POLICY BRIEF
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Medicare Fee-for-Service Health Care Expenditures among Rural and Urban Beneficiaries During 2009-2019

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KEY FINDINGS

1. From 2009 to 2019, Medicare Fee-for-Service (FFS) beneficiaries in urban counties had consistently higher price-standardized total Medicare FFS spending compared to rural micropolitan and noncore counties, but the gap of Medicare FFS beneficiaries' spending between urban and rural noncore counties was closing.
2. While Medicare FFS beneficiaries in rural and urban counties had similar spending trends, the level of spending differed in hospital inpatient and hospital outpatient services with urban beneficiaries spending more on hospital inpatient services and rural beneficiaries spending more on hospital outpatient services.
3. The declining spending on hospital inpatient services among Medicare FFS beneficiaries across all county types (urban, rural micropolitan, rural noncore) coincided with an increase in spending on hospital outpatient services from 2011 to 2019, but inpatient spending declined more slowly after 2014.
4. From 2012 to 2019 there were diverging trends between urban and rural noncore counties in per-beneficiary Medicare spending on post-acute care as urban beneficiaries experienced a declining trend on post-acute care spending and rural noncore beneficiaries experienced persistent, stable Medicare spending on post-acute care.

INTRODUCTION

In 2021, overall Medicare health care expenditures, including both traditional Medicare fee-for-service (FFS) and Medicare Advantage (MA) programs, more than doubled since 2005.[1] Medicare expenditures are projected to increase annually by 6% from 2021 to 2030 reaching $1.6 trillion by 2030.[2] Despite the rapid growth of MA enrollment,[3] over half of Medicare spending, including Part D prescription drug spending, was spent on beneficiaries covered by the FFS Medicare program as of 2021.[4]

Measuring the extent of geographic variation in Medicare expenditures is often used as a tool for identifying potential wasteful spending or unequal health care utilizations. Prior research found that geographic variations in Medicare per-beneficiary spending narrowed across the 2007 – 2018 period suggesting greater uniformity in service provision across geographic regions over time.[5,6] However, there is no comparison of rurality in the analysis[5,7] limiting our understanding of whether, and to what extent, rural Medicare beneficiaries used health care differently from their urban counterparts over the past decade (2009-2019).[5]

Rural hospitals and health care providers are heavily affected by Medicare payment policies.[8] To reduce health care costs while improving quality of care, many Medicare cost-saving policies have been implemented over the past decade. While the Patient Protection and Affordable Care Act of 2010 (ACA) affected many elements of Medicare,[9,10] other Medicare policies such as the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) reformed the way that Medicare pays physicians and other health care providers. MACRA established the Quality Payment Program, which was fully implemented in 2019, aiming to reward providers for delivering high-quality care and improving the accuracy of payments based on the value of services provided. Expansion of access to preventive services through elimination of patient out of pocket costs sought to simultaneously improve care and reduce costs by detecting conditions such as cancer at earlier, more treatable stages.[5,10] Reduction in the growth in payments to providers, coupled with tying payment to quality metrics such as the Hospital Value-based Purchasing program, the Hospital Readmissions Reduction Program, and Hospital-Acquired Condition Reduction Program, aimed to improve

health care efficiency and quality.[10] Some provisions, such as the reduction in Medicare Disproportionate Share Payments, may have had a greater effect on rural prospective payment hospitals than urban hospitals.[10] Alternative payment models – such as the Accountable Care Organization (ACO) implementation as part of the Medicare Shared Savings Program (MSSP) – had low penetration in rural areas initially[11] although ACO participation among rural and underserved providers increased after 2016 after the implementation of the ACO Investment Model.[21]

Most services (including inpatient and outpatient hospital services, skilled nursing facility services, and home health care) covered by the Medicare fee-for-service program receive annual payment increases based on statutory input price indices. The Centers for Medicare & Medicaid Services (CMS) standardized payment rates to calculate measures such as the Medicare Spending per Beneficiary measure that is used in the Hospital Value-based Purchasing program and the Quality Payment Program. The standardized payment methodology facilitates the measurement and meaningful comparison of resource use for Medicare-covered services across geographic areas and provider types by transforming actual spending amounts into standardized amounts that exclude payment adjustments including those from Hospital Value-based Purchasing program, the Hospital Readmissions Reduction Program, Hospital-Acquired Condition Reduction Program, and Medicare Disproportionate Share Hospital Payments.

However, it is still unknown whether Medicare FFS expenditures changed across rural and urban communities over the years 2009-2019. Understanding rural-urban differences in Medicare spending trends and its temporal changes across various settings will inform future health care resources allocations for Medicare FFS beneficiaries in rural and urban communities. Using county-level national data from 2009 to 2019, this study examined the rural-urban differences in the trends of per-beneficiary total Medicare FFS expenditures across the following services: 1) hospital inpatient services, 2) physician services, 3) hospital outpatient services, 4) post-acute care, and 5) other services (such as Federally Qualified Health Centers/Rural Health Clinics, outpatient dialysis facilities, ambulatory surgery centers, ambulance, other non-hospital or physician-settings Part B drugs, other unspecified physician, chiropractic, vision, hearing, speech, and other unclassified Part B services). Data from this study will further inform Medicare costs containment policy reforms for rural and urban health care settings.

METHODS

Data sources for this study included the CMS Medicare Geographic Variation Public Use files,[12] the American Community Survey, and the Area Health Resource files. The CMS Medicare Geographic Variation Public Use files used were for calendar years 2009 to 2019 and include detailed data on health care expenditures for the Medicare fee-for-service population at the county level across all 3,143 counties in the United States.[13] Medicare Geographic Variation Public Use files present expenditures in two ways: actual expenditures and standardized expenditures which take into consideration geographic variations in local wages and input prices. Therefore, these price-standardized (or payment-standardized) measures would allow us to compare resources used by Medicare FFS beneficiaries across geographic regions and health care settings. To further compare the Medicare FFS resources used per beneficiary over time, we used price-standardized cost data calculated by CMS and adjusted to 2019 dollars using the Consumer Price Index. Therefore, the current report summarizes per-capita standardized payment amounts adjusted for inflation which would be different from actual health care expenditures for Medicare beneficiaries reported in other public reports.

We also used the 2009-2019 American Community Survey one-year estimates to collect county-level sociodemographic characteristics. The Area Health Resources Files were employed to derive the 2013 Urban Influence Codes and the 2009-2019 socio-demographic characteristics such as percentages of population with incomes below 200% of the FPL, unemployment rates, percentages of population aged 65 or above, percentages of female population, and educational levels in a county.

Our key outcome is county-level price-standardized per-beneficiary Medicare FFS expenditures across all service settings and by setting including 1) hospital inpatient services, 2) physician services, 3) hospital outpatient services, 4) post-acute care, and 5) other services (such as Federally Qualified Health Centers/Rural Health Clinics, outpatient dialysis

facilities, ambulatory surgery centers, ambulance, other non-hospital or physician-settings Part B drugs, other unspecified physician, chiropractic, vision, hearing, speech, and other unclassified Part B services). Expenditures for post-acute care were categorized into skilled nursing facility, home health, hospice, and inpatient rehabilitation facility and long-term care hospital.

Statistical Analysis

This study is a descriptive quantitative analysis. Due to suppressed per-beneficiary expenditures for counties with fewer than 25 Medicare FFS beneficiaries in a year, we used multiple imputation for each of the setting-specific price-standardized per-beneficiary expenditures using generalized time-series median regressions adjusting for county-level characteristics. Characteristics included percentage of population with incomes below 200% of the federal poverty level (FPL), unemployment rates, percentage of population aged 65 or above, percentage of population that are females, percentage of population age 25 or older with a bachelor's degree, median distance in miles to the nearest emergency department, and percentage of workers with at least 60-minute commute time. We then illustrated and conducted a trend analysis of median per-beneficiary expenditures across urban, rural micropolitan, and rural noncore counties from 2009 to 2019 graphing the results to illustrate Medicare FFS expenditures over time. Additionally, we calculated the ratio of total Medicare FFS expenditures and specific expenditure categories between urban and rural in 2009 and 2019. In addition, using median regressions, we compared the differential changes in Medicare FFS expenditures between 2009 and 2019 for total per-beneficiary expenditures, expenditures in each of the 4 subsets of services (except other services), and per-beneficiary expenditures for each of the 4 subcategories of post-acute care services.

RESULTS

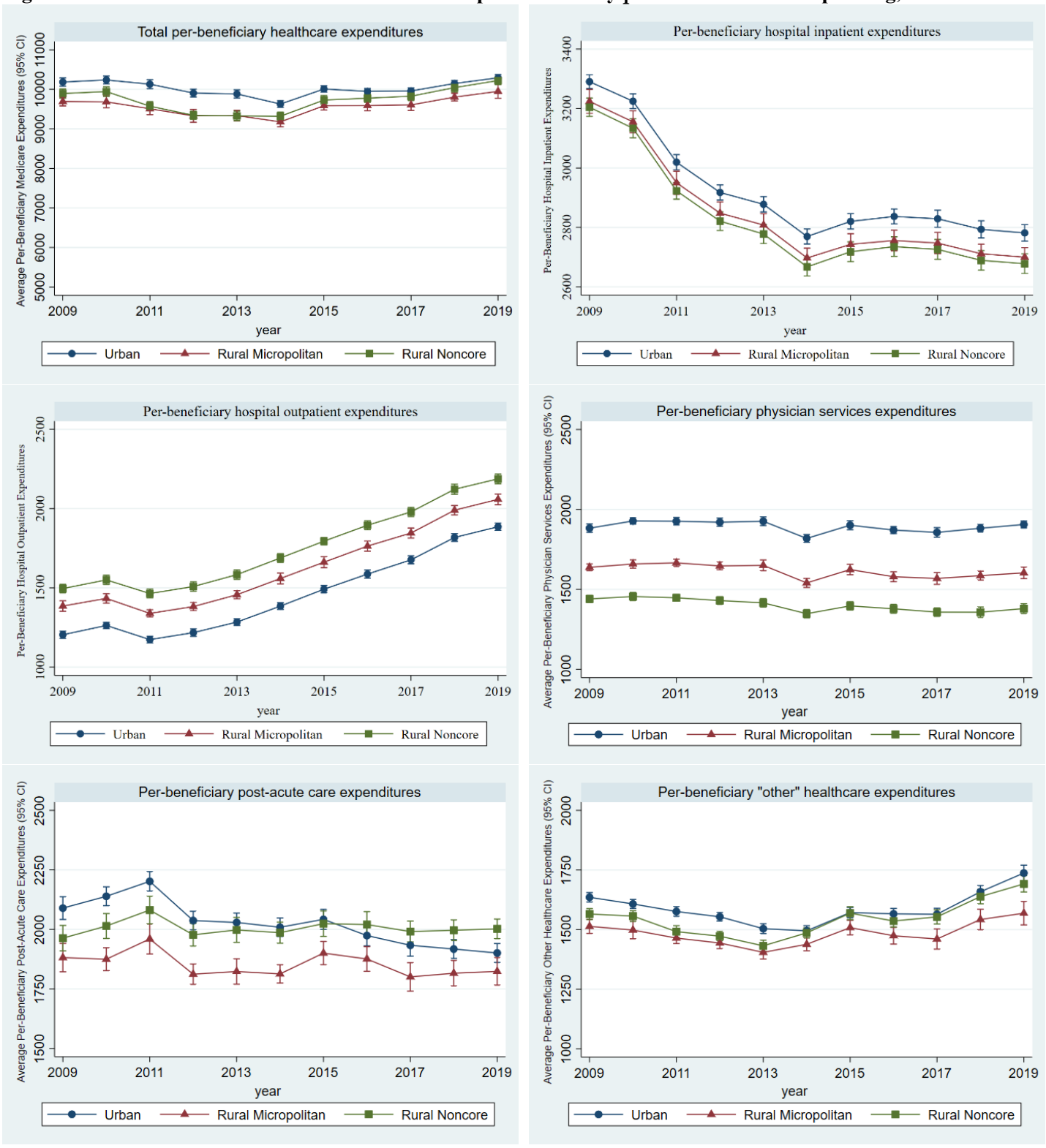
Trends in Medicare FFS per-beneficiary price-standardized spending, 2009-2019

In constant 2019 US dollars, total per-beneficiary Medicare fee-for-service spending was decreasing prior to 2014 (all $p<.001$) but consistently grew between 2014 and 2019 (all $p<.001$; Figure 1). Urban counties had higher total per-beneficiary Medicare FFS expenditures compared to rural micropolitan and noncore counties from 2009 to 2016 (all $p<.001$), but urban and rural noncore counties converged in 2017. Total per-beneficiary Medicare FFS expenditures for rural noncore counties grew faster than rural micropolitan counties and urban counties after 2014 resulting in a closing difference in total per-beneficiary Medicare FFS expenditures between 2014 and 2019 (see Figure 1).

Medicare spending patterns and relative changes in categories of services over time contributed to these trends in total per-beneficiary Medicare FFS expenditures. Hospital inpatient services decreased across urban, rural micropolitan, and rural noncore counties prior to 2014 but exhibited a relatively constant trend afterwards. In contrast, the hospital outpatient expenditures in all three groups of counties grew consistently from 2011 to 2019. Except for the year 2014 when all counties had a small drop in per-beneficiary physician services expenditures, physician services spending remained flat over time.

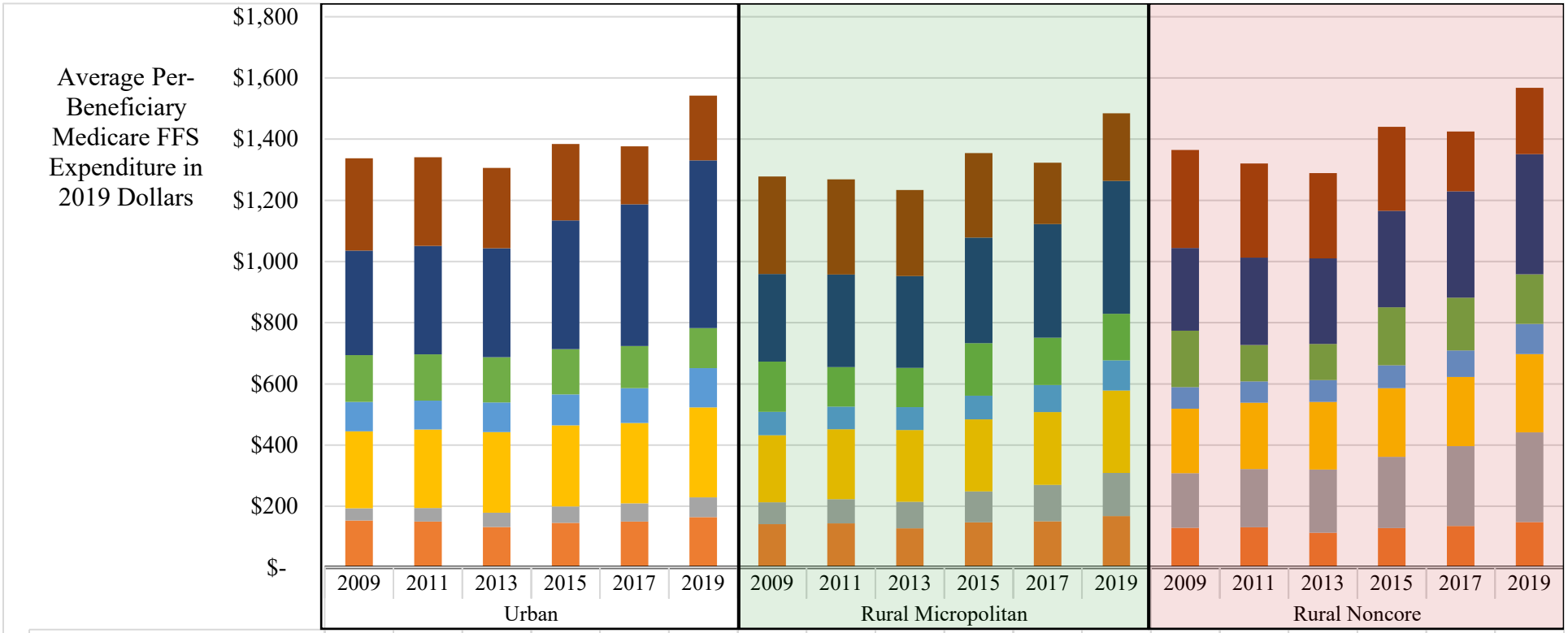
Prior to 2012, post-acute care expenditures were higher in urban counties, but urban counties experienced faster continual declines in expenditures than rural counties especially after 2016. Rural micropolitan and noncore post-acute care expenditures remained relatively constant after 2012. The expenditures on other services increased similarly in urban and rural micropolitan counties after 2013, but rural noncore counties had a steeper increasing trend of other services' spending per beneficiary compared to urban and rural micropolitan counties, especially for spending services on Federally Qualified Health Centers or Rural Health Clinics and other non-hospital Part B drug expenses (Figure 2).

Figure 1. Rural-urban differences in Medicare FFS per-beneficiary price-standardized spending, 2009-2019



Notes: All expenditures are price standardized to eliminate spending variation due to different local wages and input prices. All expenditures are inflated to 2019 US dollars based on the Consumer Price Index released by the US Bureau of Labor Statistics.

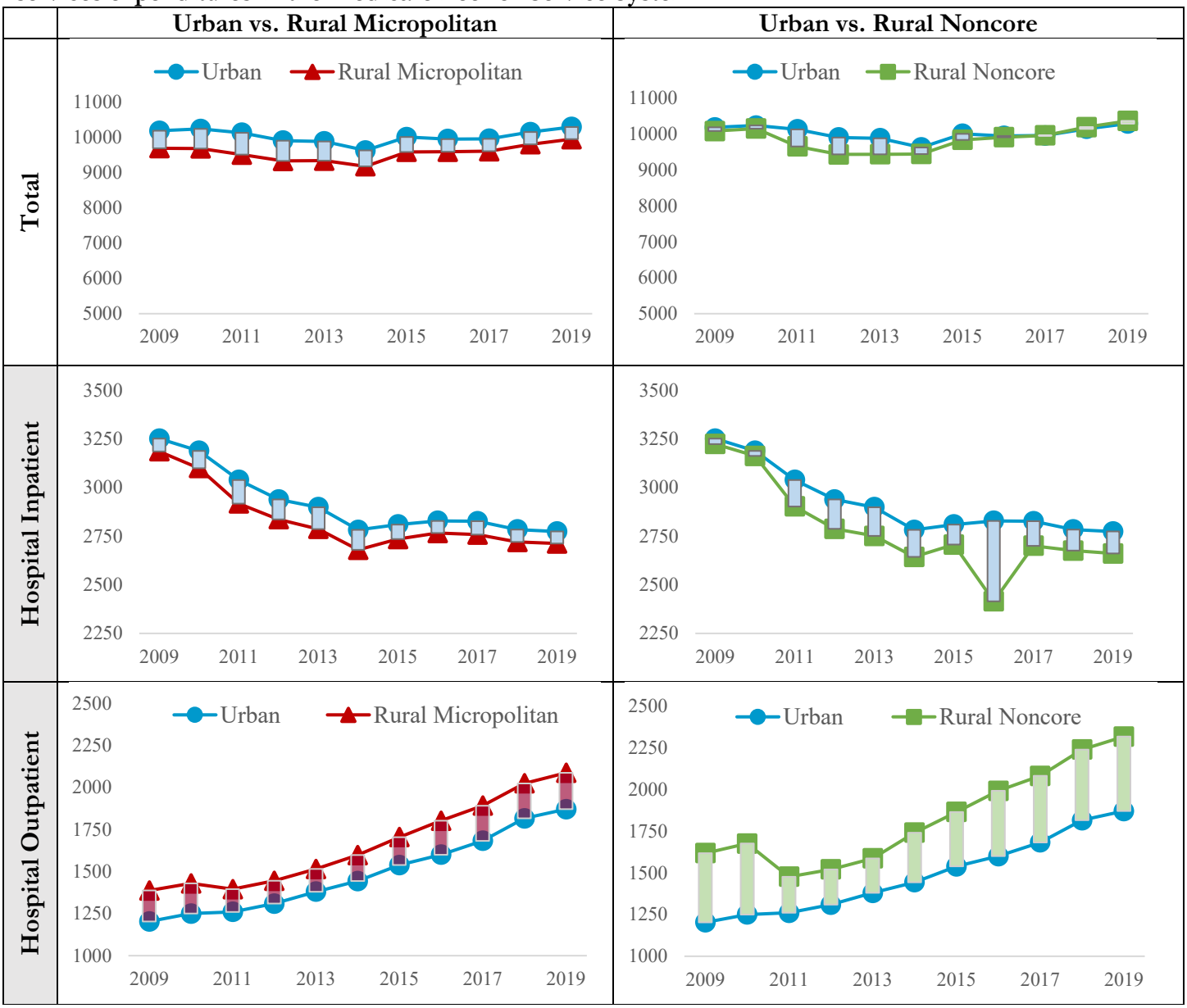
Figure 2. Distributions of "Other" Medicare FFS Expenditures by Spending Services in Urban, Rural Micropolitan, and Rural Noncore Counties, 2009-2019



	Urban						Rural Micropolitan						Rural Noncore					
	2009	2011	2013	2015	2017	2019	2009	2011	2013	2015	2017	2019	2009	2011	2013	2015	2017	2019
Durable medical equipment	$301	$290	$262	$250	$189	$212	$319	$312	$281	$277	$201	$222	$320	$308	$279	$275	$195	$217
PartB Drugs (Non-Hospital)	$342	$355	$357	$421	$463	$548	$287	$302	$300	$345	$371	$434	$271	$286	$280	$315	$347	$392
Ambulance	$153	$151	$147	$148	$138	$131	$164	$129	$128	$171	$155	$152	$184	$118	$118	$190	$173	$162
Ambulatory Surgery Center	$96	$94	$97	$101	$114	$128	$77	$73	$75	$77	$88	$99	$71	$70	$71	$75	$87	$99
Outpatient Dialysis	$251	$257	$263	$265	$263	$294	$219	$228	$235	$236	$237	$269	$211	$217	$221	$224	$226	$256
FQHC/RHC	$41	$44	$47	$54	$59	$64	$71	$80	$87	$101	$119	$141	$179	$190	$206	$233	$261	$293
Other non-specified spending	$153	$150	$132	$146	$150	$164	$142	$144	$128	$147	$151	$168	$129	$131	$113	$129	$135	$148

Notes: this figure only includes exclusively average per-beneficiary "other" Medicare FFS expenditures across urban, rural micropolitan, and rural noncore counties each year. Detailed information regarding Medicare FFS expenses associated with hospital inpatient care, outpatient services, physician offices, and post-acute care can be found in Figure 1.

Figure 3. Rural-urban differences in per-beneficiary total Medicare FFS expenditures and hospital services expenditures in the Medicare Fee-for-Service System



Notes: All expenditures are price standardized to eliminate spending variation due to different local wages and input prices. All expenditures are inflated to 2019 US dollars based on the Consumer Price Index released by the US Bureau of Labor Statistics. "Micropolitan counties" and "noncore counties" are defined by the Office of Management and Budget (OMB) as counties with an urban core population of 10,000-50,000 and those with an urban core population less than 10,000, respectively.

Rural-urban differences in Medicare Fee-for-Service expenditures

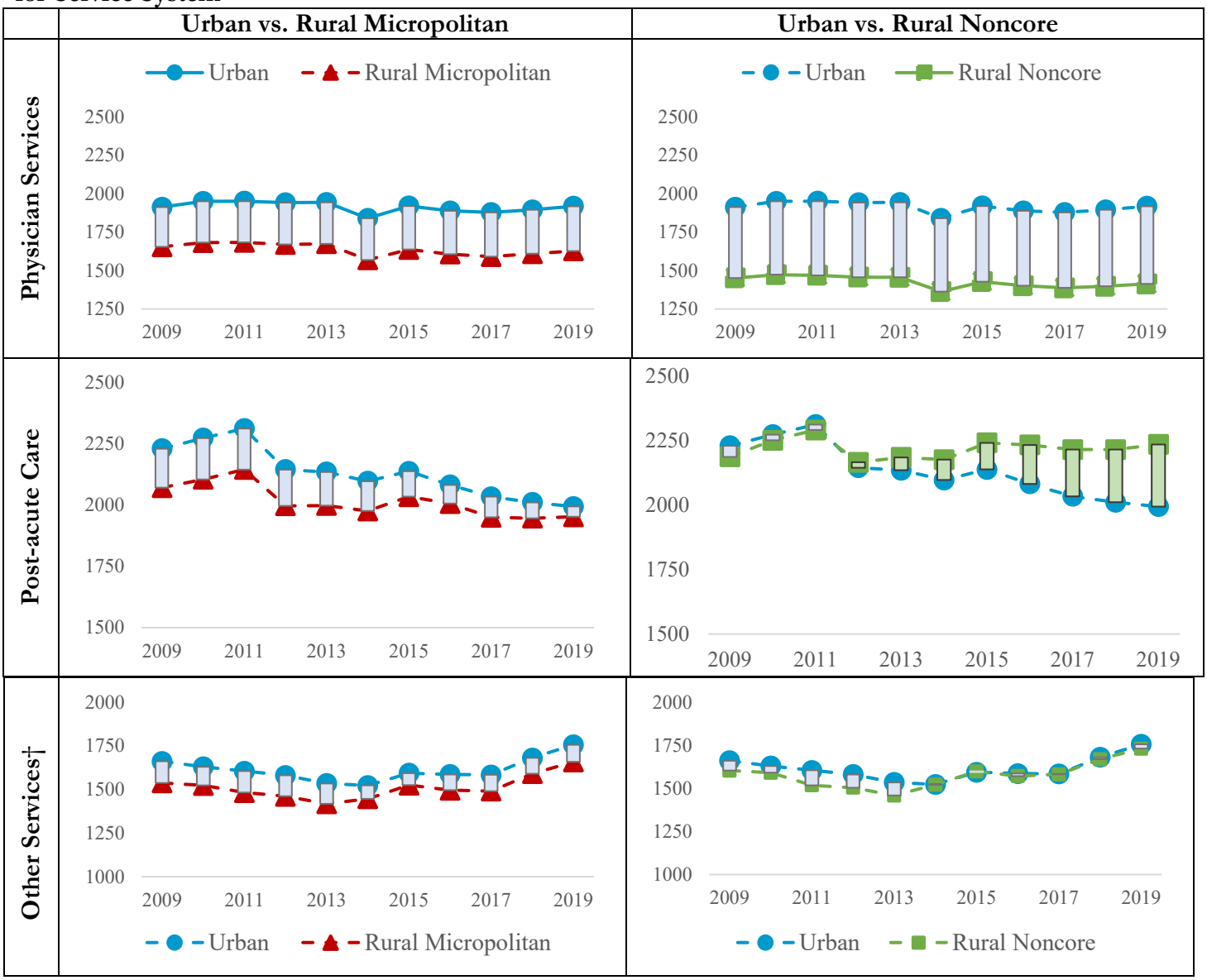
Figure 3 illustrates the level of differences in the median price-standardized per-capita Medicare FFS expenditures overall and by hospital service category. In 2019, Medicare FFS beneficiaries in rural micropolitan counties had lower median total Medicare FFS per-beneficiary spending ($342.6 less per-beneficiary price standardized spending) than those in urban counties, but those in rural noncore and urban counties had similar per capita Medicare FFS spending.

There was a consistent difference between urban and rural micropolitan counties in their total Medicare FFS per-beneficiary spending with urban counties consistently spending more than rural micropolitan counties. While before 2014 the trend of total per-beneficiary spending was decreasing, the spending exhibited an increasing trend from

2014 and beyond. The difference was stable between urban and rural micropolitan counties. However, the gap between rural noncore and urban counties shrank given the steeper increase in rural noncore areas post-2014.

From 2009 to 2019, urban beneficiaries consistently had higher hospital inpatient utilizations than rural micropolitan beneficiaries similar to the differences between urban and rural micropolitan counties in total Medicare FFS per-beneficiary spending, Urban beneficiaries also had higher Medicare FFS spending on hospital inpatient services than rural noncore beneficiaries throughout the study years. After 2011, the difference in Medicare FFS spending on hospital inpatient services between urban and rural noncore beneficiaries widened with urban beneficiaries having significantly higher spending. In contrast, rural micropolitan and noncore counties had much higher Medicare FFS spending on hospital outpatient services than urban counties; the differences were relatively steady between rural micropolitan and urban counties.

Figure 4. Rural-urban differences in per-beneficiary non-hospital care expenditures in the Medicare Fee-for-Service System



Notes: All expenditures are price standardized to eliminate spending variation due to different local wages and input prices. All expenditures are inflated to 2019 US dollars based on the Consumer Price Index released by the US Bureau of Labor Statistics. "Micropolitan counties" and "noncore counties" are defined by the Office of Management and Budget (OMB) as counties with an urban core population of 10,000-50,000 and those with an urban core population less than 10,000, respectively. †Other services included Federally Qualified Health Centers/Rural Health Clinics, outpatient dialysis facilities, ambulatory surgery centers, ambulance, other non-hospital or physician-setting Part B drugs, other unspecified physician, chiropractic, vision, hearing, and speech services, and other unclassified Part B services.

Physician services, post-acute care, and other health care services were found to differ steadily between rural micropolitan counties and urban counties with urban beneficiaries utilizing more of these services throughout 2009-2012 (Figure 4, Page 7). However, from 2012 onwards, there were diverging trends between urban and rural noncore counties in per-beneficiary Medicare spending on post-acute care, as urban beneficiaries had declining Medicare expenditures on post-acute services. This shift aligns with the 2012 inception of the MSSP which incentivizes ACOs to coordinate care and reduce low-value utilization particularly in post-acute settings.[11] Because MSSP participation was initially more prevalent in urban centers than in rural areas during this period,[11] while more research is needed, the program may have driven the urban expenditure decline. Similarly, whereas urban beneficiaries used more "other" services in 2009, the steeper increases in other services expenditures in rural noncore counties after 2014, compared to urban, had closed the gap of Medicare expenditures on other services. Understanding the differential impact of value-based payment models, like the MSSP, on these diverging rural-urban expenditure patterns after 2012 is warranted to inform resource allocation and care access across rural and urban communities.

To examine rural-urban variations in per-beneficiary Medicare FFS spending, we calculated the ratios of urban to rural per-beneficiary Medicare FFS spending across all settings and by setting. There was little or no change in the ratios of urban to rural micropolitan total Medicare FFS per-beneficiary spending. Specifically, the ratio of total per-beneficiary Medicare FFS health care expenditures in urban to rural micropolitan counties was 1.05 in 2009 vs 1.03 in 2019, a difference of −0.02 yet not statistically significant (95% CI, −0.04 to 0.01; P=.21) (Table 1). Between urban and rural micropolitan, across service categories, there was no change in differences in expenditures for hospital inpatient and hospital outpatient services (Table 1). The major significant differences between urban and rural micropolitan counties were for skilled nursing facilities and hospice services. Urban beneficiaries experienced 5% and 27% higher spending than rural micropolitan beneficiaries in 2009, respectively, while these differences narrowed or flipped in 2019 with urban counties spending 8% lower and 14% more than rural micropolitan beneficiaries in 2019.

Differences in per-beneficiary Medicare spending for urban and rural noncore beneficiaries were moderately larger than those for urban and rural micropolitan beneficiaries despite statistical significance. The urban to rural noncore ratio of total per-beneficiary Medicare FFS expenditures was not statistically different in 2009 and 2019.

This difference in total per-beneficiary Medicare expenditures between urban and rural noncore was masked by their diverging trends across service categories. By category, the gaps of Medicare spending on the four leading service categories between urban and rural noncore all grew between 2009 and 2019 but in opposite directions. For example, Medicare FFS beneficiaries in urban counties spent nearly the same on hospital inpatient services as those in rural noncore counties in 2009 (1.01; 95% CI, 1.00 to 1.03) and grew to 1.03 times as much as rural noncore (95% CI, 1.01 to 1.05). However, Medicare FFS beneficiaries living in urban counties had lower utilization on hospital outpatient services than those in rural noncore counties in both 2009 (0.76; 95% CI, 0.74 to 0.79) and 2019 (0.82; 95% CI, 0.80 to 0.84).

In sum, the gaps of Medicare spending on hospital inpatient, hospital outpatient, physician services, and post-acute care services between urban and rural noncore all grew between 2009 and 2019 but in opposite directions. Medicare FFS beneficiaries in urban counties spent nearly the same on hospital inpatient services as those in rural noncore counties in 2009 and grew to 1.03 times as much as rural noncore in 2019. However, Medicare FFS beneficiaries living in urban counties had lower utilization of hospital outpatient services than those in rural noncore counties in both 2009 and 2019.

Table 1. Rural-urban differences in per-beneficiary health care expenditures in the Medicare Fee-for-Service System in 2009 and 2019

	Rural Categories	Ratios of Urban to Rural		Changes in Urban-Rural Ratios between 2009 and 2019 (95% CI)	P Values for Differences
		2009	2019		
Total	Rural Micropolitan	1.05	1.03	-0.02 (-0.04 to 0.01)	0.207
	Rural Noncore	**1.01**	**0.99**	**-0.02 (-0.04 to 0.00)**	***0.034***
Hospital Inpatient	Rural Micropolitan	1.02	1.02	0.00 (-0.03 to 0.03)	0.917
	Rural Noncore	**1.01**	**1.03**	**0.02 (-0.01 to 0.04)**	***0.193***
Hospital Outpatient	Rural Micropolitan	0.86	0.89	0.03 (-0.02 to 0.08)	0.199
	Rural Noncore	**0.76**	**0.82**	**0.09 (0.04 to 0.14)**	***<0.001***
Physician	Rural Micropolitan	**1.15**	**1.19**	**0.03 (0.00 to 0.06)**	***0.046***
	Rural Noncore	**1.31**	**1.38**	**0.04 (0.02 to 0.07)**	***0.001***
Post-Acute Care	Rural Micropolitan	**1.11**	**1.04**	**-0.06 (-0.11 to -0.01)**	***0.014***
	Rural Noncore	**1.06**	**0.95**	**-0.11 (-0.16 to -0.07)**	***<0.001***
SNF	Rural Micropolitan	**1.05**	**0.92**	**-0.14 (-0.20 to -0.08)**	***<0.001***
	Rural Noncore	**0.90**	**0.73**	**-0.27 (-0.34 to -0.20)**	***<0.001***
Home Health	Rural Micropolitan	1.19	1.15	-0.03 (-0.11 to 0.05)	0.474
	Rural Noncore	1.31	1.29	-0.02 (-0.09 to 0.05)	0.679
IRFs & LTCHs	Rural Micropolitan	1.10	1.08	-0.02 (-0.11 to 0.08)	0.717
	Rural Noncore	**1.29**	**1.10**	**-0.14 (-0.20 to 0.08)**	***<0.001***
Hospice	Rural Micropolitan	**1.27**	**1.14**	**-0.09 (-0.16 to -0.02)**	***0.014***
	Rural Noncore	**1.39**	**1.28**	**-0.07 (-0.12 to 0.003)**	***0.033***
Other Services	Rural Micropolitan	1.08	1.11	0.03 (-0.01 to 0.07)	*0.195*
	Rural Noncore	1.04	1.03	-0.02 (-0.05 to 0.01)	*0.244*
FQHC/RHC	Rural Micropolitan	0.43	0.34	-0.09 (-0.41 to 0.23)	*0.588*
	Rural Noncore	0.10	0.11	0.02 (-0.05 to 0.09)	*0.611*
Durable medical equipment	Rural Micropolitan	0.94	0.95	0.01 (-0.03 to 0.05)	*0.519*
	Rural Noncore	0.95	0.97	0.02 (-0.01 to 0.05)	*0.252*
Outpatient Dialysis	Rural Micropolitan	1.17	1.17	-0.002 (-0.13 to 0.12)	*0.969*
	Rural Noncore	1.12	1.09	-0.03 (-0.12 to 0.06)	*0.509*
Ambulatory Surgery Centers	Rural Micropolitan	1.29	1.35	0.07 (-0.05 to 0.18)	*0.252*
	Rural Noncore	1.42	1.38	-0.04 (-0.14 to 0.05)	*0.378*
Ambulance	Rural Micropolitan	**0.99**	**0.89**	**-0.11 (-0.19 to -0.03)**	***0.010***
	Rural Noncore	**0.94**	**0.86**	**-0.08 (-0.14 to -0.02)**	***0.013***
Other non-hospital or physician-setting Part B drugs	Rural Micropolitan	**1.21**	**1.43**	**0.22 (0.12 to 0.33)**	***<.001***
	Rural Noncore	**1.31**	**1.52**	**0.21 (0.11 to 0.30)**	***<.001***

Note: SNF: Skilled Nursing Facility; IRF: Inpatient Rehabilitation Facility; LTCH: Long Term Care Hospital.

DISCUSSIONS

Rural-urban gaps in per-beneficiary Medicare FFS expenditures gradually closed after 2014 especially between rural noncore and urban counties. These rural-urban differences were diminished from 2009 when rural noncore beneficiaries had lower per-beneficiary total Medicare FFS spending than urban beneficiaries. The closing gaps may be due to the steeper decline in post-acute care in urban vs. rural noncore counties and the faster increases in hospital outpatient care per beneficiary in rural noncore vs. urban counties. There was little or no reduction in urban-rural gaps in hospital inpatient services spending as hospital inpatient services decreased similarly across urban, rural micropolitan, and rural noncore counties. In 2019, rural micropolitan beneficiaries spent less on Medicare FFS health care than urban beneficiaries, but rural noncore beneficiaries had similar spending after price standardization to those from urban counties.

Overall, our findings are consistent with prior data, indicating a shift from hospital inpatient services to outpatient care among Medicare FFS beneficiaries.[3] These shifts were largely similar between urban and

rural counties. Urban and rural micropolitan counties experienced the same shifts, while rural noncore counties saw larger changes since 2011. The rising Medicare FFS outpatient services might be due to the increasing Medicare Annual Wellness Visits during the recent decade, a continued vertical integration of physician practices to hospital systems[16] that shifted the billing from physician offices to hospital outpatient departments for the site of service, and a rise in outpatient payment rates.[13] Changes in the inpatient-to-outpatient switching pattern is expected to evolve over the next decade, due to policy shifts such as the expansion of the provider type for Rural Emergency Hospitals. A range of Medicare cost-saving measures under the ACA also targeted reductions in hospital inpatient utilization and have seen growing participation from CAHs and Rural Health Clinics. Similarly, initiatives like the Hospital Readmissions Reduction Program were designed to decrease hospital stays and utilizations.

Notably, these Hospital Pay for Performance programs and reduction in Disproportionate Share Hospital Payments would not apply to CAHs as they don't participate in such programs. While these Pay for Performance programs and cost-saving measures were implemented in different years after 2012, our results suggest a consistent annual trend from 2009-2014, indicating that the inpatient-to-outpatient shifts had begun prior to ACA implementation. In fact, the Inpatient Prospective Payment System itself has strong incentives for hospitals to move services to outpatient settings.[14] For example, PPS hospitals might increase inpatient stays for resource-intensive conditions and opt to treat less-resource-intensive conditions such as gastrointestinal hemorrhage, esophagitis, and kidney and urinary tract infections in hospital outpatient settings instead of admitting patients to the inpatient settings.[4] As hospitals are acquiring more physician practices,[15,16] hospital outpatient services are anticipated to continue to grow.

The finding that urban beneficiaries had higher total Medicare FFS spending particularly for hospital inpatient services per beneficiary than rural micropolitan and noncore counties is different from the Medicare Payment Advisory Commission report that found similar use of hospital inpatient services between rural and urban beneficiaries in 2019 despite substantial variations across states. However, nearly half of rural Medicare beneficiaries who had hospital inpatient admissions received treatment in urban hospitals where high-acuity surgical interventions are more common compared to rural hospitals that typically offer more limited services. In addition, although rural hospitals have experienced closures or conversions for more than a decade, their closures increased from 2013 to 2019 leading to a reliance of ambulance services, emergency departments, urgent care, and/or primary care in Federally Qualified Health Centers or Rural Health Clinics.[8,17]

We found that from 2012 to 2019 urban counties' post-acute care expenditures were decreasing while rural micropolitan counties and rural noncore counties have remained stable. Our sector-specific findings indicate that these changes were mostly due to the diverging trends of skilled nursing facilities spending across urban, rural micropolitan, and rural noncore counties. The Medicare Payment Advisory Commission found a national decreasing trend for Medicare SNF spending from 2013 to 2019 which is consistent to our urban findings. The national average trend driven by urban trends is not surprising as urban facilities accounted for 73 percent of national skilled nursing facilities but covered 85 percent of Medicare expenditures.[18] The relatively stable trend in rural counties' Medicare post-acute care spending might be due to the overestimated spending with the price standardization approach (adjusting for geographic differences in wage and input prices)[19] to swing beds at Critical Access Hospitals which account for nearly 60 percent of all rural hospitals.[20]

The various implementation years of the Medicare cost-saving measures under the ACA and the simultaneous enaction of multiple cost containment measures have complicated the interpretation of recent changes in per-beneficiary Medicare FFS spending overall and by service location. We found a narrowing geographic variation in per-beneficiary Medicare FFS spending between urban and rural noncore beneficiaries. A complex array of factors might contribute to narrowing urban-noncore per-beneficiary Medicare FFS spending. For example, these could result from reduced patient health care needs, improved social determinants of health, and/or improved health care access for rural noncore Medicare FFS beneficiaries. Specifically, our findings further add evidence on the similar trends of various per-beneficiary Medicare FFS expenditures between urban and rural micropolitan and on the divergence of per-beneficiary total Medicare FFS expenditures

(since 2014) and Medicare FFS expenditures on post-acute care (since 2012) between urban and rural noncore counties. By comparing these trends with the timing of service-specific cost-saving measures, we found that the downward trends preceded the implementation of these ACA-related policies. However, the reliance on county-level FFS spending data complicates our analysis; it remains difficult to determine the extent to which lower expenditures in rural areas are driven by unobservable attributes. These may include access barriers leading to reduced utilization, variations in service mix, differences in care efficiency, and varying degrees of patient compliance.[22,23,24] Given the temporary changes in some payment policies during the Public Health Emergency as a result of the coronavirus pandemic, future research is warranted to examine the trends in Medicare spending and intensity of Medicare services delivered per beneficiary during and post-COVID-19 pandemic.

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