BC Cancer Agency
CARE + RESEARCH
An agency of the Provincial Health Services Authority

Cervical Cancer Screening Program

2010 Annual Report

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Cervical Cancer Screening Program

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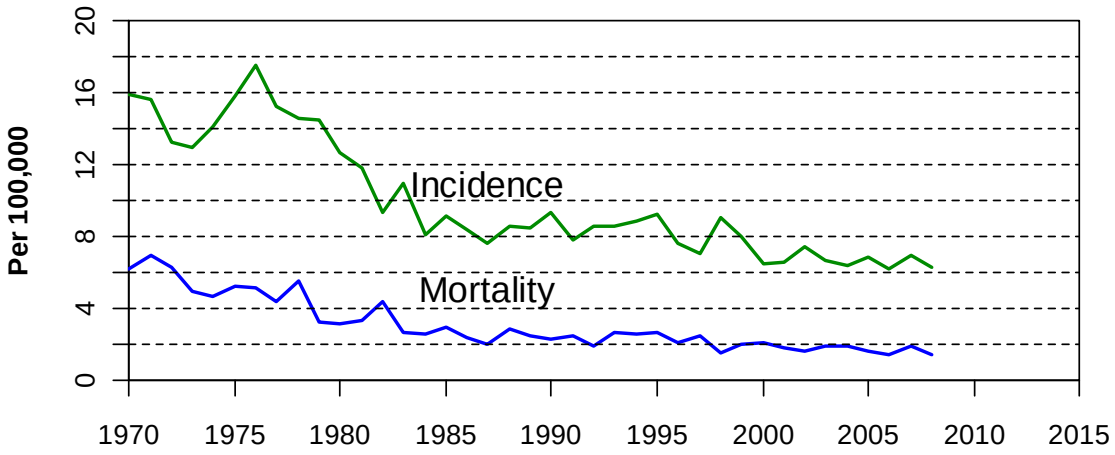
1.0 MESSAGE FROM THE MEDICAL LEADER

Cervical cancer incidence and mortality rates remained low in British Columbia (BC). The age standardized cervical cancer incidence rate for the latest period was 6.8 (Figure 1). Efforts to obtain further reductions in cervical cancer incidence are focused on promoting participation in screening and assessing appropriate screening technologies. In 2009, the Cervical Cancer Screening Laboratory (CCSL) reported on 549,482 cervical cytology slides from 522,413 women. The hysterectomy adjusted participation rate was 79%, which meets the Canadian target of 70%.

FIGURE 1: Age Standardized Incidence & Mortality Rate of Invasive Cervical Cancer in BC



***** Rates are standardized to the 1991 Canadian Population

Screening Policy and Guidelines

1) **Nomenclature for Pap Test Results**

The Cervical Cancer Screening Laboratory of the Provincial Health Services Authority (PHSA) adopted internationally standardized Bethesda nomenclature to report Pap test results on October 1, 2010. The CCSL will continue to provide follow-up recommendations with Pap test results.

The Bethesda terminology simplifies any required ongoing clinical management for women who move out of province, and allows comparisons of our outcomes with those of others. See Appendix 3 for a comparison of the Bethesda terminology to the terminology used previously.

2) **Screening Guideline Update**

BC Cancer Agency (BCCA) has reviewed and updated the Cervical Cancer Screening Guidelines for BC (see Appendix 2). The guidelines now recommend that cervical cancer screening should begin at age 21 or approximately three years after first sexual contact, whichever occurs first.

This change to the guidelines is in response to research which shows that cervical cancer is extremely rare in women under 21. However, temporary mild cervical cell changes caused by transient Human Papillomavirus (HPV) infections are common in young women. By delaying the onset of screening, we reduce detection of these temporary cervical changes without increasing the risk of invasive cervical carcinoma, therefore preventing unnecessary investigations and anxiety for the patient.

Professional and Academic Activities

Professional staff members of the Cervical Cancer Screening Program (CCSP) are involved in research, professional development, and teaching related to cervical cancer screening.

1) The HPV-FOCAL Study: A randomized controlled trial to evaluate the role of primary HPV testing in cervical cancer screening. This is a Canadian Institute of Health Research (CIHR) – sponsored trial which commenced participant recruitment in December 2007. The study has now recruited over 19,000 study participants.

2) Professional staff members of the CCSP have membership on the BC HPV-FOCAL Study Group. This provincial group meets regularly to seek cooperation between researchers who are interested in HPV related diseases.

Continuous Quality Improvement

As part of ongoing efforts to ensure the best quality, the provincial Cervical Cancer Screening Laboratory has applied for College of American Pathologists (CAP) accreditation in 2010 and hope to complete the process in 2011.

Administrative Activities

None of the CCSP activities would be possible without the dedicated support of administrative staff. On an ongoing basis, administrative staff lends support to ensure the integrity of the laboratory information system and the screening registry, enabling the tracking and recalling of women for repeat screening tests at appropriate intervals and ensuring follow-up of abnormal results.

Dr. Dirk van Niekerk

2.0 PROGRAM OVERVIEW

Healthcare providers around the province collect Pap test samples from women and send them to the Cervical Cancer Screening Laboratory in the Provincial Health Services Authority. The CCS Lab provides cytological interpretation and makes follow-up recommendations to the health care providers. The BC Cancer Agency's Cervical Cancer Screening Program (CCSP), in coordination with the CCS Lab, reminds health care providers when their patients are due for cervical screening, and tracks adherence to screening intervals and follow-up on abnormal results.

The Screening Process

The Screening Process is illustrated in a diagram at the end of this section (Page 6). The process consists of four stages:

1. Identify and invite the target population for screening.
2. Conduct screening examination.
3. Investigate abnormality identified on screening.
4. Send screening reminder at the appropriate interval.

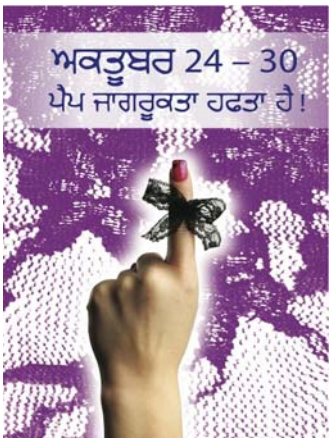
Promotion and Education

In the spring of 2010, the *BC Cancer Agency's Cervical Cancer Screening Program* supported the launching of LACE *"Live Aware, Create Empowerment"* Campaign. The LACE Campaign (www.LACEcampaign.com) promotes education, awareness, conversation and action using traditional and social media to connect with women across the province.

Following the success of the first provincial Pap Awareness Week in 2009, CCSP coordinated the second Pap Awareness Week (PAW) for October 24-30, 2010 to coincide with PAW across Canada. The main goal of PAW was to encourage women who may not have a regular doctor or who are overdue for a Pap test, to take advantage of dedicated Pap tests hours offered by participating medical offices/clinics in their communities.

The LACE Campaign provided a web-based environment to coordinate and support a grassroots approach for PAW in BC by engaging medical offices/clinics to get involved, calling for volunteers to get the word out in their communities, and providing access to professionally produced posters, postcards, radio and newspaper ads to support promotion efforts. Interested women were able to access the LACE Campaign website to 'find a clinic near them' to get their Pap tests. Over 120 clinics in 57 different communities across the Province have participated in PAW 2010.

The Community Grants Fund, a joint project with the Screening Mammography Program, continues to expand the provincial reach of screening promotions by supporting local initiatives. This funding opportunity supports partnership-building with healthcare organizations and providers in BC communities. The BC Cancer Agency's Prevention Coordinators dedicate part of their time to community-based promotion of screening.



An educational video for clinicians who perform Pap tests, produced in collaboration with BC Women's Hospital and Health Centre was released in 2010. The 30-minute video provides information on both the technical aspects of collecting a quality sample for the lab and respectful interaction with women of diverse backgrounds. Clinicians can contact ccsp@bccancer.bc.ca to request access.

An order form for a wide variety of promotion and education materials is available on CCSP's website (www.bccancer.bc.ca/cervicalscreening), under "Resources". These materials are available to health care professionals or community groups wishing to provide accurate up-to-date information to women on factors related to cervical cancer screening and to help promote participation in cervical cancer screening.

Physician Engagement

With the help of the UBC Division of Continuing Professional Development (UBC CPD), BCCA conducted a province-wide needs assessment study into the perceptions and practice patterns of BC primary care physicians with regards to five specific cancer screening topics: breast, cervical, colorectal, prostate, and hereditary predisposition to cancer. This project has been well supported by the BC Medical Association (BCMA), BC College of Family Physicians, the Society of General Practitioners of BC, the UBC Department of Family Practice, as well as the BCCA Family Practice Oncology Network. Nearly 900 physicians in BC participated in this study either by completing the survey questionnaire and/or participating in the focus group discussions. Physician feedback in this initiative will be instrumental in the design of further educational programming, clinical support strategies, promotional materials, and other engagement strategies to improve cancer screening practices and increase patient uptake in recommended cancer screening.

Quality Assurance and Quality Control

The CCS Lab has ongoing quality management activities to ensure quality and accuracy of the entire laboratory process. Quality standards are continuously monitored and evaluated with implementation of corrective actions to resolve issues or problems. Quality related activities and outcomes are reported to the Lower Mainland Laboratories Safety and Quality of Care Committee, which oversees and ensures a quality patient care service provided by the laboratories.

CCS Lab is currently in the process of preparing for the CAP accreditation. Having CAP accreditation will provide an external validation that the CCS Lab is following internationally accepted cytopathology quality standard guidelines.

Professional Development

Ongoing learning and professional development is highly encouraged for all CCS Lab staff. The laboratory participates in the CAP and American Society of Clinical Pathology (ASCP) continuing education program, as well as subscribes to the ASCP teleconference series. A collection of appropriate cytology textbooks and a subscription to the *Acta Cytologica* are available as laboratory educational resources.

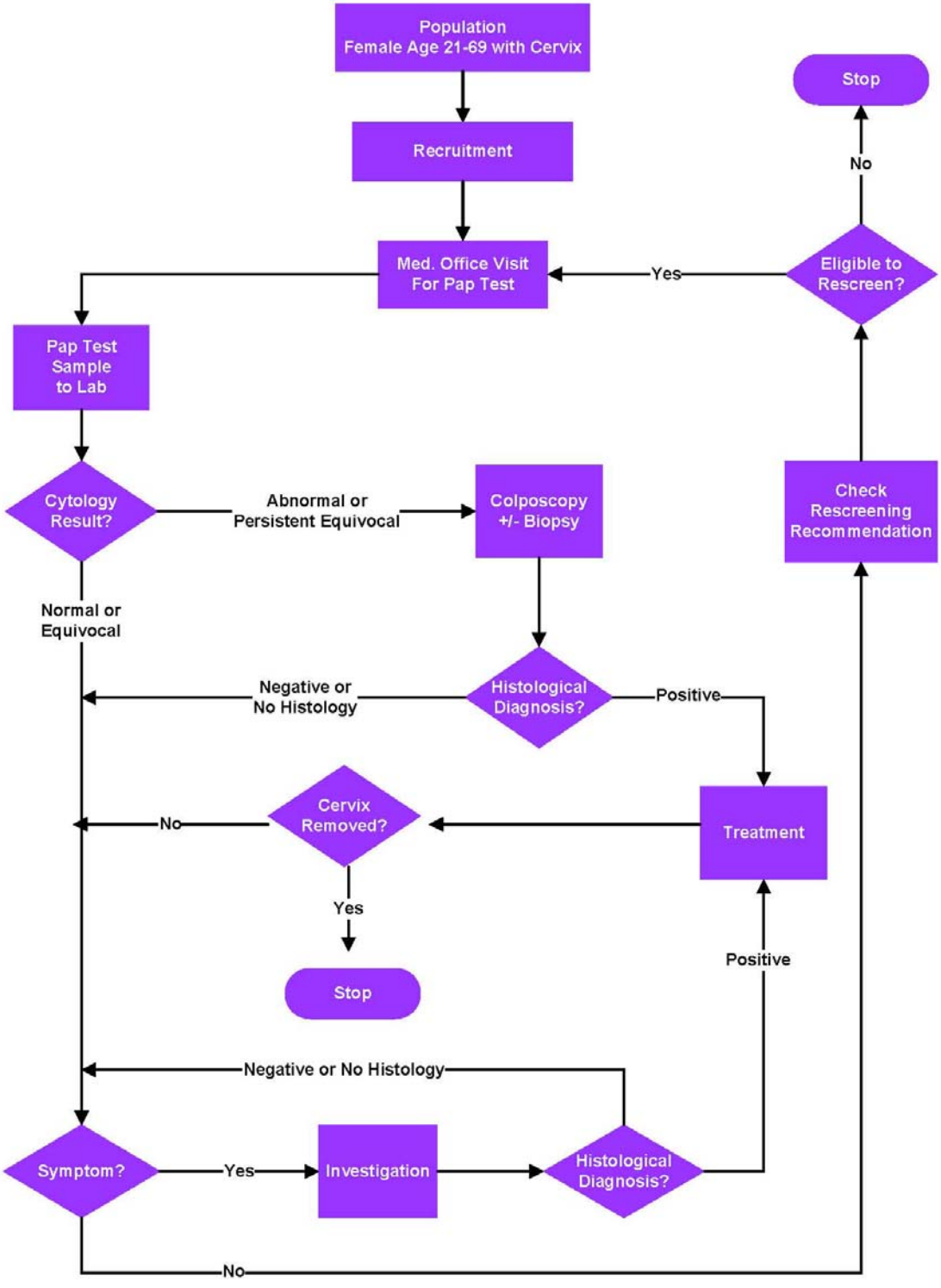
Pathologists associated with the program participate in the Royal College of Physicians and Surgeons certification or equivalent programs.

Cytotechnologists are encouraged to research, develop and present education topics in monthly internal laboratory education forums. Weekly microscope sessions are scheduled for morphological discussion between pathologist and groups of cytotechnologists.

Evaluation

Data are collected and analyzed on an ongoing basis to monitor the Program's effectiveness and to identify areas for improvement. Results of this analysis are presented in the "PROGRAM RESULTS" section of this report. Age-specific cervical cancer incidence and mortality rates are tracked in conjunction with the BC Cancer Registry.

CCSP Screening Process Overview



3.0 PROGRAM RESULTS

3.1 Utilization

The CCS Laboratory received a total of 568,949 gynecological Pap test samples from BC women in 2009. Health care professionals who submitted samples include general practitioners, gynecologists, midwives, naturopaths, nurse practitioners, registered nurses, etc. An additional 4,984 samples were submitted from the Yukon Territory. The program results in this report include samples from BC only. Unlabeled or improperly labeled samples are not processed.

Table I shows the number of gynecological Pap test samples received by 10-year age groups. The samples received include those from clinically asymptomatic women (routine screening), women with previously detected abnormalities, and a small percentage of symptomatic women.

TABLE I: Gynecological Cytology Samples Received / Processed (2009)

	Age* (Years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Samples	25,935	123,649	126,517	126,881	104,217	56,040	5,710	568,949
Number of Samples Processed (%)	25,657 (98.9%)	122,433 (99.0%)	125,300 (99.0%)	125,813 (99.2%)	103,444 (99.3%)	55,522 (99.1%)	5,594 (98.0%)	563,763 (99.1%)
Samples from Cervix/Endocervix (%)	25,631 (99.9%)	122,255 (99.9%)	124,606 (99.4%)	123,070 (97.8%)	98,587 (95.3%)	51,117 (92.1%)	4,216 (75.4%)	549,482 (97.5%)
Samples from Other Sites (%)	26 (0.1%)	178 (0.1%)	694 (0.6%)	2,743 (2.2%)	4,857 (4.7%)	4,405 (7.9%)	1,378 (24.6%)	14,281 (2.5%)

* Age is computed based on sample date.

Table II shows the number and percentage of women having one, two, and three or more cervical/endocervical pap tests in the given year. Also shown in Table II is the number of women being screened for the first time, and the percentage they represent of all women with at least one cervical/endocervical sample.

TABLE II: Number of Patients with Cervical/Endocervical Pap Test Samples (2009)

	Age* (Years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients	23,847	113,361	116,882	118,643	95,838	49,750	4,092	522,413
with 1 Sample (%)	22,462 (94.2%)	105,025 (92.6%)	109,130 (93.4%)	114,255 (96.3%)	93,112 (97.2%)	48,328 (97.1%)	3,959 (96.7%)	496,271 (95.0%)
with 2 Samples (%)	1,318 (5.5%)	8,042 (7.1%)	7,500 (6.4%)	4,246 (3.6%)	2,648 (2.8%)	1,369 (2.8%)	123 (3.0%)	25,246 (4.8%)
with 3+ Samples (%)	67 (0.3%)	294 (0.3%)	252 (0.2%)	142 (0.1%)	78 (0.1%)	53 (0.1%)	10 (0.2%)	896 (0.2%)
New Patients (%)	12,207 (51.2%)	19,492 (17.2%)	8,540 (7.3%)	4,708 (4.0%)	2,408 (2.5%)	1,202 (2.4%)	205 (5.0%)	48,762 (9.3%)

***** Age is computed based on patient's last Pap test

3.2 Participation Rates

Starting October 2010, the CCSP recommends women begin screening for cervical abnormality at age 21 or approximately three years after first sexual contact, whichever occurs first. This is a change from the previous recommendation to start Pap test screening shortly after becoming sexually active. Women can discontinue screening at age 69 if no significant abnormality was detected during their screening history. The CCSP continues to recommend biennial screening after three annual normal Pap tests. The current screening guidelines are listed in Appendix 2. For comparison with other jurisdictions providing cervical cancer screening, a three-year participation rate (i.e. the percent of women with at least one cervical/endocervical Pap test sample in a three-year period) is reported.

Table III lists participation rates by Health Service Delivery Area (HSDA) and 10-year age groups. In addition, the provincial participation rates are further adjusted for hysterectomies. The hysterectomy adjustment is based on the estimated age-specific hysterectomy rates for BC to exclude women without a cervix. Hysterectomy rates were not available by HSDAs. As there may be significant regional variations, it is not appropriate to adjust regional participation rates using province-wide hysterectomy rates. The adjusted participation rate for the BC female population ages 20-69 is 78.5%.

TABLE III: Participation Rates by HSDA (January 1, 2007 – December 31, 2009)

Health Service Delivery Area	Age* (Years)							
	<20	20-29	30-39	40-49	50-59	60-69	70+	20-69
East Kootenay	13.8	79.8	72.4	60.8	51.2	40.4	5.7	60.0
Kootenay Boundary	13.4	78.6	77.0	65.9	55.7	41.9	5.5	62.4
Okanagan	11.4	80.5	76.2	64.6	52.7	39.6	4.1	61.3
Thompson Cariboo	13.0	74.9	70.4	56.9	47.2	34.9	4.6	56.0
Fraser East	7.7	64.0	63.7	56.8	45.0	33.3	4.1	53.9
Fraser North	6.9	58.6	75.1	66.7	56.1	41.2	5.4	61.5
Fraser South	7.0	60.5	70.7	63.4	52.3	37.5	4.4	58.4
Richmond	5.8	49.3	73.4	71.5	67.1	48.7	5.6	63.4
Vancouver	5.9	57.3	73.5	72.0	60.7	47.9	6.0	64.0
North Shore/Coast Garibaldi	10.1	71.5	81.5	71.9	63.0	51.2	6.8	68.1
South Vancouver Island	12.4	69.7	78.5	68.1	58.9	46.4	4.5	64.6
Central Vancouver Island	13.0	76.3	73.4	62.2	53.0	41.4	4.6	59.5
North Vancouver Island	13.8	87.0	74.3	64.4	55.9	45.4	5.2	63.4
Northwest	12.6	79.1	71.8	59.4	46.9	32.5	4.6	58.7
Northern Interior	12.4	74.8	73.2	61.0	51.0	37.9	5.5	60.7
Northeast	11.7	76.7	66.1	53.0	43.1	27.8	4.3	56.7
British Columbia	10.2	70.1	76.0	66.8	56.1	42.2	5.1	63.3
Adjusted for Hysterectomy	10.2	70.1	82.6	84.5	83.7	68.1	5.1	78.5

* Age computed based on patient's age in 2008

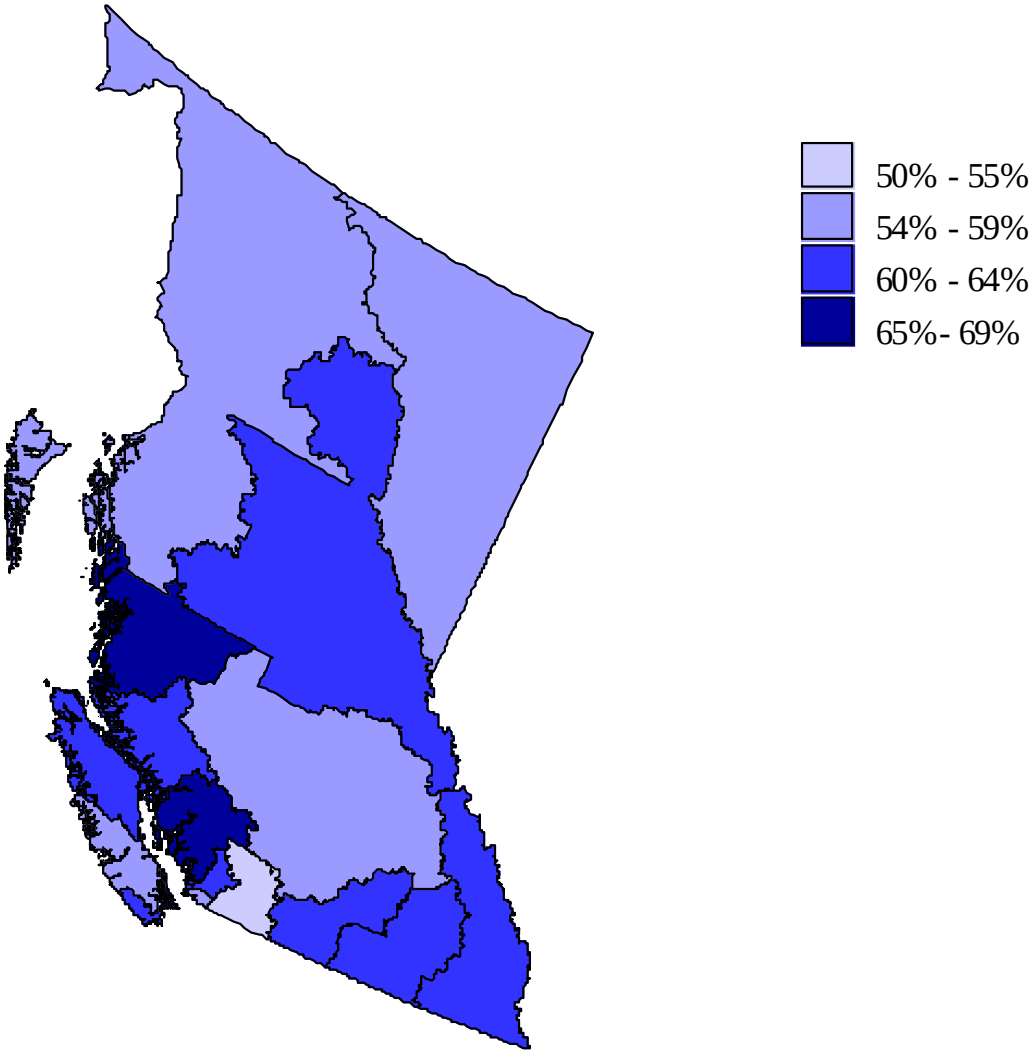
Table III indicates that participation rates remain a challenge with young women in the Lower Mainland - especially in Richmond, Vancouver and the Fraser Valley. Of interest, participation rates in the 20-29 age group have surpassed the national benchmark of 70% in three regional health authorities – Interior Health, Vancouver Island Health, and Northern Health Authorities. Participation of older women is a challenge in some areas of the province, namely Northeast, Northwest, Thompson Cariboo and Fraser East. Therefore, age-targeted recruitment initiatives will continue to be necessary to address low participation rates in specific areas and age groups.

Compared to the three-year period reported in the 2009 Annual Report, the overall BC participation rates remained largely unchanged for the most recent reporting period. However, participation rates have changed slightly in some of the Health Service Delivery Areas.

The biggest increase for the 20-29 age group was in Vancouver (2.7%). Other areas with increases over 2% in the same age group include North Vancouver/Coast Garibaldi (2.3%), North Vancouver Island (2.3%), and the Okanagan (2.1%). Participation rates have also improved in Richmond for the 50-59 age group (4.0%) and 60-69 age group (2.6%) and in East Kootenay for the age 50-59 age group (2.4%). The most notable decrease was in the Kootenay Boundary area at 6.8% in the 20-29 age range (representing approximately 256 women). Decreases were less dramatic in other areas and age groups.

Figure 2 shows the participation rates without hysterectomy correction by Health Service Delivery Area. HSDAs with lower participation rates are shown in lighter shades.

FIGURE 2: Participation Rates by HSDA January 1, 2007 – December 31, 2009



Notes:

- Population data (P.E.O.P.L.E. 35) was acquired through the Health Data Warehouse, BC Ministry of Health.
- Hysterectomy rates were estimated from a population sample of an epidemiological study conducted in 1995

3.3 Screening Interval

Repeat interval recommendations were given based primarily on the current cervical Pap test result and the cervical screening history. A patient's clinical condition may also influence the specific recommendation. The last satisfactory negative cervical Pap sample per patient taken in the reference year was used in the screening interval analyses.

Table IV shows the three-year re-screen rate of women ages 20-69 by 10-year age groups for calendar years 2004-2006, inclusive. The re-screen rate has slowly declined over the years. Further investigation is warranted.

Table V summarizes the 2006 re-screen rate for women ages 20-69 by 10-year age groups in six-month intervals. Lastly, Figure 3 shows the re-screen rate by the recommended screening interval.

TABLE IV: Re-screen Rate by Year (2004 – 2006)

Age*	Calendar Year					
	2004		2005		2006	
	n	%	n	%	n	%
20-29	96,262	81%	102,166	81%	98,675	80%
30-39	120,386	83%	121,396	82%	114,234	81%
40-49	120,809	83%	125,362	82%	118,854	81%
50-59	78,459	84%	87,796	83%	86,152	82%
60-69	35,322	75%	40,186	75%	39,443	74%
20-69	451,238	82%	476,906	81%	457,358	80%

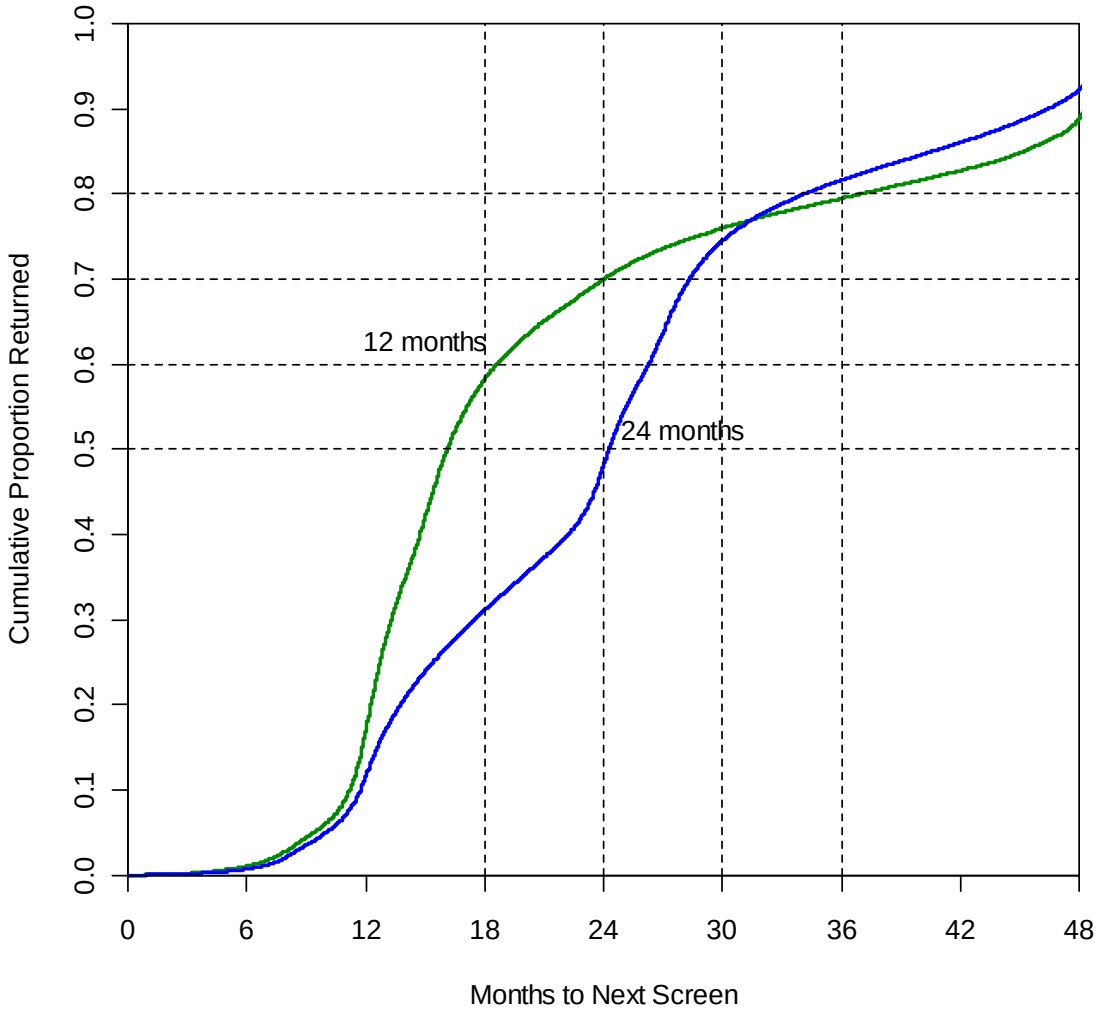
***** Age is computed based on patient's age on report date of the index Pap test

TABLE V: Re-screen Rate by Age (2006)

	Age*					
	20-29	30-39	40-49	50-59	60-69	20-69
Number of Patients	98,675	114,234	118,854	86,152	39,443	457,358
Rescreened by						
18 months	49%	44%	41%	39%	35%	43%
24 months	63%	59%	56%	55%	48%	57%
30 months	75%	75%	75%	76%	69%	75%
36 months	80%	81%	81%	82%	74%	80%

***** Age is computed based on patient's age on report date of the index Pap test

FIGURE 3: Re-screen Rate by Recommended Interval (2006)



3.4 Quality of Pap Test Samples

The adequacy of a Pap test sample for interpretation is assessed as follows: satisfactory for interpretation, satisfactory but limited for interpretation, and unsatisfactory. The *unsatisfactory* category is used when the sample quality is inadequate for an interpretation. In general, the *satisfactory but limited* category is used when the sample quality is not ideal but still possible to interpret. In previous reportings of CCSP sample quality, "no endocervical cells" was considered *satisfactory but limited* for interpretation. It has been summarized in the *satisfactory* category since the 2004 report. The absence of an endocervical, transformation zone component continues to be noted on the cytology report.

Table VI summarizes Pap test sample quality by 10-year age groups for cervical/endocervical samples. The most commonly cited factor, for approximately 88% of samples of unsatisfactory quality, is scanty sample material. Scanty sample material is especially common in the older age groups. The next most cited reason is inflammatory exudates (9%). Multiple factors may be cited. The percentage of samples reported as unsatisfactory for interpretation increased by 1.1% from the previous report. This is largely due to stricter interpretation of reporting rules by the Cervical Cancer Screening Laboratory.

The most commonly cited factor for samples which are limited for interpretation is scanty sample (71%), followed by inflammatory exudates (24%).

TABLE VI: Pap Test Sample Quality (2009)

	Age* (Years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Cervical/Endocervical Samples	25,631	122,255	124,606	123,070	98,587	51,117	4,216	549,482
Unsatisfactory (%)	837 (3.3%)	3,995 (3.3%)	4,121 (3.3%)	3,096 (2.5%)	3,479 (3.5%)	2,412 (4.7%)	266 (6.3%)	18,206 (3.3%)
Limited for Interpretation (%)	1,098 (4.3%)	5,135 (4.2%)	4,966 (4.0%)	4,378 (3.6%)	2,995 (3.0%)	1,604 (3.1%)	143 (3.4%)	20,319 (3.7%)

* Age is computed based on sample date

3.5 Cervical Pap Test Sample

In 2009, the average time from the date the sample is received to the date the finalized report is issued was 16 days. The most severe cervical/endocervical sample results for patients in a given year are summarized in Table VII. The table shows the result distribution within 10-year age groups.

TABLE VII: Pap Test Results (2009)

	Age* (Years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients	23,942	113,362	116,831	118,634	95,822	49,734	4,088	522,413
Unsatisfactory (%)	569 (2.4%)	2,716 (2.4%)	2,723 (2.3%)	2,136 (1.8%)	2,397 (2.5%)	1,650 (3.3%)	201 (4.9%)	12,392 (2.4%)
Limited for interpretation (%)	864 (3.6%)	4,005 (3.5%)	4,169 (3.6%)	3,857 (3.3%)	2,751 (2.9%)	1,503 (3.0%)	124 (3.0%)	17,273 (3.3%)
Negative** (%)	20,271 (84.7%)	97,478 (86.0%)	105,055 (89.9%)	108,309 (91.3%)	88,608 (92.5%)	45,979 (92.4%)	3,662 (89.6%)	469,362 (89.8%)
"No endocervical cells"	0	2	9	13	2	0	0	26
Reactive changes (%)	271 (1.1%)	1,093 (1.0%)	837 (0.7%)	1,176 (1.0%)	615 (0.6%)	171 (0.3%)	12 (0.3%)	4,175 (0.8%)
Atypia (of unspecified significance) *** (%)	6 (< 0.1%)	55 (< 0.1%)	45 (< 0.1%)	76 (< 0.1%)	126 (0.1%)	87 (0.2%)	27 (0.7%)	422 (0.1%)
Mild atypia (%)	1,677 (7.0%)	6,248 (5.5%)	2,956 (2.5%)	2,503 (2.1%)	1,051 (1.1%)	232 (0.5%)	23 (0.6%)	14,690 (2.8%)
No previous atypia**** in past 2 yrs	1,358	4,543	2,200	1,857	814	167	17	10,956
Mild or higher atypia**** in past 2 yrs	319	1,705	756	646	237	65	6	3,734
Moderate or higher atypia (%)	284 (1.2%)	1,767 (1.6%)	1,046 (0.9%)	577 (0.5%)	274 (0.3%)	112 (0.2%)	39 (1.0%)	4,099 (0.8%)

* Age is computed based on the date of the patient's most severe Pap test sample

** Include "no endocervical cells"

*** Small subset of atypical squamous cells of uncertain significance cannot rule out high grade lesion (ASC-H)

**** Atypia – mild or higher atypia

Table VIII shows the significant atypia rates (per 1,000 patients) by 10-year age groups. Rates are presented by cell type and level of significance. Squamous cell type is the most common. Atypical squamous cells of undetermined significance (ASC-US) and low-grade squamous intraepithelial lesion (LSIL) are reported as a combined group of mild atypia, which is more frequently reported in younger women.

TABLE VIII: Significant Atypia Rates (per 1000) (2009)

	Age* (Years)							All
	<20	20-29	30-39	40-49	50-59	60-69	70+	Ages
Number of Patients with Satisfactory Sample	23,373	110,646	114,108	116,498	93,425	48,084	3,887	510,021
Squamous:								
Mild (ASC-US/LSIL)	71.4	55.5	24.3	18.9	9.2	4.1	5.1	27.2
Moderate+ (HSIL)	11.9	14.7	8.1	3.9	1.6	1.1	4.4	6.8
Atypical (of unspecified significance)	0.3	0.4	0.3	0.3	1.1	1.5	5.1	0.6
Glandular:								
Mild	0.0	0.0	0.2	0.4	0.5	0.4	1.3	0.3
Moderate (High grade)	0.0	0.0	0.1	0.1	0.3	0.4	2.1	0.2
Marked+ (High grade)	0.2	0.3	0.2	0.3	0.2	0.2	0.0	0.3
Epithelial:								
Mild (Low grade)	0.2	0.3	0.2	0.3	0.2	0.2	0.0	0.3
Moderate+ (High grade)	0.3	1.2	0.8	0.5	0.6	0.5	2.3	0.8

* Age is computed based on the date of the patient's most severe Pap test sample

3.6 Follow-up of Abnormals

Follow-up Recommendation

The current CCSP practice is to follow mild atypia with a repeat Pap test at six-month intervals for up to two years. Patients with persistent mild atypia are then advised to have a colposcopy. Other procedures may be recommended on the basis of a patient's clinical condition and cytology history.

Table IX summarizes follow-up recommendations on the most severe atypia results for patients in a given year.

TABLE IX: Follow-up Recommendations (2009)

	Age* (Years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Patients With Mild Atypia	1,677	6,248	2,956	2,503	1,051	232	23	14,690
Repeat in 6 months (%)	1,631 (97.3%)	5,747 (92.0%)	2,689 (91.0%)	2,279 (91.1%)	942 (89.6%)	211 (90.9%)	22 (95.7%)	13,521 (92.0%)
Other investigation** (%)	46 (2.7%)	501 (8.0%)	267 (9.0%)	224 (8.9%)	109 (10.4%)	21 (9.1%)	1 (4.3%)	1,169 (8.0%)
Patients with Moderate or Higher Atypia	284	1,767	1,046	577	274	112	39	4,099
Colposcopy and/or ECC (%)	271 (95.4%)	1,737 (98.3%)	1,013 (96.8%)	530 (91.9%)	212 (77.4%)	74 (66.1%)	23 (59.0%)	3,860 (94.2%)
Other investigation (%)	13 (4.6%)	30 (1.7%)	33 (3.2%)	47 (8.1%)	62 (22.6%)	38 (33.9%)	16 (41.0%)	239 (5.8%)
Patients with Atypia NOS	6	55	45	76	126	87	27	422
Repeat in 6 months (%)	3 (50.0%)	16 (29.1%)	17 (37.8%)	24 (31.6%)	14 (11.1%)	6 (6.9%)	2 (7.4%)	82 (19.4%)
Colposcopy and/or ECC (%)	1 (16.7%)	31 (56.4%)	22 (48.9%)	25 (32.9%)	11 (8.7%)	12 (13.8%)	1 (3.7%)	103 (24.4%)
Other investigation (%)	2 (33.3%)	8 (14.5%)	6 (13.3%)	27 (35.5%)	101 (80.2%)	69 (79.3%)	24 (88.9%)	237 (56.2%)

* Age is computed based on the date of the patient's worst Pap test in the year

** The predominant recommendation was colposcopy investigation

*** ECC: Endocervical Curettage

Compliance to Colposcopy Recommendations

Table X presents age-specific compliance to colposcopy recommendations for patients with findings of mild atypia and moderate or more severe cervix/endocervix samples. Compliance is defined as having been achieved when a colposcopy examination was conducted within one week to one year of being recommended. Colposcopy examinations performed within one week of recommendation are not likely to be prompted by that recommendation.

TABLE X: Colposcopy Compliance Rates (2009)

	Age*							All Age
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients with Mild Atypia	31	430	235	180	76	15	1	968
Colposcopy by								
3 months	48%	43%	46%	52%	51%	40%	100%	46%
6 months	74%	69%	81%	83%	80%	73%	100%	76%
9 months	81%	76%	86%	87%	83%	73%	100%	81%
12 months	81%	79%	89%	89%	86%	80%	100%	84%
Number of Patients with Moderate+ Atypia	271	1737	1013	530	212	74	23	3860
Colposcopy by								
3 months	54%	54%	60%	58%	59%	54%	43%	57%
6 months	76%	77%	80%	81%	78%	69%	57%	78%
9 months	81%	83%	85%	85%	83%	76%	57%	83%
12 months	83%	85%	87%	87%	84%	78%	57%	85%

* Age is computed based on date of Pap test sample

Positive Predictive Value of Cytology

The positive predictive value (PPV) of cytology is assessed for positive Pap tests that have had confirmational investigation, such as colposcopy and/or pathology reported within one year after the tests are reported. Surveillance with repeat Pap tests only is not regarded as confirmational investigation. This measure is an indicator of the predictive validity of a positive test. However, it is important to note the limitations of cytology and histology, i.e. specimen sampling may not be representative of the lesion, and interpretation is subject to observer variation for cytology, and to lesser extent for histology. Furthermore, there may be progression or regression of the lesion in the period between cytology and histology, particularly with mildly abnormal lesions. Histological diagnosis was based on the most severe histological diagnosis from cervical pathology reported up to one year after the Pap test. Cervical intraepithelial neoplasia (CIN) result reporting terminology is used.

Table XI below shows the number of Pap tests with findings of mild or higher squamous atypia that are recommended for investigation, and the PPV of cytology for positive tests with confirmational investigation. Results are shown separately for tests with mild squamous atypia recommended to have further investigation, and for tests with moderate or higher atypia.

TABLE XI: Positive Predictive Value of Cytology (2008)

	Significant Cytology Finding			
	Mild Atypia*		Moderate+ Atypia	
	No.	%	No.	%
Samples:	1,156	100.0%	3,514	100.0%
without confirmational investigation	265	22.9%	302	8.6%
with confirmational investigation**	891	77.1%	3,212	91.4%
with pathological diagnosis	816	70.6%	3,090	87.9%
Positive Predictive Value:				
CIN II or higher	223	27.3%	2164	70.0%
CIN III or higher	101	12.4%	1537	49.7%
Other Histology Finding:				
Glandular				
Severe	-	-	1	<0.1%
In situ	3	0.4%	52	1.7%
Invasive	1	0.1%	29	0.9%
Other invasive	-	-	1	<0.1%

* With recommendation for colposcopy investigation

** Do not include investigation where there are only repeated Pap tests

The PPV for CIN II or higher on histology is 70% for moderate or higher atypia, and 27% for mild atypia that were referred for further investigation. The majority of Pap test samples with mild atypia cytology results were recommended to repeat the test in six months (92%). Some of these samples would have further indication, such as subsequent significant test results to warrant colposcopy or other investigation within one year (8%).

3.7 Provincial Colposcopy Program

The Provincial Colposcopy Program was developed to act in a complimentary manner to CCSP. This service currently consists of 24 hospital-based clinics located throughout the province. Their locations and the community gynecologists are listed in Appendix 3: Colposcopy Clinic Locations and Personnel Staffing.

The majority of all diagnostic colposcopic examinations in the province are performed through these regional, hospital-based clinics. Individuals who are affiliated with the Provincial Colposcopy Program essentially confine their colposcopic practices to the hospital-based clinics. All participating individuals are certified and use a uniform reporting system with standardized terminology. Results of all colposcopic examinations and suggested course of follow-up action are recorded on a standardized form. Copies of this form are sent to both the referring physician and to CCSP for incorporation into the provincial database. The data are summarized for the annual continuing medical education workshop in colposcopy, held by the Provincial Colposcopy Program.

In 2007, the BC Cancer Agency's Colposcopy Program initiated the process of linking all provincial colposcopy clinics through a centralized colposcopy database. This project will facilitate communication between colposcopists, improve quality assurance, follow-up tracking and reminder process, and support research.

In 2009, 12,143 colposcopy examinations were provided. A cytological abnormality was the most common reason for colposcopy referral (see Figure 4) and the primary site of investigation was the cervix (see Figure 5).

FIGURE 4: Reason for Referral to Colposcopy Clinic (2009)

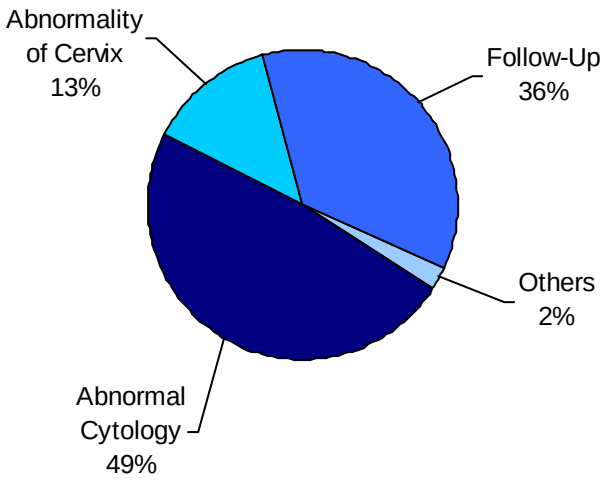
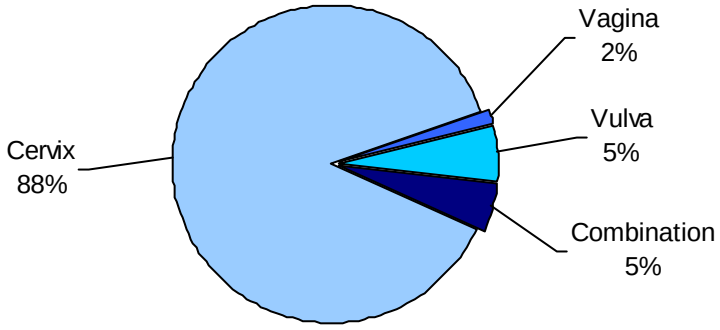


FIGURE 5: Site of Colposcopic Investigation (2009)



3.8 Pre-Cancer Detection Rate

Pap tests can identify pre-cancerous lesions where treatment is more likely to be effective in preventing the development of cervical cancer and, thus, reducing the morbidity of treating more advanced disease. Pre-cancerous lesions are histologically confirmed CIN II or III lesions. The pre-cancer detection rate is influenced by a number of factors, such as the screening test, the population's risk profile, and the screening coverage.

Table XII shows the number of women screened in 2008, and the pre-cancer detection rate for women ages 20-69 by 10-year age groups. The pre-cancer detection rate in 2008 for women ages 20-69 in BC is 5.0 per 1,000. This would be an important indicator to monitor over time as the environment changes in screening participation, HPV vaccination, and screening policies.

TABLE XII: Pre-Cancer Detection Rate (2008)

	Age* (Years)						
	20-29	30-39	40-49	50-59	60-69	70+	20-69
Number of Women Screened	103,098	108,948	111,089	86,588	43,324	3,829	453,047
Number of Pre-Cancer Detections	1,128	704	321	92	40	8	2,285
Pre-Cancer Detection Rate (per 1,000)	10.9	6.5	2.9	1.1	0.9	2.1	5.0

* Age is based on women's age in 2008

3.9 Cancer Statistics

New invasive cervical cancers diagnosed in 2006 to 2008 were identified from the British Columbia Cancer Registry and data collected by the CCSP. The cancer counts and incidence rates for 2006-2008 are presented in Table XIII.

TABLE XIII: Invasive Cervical Cancers (2006 – 2008)

		Age at Diagnosis (Years)						Age 20+
		20-29	30-39	40-49	50-59	60-69	70+	
2008	**Number of cases**							
	All cell types	10	26	48	34	19	23	160
	Squamous cell only	6	16	38	25	13	16	114
	Incidence rate (per 100,000)							
	All cell types	*3.4*	*8.8*	*13.7*	*10.4*	*8.6*	*9.2*	*9.2*
	Squamous cell only	*2.0*	*5.4*	*10.8*	*7.7*	*5.9*	*6.4*	*6.6*
2007	**Number of cases**							
	All cell types	6	43	37	37	15	19	157
	Squamous cell only	5	28	23	30	13	14	113
	Incidence rate (per 100,000)							
	All cell types	*2.1*	*14.7*	*10.5*	*11.6*	*7.2*	*7.7*	*9.2*
	Squamous cell only	*1.7*	*9.6*	*6.6*	*9.4*	*6.2*	*5.7*	*6.6*
2006	**Number of cases**							
	All cell types	7	35	43	25	16	20	146
	Squamous cell only	4	23	26	20	13	17	103
	Incidence rate (per 100,000)							
	All cell types	*2.4*	*11.5*	*12.0*	*8.0*	*8.2*	*8.2*	*8.6*
	Squamous cell only	*1.4*	*7.5*	*7.3*	*6.4*	*6.7*	*7.0*	*6.0*

Notes:

1. Population estimates: BC STATS, BC Ministry of Finance and Corporate Relations
2. Population data was acquired through the Health Data Warehouse, BC Ministry of Health
3. Cancer data source: BC Cancer Registry and Cervical Cancer Screening Program of BC Cancer Agency

Invasive Squamous Carcinoma

Screening history of women diagnosed with invasive squamous cell carcinomas in 2008 is summarized in Table XIV. As Pap tests performed within six months prior to the invasive cancer diagnosis are less likely to be done for screening purpose, these Pap samples are disregarded in the categorization of screening history.

Table XIV shows that 50% of patients are “inactive” screening participants (>5 years or no screening history with CCSP), 13.4% are “under screened” (>3 to 5 years), and 36.6% are “active” screening participants (0.5 to 3 years).

TABLE XIV: Screening History for Invasive Squamous Cell Cervical Cancer Patients (2008)

	Age at Diagnosis (Years)						All Cancers
	20-29	30-39	40-49	50-59	60-69	70+	
No. of Invasive Squamous Cell Cancers	6	16	38	25	11	16	112
No Screening History or Last Screened >5 years prior	2 (33.3%)	6 (37.5%)	16 (42.1%)	16 (64.0%)	6 (54.5%)	10 (62.5%)	56 (50.0%)
3 to 5 years prior (%)	2 (33.3%)	2 (12.5%)	5 (13.2%)	1 (4.0%)	1 (9.1%)	4 (25.0%)	15 (13.4%)
Pap Test 0.5 to 3 year prior (%)	2 (33.3%)	8 (50.0%)	17 (44.7%)	8 (32.0%)	4 (36.4%)	2 (12.5%)	41 (36.6%)

Note: Pap tests performed within six months prior to the invasive cancer diagnosis are less likely to be done for screening purposes, thus these Pap test samples are disregarded in the categorization of screening history.

Adenocarcinoma

Screening history of women diagnosed with adenocarcinoma in 2008 is summarized in Table XV. As Pap tests performed within six months prior to the invasive cancer diagnosis are less likely to be done for screening purposes, these Pap test samples are disregarded in the categorization of screening history.

Table XV shows that 20% of patients are "inactive" screening participants (>5 years or no screening history with CCSP), 10% are "under screened" (>3 to 5 years), and 70% are "active" screening participants (0.5 to 3 years).

TABLE XV: Screening History for Invasive Adenocarcinoma Cervical Cancer Patients (2008)

	Age at Diagnosis (Years)						All Cancers
	20-29	30-39	40-49	50-59	60-69	70+	
No. of Invasive Adenocarcinoma	4	9	9	9	5	4	40
No Screening History or Last Screened >5 years prior	-	-	3	-	2	3	8
	-	-	(33.3%)	-	(40.0%)	(75.0%)	(20.0%)
3 to 5 years prior (%)	1	1	1	-	-	1	4
	(25.0%)	(11.1%)	(11.1%)	-	-	(25.0%)	(10.0%)
Pap Test 0.5 to 3 years prior (%)	3	8	5	9	3	-	28
	(75.0%)	(88.9%)	(55.6%)	(100.0%)	(60.0%)	-	(70.0%)

Note: Pap tests performed within six months prior to the invasive cancer diagnosis are less likely to be done for screening purpose, thus these Pap test samples are disregarded in the categorization of screening history.

APPENDIX 1:
General Cancer Screening Program Overview

Definition of Screening

Screening is a prevention strategy. Primary cancer prevention strategy involves changes of behavior or habits that reduce a risk, for example, stopping smoking, fat reduction in the diet, etc. Screening for cancer is a secondary prevention strategy. Secondary cancer prevention strategy targets disease in process[1]. A secondary prevention can reduce cancer morbidity and mortality by diagnosing invasive disease at an earlier, more favorable prognostic stage; and, detecting precursor lesions associated with some cancers that once eliminated, prevent progression to invasive disease. Screening is "*the application of various tests to apparently healthy individuals to sort out those who probably have risk factors or are in the early stages of specified conditions.*"[2]

Limitations of Screening

The decision to screen an at-risk population for pre-clinical signs of cancer is based on well-established criteria related to cancer and the screening tests that we use to identify individuals who may have occult disease. [3, 4, 5]

The overall objective of a screening program is to reduce morbidity and mortality from cancer. The goal of screening is to "apply a relatively simple, inexpensive test to a large number of persons in order to classify them as likely or unlikely to have the cancer". The emphasis on likelihood underscores the limits of what should be expected from screening (i.e., screening tests are not diagnostic tests).

A person with an abnormal screening test does not have a definitive diagnosis until additional, more sophisticated diagnostic tests are completed. The emphasis on likelihood also is important because screening tests are inherently limited in their accuracy, which varies by test, cancer site, and individual characteristics. Although most of screening interpretations are accurate, it is inevitable that some individuals are identified as possibly having cancer when they do not, and screening tests fail to identify some individuals who do not have the disease.

The comparative evaluation of accuracy versus error cannot be considered in absolute terms, but rather should be evaluated in terms of the relative consequences of one or the other kind of error.

Organized Population Screening Program

To reduce morbidity and mortality from cancer in a population by screening, there must be coordinated and effective strategies to ensure acceptance and utilization of the established screening test. Since screening is targeted at asymptomatic women, the fine balance between maximizing benefits and minimizing undesirable effects must be maintained.

An organized approach to screening ensures that the target population has access to the screening service and that it accepts and uses the services offered. This is achieved by including the following six program components:

1. Health Promotion
2. Professional Development/Education
3. Recruitment & Retention
4. Screening Test & Reporting
5. Follow-up
6. Evaluation/Research Partnerships

The success of screening is a shared responsibility of the team of individuals working together to develop goals, set standards, monitor progress, and continue improvement in each of the six components.

---

1 US Preventive Services Task Force: Guide to Clinical Preventive Services, Ed 2. Baltimore, Williams & Wilkins, 1996

2 Morrison A: Screening in Chronic Disease. New York, Oxford Press, 1992

3 Cole P, Morrison AS: Basic issues in cancer screening. In Miller AB (ed); Screening in Cancer. Geneva, International Union Against Cancer, 1978, p7

4 Miller AB; Fundamentals of Screening. In Screening for Cancer. Orlando, Academic Press, 1985, p3

5 Wilson JMG, Junger G; Principles and Practice of Screening for Disease. Geneva, World Health Organization, 196

APPENDIX 2:
CCSP Screening Guidelines

Cervical Cancer Screening

Clinical Practice Guidelines

BC Cancer Agency
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Screening Initiation

Cervical cancer screening should begin at age 21 or approximately three years after first sexual contact, whichever occurs first. Sexual contact includes intercourse as well as digital or oral sexual contact involving the genital area with a partner of either gender.

The guideline of screening initiation at age 21 provides a way for healthcare providers to offer cervical screening and have a discussion about sexual history. Unfortunately, some women may be reluctant to share information about previous sexual contacts with their healthcare provider. This may be due to a number of reasons, such as embarrassment, fear of disclosing premarital sexual relationship(s), or a history of sexual abuse or assault. A woman's choice to be screened or not should always be respected.

Women who have never had any sexual contact do not need to be screened.

Screening Interval

Repeat Pap tests every 12 months until there are three consecutive negative results, then continue at 24-month intervals.

Discontinue Screening

Women older than 69 years should discontinue screening if they have had at least three negative Pap tests in the past 10 years, with no previous history of biopsy confirmed significant abnormalities (CIN*2 or CIN 3, AIS** or invasive cervical cancer).

Women older than 69 who have never been screened, should be screened with three annual Pap tests. If results are negative, discontinue screening.

HPV vaccination is recommended for females between nine and 26 years of age. For National Advisory Committee on Immunization (NACI) guidelines visit:
www.phac-aspc.gc.ca/publicat/ccdr-rmtc/07vol33/acs-02/index-eng.php

A woman with a visibly abnormal cervix or abnormal bleeding should be referred appropriately, regardless of the Pap test findings

Screening Women with Special Circumstances

- Women should follow regular guidelines for screening if they (1) received the HPV vaccine, (2) are lesbian or (3) are pregnant.
- Women with immunosuppression should be screened annually. This includes women with human immunodeficiency virus (HIV/AIDS), lymphoproliferative disorders, an organ transplant, and women under long-term immunosuppression therapy.
- Women currently being assessed by a colposcopy clinic or being followed by a cancer clinic should not undergo additional Pap testing unless being directed by the treating physician.
- Women who have ever had biopsy confirmed CIN 2, CIN 3, AIS or invasive cervical cancer should be screened annually thereafter.
- Women who have had a hysterectomy with the cervix removed
  - and have a history of invasive cervical cancer, should have a vault smear annually thereafter;
  - and have a history of CIN 2, CIN 3 or AIS, should have a vault smear until there are three consecutive negative results in a three-year period, then discontinue screening;
  - due to benign disease, may discontinue screening if adequate pathological documentation exists that the cervix has been removed completely and there is no history of biopsy confirmed CIN 2, CIN 3, AIS or invasive cervical cancer.
- Women who have undergone subtotal hysterectomy and retained their cervix should continue with screening according to the guidelines.

* CIN - cervical intraepithelial neoplasia
** AIS - adenocarcinoma in situ

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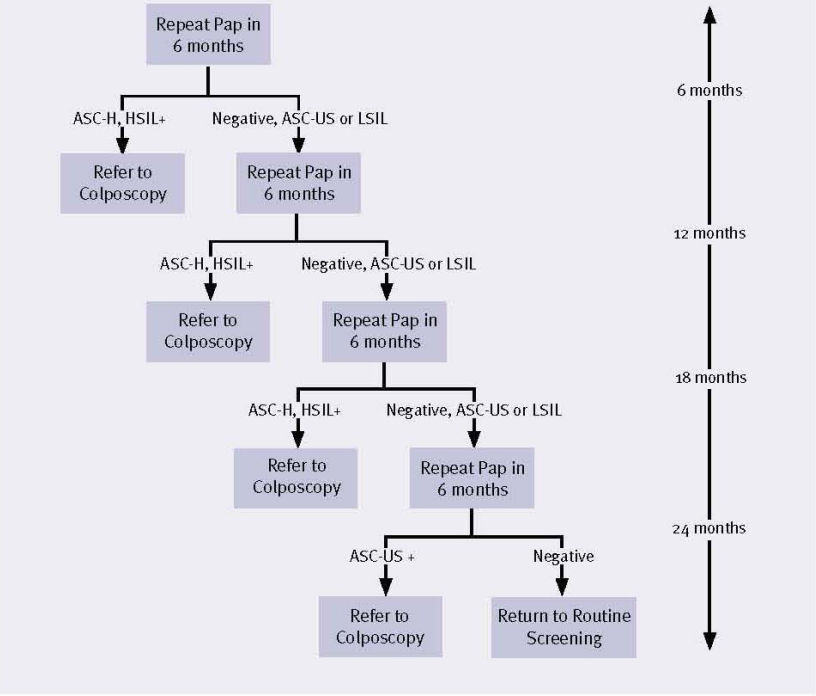
Cervical Cancer Screening

Results and Recommended Management

Pap Test Result	Recommended Management
Atypical squamous cells of undetermined significance (ASC-US) Low-grade squamous intraepithelial lesion (LSIL)	 ASC-US in background of atrophy should be repeated after topical estrogen
Atypical squamous cells – cannot exclude HSIL (ASC-H) High-grade squamous intraepithelial lesion (HSIL) Atypical glandular cells (AGC), Adenocarcinoma in situ (AIS)	Refer for colposcopy
Squamous cell carcinoma, adenocarcinoma, other malignancy	Refer to specialist care
After age 40, endometrial cells should be managed as appropriate	

APPENDIX 3:
Terminology for Reporting Cervical Cytology Results

Bethesda System (after October 1, 2010)	BC Cervical Cancer Screening Program (before October 1, 2010)
Unsatisfactory: state reason	Unsatisfactory: state reason
Negative for Intraepithelial Lesion or Malignancy (NILM)	Negative, no atypical cells are seen
NILM Reactive Change due to: • Trichomonas vaginalis • Fungal organisms morphologically consistent with Candida sp. • Cellular changes associated with Herpes Simplex Virus • Inflammation • Treatment effects	Benign changes due to: • Trichomonas vaginalis • Monilia (Candida species) • Cellular changes suggestive of Herpes simplex viral infection • Inflammation • Radiation effect
Atypical Squamous Cells of Undetermined Significance (ASC¬US)	Some cases of Mild squamous dyskaryosis, Atypia nos, or Benign changes
Atypical Squamous Cells, Cannot Exclude HSIL (ASC-H)	Some cases of Moderate or Marked squamous dyskaryosis, or Atypia nos.
Low-grade Squamous Intraepithelial Lesion (LSIL)	Mild squamous dyskaryosis
High-grade Squamous Intraepithelial Lesion (HSIL) • Moderate • Marked	Moderate squamous dyskaryosis • Marked squamous dyskaryosis • Some cases of Suspicious squamous cells
Squamous Cell Carcinoma	Some cases of Suspicious squamous cells Malignant squamous cells
Adenocarcinoma	Malignant glandular cells
Carcinoma, unspecified	Malignant epithelial cells
Atypical Glandular Cells, not otherwise specified (AGC – NOS),	Mild glandular atypia Some cases of Moderate glandular atypia
Atypical Glandular Cells, favour neoplastic (AGC – favour neoplastic)	Some cases of Moderate glandular atypia Marked glandular atypia
Adenocarcinoma in situ (AIS)	Suspicious glandular cells

APPENDIX 4:
Colposcopy Clinic Locations and Personnel Staffing

ABBOTSFORD
Abbotsford Regional Hospital
32900 Marshall Road
Abbotsford, BC V2S 0C2
Phone: 604-851-4700
Dr. F. Ahman

COMOX
St. Joseph's General Hospital
2137 Comox Avenue
Comox, BC V9M 1P2
Phone: 250-339-2242
Dr. D. Hartman, Dr. B.M. Bagdan

DUNCAN
Cowichan District Hospital
3045 Gibbins Road
Duncan, BC V9L 1E5
Phone: 250-746-4141
Dr. S. Hancock

KAMLOOPS
Royal Inland Hospital
311 Columbia Street
Kamloops, BC V2C 2T1
Phone: 250-374-5111
Dr. A. Human

KELOWNA
Kelowna General Hospital
2268 Pandosy Street
Kelowna, BC V1Y 1T2
Phone : 250-862-4000
Dr. P. Wilson, Dr. M. Jones

LANGLEY
Langley Memorial Hospital
22051 Fraser Highway
Langley, BC V3A 4H4
Phone: 604-533-6406
Dr. E. Mah

MAPLE RIDGE
Ridge Meadows Hospital &
Health Care Centre
11666 Laity Street
Maple Ridge, BC V2X 7G5
Phone: 604-463-4111
Dr. W.H. Yeung

NANAIMO
Nanaimo Regional General Hospital
1200 Dufferin Crescent
Nanaimo, BC V9S 2B7
Phone: 250-754-2141
Dr. P. Mitchell, Dr. A. Hunt

NEW WESTMINSTER
Royal Columbian Hospital
330 East Columbia Street
New Westminster, BC V3L 3W7
Phone: 604-520-4253
Dr. S. Pedersen, Dr. L. Neapole

NORTH VANCOUVER
Lions Gate Hospital
231 East 15th Street
North Vancouver, BC V7L 2L7
Phone: 604-988-3131
Dr. V. Scali, Dr. E. Hoyer,
Dr. R. Goodall, Dr. J. Schouls

PENTICTON
Penticton Regional Hospital
550 Carmi Avenue
Penticton, BC V2A 3G6
Phone: 250-492-4000
Dr. M. Jones

PRINCE GEORGE
Prince George Regional Hospital
1475 Edmonton Street
Prince George, BC V2M 1S2
Phone: 250-565-2000
Dr. B. Galliford, Dr. M. Odulio,
Dr. W. Kingston

Colposcopy Clinic Locations and Personnel Staffing – *Continued*

PRINCE RUPERT
Prince Rupert Regional Hospital
1305 Summit Avenue
Prince Rupert, BC V8J 2A6
Phone: 250-624-2171
Dr. M. Pienaar

RICHMOND
Richmond General Hospital
7000 Westminster Highway
Richmond, BC V6X 4A2
Phone: 604-278-9711
Dr. H. Mackoff, Dr. H. Robson

SECHELT
St. Mary's Hospital
Box 7777, 5544 Sunshine Coast Hwy
Sechelt, BC V0N 3A0
Phone: 250-885-2224
Dr. R. Kellett

SURREY
Surrey Memorial Hospital
13750 - 96th Avenue
Surrey, BC V3V 1Z2
Phone: 604-581-2211
Dr. P. Yeung, Dr. M. Bakhet

TERRACE
Mills Memorial Hospital
4720 Haughland Avenue
Terrace, BC V8G 2W7
Phone: 250-635-2211
Dr. L. Almas

TRAIL
Kootenay Boundary Regional Hospital
1200 Hospital Bench
Trail, BC V1R 4M1
Phone: 250-368-3311
Dr. A. Dobson, Dr. K. Hale

VANCOUVER
BCCA/VHHSC
855 West 12th Avenue
Vancouver, BC V5Z 1M9
Phone: 604-875-4111
Dr. T. Ehlen, Dr. D. Miller, Dr. M. Heywood, Dr. S. Finlayson, Dr. J. Kwon, Dr. L. Sadownik, Dr. J. McAlpine, Dr. M. Carey

VANCOUVER
St. Paul's Hospital
1081 Burrard Street
Vancouver, BC V6Z 1Y6
Phone: 604-682-2344
Dr. G. Kinney, Dr. Elisabet Joa, Dr. R. Geoffrion

VERNON
Vernon Jubilee Hospital
2101 - 32nd Street
Vernon, BC V1T 5L2
Phone : 250-545-2211
Dr. C. Hatfield, Dr. K. Daniel

VICTORIA
Royal Jubilee Hospital
1952 Bay Street
Victoria, BC V8R 1J8
Phone : 250-370-8000
Dr. M. Mazgani, Dr. D. Quinlan
Dr. M. Rippington, Dr. H. Hunt

WHITE ROCK
Peace Arch Memorial Hospital
15521 Russell Avenue
White Rock, BC V4B 2R4
Phone: 604-531-5512
Dr. J. Christilaw, Dr. G. Jackson

WILLIAMS LAKE
Cariboo Memorial Hospital
517 North 6th Avenue
Williams Lake, BC V2G 2G8
Phone: 250-392-4411
Dr. S. Raffard, Dr. G. Gill

Educational Materials

Education materials for health care providers and women are available at no charge from the Cervical Cancer Screening Program.

For health care providers

- Educational video (online or DVD) – A Women-Centered Approach to Cervical Cancer Screening
- Information cards on the following:
  - Cervical Cancer Screening Clinical Practice Guidelines
  - Pap Sampling Technique

For women

- Brochures about Pap tests and HPV
- Booklets about cervical cancer and abnormal results
- Posters
- Postcards
- Calendar reminder stickers

Educational materials online

Education materials and the order form are available at:

www.bccancer.bc.ca/cervicalscreening → Resources
www.bccancer.bc.ca/cervicalscreening → For Health Professionals

APPENDIX 6:
Glossary

- **Age-Standardized Incidence Rate**

  Age-standardized incidence rate is the weighted average of the age-range specific incidence rates, where the weights are the proportions of people in the corresponding age groups of the 1991 Canadian population.

$$\text{Age - Standardized Incidence Rate} = \sum_i \left(\frac{\text{Ca}_\text{i}}{\text{Pop}_\text{i}} \times \text{weight}_\text{i} \times 100{,}000 \right)$$

  Where Ca_i is the number of cervical cancers detected in a given year for age group *i*, pop_i is the BC female population in a given year for age group *i*, and weight_i is the proportion of people in age group *i* of the 1991 Canadian population.

- **Age-Standardized Mortality Rate**

  Age-standardized mortality rate is the weighted average of the age-range specific mortality rates, where the weights are the proportions of people in the corresponding age groups of the 1991 Canadian population.

$$\text{Age - Standardized Mortality Rate} = \sum_i \left(\frac{\text{Deaths}_\text{i}}{\text{Pop}_\text{i}} \times \text{weight}_\text{i} \times 100{,}000 \right)$$

  Where $Deaths_i$ is the number of cervical cancer deaths in a given year for age group *i*, pop_i is the BC female population in a given year for age group *i*, and weight_i is the proportion of people in age group *i* of the 1991 Canadian population.

- **Incidence Rate**

  Incidence rate is the proportion of women in the population who develop cervical cancer in a given year, expressed as the number of deaths per 100,000 people.

$$\text{Incidence Rate} = \frac{\text{Number of cervical cancer detected in a given year}}{\text{BC female population in a given year}} \times 100{,}000$$

- **Mortality Rate**

  Mortality rate is the proportion of women in the population who died of cervical cancer in a given year, expressed as the number of deaths per 100,000 people at risk.

$$\text{Mortality Rate} = \frac{\text{Number of cervical cancer deaths in a given year}}{\text{BC female population in a given year}} \times 100{,}000$$

- **Participation Rate**

  BC Overall

  Proportion of women in the BC female population (20-69 years of age) had a Pap test sample taken from the cervix and/or endocervix and processed at least once over a three-year period. Age is calculated in year two of the reporting period.

$$\text{Participation Rate} = \frac{\text{Number of women (age 20 - 69) with at least one Pap test in a 3 - year period}}{\text{Number of women in the BC (age 20 - 69) population at year two}} \times 100$$

  BC Adjusted for Hysterectomy

  Proportion of women out of the target BC female population (20-69 years of age) without hysterectomy had a Pap test sample taken from the cervix and/or endocervix and processed at least once over a three-year period. The BC female population without hysterectomy is computed using the hysterectomy rates estimated from a population sample of an epidemiological study conducted in 1995.

- **Positive Predictive Value**

  Proportions of Pap test samples with significant cytology findings and have histological confirmation of cervical abnormality out of those samples with significant cytology and had follow-up investigation with pathological result. Surveillance with repeat Pap test only is not regarded as follow-up investigation.

$$\text{PPV} = \frac{\text{Number of samples with significant pathology and cytology findings}}{\text{Number of samples with significant cytology findings, investigated and has pathological diagnosis}}$$

- **Pre-Cancer Detection Rate**

  Number of pre-cancerous lesions detected per 1,000 women who had a Pap test in a 12-month period.

$$\text{Pre - Cancer Detection Rate} = \frac{\text{Number of women with histology CIN II and CIN III}}{\text{Number of women who had at least one Pap test}} \times 1{,}000$$

- **Re-screen Rate**

  Proportion of women with a negative sample returned for Pap test.

$$\text{Rescreen Rate} = \frac{\text{Number of women returned for Pap test after an index sample with negative result}}{\text{Number of women with a negative sample eligible to return for Pap test}}$$

APPENDIX 7:
Acknowledgments and Contributors

The Cervical Cancer Screening Program would like to thank its partners who have supported and contributed to the Program over the years. The success of the Program depends on an integrated system of:

- Community health professionals taking the cervical Pap test samples (Pap test slides).
- Dedicated and highly trained staff to process and read the slides.
- Community facilities providing space and personnel to support regional colposcopy clinics.
- Medical specialists to provide colposcopy follow-up and treatment.

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- BC Centre for Disease Control
- BC College of Registered Nurses
- BC Medical Association
- BC Naturopathic Association
- BC Women's Hospital and Health Centre
- Canadian Cancer Society
- First Nations Health Council
- SFU Faculty of Health Sciences
- UBC Faculty of Medicine
- Women's Health Bureau

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APPENDIX 8:
Publications and Presentations

Publications:

1. Ogilvie G, **van Niekerk D**, Krajden M, Martin RE, **Ehlen GE**, Ceballos K, Peacock SJ, **Smith LW**, **Kan L**, Cook DA, Mei W, Gavin S, Franco, EL, **Coldman A**. A randomized controlled trial of human papillomavirus (HPV) testing for cervical cancer screening: trial design and preliminary results (HPV FOCAL Trial). BMC Cancer 2010: 10:111 http://www.biomedcentral.com/1471-2407/10/111

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