BC CANCER CERVIX SCREENING

Provincial Health Services Authority

BC Cancer Cervix Screening
2019 Program Results

October 2024

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PROGRAM OVERVIEW

BC Cancer Cervix Screening has oversight responsibility for cervix screening in BC. The program reminds healthcare providers when their patients are due for screening, tracks adherence to screening recommendations, and monitors system performance and outcomes of cervix screening activities. In BC, Pap tests are recommended every three years for eligible people 25-69 years of age. Pap tests are provided by primary care providers and trained nurses in the province and the tests are interpreted and reported by the Cervical Cancer Screening Laboratory (CCSL) of the Provincial Health Services Authority.

The Screening Process

The Screening Process is illustrated in Figure 1 (Page 4). This process consists of four stages:

1.   Identify and invite the target population for screening

2.   Conduct screening examinations

3.   Investigate abnormalities identified during screening

4.   Send screening reminders at the appropriate interval

FIGURE 1: BC CANCER CERVIX SCREENING PROCESS OVERVIEW
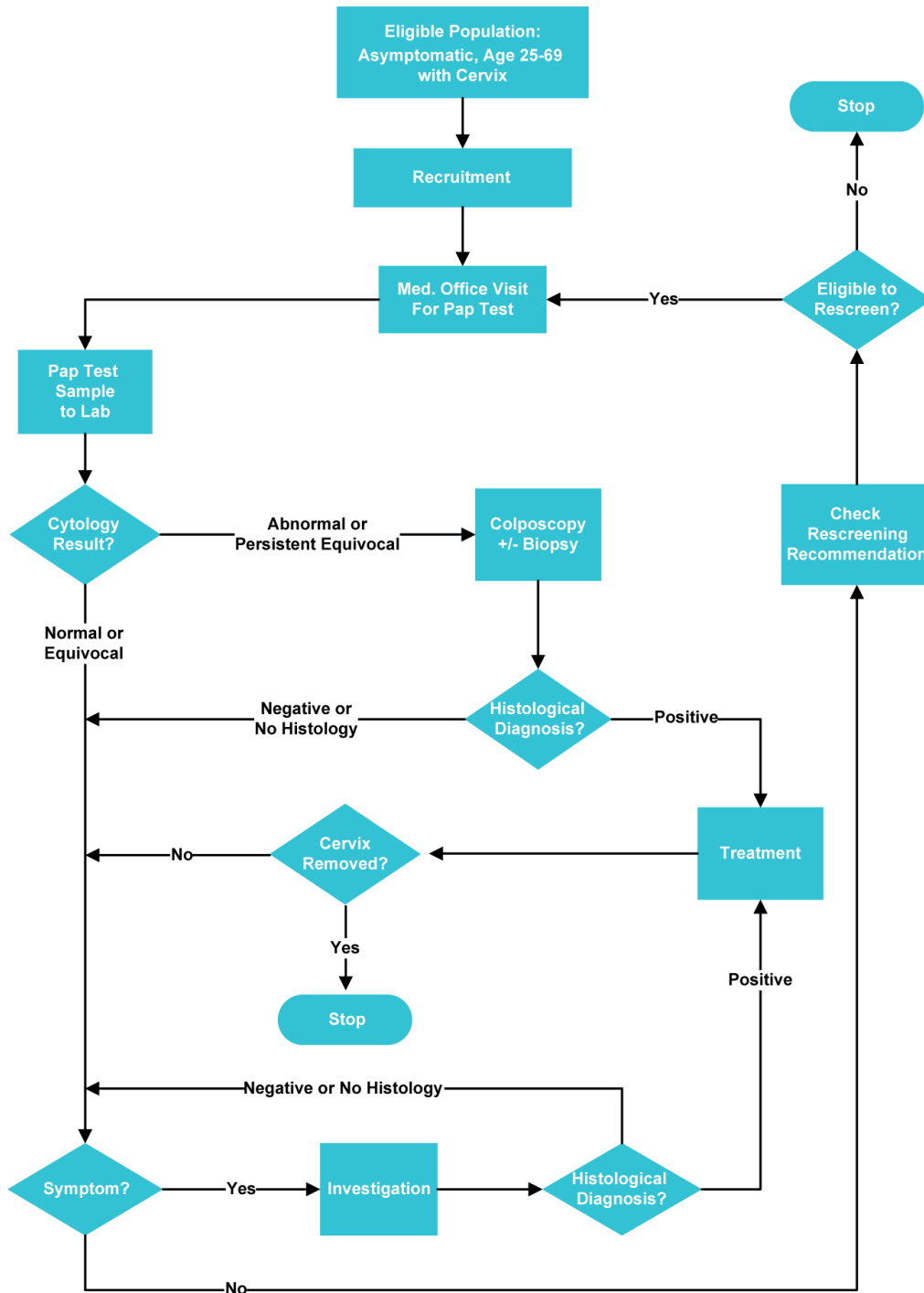
For detailed information on the management of higher than average risk patients, see the BC Cancer Cervix Screening Overview document.

PROGRAM RESULTS

a) Volume of Samples

TABLE 1: NUMBER OF PATIENTS WITH CERVICAL/ENDOCERVICAL PAP TEST SAMPLES, 2019

|	<20	20-24	25-29	30-39	40-49	50-59	60-69	70+	All Ages
Number of Patients	425	5,202	35,802	78,818	67,705	67,066	51,117	2,238	308,373
Number of Smears	435	5,349	36,899	81,032	69,531	68,467	51,783	2,292	315,788
New Patients	375	2,481	10,878	11,217	4,199	2,621	2,089	9191	34,051
(%)	88%	48%	30%	14%	6%	4%	4%	9%	11%

Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed on patient's last Pap test

b) Participation Rates

Participation rate is defined as the percent of eligible people with at least one cervical/endocervical Pap test in a three-year period. Statistic Canada's Canadian Community Health Survey (CCHS) data is used to adjust the denominator for hysterectomy rates in BC as most people who have had a total hysterectomy do not need routine screening. Hysterectomy rates can be calculated from the CCHS and applied to 10 year age groups at the provincial level. However, due to small sample size and large variation in rate estimates, they can only be calculated at the level of Health Authority across the target age group (25-69).

FIGURE 2: PARTICIPATION RATES BY AGE GROUP, 2019
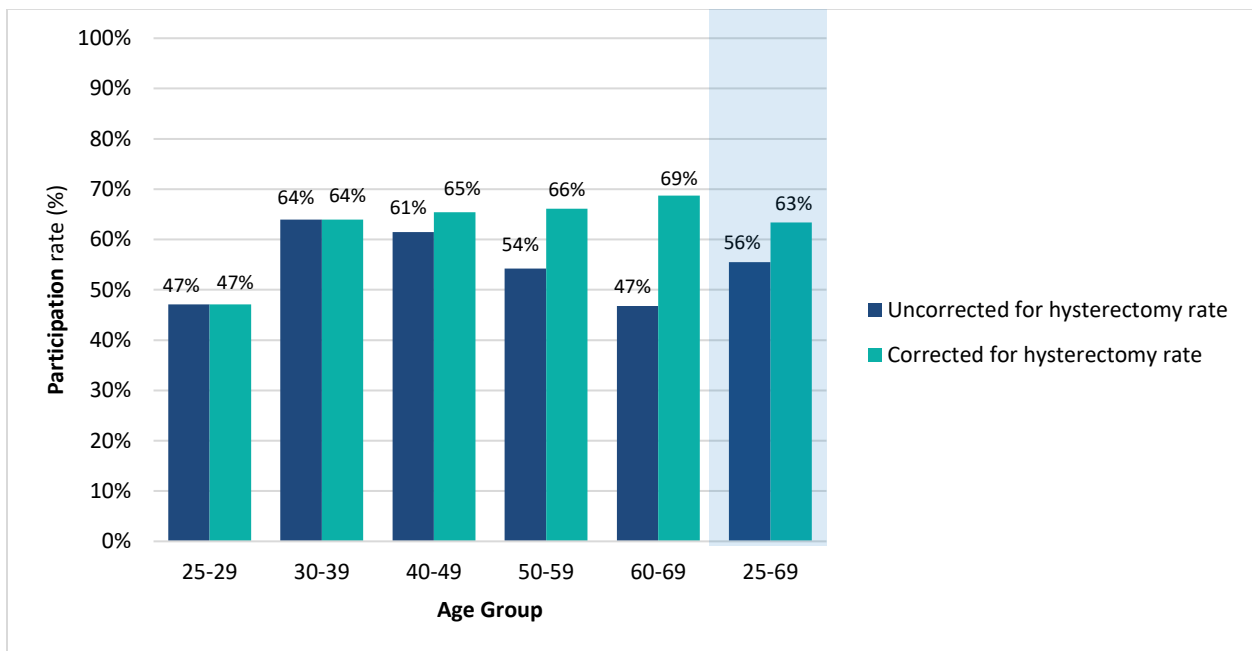
Notes:
1. Based on average of 2019 and 2020 female population estimates
2. Population data source: P.E.O.P.L.E. 2023 (Sept 2023), BC STATS, Service BC, BC Ministry of Citizen's Services
3. Hysterectomy adjustment calculated using 2012 Canadian Community Health Survey
4. BC Cancer Cervix Screening data extraction date: 28/3/2024
5. Age is computed based on patient's age at end of 2019

TABLE 2: PARTICIPATION RATES FOR AGES 25-29, 30-34, AND 35-39 BY HSDA, 2019

Health Authority	Health Service Delivery Area	25-29	30-34	35-39
Interior	East Kootenay	67%	73%	73%
Interior	Kootenay Boundary	62%	68%	66%
Interior	Okanagan	56%	66%	67%
Interior	Thompson Cariboo Shuswap	58%	68%	65%
Fraser	Fraser East	50%	60%	59%
Fraser	Fraser North	42%	58%	64%
Fraser	Fraser South	43%	55%	60%
Vancouver Coastal	Richmond	39%	60%	66%
Vancouver Coastal	Vancouver	39%	64%	73%
Vancouver Coastal	North Shore/Coast Garibaldi	57%	69%	70%
Vancouver Island	South Vancouver Island	47%	62%	67%
Vancouver Island	Central Vancouver Island	54%	65%	64%
Vancouver Island	North Vancouver Island	65%	65%	66%
Northern	Northwest	59%	67%	63%
Northern	Northern Interior	54%	62%	63%
Northern	Northeast	57%	65%	60%
BC		**47%**	**62%**	**66%**

Notes:
1. Based on average of 2019 and 2020 female population estimates
2. Population data source: P.E.O.P.L.E. 2023 (Sept 2023), BC STATS, Service BC, BC Ministry of Citizen's Services
3. Hysterectomy adjustment calculated using 2012 Canadian Community Health Survey
4. BC Cancer Cervix Screening data extraction date: 28/3/2024
5. Age is computed based on patient's age at end of 2019

**FIGURE 3: PARTICIPATION RATES BY HEALTH AUTHORITY, 2019**
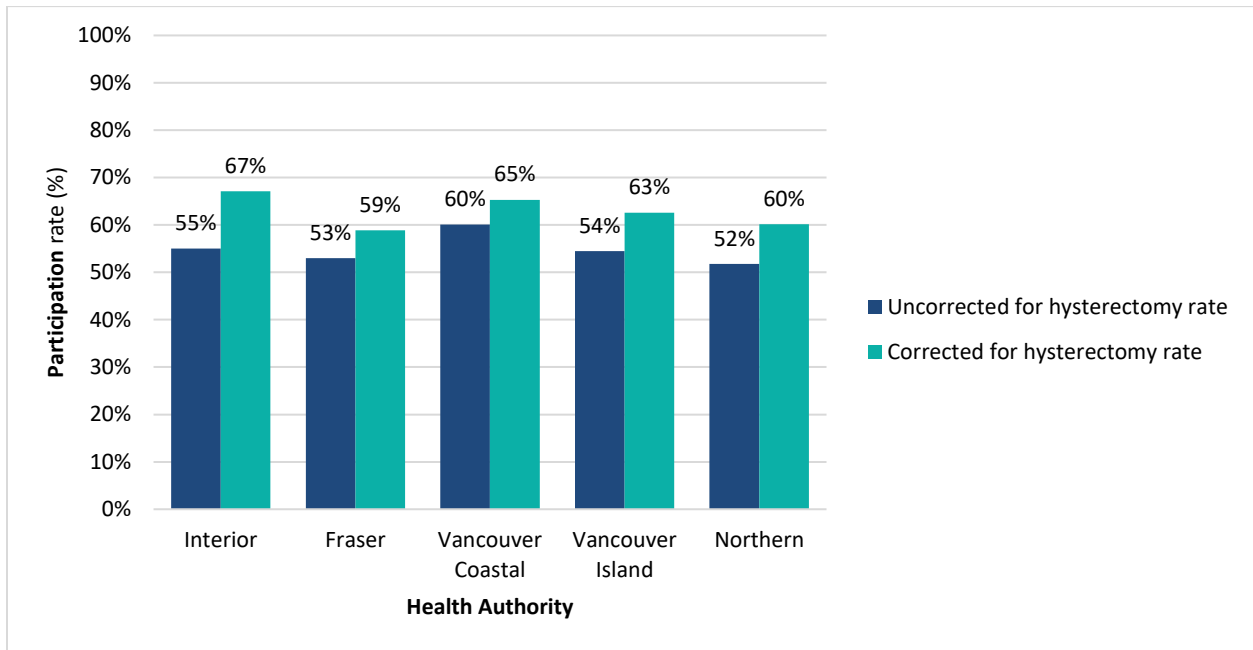
Notes:

1. Based on average of 2019 and 2020 female population estimates
2. Population data source: P.E.O.P.L.E. 2023 (Sept 2023), BC STATS, Service BC, BC Ministry of Citizen's Services
3. Hysterectomy adjustment calculated using 2012 Canadian Community Health Survey
4. BC Cancer Cervix Screening data extraction date: 28/3/2024
5. Age is computed based on patient's age at end of 2019
6. Data includes patients between ages 25-69

c) Retention Rate

Retention rate is defined as the proportion of average risk participants with a previous negative screen who returned for a Pap test by 42 months. Retention rate curves changed for index screens in 2015 and 2016 due to the policy change in 2016 which extended the screening interval from two years to three years. Retention rate for 2016 index screens also started to change due to the COVID-19 pandemic that occurred in early 2020 which affected access to health services.

FIGURE 4: RETENTION RATES BY PREVIOUS SCREEN YEAR, 2012-2016
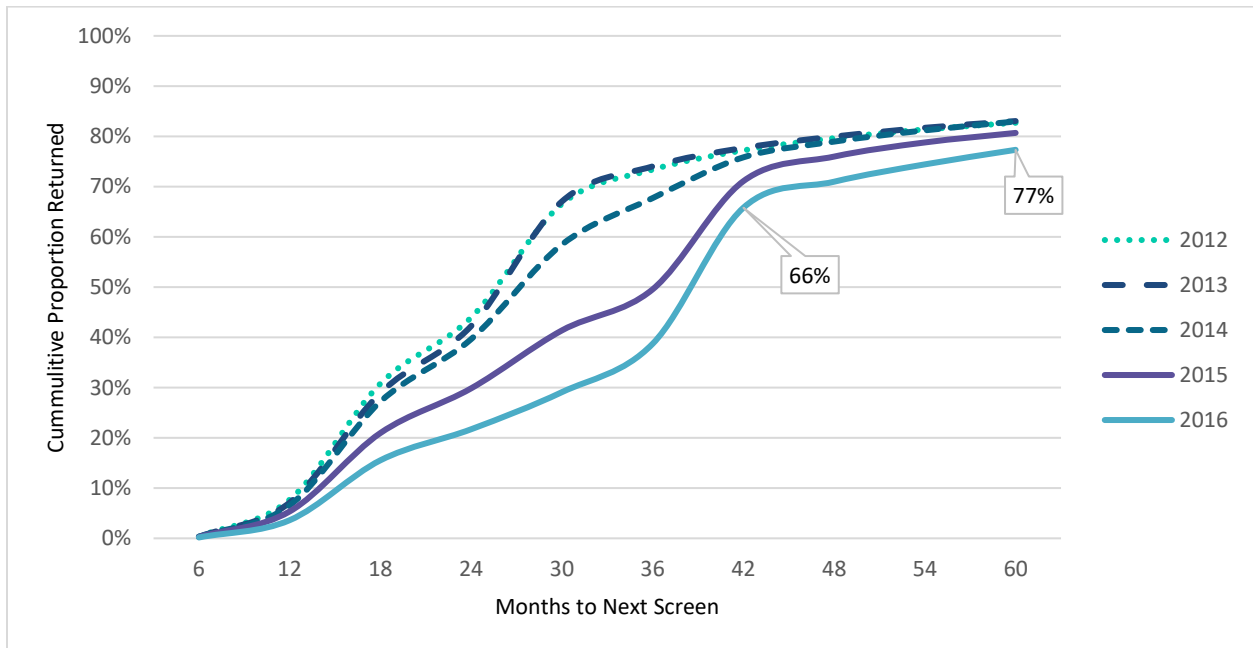
Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Data includes patients between ages 25-69

TABLE 3: RETENTION RATES (%) BY AGE GROUP, 2016

	25-29	30-39	40-49	50-59	60-69	25-69
Number of patients	43,940	93,599	83,977	84,387	44,509	350,412
Re-screened by						
18 Months	15%	16%	16%	16%	13%	**16%**
24 Months	22%	23%	23%	22%	18%	**22%**
30 Months	29%	30%	30%	29%	25%	**29%**
36 Months	38%	39%	39%	39%	35%	**39%**
42 Months	58%	63%	67%	70%	68%	**66%**

Notes:

1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on patient's age on report date of the index Pap test

FIGURE 5: 42-MONTH RETENTION RATE BY AGE GROUP OVER TIME, 2012 – 2016
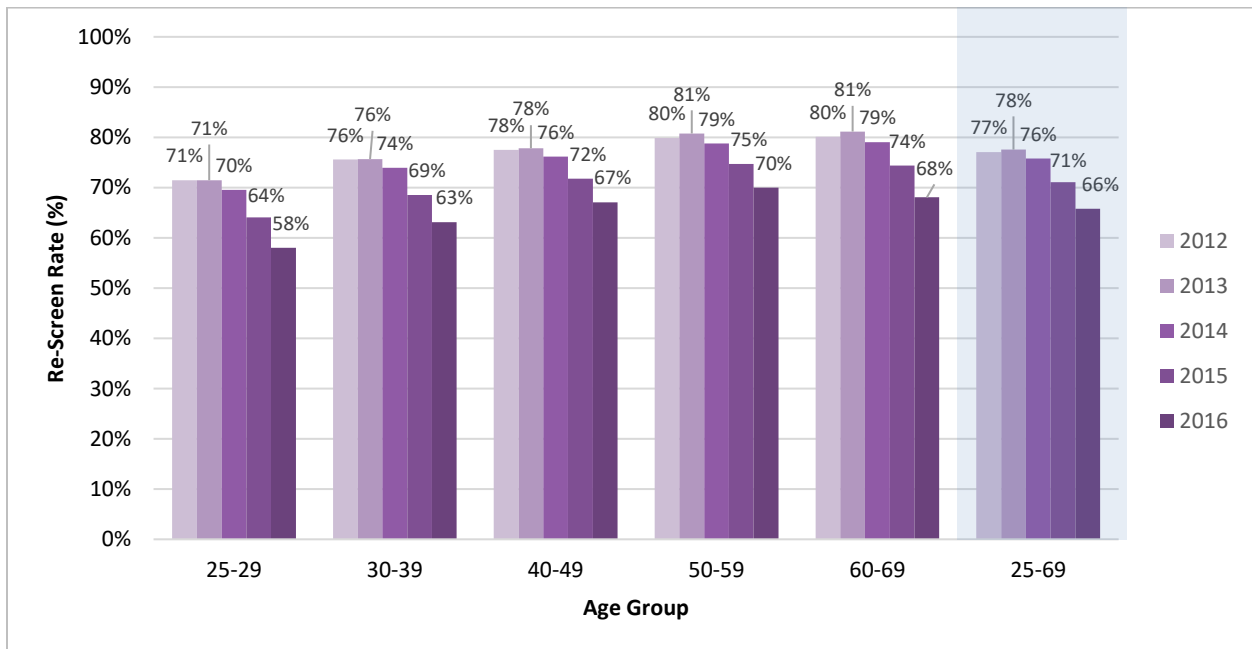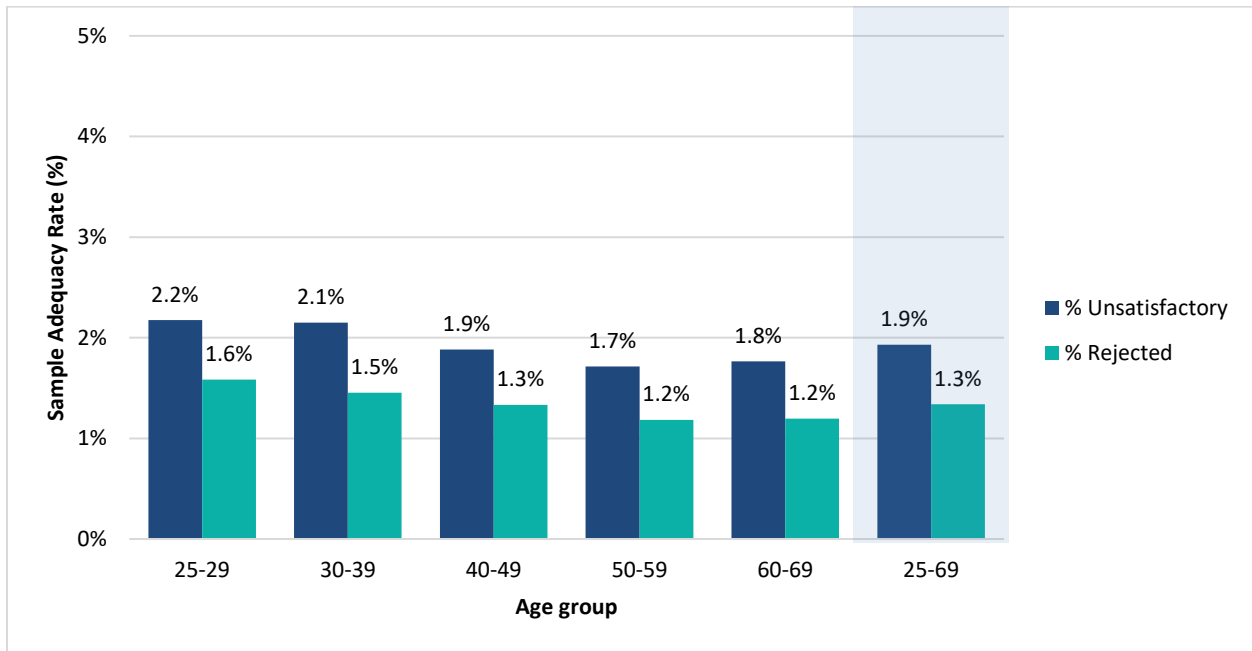

Notes:

1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on patient's age on report date of the index Pap test

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d) Adequacy of Pap Test Samples

The most commonly cited factor for unsatisfactory cytology sample was insufficient squamous cellularity and obscuring inflammation, which represented 58% of the unsatisfactory samples. Additionally, some cytology samples were rejected by the CCSL. The most cited reason for a rejected cytology sample was due to missing or incorrect patient name or date of birth, which represented 71% of rejected samples. Multiple factors may be cited.

FIGURE 6: CERVICAL SAMPLE ADEQUACY RATES BY AGE GROUP, 2019
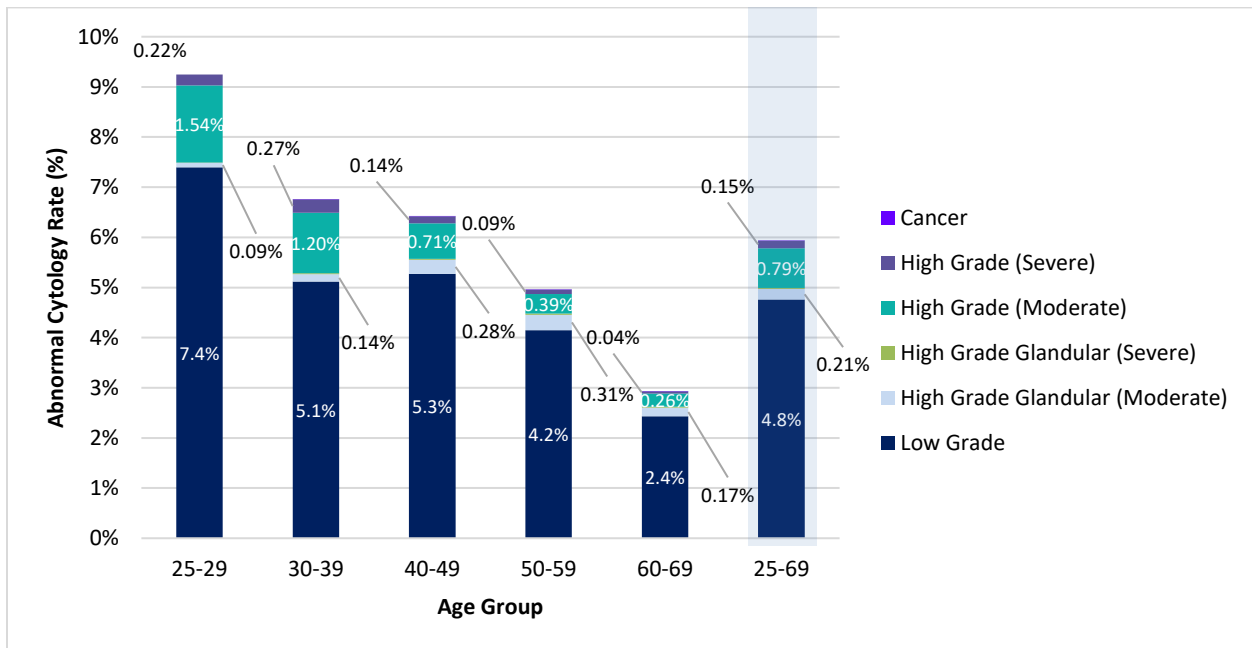

Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on sample date

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e) Screening Test Results

Pap test reporting turnaround time is the average number of days from the date the sample is received in the CCSL to the date the finalized report is issued. The target turn around time is for 90% of reports to be issued in 28 days. In 2019, 90% of Pap tests had a turn-around time of 36 days. Of the Pap tests submitted, 78% met the target turn-around time standard.

The CCSL uses the international standardized Bethesda nomenclature to report Pap test results (Appendix A). See Appendix A for acronym definitions.

FIGURE 7: ABNORMAL SCREENING TEST RESULT DISTRIBUTION BY AGE GROUP, 2019

Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on sample date
3. **Cancer** includes adenocarcinoma, endocervical adenocarcinoma, endometrial adenocarcinoma, squamous cell carcinoma; **High Grade (Severe)** includes HSIL (Severe); **High Grade (Moderate)** includes ASC-H or HSIL Moderate; **High Grade Glandular (Severe)** includes AGC-FN, AEC-FN, atypical endometrial cells-favour neoplastic,; **High Grade Glandular (Moderate)** includes AGC; **Low Grade** includes ASC-US or LSIL

f) Follow-up of Abnormal Pap Test Results

Follow-up Recommendation

The current screening guideline is to follow ASC-US or LSIL results with a repeat Pap test at six-month intervals for up to one year. Colposcopy is recommended for either persistent ASC-US or LSIL or an initial interpretation of AGC, ASC-H, HSIL, AIS or invasive carcinoma. "Other Investigations" are predominantly recommendations for further investigation for suspected endometrial abnormalities.

TABLE 4: FOLLOW-UP RECOMMENDATIONS BY AGE GROUP, 2019

|	25-29	30-39	40-49	50-59	60-69	25-69
Patients with ASC-US or LSIL	2,136	3,115	2,715	2,365	1,079	**11,410**
Repeat in 6 months	1,846	2,645	2,288	2,078	964	**9,830**
(%)	86%	85%	84%	88%	89%	**86%**
Colposcopy	289	460	424	283	115	**1,571**
(%)	14%	15%	16%	12%	11%	**14%**
AGC, ASC-H, HSIL, AIS or carcinoma	672	1,312	791	552	257	**3,584**
Colposcopy	672	1,308	765	490	224	**3,459**
(%)	100%	100%	97%	89%	87%	**97%**
Other Investigation	0	2	25	59	31	**117**
(%)	0%	0%	3%	11%	12%	**3%**

Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on the date of the patient's most severe Pap test in the year

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Colposcopy Follow-up Rate

The colposcopy follow-up rate is the percentage of participants recommended to have a colposcopy examination that had the follow-up procedure within 12 months of the Pap test. Colposcopies performed within one week of the Pap test are excluded, as the Pap test is unlikely to be the reason for the colposcopy referral.
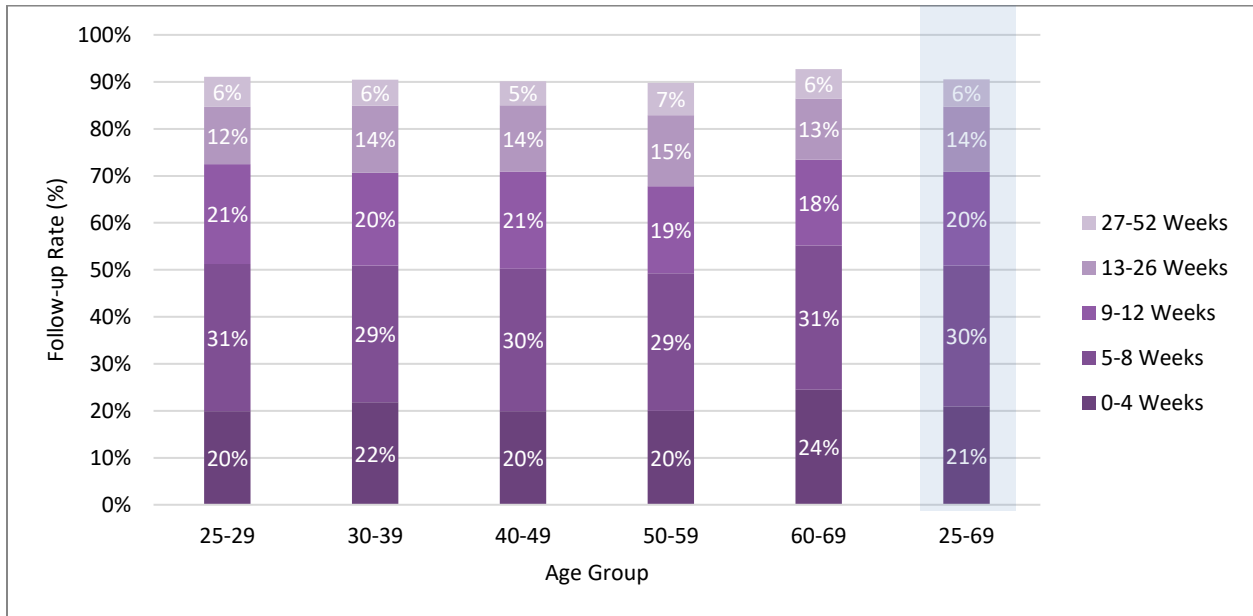
FIGURE 8: COLPOSCOPY FOLLOW-UP RATES THOSE WITH PERSISTENT ASC-US OR LSIL PAP TEST RESULT BY AGE GROUP, 2019
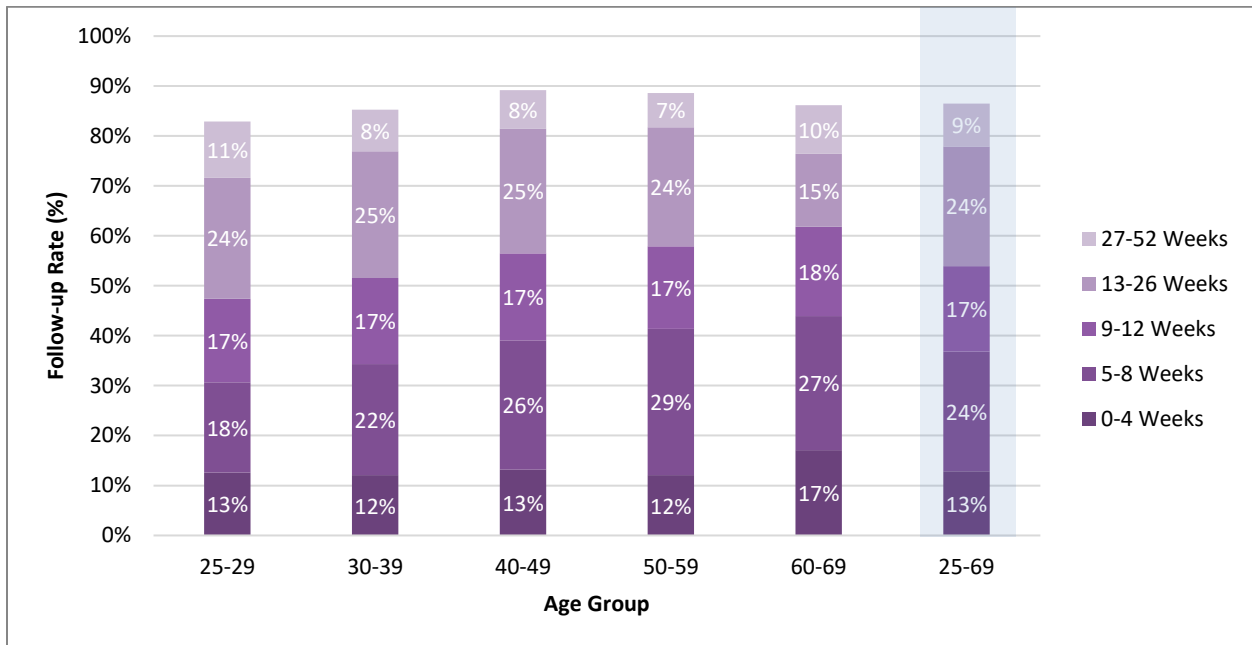
Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on patient's age on report date of the index Pap test

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FIGURE 9: COLPOSCOPY FOLLOW-UP RATES FOR THOSE WITH ASC-H,HSIL MODERATE OR AGC PAP TEST RESULT BY AGE GROUP, 2019

Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on patient's age on report date of the index Pap test

FIGURE 10: COLPOSCOPY FOLLOW-UP RATES FOR THOSE WITH PERSISTENT AGC-FN, AIS OR HSIL SEVERE PAP TEST RESULT BY AGE GROUP, 2019
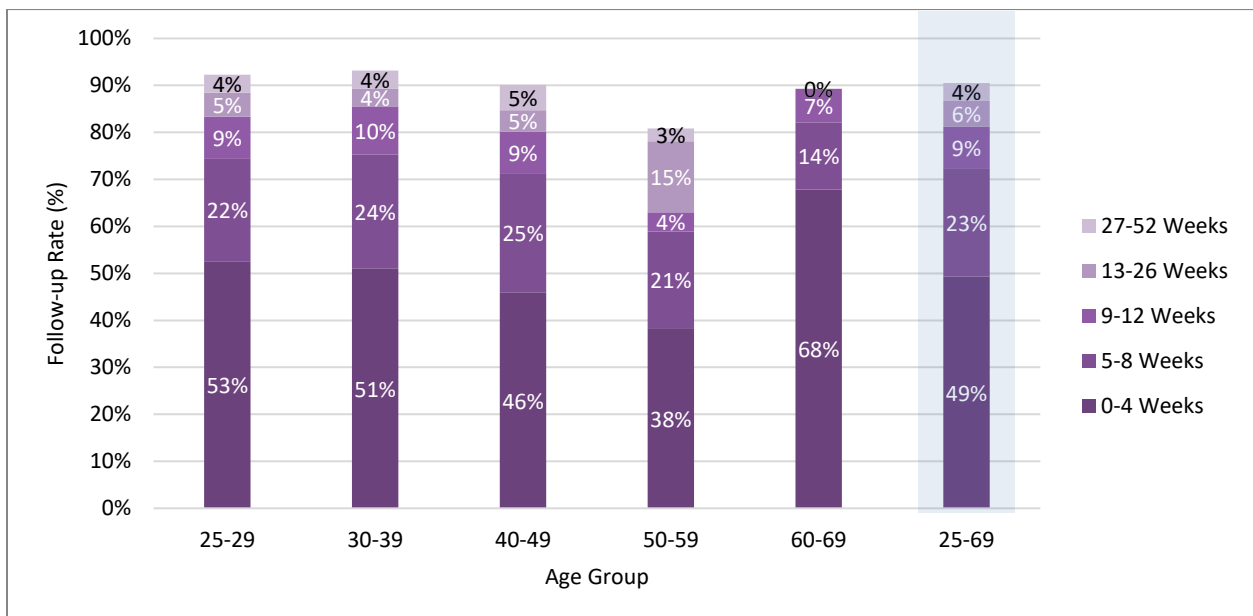
Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on patient's age on report date of the index Pap test

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Positive Predictive Value

The positive predictive value (PPV) is the chance of having histologically confirmed pathology when colposcopy has been recommended and a follow-up investigation with biopsy has been completed. For histology reporting cervical intraepithelial neoplasia (CIN) terminology is used.

TABLE 5: BIOPSY RATE, 2019

	ASC-US or LSIL	AGC	ASC-H or HSIL Moderate	AGC-FN, AIS or HSIL Severe
Recommended for colposcopy	1,573	520	2,407	531
- with biopsy performed	1,353 (86%)	436 (84%)	2,184 (91%)	482 (91%)

Notes:
1.   BC Cancer Cervix Screening data extraction date: 28/3/2024

TABLE 6: POSITIVE PREDICTIVE VALUE, 2019

|	ASC-US or LSIL	AGC	ASC-H or HSIL Moderate	AGC-FN, AIS or HSIL Severe
CIN 2 or More Severe	223 (16%)	84 (19%)	1,354 (62%)	437 (91%)
CIN 3 or More Severe	112 (8%)	76 (17%)	922 (42%)	403 (84%)
Carcinoma	1 (0%)	18 (4%)	28 (1%)	52 (11%)

Notes:
1.   BC Cancer Cervix Screening data extraction date: 28/3/2024

g) Pre-Cancer Detection Rate

Pre-Cancer Detection Rate is defined as the number of pre-cancerous lesions detected per 1,000 people screened in a 12-month period. Pre-cancerous lesions are histologically confirmed CIN 2, CIN 3 or adenocarcinoma *in situ* (AIS).

FIGURE 11: PRE-CANCER DETECTION PER 1,000 PEOPLE SCREENED BY AGE GROUP, 2019
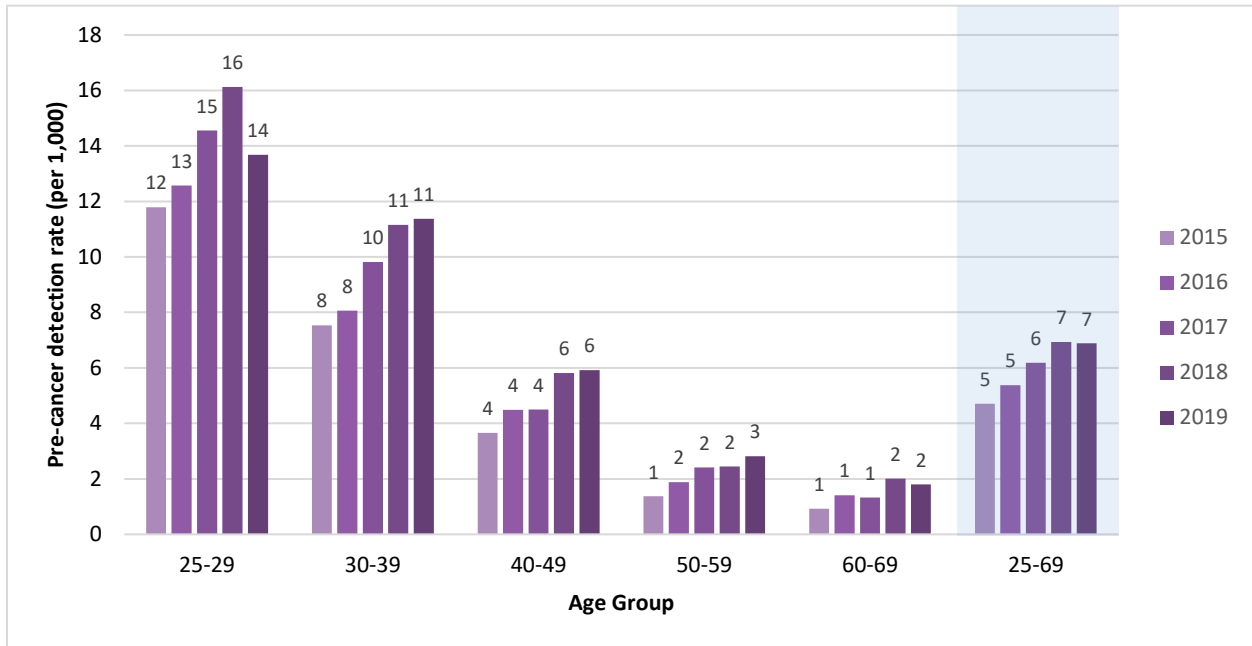
Notes:
1. BC Cancer Cervix Screening data extraction date: 26/4/2024
2. Age is computed based on the date of the patient's most severe Pap result in the year

h) Cancer Incidence

Age standardized incidence and mortality rates over time are shown in Figure 12. New invasive cervical cancers diagnosed in 2014-2018 were identified from the British Columbia Cancer Registry and the data collected by BC Cancer Cervix Screening. The age-specific cancer incidence rates for 2014-2018 are presented in Figure 13, and the cancer counts are shown in Table 7.

Age-Standardized Incidence Rate: weighted average of the age-range specific incidence rates, where the weights are the proportions of people in the corresponding age groups of the 2011 Canadian population (8.5/100,000, 2018).

Age-Standardized Mortality Rate: weighted average of the age-range specific mortality rates, where the weights are the proportions of people in the corresponding age groups of the 2011 Canadian population (1.9/100,000, 2018).

Incidence Rate: proportion of people in the population who develop cervical cancer in a given year, expressed as the number of cancer cases per 100,000 people.

Mortality Rate: proportion of people in the population who died of cervical cancer in a given year, expressed as the number of deaths per 100,000 people.

FIGURE 12: AGE STANDARDIZED INCIDENCE & MORTALITY RATE OF INVASIVE CERVICAL CANCER IN BC OVER TIME
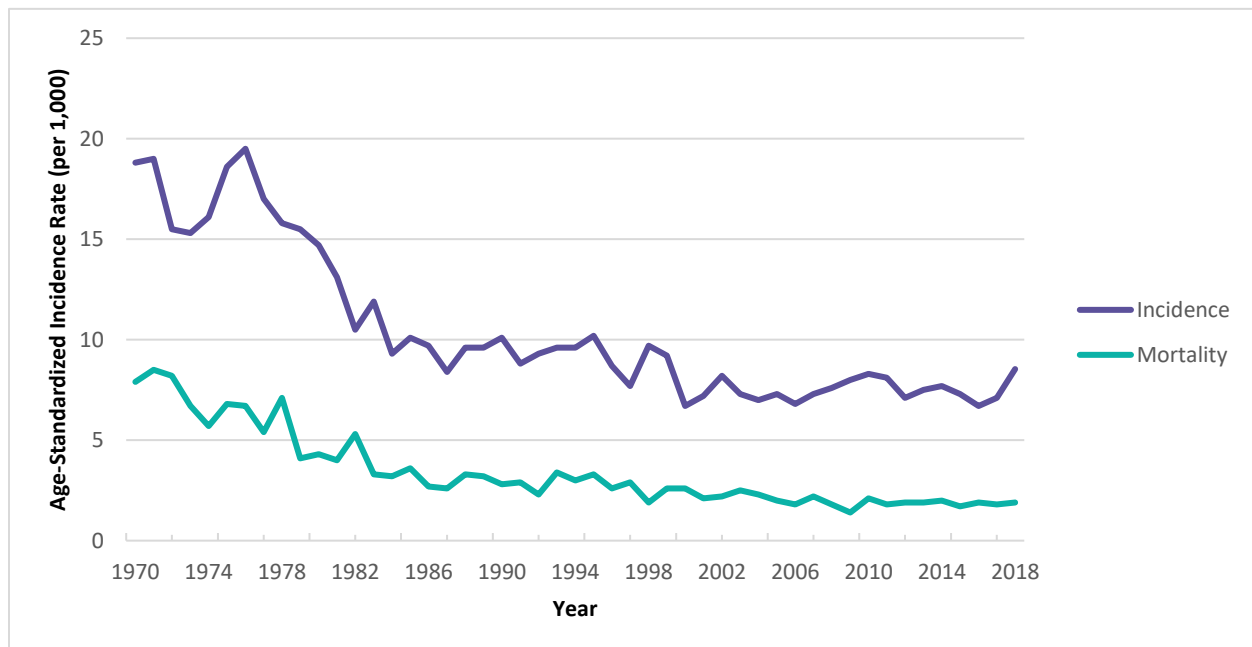
Notes:
1.   Rates are standardized to the 2011 Canadian population

FIGURE 13: INVASIVE CERVICAL CANCER INCIDENCE PER 100,000 BY AGE GROUP, 2014 – 2018
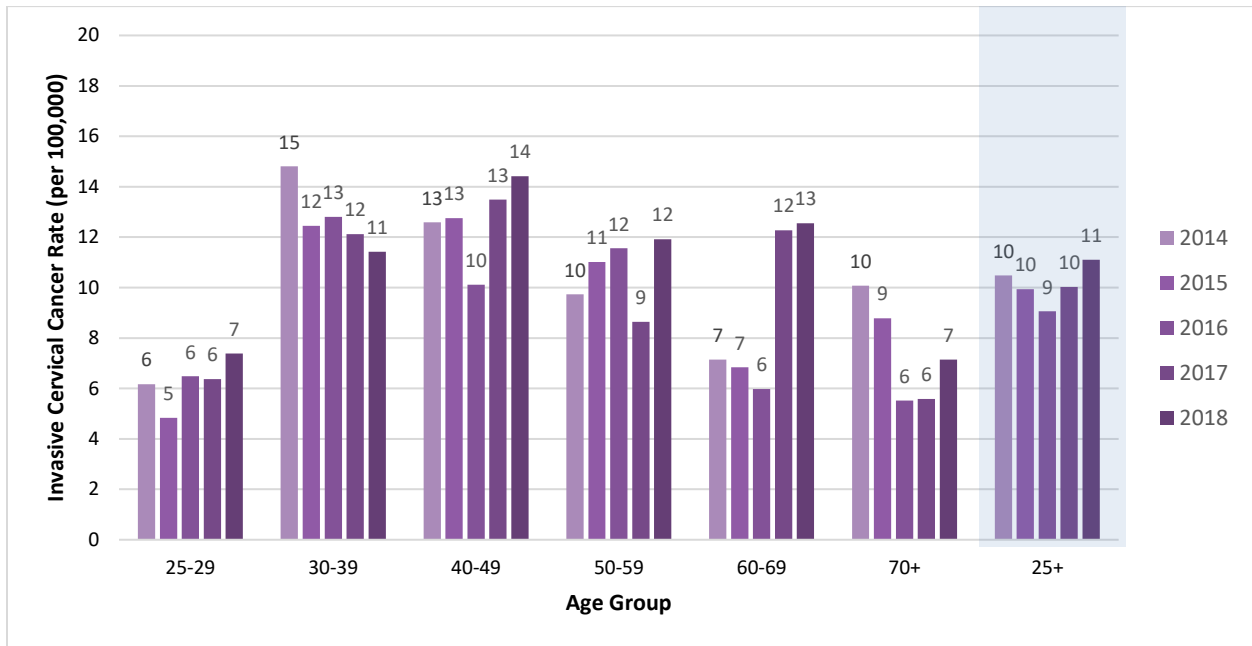
Notes:

1. Population data source: P.E.O.P.L.E. 2023 (Sept 2023), BC STATS, Service BC, BC Ministry of Citizen's Services
2. BC Cancer Cervix Screening data extraction date: 28/3/2024
3. Age is computed based on date of diagnosis

TABLE 7: NUMBER OF INVASIVE CERVICAL CANCERS BY AGE GROUP, 2014 – 2018

|		20-24	25-29	30-39	40-49	50-59	60-69	70+	20+
2018	**Number of cases**								
	All cell types	0	13	40	47	44	42	24	**210**
	Squamous cell only	0	10	25	31	29	27	20	**142**
	Incidence rate (per 100,000)								
	All cell types	0.00	7.39	11.43	14.42	11.92	12.55	7.14	**10.21**
	Squamous cell only	0.00	5.68	7.14	9.51	7.86	8.07	5.95	**6.90**
2017	**Number of cases**								
	All cell types	0	11	41	44	32	40	18	**186**
	Squamous cell only	0	7	26	25	18	25	9	**110**
	Incidence rate (per 100,000)								
	All cell types	0.00	6.37	12.12	13.49	8.64	12.27	5.59	**9.23**
	Squamous cell only	0.00	4.05	7.69	7.67	4.86	7.67	2.79	**5.46**
2016	**Number of cases**								
	All cell types	2	11	42	33	43	19	17	**167**
	Squamous cell only	2	7	34	25	26	9	11	**114**
	Incidence rate (per 100,000)								
	All cell types	1.30	6.48	12.81	10.11	11.56	5.98	5.52	**8.45**
	Squamous cell only	1.30	4.12	10.37	7.66	6.99	2.83	3.57	**5.77**
2015	**Number of cases**								
	All cell types	3	8	40	42	41	21	26	**181**
	Squamous cell only	2	6	30	31	24	14	19	**126**
	Incidence rate (per 100,000)								
	All cell types	1.98	4.84	12.45	12.75	11.01	6.84	8.78	**9.31**
	Squamous cell only	1.32	3.63	9.34	9.41	6.45	4.56	6.42	**6.48**
2014	**Number of cases**								
	All cell types	2	10	47	42	36	21	29	**187**
	Squamous cell only	2	7	35	26	23	16	21	**130**
	Incidence rate (per 100,000)								
	All cell types	1.31	6.17	14.80	12.59	9.73	7.15	10.07	**9.75**
	Squamous cell only	1.31	4.32	11.02	7.79	6.22	5.44	7.29	**6.78**

Notes:
1. Population data source: P.E.O.P.L.E. 2023 (Sept 2023), BC STATS, Service BC, BC Ministry of Citizen's Services
2. BC Cancer Cervix Screening data extraction date: 26/4/2024
3. Age is computed based on date of diagnosis

i) Screening History in Cases of Invasive Cancer

Pap tests performed within six months prior to the invasive cancer diagnosis are less likely to be done for screening purposes; these Paps are disregarded in the categorization of screening history.
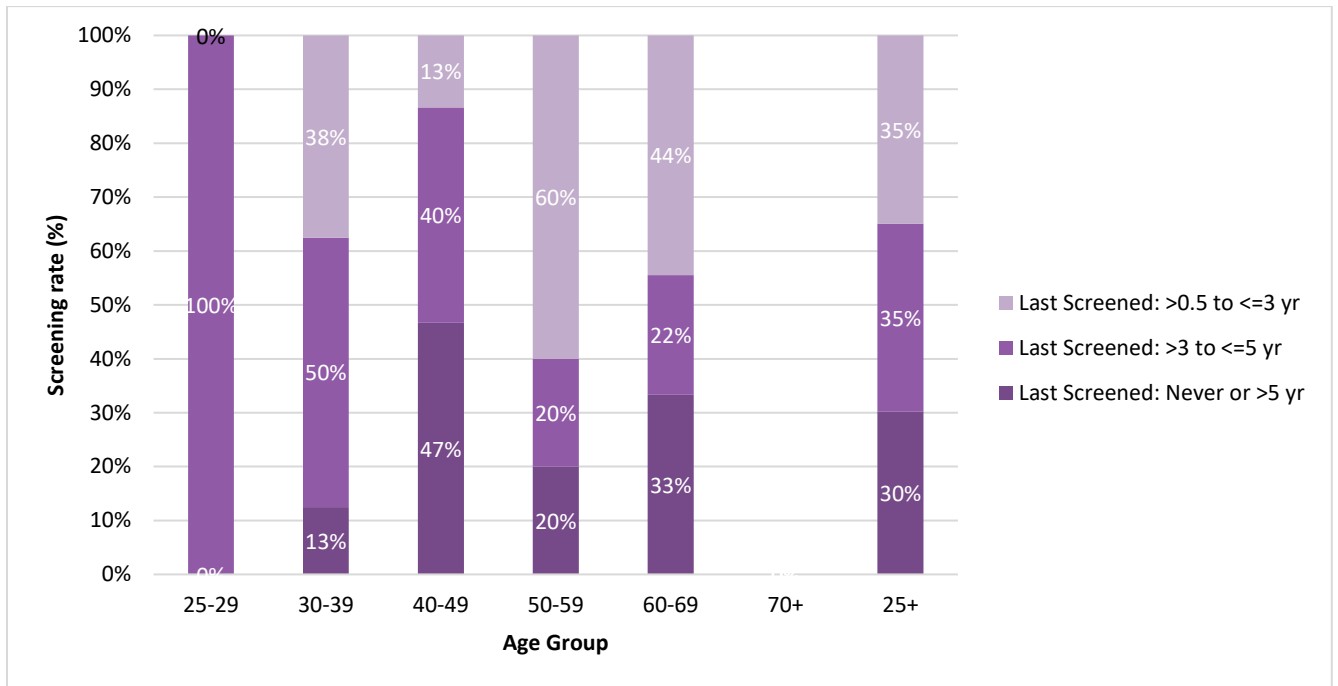
FIGURE 14: SCREENING HISTORY OF THOSE DIAGNOSED WITH SQUAMOUS CELL CARCINOMA, 2018
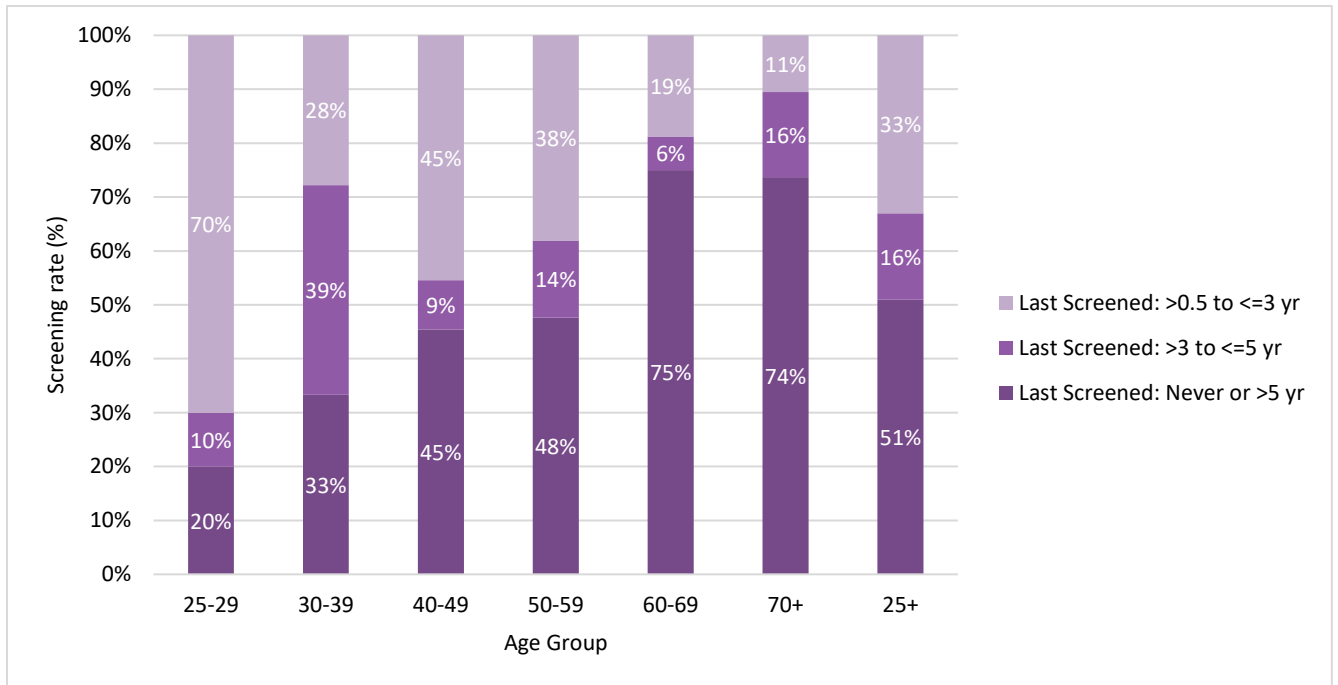
Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on date of diagnosis

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FIGURE 15: SCREENING HISTORY OF THOSE DIAGNOSED WITH ADENOCARCINOMA, 2018

Notes:
1. BC Cancer Cervix Screening data extraction date: 28/3/2024
2. Age is computed based on date of diagnosis

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APPENDIX – THE 2014 BETHESDA SYSTEM

SPECIMEN ADEQUACY

☐ Satisfactory for evaluation

☐ Unsatisfactory for evaluation

INTERPRETATION/RESULT

NEGATIVE FOR INTRAEPITHELIAL LESION OR MALIGNANCY
(When there is no cellular evidence of neoplasia, state this in the General Categorization above and/or in the Interpretation/Result section of the report--whether or not there are organisms or other non-neoplastic findings)

Non-Neoplastic Findings (optional to report)
Organisms
OTHER
  ➢ Endometrial cells (in a woman 45 years of age)
    (Specify if "negative for squamous intraepithelial lesion")

EPITHELIAL CELL ABNORMALITIES
  SQUAMOUS CELL
    ➢ Atypical squamous cells
      • of undetermined significance (ASC-US)
      • cannot exclude HSIL (ASC-H)
    ➢ Low-grade squamous intraepithelial lesion (LSIL)
      (*encompassing: HPV/mild dysplasia/CIN 1*)
    ➢ High-grade squamous intraepithelial lesion (HSIL)
      (*encompassing: moderate and severe dysplasia, CIS; CIN 2 and CIN 3*)
      • with features suspicious for invasion (if invasion is suspected)
    ➢ Squamous cell carcinoma (SCC)

GLANDULAR CELL
    ➢ Atypical (AGC)
      • endocervical cells (NOS or specify in comments)
      • endometrial cells (NOS or specify in comments)
      • glandular cells (NOS or specify in comments)
    ➢ Atypical
      • endocervical cells, favor neoplastic (AEC-FN)
      • glandular cells, favor neoplastic (AGC-FN)
    ➢ Endocervical adenocarcinoma in situ (AIS)
    ➢ Adenocarcinoma
      • endocervical
      • endometrial
      • extrauterine
      • not otherwise specified (NOS)

OTHER MALIGNANT NEOPLASMS (specified)
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