Cancer Care Nova Scotia
Many Hearts • Many Minds • One Goal
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Cancer Information for Primary Caregivers
In Practice

Understanding Cancer in Nova Scotia

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Overview

Cancer embraces a multitude of diseases with different etiologies, presentations and degrees of severity. It poses an ever-increasing threat to populations and health care systems on all fronts, local, national and international. It has no boundaries, affecting people across genders, ages, ethnicities and geography. Cancer is now a chronic disease that affects approximately 153,100 Canadians annually and more than 11 million people worldwide.

In Nova Scotia, nearly 8,400 residents[1] experienced a cancer diagnosis in 2004. Today, nearly 28,000 Nova Scotians (1 in 34) are living with an invasive cancer, diagnosed within the previous 15 years. Cancer incidence increases with age and in Nova Scotia, two-thirds of new cases occur in those over 60 years of age. As the baby boomers age, the incidence of cancer is expected to increase substantially and so too the demands for treatment and care. The health care system currently struggles to address the pressure resulting from the growing cancer burden and the spiraling costs and complexity of care. Enhanced disease surveillance and prospective monitoring of system performance will be essential for the provision of sustainable, effective, and timely cancer services.

In parallel to informed cancer planning and system management, a critical need for reducing the future burden of cancer has emerged. Nearly 50% of all cancers are deemed preventable. Screening and early detection programs to identify and treat precancerous conditions and early stage disease will be crucial to complement risk factor reduction through primary prevention. To date, the main approach in the battle against cancer has been reactive, focusing on diagnosis and treatment. Approximately 80% of national research funding is allocated to basic research, diagnosis and treatment; supportive and palliative care and cancer prevention share the remaining funds. This reactive tactic, alone, is not sustainable. Clearly, we must prepare to address the emerging cancer demand and concurrently take advantage of any and all opportunities to reduce the future burden. It will take time to reap the benefits, but increased efforts at prevention and early detection must be emphasized now. Cancer control involves a continuum from prevention and screening, diagnosis through treatment, supportive care and palliative care. A proactive and comprehensive approach focusing upon all components of the continuum, as well as the transitions that bridge these components, is key to our future.

Current Cancer Incidence

More than 25,000 people in Nova Scotia were diagnosed with invasive cancer between 2000 and 2004. There were 9% more cancers diagnosed in males (13,265 people) than in females (11,809 people; see Tables 1 and 2, next page). On average, approximately 5,000 invasive cases were registered annually. Prostate, lung and colorectal cancers accounted for 59% of all cancer cases recorded for males between 2000 and 2004. A similar proportion (57%) was accounted for by breast, colorectal and lung cancers for females. Among males, prostate cancer was the most frequently diagnosed cancer type, affecting nearly 700 men in the province annually (Table 1). Females were most often diagnosed with breast cancer

[1]*Estimate includes invasive (5,147 cases), in situ (947 cases) and basal and squamous cell skin cancers (2,360 cases) diagnosed in 2004.*

Table 1. **Incidence counts[1] and rates of invasive cancer among males, Nova Scotia 2000-2004.[2]**

MALES	Age at Diagnosis						Total New Cases		Incidence Rate[3] per 100,000	
Cancer Type	**0-29**	**30-49**	**50-59**	**60-69**	**70-79**	**80+**	**2000-04**	**2004**	**2000-04**	**2004**
Prostate		77	546	1,240	1,120	471	3,454	733	136.2	137.4
Lung, Trachea and Bronchus		81	319	695	838	362	2,295	470	90.5	88.7
Colon and Rectum (Colorectal)	7	136	336	506	627	435	2,047	409	80.2	76.7
Bladder		30	70	152	195	144	591	101	23.4	19.3
Non-Hodgkin's Lymphoma	19	91	127	131	114	55	537	119	20.7	22.3
Kidney, Ureter and Other Urinary	5	57	127	145	120	59	513	105	19.6	19.2
Melanoma of Skin	13	99	95	124	92	63	486	105	19.0	19.5
Oral (buccal cavity and pharynx)		71	101	123	84	41	426	86	16.1	15.9
Stomach		19	42	88	94	62	307	65	12.1	12.1
Leukemia	34	45	39	44	72	62	296	68	12.0	13.5
Pancreas		14	37	81	100	54	286	61	11.3	11.5
Brain	21	40	37	54	31	18	201	39	8.0	7.2
Oesophagus		14	29	64	58	34	199	40	7.8	7.6
Larynx		6	36	51	54	17	164	36	6.3	6.6
Testis	49	69	7				129	33	6.2	8.3
ALL CANCERS	**218**	**1,009**	**2,139**	**3,790**	**3,945**	**2,164**	**13,265**	**2,742**	**522.7**	**518.8**

[1] Age-specific/site-specific counts <5 are not presented to ensure confidentiality.
[2] Incidence counts and rates for less common cancer types are available at www.cancercare.ns.ca.
[3] Rates are age-standardized to the 1991 Canadian population.

Table 2. **Incidence counts[1] and rates of invasive cancer among females, Nova Scotia 2000-2004.[2]**

FEMALES	Age at Diagnosis						Total New Cases		Incidence Rate[3] per 100,000	
Cancer Type	**0-29**	**30-49**	**50-59**	**60-69**	**70-79**	**80+**	**2000-04**	**2004**	**2000-04**	**2004**
Breast	9	615	800	656	680	504	3,264	647	105.0	101.4
Colon and Rectum (Colorectal)		113	227	348	524	581	1,797	363	53.6	52.9
Lung, Trachea and Bronchus		96	270	458	545	276	1,649	333	53.2	52.1
Body of Uterus		59	155	154	115	85	568	120	18.4	18.8
Melanoma of Skin	20	143	97	77	78	57	472	99	16.4	16.5
Non-Hodgkin's Lymphoma	7	63	83	87	98	65	403	86	13.2	13.4
Kidney, Ureter and Other Urinary	7	48	54	76	96	77	358	69	11.5	10.9
Ovary	8	48	78	71	80	53	338	56	11.1	8.4
Cervix	24	159	53	26	30	18	310	62	12.2	11.2
Pancreas		14	30	49	84	100	279	72	8.1	10.4
Leukemia	29	37	25	35	58	62	246	47	8.3	7.8
Thyroid	24	102	43	24	15	12	220	51	8.8	9.7
Oral (buccal cavity and pharynx)		15	27	53	42	34	191	43	6.1	6.7
Bladder		8	21	39	64	51	183	36	5.6	5.2
Stomach		14	17	30	54	55	170	38	5.0	5.5
Brain	21	24	24	23	32	25	149	36	5.3	5.9
ALL CANCERS	**224**	**1,681**	**2,163**	**2,455**	**2,894**	**2,392**	**11,809**	**2,405**	**380.1**	**374.3**

[1] Age-specific/site-specific counts <5 are not presented to ensure confidentiality.
[2] Incidence counts and rates for less common cancer types are available at www.cancercare.ns.ca.
[3] Rates are age-standardized to the 1991 Canadian population.

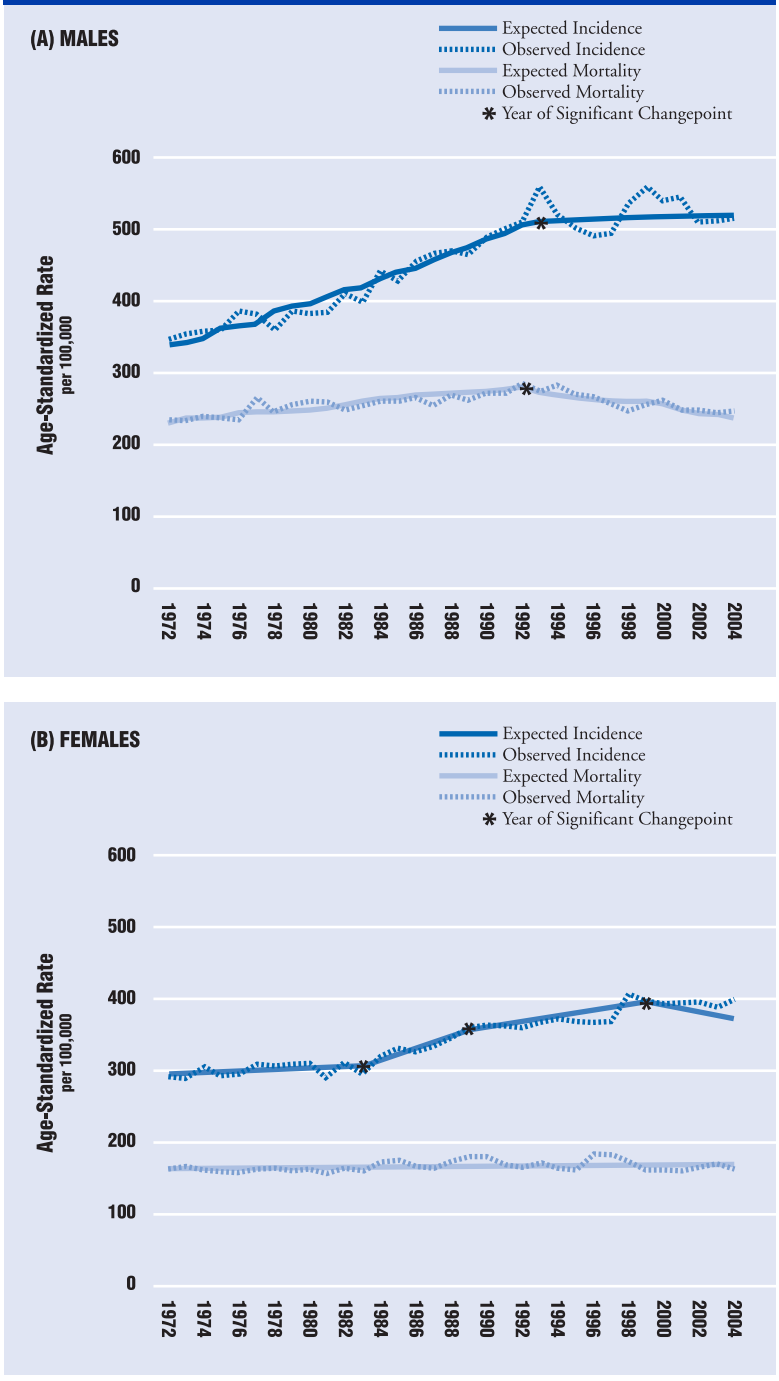
(Table 2). In Nova Scotia, 647 women were diagnosed with invasive breast cancer in 2004. Age-standardized cancer incidence rates in Nova Scotia tend to be higher than those reported for Canada as a whole, with lung, colorectal, kidney, melanoma and cervical cancers driving this difference. Lung cancer age standardized incidence rates (ASIR) in Nova Scotia are among the highest in Canada. The disease affects a larger proportion of males than females, with ASIR in males being 41% higher (90.5 cases per 100,000; 95% CI: 86.8-94.3; Table 1) than those of females (53.2 cases per 100,000; 95% CI: 50.6-55.8; Table 2).

This gap in lung cancer incidence rates between sexes has narrowed in recent years as the rates in males gradually decreased while those in females continued to increase. An increased risk of developing lung cancer has been linked to both tobacco consumption and exposure to environmental tobacco smoke. In fact, 80-90% of all cases of lung cancer are attributable to tobacco consumption, with an average lag time of about 20 years. Currently, the prevalence of regular smoking remains high among adult Nova Scotians (23%), pregnant women (22%) and youth (20%, ages 15-19 inclusive).

Trends Over Time

Examination of time trends in cancer incidence and mortality can provide key information on the potential causes of cancer and the success of prevention and intervention efforts. Many factors can influence the onset of cancer and the outcome of treatment: exposure to risk factors (e.g., age, physical activity, diet,

Figure 1. **Trends in age-standardized incidence (dark blue) and mortality (light blue) rates, all invasive cancers, males (A) and females (B), Nova Scotia 1971-2004. Fitted lines (solid lines) indicate general tendencies and asterisks (*) indicates year of a significant change in trend.**



smoking, ionizing or solar radiation, alcohol, drugs, parasites, viruses, environmental and/or occupational exposure), time lags in the manifestation of the disease, varying degrees of effort in detecting the disease, treatment options chosen, variation in population structure due to immigration/emigration, lifestyle changes and education.

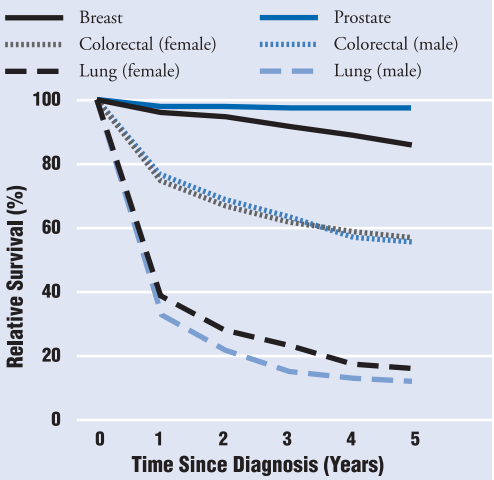
Cancer incidence and mortality rates for both sexes have increased since 1971 (Figure 1). Among males, incidence rates increased 54.9% (335 to 519 cases per 100,000); among females rates increased 22.6% (305 to 374 cases per 100,000). Gender-related differences in the cancer incidence rates have gradually increased over time but have remained relatively constant over the past decade, with males being, on average, 37% more likely to be diagnosed with invasive disease than females. Both sexes have shown a reduction in the annual rate of increase over time.

The rates of cancer incidence appear to have stabilized among Nova Scotians throughout the 1990s, with male and female rates increasing at an average of 0.4% and 0.7% annually, respectively. The levelling off of male cancer incidence rates has been observed since 1993, while that of females has been more recent (1999).

Male mortality due to cancer increased 14.3% between 1971 and 2004. The rate reached its peak in 1992 when 284 cancer-related deaths per 100,000 were reported annually, and has since declined at a rate of 1.2% per year, to approximately 243 deaths per 100,000. This later trend was largely a result of a decline in the rate of death due to lung cancer, which decreased at a rate of 1.8% per year during the same period.

Female mortality due to cancer has remained relatively stable since 1971, with an average of approximately 166 deaths per 100,000 per year.

Figure 2. **Five-year relative survival, invasive common cancers, diagnosed in Nova Scotia 1997-2001.**



Cancer Survival

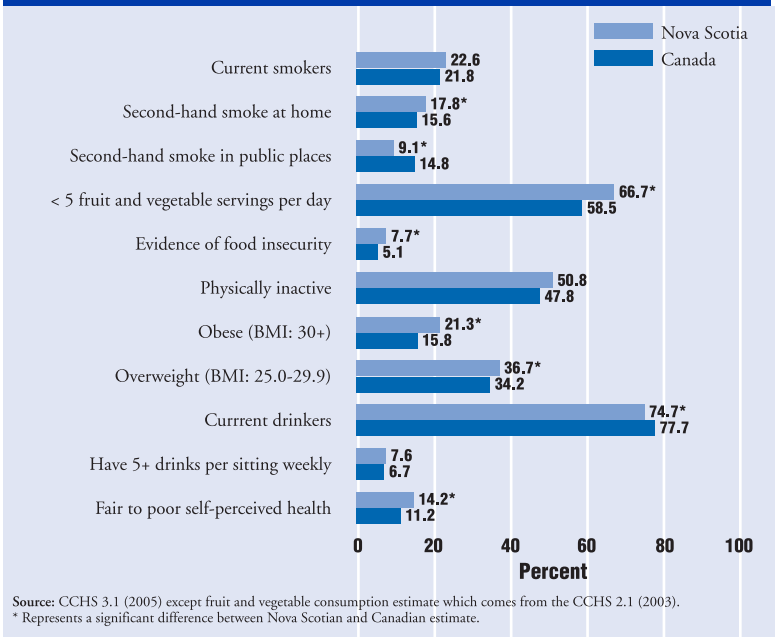
The analysis of cancer survival considers the length of time between the initial diagnosis and death of a cancer patient. It is influenced by the type and the location of cancer, the nature of the disease (e.g. rate of tumour development), the age of the patient and stage of the disease at diagnosis, the availability and effectiveness of treatment, variation in diagnostic techniques and prior health.

Figure 2 describes the five-year survival experience of Nova Scotians diagnosed with common invasive cancers (prostate, breast, lung or colorectal cancers) in the years 1997-2001 followed to the end of 2004. To account for the age dependence of survival ratios, survival is expressed relative to the mortality rate of the general population, largely unaffected by cancer. The five-year relative survival ratios were highest for prostate cancer (98.3%), followed by breast (86.3%), colorectal (Men: 58.5%, Women: 56.3%) and lung cancer (Men: 14.6%, Women: 16.9%). Of particular interest, is a small but significant improvement observed in the survival of women diagnosed with breast cancer in the early 1990s compared to women diagnosed more recently, for which the five-year relative survival ratios increased from 82 to 86%. This improvement in cancer outcome may be the result of a combination of increased screening efforts and better adherence to evidence-based treatment guidelines.

Cancer Control

Historically, attempts to control cancer have been largely reactive, focusing almost exclusively on diagnosis and treatment. However, cancer control involves a continuum of potential

Figure 3. **Prevalence of modifiable cancer risk factors, Nova Scotia and Canada 2005.**



Source: CCHS 3.1 (2005) except fruit and vegetable consumption estimate which comes from the CCHS 2.1 (2003).
* Represents a significant difference between Nova Scotian and Canadian estimate.

interventions that includes disease prevention, screening, diagnosis, treatment, supportive care and palliative care. A proactive and comprehensive approach, focusing on all components of the continuum, as well as the transitions that bridge these components, is necessary if cancer care is to be sustainable and viable.

A comprehensive approach to cancer prevention that encourages the adoption of healthy lifestyle choices and reduces potential social, behavioural and environmental cancer risk factors has been repeatedly identified as a necessary component of a comprehensive cancer control strategy.

In Nova Scotia, a number of provincial strategies have been established including Healthy Eating Nova Scotia; Active Kids, Healthy Kids; A Comprehensive Tobacco Control Strategy and the newly developed Chronic Disease Prevention Strategy. Promoting healthy living, addressing known risk factors and reducing the future burden of chronic diseases such as cancer are key targets within these strategies.

Cancer prevention aims to minimize and eliminate modifiable risks that cause cancer. In developed countries, nearly 50% of all cancers are deemed preventable through the adoption of healthy eating habits, active and tobacco-free lifestyles and by avoiding exposure to ultraviolet rays and known environmental carcinogens and infectious agents. Risk factors as such, are numerous and often engrained within our lives and must be considered within the context of the broader determinants of health (e.g. income, education, culture). Healthy lifestyle must become the norm in Nova Scotia. Currently, 22.6% of Nova Scotians smoke, 66.7% do not meet the daily recommended intake of fruit/vegetables, 50.8% are physically inactive and 58% are overweight/obese, yet 85.8% of the population consider themselves healthy (Figure 3).

Screening has as its goal the detection of cancer or its precursor conditions early in the disease development, before symptoms appear. The implementation of population-based screening depends on the natural history of the disease, the availability of effective early treatment options, and evidence of benefits and cost-effectiveness. Evidence currently supports population-based screening for cervical, breast and colorectal cancers.

Two large screening trials in Europe and the United States are currently evaluating the effectiveness of screening to reduce mortality from prostate cancer. Interest in screening for other cancers such as cancer of the lung, liver, testis and ovaries continues to grow, but currently available tests have not been shown to be effective.

Surgery (including biopsies), chemotherapy and radiotherapy represent the primary forms of cancer treatment available today. They are tools that continue to be refined with advances in research, technology and a better overall understanding of the disease. Surgery is required to

Cancer Care Nova Scotia is a program of the Department of Health. Its mandate is to evaluate, coordinate and strengthen the cancer system in Nova Scotia.

Cancer Care Nova Scotia works with and supports professionals and stakeholders in the health care system to bring about patient-centred change. Its ultimate goal is to reduce the burden of cancer on individuals, families, communities and the health care system.

In Practice is a supplement to *Cancer Care Nova Scotia's* newsletter. It is written specifically for primary care practitioners with information that we hope will make a difference in your cancer practice.

Please contact Christine Smith, Communications Coordinator, *Cancer Care Nova Scotia,* by phone at 902-473-2932 or by email at christine.smith@ccns.nshealth.ca with comments or suggestions for future topics.

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establish the diagnosis in almost all cancers and it is the primary form of therapy in almost half of all diagnoses. Nearly one-half of all cancer patients are also treated with radiation therapy at some point in the trajectory of their disease. An even larger number of patients are treated with chemotherapy, including those offered hormonal treatment to manage breast or prostate cancers.

Cancer supportive care ensures the provision of services required to meet the physical, social, emotional, nutritional, informational, psychological, spiritual and practical needs of patients. These needs may emerge throughout the spectrum of the cancer experience - from diagnosis through treatment or follow-up phases, encompassing issues of survivorship, recurrence, palliative care and bereavement.

With the aging of the Nova Scotia population, an increasing number of people will be diagnosed with cancer. Supporting, improving and expanding supportive and palliative care services will be critical to ensure that all those in need receive the services they deserve.

Summary

In Nova Scotia, we estimate that 23 individuals are diagnosed daily with some form of cancer, a number that will continue to increase with our rapidly aging population. The burden of the disease is real, as is the challenge faced by the health care system to provide and plan for care. Equally challenging and important is the need to broaden our focus from 'illness-management' to also emphasize a 'wellness-approach' that supports our people and communities to adopt a healthier way of living.

Full Report Available

The publication, *Understanding Cancer in Nova Scotia*, from which this report is abstracted, profiles cancer incidence in more detail and addresses issues relating to cancer survival, prevalence and projections, while emphasizing the overarching need for a coordinated and comprehensive cancer control program.

Full references to relevant scientific literature are also contained in this report. It is available in electronic form on *Cancer Care Nova Scotia's* website at: *www.cancercare.ns.ca/media/documents/understandingcancer1.pdf*