Title: Trends in Utilization and Costs of Initial Cancer Treatment in Ontario

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ABSTRACT Word Count: 250

Background: Cancer incidence and treatment-related costs are rising in Canada. We estimated health care utilization and costs in the first year post-diagnosis for patients diagnosed with seven common types of cancer in Ontario to examine temporal trends in patterns of care and costs.

Methods: We selected patients aged 19-44 years diagnosed with melanoma, female breast (breast hereafter), testicular and thyroid cancers, and patients aged 45 and older diagnosed with breast, prostate, lung, and colorectal cancers from the Ontario Cancer Registry from 1997 to 2007. Using linked administrative databases, we determined use and costs of chemotherapy, radiation therapy, cancer-related surgery, other hospitalizations and home care.

Results: The greatest increases from 1997 to 2007 were for melanoma, breast, colorectal, lung and prostate cancers ($p < 0.05$). For prostate and lung cancers mean costs increased 50% (from $11,490 and $22,037 to $15,170 and $34,473, respectively). Mean costs doubled for breast (from $15,460 and $12,909 to $35,977 and $29,362 for younger and older patients, respectively) and colorectal cancers (from $24,769 to $43,964) and nearly tripled for melanoma (from $3,581 to $8,934). Hospitalization-related costs accounted for the largest portion of total costs. The use of chemotherapy, radiation therapy and home care generally increased for all cancers.

Conclusions: The statistically significant increase in costs of initial cancer treatment is primarily due to more patients receiving adjuvant therapy and home care and rising expenditures for these and cancer-related surgeries. Understanding trends in utilization

and costs can help policy makers achieve a more accountable, high-performing health care system.

Key words: cancer, utilization, cost, trends, initial care, Ontario

INTRODUCTION

The incidence of cancer in Canada has increased recently due to population growth and aging (1). This, with increased use of expensive new drugs and technologies to treat cancer, has led to a rise in cancer-related expenditures, which consume an increasing share of limited healthcare budgets (2, 3, 4).

Previous studies have shown that a large portion of cancer-related costs is incurred in the year following diagnosis (5, 6, 7). There is limited understanding of which resources and health services contribute the most to the overall cost and whether higher prices and/or greater utilization can explain the recent increase in expenditures.

We examined temporal trends in health care resource use and costs for female breast, testicular and thyroid cancers and melanoma for younger patients (aged 19 to 44 years) and female breast, prostate, lung and colorectal cancers for older patients (aged 45 years and above) to understand how patterns of care and respective costs for these cancers have changed. This age cut-off is based on previous work (there is no standard international definition of "young adult") (8); the rationale is that it stretches from "adolescence" to menopause, in which the latter is known to induce marked changes in the cancer profile of women (8). These sites account for approximately 60% of all cancers in each age group. Our results will help shed light on current and future cancer care needs.

METHODS

Cohort selection

We selected patients from the Ontario Cancer Registry, the population-based registry for Canada's largest province (population 13.2 million) (9). We included cancer patients 19 years of age or older whose first diagnosis occurred between January 1st 1997 and December 31st 2007 and who lived 12 months or more after diagnosis. We included patients assigned a single, valid International Classification of Diseases-Oncology (ICD-O) topography code for a primary cancer (female breast, (breast hereafter), thyroid, testicular, and melanoma for ages 19-44, and breast, prostate, lung and colorectal for ages 45 and older) with no second cancer diagnosed within 90 days of the initial diagnosis. To ensure our cohort represented clinical practice, the 20 most frequent histology codes for each cancer were reviewed by two practicing oncologists (K.C. and W.C). We excluded all patients with missing, unusual or incorrect tumour types (see Appendix, Table 1).

Defining Resource Categories and Costs

We estimated and compared trends in utilization and costs for all health care provided (e.g., inpatient and outpatient hospital care, physician services, outpatient drugs, diagnostic tests, home care, continuing care and long-term care) during the 12-month period after diagnosis (including date of diagnosis). In addition, we examined the trends in utilization and mean costs for specific cancer treatments – cancer-related surgery, chemotherapy, radiation therapy (RT) and other cancer-related hospitalizations, as well as home care given its growing importance in Ontario in caring for cancer patients.

RT and New Drug Funding Program (NDFP) data were obtained from Cancer Care Ontario; all other administrative data – Discharge Abstract Database (DAD); National

Ambulatory Care Reporting System; Continuing Care Reporting System; the Ontario Health Insurance Plan (OHIP); Ontario Drug Benefit (ODB) plan; Ontario Home Care Administrative System; Home Care Database – were obtained through the Institute for Clinical Evaluative Sciences in Toronto, Ontario (Table 1). Individual patient-level data were linked using OHIP numbers and de-identified for analyses.

We employed validated costing methods used in previous work to obtain robust estimates of utilization and costs (10). To select all cancer-related surgeries during a patient's hospitalization, we used the Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures (CCP) codes (before March 31st 2002 inclusive) and the Canadian Classification of Health Interventions (CCI) codes (after April 1st 2002 inclusive) (11). As these codes are not comparable, we were not able to reliably estimate cancer-related surgeries and other hospitalizations for the 2002 calendar year. Cost estimates for other resources were available in the data or obtained from other sources (published work (12), Community Care Access Centres (13) and the Ministry of Health and Long-term Care (13)). Details are provided in the Appendix.

Costs were adjusted to 2009 Canadian dollars using the health care component of the Statistics Canada Consumer Price Index for Ontario (14).

Analysis: Assessing Trends in Costs

We examined the percentage of patients receiving each treatment/modality of care described above, the respective mean cost in each year of diagnosis, and total mean costs of care for each cancer site by year of diagnosis.

We used linear regression models with percentage of patients treated and costs as the dependent variables and year as the independent variable to determine the statistical significance of trends over time. For each slope estimated, we calculated the two-sided p-values and 95% confidence intervals (CIs) through normal approximation (15, 16).

Study approval was obtained from the Research Ethics Board at the University of Toronto.

RESULTS

Our cohorts consisted of 20,821 patients 19 to 44 years of age and 178,797 patients 45 years of age and older (of whom 101,426 were 65 and older). The most common cancer among younger patients was breast (44%), followed by thyroid (26%). Prostate and breast (36% and 31%, respectively) were the most common cancer sites among older patients. The younger patients were 76% female, while the older group was 54% male. Table 2 provides characteristics for each group.

We found a statistically significant increase in first year post-diagnosis mean costs for melanoma, breast, lung, colorectal and prostate cancers from 1997 to 2007 ($p < 0.05$)

(Figures 1A and 1B). Among younger patients, mean costs for breast cancer more than doubled from $15,460 in 1997 to $35,977 in 2007, while costs nearly tripled for melanoma, from $3,581 in 1997 to $8,934 in 2007. For older patients, mean costs approximately doubled for breast and colorectal cancers (from $12,909 and $24,769 in 1997 to $29,362 and $43,964 in 2007), and increased about 50% for prostate and lung cancers (from $11,490 and $22,037 in 1997 to $15,170 and $34,471 in 2007, respectively). Colorectal and lung cancers presented the largest mean total costs throughout our analysis period. Overall, the greatest changes worth noting in first year post-diagnosis costs occurred for breast (both age groups), colorectal and lung cancers; we examine these cancers in more detail below.

Breast Cancer

Chemotherapy use rose from 70% to 77% for patients aged 19-44 ($p > 0.05$), and from 27% to roughly 43% ($p < 0.05$) among patients aged 45+ (Figure 2; Tables 2A and 2B, Appendix). Chemotherapy costs increased 5-fold for all patients (from $2,286 to $11,834 for patients aged 19-44, $p < 0.05$; from $791 to $5,978 for patients 45+, $p < 0.05$) (Tables 3A and 3B, Appendix).

The percentage of patients 19-44 undergoing RT increased from 49% to 71% ($p < 0.05$) (Figure 3), while corresponding expenditures tripled from $2,067 to $6,268 ($p < 0.05$; yearly rate of increase = $393, CI = $224 to $563) (Table 3A, Appendix). The proportion of patients 45+ receiving RT increased from 44% to 66% ($p < 0.05$) (Figure 3);

corresponding costs more than tripled, from $1,620 to $4,920 ($p < 0.05$) (yearly increase = $297, CI = $155 to $438) (Table 3B, Appendix).

The use of home care increased from 64% to 80% ($p < 0.05$) for patients 19-44 and from 60% to 72% ($p < 0.05$) for patients 45+ (Figure 4); corresponding costs increased for both age groups (Tables 3A and 3B, Appendix).

The proportion of patients undergoing cancer-related surgery remained constant at around 94% (Figure 5A). Corresponding expenditures for patients 19-44 decreased from 1997 to 2001 and increased from 2003 to 2007 (Figure 5B). For patients 45+, expenditures were similar in value and trend. The proportion of patients requiring other hospitalizations also remained relatively constant throughout our analysis period, as did corresponding costs (Tables 2A, 2B, 3A and 3B in Appendix).

Colorectal Cancer

The use of home care increased from 52% to 63% ($p < 0.05$) (Figure 4); related costs followed a similar pattern, increasing from $2,190 to $3,679 ($p < 0.05$) (Table 3B, Appendix). Although few patients received RT, both utilization and costs increased slightly over our analysis period (Figure 3; Table 3B, Appendix).

Approximately 90% of patients were treated with surgery over all years but expenditures increased significantly (Figures 5A and 5B). The proportion of patients that required

other hospitalizations remained constant around 78% before 2002 and 85% after 2002; costs increased for both time periods (Tables 2B and 3B, Appendix).

The proportion of patients treated with chemotherapy increased slightly; respective costs doubled (Figure 2A; Table 3B, Appendix).

Lung

The proportion of patients treated with chemotherapy doubled from 18% to 36% ($p < 0.05$) (Figure 2); corresponding costs more than tripled, from $685 to $2,576 ($p < 0.05$) (Table 3B, Appendix). The proportion of patients treated with RT increased from 24% to 32% while corresponding mean costs more than doubled, from $676 to $1,498 (Figure 3; Table 3B, Appendix). The proportion of patients using home care increased from 42% to 52% ($p < 0.05$) (Figure 4); respective mean costs increased from $1,784 to $2,236 ($p < 0.05$) (Table 3B, Appendix).

The proportion of patients that underwent cancer-related surgery decreased from 79% in 1997 to 75% in 2001 and increased from about 68% in 2003 to 73% in 2007 ($p < 0.05$) (Figure 5A). Associated mean costs were relatively constant from 1997 to 2001 (around $9,000) but increased from $8,697 in 2003 to $10,737 in 2007 ($p < 0.05$) (Figure 5B). The proportion of patients undergoing other hospitalizations decreased from 60% in 1997 to 55% in 2001 and remained relatively constant (around 58%) from 2003 to 2007; respective mean costs remained constant before 2002 but increased from $3,489 in 2003 to $4,472 in 2007 (Tables 2B and 3B, Appendix).

INTERPRETATION

We found statistically significant increases in mean total costs for breast, prostate, lung and colorectal cancers in Ontario from 1997 to 2007 for patients who lived at least 1 year post-diagnosis (i.e. medium- and long-term survivors). Among younger patients, mean costs for breast cancer more than doubled; for older patients, mean costs approximately doubled for breast and colorectal cancers and increased about 50% for prostate and lung cancers.

These increases were due in part to increased chemotherapy and RT utilization; this is concordant with findings from the US (7, 17). Higher use of home care and rising expenditures for cancer-related surgeries also contributed to this increase. Patterns of care and practice tend to be similar in other Canadian provinces and other developed countries; thus, these findings are likely extendable Canada-wide and mirror patterns of care for other developed countries.

Chemotherapy use increased over time, particularly for younger breast cancer and older lung cancer patients. This could be due to more patients receiving adjuvant chemotherapy, which has been clinically proven to increase patient survival (18, 19, 20). Furthermore, treatments with personalized medicine and biologic agents, which are often more expensive than traditional chemotherapy agents, have increased in use (21).

The increase in RT utilization and costs, in particular for breast cancer (all ages), is likely due to increased availability, changes in patterns of care and more sophisticated methods, like conformal and intensity-modulated RT. For example, oncologists have increasingly used adjuvant RT in breast cancer patients who undergo breast conserving surgery (i.e., lumpectomy), a procedure that increased during our analysis period (22).

Hospitalizations (cancer-related surgeries and other) accounted for the largest portion of expenditures during the initial phase of care. For most cancers, the proportion of patients undergoing cancer-related surgeries remained relatively constant over time, although the trend for breast cancer patients may have been slightly different had we included same-day procedures for breast-conserving surgery. Surgery-related expenditures generally increased, in particular for breast, colorectal and lung cancers, suggesting an increase in price, likely due to the use of more advanced and expensive surgical techniques, such as laparascopic and robotic surgeries.

A particularly interesting finding is the increased use of home care, especially among older patients. Post-acute home care is typically used for cancer patients in the first thirty days following hospital discharge (13). This is the direction the Ontario government is moving towards (23).

Little research has been done on the trends of cancer care and associated costs. Warren et al. (2008) reported statistically significant increases in the costs of initial care for patients 65 and older for breast, lung and colorectal cancers from 1991 to 2002 in the US, with lung and colorectal being the most costly overall (7). They found that hospitalization

costs accounted for the largest portion of the overall cost and RT use generally increased. Our findings are similar but our cost estimates for each treatment category are lower possibly due to differences in analysis periods (their initial phase of care included 2 months pre-diagnosis and 12 months post-diagnosis), unit costs, patient age and, in some instances, differences in patterns of care. When we restricted our sample to patients aged 65 and older, our results were qualitatively the same although utilization and costs were slightly higher than the overall results.

Strengths

Our study included patients younger than 65, an age group rarely studied, and compared many different cancer sites, thus providing direct comparability of their relative costs previously not readily available in the literature. We made use of rich administrative data, detailed costing methods, and a large population-based sample of all adults in Ontario. Our study is one of the few to use Ontario administrative data to examine trends in cancer-related expenditures.

Limitations

We examined only the most prevalent cancer sites for two age groups, and highlighted a select group of cancer-related resources. There were some limitations with the data, including a change in procedural-related coding systems such that we could not examine hospitalizations for 2002. Our chemotherapy estimates were based on OHIP physician claims and may underestimate actual utilization, and our cost of RT is based on a dated estimate. In addition, the ODB only covers patients aged 65 and over and special cases.

Finally, we did not look beyond the first year post-diagnosis and may have included (high) costs of the pre-death period for some patients. This is likely to be of concern for cancers with short survival (colorectal and lung cancers).

Conclusions

We found statistically significant increases in the costs of initial treatment for most cancer sites in Ontario from 1997 to 2007 for two age groups of patients. The greatest changes occurred for breast, colorectal and lung cancers, primarily due to more patients receiving adjuvant therapy and home care and rising expenditures for these services and cancer-related surgeries. As expenditures continue to rise, it is important to determine the drivers behind this increase. Chemotherapy will likely place a strain on the Ontario health care budget, although there is potential to reduce costs. For example, tailoring of personalised medicine and the use of gene expression profiling among women with breast cancer can be cost-saving (24, 25).

Understanding the trends in utilization and costs is particularly important for planning and resource allocation. Our robust estimates of trends in cancer-related expenditures can aid policy makers' decisions, and serve as important inputs for researchers interested in modelling cost implications of emerging technologies and practices in Canada and other developed countries.

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TABLES AND FIGURES

Table 1 – Databases[1] and resources

Database	Resources
New Drug Funding Program	chemotherapy drugs
Activity Level Reporting System	radiation therapy
Ontario Health Insurance Plan Claims History Database	diagnostic tests, physician services, chemotherapy visits, emergency department visits pre-2002
Ontario Drug Benefit plan data	outpatient prescription drugs for patients aged ≥65, oral anti-neoplastic drugs, long-term care indicator
CIHI-Discharge Abstract Database	inpatient hospitalizations (cancer-related surgeries and other hospitalization), same-day surgery pre-2002
CIHI-National Ambulatory Care Reporting System	emergency department visits post-2002; same-day surgery post-2002
Continuing Care Reporting System	stays in complex continuing care facilities
Ontario Home Care Administrative System	home care pre-April 2005
Home Care Database	home care post-April 2005

[1] All databases were available at the Institute for Clinical Evaluative Sciences, Toronto, Ontario, Canada, with the exception of the New Drug Funding Program and Activity Level Reporting System which were obtained from Cancer Care Ontario.

Legend:
CIHI – Canadian Institute for Health Information

Table 2 – Characteristics of cancer patients by age group

Characteristic	Patients under age 45 years	Patients 45 years and older
Type of cancer, n (%)		
Female Breast	9,147 (43.9)	55,670 (31.1)
Thyroid	5,394 (25.9)	--
Melanoma	3,816 (18.3)	--
Testis	2,464 (11.8)	--
Lung	--	14,372 (8.0)
Colorectal	--	43,621 (24.4)
Prostate	--	65,134 (36.4)
Age at diagnosis		
Mean	36.5	66.2
Median	38	66
Sex		
Female, n (%)	15,882 (76.3)	82,266 (46)
Male, n (%)	4,939 (23.7)	96,531 (54)
Neighbourhood income quintile, n (%)		
Missing	105 (0.5)	712 (0.4)
1 (low)	3,520 (16.9)	31,330 (17.5)
2 (medium-low)	3,917 (18.8)	35,712 (20.1)
3 (medium)	4,224 (20.3)	35,308 (19.7)
4 (medium-high)	4,428 (21.3)	36,006 (20.1)
5 (high)	4,627 (22.2)	39,729 (22.2)
Rural residence, n (%)	2,202 (10.6)	27,274 (15.3)

Figure Legends

Figure 1A – Trends in mean cost in constant 2009 dollars during the initial year after diagnosis for patients under age of 45 (error bars are 95% confidence intervals)

Figure 1B – Trends in mean cost in constant 2009 dollars during the initial year after diagnosis for patients age 45 years and older (error bars are 95% confidence intervals)

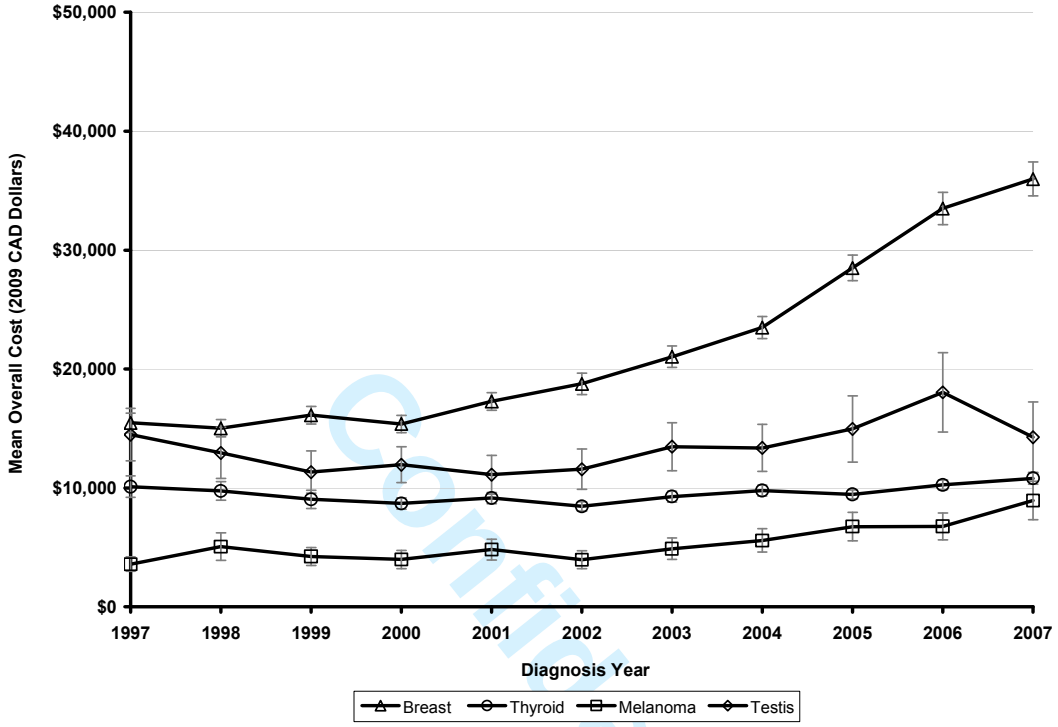
Figure 2 – Trends in the percentage of patients receiving chemotherapy during the initial year of treatment

Figure 3 – Trends in the percentage of patients receiving radiation therapy during the initial year of treatment

Figure 4 – Trends in the percentage of patients receiving home care during the initial year of treatment

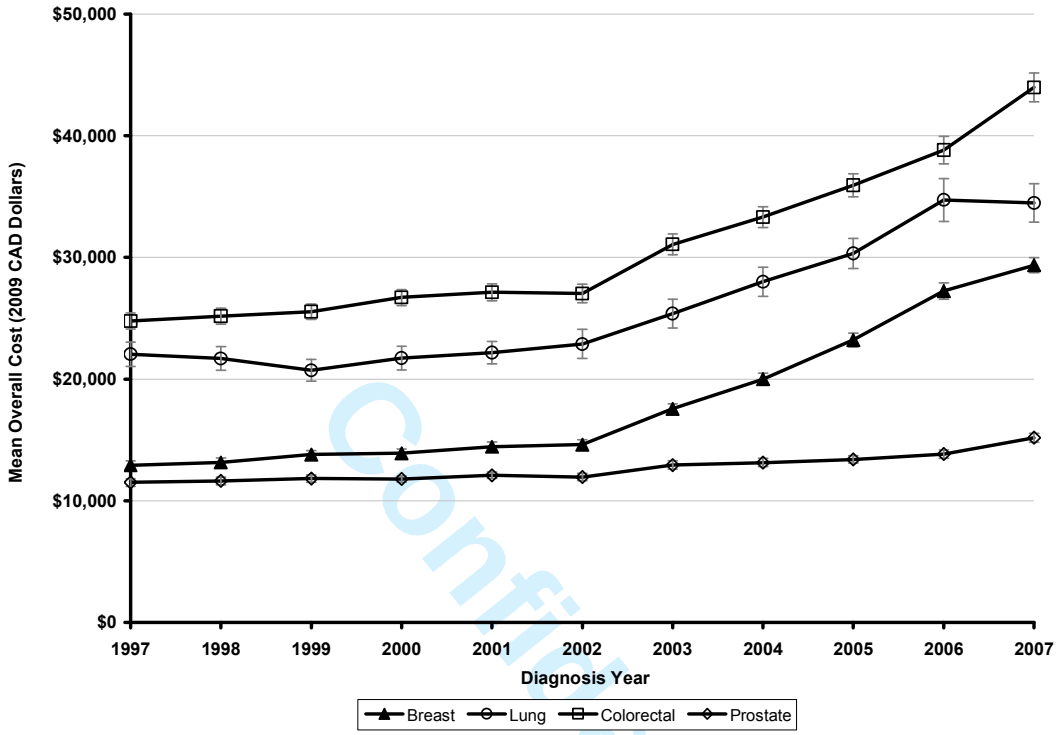
Figures 5A and B – Trends in (A) the percentage of patients undergoing cancer-related surgery and (B) the mean cost in constant 2009 dollars during the initial year of treatment

Figure 1A



Parameter estimates for the slopes provide the rate at which expenditures are increasing over time; these are as follows: breast $2,125 per year, 95% confidence interval (CI) [1477; 2773], $p < 0.0001$; testis $320 per year, 95% CI [-63; 703], $p = 0.0911$; thyroid $81 per year, 95% CI [-69; 231], $p = 0.2522$; melanoma $401 per year, 95% [200; 601], $p = 0.0014$.

Figure 1B



Parameter estimates for the slopes provide the rate at which expenditures are increasing over time; these are as follows: breast $1,666 per year, 95% confidence interval (CI) [1182; 2150], $p < 0.0001$; prostate $333 per year, 95% CI [206; 460], $p = 0.0002$; lung $1,509 per year, 95% CI [966; 2053], $p = 0.0001$; colorectal $1,856 per year, 95% [1499; 2213], $p < 0.0001$.

Figure 2

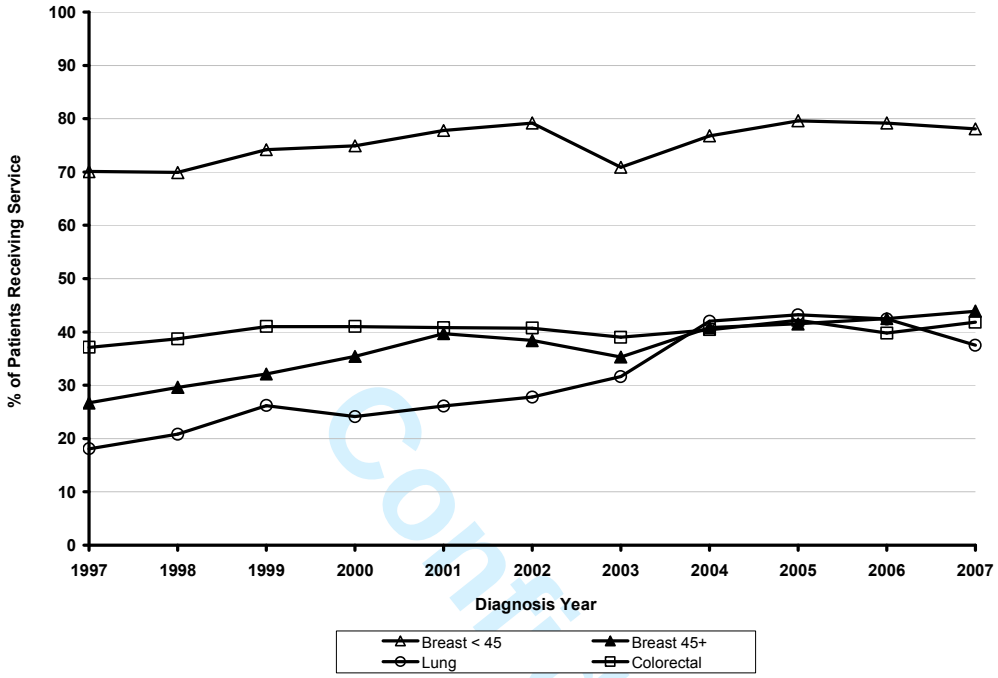


Figure 3

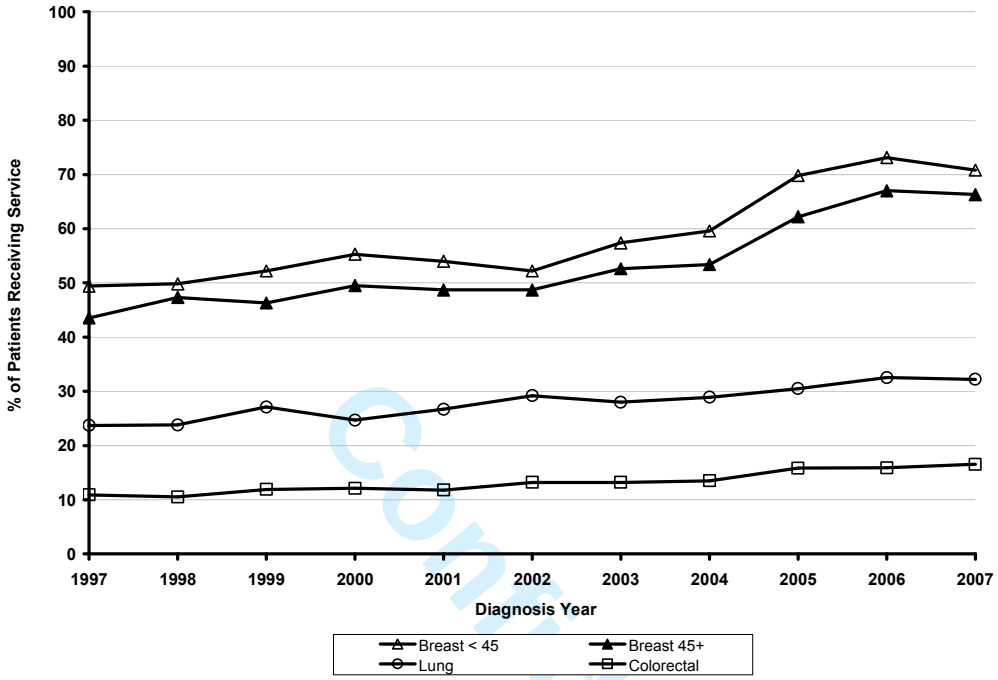
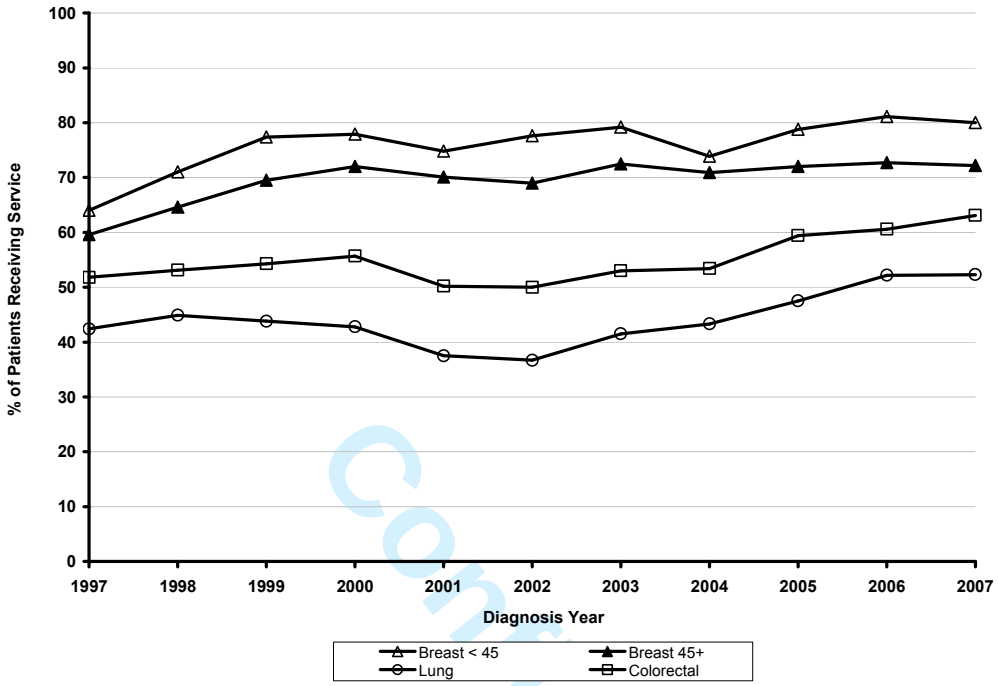
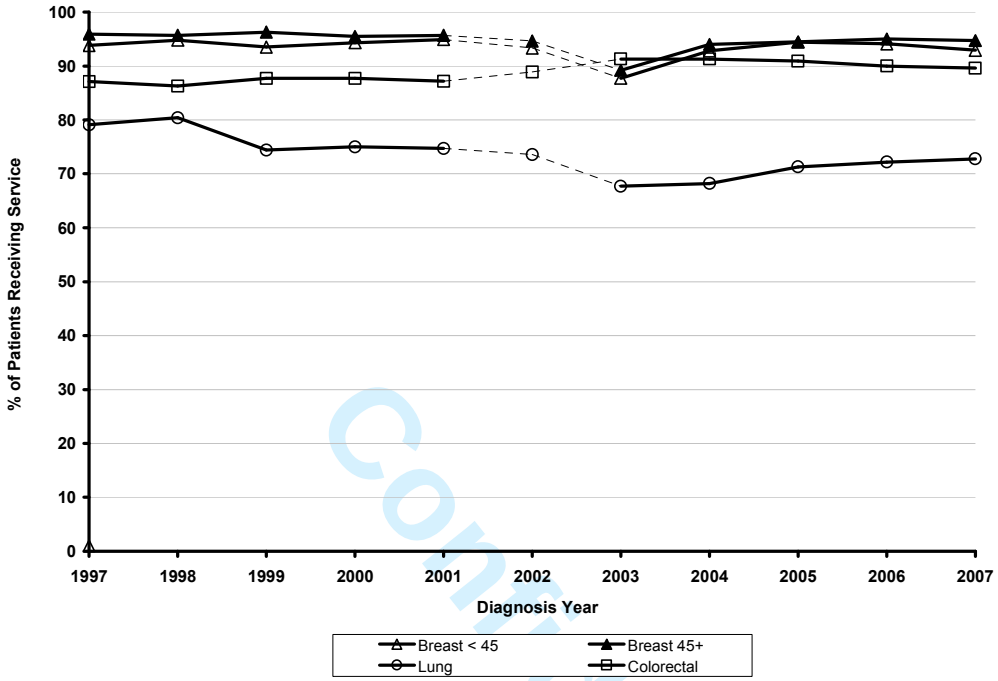
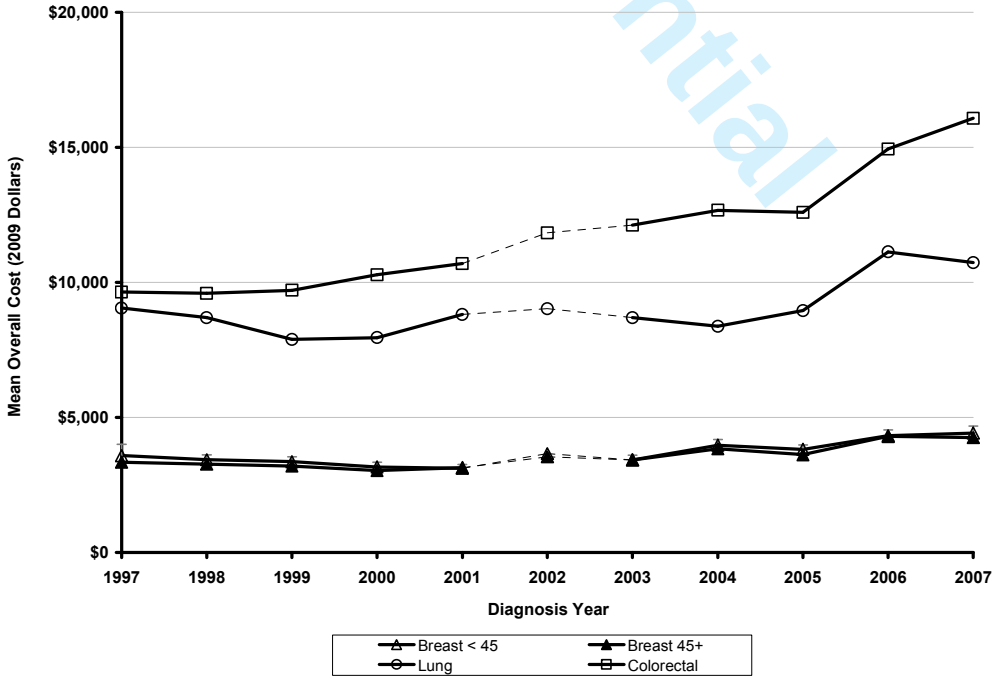


Figure 4



Figures 5A and B





Note: The data point for 2002 was obtained through linear interpolation; we do not have reliable data for this year.

Appendix 1 – Cancer and Histology Codes

Table 1. ICD-0 and included histology codes

Cancer	ICD-O Code(s)	Included Histologies
Colorectal	C18.0, C18.2 – C18.9 C19.9 C20.9 C21.8	8000, 8010, 8020, 8070, 8140, 8144, 8210, 8211, 8221, 8240, 8246, 8260, 8261, 8262, 8263, 8310, 8480, 8481, 8490, 8510
Lung	C33.9 C34.*	8000, 8010, 8012, 8020, 8040, 8042, 8046, 8070–8072, 8140, 8240, 8246, 8250, 8255, 8260, 8480, 8481, 8550, 8560
Melanoma	C44.*	8720 – 8790 (with or without ICD-10 code C44.*)
Female breast	C50.* (female)	8000, 8010, 8050, 8140, 8211, 8480, 8500, 8501, 8503, 8504, 8510, 8520–8524, 8530, 8541, 8543, 8575
Prostate	C61.9	8000, 8010, 8041, 8046, 8070, 8130, 8140, 8145, 8201, 8255, 8260, 8310, 8340, 8341, 8380, 8480, 8481, 8490, 8500, 8550
Testis	C62.*	8000, 8001, 8010, 8140, 8650, 8940, 9061, 9062–9065, 9070, 9071, 9080, 9081, 9083, 9085, 9100, 9101, 9364
Thyroid	C73.9	8000, 8010, 8021, 8050, 8070, 8071, 8140, 8260, 8290, 8330, 8331, 8335, 8337, 8340–8344, 8350, 8510

Legend: ICD-O – International Classification of Disease-Oncology

Appendix 2– Costing Methodology

Chemotherapy

We used 3 sources to determine chemotherapy use: the Ontario Health Insurance Plan (OHIP), the New Drug Funding Program (NDFP) and the Ontario Drug Benefit (ODB) program databases. We used physicians' billings for chemotherapy injections from the OHIP database to identify the number of chemotherapy visits. This database only includes the cost of chemotherapy administration by the physician; other costs associated with chemotherapy visits (drugs, supplies, nursing services) were estimated from the Canadian Institute for Health Information (CIHI) National Ambulatory Care Reporting System (NACRS) data (available from 2002/03 onwards) using the resource intensity weight (RIW) methodology (1, 2, 3). RIWs are estimated annually by the CIHI and represent the relative costs of different types of patient. We multiplied the RIW associated with each chemotherapy visit by the average provincial cost per weighted case to obtain the total cost for all visits from 2003 onwards and applied the average 2003 value to all chemotherapy visits that occurred in the pre-2003 period. We also obtained data on the dosages and costs of expensive chemotherapy drugs covered under the NDFP and oral anti-neoplastic drugs covered under the ODB program from their respective databases.

Radiation Therapy

We obtained information on RT using the Activity Level Reporting data from CCO. Each record has a National Hospital Productivity Improvement Project (NHPIP) code. We estimated the cost per NHPIP unit as $8.03 in 1995/96 from published Ontario data (4);

this includes salaries and benefits for secretaries, nurses, physicists, therapists, and the cost of equipment, supplies, and services.

Inpatient Hospitalizations

The frequency and type of inpatient hospitalizations were obtained from the CIHI Discharge Abstract Database (DAD). We used the Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures (CCP) codes (before March 31st 2002 inclusive) and the Canadian Classification of Health Interventions (CCI) codes (after April 1st 2002 inclusive) (13) to select all cancer-related surgeries during a patient's hospitalization. All other inpatient stays that did not include a cancer-related surgery ("other hospitalizations") were also obtained from the DAD. The costs of all hospitalizations were estimated using the RIW methodology (1, 2, 3). As the CCP and CCI codes are not comparable, we were not able to obtain reliable estimates of cancer-related surgeries and other hospitalizations for the 2002 calendar year.

Home Care

We estimated the frequency, duration and type of home care service from the Ontario Home Care Administrative System (pre-April 2005) and the Home Care Database (post-April 2005). Unit costs were obtained from the Community Care Access Centres, Toronto (5).

Ambulatory Care (Same-day Surgery and Emergency Department Visits)

The NACRS contains administrative, clinical, financial, and demographic data for hospital-based ambulatory care, including same day surgery (SDS), emergency department (ED) visits, medical day/night care, and high-cost ambulatory clinics, and is available from 2002/03 onwards. We used the NACRS data to estimate utilization from 2002/2003 onwards for SDS and ED visits and the RIW methodology to estimate costs (1, 2, 3). For the pre-NACRS period, the number of SDS was determined from the DAD while the number of ED visits was estimated from the OHIP claims history database. The RIW methodology was employed to determine the costs for SDS visits identified before 2002 (1-3); we applied the average 2002 cost for ED visits prior to 2002.

Outpatient Drugs

Individuals aged 65 years and older, long-term care residents, individuals receiving home care and other selected groups are eligible for prescription drug coverage under the ODB Plan. We estimated the quantity and cost of outpatient prescription drugs for all covered patients from the ODB Plan records.

Complex Continuing Care (CCC)

The frequency and length of stay in a CCC facility were obtained from the Continuing Care Reporting System data. We estimated the cost of each stay by multiplying the length of stay in days by the average case mix index (a diagnosis-related group weight) per patient-stay and the cost per weighted day for chronic care (5).

Long-term Care (LTC)

We estimated the time spent in LTC facilities using the LTC flag in the Ontario Drug Benefit Plan database. We dated the onset of LTC from the first of three consecutive LTC-flagged drug claims and dated the cessation of LTC from the first of three consecutive non-LTC flagged drug claims to obtain the length of stay. The costs associated with nursing, food and programming for LTC residents are covered by the Ministry of Health and Long-term Care (5).

Diagnostic Tests and Physician Services

We obtained the number of diagnostic tests and their respective cost from the OHIP data. We divided the cost into technical and professional components. The technical component was included in the cost of diagnostic tests while the professional component was included in the cost incurred with physician services. The number of all physician services and respective payments were estimated from the claims history database of the OHIP.

We used the health care component of the Statistics Canada Consumer Price Index for Ontario to adjust for inflation and reported all costs in 2009 Canadian dollars.

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Appendix 3 – Supplementary Tables

Table 2A. Number and percentage of patients under age 45 years at diagnosis for specific cancer services by cancer site and year of diagnosis

	Year of Diagnosis											Total
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	
BREAST *Total number of patients*	*810*	*808*	*826*	*805*	*802*	*814*	*795*	*884*	*930*	*861*	*812*	*9147*
Cancer-directed surgery	760 (93.8)	766 (94.8)	772 (93.5)	759 (94.3)	761 (94.9)	--	697 (87.7)	820 (92.8)	878 (94.4)	810 (94.1)	754 (92.9)	8346 (91.2)
Chemotherapy	568 (70.1)	565 (69.9)	613 (74.2)	603 (74.9)	624 (77.8)	645 (79.2)	564 (70.9)	679 (76.8)	740 (79.6)	682 (79.2)	634 (78.1)	6917 (75.6)
Radiation therapy	400 (49.4)	402 (49.8)	431 (52.2)	445 (55.3)	433 (54)	425 (52.2)	456 (57.4)	527 (59.6)	649 (69.8)	629 (73.1)	575 (70.8)	5372 (58.7)
Other hospitalizations	214 (26.4)	205 (25.4)	218 (26.4)	207 (25.7)	194 (24.2)	--	216 (27.2)	242 (27.4)	251 (27)	246 (28.6)	249 (30.7)	2438 (26.7)
Home care	518 (64)	574 (71)	639 (77.4)	627 (77.9)	600 (74.8)	632 (77.6)	630 (79.2)	653 (73.9)	731 (78.6)	697 (81)	650 (80)	6951 (76)
THYROID *Total number of patients*	*326*	*309*	*365*	*402*	*456*	*526*	*479*	*587*	*612*	*658*	*674*	*5394*
Cancer-directed surgery	260 (79.8)	248 (80.3)	300 (82.2)	317 (78.9)	369 (80.9)	--	454 (94.8)	560 (95.4)	590 (96.4)	638 (97)	660 (97.9)	4872 (90.3)
Chemotherapy	0 (0)	0 (0)	1 (0.3)	0 (0)	0 (0)	1 (0.2)	0 (0)	0 (0)	1 (0.2)	1 (0.2)	1 (0.1)	5 (0.1)
Radiation therapy	2 (0.6)	0 (0)	1 (0.3)	1 (0.2)	2 (0.4)	1 (0.2)	0 (0)	0 (0)	1 (0.2)	1 (0.2)	1 (0.1)	10 (0.2)
Other hospitalizations	267 (81.9)	264 (85.4)	292 (80)	323 (80.3)	359 (78.7)	--	303 (63.3)	369 (62.9)	362 (59.2)	343 (52.1)	358 (53.1)	3594 (66.6)
Home care	25 (7.7)	38 (12.3)	31 (8.5)	25 (6.2)	33 (7.2)	28 (5.3)	26 (5.4)	29 (4.9)	38 (6.2)	38 (5.8)	32 (4.7)	343 (6.4)
MELANOMA *Total number of patients*	*320*	*302*	*350*	*368*	*332*	*350*	*362*	*351*	*348*	*406*	*327*	*3816*
Cancer-directed surgery	156 (48.8)	154 (51)	188 (53.7)	213 (57.9)	200 (60.2)	--	135 (37.3)	122 (34.8)	164 (47.1)	201 (49.5)	165 (50.5)	1746 (45.8)
Chemotherapy	13 (4.1)	20 (6.6)	17 (4.9)	19 (5.2)	24 (7.2)	27 (7.7)	21 (5.8)	29 (8.3)	39 (11.2)	42 (10.3)	41 (12.5)	292 (7.7)
Radiation therapy	0 (0)	2 (0.7)	3 (0.9)	6 (1.6)	4 (1.2)	1 (0.3)	5 (1.4)	1 (0.3)	5 (1.4)	17 (4.2)	10 (3.1)	54 (1.4)
Other hospitalizations	53 (16.6)	42 (13.9)	51 (14.6)	44 (12)	41 (12.3)	--	81 (22.4)	91 (25.9)	91 (26.1)	80 (19.7)	82 (25.1)	694 (18.2)

Home care	32 (10)	35 (11.6)	46 (13.1)	50 (13.6)	42 (12.7)	51 (14.6)	51 (14.1)	44 (12.5)	72 (20.7)	63 (15.5)	64 (19.6)	550 (14.4)
TESTIS *Total number of patients*	*213*	*200*	*206*	*230*	*211*	*236*	*232*	*244*	*248*	*235*	*209*	*2464*
Cancer-directed surgery	197 (92.5)	190 (95)	186 (90.3)	217 (94.3)	202 (95.7)	--	175 (75.4)	234 (95.9)	232 (93.5)	223 (94.9)	204 (97.6)	2195 (89.1)
Chemotherapy	64 (30)	66 (33)	66 (32)	81 (35.2)	59 (28)	64 (27.1)	61 (26.3)	66 (27)	70 (28.2)	73 (31.1)	60 (28.7)	730 (29.6)
Radiation therapy	56 (26.3)	53 (26.5)	53 (25.7)	56 (24.3)	53 (25.1)	63 (26.7)	51 (22)	45 (18.4)	41 (16.5)	38 (16.2)	28 (13.4)	537 (21.8)
Other hospitalizations	59 (27.7)	48 (24)	41 (19.9)	45 (19.6)	47 (22.3)	--	65 (28)	68 (27.9)	74 (29.8)	59 (25.1)	47 (22.5)	607 (24.6)
Home care	39 (18.3)	50 (25)	47 (22.8)	53 (23)	39 (18.5)	50 (21.2)	50 (21.6)	40 (16.4)	59 (23.8)	53 (22.6)	39 (18.7)	519 (21.1)

Note: -- we do not have reliable data for this year.

Table 2B. Number and percentage of patients age 45 years and older at diagnosis for specific cancer services by cancer site and year of diagnosis

	Year of Diagnosis											Total
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	
BREAST *Total number of patients*	*4683*	*4686*	*4857*	*4794*	*4976*	*5229*	*4951*	*5145*	*5295*	*5423*	*5631*	*55670*
Cancer-directed surgery	4489 (95.9)	4484 (95.7)	4678 (96.3)	4577 (95.5)	4761 (95.7)	--	4414 (89.2)	4835 (94)	5004 (94.5)	5152 (95)	5330 (94.7)	51371 (92.3)
Chemotherapy	1251 (26.7)	1385 (29.6)	1558 (32.1)	1696 (35.4)	1976 (39.7)	2009 (38.4)	1746 (35.3)	2100 (40.8)	2196 (41.5)	2306 (42.5)	2471 (43.9)	20694 (37.2)
Radiation therapy	2035 (43.5)	2217 (47.3)	2247 (46.3)	2373 (49.5)	2421 (48.7)	2546 (48.7)	2603 (52.6)	2746 (53.4)	3293 (62.2)	3633 (67)	3733 (66.3)	29847 (53.6)
Other hospitalizations	918 (19.6)	980 (20.9)	958 (19.7)	971 (20.3)	1030 (20.7)	--	1196 (24.2)	1390 (27)	1286 (24.3)	1339 (24.7)	1399 (24.8)	12428 (22.3)
Home care	2789 (59.6)	3028 (64.6)	3377 (69.5)	3450 (72)	3489 (70.1)	3608 (69)	3591 (72.5)	3646 (70.9)	3806 (71.9)	3943 (72.7)	4065 (72.2)	38792 (69.7)
LUNG *Total number of patients*	*1204*	*1191*	*1248*	*1282*	*1305*	*1195*	*1254*	*1342*	*1422*	*1449*	*1480*	*14372*
Cancer-directed surgery	952 (79.1)	957 (80.4)	928 (74.4)	962 (75)	975 (74.7)	--	849 (67.7)	915 (68.2)	1014 (71.3)	1046 (72.2)	1077 (72.8)	10449 (72.7)
Chemotherapy	218 (18.1)	248 (20.8)	327 (26.2)	309 (24.1)	341 (26.1)	332 (27.8)	396 (31.6)	563 (42)	615 (43.2)	615 (42.4)	555 (37.5)	4519 (31.4)
Radiation therapy	285 (23.7)	283 (23.8)	338 (27.1)	317 (24.7)	348 (26.7)	349 (29.2)	351 (28)	388 (28.9)	434 (30.5)	471 (32.5)	477 (32.2)	4041 (28.1)
Other hospitalizations	722 (60)	703 (59)	698 (55.9)	724 (56.5)	712 (54.6)	--	682 (54.4)	780 (58.1)	848 (59.6)	835 (57.6)	840 (56.8)	8039 (55.9)
Home care	510 (42.4)	535 (44.9)	546 (43.8)	549 (42.8)	489 (37.5)	439 (36.7)	521 (41.5)	581 (43.3)	675 (47.5)	752 (51.9)	774 (52.3)	6371 (44.3)
COLORECTAL *Total number of patients*	*3188*	*3479*	*3620*	*3873*	*3940*	*3951*	*3877*	*4254*	*4388*	*4505*	*4546*	*43621*
Cancer-directed surgery	2778 (87.1)	3002 (86.3)	3173 (87.7)	3397 (87.7)	3436 (87.2)	--	3540 (91.3)	3886 (91.3)	3988 (90.9)	4055 (90)	4073 (89.6)	38868 (89.1)
Chemotherapy	1183 (37.1)	1346 (38.7)	1483 (41)	1587 (41)	1606 (40.8)	1610 (40.7)	1512 (39)	1718 (40.4)	1850 (42.2)	1794 (39.8)	1900 (41.8)	17589 (40.3)
Radiation therapy	348 (10.9)	367 (10.5)	430 (11.9)	467 (12.1)	463 (11.8)	522 (13.2)	513 (13.2)	574 (13.5)	694 (15.8)	717 (15.9)	751 (16.5)	5846 (13.4)
Other hospitalizations	2463 (77.3)	2746 (78.9)	2851 (78.8)	3076 (79.4)	3044 (77.3)	--	2935 (75.7)	3615 (85)	3752 (85.5)	3831 (85)	3827 (84.2)	34219 (78.4)
Home care	1650 (51.8)	1849 (53.1)	1965 (54.3)	2158 (55.7)	1979 (50.2)	1974 (50)	2055 (53)	2272 (53.4)	2602 (59.3)	2727 (60.5)	2870 (63.1)	24101 (55.3)
PROSTATE												

Total number of patients	*4685*	*4684*	*4947*	*5351*	*6176*	*5846*	*5756*	*6321*	*6861*	*7246*	*7261*	*65134*
Cancer-directed surgery	2446 (52.2)	2201 (47)	2266 (45.8)	2352 (44)	2816 (45.6)	--	2740 (47.6)	3073 (48.6)	3370 (49.1)	3498 (48.3)	3403 (46.9)	30791 (47.3)
Chemotherapy	57 (1.2)	51 (1.1)	67 (1.4)	78 (1.5)	76 (1.2)	94 (1.6)	51 (0.9)	50 (0.8)	72 (1)	67 (0.9)	81 (1.1)	744 (1.1)
Radiation therapy	1034 (22.1)	1147 (24.5)	1121 (22.7)	1385 (25.9)	1651 (26.7)	1636 (28)	1582 (27.5)	1677 (26.5)	1949 (28.4)	1968 (27.2)	2253 (31)	17403 (26.7)
Other hospitalizations	2530 (54)	2516 (53.7)	2605 (52.7)	2666 (49.8)	2945 (47.7)	--	2545 (44.2)	3046 (48.2)	3544 (51.7)	3528 (48.7)	3563 (49.1)	30940 (47.5)
Home care	1290 (27.5)	1306 (27.9)	1434 (29)	1482 (27.7)	1631 (26.4)	1512 (25.9)	1602 (27.8)	1764 (27.9)	2093 (30.5)	2273 (31.4)	2345 (32.3)	18732 (28.8)

Note: -- we do not have reliable data for this year.

Table 3A. Mean cost estimates for specific cancer services by cancer site and year of diagnosis for the initial year of treatment (patients under age 45 years at diagnosis) (95% confidence intervals in brackets)

	Year of Diagnosis											Overall Mean Cost
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	
BREAST												
Total number of patients	*810*	*808*	*826*	*805*	*802*	*814*	*795*	*884*	*930*	*861*	*812*	*9,147*
Cancer-directed surgery	3,584 (3,167; 4,001)	3,433 (3,251; 3,615)	3,358 (3,178; 3,538)	3,165 (2,994; 3,336)	3,115 (2,974; 3,257)	--	3,426 (3,247; 3,604)	3,978 (3,771; 4,186)	3,820 (3,661; 3,979)	4,330 (4,113; 4,547)	4,422 (4,165; 4,679)	3,586 (3,514; 3,658)
Chemotherapy	2,286 (2,146; 2,425)	2,201 (2,066; 2,337)	2,538 (2,255; 2,821)	2,589 (2,358; 2,821)	4,739 (4,448; 5,030)	5,119 (4,797; 5,442)	5,383 (4,997; 5,770)	6,139 (5,738; 6,540)	8,844 (8,193; 9,495)	10,836 (9,955; 11,717)	11,834 (10,890; 12,777)	5,756 (5,588; 5,924)
Radiation therapy	2,067 (1,899; 2,235)	2,030 (1,865; 2,194)	2,207 (2,033; 2,381)	2,160 (1,993; 2,327)	2,177 (2,007; 2,346)	2,311 (2,127; 2,495)	2,554 (2,352; 2,756)	3,102 (2,866; 3,337)	4,407 (4,104; 4,710)	5,374 (4,984; 5,764)	6,268 (5,816; 6,720)	3,180 (3,097; 3,264)
Other hospitalizations	1,465 (1,157; 1,773)	1,297 (1,016; 1,578)	1,408 (1,130; 1,686)	1,138 (932; 1,344)	1,254 (1,035; 1,473)	--	1,229 (1,001; 1,457)	1,405 (1,141; 1,669)	1,326 (1,095; 1,556)	1,477 (1,243; 1,711)	1,862 (1,520; 2,203)	1,399 (1,319; 1,479)
Home care	1,275 (1,105; 1,446)	1,469 (1,294; 1,643)	1,679 (1,496; 1,861)	1,617 (1,439; 1,796)	1,204 (1,078; 1,331)	1,365 (1,189; 1,540)	1,351 (1,204; 1,497)	1,477 (1,332; 1,622)	2,269 (2,076; 2,462)	2,854 (2,633; 3,075)	2,706 (2,497; 2,915)	1,763 (1,709; 1,818)
Total Cost	15,460 (14,641; 16,278)	15,021 (14,296; 15,745)	16,119 (15,370; 16,868)	15,374 (14,656; 16,093)	17,274 (16,534; 18,014)	18,646 (17,762; 19,530)	20,271 (19,403; 21,139)	22,645 (21,754; 23,536)	27,579 (26,536; 28,623)	32,486 (31,147; 33,824)	34,974 (33,563; 36,385)	21,595 (21,273; 21,918)
THYROID												
Total number of patients	*326*	*309*	*365*	*402*	*456*	*526*	*479*	*587*	*612*	*658*	*674*	*5,394*
Cancer-directed surgery	2,952 (2,744; 3,160)	3,098 (2,725; 3,471)	3,186 (2,721; 3,651)	2,830 (2,646; 3,014)	3,088 (2,907; 3,269)	--	4,228 (4,019; 4,438)	4,405 (4,226; 4,585)	4,140 (3,982; 4,299)	4,900 (4,722; 5,078)	4,730 (4,566; 4,894)	3,908 (3,840; 3,976)
Chemotherapy	-	-	8 (-8; 24)	-	-	1 (-1; 2)	-	-	0 (-0; 0)	16 (-16; 49)	7 (-7; 21)	4 (-1; 8)
Radiation therapy	18 (-8; 44)	-	1 (-1; 2)	8 (-8; 24)	15 (-6; 36)	6 (-6; 18)	-	-	5 (-5; 16)	6 (-6; 17)	14 (-14; 42)	7 (2; 12)
Other hospitalizations	2,946 (2,565; 3,327)	2,817 (2,492; 3,142)	2,684 (2,445; 2,924)	2,694 (2,458; 2,930)	2,878 (2,555; 3,201)	--	1,774 (1,521; 2,028)	1,862 (1,618; 2,107)	1,583 (1,448; 1,717)	1,510 (1,356; 1,664)	1,764 (1,508; 2,019)	2,088 (2,014; 2,163)
Home care	126 (-12; 264)	199 (29; 369)	56 (30; 82)	37 (13; 62)	45 (22; 68)	18 (10; 25)	53 (6; 100)	32 (15; 48)	82 (44; 121)	112 (45; 179)	81 (44; 119)	72 (55; 90)
Total Cost	10,102 (9,205; 10,999)	9,745 (8,971; 10,519)	9,034 (8,274; 9,793)	8,695 (8,230; 9,161)	9,136 (8,651; 9,622)	8,436 (8,062; 8,811)	9,266 (8,803; 9,728)	9,771 (9,316; 10,226)	9,452 (9,077; 9,827)	10,242 (9,835; 10,648)	10,796 (10,291; 11,301)	9,580 (9,424; 9,737)
MELANOMA												
Total number of patients	*320*	*302*	*350*	*368*	*332*	*350*	*362*	*351*	*348*	*406*	*327*	*3,816*
Cancer-directed surgery	751 (583; 919)	955 (722; 1,189)	1,158 (888; 1,427)	956 (801; 1,112)	1,245 (1,012; 1,478)	--	633 (504; 762)	679 (523; 834)	993 (804; 1,181)	1,117 (906; 1,328)	1,195 (951; 1,439)	910 (850; 969)

Chemotherapy	202 (86; 319)	484 (252; 715)	484 (244; 723)	464 (231; 697)	880 (524; 1,236)	730 (439; 1,021)	743 (408; 1,078)	1,012 (626; 1,398)	1,478 (1,023; 1,934)	1,400 (972; 1,827)	1,789 (1,244; 2,333)	888 (781; 996)
Radiation therapy	-	28 (-12; 67)	30 (-6; 66)	55 (8; 102)	37 (1; 73)	9 (-8; 26)	56 (2; 111)	11 (-11; 33)	30 (1; 58)	216 (74; 357)	107 (31; 184)	56 (36; 75)
Other hospitalizations	454 (310; 599)	745 (302; 1,187)	403 (242; 565)	386 (241; 531)	513 (323; 702)	--	693 (474; 912)	1,076 (766; 1,386)	839 (608; 1,070)	832 (563; 1,102)	1,402 (995; 1,810)	719 (637; 800)
Home care	141 (81; 201)	283 (158; 408)	233 (133; 334)	349 (199; 499)	243 (128; 359)	179 (116; 242)	216 (139; 294)	198 (108; 288)	460 (304; 617)	373 (261; 485)	675 (475; 875)	305 (269; 342)
Total Cost	3,581 (2,974; 4,189)	5,062 (3,911; 6,213)	4,225 (3,466; 4,984)	3,967 (3,207; 4,728)	4,813 (3,930; 5,696)	3,929 (3,170; 4,688)	4,718 (3,851; 5,585)	5,354 (4,402; 6,305)	6,414 (5,268; 7,560)	6,438 (5,366; 7,510)	8,499 (6,976; 10,021)	5,188 (4,890; 5,486)
TESTIS												
Total number of patients	*213*	*200*	*206*	*230*	*211*	*236*	*232*	*244*	*248*	*235*	*209*	*2,464*
Cancer-directed surgery	3,245 (2,058; 4,433)	2,806 (2,397; 3,214)	2,550 (1,913; 3,187)	2,100 (1,733; 2,467)	1,690 (1,385; 1,996)	--	2,180 (1,366; 2,994)	2,340 (1,803; 2,877)	2,532 (1,991; 3,073)	3,378 (2,232; 4,524)	3,329 (1,572; 5,085)	2,479 (2,227; 2,731)
Chemotherapy	2,087 (1,607; 2,566)	2,006 (1,550; 2,463)	2,055 (1,593; 2,516)	2,271 (1,843; 2,699)	1,809 (1,385; 2,233)	1,837 (1,421; 2,253)	1,652 (1,216; 2,089)	1,724 (1,266; 2,182)	2,327 (1,800; 2,855)	2,816 (2,204; 3,428)	2,588 (1,932; 3,245)	2,106 (1,957; 2,256)
Radiation therapy	804 (596; 1,012)	788 (592; 985)	833 (613; 1,054)	813 (606; 1,019)	805 (589; 1,021)	867 (669; 1,066)	658 (484; 832)	540 (388; 693)	521 (361; 680)	454 (308; 600)	421 (265; 576)	678 (622; 734)
Other hospitalizations	2,014 (1,235; 2,794)	1,924 (875; 2,973)	1,181 (653; 1,710)	1,489 (860; 2,118)	1,468 (742; 2,194)	--	2,324 (1,503; 3,145)	2,469 (1,709; 3,228)	2,973 (1,237; 4,708)	2,936 (1,854; 4,019)	1,711 (1,010; 2,412)	2,070 (1,786; 2,354)
Home care	274 (123; 425)	362 (185; 539)	256 (157; 355)	315 (199; 430)	249 (138; 360)	300 (115; 484)	304 (171; 437)	224 (120; 328)	551 (283; 819)	1,065 (581; 1,548)	682 (335; 1,030)	419 (349; 490)
Total Cost	14,474 (12,269; 16,679)	12,946 (10,789; 15,102)	11,331 (9,559; 13,104)	11,950 (10,443; 13,457)	11,109 (9,478; 12,739)	11,486 (9,810; 13,162)	12,891 (10,939; 14,842)	12,626 (10,749; 14,504)	14,356 (11,615; 17,096)	17,259 (13,993; 20,525)	13,694 (10,785; 16,603)	13,133 (12,455; 13,810)

Note: -- we do not have reliable data for this year.

Table 3B. Mean cost estimates for specific cancer services by cancer site and year of diagnosis for the initial year of treatment (patients age 45 years and older at diagnosis) (95% confidence intervals in brackets)

	Year of Diagnosis											Overall Mean Cost
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	
BREAST												
Total number of patients	*4,683*	*4,686*	*4,857*	*4,794*	*4,976*	*5,229*	*4,951*	*5,145*	*5,295*	*5,423*	*5,631*	*55,670*
Cancer-directed surgery	3,345 (3,198; 3,492)	3,273 (3,151; 3,394)	3,206 (3,093; 3,319)	3,028 (2,954; 3,102)	3,145 (3,048; 3,242)	2,384 (2,269; 2,499)	3,426 (3,341; 3,512)	3,840 (3,739; 3,942)	3,620 (3,527; 3,713)	4,294 (3,954; 4,634)	4,255 (4,141; 4,370)	3,455 (3,410; 3,501)
Chemotherapy	791 (747; 834)	836 (791; 881)	939 (887; 991)	1,050 (992; 1,108)	1,759 (1,665; 1,853)	1,827 (1,732; 1,921)	2,169 (2,060; 2,277)	2,821 (2,693; 2,950)	4,152 (3,931; 4,373)	5,159 (4,899; 5,418)	5,978 (5,697; 6,259)	2,594 (2,543; 2,644)
Radiation therapy	1,620 (1,560; 1,681)	1,680 (1,622; 1,739)	1,695 (1,634; 1,755)	1,701 (1,641; 1,760)	1,661 (1,603; 1,719)	1,701 (1,643; 1,759)	1,950 (1,882; 2,018)	2,330 (2,244; 2,415)	3,210 (3,100; 3,319)	4,189 (4,054; 4,324)	4,920 (4,772; 5,068)	2,480 (2,451; 2,509)
Other hospitalizations	1,094 (974; 1,213)	1,081 (971; 1,191)	1,044 (932; 1,156)	1,098 (977; 1,220)	1,232 (1,107; 1,356)	1,218 (1,083; 1,353)	1,394 (1,263; 1,525)	1,609 (1,441; 1,778)	1,406 (1,265; 1,548)	1,619 (1,469; 1,769)	1,724 (1,539; 1,908)	1,332 (1,289; 1,374)
Home care	1,358 (1,267; 1,449)	1,532 (1,434; 1,630)	1,623 (1,524; 1,723)	1,685 (1,587; 1,783)	1,319 (1,234; 1,403)	1,298 (1,224; 1,372)	1,414 (1,331; 1,497)	1,514 (1,427; 1,601)	2,049 (1,955; 2,142)	2,538 (2,439; 2,637)	2,504 (2,415; 2,593)	1,731 (1,703; 1,758)
Total Cost	*12,909 (12,556; 13,261)*	*13,144 (12,774; 13,513)*	*13,785 (13,456; 14,115)*	*13,903 (13,555; 14,251)*	*14,424 (14,030; 14,817)*	*14,552 (14,139; 14,965)*	*17,177 (16,768; 17,587)*	*19,487 (19,018; 19,956)*	*22,626 (22,069; 23,182)*	*26,638 (25,960; 27,316)*	*28,718 (28,093; 29,344)*	*18,229 (18,078; 18,380)*
LUNG												
Total number of patients	*1,204*	*1,191*	*1,248*	*1,282*	*1,305*	*1,195*	*1,254*	*1,342*	*1,422*	*1,449*	*1,480*	*14,372*
Cancer-directed surgery	9,046 (8,450; 9,643)	8,697 (8,153; 9,241)	7,890 (7,376; 8,403)	7,953 (7,450; 8,457)	8,818 (8,248; 9,389)	8,041 (7,240; 8,842)	8,697 (7,890; 9,504)	8,374 (7,682; 9,066)	8,959 (8,275; 9,644)	11,130 (9,817; 12,443)	10,737 (9,887; 11,587)	8,997 (8,763; 9,232)
Chemotherapy	685 (574; 795)	860 (731; 989)	1,398 (1,226; 1,571)	1,431 (1,243; 1,619)	1,495 (1,316; 1,673)	1,601 (1,415; 1,788)	2,055 (1,836; 2,275)	2,804 (2,559; 3,049)	2,935 (2,704; 3,167)	2,853 (2,630; 3,076)	2,576 (2,359; 2,794)	1,931 (1,870; 1,993)
Radiation therapy	676 (596; 755)	686 (603; 769)	833 (740; 926)	710 (630; 790)	780 (698; 862)	905 (812; 999)	838 (749; 927)	955 (859; 1,051)	1,078 (964; 1,193)	1,277 (1,142; 1,412)	1,498 (1,327; 1,668)	947 (914; 980)
Other hospitalizations	3,621 (3,165; 4,077)	3,666 (3,280; 4,051)	3,228 (2,839; 3,617)	3,747 (3,238; 4,256)	3,638 (3,212; 4,063)	3,283 (2,836; 3,731)	3,489 (3,123; 3,855)	4,084 (3,609; 4,559)	3,990 (3,581; 4,399)	4,752 (4,199; 5,305)	4,472 (3,833; 5,112)	3,845 (3,701; 3,989)
Home care	1,784 (1,543;	1,544 (1,345;	1,508 (1,312;	1,685 (1,462;	1,082 (919;	1,051 (870;	1,249 (1,061;	1,398 (1,217;	2,107 (1,871;	2,216	2,236 (2,039;	1,646 (1,584;

	2,025)	1,743)	1,703)	1,908)	1,244)	1,233)	1,436)	1,579)	2,343)	(2,008; 2,425)	2,432)	1,708)
Total Cost	*22,037 (21,042; 23,033)*	*21,688 (20,712; 22,663)*	*20,712 (19,829; 21,595)*	*21,715 (20,741; 22,689)*	*22,163 (21,240; 23,086)*	*22,844 (21,651; 24,037)*	*25,002 (23,826; 26,178)*	*27,492 (26,293; 28,691)*	*29,630 (28,410; 30,850)*	*33,968 (32,218; 35,717)*	*33,797 (32,210; 35,384)*	*25,876 (25,495; 26,257)*
COLORECTAL *Total number of patients*	*3,188*	*3,479*	*3,620*	*3,873*	*3,940*	*3,951*	*3,877*	*4,254*	*4,388*	*4,505*	*4,546*	*43,621*
Cancer-directed surgery	9,637 (9,288; 9,986)	9,598 (9,238; 9,958)	9,705 (9,404; 10,005)	10,283 (9,928; 10,638)	10,694 (10,360; 11,027)	11,073 (10,645; 11,501)	12,121 (11,663; 12,579)	12,675 (12,197; 13,153)	12,597 (12,118; 13,077)	14,939 (14,253; 15,626)	16,080 (15,406; 16,754)	11,956 (11,808; 12,105)
Chemotherapy	2,773 (2,624; 2,923)	2,907 (2,755; 3,058)	3,242 (3,086; 3,398)	3,368 (3,202; 3,534)	3,501 (3,324; 3,679)	3,375 (3,196; 3,554)	3,916 (3,698; 4,134)	4,421 (4,208; 4,635)	4,371 (4,164; 4,578)	3,438 (3,279; 3,597)	5,907 (5,639; 6,175)	3,814 (3,755; 3,874)
Radiation therapy	522 (468; 575)	505 (454; 555)	569 (517; 621)	558 (509; 607)	542 (494; 591)	592 (543; 642)	589 (539; 639)	599 (551; 647)	708 (657; 760)	738 (685; 792)	849 (787; 911)	624 (609; 640)
Other hospitalizations	3,931 (3,680; 4,183)	4,157 (3,902; 4,413)	4,087 (3,813; 4,361)	4,232 (3,951; 4,513)	4,144 (3,894; 4,394)	2,993 (2,758; 3,227)	3,270 (3,043; 3,498)	3,794 (3,557; 4,031)	3,930 (3,676; 4,184)	4,228 (3,977; 4,480)	4,610 (4,301; 4,919)	3,952 (3,874; 4,031)
Home care	2,190 (2,046; 2,333)	2,274 (2,129; 2,418)	2,300 (2,151; 2,449)	2,390 (2,252; 2,529)	1,799 (1,682; 1,916)	1,777 (1,664; 1,890)	1,925 (1,810; 2,039)	2,053 (1,934; 2,172)	3,031 (2,885; 3,177)	3,526 (3,378; 3,674)	3,679 (3,534; 3,823)	2,492 (2,450; 2,533)
Total Cost	*24,769 (24,101; 25,438)*	*25,170 (24,516; 25,824)*	*25,534 (24,907; 26,161)*	*26,699 (26,036; 27,362)*	*27,125 (26,427; 27,823)*	*26,958 (26,190; 27,727)*	*30,274 (29,415; 31,133)*	*32,211 (31,360; 33,062)*	*34,797 (33,856; 35,737)*	*37,821 (36,701; 38,941)*	*43,089 (41,902; 44,276)*	*30,928 (30,657; 31,199)*
PROSTATE *Total number of patients*	*4,685*	*4,684*	*4,947*	*5,351*	*6,176*	*5,846*	*5,756*	*6,321*	*6,861*	*7,246*	*7,261*	*65,134*
Cancer-directed surgery	2,886 (2,753; 3,019)	2,591 (2,468; 2,713)	2,544 (2,434; 2,653)	2,447 (2,350; 2,545)	2,775 (2,669; 2,882)	2,678 (2,570; 2,786)	2,994 (2,836; 3,153)	3,225 (3,096; 3,353)	3,174 (3,083; 3,264)	3,786 (3,629; 3,943)	3,815 (3,687; 3,944)	3,050 (3,012; 3,088)
Chemotherapy	23 (12; 34)	10 (6; 14)	15 (7; 22)	19 (6; 31)	19 (12; 26)	27 (17; 36)	30 (17; 43)	16 (9; 24)	34 (18; 50)	26 (15; 36)	29 (16; 42)	23 (20; 26)
Radiation therapy	1,334 (1,259; 1,409)	1,613 (1,527; 1,700)	1,559 (1,472; 1,646)	1,792 (1,703; 1,882)	1,926 (1,838; 2,014)	2,087 (1,992; 2,181)	2,146 (2,046; 2,245)	2,077 (1,981; 2,172)	2,339 (2,236; 2,443)	2,402 (2,293; 2,512)	2,978 (2,849; 3,106)	2,084 (2,053; 2,115)
Other hospitalizations	1,598 (1,463; 1,732)	1,631 (1,488; 1,774)	1,660 (1,520; 1,800)	1,574 (1,448; 1,699)	1,619 (1,496; 1,743)	1,223 (1,081; 1,364)	1,627 (1,470; 1,784)	1,557 (1,421; 1,692)	1,588 (1,449; 1,726)	1,629 (1,492; 1,766)	1,725 (1,589; 1,860)	1,586 (1,544; 1,628)
Home care	501 (436; 565)	474 (411; 537)	478 (421; 535)	409 (360; 458)	313 (279; 348)	311 (272; 351)	350 (302; 397)	324 (289; 360)	524 (484; 564)	638 (599; 676)	645 (604; 686)	458 (444; 472)
Total Cost	*11,490 (11,179; 11,801)*	*11,617 (11,311; 11,922)*	*11,814 (11,519; 12,109)*	*11,774 (11,501; 12,046)*	*12,081 (11,807; 12,356)*	*11,931 (11,630; 12,232)*	*12,894 (12,553; 13,235)*	*13,099 (12,758; 13,440)*	*13,367 (13,050; 13,683)*	*13,800 (13,469; 14,131)*	*15,141 (14,777; 15,505)*	*12,785 (12,687; 12,882)*

Note: -- we do not have reliable data for this year.