

Medicare Spending on Urinary Tract Infections: A Retrospective Database Analysis

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ABSTRACT

Background: Medical visits for UTIs represent 1%-6% of all healthcare visits (~7 million visits) and are estimated to cost the United States (US) healthcare system at least \$1.6 billion annually. UTIs are associated with significant morbidity; particularly among the elderly, where UTIs are most prevalent. Little is known about the specific costs to Medicare of UTI.

Methods: We conducted a retrospective cohort study of the Medicare fee-for-service (FFS) data. Patients were included for analysis if the following criteria were met: (1) enrolled in Medicare FFS from January 1, 2016 through December 31, 2019, (2) not enrolled in Medicare Advantage during that time period, (3) did not have any UTI diagnoses in 2016, and (4) enrolled in Medicare Part D. Individuals were categorized as having uncomplicated UTI (uUTI), complicated UTI (cUTI), or those who first had a uUTI that progressed to a cUTI (uUTI to cUTI). Medicare spending in the 12 months post-diagnosis was calculated, and patients were stratified by primary residence (home or institution).

Results: 2,330,123 patients were included for analysis; 92% were home-based, 8% were institutionally-based. Mean Charlson Comorbidity Index (CCI) across all patients was 2.16. In the 12 months after initial diagnosis, average Medicare spend was \$33,984, \$9,941 of which was UTI-related. Annual UTI-related costs were approximated \$9,000 for home-based vs. \$21,444 for institution-based patients. Mean drug spend per patient on antibiotics was \$872. Broadly, uUTI patients were least expensive, followed by cUTI patients, with uUTI to cUTI patients being most expensive. Higher costs were observed for institution-based patients, largely due to more frequent acute hospitalizations and Medicare Part A-paid skilled nursing stays.

Conclusions: UTI-related spending represents approximately one-third of total annual Medicare spend for patients diagnosed with a UTI. Given average Medicare spending of approximately \$15,000 per person in 2019, UTI is associated with substantially increased per patient cost and represents a significant source of spending for Medicare.

INTRODUCTION

Urinary tract infections (UTIs) occur frequently in the US population, affecting an estimated 20% of women over the age of 65.¹ An estimated 3.1% of men and 1.8% of women over the age of 65 have a complicated UTI (cUTI) each year.² Prior research evaluated the 30-day cost for all patients with a cUTI and found an estimated \$2146 in all-cause health care spending.² Little research has been done on the Medicare population to determine total spending associated with UTI patients, including the spending for individuals residing in a long-term care facility versus home. The objectives of this study was to examine the total spending for patients with various forms of UTI and determine how spending varied by patient type, patient residence, and setting of care.

METHODS

We analyzed the 100% Medicare claims data from 2016-2019. We limited the analysis to individuals who were enrolled in Medicare from January 1, 2016 through December 31, 2019, allowing for mortality during 2017-2019; had Medicare Part D coverage; and were not enrolled in a Medicare Advantage plan at any point during the study period. We excluded any individuals who had a Medicare claim with a diagnosis of UTI in 2016. We stratified patients based on their primary residence, classifying anyone who required a stay at a nursing facility for more than 100 days as noted in the Minimum Data Set as institutional and all other individuals as home. We separated patients into three mutually-exclusive categories: patients who only had a diagnosis classified as uncomplicated UTI (uUTI); patients who only had a diagnosis classified as complicated UTI (cUTI); and patients who initially had a uUTI diagnosis that was followed by a cUTI diagnosis within 1 year. We categorized diagnoses as outlined by Carreno.² We then measured all Medicare utilization and spending for these patients from the date of the first UTI diagnosis for 365 days, and separated by setting of care. We measured the Charlson Comorbidity Index (CCI) value using diagnoses submitted on inpatient hospital or physician claims during the first 30 days after initial UTI diagnosis. We measured UTI-specific spending by limiting to claims that contained at least one UTI diagnosis. Antibiotic spending includes drugs paid under either the Part B or Part D systems.

¹ Medina M, Castillo-Pino E. An introduction to the epidemiology and burden of urinary tract infections. Ther Adv Urol. 2019 May 2;11:1756287219832172. doi: 10.1177/1756287219832172. PMID: 31105774; PMCID: PMC6502976.

² Carreno JJ, Tam IM, Meyers JL, Esterberg E, Candrilli SD, Lodise TP Jr. Corrigendum to: Longitudinal, Nationwide, Cohort Study to Assess Incidence, Outcomes, and Costs Associated With Complicated Urinary Tract Infection. Open Forum Infect Dis. 2020 Jan 13;7(1):ofz536. doi: 10.1093/ofid/ofz536. Erratum for: doi: 10.1093/ofid/ofz446. PMID: 31951222; PMCID: PMC6956781.

RESULTS

Figure 1: Distribution of Medicare FFS Individuals by UTI Status and Primary Residence

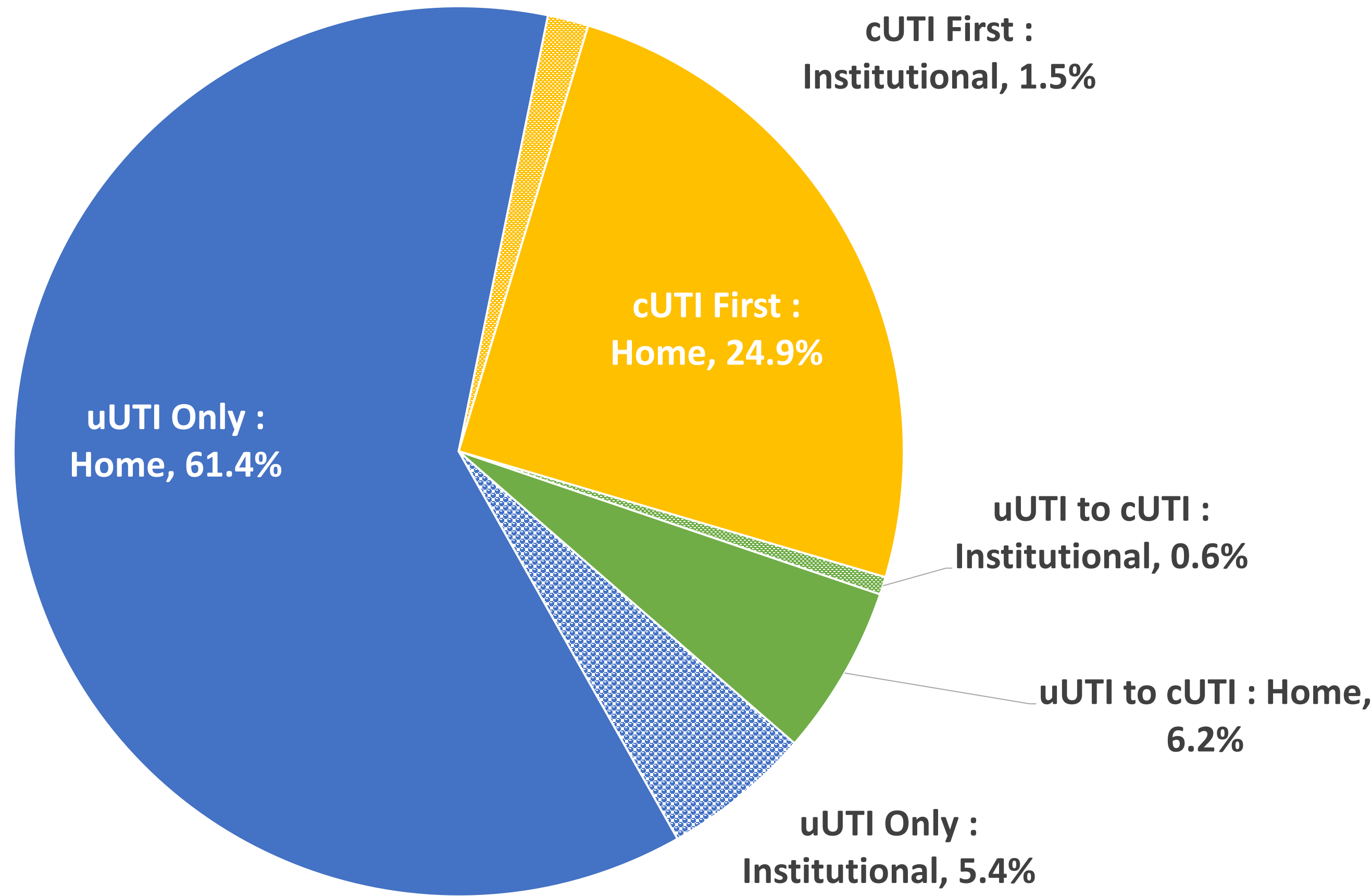


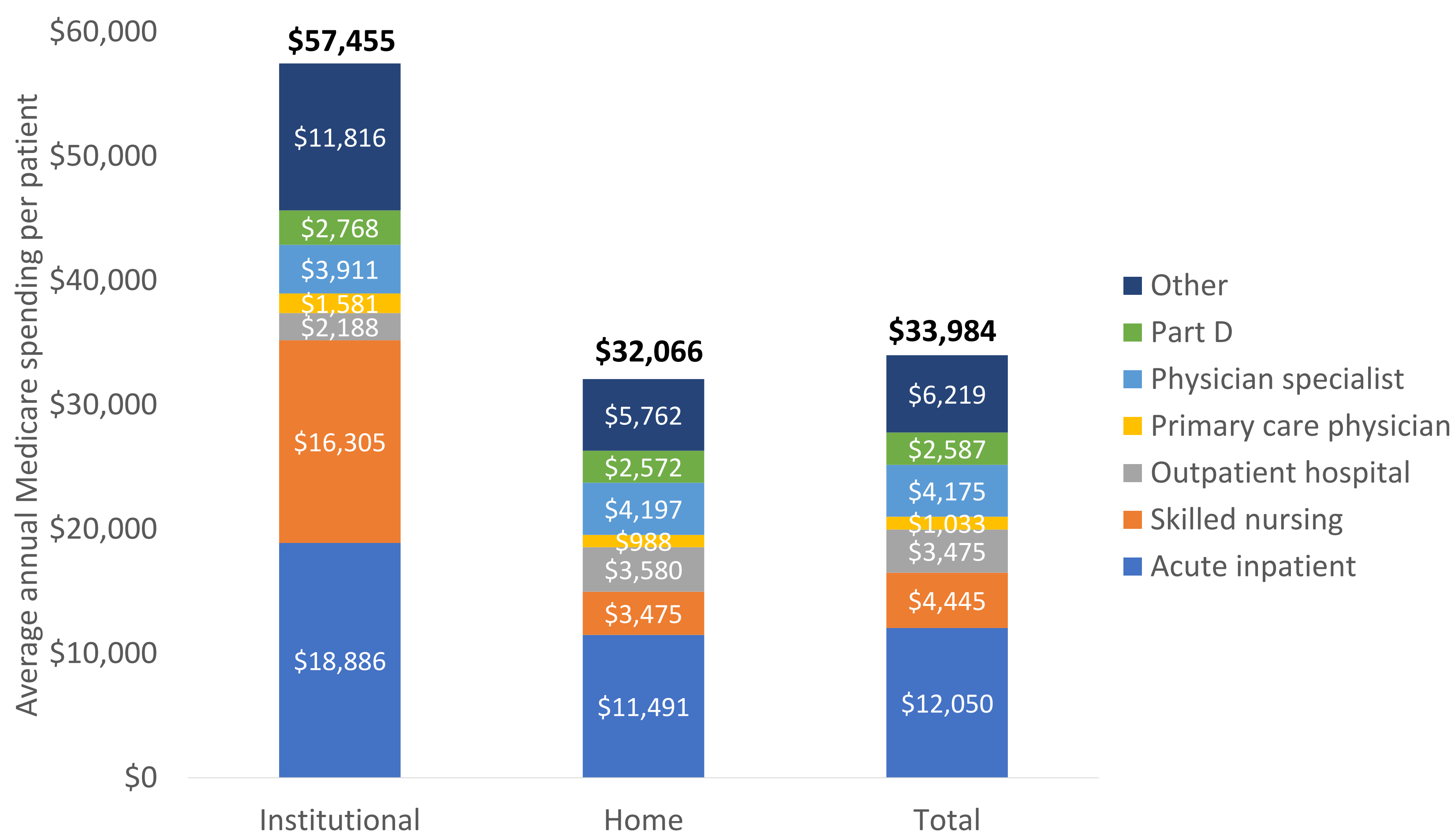
Table 1: Average Medicare Spending by Type of UTI and Patient Primary Residence

	uUTI only		cUTI only		uUTI to cUTI	
	Institution	Home	Institution	Home	Institution	Home
No. of Medicare beneficiaries	126,516	1,430,711	34,570	579,339	15,002	143,985
Avg CCI Score	3.378	1.970	3.539	2.127	3.741	2.607
Avg Medicare spending 30 days after initial diagnosis	\$17,514	\$9,424	\$18,713	\$9,838	\$20,203	\$13,298
Avg Medicare spending on UTI events 30 days after initial diagnosis	\$11,754	\$5,892	\$11,630	\$5,565	\$13,611	\$8,661
Average Medicare spending on antibiotics 30 days after initial diagnosis	\$249	\$257	\$211	\$364	\$232	\$343
Avg Medicare spending 365 days after initial diagnosis	\$57,016	\$32,505	\$68,529	\$34,775	\$72,109	\$45,548
Avg Medicare spending on UTI events 365 days after initial diagnosis	\$20,894	\$8,975	\$25,862	\$9,643	\$31,133	\$15,968
Average Medicare spending on antibiotics 365 days after initial diagnosis	\$658	\$785	\$902	\$1,231	\$1,016	\$1,363

Table 2: All-Cause Utilization and Spending by Provider Type, Patient Primary Residence and Type of UTI

Provider type	uUTI only				cUTI only				uUTI to cUTI			
	Institution	Home	Institution	Home	Institution	Home	Institution	Home	Institution	Home	Institution	Home
	% of population with any event	Avg spending per event	% of population with any event	Avg spending per event	% of population with any event	Avg spending per event	% of population with any event	Avg spending per event	% of population with any event	Avg spending per event	% of population with any event	Avg spending per event
Acute inpatient	79.8%	\$14,992	50.2%	\$15,636	78.5%	\$17,925	47.1%	\$17,909	80.7%	\$15,611	65.8%	\$16,438
Skilled nursing	61.1%	\$10,839	18.7%	\$11,691	64.9%	\$11,486	16.6%	\$11,855	66.6%	\$10,952	24.3%	\$11,593
Outpatient hospital	75.3%	\$1,042	89.9%	\$1,279	75.4%	\$1,229	82.5%	\$1,620	76.5%	\$1,076	86.5%	\$1,562
Primary care physician	94.3%	\$505	91.3%	\$371	95.6%	\$628	90.6%	\$413	95.4%	\$535	93.2%	\$460
Physician specialist	95.8%	\$1,005	97.8%	\$1,058	98.3%	\$1,339	99.1%	\$1,318	97.9%	\$1,083	98.6%	\$1,334
Part D	84.2%	\$624	73.8%	\$595	84.6%	\$735	71.4%	\$651	85.4%	\$642	72.8%	\$689

Figure 2: Average Annual All-Cause Medicare FFS Spending per Patient with Any UTI



CONCLUSIONS

Of the 2,330,123 patients in the analysis, the majority (92%) resided at home while a small portion (8%) resided in a long-term care institution. Total Medicare spending during the year after initial UTI diagnosis for patients residing in a long-term care institution was consistently higher than patients residing at home, while Medicare spending for patients with a cUTI was generally higher than spending on patients with a uUTI. Spending associated with a diagnosis of UTI represented 60-65% of all spending during the first 30 days after UTI diagnosis, dropping to 25-40% of all spending over the full year after UTI diagnosis. The majority of patients with a UTI had at least one inpatient hospital stay during the year, with higher inpatient rates associated with patients residing in a long-term care institution. With overall estimated annual Medicare spending of \$33984 per patient, individuals with any UTI have approximately 2.3x higher costs than the average Medicare enrollee. UTI is associated with substantially increased per patient cost and represents a significant source of spending for Medicare.

ACKNOWLEDGEMENT

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