

# Increasing Out-of-Pocket Costs by Stage Among Commercially Insured Patients Diagnosed with Cancer 2016-2020

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## BACKGROUND

- Cancer represents a significant source of disease burden in the US.
  - 1 in 2 men and 1 in 3 women are estimated to develop invasive cancer within their lifetime;<sup>1</sup> >1.9 million new US cancer cases were estimated in 2022.<sup>2</sup>
  - Cancer is the second leading cause of death in the US,<sup>3</sup> with an estimated 609,360 cancer-related deaths in the US in 2022.<sup>2</sup>
- Identification and treatment of cancer at an early stage, before it has a chance to spread or progress and require more complex and intensive treatment, may be associated with decreased morbidity and mortality as well as lower cancer treatment and management costs.<sup>4</sup>
- A cancer diagnosis can result in significant financial burden and distress for patients.
  - Cancer patients incurred an estimated \$16.2 billion in out-of-pocket (OOP) costs for cancer care in 2019<sup>5</sup> and in 2014 US employers, insurance companies, taxpayer-funded public programs, and cancer patients and their families spent ~\$8.8 billion on cancer-related health care.<sup>6,7</sup>
  - Almost half of cancer patients experience great economic burden or financial toxicity,<sup>8</sup> which may lead to poorer quality of life, emotional distress, reduced treatment adherence and access, further exacerbation of existing disparities in care, and worse clinical outcomes.<sup>9-18</sup>

## OBJECTIVE

- To better understand the economic burden for cancer patients following a cancer diagnosis, we estimated the mean patient OOP costs in year 1 post-cancer diagnosis by cancer type and stage, and insurance coverage.

## METHODS

- A retrospective analysis was conducted with Optum's de-identified Integrated Claims-Clinical dataset with Enriched Oncology, which includes data from Medicare Advantage and commercially insured members (1/1/2008-7/31/2020).
- Adult members with staged breast, colorectal, lung, or ovarian cancer, newly diagnosed between 1/1/2016-6/30/2020 and continuous enrollment for ≥1 month post-diagnosis were included.
- OOP costs included copay, coinsurance, and deductible.
- Mean OOP costs were calculated in each month over a 1-year period post-cancer diagnosis.
- In each month, OOP costs were calculated for those with continuous enrollment and no death reported in the month.
- Mean annual OOP cost per patient by insurance coverage (commercial or Medicare Advantage) was estimated by summing the month 1-12 mean OOP costs and stratifying by stage at cancer diagnosis.

## KEY RESULT: PATIENT OUT-OF-POCKET COSTS WERE GENERALLY HIGHER IN PATIENTS WITH LATER CANCER STAGING AT DIAGNOSIS

### Patient Demographics and Characteristics (Commercial Insurance)

- Among members insured by a commercial insurance plan and diagnosed with breast, colorectal, lung, or ovarian cancer from 2016-2020, 6,028 eligible members were identified for inclusion in this analysis (Table 1):
  - Breast cancer: 3,686 (61.1%)
  - Colorectal cancer: 1,010 (16.8%)
  - Lung cancer: 1,010 (16.8%)
  - Ovarian cancer: 322 (5.3%)
- Across all four cancers reported, the mean age ranged from 48.1 to 61.2 years.
- For members diagnosed with cancers not exclusively among females (colorectal and lung), the percentage of females ranged from 41.5% to 63.5%.
- Most individuals resided in the Midwest (24.1% to 44.8%) or Northeast (24.1% to 69.0%) geographic regions.
- Mean Charlson Comorbidity Index (CCI) was below or equal to a score of 1.4 for all cancers reported.

### OOP Costs Among Commercially Insured Patients

- Mean year 1 commercial OOP costs generally increased by stage at diagnosis (mean cost difference stage I to IV, all cancers: p<0.001) (Figure 2; Table 2).
- Absolute mean commercial OOP cost increased from stage I to IV (Figure 3):
  - Breast cancer by +\$2,369 (26% increase)
  - Colorectal cancer by +\$1,213 (13% increase)
  - Lung cancer by +\$6,306 (76% increase)
  - Ovarian cancer by +\$3,273 (49% increase)

### Patient Demographics and Characteristics (Medicare Advantage)

- Among members insured by a Medicare Advantage plan and diagnosed with breast, colorectal, lung, or ovarian cancer from 2016-2020, 4,655 eligible members were identified for inclusion in this analysis:
  - Breast cancer: 2,003 (43.0%)
  - Colorectal cancer: 772 (16.6%)
  - Lung cancer: 1,687 (36.2%)
  - Ovarian cancer: 193 (4.1%)
- Across all four cancers reported, the mean age ranged from 68.7 to 72.8 years.
- For members diagnosed with cancers not exclusively among females (colorectal and lung), the percentage of females ranged from 46.9% to 56.1%.
- Most individuals resided in the Midwest (32.6% to 47.4%).
- Mean CCI was below or equal to a score of 2.2 for all cancers reported.

### OOP Costs Among Medicare Advantage Insured Patients

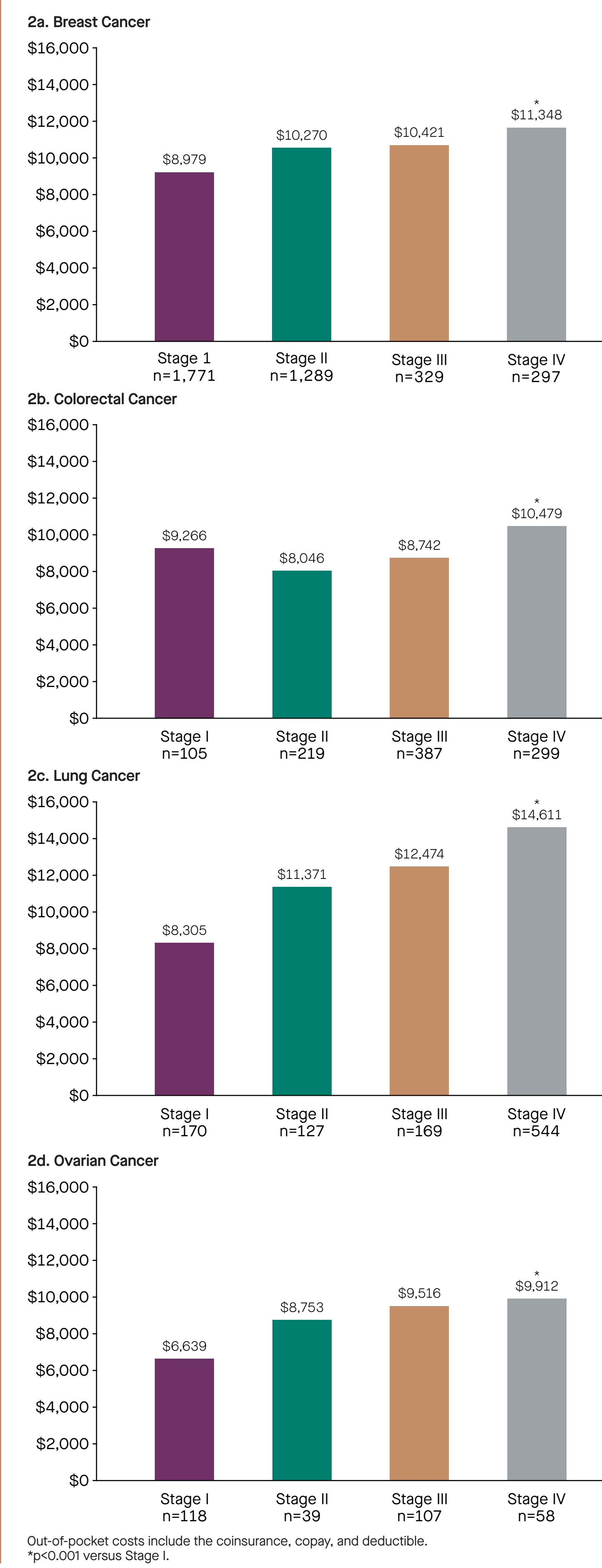
- Mean year 1 Medicare Advantage OOP costs generally increased by stage at diagnosis (mean cost difference stage I to IV, all cancers: p<0.001) (Figure 4).
- Absolute mean commercial OOP cost increased from stage I to IV:
  - Breast cancer by +\$5,014, (119% increase)
  - Colorectal cancer by +\$6,414 (152% increase)
  - Lung cancer by +\$7,340 (110% increase)
  - Ovarian cancer by +\$6,191 (186% increase)

**Table 1. Patient Demographics and Characteristics by Cancer Type and Stage, Diagnosed 2016-2020 (Commercial Insurance)**

Breast Cancer (n=3,686)	I	II	III	IV
n	1,771	1,289	329	297
Age, mean (SD), years <sup>a</sup>	53.8 (9.3)	51.4 (9.7)	51.0 (10.1)	52.6 (10.2)
Female Gender, n (%) <sup>a</sup>	1,763 (99.5)	1,280 (99.3)	328 (99.7)	294 (99.0)
<b>Geographic Region, n (%)<sup>a,b</sup></b>				
Midwest	716 (40.4)	515 (40.0)	124 (37.7)	111 (37.4)
Northeast	702 (39.6)	485 (37.6)	104 (31.6)	98 (33.0)
South	184 (10.4)	154 (11.9)	53 (16.1)	65 (21.9)
West	129 (7.3)	100 (7.8)	31 (9.4)	18 (6.1)
Unknown	40 (2.3)	35 (2.7)	17 (5.2)	5 (1.7)
CCI, mean (SD) <sup>c</sup>	0.3 (0.8)	0.3 (0.8)	0.3 (0.8)	0.5 (1.1)
Colorectal Cancer (n=1,010)	I	II	III	IV
n	105	219	387	299
Age, mean (SD), years <sup>a</sup>	54.6 (10.9)	53.7 (11.2)	53.4 (10.1)	52.6 (11.0)
Female Gender, n (%) <sup>a</sup>	44 (41.9)	92 (42.0)	182 (47.0)	124 (41.5)
<b>Geographic Region, n (%)<sup>a,b</sup></b>				
Midwest	47 (44.8)	85 (38.8)	154 (39.8)	116 (38.8)
Northeast	37 (35.2)	80 (36.5)	126 (32.6)	72 (24.1)
South	17 (16.2)	31 (14.2)	69 (17.8)	80 (26.8)
West	2 (1.9)	14 (6.4)	20 (5.2)	19 (6.4)
Unknown	2 (1.9)	9 (4.1)	18 (4.7)	12 (4.0)
CCI, mean (SD) <sup>c</sup>	0.9 (1.3)	0.5 (0.9)	0.5 (1.1)	0.7 (1.0)
Lung Cancer (n=1,010)	I	II	III	IV
n	170	127	169	544
Age, mean (SD), years <sup>a</sup>	60.7 (8.6)	60.2 (9.2)	61.2 (8.7)	58.6 (8.6)
Female Gender, n (%) <sup>a</sup>	108 (63.5)	73 (57.5)	81 (47.9)	280 (51.5)
<b>Geographic Region, n (%)<sup>a,b</sup></b>				
Midwest	50 (29.4)	31 (24.4)	70 (41.4)	195 (35.8)
Northeast	86 (50.6)	63 (49.6)	59 (34.9)	218 (40.1)
South	21 (12.4)	22 (17.3)	31 (18.3)	90 (16.5)
West	6 (3.5)	6 (4.7)	9 (5.3)	27 (5.0)
Unknown	7 (4.1)	5 (3.9)	0 (0.0)	14 (2.6)
CCI, mean (SD) <sup>c</sup>	1.4 (1.4)	1.1 (1.4)	1.4 (1.5)	1.2 (1.4)
Ovarian Cancer (n=322)	I	II	III	IV
n	118	39	107	58
Age, mean (SD), years <sup>a</sup>	48.1 (12.4)	52.6 (9.9)	53.0 (11.7)	55.6 (9.9)
Female Gender, n (%) <sup>a</sup>	118 (100.0)	39 (100.0)	107 (100.0)	58 (100.0)
<b>Geographic Region, n (%)<sup>a,b</sup></b>				
Midwest	51 (43.2)	15 (38.5)	43 (40.2)	18 (31.0)
Northeast	44 (37.3)	13 (33.3)	32 (29.9)	20 (34.5)
South	15 (12.7)	8 (20.5)	23 (21.5)	12 (20.7)
West	6 (5.1)	1 (2.6)	7 (6.5)	4 (6.9)
Unknown	2 (1.7)	2 (5.1)	2 (1.9)	4 (6.9)
CCI, mean (SD) <sup>c</sup>	0.3 (0.7)	0.3 (0.8)	0.5 (1.1)	0.7 (1.2)

CCI, Charlson Comorbidity Index; SD, standard deviation.  
<sup>a</sup>Demographics were calculated at the time of cancer diagnosis.  
<sup>b</sup>Percentages may not total to 100% due to rounding.  
<sup>c</sup>CCI was calculated among subjects with 6 months of continuous insurance eligibility prior to their cancer diagnosis.

**Figure 2. Mean Out-of-Pocket Costs by Cancer Type and Stage Among Commercially Insured Members, Year 1 Post Diagnosis**

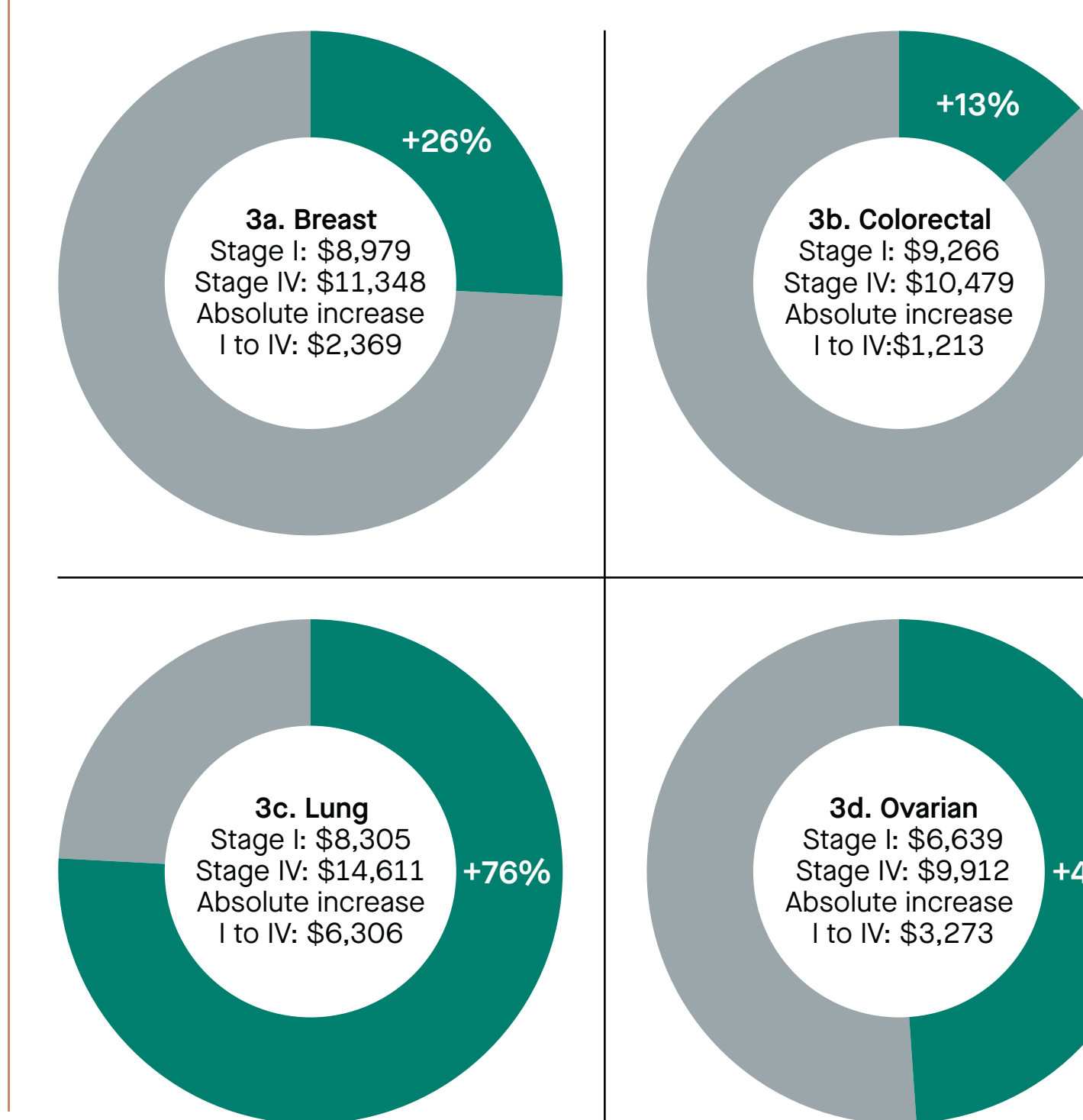


**Table 2. Out-of-Pocket Costs by Cancer Type and Stage Among Commercially Insured Patients, Year 1 Post Diagnosis**

Stage	I	II	III	IV
<b>Breast Cancer</b> (n=3,686)				
n	1,771	1,289	329	297
OOP Cost, mean (SD)	\$8,979 (\$8,809)	\$10,270 (\$9,938)	\$10,421 (\$12,130)	\$11,348 (\$9,895)
OOP Cost, median (range)	\$1,204 (\$0-\$450,374)	\$1,295 (\$0-\$375,082)	\$1,259 (\$0-\$375,082)	\$1,769 (\$0-\$292,270)
<b>Colorectal Cancer</b> (n=1,010)				
n	105	219	387	299
OOP Cost, mean (SD)	\$9,266 (\$7,544)	\$8,046 (\$11,136)	\$8,742 (\$8,471)	\$10,479 (\$8,985)
OOP Cost, median (range)	\$1,803 (\$0-\$139,104)	\$1,277 (\$0-\$232,267)	\$1,535 (\$0-\$230,331)	\$2,020 (\$0-\$246,246)
<b>Lung Cancer</b> (n=1,010)				
n	170	127	169	544
OOP Cost, mean (SD)	\$8,305 (\$7,439)	\$11,371 (\$11,872)	\$12,474 (\$10,396)	\$14,611 (\$13,372)
OOP Cost, median (range)	\$1,342 (\$0-\$156,739)	\$1,167 (\$0-\$247,965)	\$2,116 (\$0-\$240,354)	\$2,563 (\$0-\$398,354)
<b>Ovarian Cancer</b> (n=322)				
n	118	39	107	58
OOP Cost, mean (SD)	\$6,639 (\$6,906)	\$8,753 (\$8,344)	\$9,516 (\$9,952)	\$9,912 (\$7,438)
OOP Cost, median (range)	\$980 (\$0-\$120,369)	\$2,728 (\$0-\$82,403)	\$1,354 (\$0-\$203,469)	\$1,771 (\$0-\$89,284)

OOP, out-of-pocket; SD, standard deviation.  
OOP costs include the coinsurance, copay, and deductible.

**Figure 3. Absolute Percentage Increase from Stage I to IV in Mean OOP Costs Among Commercially Insured Members, Year 1 Post Diagnosis**



**Figure 4. Mean Out-of-Pocket Costs by Cancer Type and Stage Among Medicare Advantage Insured Members, Year 1 Post Diagnosis**



Out-of-pocket costs include the coinsurance, copay, and deductible.  
\*p<0.001 versus Stage I.

## CONCLUSIONS

- Mean annual OOP costs per patient among the commercially insured during the year post-cancer diagnosis were significantly higher among those diagnosed at later versus earlier cancer stages.
- While average commercial OOP costs in year 1 post diagnosis remain ≥\$13,372 in the cancers of interest, some patients face extreme economic burden (upper range of year 1 costs in the several hundred thousands).
  - Recent data suggests many US households (46%) did not have enough cash on hand to cover an unexpected \$400 expense.<sup>19</sup>
  - Even relatively minimal or average OOP costs in line with the estimates from this study could push a cancer patient into financial toxicity.
  - Estimated OOP costs are conservative as only recorded coinsurance, copay, and deductible were included, which may not reflect the full spectrum of additional healthcare-related costs incurred by cancer patients (e.g., insurance premiums).
  - Similar trends of increased mean OOP cost in year 1 post diagnosis for those diagnosed at later versus earlier cancer stage were also evidenced in Medicare Advantage insured patients.
  - Earlier cancer diagnosis may enable reduced patient financial burden through earlier cancer diagnosis requiring less intensive treatment and management and associated OOP costs.

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