

Health Care Expenditure Burden of Cancer Care in the United States

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Abstract

Using nationwide data, this study estimated and compared annual health care expenditures per person between noncancer and cancer patients, and among patients with the 4 most common cancers. Two-part models were used to estimate mean expenditures for each group by source of payment and by service type. We found that cancer patients had nearly 4 times higher mean expenditures per person (\$16346) than those without cancer (\$4484). These differences were larger among individuals aged 18 to 64 years than those ≥ 65 years. Medicare was the largest source of payment for cancer patients, especially among those ≥ 65 years. Among the 4 most common cancers, the most costly cancer was lung cancer. Ambulatory care visits accounted for the majority of health care expenditures for those with breast cancer, while for those with other cancers, inpatient services also contributed to a significant portion of expenditures especially among younger patients. This study demonstrates that cancer patients experience a substantially higher health care expenditure burden than noncancer patients, with lung cancer patients having the highest expenditures. Expenditure estimates varied by age group, source of payment, and service type, highlighting the need for comprehensive policies and programs to reduce the costs of cancer care.

Keywords

cancer, health care expenditures, economic burden, MEPS, United States

What do we already know about this topic?

Cancer patients have higher health care expenditures than those without cancer.

How does your research contribute to the field?

We note 3 key contributions to the existing literature on the health care expenditure burden of cancer care in the United States. First, we provide national estimates of cancer care costs at the individual level, which could be useful resources for the development of insurance design and policies to address the rising costs of cancer care. In addition, our age group comparisons allowed us to demonstrate that young cancer patients had a relatively high financial burden of cancer care compared with both those without cancer and elderly patients with cancer. Last, we particularly provide and compare the estimates of cancer care for the 4 most common cancers, breast, lung, prostate, and colorectal cancer, which were not well addressed in previous studies.

What are your research's implications toward theory, practice, or policy?

By providing the estimates of expenditures by source of payment and type of service, our findings would be useful resources for policy makers, health care system, and employers when they design benefits for cancer patients or develop policies to address the rising costs of cancer care.

Introduction

Cancer research over the past few decades has led to advances in the early detection and treatment of cancer, resulting in declines in overall incidence and death rates due to cancer.¹ However, cancer remains the second leading cause of death in the United States and cancer survivors are a rapidly growing population, and is expected to rise to 19 million by 2024 due to the growth and aging of the US population.^{2–5} The

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most commonly diagnosed cancer in the United States is breast cancer, with more than 255 000 new cases expected among men and women in 2017.⁶ The next most common cancers are lung, prostate, and colorectal cancers, excluding nonmelanoma skin cancers.⁷

Health care expenditures on cancer treatment have also greatly increased over the past 2 decades. According to the Agency for Healthcare Research and Quality, a total of \$57 billion was spent on cancer care in 2001, compared with \$88.3 billion in 2011,⁸ and the National Cancer Institute reported that national estimates of cancer care costs are expected to rise to as high as \$173 billion by 2020.² These increasing costs pose financial challenges for patients, families, governments, and society as a whole.⁹ For example, the financial burden of cancer care has been linked to several negative consequences for patients, such as medical debts, bankruptcies, forgoing or delaying necessary medical care, or avoiding filling prescriptions.⁹ In addition, poor adherence to cancer treatment can have drastic consequences for cancer patients, resulting in less effective treatment, shorter survival, poorer prognosis, and greater risk of recurrence.^{9,10} From the societal standpoint, these consequences may lead to lost worker productivity and additional health care spending.¹¹ Thus, estimating the nature and extent of health care spending on cancer care is necessary to understand the scope of cancer costs and to inform the development of policies and programs to address the rising costs of cancer care, which is an increasingly important issue for health care policy makers, health care systems, employers, and society.¹²

Although previous studies have estimated the costs of cancer care, estimated expenditures vary widely by study depending on the scope of the analysis, study population, data, and study period.^{2,13-18} These studies have generated gross national estimates of health care expenditures instead of estimates at the individual level,^{2,16} or only include patients with specific cancer types^{13,15} or used outdated data.^{14,17,18} Although the gross national estimates of expenditures are important to estimate the overall economic burden of cancer care on the US health care system, the estimates of expenditures at the individual level are also crucial to understand the extent of financial burden of cancer care for individuals. In this regard, using nationwide data, this study builds on previous studies by estimating and comparing mean annual health care expenditures per person between patients with and without cancer, and among patients with breast, lung, prostate, and colorectal cancer. Expenditures were also examined by source of payment and by type of service.

Methods

Data

Five years of data were pooled from the 2010 to 2014 waves of the Medical Expenditure Panel Survey (MEPS). The MEPS is a nationally representative panel survey sponsored

by the Agency for Healthcare Research and Quality that provides comprehensive data on health care use, expenditures, sources of payment, and health insurance coverage in the US civilian noninstitutionalized population, as well as survey respondents' health status, medical conditions, and sociodemographic characteristics.¹⁹ The MEPS collects expenditure information using a combination of self-reported responses in the MEPS household component and follow-back surveys with providers in the linked MEPS medical provider component.¹⁹ From the MEPS household component, detailed information on health care expenditures, health insurance coverage, demographics, and socioeconomic characteristics were used.¹⁹ The linked Medical Conditions files were utilized to identify the cancer patient population in this study.²⁰

Study Population

All adults aged 18 years or older were selected in each study year. Cancer patients were identified using the medical condition variable, CCCODEX, in the Medical Conditions file, which compiles the *International Classification of Disease, Ninth Revision, Clinical Modification* codes into clinically meaningful categories.²⁰ The CCCODEX values from 11 to 45 were used to identify cancer patients who were currently experiencing any type of cancer.²¹ The following code values were selected to identify patients with the 4 most common cancers: 24 for breast, 19 for lung, 29 for prostate, and 14 and 15 for colorectal cancer.

Health Care Expenditures

The main outcome of interest was the mean of annual health care expenditures, which were estimated at the individual level. Health care expenditures were estimated using the sum of direct payments for all health care services during the year, by source of payment (private insurance, Medicare, Medicaid, out-of-pocket, and others), type of service (ambulatory care, hospital inpatient care, prescription medicines, and other services), and age group (18 to 64 and ≥ 65 years). Out-of-pocket expenditures included deductibles, co-insurance, and co-payments paid for all health care services, excluding over-the-counter drugs. Consistent with previous research, the sample for each source of payment included all individuals who had positive payments from that source.¹⁶ Adjusted analyses of expenditures were conducted controlling for age, sex, race/ethnicity, marital status, education, poverty status, health insurance status, and number of chronic conditions. These covariates were selected based on the Andersen's Behavioral Model of Health Services Use (6th edition),²² which was used as a guiding theoretical framework and helped to identify variables associated with utilization of and expenditures for health care services among cancer patients. Demographic variables such as age, sex, race/ethnicity, marital status, and education were used as predisposing factors because it was believed that these variables

might affect use of health care services. Poverty status and health insurance status were included as enabling factors, which affect an individual's ability to obtain and pay for health care services. Last, the number of health conditions were considered as need factors because it may lead to need for health care services and health care expenditures. All expenditures were adjusted to 2014 US dollars using the Consumer Price Index.

Statistical Analysis

Two-part models were used to estimate health care expenditures overall and for cancer care, accounting for zero expenditure values and skewness in the distribution of expenditures. For the first part of the model, logistic regression was used to predict the probability of whether or not an individual had a positive expenditure. In the second part of the model, a generalized linear regression model with a log link and gamma distribution was used to predict mean expenditures only for those who had positive expenditures.²³ The same covariates were included in both models, which were also stratified by age (18 to 64 and ≥ 65 years). Separate two-part models were estimated to predict mean expenditures for each group by payment source and service type. Expenditures were then compared between cancer and noncancer patients, as well as among patients with the 4 most common cancers. Statistical differences were evaluated for these comparisons using *t* tests and analysis of variance, respectively.

Descriptive statistics were used to describe the sample characteristics. Statistical differences for each comparison group were evaluated using chi-square tests for categorical variables and *t* tests for continuous variables. All statistical analyses were conducted at an alpha level of 0.05, and 95% confidence intervals were derived for expenditures using Stata 14.2 (StataCorp, College Station, Texas). All estimates were weighted to represent national estimates for the civilian noninstitutionalized US population and reported at the person level. Survey weights were adjusted for pooling to represent the average annual population size from 2010 to 2014.

Results

Sample Characteristics

Of 121 482 individuals aged ≥ 18 years, 6799 were cancer patients (weighted = 17 244 586). Of these, 3269 were nonelderly cancer patients aged 18 to 64 years (weighted = 7 869 226) and 3530 were elderly cancer patients ≥ 65 years (weighted = 9 375 340). The majority of cancer patients were female, non-Hispanic white, married, had some college degree, had high income, and had ≥ 2 chronic health conditions (Online Appendix 1). Cancer patients were more likely to have public insurance and less likely to be uninsured compared with those without cancer. Among

patients with the 4 most common cancers, patients with breast cancer were more likely to be younger, and those with prostate cancer were more likely to be 65 or older (Online Appendix 2). Patients with lung and colorectal cancer had lower education and were more likely to be poor or low-income, have public insurance, and be uninsured compared with those with breast and prostate cancer. Lung cancer patients were more likely to have multiple chronic health conditions than the other cancer types.

Annual Health Care Expenditures

Cancer patients versus noncancer patients. Overall, cancer patients had significantly higher mean annual health care expenditures than those without cancer (Table 1). Estimated mean expenditures for all adult cancer patients were \$16 346, which was nearly 4 times higher than those without cancer (\$4484). Cancer patients aged 18 to 64 years had mean expenditures of \$17 210, compared with \$3770 for those without cancer. Smaller differences were seen among those ≥ 65 years, where mean expenditures were \$14 368 for cancer patients and \$8634 for those without cancer.

The differences in expenditures between cancer and noncancer patients varied by payment source and service type. Among all adult cancer patients, Medicare had the highest mean expenditures, although there were no major differences from private insurance, which was second highest. Conversely, private insurance had the highest mean expenditures for cancer patients aged 18 to 64 years, while Medicare was the highest among those ≥ 65 years. Higher mean annual out-of-pocket expenditures were seen among patients with cancer than those without cancer regardless of age group (\$1592 vs \$682), although these differences were smaller in the elderly group than in the nonelderly group (\$1599 vs \$1198 and \$1507 vs \$592, respectively). Mean annual expenditures by type of service for cancer and noncancer patients are shown in Table 1 and Figure 1. Among cancer patients, ambulatory care visits accounted for the largest portion of health care expenditures regardless of age group (41%), followed by hospital inpatient (27%), prescription medicines (21%), and other services (10%).

Unweighted mean expenditures are available in Online Appendix 3 and full results of two-part models for all adults aged 18 years or older are presented in Online Appendices 4 and 6.

Four most common cancers. Of the 4 most common cancer types, mean expenditures were the highest among lung cancer patients followed by colorectal cancer patients, across all age groups (Table 2). Among lung cancer patients, mean expenditures were \$35 141 for all adult cancer patients, \$38 247 for those aged 18 to 64 years, and \$33 752 for those ≥ 65 years. Expenditures among breast cancer and prostate cancer patients were less than half of those seen in lung cancer patients.

Table 1. Mean Annual Health Care Expenditures Between Noncancer and Cancer Patients, by Age Group, Source of Payment, and Service Type.

		No cancer		Any cancer		
Sample size (n)		114683		6799		
Population size (N)		219658988		17244586		
		Mean	95% CI	Mean	95% CI	P ^a
All adults (≥ 18 years)	All sources of payment	\$4484	4361-4607	\$16346	15141-17552	<.001
	Source of payment					
	Private insurance	\$2249	2158-2339	\$5308	4718-5899	<.001
	Medicare	\$1248	1179-1317	\$5959	5366-6553	<.001
	Medicaid	\$433	388-478	\$686	525-848	<.01
	Out-of-pocket	\$682	662-702	\$1596	1481-1712	<.001
	Other	\$422	392-451	\$1395	1085-1705	<.001
	Service type ^b					
	Hospital inpatient service	\$1222	1155-1290	\$4309	3725-4894	<.001
	Ambulatory care visits	\$1698	1637-1760	\$6476	6067-6884	<.001
Age 18-64 years	All sources of payment	\$3770	3640-3900	\$17210	15077-19343	<.001
	Source of payment					
	Private insurance	\$2822	2707-2938	\$12619	10769-14469	<.001
	Medicare	\$389	342-437	\$1889	1378-2401	<.001
	Medicaid	\$465	415-516	\$1344	965-1723	<.001
	Out-of-pocket	\$592	573-611	\$1507	1363-1652	<.001
	Other	\$371	341-402	\$1688	989-2388	<.001
	Service type ^b					
	Hospital inpatient service	\$985	915-1056	\$4609	3665-5552	<.001
	Ambulatory care visits	\$1495	1439-1550	\$6778	6075-7480	<.001
Age ≥ 65 years	All sources of payment	\$8634	8303-8965	\$14368	13337-15398	<.001
	Source of payment					
	Private insurance	\$1267	1155-1379	\$2022	1785-2259	<.001
	Medicare	\$5241	5002-5480	\$9184	8267-10102	<.001
	Medicaid	\$305	235-375	\$170	118-222	<.001
	Out-of-pocket	\$1198	1127-1269	\$1599	1458-1741	<.001
	Other	\$676	600-751	\$1239	1037-1441	<.001
	Service type ^b					
	Hospital inpatient service	\$2549	2335-2764	\$4068	3403-4734	<.001
	Ambulatory care visits	\$2849	2635-3063	\$6086	5600-6572	<.001
Prescription medicines	\$2198	2094-2301	\$2745	2556-2934	<.001	
Other services	\$1466	1360-1572	\$1767	1549-1984	<.01	

Note. All monetary amounts are in 2014 US dollars and rounded off to the nearest whole number. CI = confidence interval.

^aP values reflect 2-sample t test or chi-square test for differences from those without a history of cancer (No cancer group).

^bAmbulatory care visits included office-based visits and hospital outpatient visits. Hospital inpatient care referred to inpatient hospital stays including zero-night stays. Prescription medications included all medications for treatment of any conditions. Other services included emergency room visits, dental visits, home health care, vision aids and other medical supplies and equipment.

Among all adult cancer patients with the 4 most common cancers, private health insurance had the highest mean expenditures for breast, lung, and colorectal cancer, whereas Medicare had the highest for prostate cancer. Private health insurance had the highest mean expenditures for patients aged 18 to 64 years, and Medicare had the highest for those ≥65

years. Despite markedly different total expenditures, there were no significant differences in mean annual out-of-pocket expenditures across the cancer types.

Among breast cancer patients, ambulatory care visits accounted for the largest proportion of spending, regardless of age group (Figure 2). Among patients with lung, prostate,

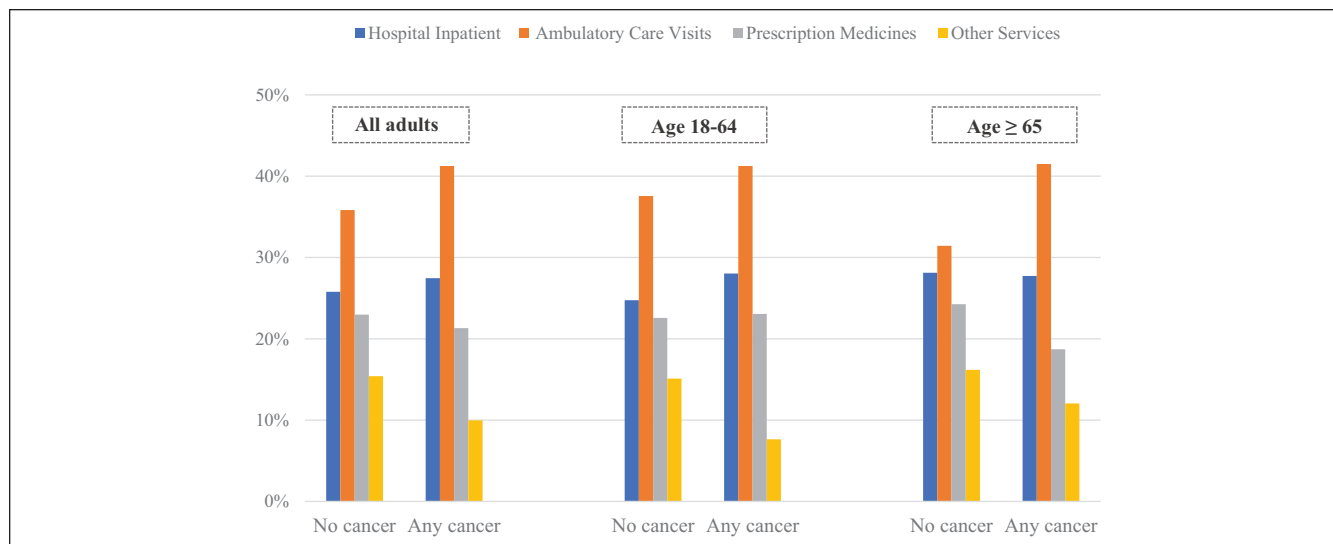


Figure 1. Percentage of health care expenditures by type of service between noncancer and cancer patients by age group.

Note. Percentages are from predicted mean expenditures from two-part models controlling for age, sex, race/ethnicity, marital status, education, poverty status, health insurance status, and number of chronic conditions. Ambulatory care visits included office-based visits and hospital outpatient visits. Hospital inpatient care referred to inpatient hospital stays including zero-night stays. Prescription medications included all medications for treatment of any conditions. Other services included emergency room visits, dental visits, home health care, vision aids, and other medical supplies and equipment.

and colorectal cancer aged 18 to 64 years, hospital inpatient and ambulatory care visits accounted for the largest share of expenditures. Among those ≥ 65 years, ambulatory care visits accounted for the largest share of expenditures among patients with lung and prostate cancer, while hospital inpatient care accounted for the largest share among colorectal cancer patients. Full results for all adults aged 18 years or older are available in Online Appendices 5 and 7.

Discussion

Cancer treatment exerts a considerable economic burden on the US health care system. Compared with individuals without cancer, mean annual health care expenditures per person were nearly 4 times higher among cancer patients (\$16 346 vs \$4484), with greater differences seen among those age 18 to 64 years than those ≥ 65 years. These expenditures were substantially higher than those seen in the general US population, which were \$8054 in 2014.²⁴ The trends seen in this study were similar to a previous study using data from 2008 to 2010, although the magnitude of expenditures for cancer patients were higher, reflecting the rising costs of cancer treatment.¹⁸ As spending on ambulatory care visits accounted for the majority of health care expenditures for both cancer and noncancer patients, ambulatory care visits could be a prime target for cost-containment strategies. In addition, the distribution of expenditures by type of service varied by cancer type, which implies that multiple strategies may be needed to address treatment costs for different cancer types.

We note 3 key contributions to the existing literature on the health care expenditure burden of cancer care in the

United States. First, we provide national estimates of cancer care costs at the individual level, which could be useful resources for the development of insurance design and policies to address the rising costs of cancer care. In addition, our age group comparisons allowed us to demonstrate that young cancer patients had a relatively high financial burden of cancer care compared with both those without cancer and elderly patients with cancer. Last, we particularly provide and compare the estimates of cancer care for the 4 most common cancers, breast, lung, prostate, and colorectal cancer, which were not well addressed in previous studies.^{2,13-18}

This study found that younger cancer patients had relatively higher health care costs burden than elderly cancer patients. Cancer patients age 18 to 64 years had higher mean expenditures than elderly patients age ≥ 65 years (\$17 210 vs \$14 348) and the differences in mean expenditures between noncancer and cancer patients were considerably higher among younger cancer patients than among elderly patients; the difference was 4 times more among younger cancer patients, while nearly twice as high among elderly cancer patients. These findings imply that younger patients with cancer may face considerably more financial hardship than elderly patients. Furthermore, considering that patients age 18 to 64 years are the working-age population, they may bear additional indirect costs due to cancer, such as lost productivity due to employment disability, missed workdays, or lost household productivity.^{18,25} As there are still a considerable number of people who are underinsured (45%) or uninsured (12%) among the working-age population in the United States,^{26,27} this group may be more vulnerable to the financial burden of cancer care, and should be carefully considered by

Table 2. Mean Annual Health Care Expenditures Among Patients With Four Most Common Cancers, by Age Group, Source of Payment, and Service Type.

		Breast cancer		Lung cancer		Prostate cancer		Colorectal cancer		
Sample size (n)		985		201		726		299		
Population size (N)		2258403		459515		1734866		597869		
		Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	P ^a
All adults (≥ 18 years)	All sources of payment	\$14912	12955-16870	\$35141	27123-43158	\$15613	12061-19165	\$23294	17404-29185	<.01
	Source of payment									
	Private insurance	\$8582	6774-10391	\$21018	12519-29518	\$5389	3270-7507	\$14058	7845-20271	<.01
	Medicare	\$4731	3741-5720	\$18948	11390-26507	\$7982	5680-10284	\$9219	6351-12088	<.01
	Medicaid	\$1059	653-1466	\$1053	364-1743	\$316	133-499	\$1560	552-2568	<.01
	Out-of-pocket	\$1616	1337-1894	\$1421	1134-1709	\$1329	1164-1494	\$1434	1158-1710	0.28
	Other	\$1113	669-1558	\$4082	1092-7072	\$1714	1206-2221	\$1810	403-3217	<.05
	Service type ^b									
	Hospital inpatient service	\$2620	1801-3439	\$12179	7239-17119	\$5488	3074-7902	\$9220	5450-12990	<.01
	Ambulatory care visits	\$7814	6492-9135	\$15099	10266-19932	\$6081	5220-6943	\$9068	7154-10982	<.01
Prescription medicines	\$3410	2847-3974	\$4165	2968-5363	\$2247	1913-2582	\$2941	2188-3695	<.01	
Other services	\$1443	1146-1740	\$2173	1309-3037	\$1689	1306-2073	\$1633	986-2280	0.31	
Age 18-64 years	All sources of payment	\$16046	13249-18843	\$38247	25745-50750	\$14832	8769-20896	\$28021	14994-41048	<.01
	Source of payment									
	Private insurance	\$12168	9218-15118	\$35600	16005-55195	\$12692	5705-19679	\$25938	8550-43326	0.10
	Medicare	\$2332	870-3794	\$4753	787-8718	\$407	74-739	\$2918	561-5276	<.01
	Medicaid	\$1952	1113-2791	\$3000	227-5773	\$843	90-1597	\$3190	1067-5312	0.07
	Out-of-pocket	\$1520	1294-1746	\$1613	1140-2086	\$1197	891-1503	\$1843	1176-2509	0.19
	Other	\$1113	669-1558	\$4082	1092-7072	\$1714	1206-2221	\$1810	403-3217	0.54
	Service type ^b									
	Hospital inpatient service	\$2213	1426-3000	\$15977	6751-25202	\$6839	602-13075	\$12371	3896-20845	<.01
	Ambulatory care visits	\$9500	7314-11685	\$15493	9374-21611	\$6295	4257-8333	\$12779	7471-18088	<.01
Prescription medicines	\$4067	2796-5339	\$3161	1641-4680	\$1543	1006-2080	\$3070	1750-4389	<.01	
Other services	\$1070	863-1277	\$2113	983-3243	\$1170	690-1651	\$1194	429-1958	0.35	
Age ≥ 65 years	All sources of payment	\$13820	11705-15935	\$33752	22693-44811	\$15529	11750-19307	\$19053	13914-24193	<.01
	Source of payment									
	Private insurance	\$2480	1873-3087	\$3378	1045-5710	\$1671	1229-2114	\$2595	1260-3929	<.05
	Medicare	\$7748	6054-9441	\$25907	15045-36769	\$10403	7412-13395	\$13013	8905-17121	<.01
	Medicaid	\$420	143-696	\$430	86-773	\$148	54-243	\$326	25-627	0.09
	Out-of-pocket	\$1690	1227-2154	\$1354	1003-1704	\$1365	1173-1558	\$1308	971-1645	0.49
	Other	\$779	497-1062	\$2862	1190-4533	\$1605	1069-2140	\$830	483-1176	
	Service type ^b									
	Hospital inpatient service	\$3093	1614-4572	\$9014	5243-12784	\$4890	2748-7031	\$8564	3929-13199	<.05
	Ambulatory care visits	\$6379	5188-7571	\$14319	8358-20281	\$5827	4968-6685	\$6420	3999-8840	<.05
Prescription medicines	\$2968	2501-3435	\$4471	2941-6001	\$2441	2011-2872	\$2953	1949-3957	.07	
Other services	\$1810	1291-2330	\$1848	1033-2663	\$1863	1385-2341	\$1990	1102-2878	.98	

Note. All monetary amounts are in 2014 US dollars and rounded off to the nearest whole number. CI = confidence interval; ANOVA = analysis of variance.

^aP values reflect ANOVA test for differences among the 4 types of cancer groups: breast, lung, prostate, and colorectal cancer.

^bAmbulatory care visits included office-based visits and hospital outpatient visits. Hospital inpatient care referred to inpatient hospital stays including zero-night stays.

Prescription medications included all medications for treatment of any conditions. Other services included emergency room visits, dental visits, home health care, vision aids and other medical supplies and equipment.

employers and policy makers when designing insurance benefits.

Among patients with the 4 most common cancers, overall, patients with lung cancer were more likely to have significantly higher mean annual health care expenditures followed by patients with colorectal cancer, which is consistent with previous research.¹⁷ This may reflect the differences in stage distribution at diagnosis, survival, intensity of treatment, and comorbidity burden for patients with lung cancer. Previous research has shown that the costs of cancer care are highest in the initial and last year of life, representing a nonlinear U-shaped curve.¹⁷ For lung cancer, most patients are diagnosed at advanced stages with relatively

short survival duration, with a 5-year survival rate of 18.6% for lung cancer compared with 89.7% for breast cancer, 98.2% for prostate cancer, and 64.5% for colorectal cancer; thus, more intensive care may be necessary for patients with lung cancer, leading to higher spending on both hospital inpatient and outpatient services.^{3,4,17} In addition, patients with lung cancer have a higher comorbidity burden than other cancer types, which is supported by our findings and previous research.³ Colorectal cancer patients had the second highest mean expenditures with higher spending on hospital inpatient services, which may be due to the nature of treatment for colorectal cancer where surgery is the most common treatment for all stages of colon cancer.²⁸ The

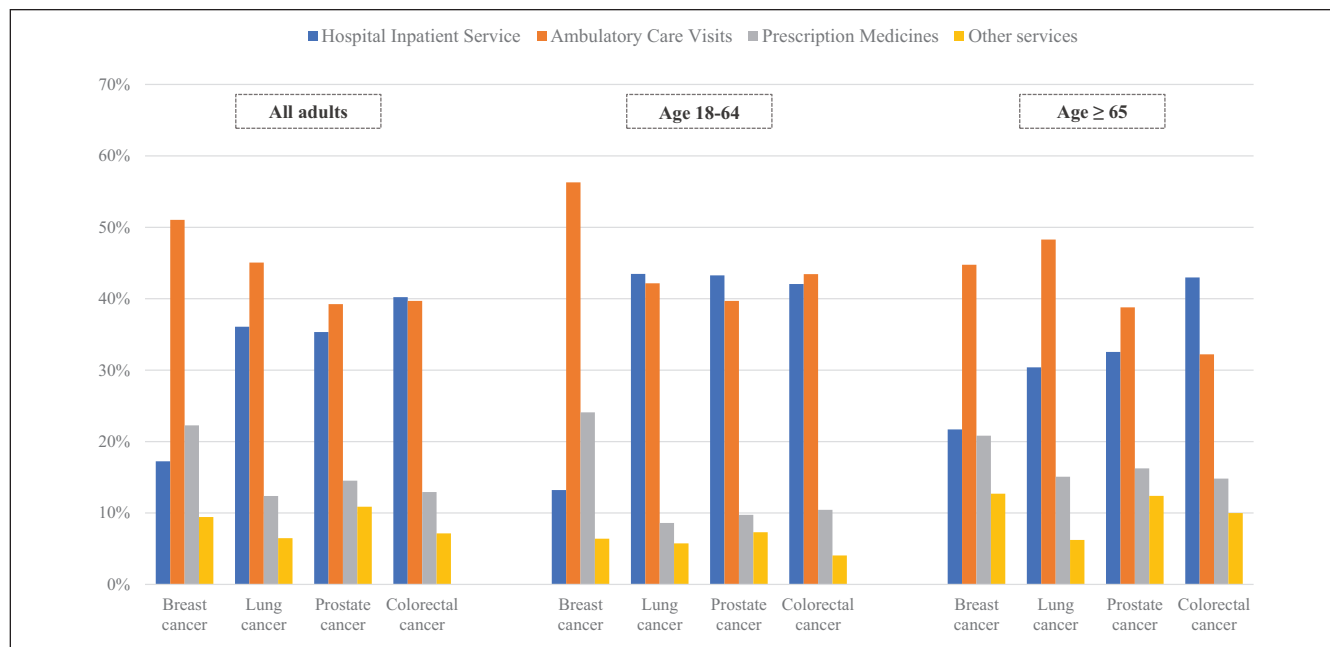


Figure 2. Percentage of health care expenditures by type of service among patients with the 4 most common cancers by age group: Medical Expenditure Panel Survey, 2010 to 2014.

Note. Ambulatory care visits included office-based visits and hospital outpatient visits. Hospital inpatient care referred to inpatient hospital stays including zero-night stays. Prescription medications included all medications for treatment of any conditions. Other services included emergency room visits, dental visits, home health care, vision aids, and other medical supplies and equipment.

survival rate is relatively lower than for breast and prostate cancer, although it is higher than lung cancer.⁴

Due to higher out-of-pocket expenditures, cancer patients are exposed to higher economic burdens than those without cancer. Although out-of-pocket expenditures were similar across the 4 most common cancers, the extent of financial burden patients experience will vary based on their income and financial resources available, which may vary by cancer type. For example, patients with lung and colorectal cancer may be more likely to experience higher financial burden than others because they were more likely to be poor or low-income and/or older. As financial burden due to cancer care has been linked to adverse health consequences including forgoing or delaying necessary medical care and poor medication adherence,⁹ comprehensive cost-saving strategies are needed to protect patients from the high and rising costs of cancer care.

When comparing expenditures by source of payment, important differences were observed where private insurance was the largest payment source for cancer patients age 18 to 64, whereas Medicare was the largest for those ≥ 65 years. For example, Medicare paid approximately 3 times as much for elderly breast cancer patients as private insurance and 10 times as much for prostate cancer. The increasing share of cancer treatments paid by Medicare will continue to rise as it is expected that 73% of cancer survivors will be ≥ 65 years by 2040.³ The significantly greater burden of cancer treatment costs on publicly funded program such as Medicare is

an important policy issue, as the responsibility of paying for cancer treatment will be increasingly passed on to taxpayers, government, and society, alongside the increasing financial burden on cancer patients. Policy makers and health plan administrators should utilize these findings when considering cost-saving strategies, and cost-effective cancer treatment should be emphasized by providers and health systems. This study is subject to several limitations. The MEPS data only include noninstitutionalized patients as a survey sample, which may result in an underestimation of cancer patients with particular types or severity of cancer, which would result in underestimates of cancer expenditures. Second, it was not possible to estimate expenditures by cancer stage or intensity due to a lack of information in the data, which might also contribute to higher expenditures. Third, all-cause health care expenditures were estimated as information on cancer-attributable expenditures were not available. Last, although our findings may include some early effects of policy changes under the Affordable Care Act (ACA), future research might be needed to specifically examine the impact of the ACA on health care expenditure burden of cancer care by providing trends in expenditures before and after the ACA.

Conclusions

As the costs of cancer care are expected to continue increasing in the near future, comprehensive policies and programs

are needed to reduce the costs of cancer care while maintaining or improving important aspects of oncology care such as access to high-value interventions, evidence-based use of treatment, and patient-centered care.²⁹ Estimated mean annual health care expenditures for cancer patients are nearly 4 times higher than for those without cancer, with lung cancer patients having the highest mean expenditures among the 4 most common cancers. Medicare pays a significant amount of health care costs for cancer patients. The findings in this study may be helpful in developing comprehensive cost-saving strategies for cancer care in the United States.

Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online.

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