes	No	Every 2 years	Every 2 years	NA	Post-menopausal women	Women 23-55 years	NA	Full/partial	Full/partial	NA	No
Trinidad & Tobago	Yes	Yes	Yes	Once every year	NR	NR	Available for all women	NR	NR	Free	Free	Free	Yes by Sexual and reproductive programmes, Population programme Unit, EPI programme

NA=not available; NR=no response

Screening guidelines

Cytology (Pap test): Barbados, Bermuda, Belize, Dominica, Jamaica and St. Vincent and the Grenadines reported that they target both pre-menopausal and post-menopausal women for cytological screening of cervical cancer with ages ranging from 15 to 65 years. St. Kitts and Nevis and Guyana reported that they target all sexually active women, whereas Trinidad and Tobago indicated that cytology screening was available for all women.

Countries varied in their responses for recommended cytology screening intervals. Trinidad and Tobago reported yearly screening for their targeted population, whereas Suriname and the Cayman Islands reported that they recommend screening every two years. Barbados and Bermuda indicated that they follow the screening guidelines outlined by The American Congress of Obstetricians and Gynecologists (ACOG), which indicates longer screening intervals for older populations. For examplein Bermuda, reported screening intervals for cervical cancer is every two years for women ages 20 to 30 years, but every three years for women greater than 30 years. Belize, Jamaica, St. Vincent and the Grenadines and St. Kitts and Nevis reported that they screen their target population every three years after the first two or three yearly or consecutive negative tests.

VIA screening guidelines: Belize, Guyana and Suriname reported that their VIA screening guideline cover women aged 21 – 55 years, 25 – 49 years and 23 – 55 years, respectively. However, the Cayman Islands reported they include 15 year and older in their guideline for VIA screening, which is used not as a primary screening test, but as a followup test of abnormal Pap smears.With regards to VIA screening interval, Suriname was the only respondent and noted that VIA screening is recommended every two years in their guidelines.

HPV testing guidelines: The countries responding to having HPV testing in place did not provide specific information on their guidelines. Bermuda indicated that HPV testing is used to monitor women who have a Pap test result of atypical cells of undetermined significance (ASCUS). In this population, women undergo HPV testing immediately and 12 months after initial diagnosis.

Screening program coverage

With regards to Pap screening coverage, 7 countries [Barbados, Belize, the Cayman Islands, Jamaica, St. Kitts and Nevis, St. Vincent and the Grenadines and Suriname] provided responses. Reported coverage ranged from 8% (St. Vincent and the Grenadines) to greater than 85% (Cayman Islands). All of these countries reported falling short of their targeted coverage, which ranges from25% (St. Vincent and the Grenadines) to 100% (Barbados). For VIA screening, Suriname was the only country to report information. They noted that the coverage of their target population is less than 15%, which falls short of their targeted coverage of 80%.

Follow up on abnormal screening test results

With the exception of the Cayman Islands, none of the countries were able to report information on the percentage of women with an abnormal screening test result who received follow up diagnosis and treatment (if indicated). The Cayman Islands have reported that 97% of women with an abnormal Pap test result are followed up for further evaluation and treatment. Suriname indicated that recent data of follow up was not available, yet they reported that 35% of women received complete follow up and treatment during a National Pap Smear Project from 1998 - 2001.

Cost of screening to women

With regards to costs to women for screening services, cytology testing was reported as free of charge in 6 countries [Barbados, Belize, Dominica, Jamaica, St. Kitts and Nevis and Trinidad and Tobago]. However, Barbados indicated that women could also provide full or partial payment for cytology. Guyana and St. Vincent and the Grenadines reported that women obtaining cytology screening services pay for the services in full. Other countries stated that cytology screening can range from partial payment (provided that the woman is insured) to full payment. For example, Suriname reported that women who are insured (80% of the population) provide partial co-payment for their cytology test, whereas women who are uninsured will pay in full.

VIA screening services are reported free of charge in 3 countries:Belize, Guyana and Trinidad and Tobago. The Cayman Islands reported that women provide partial payment, whereas St. Vincent and the Grenadines reported that women provide full payment. Suriname indicated that the cost for VIA services could be full or partial and depends on the patient's insurance status. For HPV DNA testing, Barbados indicated that women pay in full for this test, whereas Bermuda indicated that women make either partial or full payment.

Diagnosis and Treatment of pre-cancer

Table 9 summarizes the available services for diagnosis and treatment of pre-cancerous cervical lesions.

TABLE 9: AVAILABLE SERVICES FOR DIAGNOSIS AND TREATMENT OF PRE-CANCEROUS CERVICAL LESIONS

Country	Available services											Laboratory services				
	Colposcopy			Cryotherapy		LEEP		Cold Knife Conization		VIA followed by cryotherapy		No. cytology labs	Number of pap smears processed in past year	Internal quality control	External quality control	Information system
	Y/N	Number	Cost to patient	Y/N	Cost to patient	Y/N	Cost to patient	Y/N	Cost to patient	Y/N	Cost to patient					
Barbados	Yes	1	Free	Yes	Free	Yes	Free	Yes	Free	No	NA	1	NR	Yes	Yes	Yes
Belize	Yes	4	US $80	No	NA	Yes	Partial	Yes	Partial	NR	NR	2	6,565	No	Yes	Yes
Bermuda	Yes	1	US $525	No	NA	Yes	Full	Yes	Full	No	NA	1	NA	NA	NA	Yes
Cayman Islands	Yes	3	CI $300	Yes	Full	Yes	Full	Yes	Full	Yes	Full	1	2,500	Yes	Yes	Yes
Dominica	Yes	NR	EC $150	Yes	EC $250	NR	NR	Yes	EC $510	Yes	EC $250	1	2,149	Yes	Yes	Yes
Guyana	Yes	NR	Free	Yes	Free	Yes	Free	NR	NR	Yes	Free	1	1,926 (2010-2013)	Yes	NR	Yes
Haiti	No	NA	NA	Yes	NR	NR	NR	No	NA	Yes	NR	1	NA	No	No	No
Jamaica	Yes	5	Free	Yes	Free	Yes	Free	Yes	Free	Yes	Free	3	32,774	Yes	Yes	Yes
St Kitts & Nevis	Yes	2	NR	No	NA	No	NA	Yes	Full	No	NA	1	2,203	Yes	Yes	Yes
St. Maarten	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	NA	NA	NA	NA
St Vincent & Grenadines	Yes	NR	NR	Yes	NR	Yes	NR	Yes	NR	Yes	NR	1	NR	Yes	No	No
Suriname	Yes	1 - 2	Unknown	Yes	Partial	Yes	NR	NR	NR	Yes	Free	2	2,684	Yes	No	Yes
Trinidad & Tobago	Yes	NR	Free	NR	NR	Yes	NR	NR	NR	NR	NR	4	NR	NR	NR	No

NA=not available; NR=no response

Cytology laboratory

All countries, with the exception of St. Maarten reported having public health laboratories for processing cytology tests. The reported number of government laboratories range from 1(most countries) to as many as 4 (Trinidad and Tobago). The reported number of cytology test processed in the previous year ranged from 2,203 (St. Kitts and Nevis) to 6,565 (Belize). Guyana reported that 1,926 cytology tests were processed over the past three years. Eight countries also indicated the presence of private cytology laboratories. The reported number of private laboratories ranged from 1 (Dominica, Guyana and the Cayman Islands) to 8 (Jamaica). Barbados, Bermuda and the Cayman Islands also reported that the number of pap smears processed within the private sector is 1,253, 3,000 and 2,186, respectively.

Internal quality control procedures for cytology were reported in 9 countries [Barbados, the Cayman Islands, Dominica, Guyana, Jamaica, St. Kitts and Nevis, St. Vincent and the Grenadines and Suriname]. Furthermore, Barbados, Belize, the Cayman Islands, Dominica, Jamaica and St. Kitts and Nevis reported having external quality control procedures.

All countries except Haiti, St. Vincent and the Grenadines and Trinidad and Tobago indicated that they have an information system for cytology tests within their laboratories and that this system also includes information from the private sector.

VIA screening, followed by cryotherapy treatment

A single visit screen and treat approach, using VIA screening followed by cryotherapy treatment was reported as being offered in 7 countries [The Cayman Islands, Dominica, Guyana, Haiti, Jamaica, St. Vincent and the Grenadines and Suriname]. Yet,only 3 [Guyana, Jamaica and Suriname]reported that the procedure was free for all patients. The Cayman Islands reported that the patient is required to provide the full payment, but did provide information on the exact cost. Dominica reported a cost of EC$250 (approx. US$675). The Cayman Islands, Guyana, Jamaica and Trinidad and Tobago also stated that the procedure is offered in their private health sector

Colposcopy services

Public sector colposcopy services were reported as available in almost all countries surveyed. All countries reported having at least one type of treatment for pre-cancerous lesions,cryotherapy, LEEP, or cold knife conization available within their public health care system, with the exception of St. Maarten. All these procedures are available in Barbados, the Cayman Islands, Jamaica and St. Vincent and the Grenadines.

A few of the countries who reported offering coloscopy , also provided information on the number of available colposcopes, which ranged from 1 (Barbados and Bermuda) to 5 (Jamaica). Colposcopy services are reported as free of charge in Barbados, Guyana, Jamaica and Trinidad and Tobago. Cost for colposcopy procedure in Belize, Cayman Islands, Dominica and Bermuda is US$80, CI$300 (approx. US$366), EC$150 (approx. US$405) and US$525, respectively.

Eight countries reported that colposcopy was also offered in the private health sector. The reported number of colposcopes available in the private sector ranged from 1 (Bermuda) to 7 (Cayman Islands) and the number of colposcopes in both sectors, the reported number of colposcopes available in the private sector was equal or greater in all cases. In most cases, the reported cost of the procedure was also higher in the private health sector. For example, the reported cost of colposcopy in the private sector in Barbados could range from US$150 to US$300.

Cryotherapy

Eight countries, namely Barbados, Cayman Islands, Dominica, Guyana, Haiti, Jamaica, St. Vincent and the Grenadines and Suriname indicated that they offer cryotherapy.In those countries reporting costs, cryotherapy treatment was reported as free of charge to women in Barbados, Guyana and Jamaica. The Cayman Islands reported that patients are required to provide the full cost, but did not provide information on the cost of service to the patient. Dominica reported that cryotherapy services cost EC$250 (approx. US$675). Suriname indicated that the cost of cryotherapy depends on country location and medical insurance status. Specifically, cryotherapy was reported as being free for women who lived in the interior areas of Suriname. However, for other women, cryotherapyis partially or fully covered for women who have medical insurance coverage. Eight countries reported that cryotherapy is also offered in the private sector and patients will make either full or partial payments.

LEEP

Ninecountries indicated that they offer loop electrosurgical excision procedure (LEEP). St. Kitts and Nevis does not offer LEEP procedure and Dominica, St. Maarten and Haiti did not provide information. Barbados, Guyana and Jamaica reported that this procedure is free to patients within the public health sector. Bermuda and Cayman Islands stated that women are required to pay in full, whereas Belize indicated that some insurance coverage is provided and only partial payment is required. None of these countries provided information on the exact cost for the procedure. Ten countries reported that LEEP treatment is also offered in the private sector. In all cases, it was reported that patients are required in pay in full, but exact costs were not provided.

Cold knife conization

Eight countries indicated that they offer cold knife conization in their public health care sectors. Haiti reported that this procedure is not offered, whereas Guyana, St. Maarten, Suriname and Trinidad and Tobago did not provide information. Barbados and Jamaica reported that this procedure is free. Belize reported that partial payment by the patient is required for this procedure. Bermuda, Cayman Islands and St. Kitts and Nevis reported that patients are expected to provide full payment. The patient's out-of-pocket cost was not provided for those countries who reported partial or full payment. Dominica reported that cold knife conization procedure will cost EC$510 (approx. US$1377) and patients are expected to cover the entire costs for the procedure. Nine countries also reported that cold knife conization is offered in the private sector and full payment is required.

Treatment and palliative care for invasive cervical cancer

Nine countries [Barbados, Belize, Dominica, Guyana, Jamaica, Haiti, St Kitts & Nevis, St Vincent & Grenadines, Trinidad & Tobago] indicated that gynecologists are available to perform radical hysterectomy in the public sector.

TABLE 10: AVAILABLE SERVICES FOR INVASIVE CANCER TREATMENT AND PALLIATIVE CARE

Country	Gynecologist to perform radical hysterectomy	Availability of chemotherapy	Availability of radiotherapy	Availability of palliative care
Barbados	Yes	Yes	Yes	Yes, not coordinated
Belize	Yes	NR	Not available	Yes, but not structured
Bermuda	Not available	Yes	Not available	Yes
Cayman Islands	Not available	Yes	Not available	Yes
Dominica	Yes	Yes	Not available	Yes, but not structured
Guyana	Yes	Yes	Not available	Only symptomatic treatment, not palliative
Haiti	Yes	Yes, but drugs are brought from overseas	Not available	Yes, but small unit at General Hospital
Jamaica	Yes	Yes, at four regional hospitals	Yes, available at one hospital. Out dated technology and long waits	Yes, one facility. Free for patients
St Kitts & Nevis	Yes	Not available	Not available	Yes, pain management and home care
St. Maarten	Not available	Yes, referred to specialists either locally or abroad	Yes, referred to specialists either locally or abroad	Not available
St Vincent & Grenadines	Yes	Not available	Not available	Not available
Suriname	Not available	Yes	Yes, since early 2012 at the Centre for Radiotherapy	Yes, provided by Homecare organizations
Trinidad & Tobago	Yes	Yes, at one centre	Yes	NR

NR=no response

Chemotherapy

Chemotherapy is available in ten countries, though Haiti indicated that chemotherapy drugs are usually imported from other countries. Belize, St. Kitts & Nevis, and St. Vincent and the Grenadines reported that chemotherapy was not available. Dominica offers chemotherapy at a cost to the patient. In

Guyana, chemotherapy is provided to the patient free of cost as along as the patient is part of the Georgetown Public Health Clinics (GPHC). Patients, who are not part of the public health system in Guyana, are required to purchase the chemotherapy drugs. If a patient cannot afford to purchase chemotherapy drugs, they are referred to the GPHC, but waiting periods could be as long as a month. In Trinidad and Tobago, chemotherapy obtained by a patient in the private sector will be subsidized by the Government.

Radiotherapy

Radiotherapy is not available in most countries that responded to the survey. Only five countries, namely Barbados, Jamaica, St. Maarten, Suriname and Trinidad and Tobago, indicated that they have radiotherapy services. However, Jamaica has indicated difficulties in administrating radiotherapy as their equipment is outdated. In Jamaica, radiotherapy is available at one facility with up to date technology in Kingston. In Guyana, radiotherapy is available in the Cancer Institute of Guyana, which collaborates with the Guyanese Ministry of Health to provide radiotherapy to patients who are part of the public system. Dominican patients in need of radiotherapy are sent to Barbados.

Palliative care

Eight countries offer palliative care to patients diagnosed with cervical cancer in the public health sector. The Cayman Islands reported that palliative care is well developed in both public and private health sectors. In Suriname, palliative care is offered by home care organizations and is supervised by the patient's family doctor. In Belize, health care professionals provide palliative care in collaboration with the Belize Cancer Society, but palliative care is not very well structured. Barbados and Dominica also reported that palliative care treatment is not well-structured or coordinated. In Dominica, clients are mostly supported by family members and the Dominica Cancer Society. In Haiti and Jamaica, only one facility offers palliative care publicly. However, it should be noted that palliative care in Jamaica is free. In addition, three other sites within Jamaica offer palliative services at a cost to the patient. In Guyana, patients that are part of the public health sector are offered symptomatic treatment and not palliative care. However, palliative care is offered at the private hospital or at the patients' home by a private foundation. Unfortunately, palliative care is not available in St. Vincent and the Grenadines.

Health human resources for cervical cancer control

A summary of available human resources is shown in Table 11. With regards to the public health sector, all thirteen countries reported that they have gynecologists. Seven countries reported that they have radiotherapists and eight countries reported that they have oncologists. In addition, four countries reportedly have gynecological oncologists and four countries indicated the presence of nurse oncologists. Furthermore, four countries stated that they have medical physicists; six countries indicated that they have palliative care specialists and six countries reportedly have pathologists. All countries except St. Maarten, indicated the presence of cytotechnologists. The reported number of trained cytology staff in the public health sectors ranged from one (Suriname and St. Vincent and the Grenadines) to ten (Barbados, Haiti and Jamaica).

Continuous training for personnel (doctors, nurses, pathologists, cytotechnologists) involved in cervical cancer services are offered in Belize, the Cayman Islands, Guyana, Jamaica and St. Vincent and the Grenadines.

Program Monitoring, Evaluation and Cancer Registries

Table 12 summarizes program monitoring and provides information on cancer registration. Few countries reported having a cervical cancer program evaluation, and only the Cayman Islands and

Jamaica reported such evaluations. With regards to information systems, five countries [Belize, Guyana, Jamaica, St. Kitts and Nevis and St. Vincent and the Grenadines] indicated that an information system to track women in the screening program was available.

TABLE 12: MONITORING OF CERVICAL CANCER PREVENTION PROGRAMS

Country	Program evaluation	Cancer registry	Information system for follow-up	Unique identifiers
Barbados	No	Yes	No	No
Belize	No	No	Yes	Yes
Bermuda	No	Yes	No	No
Cayman Islands	Yes	Yes (Population-based)	No	No
Dominica	No	No	No	No
Guyana	NR	Yes (Population-based)	Yes	NR
Haiti	No	No	No	No
Jamaica	Yes	Yes (Population-based)	Yes	No
St Kitts & Nevis	No	No	Yes	No
St. Maarten	No	No	No	No
St Vincent & Grenadines	No	No	Yes	Yes
Suriname	No	Yes	No	No
Trinidad & Tobago	No	Yes (Population-based)	No	No

NR=no response

Cancer registries

Seven countries report having cancer registries to track incidence and mortality [Barbados, Bermuda, Cayman Islands, Guyana, Jamaica, Suriname and Trinidad and Tobago], and four are reported as population-based. Unique patient identifiers are only available in Belize and St. Vincent and the Grenadines. In Belize, unique identification numbers are automatically generated by the Belize Health Information System and serves as an alternative to the social security number.

The cancer registry in Barbados is part of a larger registry which also collects information on other chronic non-communicable diseases, namely stroke and CVD[22]. Currently, cancer registration is retrospective and information on cancer incidence is currently being collected from previous years. This registry is housed within the Chronic Disease Center at the University of West Indies at Cavehill and is supported by the Ministry of Health in Barbados.

The Bermuda National Tumour Registry is a population based cancer registry which was established in 1979. The cancer registry underwent restructuring in 2004 and was re-launched in 2008[23]. The Cayman

Islands cancer registry is a population based cancer registry located at the government hospital and collects data on all identified cancers within the population of the Cayman Islands[24]. The Elizabeth Quamina Cancer Registry in Trinidad and Tobago was established in 1994 and serves as the national cancer registry for the island[25]. The Cancer Registry of Guyana, which was established in 2000, serves in the same capacity[6]. Both registries are housed within the Ministries for Health in their respective countries. The cancer registry in Jamaica is part of the Department of Pathology at the University of the West Indies at Mona, and covers 24% to 26% of the Jamaican population located in the St. Andrew and Kingston's area[7]. The registry was established in 1958, making it the longest established registry within the English-speaking Caribbean. As reported on the situational survey, an additional registry is housed in the Western Regional Health authority and covers cancer incidence in that region, which accounts for 18% of Jamaica's population.

The cancer registry in Suriname is managed by the Pathologic Anatomy Laboratory of the Academic Hospital in Paramaribo and has collected information on histologically-confirmed cases of cancer since 1960. It is generally regarded as the national cancer registry of Suriname[8, 9]. Although not reported in the survey, The Bahamas has a hospital based cancer registry which is housed within the Princess Margaret Hospital and collects information on all cancer cases diagnosed in public health sector.

General self assessment

Respondents provided a general assessment of the status of cervical cancer programs in their country and results are presented in Table 13. Most respondents characterize the burden of cervical cancer in as high, as is the political interest in addressing cervical cancer. In addition, all of the respondents reported that it was feasible their government will provide funding to strengthen screening services for cervical cancer and this would likely occur in the coming years. In regards to the HPV vaccine, five countries believe that there is a high or moderate likelihood that their government was likely to fund its introduction. In addition, respondents noted the importance of civil society's role in cancer prevention and control and rated civil societies' response as satisfactory.

TABLE 13: GENERAL ASSESSMENT OF CERVICAL CANCER PROGRAM

Assessment	High	Moderate	Low	Unknown
Cervical cancer burden in country	Belize, Dominica, Guyana, Haiti, Trinidad and Tobago	Barbados	Cayman Islands, St. Kitts and Nevis	St. Maarten
Need for improving women's health services	Barbados, Belize, Guyana, Haiti, Trinidad and Tobago	Dominica, St. Kitts and Nevis, St. Maarten	Cayman Islands	n/a
Need for improving adolescent health services	Barbados, Belize, Dominica, Guyana, St. Kitts and Nevis, Trinidad and Tobago	St. Maarten	Cayman Islands	Haiti
Opportunities for receiving external and collaborating organization support	St. Kitts and Nevis, Trinidad and Tobago	Cayman Islands, Dominica and St. Maarten	Barbados, Belize, Haiti	Guyana
Rating of current screening policies	Cayman Islands	Dominica, Guyana, Trinidad and Tobago	Barbados, Belize, Haiti, St. Kitts and Nevis, St. Maarten	n/a
Success of current screening policies	Cayman Islands, Dominica	Barbados, Guyana, Trinidad and Tobago	Belize, Haiti, St. Maarten	St. Kitts and Nevis
Rating of current adolescent immunization policies	Cayman Islands	Guyana, St. Maarten and Trinidad and Tobago	Barbados, Belize, Dominica, Haiti, St. Kitts and Nevis	n/a
Success of current adolescent immunization policies	Barbados, Belize, Cayman Islands	St. Maarten, Trinidad and Tobago	Dominica, Guyana, Haiti, St. Kitts and Nevis	n/a
Political interest in improving cancer control	Belize, Cayman Islands, St. Kitts and Nevis, Trinidad and Tobago	Dominica, Guyana, Haiti, St. Maarten	Barbados	n/a
Political interest in improving cervical cancer control	Belize, Cayman Islands, Haiti, St. Kitts and Nevis, Trinidad and Tobago	Dominica, Guyana, St. Maarten	Barbados	n/a
Likelihood of government funding for strengthening screening services	Belize, Cayman Islands, Haiti, Trinidad and Tobago	Barbados, Dominica, Guyana, St. Kitts and Nevis, St. Maarten	n/a	n/a
Likelihood of government funding for introduction of the vaccine	Barbados, Cayman Islands, Guyana, St. Maarten, Trinidad and Tobago	Haiti	Belize, Dominica	St. Kitts and Nevis

Feasibility of strengthening screening programs in the coming years	Belize, Cayman Islands, Dominica, Guyana, Haiti, Trinidad and Tobago	Barbados, St. Kitts and St. Maarten	n/a	n/a
Feasibility of introducing HPV vaccination programs in the coming years	Guyana, Haiti, St. Maarten, Trinidad and Tobago	Barbados, Belize, Dominca	Cayman Islands, St. Kitts and Nevis	n/a
Current role of civil society in cervical cancer prevention, treatment and control	Cayman Islands	Barbados, Dominica, Haiti, Trinidad and Tobago	Belize, Guyana, St. Kitts and Nevis, St. Maarten	n/a
Importance of civil society in cervical cancer prevention, treatment and control	Belize, Cayman Islands, Dominica, Guyana, St. Kitts and Nevis, St. Maarten, Trinidad and Tobago	Barbados	Haiti	n/a

CIVIL SOCIETY IN THE CARIBBEAN

Civil society actors were reported as providing services for cervical cancer in seven countries [Barbados, Belize, Cayman Islands, Dominica, Guyana, Haiti, St. Maarten]. In addition, five countries [Barbados, Cayman Islands, Dominica, Haiti, St. Maarten] indicated that civil society organizations are actively working in communications, social mobilization and advocacy.

The Healthy Caribbean Coalition, a civil society alliance to combat chronic diseases, is mobilizing civil society actors around the issue of cervical cancer screening and treatment. To this end, they have launched a regional Civil Society cervical cancer advocacy initiative beginning with a regional advocacy capacity building workshop for 20 cancer societies representing 16 Caribbean countries. This was followed by the development of a Caribbean Cancer Alliance and the launch of the first of its kind Caribbean cervical cancer e-petition (CCCEP) calling on Heads of States to increase access to cervical cancer screening and treatment for Caribbean women. The HCC has also developed two tools for CSOs. 'The Caribbean Civil Society Cervical Cancer Advocacy Handbook and Planning Tool' is a practical tool for the design and implementation of community based cervical cancer advocacy initiatives; and 'Connecting Communicating, Collaborating, HCC Social Media 'How to" Guide' is a resource to strengthen NCD related eHealth and social media capacity among CSOs. As well, the HCC has recently conducted a mapping and prepared an extensive report of current cancer NGO efforts for cervical cancer prevention and control in the Caribbean. More information about the e-petition and the mapping report can be found on the HCC website: http://healthycaribbean.org/

TABLE 14: CIVIL SOCIETY RESPONSE

	Yes	No
Civil Society Organizations providing services related to cervical cancer	Barbados, Belize, Cayman Islands, Dominica, Guyana, Haiti, St. Maarten	St. Kitts and Nevis
Civil Society Organizations working specifically in cervical cancer communication, social mobilization and advocacy	Barbados, Cayman Islands, Dominica, Haiti, St. Maarten	Belize, St. Kitts and Nevis, Trinidad and Tobago

CONCLUSION

Cervical cancer is a significant public health burden in the Caribbean region, where it is the second most common cancer and cause of cancer deaths among women. While incidence data is scarce from this region, cervical cancer incidence varies among the non-Latin Caribbean countries. Mortality data, from the countries included in this analysis also varied. From 2006 to 2008, cervical cancer mortality ranged from 2.8/100,000 to 21.7/100,000. These data may be underestimated for issues related to completeness of data collection, coding, and accuracy of pathological diagnosis. Introduction of new cancer registries and the improvements to current cancer registries is necessary to gain a more accurate understanding of the burden of cervical cancer, especially incidence.

This analysis illustrates the level of capacity available for cervical cancer screening, diagnosis, treatment and palliative care in several Caribbean countries. The human and infrastructural resources are notably greater in the larger countries such as Jamaica and Trinidad and Tobago, yet several of the smaller countries, such as the Cayman Islands and St. Vincent and the Grenadines offer a range of services. Of urgent need, however, is to improve radiotherapy capacity which has limited availability.

HPV vaccine introduction has not reached its full potential in this region, with only a limited number of countries including these vaccines into their national immunization programs. Perhaps one of the greatest challenges in this region, however, is the limited capacity of cytology laboratories to meet the demands needed for a high screening coverage, acceptable turn around time for Pap test results, and quality control. In this regard, HPV DNA testing and VIA screening, as well as single visit VIA screening followed by cryotherapy treatment can offer viable solutions to address the cytology problem. Yet, few countries in this region are fully embracing these new technologies into their cervical cancer screening policies, and programs in a systematic manner.

Most countries were unable to report data on their current screening program coverage, and in addition were not able to provide information on the percentage of women receiving follow up diagnosis and treatment. For those who did report, current coverage rates were very low, which has implications for the effectiveness of the program. This calls attention for the need for information systems with unique patient identifiers to follow up women and ensure connection of all levels of the health care system.

The limited human resources is also a challenge. Although most countries have gynecologists, other specialized personnel such as cytologists, radiotherapists, oncologists and gynecological and nurse oncologists are very limited. In addition, most countries do not have continuous training programs that provide up to date health information to their health personnel.

Despite these numerous challenges, countries responding to this cervical cancer program assessment note that political will exists to improve access to HPV vaccination, screening and treatment, and that civil society actors are playing a critical role in cervical cancer prevention and control. This indicates the potential to improve the effectiveness of programs, and save more women's lives in the Caribbean.

ANNEX 1: RESPONDENTS TO THE 2012 – 2013 NON-LATIN CARIBBEAN CERVICAL CANCER PROGRAM ASSESSMENT SURVEY

Country	Name	Position	Organization	Date completed questionnaire
Barbados	Vikash Chatrani	Senior registrar/Director	Queen Elizabeth Hospital /Barbados Cancer Society	7-Mar-13
Bermuda	Hilda Dunsmmore Rhonda Simmons	Medical officer	Department of Health Bermuda Cancer & Health Centre	28-Feb-12
Belize	Natalia Largaespada Beer Laura Tucker Longsworth	Maternal, Child Health President	Ministry of Health Belize Cancer Society	9-Mar-13
Cayman Islands	Sook Lee Yin	Medical Director	Cayman Islands Cancer Society	11-Mar-13
Dominica	Angela C Desabaye	Member	Dominica Cancer Society	18-Mar-13
Guyana	Fiona lLegall	General Manager	Guyana Cancer Institute	15-Mar-13
Haiti	GertySurena	Executive Director	Groupe de Support Contre Le Cancer (GSCC)	7-Mar-13
Jamaica	Tamu Davidson	Medical epidemiologist	Ministry of Health	22-Feb-12
St Kitts & Nevis	Petrinella Edwards	Ministry of Health and Social Services	NCD Programme Coordinator	4-Mar-13
St. Maarten	Maria Henry	NR	Ministry Public Health Social Development and Labor	6-Mar-13
St Vincent & Grenadines	Naomi D Prince	Coordinator Family Planning Programme	Ministry of Health	23-Feb-12
Suriname	Grüngberg Antoon	NR	Ministry of Health	21-Feb-12

ANNEX 2: HPV PREVALENCE STUDIES FROM THE CARIBBEAN IDENTIFIED IN PEER-REVIEW LITERATURE

Country (Year)	Study Population	HPV prevalence studies results	Sources
Barbados			
1993	Women with histologically proven genital carcinoma	HPV DNA was identified in 90% of the samples of histologically confirmed carcinoma (n = 20). HPV 16 was present in 65% samples, HPV 33 and 45 were present in 5%	Prussia PR, terSchegget J, Smits HL. W.I Medical J. 1993: 42: 144 – 146.
Belize			
2007	Women who respnded to the cervical cancer prevention campaign	The prevalence of high-risk genotypes was 15.6% in a sample of 463 women from general population, 10.1% in those women with normal cytology, 93% in women with HSIL. Most common HPV types are HPV 16, 18, 56 and 52 in study population, HPV 16 and 18 in women with normal cytology and HPV 16, 31, 35 and 58 in women with HSIL	Cathro HP, Loya T, Dominquez F, et al. Human Pathology 2009: 40: 942 - 949
Guyana			
2004 - 2008	Indigenous Amerinidian women	Among study sample of Amerinidian women, prevalence of HPV was 19.5% for all women, 11% in women with normal cytology. Most common genotypes were HPV 31, 16 and 52 in women with CINII/III (n=35), and HPV 18, 16, 31 and 39 in the women with invasive cervical cancer (n=9)	Rebecca S. Kightlinger RS, Irvin WP, Archer KJ,et al. American Journal of Obstetrics & Gynecology 2010: 202:626:e1-7
Jamaica			
1990	Women who visited an STD clinic in Kingston	HPV was identified in 28.7% of cervical swabs obtained from this study population. The prevalence of HPV was 39% in women 15 to 19 years of age, and gradually decreased with increasing age	Figueroa JP, Ward E, Luthi TE et al. Sexually Transmitted Diseases. 1995, 22(2):114 - 117
1991 - 1993	Women referred for coloposcopy at a health clinic in Kingston	HPV prevlance study revealed the prevalence of three high risk HPV genotypes, 16, 18 and 45 among patients undergoing colposcopy	Rattary C, Strickler HD, Escoffery C et al. Journal of Infectious Diseases. 1996, 173:718 - 721
2003 - 2006	Pregnant women from the Ante Natal Clinic at the University Hospital in Kingston and non-pregnant women from a family practice in Western Jamaica	HPV presence was identified in 87.7% of the study population, with a higher prevalence in the pregnant study participants. In addition, pregnant study participants also had the highest prevalence for high-risk HPV and multiple HPV infections	Watt A, Garwood D, Jackson M et al. Infectious Agents and Cancer, 2009, 4(Suppl 1):S11
2010	Sexually-active women who attended a selected public or private primary health clinic in one of the four health authority regions	HPV prevalence for any genotype was 54%. Oncogenic HPV genotypes were found in 34.9% of the total study population, and predominant HPV genotypes included HPV 16 , 35, 62, 83, 61, 58, 84, 18, 66 and 81. Oncogenic HPV were found in30.6% of women who had a normal cytology test and 84% of women with abnormal cytology test were HPV positive.	Lewis-Bell K, Luciani S, Unger ER et al. Rev PanamSaludPublica. 2013;33(3):159–65

Suriname			
1992 - 1994; 1992 - 1995	Women with newly diagnosed invasive cervical lesions from Surinam and the Netherlands	HPV prevalence was 82% in 258 women with malignant cervical lesions (n=130). HPV 16 and 18 were the most common genotypes. Differences in HPV prevalence among three ethnic groups were not observed.	Krul EJT, Van de Vijver MJ, Schuuring E et al. Int J. Gynecol. Cancer 1999, 9:206 - 211
Trinidad and Tobago			
2004	Women from the general population	HPV was detected in 35.4% of cancer-free subjects (n = 212). Among the women with positive HPV test, 57.3% carried at least one high-risk HPV genotype. In addition, 33% of these women had multiple HPV infections. HPV 45 and 16 were the pre-dominant types	Ragin CRR, Wheeler VW, Wilson JB et al. Biomarkers. 2007, 12(5):510 - 522
2007	Women who attended three primary health care centers in the northern part of Trinidad	HPV prevalence was 40.6% for both low-risk and high-risk HPV. In addition, 65.9% of HPV positive women were infected with high-risk HPV. HPV 52, 66 and 16 were the predominant genotypes	Andall-Brereton GM, Hosein F, Salas RA et al. Rev PanamSaludPublica. 2011 Apr;29(4):220 - 226
2012	Women with invasive cervical squamous cell carcinoma from public health institutions and private practices	HPV was identified in 91.8% of the samples. Most common HPV genotypes were 16 (66.1%) and 18 (17.8%).	HoseinF,Mohammed W, Zubach V et al. Rev PanamSaludPublica. 2013;33(4):267 – 270

REFERENCES

1. Globocan, IARC/WHO (2008).

2. Caribbean Epidemiology Centre/Pan American Health Organization/World Health Organization. The Caribbean Cervical Cancer Prevention and Control Project: Caribbean framework for developing national screening and clinical guidelines for cervical cancer prevention and control. (2004).

3. Luciani, S.,Andrus, J.K. A Pan American Health Organization strategy for cervical cancer prevention and control in Latin America and the Caribbean. *Reprod Health Matters* 16, 59-66 (2008).

4. Brathwaite, A.F., Brathwaite, N. & del Riego, A. Epidemiological profile of cancer for Grand Bahama residents: 1988-2002. *West Indian Med J* 56, 26-33 (2007).

5. Dallaire, F., Dewailly, E. & Rouja, P. Cancer incidence and mortality rates in Bermuda. *West Indian Med J* 58, 367-74 (2009).

6. Best Plummer, W.S., Persaud, P. & Layne, P.J. Ethnicity and cancer in Guyana, South America. *Infect Agent Cancer* 4 Suppl 1, S7 (2009).

7. Gibson, T.N., Hanchard, B., Waugh, N. & McNaughton, D. Age-specific incidence of cancer in Kingston and St. Andrew, Jamaica, 2003-2007. *West Indian Med J* 59, 456-64 (2010).

8. Mans, D.R., Mohamedradja, R.N., Hoeblal, A.R.D., Rampadarath, R.,Tjin A Joe, S.S.., Wong, J., Ramautar, P., Mahabier, R., Vrede, M.A. . Cancer incidence in Suriname from 1980 through 2000 a descriptive study. *Tumori* 89, 368-76 (2003).

9. Mans, D.R.A., Rijkaard, E., Dollart, J., Belgrave, G., Tjin A Joe, S.S., Matadin, R., Algu, A., Hoeblal, A.R.D., Kalloe, R., Nurmohamed, Z., Rampadarath, R., Mohamedradja, R.N., Tewarie, A., Sewgobin, S., Ramautar, B., Jagesar, A., Mohan, R., Adhin, S., Bansie, R., Vrede, M.A. Differences between urban and rural areas of the Republic of Suriname in the ethnic and age distribution of cancer - a retrospective study from 1980 through 2004. *The Open Epidemiology Journal,* 1, 30 - 35 (2008).

10. The Ministry of Health, Govenment of the Republic of Trinidad and Tobago.Dr. Elizabeth Quamina Cancer Registry. Cancer in Trinidad and Tobago 2000-2002

11. Prussia, P.R., ter Schegget, J. & Smits, H.L. Detection of oncogenic HPV DNA by a consensus polymerase chain reaction method in genital carcinomas in twenty women in Barbados. *West Indian Med J* 42, 144-6 (1993).

12. Cathro, H.P. et al. Human papillomavirus profile of women in Belize City, Belize: correlation with cervical cytopathologic findings. *Hum Pathol* 40, 942-9 (2009).

13. Kightlinger, R.S. et al. Cervical cancer and human papillomavirus in indigenous Guyanese women. *Am J Obstet Gynecol* 202, 626 e1-7 (2010).

14. Figueroa, J.P. et al. Prevalence of human papillomavirus among STD clinic attenders in Jamaica: association of younger age and increased sexual activity. *Sex Transm Dis* 22, 114-8 (1995).

15. Rattray, C. et al. Type-specific prevalence of human papillomavirus DNA among Jamaican colposcopy patients. *J Infect Dis* 173, 718-21 (1996).

16. Watt, A. et al. High-risk and multiple human papillomavirus (HPV) infections in cancer-free Jamaican women. *Infect Agent Cancer* 4 Suppl 1, S11 (2009).

17. Lewis-Bell, K. et al. Genital human papillomaviruses among women of reproductive age in Jamaica. *Rev Panam Salud Publica* 33, 159-65 (2013).

18. Krul, E.J. et al. Human papillomavirus in malignant cervical lesions in Surinam, a high-risk country, compared to the Netherlands, a low-risk country. *Int J Gynecol Cancer* 9, 206-211 (1999).

19. Ragin. C.C., W., r V.W., Wilson, J.B., Bunker, C.H., Gollin, S.M., Patrick, A.L., Taioli, E. Distinct distribution of HPV types among cancer-free Afro-Caribbean women from Tobago. *Biomarkers* 12, 510-22 (2007).

20. Andall-Brereton, G.M., Hosein, F., Salas, R.A., Mohammed, W., Monteil, M.A., Goleski, V., Severini, A., Quesnel, S.M., Carrington, C.V., Boodram, L.L., Boisson, E., Akpaka, P.E., Paul, R.C. Human papillomavirus genotypes and their prevalence in a cohort of women in Trinidad. *Rev Panam Salud Publica* 29, 220-26 (2011).

21. Hosein, F., Mohammed, W., Zubach, V., Legall, G., Severini, A. Human papillomavirus genotypes in invasive cervical squamous cell carcinoma in Trinidad. *Rev Panam Salud Publica* 33, 267-70 (2013).

22. The BNR, Ministry of Health, Government of Barbados. The Barbados National Registry for chronic non-communicable disease. [Online] http://www.bnr.org.bb/cms (2009).

23. Bermuda Hospital Board. The Bermuda Tumour Registry. [Online] http://www.bermudahospitals.bm/cancer/tumour-registry.asp (2013)

24. Cayman Islands Cancer Society. The Cayman Islands Cancer Registry. [Online] http://www.cics.ky/index.php/registry (2013).

25. The Ministry of Health, *Govenment of the Republic of Trinidad and Tobago*. St. Elizabeth Quamina Cancer Registry. [Online] http://www.health.gov.tt/sitepages/default.aspx?id=160 (2013).