

Objectives

Multiple primary cancers indicate that a patient or an individual has more than one cancer in the same or a different organ but do not include instances of metastasis of initial primary cancers.

This study aims to evaluate healthcare utilization and costs among individuals with ≥ 2 distinct malignant cancer sites compared with those with 0–1 cancer site using nationally representative data from the United States.

Methods

We conducted a pooled, repeated cross-sectional analysis of adults in MEPS (2018–2023) using person-level files linked to condition-level records by the unique person identifier (DUPERSID) and calendar year (YEAR). Survey design elements (strata and PSU) and person weights were applied to produce nationally representative estimates

Healthcare resource utilization (HCRU) costs were assessed using two complementary measures. All-cause HCRU costs were defined as total annual healthcare expenditures (EXPTOT), representing the sum of all direct medical payments across care settings. Cancer-attributable HCRU costs were derived using MEPS condition–event linkage files by summing expenditures for healthcare events associated with malignant neoplasm diagnoses (ICD-10-CM C00–C97). This approach isolates spending directly attributable to cancer-related care.

Results

In a nationally representative sample of 151,452 individuals (weighted N = 330 million person-years), 8.7% reported a history of cancer, and 0.34% had ≥ 2 distinct malignant cancer sites.

Patients with multi-site cancer were predominantly older, with 79% aged ≥ 65 years, compared with 18% in the 0–1 cancer group. A slightly higher proportion was male (56% vs 49%). Multi-site cancer patients also showed greater representation in higher educational categories and a modestly higher prevalence of cost-related care delays (7.0% vs 6.3%).

Compared with those with zero or one cancer site, multi-site cancer was associated with more than twice the rate of emergency department visits (IRR = 2.06, $p < 0.001$),

Results

Table 1. Sociodemographic details of participants

Characteristic	0–1 Cancer Sites	≥ 2 Cancer Sites	Total
Sex			
Male	161,624,047 (48.95%)	620,817 (56.0%)	162,244,864 (49.14%)
Female	167,452,679 (50.72%)	486,255 (44.0%)	167,938,934 (50.86%)
Age			
18–44	116,219,171 (35.20%)	19,602 (1.8%)	116,238,774 (35.20%)
45–64	81,815,318 (24.78%)	212,108 (19.2%)	82,027,426 (24.84%)
≥ 65	58,194,129 (17.62%)	875,362 (79.1%)	59,069,491 (17.89%)
Other	72,848,107 (22.06%)	–	72,848,107 (22.06%)
Education Level			
No degree	31,293,531 (12.15%)	70,226 (6.4%)	31,363,757 (12.17%)
GED	9,100,142 (3.53%)	38,482 (3.5%)	9,138,624 (3.55%)
High school diploma	102,168,407 (39.66%)	370,150 (33.7%)	102,538,557 (39.80%)
Bachelor’s degree	53,969,385 (20.95%)	279,768 (25.5%)	54,249,153 (21.06%)
Master’s degree	26,189,141 (10.17%)	161,104 (14.7%)	26,350,245 (10.23%)
Doctorate degree	7,150,251 (2.78%)	72,565 (6.6%)	7,222,815 (2.80%)
Other degree	26,643,843 (10.34%)	106,470 (9.7%)	26,750,313 (10.38%)

Table 2. Per-patient-per-month (PPPM) healthcare utilization by multi-site cancer status..

HCRU PPPM	0–1 Cancer Sites (Mean)	≥ 2 Cancer Sites (Mean)	% Increase
ER visits	0.0157	0.0359	128%
Inpatient stays	0.0067	0.0264	293%
Prescription fills	0.7529	2.1651	188%

HCRU PPPM	0–1 Cancer Sites (Mean)	≥ 2 Cancer Sites (Mean)	% Increase
Total cost PPPM	\$611	\$2,988	389%
Cancer cost PPPM	\$19	\$837	4320%

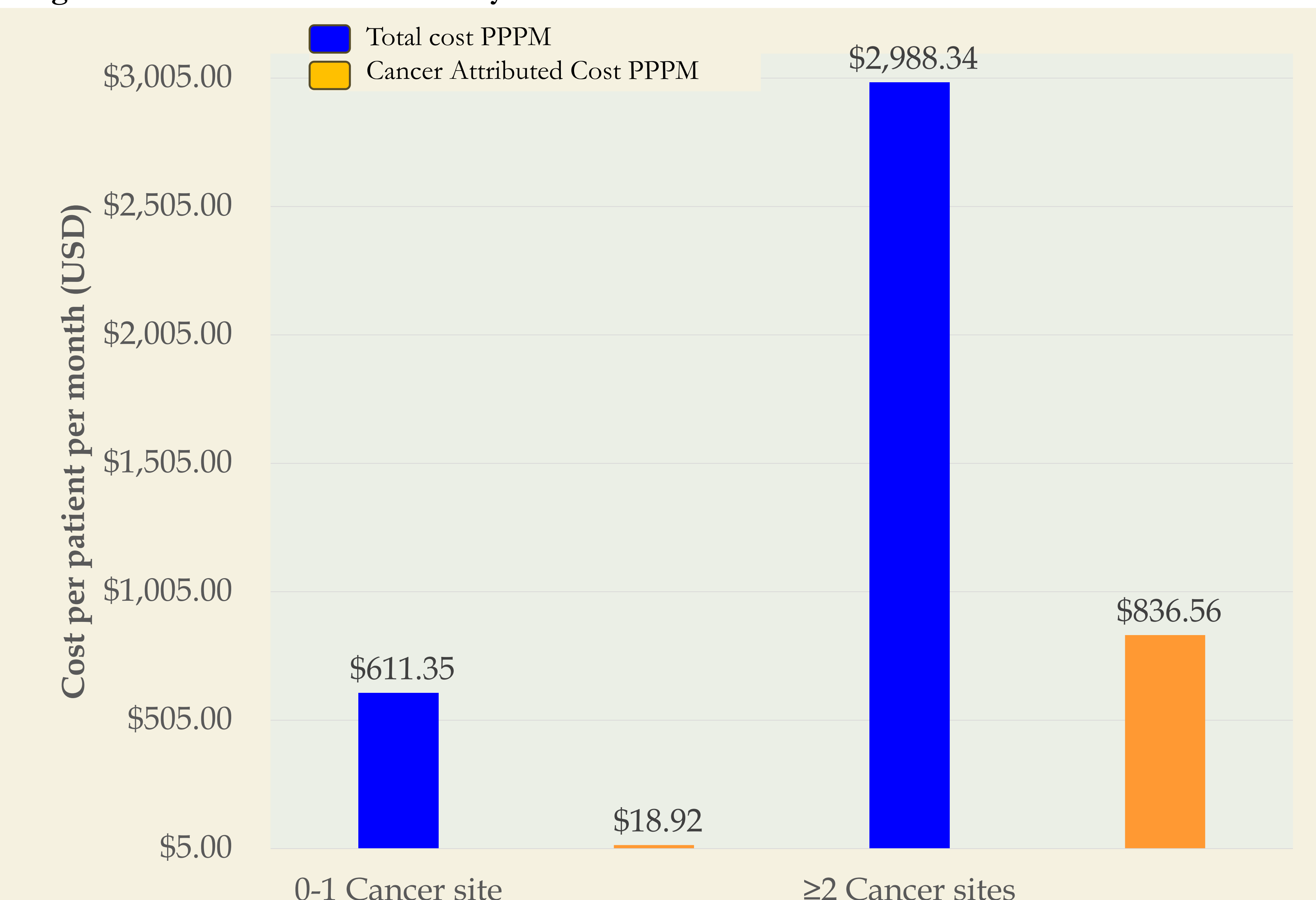
approximately 2.6-fold higher inpatient hospitalization rates (IRR = 2.58, $p < 0.001$), and an 86% higher rate of prescription medication use (IRR = 1.86, $p < 0.001$).

Individuals with ≥ 2 distinct malignant cancer sites had approximately 4.4 times higher total healthcare costs compared with those with 0–1 cancer site, after adjustment for covariates. Individuals with multi-site cancer had approximately 3.0 times higher cancer-attributable costs compared with those with 0–1 cancer sites.

Patients with multi-site cancer were slightly more likely to delay care due to cost compared with those with 0–1 cancer site. Patients with ≥ 2 cancer sites demonstrated a higher prevalence of cost-related care delays, suggesting increased financial burden and potential barriers to timely care (7.0% vs 6.3%).

Multi-site cancer is associated with a dramatically higher economic burden, with monthly cancer-related costs exceeding \$800 compared to $< \$20$ in single-site patients.

Figure 1. Healthcare utilization by cancer status



Conclusions

These findings highlight the significant clinical and economic impact of multi-site cancers and underscore the need for targeted care strategies, improved care coordination, and policies addressing financial burden in this high-risk population. Future research should further examine longitudinal outcomes, treatment pathways, and interventions to optimize care and reduce costs for patients with multiple primary cancers.