Ryan R. Woods, MSc, Max J. Coppes, MD, PhD, MBA, Andrew J. Coldman, PhD

Cancer incidence in British Columbia expected to grow by 57% from 2012 to 2030

A comprehensive provincial strategy is needed to address the demand for cancer-related services expected to follow a rise in cases as the province's population increases and ages.

ABSTRACT

Background: **The population of British Columbia is growing and is forecast to reach 5.6 million by the year 2030. With a significant increase in the number of seniors anticipated, new cancer diagnoses in the province are expected to increase substantially over the next 15 years.**

Methods: **Population projections from BC Stats and cancer incidence and mortality data from the BC Cancer Registry were used to estimate the number of new cases of cancer and cancer deaths for BC. To describe recent trends in cancer incidence and mortality, rates were age-standardized to the 1991 Canadian population and summarized using the annual percentage change from 2002 to 2011. Trends in cancer rates were then modeled using Poisson regression, fitting separate models for each type of cancer which were used to generate extrapolations of cancer rates through to 2030.**

Results: **By 2030, the annual number of new cases of cancer in BC is expected to increase by 57%. The magnitude of the projected increase varies by cancer and by sex, reflecting differences in current cancer trends. Today's four most common cancers, lung cancer, colorectal cancer, breast (female) cancer, and prostate cancer, are expected to continue to be the most commonly diagnosed cancers in 2030. Notable increases are expected in melanoma and thyroid cancer in both sexes and uterine cancer in females. Lung cancer will continue to be the most common cause of cancer death in the province, while colorectal cancer, pancreatic cancer, and hematological malignancies are all expected to be significant causes of cancer mortality in 2030.**

Conclusions: **The expected rise in new cancer cases and deaths between 2012 and 2030 is substantial and means BC will need to prepare for increased cancer-related demands in laboratory and diagnostic services, surgical and radiation treatment, systemic therapy, pain services, and palliative care. With more cancer patients age 70 and older expected, BC will also need to increase expertise in the emerging area of geriatric oncology. Given the complexity and growing cost of cancer care overall, a provincial strategy is needed to address future demand for services.**

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Background

The population of British Columbia is growing and is forecast to reach more than 5.6 million by the year 2030.[1] At the same time, BC's population is aging; the rapid aging of Canada's population in recent years has been well described in both the academic literature and by Canadian media, as have the potential impacts of this demographic shift on the social system and broader economy.[2-6] From a health care perspective, an aging population will give rise to a greater burden of chronic diseases associated with older age, and consequently is expected to increase demand for health care services. One group of

Mr Woods is scientific director of the BC Cancer Registry, Cancer Control Research, BC Cancer Agency. Dr Coppes is chief medical and academic officer, Renown Health, Reno, Nevada; affiliate professor of medicine at UBC; and adjunct professor in the Faculty of Health Sciences at SFU. From 2012 to 2014 he was vice president of Provincial Cancer Care and Research for the Provincial Health Services Authority, and head of the BC Cancer Agency. Dr Coldman is past vice president of Population Oncology, BC Cancer Agency, and an emeritus scientist in Cancer Control Research, BC Cancer Agency.

diseases closely associated with older age is cancer. Overall rates of cancer increase with age for both men and women and reach peak incidence between age 70 and 90. Despite having the lowest overall cancer rates in Canada,[7] British Columbians can be expected to experience substantially more cancers than in the past. Insight into the predicted growth is essential for health care providers and those responsible for planning cancer-related services in BC so they can develop strategies that will address this growth.

Projections for future cancer cases and deaths have been produced by cancer control agencies and researchers for a number of years.[8-13] The BC Cancer Agency produces new forecasts each year for the province of BC. These projections are used by health care planners to determine where future treatment infrastructure, such as regional cancer centres, or treatment delivery equipment may be required; these projections also inform decisions about the number of specialists that need to be recruited to meet anticipated demands. Cancer projections have generally focused on new cases and mortality (diagnosis and death) to identify the points in the cancer care continuum where health service utilization is highest. While not the focus of this report, it is increasingly recognized that the burden of cancer care is affected not just by new cases (incidence) but also by existing cases (prevalence). With new and more effective treatments available, patients with cancers diagnosed years ago continue to live and require ongoing therapies. It is therefore important to consider any increase in incidence as only part of the growing cancer burden faced by agencies responsible for cancer care, albeit an important one.

As in other jurisdictions, cancer care in BC is complex and multidisciplinary, and is provided by many different health organizations across the province, meaning that the anticipated changes in the number of cancer cases will have a broad impact.

Methods

Estimating future cancer numbers traditionally requires two key pieces of information: population projections broken down by age and sex, and projections for future cancer cases broken down by age, sex, and cancer type. For this report, population projections were obtained from BC Stats, the central statistical agency of the province of BC. BC Stats generally releases a version of their population projections, known as PEOPLE, once a year. This report utilized PEOPLE 2012, which includes population projections by regional health authority, age, and sex through to 2036.[1]

Data on cancer incidence and mortality were obtained from the BC Cancer Registry, the provincial population-based registry of all incident cases of cancer reported in BC residents. All invasive cancers were included in the incidence projections reported here, with the exception of nonmelanoma skin cancers. Models and projections for bladder cancer incidence included in situ cases of bladder cancer, consistent with other published cancer statistics for bladder cancer. Rates were tabulated by regional health authority, age (seven groups: 0 to 19 years, 20 to 39, 40 to 49, 50 to 59, 60 to 69, 70 to 79, 80+), sex, calendar year, and 24 cancer type groupings based on those used in a major statistical publication of Canadian cancer statistics.[7]

To describe recent trends in cancer incidence and mortality, rates were age-standardized to the 1991 Canadian population and summarized using the annual percentage change (APC) from 2002 to 2011. This measure is calculated assuming that rates change linearly over the period on the log-scale. One of the advantages of this summary method is that it yields change estimates that are comparable across rare and common cancers.

Cancers were grouped into five possible categories based on both the statistical significance of the estimated trend and the magnitude of the APC over the period studied. Rates were considered to be *increasing significantly* if the trend in the age-standardized rates was statistically significant and the magnitude of the APC was greater than 1%; if the trend was either statistically significant or the APC greater than 1% (but not both) the rates were considered to be *increasing slowly*. Similarly, any statistically significant decrease with an APC of less than –1% was considered to be *decreasing significantly*; if the trend was statistically significant or the APC less than –1% (but not both) the cancer was considered to be *decreasing slowly*. Any cancers with trends that were not statistically significant and APC values less than or equal to 1% or –1% were considered *stable*.

Trends in cancer rates were analyzed using Poisson regression models, fitting separate models for each type of cancer and then using these to generate extrapolations of cancer rates through to 2030. The best model for each cancer was selected by comparing the fit of models that included any subset of the following variables: sex, age, regional health authority, year of diagnosis, and potential interactions between these terms. Model fit was assessed using the Akaike information criterion (AIC), with the best model considered to be the one with the lowest AIC value.

As cancer incidence rates for breast and prostate cancer have historically been more volatile than rates for other

cancers because of population screening, average rates for the past 2 years were estimated for each age group and used to project future incidence.

Projections of future cancer deaths were generated using a similar methodological approach, with the exception that statistical models were used to forecast future cancer rates for breast and prostate cancers in place of the average rates used for incidence. Model-based approaches to forecasting breast and prostate cancer mortality rates are possible as trends in mortality rates are more stable than the generally volatile incidence rates for these cancers.

Results

The population of BC is forecast to increase by 22% in the next 15 years;[1] this represents an increase of more than 1 million residents between 2012 and 2030. Of greater relevance to the future number of new cancer cases is the expected growth in the number of seniors in the province: the population age 60 and older is expected to grow by 61% over this period, and the population age 70 and older is expected to grow by 87%. Presented another way, in 2012 about 1 in every 9 BC residents was older than 70; by 2030 this number is expected to be closer to 1 in 6. This will mean that of the more than 5.6 million residents expected to live in BC in 2030, more than 1.6 million will be older than 60 and close to 1 million will be older than 70.

Trends

Trends in cancer incidence in the province have generally been stable or decreasing in recent years for both males and females; when all cancers are examined together, the rates have been essentially flat over the past decade (–0.2% APC for males; 0.4% APC for females). Despite this, there are a number of cancers that have shown increases, most notably melanoma and thyroid cancer in both sexes, testicular cancer in males, and uterine cancer in females (**Table 1**). Trends in the rates

Table 1. Trends in incidence and mortality rates for selected cancers in BC, 2002 to 2011.

Cancer incidence			
Trend pattern	**Trend strength**	**Males (annual percentage change)**	**Females (annual percentage change)**
Increasing	Significantly	kidney (1.1*), melanoma (1.9), multiple myeloma (1.2), oral (1.2), testis (3.6), thyroid (5.3)	thyroid (3.6), multiple myeloma (2.3), melanoma (2.5), liver (1.8), uterus (2.3)
	Slowly	liver (1.0)	breast (1.0)
Stable	Stable	bladder (1.0), brain (–0.7), colorectal (–0.2), esophagus (0.4), leukemia (0.7), pancreas (0.6), prostate (–0.6), all other cancers (–0.5)	bladder (–0.3), brain (–0.3), cervix (0.8), kidney (–0.4), larynx (0.7), leukemia (0.1), lung (–0.8), non-Hodgkin lymphoma (0.2), oral (0.8), ovary (–0.7), stomach (0.5), all other cancers (–0.3)
Decreasing	Significantly	Hodgkin lymphoma (–2.1), larynx (–1.8), lung (–2.0), non-Hodgkin lymphoma (–1.1), stomach (–1.5)	esophagus (–3.0), pancreas (–2.0), Hodgkin lymphoma (–1.7)
	Slowly	—†	Colorectal (–0.7)
Cancer mortality			
Trend pattern	**Trend strength**	**Males**	**Females**
Increasing	Significantly	liver (2.7)	liver (1.6), bladder (1.9), uterus (2.3)
	Slowly	—	—
Stable	Stable	bladder (–0.1), brain (–0.7), kidney (–0.4), pancreas (0.1)	leukemia (–1.0), brain (0.6), Hodgkin lymphoma‡ (0.8), thyroid (–0.4)
Decreasing	Significantly	colorectal (–1.7), esophagus (–1.1), Hodgkin (–1.1), larynx (–5.9), leukemia (–2.6), lung (–2.9), non-Hodgkin (–3.0), oral (–1.0), prostate (–2.8), stomach (–4.4), testis (–3.3), thyroid (–4.2), all other cancers (–1.6)	breast (–3.0), cervix (–3.0), colorectal (–1.2), esophagus (–2.9), kidney (–2.7), larynx (–4.6), lung (–1.2), melanoma (–3.3), multiple myeloma (–3.1), non-Hodgkin lymphoma (–2.0), oral (–3.7), ovary (–2.6), pancreas (–3.2), stomach (–4.2), all other cancers (–3.1)
	Slowly	—	—

* Value in parentheses is the annual percentage change (APC) in the age-standardized rates
† Dash indicates that no cancers met this criterion
‡ Hodgkin lymphoma mortality in women is based on very few events, and trends are thus estimated from the APC of the crude rates over the period

of cancers such as these, which are becoming more common, will tend to exacerbate the growth in the number of new cases brought on by population growth and aging. For melanoma of the skin, the annual percentage changes for males and females were estimated to be 1.9% and 2.5%, respectively; thus, melanoma has been increasing in our population irrespective of aging and population growth. Thyroid cancer has the largest estimated APC values for any of the cancers studied for both males (5.3%) and females (3.6%); thus, we can expect a continued increase in numbers of annual cases of thyroid cancer in the coming years.

Overall, trends in cancer mortality rates in BC have been encouraging in recent years. The total cancer mortality rates have been declining by about 2% per year over the past decade. For males, strong decreases in mortality have been seen for some of the major cancers, including non-Hodgkin lymphoma, lung cancer, prostate cancer, and colorectal cancer. For females, mortality due to common malignancies such as breast cancer, colorectal cancer, non-Hodgkin lymphoma, and pancreatic cancer has declined significantly. Although the rate of decline for female lung cancer mortality (APC –1.2%) is not as strong as the decline for male lung cancer mortality (APC –2.9%), it is declining at last after lagging behind for the past decade. Unfortunately, mortality rates have increased for liver cancer for both males (APC 2.7%) and females (APC 1.6%), and this will contribute to a significant percentage increase in the number of deaths due to liver cancer over the coming 15 years.

Table 2. New cancer cases reported in BC for 2012 and projected for 2030.

	Reported 2012		Projected 2030	
All cancers (total)	23 521		37 095	
Males (total)	12 192		19 690	
Females (total)	11 329		17 405	
	Males	**Females**	**Males**	**Females**
Selected cancers				
Breast (female)	—	3198	—	4875
Colorectal	1657	1364	2410	1780
Gastrointestinal (other)*	988	593	1535	720
Lung	1501	1492	1660	2110
Lymphoma/leukemia	996	742	1455	1090
Melanoma	522	443	1275	1220
Prostate	3152	—	5170	—
All other cancers	3376	3497	6185	5605

*Liver, pancreas, stomach, and esophagus

New cases of cancer

Combining population projections and predicted future cancer incidence rates extrapolated from recent trends provides estimates of future numbers of cancer cases. The number of new cancer cases for BC is predicted to increase quite dramatically over the period studied, rising from 23 521 cases in 2012 to more than 37 000 in 2030, a 57% increase. Significant increases in the number of new cases will be observed in both males and females, although a higher percentage increase is expected in males (62%) than in females (54%). Today's four most common cancers, lung cancer, colorectal cancer, breast (female) cancer, and prostate cancer, are expected to continue to be the most commonly diagnosed cancers in 2030 (**Table 2**). The number of breast cancers diagnosed in BC women is expected to increase from 3198 cases in 2012 to 4875 in 2030 (a 52% increase); prostate cancer cases are expected to increase by 64% over this period and will be the most commonly diagnosed cancer in BC in 2030. Historically, counts of new lung cancer cases have been higher in BC males than BC females; however, the projected number of cases for women in 2030 is higher than the number for men (2110 cases in females vs 1660 cases for males) as a result of the different rates of decline in lung cancer rates for men and women.

As noted above, cancers with significantly rising incidence rates in recent years will see the greatest percentage increase in incidence in future. The number of new melanoma cases is forecast to grow from 965 cases in 2012 to almost 2500 cases in 2030; this increase is expected to be significant for both males (144% increase) and females (176% increase). The expected number of thyroid cancers diagnosed in the province will increase from 455 cases in 2012 to an expected 1265 cases in 2030 (a 178% increase). Testicular cancer is a relatively uncommon cancer (approximately1% of all male cancers in 2012) that typically arises in younger males and thus would not be expected to increase significantly as a result of an aging population; however, because of rising rates of this cancer we do expect an 86% increase in the number of new cases annually, with a net annual increase in testicular cancer amounting to about 100 more cases per year by 2030.

Cancer deaths

Despite declining rates of cancer mortality, the predicted number of BC residents dying of cancer is also projected to increase over the coming 15 years, although the percentage increase in the number of cancer deaths is not as dramatic as the increase in new cancer cases (**Table 3**). We expect that 11 195 British Columbians will die of cancer in 2030; this represents a 19% increase from the number of cancer deaths in 2012. As was the case in 2012, more male British Columbians are expected to die of cancer than females in 2030. Lung cancer will continue to be the most common cause of cancer death in the province, with an estimated 2775 deaths in 2030. The distribution of lung cancer deaths according to sex is expected to change significantly, reflecting recent reports of lung cancer incidence. Despite an aging population, the number of lung cancer deaths in BC males will actually decrease slightly over the next 15 years in keeping with decreases in male lung cancer mortality rates (APC –2.9%). In females, however, the number of lung cancer deaths is expected to rise by about 52% between 2012 and 2030, with 1610 BC women expected to die of lung cancer in 2030. Meanwhile, colorectal cancer, pancreatic cancer, and hematological malignancies are all expected to remain significant causes of cancer mortality accounting for more than one-quarter of all cancer deaths in 2030.

Conclusions

The data provided here strongly suggest a rapid rise in new cancer cases to be diagnosed annually over the next 15 years. The total number of cases is expected to increase by 57% between 2012 and 2030, with most of this rise attributable to the aging of the large baby boomer cohort. If the rates for many cancers had not already been declining in BC, the total number of cases would have been even higher. There are, however, cancers such as melanoma and thyroid cancer whose rates are rising and exacerbating the effects brought on by aging and population growth. For these cancers, we predict a substantially higher percentage increase in new cases.

Table 3. Cancer deaths reported in BC for 2012 and projected for 2030.

	Reported 2012		Projected 2030	
All cancers (total)	9107		11 195	
Males (total)	4770		6115	
Females (total)	4337		5085	
	Males	**Females**	**Males**	**Females**
Selected cancers				
Breast (female)	—	658	—	495
Colorectal	558	541	715	645
Lung	1197	1059	1165	1610
Lymphoma/leukemia	379	304	500	375
Pancreas	277	258	485	220
Prostate	522	—	610	—
Liver	124	29	270	85

Trends in other jurisdictions

The findings described here are not unlike those in published reports from across North America and in other parts of the developed world. A recent report from the Alberta government[14] presented cancer incidence projections to 2030 that include an anticipated increase of 64% from 2010 case numbers. In an accompanying plan the government outlines strategies and actions to meet this demand.[15] Similarly, published projections for the province of Manitoba have estimated an increase in cancer incidence of 36% between 2005 and 2026. In both the Alberta and the Manitoba reports, the authors have identified an aging population as a major driver of the expected increase.[9] A recently published manuscript of short-term cancer projections from Switzerland suggests an anticipated increase in cancer cases of 30% in males and 20% in females for a 10-year period ending in 2019.[13] As in our findings, the authors note that rapid increases in thyroid cancer and melanoma incidence rates will result in a greater percentage increase for new melanoma and thyroid cancer cases than for other cancers. Finally, reports from the United States have also suggested similar expected increases in new cancer cases occurring between 2010 and 2030.[11,12] Smith and colleagues[11] estimate that over this period, the US should expect an increase of 45% in the number of new cancer cases. Their approach, however, was based largely on an assumption that rates would remain constant over this 20-year period. Rahib and colleagues followed up on the Smith report by permitting rates to vary based on current trends, and they estimated the overall expected increase for the same 20-year period to be 36%,[12] noting much larger increases for malignancies such as melanoma, liver cancer,

thyroid cancer, and pancreatic cancer due to the current increasing trends in these cancers in the US. Clearly, BC is only one of many jurisdictions to face a rapidly increasing cancer burden.

Anticipated challenges

What do these changes mean for the future? First and foremost, BC needs to adequately prepare for a significant increase in demand for services related to cancer, including laboratory and diagnostic services, surgical and radiation treatment, systemic therapy, pain services, and palliative care.

Second, since most of the new cases will develop in individuals age 70 and older, an increasing number of patients with cancer will present with comorbidities. Many of today's treatments are based on experiences with younger patients who do not have coexisting chronic disorders, and the experiences gained cannot necessarily be applied to older individuals with comorbidities. We believe, therefore, that BC urgently needs to increase its expertise in geriatric oncology,[16,17] a new specialty in many other jurisdictions.

Third, the predicted increases will represent a growing challenge for family practitioners. In general, of course, the impact on individual FPs will be variable and depend on the geographic location and the patients served in a particular practice.

Fourth, significant fiscal pressures on the health care system as a whole and that of the BC Cancer Agency in particular can be expected. Recently we reported that the cost of oral, subcutaneous, and intramuscular cancer drugs (referred to as take-home medications) rose by 134% from fiscal years 2005–2006 to 2012–2013 (a 7-year period).[18] Increasing incidence combined with the escalating cost of chemotherapy leads to financial needs that may be hard to meet.

Finally, the improving survival rates for many cancer types will result in a significant increase in prevalence and more patients with histories of multiple cancers, a burden that will be shared by oncologists and FPs. In 2012, 16% of new diagnoses occurred in patients with a history of cancer; as survival rates continue to improve, this figure is likely to be even higher in 2030.

BC needs to adequately prepare for a significant increase in demand for services related to cancer.

Risk perception and reduction

As well as increasing awareness of cancer, the anticipated increase in incidence and prevalence may also result in a perception of increased risk that has significant consequences. For example, the public generally associates environmental pollution with cancer; it is entirely possible that concerns about pollution as a cause of increased cancer incidence will intensify. Also, random associations between individuals affected by cancer (e.g., those living or working in the same building) will increase and may give rise to heightened concerns about cancer clusters. True cancer clusters are extremely rare, especially outside of an industrial setting, so the vast majority of concerns will be false alarms.

Finally, with the general increase in cancer incidence driven largely by population growth and aging, more people will have a family member affected by cancer; and since cancer in a family member is commonly (but erroneously) felt to be the major determinant of cancer risk, more people may be concerned about their individual risk. In all these cases, FPs will need to respond to patient questions and concerns.

Given that we have been able to reduce incidence rates for many cancers over the past few years, we should consider what can be done to further reduce cancer rates. The risk factors that we know contribute to most of the cancer burden are smoking, drinking excessive amounts of alcohol, obesity, poor diet, sun overexposure, and lack of exercise. There is ample evidence that changes in these factors strongly influence future individual cancer risks. While we probably cannot change risk factors fast enough across our population to counteract the projected effect of population growth and aging, the prospect of dramatic increased incidence should act as a strong impetus to invest more, and quickly, in programs that will see fewer people smoking, fewer people drinking excessive amounts of alcohol, fewer overweight people, more people eating healthy diets, more people protecting themselves from sun overexposure, and more people exercising meaningfully on a regular basis. The sooner such lifestyles become the norm, the sooner we will see a further reduction in cancer incidence rates. A new program expected to result in decreased cancer incidence is BC's colorectal screening program. With sufficiently high public participation, this program should largely offset the demographically driven increase in the number of new diagnoses of colorectal cancer in BC within a decade.

Projection limitations

As with all projections, ours are based on a number of assumptions that cannot be fully tested at present. The first is that the population forecasts used

are assumed to be an accurate reflection of future demography. A number of social and economic factors could affect these population projections, including changes in the cost of living, economic opportunities in or beyond BC, and federal immigration policies. Additionally, the future cancer rates are extrapolated from statistical models based on current trends that are assumed to continue into the future. A number of factors could affect the trends in cancer rates, including changes in cancer screening policy, successful cancer prevention initiatives, and changes in diagnostic technology. Although established trends are already incorporated in the projection model we use, sudden changes in factors that strongly influence cancer diagnosis can result in unforeseen effects. For example, in the 1990s the rapid uptake of PSA testing as a screening tool for prostate cancer resulted in an unanticipated surge in the number of newly diagnosed prostate cancers.[19] Thus, forecasting future incidence of individual cancers requires some caution. In our experience, population projections have the greatest impact on the total number of future cases and deaths, and are thus the most important assumption taken with respect to the total cancer burden.

Provincial strategy needed

We strongly encourage the health care system to promote healthy lifestyle choices, but in the meantime to plan for an increase in the number of patients diagnosed with a new cancer as well as an increase in the number of patients living with cancer. Given the magnitude of the projected increase in the number of British Columbians who will be diagnosed with cancer over the next 15 years and the ongoing increase in the cost of treatment (in particular for chemotherapy drugs), we see the need to develop a comprehensive provincial strategy to address the predicted future cancer burden, recognizing that increases in incidence and costs are already occurring and will continue.

Competing interests

None declared.

References

1. BC Stats. Population projections. Accessed 30 November 2013. www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationProjections.aspx.
2. Grant T. Canada's aging population expected to head west. The Globe and Mail. 17 September 2014. Accessed 2 April 2015. www.theglobeandmail.com/report-on-business/economy/canadas-aging-population-projected-to-exacerbate-health-care-strain/article20651306.
3. Morgan SG. Prescription drug expenditures and population demographics. Health Serv Res 2006;41:411-428.
4. Ries NM. Ethics, health research, and Canada's aging population. Can J Aging 2010;29:577-585.
5. Rawson NS, Chu R, Ismaila AS, et al. The aging Canadian population and hospitalizations for acute myocardial infarction: Projection to 2020. BMC Cardiovasc Disord 2012;12:25.
6. Cronshaw SF. Aging workforce demographics in Canada: Occupational trends, work rates, and retirement projections. In: Borman WC, Hedge JW (eds). The Oxford handbook of work and aging. Oxford: Oxford University Press; 2012. p. 98-114.
7. Canadian Cancer Society's Advisory Committee on Cancer Statistics. Canadian Cancer statistics 2014. Toronto, ON: Canadian Cancer Society; 2014.
8. Lee TC, Dean CB, Semenciw R. Short-term cancer mortality projections: A comparative study of prediction methods. Stat Med 2011;30:3387-3402.
9. Nowatzki J, Moller B, Demers A. Projection of future cancer incidence and new cancer cases in Manitoba, 2006-2025. Chronic Dis Can 2011;31:71-78.
10. Møller B, Fekjaer H, Hakulinen T, et al. Prediction of cancer incidence in the Nordic countries up to the year 2020. Eur J Cancer Prev 2002;11(suppl 1):S1-96.
11. Smith BD, Smith GL, Hurria A, et al. Future of cancer incidence in the United States: Burdens upon an aging, changing nation. J Clin Oncol 2009;27:2758-2765.
12. Rahib L, Smith BD, Aizenberg R, et al. Projecting cancer incidence and deaths to 2030: The unexpected burden of thyroid, liver, and pancreas cancers in the United States. Cancer Res 2014;74:2913-2921.
13. Rapiti E, Guarnori S, Pastoors B, et al. Planning for the future: Cancer incidence projections in Switzerland up to 2019. BMC Public Health 2014;14:102.
14. Alberta Health. Cancer services and challenges in Alberta: A companion document. February 2013. Accessed 2 April 2015. www.health.alberta.ca/initiatives/cancer-plan.html.
15. Alberta Health. Changing our future: Alberta's cancer plan to 2030. February 2013. Accessed 2 April 2015. www.health.alberta.ca/initiatives/cancer-plan.html.
16. Repetto L, Balducci L. A case for geriatric oncology. Lancet Oncol 2002;3:289-297.
17. Lichtman SM, Balducci L, Aapro M. Geriatric oncology: A field coming to age. J Clin Oncol 2007;25:1821-1823.
18. Walisser S, Fung M, Logan H, et al. Changes in take home medications (THM) cancer drug therapy dispensed from FY06 to FY13 in the British Columbia provincial oncology drug program. Presented at the annual Applied Research in Cancer Control (ARCC) conference, Toronto, ON, 12 May 2014.
19. Coldman AJ, Phillips N, Pickles TA. Trends in prostate cancer incidence and mortality: An analysis of mortality change by screening intensity. CMAJ 2003;168:31-35. BCMJ