Sociodemographic Variation in the Use of Conservative Therapy Before MRI of the Lumbar Spine for Low Back Pain in the Era of Public Reporting

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Abstract

Purpose: To evaluate the relationship between use of MRI of the lumbar spine for low back pain without prior conservative therapy and sociodemographic factors after the implementation of public reporting for Medicare's Hospital Outpatient Imaging Efficiency Measure for MRI Lumbar Spine for Low Back Pain (OP-8) metric.

Materials and Methods: We conducted a secondary data analysis using a nationally representative sample of 2009 to 2014 Medicare claims to evaluate trends in use of conservative therapy before MRI of the lumbar spine. Continuously enrolled fee-for-service Medicare beneficiaries were included. We applied the same criteria used by Medicare to generate a measure consistent with OP-8. Regression was used to evaluate trends in OP-8 by reporting status (outpatient hospital or clinic) and beneficiary characteristics. Age, sex, and race from the Medicare denominator and area-level socioeconomic measures from the Area Health Resource File were used as covariates.

Results: Use of conservative therapy before MRI increased regardless of OP-8 reporting status. Several sociodemographic characteristics were associated with the likelihood of receiving conservative therapy before MRI; beneficiaries were less likely to receive conservative therapy before MRI if they were male, older, black, Hispanic or Latino; if they lived in the West or in an area with more college graduates; or if they had low incomes. Beneficiaries were more likely to receive conservative therapy before MRI if they had poorer health or lived in areas with higher home values.

Conclusion: Variations in use of conservative therapy according to factors other than clinically relevant factors, such as health status, are worrying. Further strategies are needed to improve appropriateness and equity in the provision of diagnostic imaging.

Key Words: Low back pain, Medicare, MRI utilization, outpatient imaging efficiency, OP-8

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INTRODUCTION

The use of advanced medical imaging has increased over time, accompanied by a significant rise in imaging costs [1]. Medical imaging has been targeted as an area for potential reduction by CMS and other payers. Policy initiatives have targeted perceived inappropriate utilization through a variety of approaches with varying degrees of success. Although research has shown decreasing utilization of some of these advanced imaging examinations and modalities [2,3], the full effect of these policy initiatives on the entire spectrum of health care remains largely unknown.

Public reporting of several metrics for appropriate use of outpatient imaging was pursued after a report from the Government Accountability Office (GAO), which noted that spending for medical imaging was growing quickly—doubling between 2000 and 2006—and imaging was likely being misused given the unexplained degree of regional variation in imaging use [1]. Up-front efforts to reduce inappropriate imaging utilization, such as pre-authorization, could not be easily implemented nor

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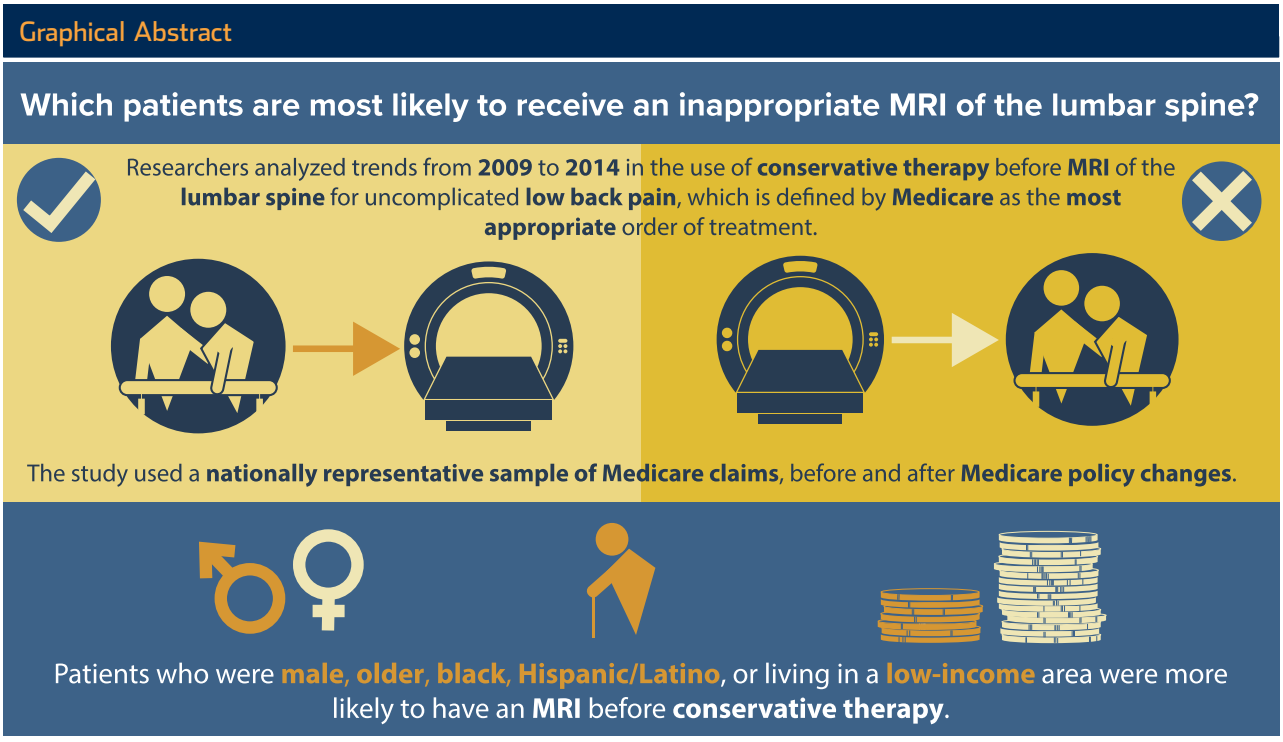
Graphical Abstract



could they be feasible given lack of clarity on the legality of CMS doing so [1]. The website Medicare Hospital Compare (https://www.medicare.gov/hospitalcompare) began reporting indicators for medical imaging efficiency in outpatient hospitals beginning in 2010. Medicare's Hospital Outpatient Imaging Efficiency Measure for MRI Lumbar Spine for Low Back Pain (OP-8) is an imaging efficiency metric evaluating the appropriateness for MRI of the lumbar spine for low back pain [4]. MRI of the lumbar spine for low back pain performed without prior conservative management is considered inappropriate based on this efficiency metric. OP-8 represents the proportion of beneficiaries with low back pain who did not receive conservative therapy (physical therapy, chiropractic care, or evaluation and management) before receiving an MRI of the lumbar spine. Although this metric is not risk adjusted, beneficiaries with certain health conditions or recent procedures are excluded from the calculation of this measure. Excluded health conditions span infectious, inflammatory, traumatic, and congenital causes, including, but not limited to, intraspinal abscess, diagnosis of cancer, congenital spinal cord malformation, subarachnoid hemorrhage, recent surgery, postoperative fluid collection, and intravenous drug usage.

It is unclear if public reporting of OP-8 has been effective in terms of changing MRI utilization and conservative therapy utilization based on the current literature. One study evaluated changes in OP-8 associated with public reporting but had several important limitations. The study only included data from several sites in Texas and used privately insured working patients as a comparison group, despite the differences in demographics and health status between these patients and Medicare patients [5]. Research on other imaging efficiency indicators used by Medicare has found improvements in appropriate imaging use but uneven effects according to provider type [6]; thus, the expected impact of OP-8 is uncertain and deserves further analysis.

Prior research has shown that variation exists in imaging utilization rates according to patient socioeconomic status [7-10]. A recent article evaluating the use of imaging for lumbar radiculopathy and myelopathy found a higher rate of all imaging modalities, including MRI, in patients with lower income [11]. Only one study has examined the association between socioeconomic status and *appropriate* use of imaging. Doukky et al studied the association of insurance carrier, prior authorization, and socioeconomic status and appropriate use of single-photon emission CT myocardial perfusion imaging [12]. Their study found that socioeconomic status was not independently predictive of inappropriate imaging use. More broadly, a systematic review of overuse of unnecessary health care found that overuse was more likely to be from white patients compared with ethnoracial minority patients [13];

although it is unclear whether or not this trend generalizes to diagnostic imaging. Understanding these trends can aid in the development of targeted strategies to achieve high levels of equitable and appropriate care across all sociodemographic groups.

The goals of this study were to evaluate OP-8 trends over time by site of service and to evaluate patient characteristics associated with not receiving conservative therapy for low back pain before imaging. We hypothesized that appropriate MRI use would be lower in sociodemographic groups that have historically faced limited access to care and would differ by site of service over time.

MATERIALS AND METHODS

We conducted a secondary data analysis using claims and the denominator file from the Medicare Limited Data Set (LDS) 5% sample from 2004 through 2014. From the LDS, we included beneficiaries who were continuously enrolled in fee-for-service (FFS) Medicare for a minimum of 5 years. An indicator variable consistent with OP-8 was created according to the criteria used by CMS for each beneficiary who underwent outpatient MRI of the lumbar spine and had a diagnosis of low back pain for years 2009 to 2014 (ie, use of same procedure codes, diagnostic codes, and inclusion or exclusion criteria as CMS; Supplemental Table 1), and data from 2004-2008 were used only to apply exclusion criteria because some excluding conditions require up to a 5-year look-back period. We then evaluated the presence of any claims for conservative therapy, including physical therapy, chiropractic services or evaluation, and management. From the LDS denominator file, we extracted basic demographic information, including age, sex, and race for each beneficiary. We also used data from the Area Health Resource File (AHRF), which contains area-level socioeconomic and health care–related measures that may be associated with the outcome but are not available in the LDS. AHRF data were merged with the Medicare LDS data at the county level. Using diagnostic codes reported on inpatient and outpatient claims, we identified conditions in the Charlson comorbidity index as a summary measure of health status.

We classified each MRI as occurring at either an outpatient hospital or outpatient clinic according to file presence; MRI claims that had at least one associated record in the LDS outpatient file were classified as outpatient hospital, and any MRI claims that only had associated records in the LDS carrier file were classified as outpatient clinic (because of separate billing of technical and professional components, sometimes claims have a component in each file). The classification of outpatient hospital and outpatient clinic distinguishes MRIs in which the provider will be subjected to OP-8 reporting (hospital) and those who will not (clinic).

We calculated descriptive statistics for all variables of interest. Generalized estimating equation (GEE) for Poisson regression was used to evaluate the association between the outcome of conservative therapy utilized before MRI with time; site (clinic versus hospital); an interaction for site by time (to test OP-8 reporting effectiveness); beneficiary demographic characteristics (age, sex, race); region of residence; the AHRF area-level measures for income, education, median home value, percent urban population; an indicator for persistent poverty; and an indicator for retirement destination (we expected that providers in areas with many of retirees would have more experience treating older adults and thus may refer patients for conservative therapy at different rates than providers who treat younger populations). We examined potential race by sex interactions, race by persistent poverty interactions, and race by median home value interactions; we included interactions that may be confounders using a threshold of $P \leq .20$ [14]. We also included an indicator for outpatient hospital (reference group was outpatient clinic), time, and an interaction term for outpatient hospital by time to allow the slopes (ie, time trends) to differ for outpatient hospitals and outpatient clinics. The interaction between time and hospital was intended to measure the impact of OP-8 reporting (ie, the rate of change in use of conservative therapy was expected to differ at sites that were subject to public reporting if public reporting was in fact effective at changing inappropriate MRI utilization). We then generated model-based rate ratios (RRs) for all independent variables. We plotted model-based estimates of the proportion of MRIs without prior conservative therapy for beneficiaries who had no excluding conditions by site of service over time. We used a type I error rate of 0.05.

This study was reviewed and received an exemption from our university's institutional review board. SAS 9.4 was used for data management and analyses (SAS Institute, Cary, North Carolina).

RESULTS

From 2009 through 2014, there was a total of 285,911 MRIs of the lumbar spine for low back pain in our sample of continuously enrolled FFS Medicare beneficiaries. We excluded 195,488 MRIs from the analysis because the beneficiary had an excluded condition or

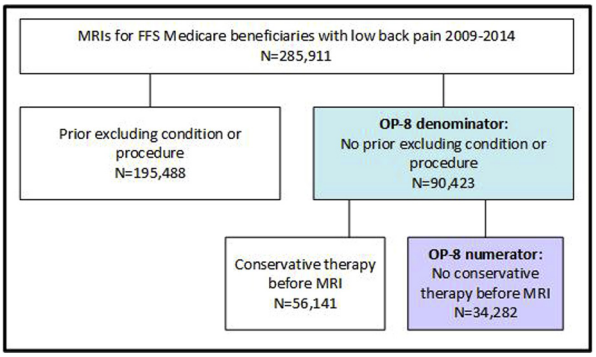


Fig 1. Sample size and exclusions. MRIs for Medicare beneficiaries who have a relevant condition or procedure before their MRI are excluded from the OP-8 and excluded from our analyses. OP-8 represents the proportion of beneficiaries with low back pain who did not receive conservative therapy (physical therapy, chiropractic care or evaluation, and management) before receiving an MRI of the lumbar spine for low back pain. During the period evaluated, CMS was excluding from the OP-8 denominator MRIs from Medicare beneficiaries who had intraspinal abscess on the MRI claim, recent spine surgery, cancer, congenital spine or spinal cord malformations, inflammatory or autoimmune disorders, certain infectious conditions, spinal vascular malformations or occult subarachnoid hemorrhage, spinal cord infarction, neoplastic abnormalities, treatment fields for radiation therapy, syringohydromyelia, scoliosis, postoperative fluid collections and soft-tissue changes, trauma, intravenous drug abuse, neurologic impairment, HIV, or unspecified immune deficiencies. FFS = fee for service; OP-8 = Medicare's Hospital Outpatient Imaging Efficiency Measure for MRI Lumbar Spine for Low Back Pain.

procedure before the MRI (Fig. 1). A majority of the beneficiaries were women (57.9% overall), and the median age was 72 years (Table 1). The proportion of beneficiaries who did not receive conservative therapy before MRI decreased over time across all sites of service, regardless of having an OP-8 excluding condition (Fig. 2).

The GEE regression found that the rate of MRI utilization without prior conservative therapy decreased over time ($P < .001$), but the rate of change did not differ between outpatient hospitals and outpatient clinics ($P = .26$) (Supplemental Table 1). Compared with females, males were more likely to have an MRI without prior conservative therapy ($P < .0001$), and there was a significant interaction for black males ($P = .0001$), which further increased this difference. Compared with non-Hispanic white females, several groups were more likely to have an MRI without prior conservative therapy, including non-Hispanic white males (RR = 1.10, 95% confidence interval [CI]: 1.08, 1.12), black males (RR = 1.18, 95% CI: 1.10, 1.27), Hispanic females (RR = 1.13, 95% CI: 1.05, 1.22), Hispanic males (RR = 1.24, 95% CI: 1.15, 1.34), Asian males (RR = 1.13, 95% CI: 1.04, 1.23), females of other races (RR = 1.24, 95% CI: 1.16, 1.32), and males of other races (RR = 1.36, 95% CI: 1.28, 1.46) (Table 2). Beneficiaries who had a greater comorbidity burden were more likely to receive conservative therapy before MRI ($P < .0001$). Area-level incomes $15,000 to $24,999 were associated with a higher rate of MRIs without prior conservative therapy (RR = 1.02, 95% CI: 1.003, 1.03 for areas with 5% of residents at this income level, increasing to 1.07, 95% CI: 1.01, 1.14 for areas with 20% of residents at this income level). Beneficiaries in the West and in areas with a higher percentage of college graduates had a higher rate of MRIs without prior conservative therapy ($P < .001$ for each). Beneficiaries living in areas with higher home values had higher utilization of conservative therapy before MRI, but these effects were not present for black beneficiaries. Persistent poverty had interactions with race; beneficiaries of unknown race were less likely to receive conservative therapy before MRI (RR = 2.26, 95% CI: 1.54, 3.32). Retirement destination areas had higher utilization of conservative therapy before MRI ($P < .001$).

DISCUSSION

This study found that the proportion of Medicare beneficiaries receiving conservative therapy before MRI of the lumbar spine for uncomplicated low back pain varied according to beneficiary demographics and socioeconomics characteristics, but there was an overall increase in the use of conservative therapy before MRI with similar rates of change across outpatient clinics and outpatient hospitals during 2009-2014. These trends were similar for MRIs of beneficiaries who had a condition or procedure that excluded them from the OP-8 denominator, although beneficiaries with an excluded condition or procedure utilized conservative therapy before MRI at *higher* rates than beneficiaries who did not have an exclusion and met the OP-8 denominator criteria. It is unclear whether increasing conservative therapy trends at both sites of service indicate spillover effects related to OP-8 reporting from outpatient hospitals to outpatient clinics or whether these trends indicate a lack of (or very minimal) response to public reporting of OP-8 for outpatient hospitals. This conclusion was similar to that of a prior study

Table 1. Sample characteristics

Variable	No Conservative Therapy Before MRI	Conservative Therapy Before MRI
Sex, n (%)		
Female	19,098 (36.51%)	33,212 (63.49%)
Male	15,184 (39.84%)	22,929 (60.16%)
Ethnoracial group, n (%)		
Non-Hispanic white	29,310 (85.5%)	48,312 (86.05%)
Black	3,029 (8.84%)	4,873 (8.68%)
Hispanic	505 (1.47%)	790 (1.41%)
Asian or Pacific Islander	475 (1.39%)	834 (1.49%)
American Indian or Alaska Native	143 (0.42%)	227 (0.40%)
Other race	757 (2.21%)	993 (1.77%)
Race unknown	63 (0.18%)	112 (0.20%)
Region, n (%)		
Abroad	121 (0.36%)	149 (0.27%)
Midwest	8,716 (25.83%)	13,865 (25.08%)
Northeast	5,209 (15.44%)	9,402 (17.01%)
South	14,210 (42.12%)	22,879 (41.38%)
West	5,483 (16.25%)	8,990 (16.26%)
Persistent poverty area, n (%)	2,051 (6.03%)	2,987 (5.35%)
Retirement destination, n (%)	5,141 (15.12%)	8,897 (15.95%)
Age (y), median (IQR)	72 (68, 77)	72 (68, 78)
Weighted Charlson comorbidity score, median (IQR)	1 (0, 2)	1 (0, 3)
Education—percent of residents with a 4-year college degree, median (IQR)	25.9 (17.60, 36.70)	26.3 (18.20, 37.00)
Income (proportion of households in area within income range) ($), median (IQR)		
<10,000	0.06 (0.05, 0.08)	0.06 (0.05, 0.08)
10,000-14,000	0.05 (0.04, 0.07)	0.05 (0.04, 0.07)
15,000-24,000	0.11 (0.08, 0.13)	0.10 (0.08, 0.13)
25,000-49,000	0.25 (0.21, 0.28)	0.25 (0.21, 0.28)
50,000-99,999	0.31 (0.28, 0.33)	0.31 (0.29, 0.33)
≥100,000	0.19 (0.13, 0.28)	0.20 (0.14, 0.29)
Median home value ($), median (IQR)	151,500 (112,800, 230,900)	156,000 (117,400, 231,200)
Urban population (%), median (IQR)	83.30 (54.70, 96.60)	85.40 (57.90, 96.80)

Results are based on a total of 285,911 MRIs of the lumbar spine during 2009 to 2014 for fee-for-service Medicare beneficiaries with low back pain.
IQR = interquartile range.

that showed an increasing prevalence of coding of excluding conditions for OP-8 at both outpatient hospitals and outpatient clinics [15]. These increases in conservative therapy utilization are encouraging, showing that quality and appropriateness of care are potentially improving across all outpatient settings, despite only being monitored in the outpatient hospital setting. However, those positive trends are tempered with evidence that the provision of care may vary according to nonclinical factors, including demographic characteristics, socioeconomic status, and area of residence. We found that males were less likely to receive conservative therapy before MRI, and this difference was even larger for black males. Also, Hispanic and other race beneficiaries were less likely to receive conservative therapy before MRI. Both higher area-level home values and certain income levels were associated with higher use of conservative therapy. Interestingly, this association with home values was not present for black beneficiaries because of an interaction between race and home value; we speculate that this trend is related to America's history of racial segregation, which has been identified as a cause of health disparities [16]. Furthermore, our estimates might underestimate the true association between racial group and prior conservative therapy use, given the potential for income (which was adjusted for) to be correlated with racially based discrimination [17]. Beneficiaries who

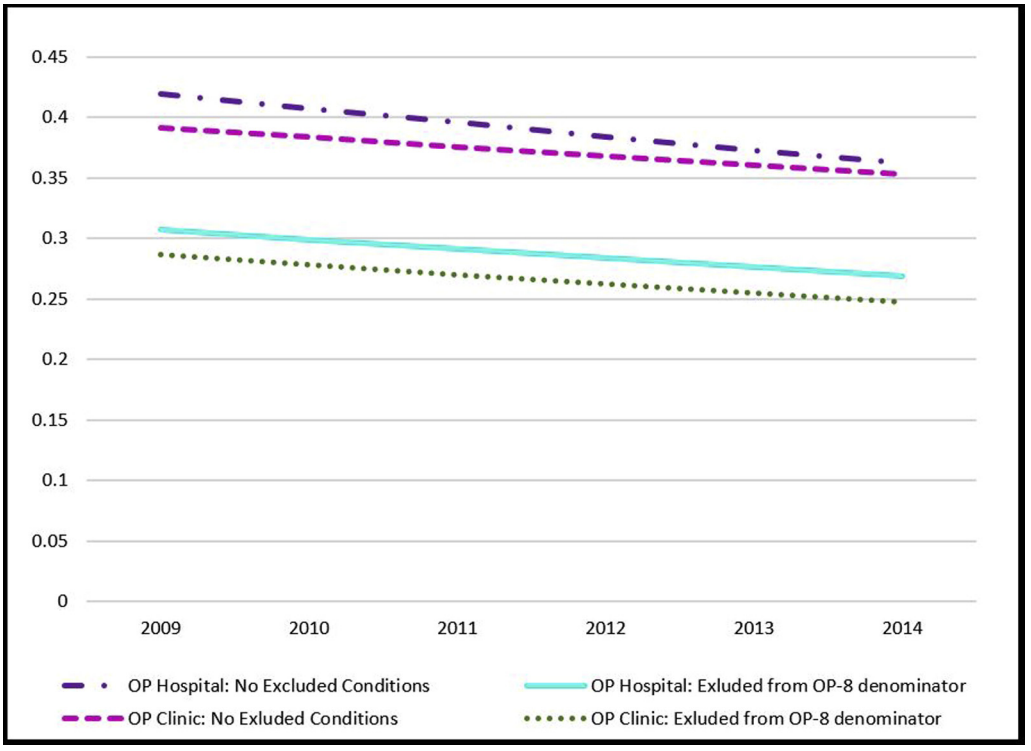


Fig 2. OP-8: proportion of MRIs of the lumbar spine without prior conservative therapy (y-axis), over time (x-axis) by site and excluded conditions. OP-8 = Medicare's Hospital Outpatient Imaging Efficiency Measure for MRI Lumbar Spine for Low Back Pain.

lived in retirement destination areas were more likely to receive conservative therapy, which we attribute to providers in these areas having more experience treating Medicare beneficiaries and being more familiar with Medicare policies. Initiatives promoting efficient use of care and resources should support appropriate and equitable use of health care for all groups of patients.

Our findings echo similar results from prior studies evaluating racial disparities in radiological testing in the pediatric emergency setting [18]. However, in that study, the authors found that clinical conditions with an established evaluation protocol had no racial differences in imaging rates between groups of patients [18]. Uncomplicated low back pain has an established protocol, requiring antecedent conservative therapy, and would be expected to have no difference amongst groups. Our findings are concordant with those documented in screening mammography research, in which racial disparities in utilization are evident in black and Hispanic populations despite an established evaluation protocol [19]. Another study found regional variation in imaging utilization, but it was unclear how much of that variation reflected underlying clinically relevant differences in regional populations [20]. Based on our findings that OP-8 varied according to health status (comorbidities) and socioeconomic characteristics, we speculate that regional variation in imaging utilization among Medicare beneficiaries may be attributable to a combination of both clinically relevant factors and factors unrelated to clinical need.

Several prior studies in the neurosurgical literature have evaluated racial disparities with regards to lumbar spine surgery. Lad et al found that African American patients were more likely to experience postoperative complications and have longer hospital stays for surgery for lumbar stenosis [21]. Elsamadicy et al studied patient satisfaction after lumbar spine surgery and found that African American patients had lower baseline and follow-up patient-reported outcomes and were less likely to state that surgery met their expectations [22]. Imaging plays a central role in the path to surgical intervention for lower back pain. Further research should evaluate the role specifically of inappropriate imaging and these downstream outcomes for particular groups of patients.

Due to the prevailing influence of Medicare in the US health system, CMS has unique opportunities and

Table 2. Regression results: model-based rate ratios

Variable	Rate Ratio (SE)	95% CI	*P* Value
Outpatient hospital			
2009	1.03 (0.02)	1.003, 1.06	.03
2010	1.00 (0.01)	0.98, 1.03	.73
2011	0.98 (0.01)	0.95, 1.00	.06
2012	0.95 (0.01)	0.93, 0.97	<.0001
2013	0.92 (0.01)	0.90, 0.95	<.0001
2014	0.90 (0.01)	0.87, 0.93	<.0001
Outpatient clinic (2009 is reference group)			
2010	0.98 (0.003)	0.97, 0.98	<.0001
2011	0.96 (0.01)	0.94, 0.97	<.0001
2012	0.94 (0.01)	0.92, 0.95	<.0001
2013	0.91 (0.01)	0.89, 0.94	<.0001
2014	0.89 (0.01)	0.87, 0.92	<.0001
Age (y)			
70	1.01 (0.002)	1.00, 1.01	.001
75	1.02 (0.005)	1.01, 1.02	.001
80	1.03 (0.01)	1.01, 1.04	.001
85	1.04 (0.01)	1.01, 1.06	.002
90	1.05 (0.02)	1.02, 1.09	.003
Race and sex			
NHW female (reference group)			
NHW male	1.10 (0.01)	1.08, 1.12	<.0001
Black female	0.96 (0.03)	0.89, 1.03	.23
Black male	1.18 (0.04)	1.10, 1.27	<.0001
Hispanic female	1.13 (0.04)	1.05, 1.22	.002
Hispanic male	1.24 (0.05)	1.15, 1.34	<.0001
Asian female	1.03 (0.04)	0.95, 1.11	.49
Asian male	1.13 (0.05)	1.04, 1.23	.003
AIAN female	1.02 (0.07)	0.90, 1.17	.73
AIAN male	1.13 (0.08)	0.98, 1.29	.09
Other race female	1.24 (0.04)	1.16, 1.32	<.0001
Other race male	1.36 (0.05)	1.28, 1.46	<.0001
Race unknown female	1.00 (0.11)	0.80, 1.24	.98
Race unknown male	1.10 (0.12)	0.88, 1.36	.41
Weighted Charlson comorbidity score	0.94 (0.002)	0.93, 0.94	<.0001
Region (reference group is Northeast)			
Midwest	1.02 (0.02)	0.99, 1.05	.16
South	1.02 (0.01)	0.99, 1.04	.28
West	1.06 (0.02)	1.03, 1.09	.0002
Abroad	1.72 (0.57)	0.90, 3.29	.10
Education (% with 4-year college degree)			
10	1.03 (0.01)	1.02, 1.04	<.0001
20	1.06 (0.01)	1.04, 1.09	<.0001
30	1.10 (0.02)	1.06, 1.14	<.0001
40	1.13 (0.03)	1.08, 1.19	<.0001
50	1.17 (0.04)	1.10, 1.24	<.0001
60	1.20 (0.05)	1.12, 1.30	<.0001

(continued)

Table 2. Continued

Variable	Rate Ratio (SE)	95% CI	*P* Value
Area-level income ($)			
<10,000			
5% of residents	1.01 (0.01)	0.99, 1.02	.46
10% of residents	1.01 (0.02)	0.98, 1.05	.46
15% of residents	1.02 (0.03)	0.97, 1.07	.46
20% of residents	1.03 (0.03)	0.96, 1.10	.46
10,000-14,999			
2.5% of residents	1.00 (0.01)	0.99, 1.01	.54
7.5% of residents	1.01 (0.02)	0.98, 1.04	.54
12.5% of residents	1.02 (0.03)	0.96, 1.07	.54
15,000-24,999			
5% of residents	1.02 (0.01)	1.003, 1.03	.02
10% of residents	1.04 (0.02)	1.01, 1.07	.02
15% of residents	1.05 (0.02)	1.01, 1.10	.02
20% of residents	1.07 (0.03)	1.01, 1.14	.02
Income 25,000-49,999			
15% of residents	1.01 (0.02)	0.98, 1.05	.54
20% of residents	1.02 (0.02)	0.97, 1.07	.54
25% of residents	1.02 (0.03)	0.96, 1.08	.54
30% of residents	1.02 (0.04)	0.95, 1.10	.54
Median home value ($)			
Nonblack beneficiaries			
100,000	0.96 (0.01)	0.95, 0.98	<.0001
200,000	0.93 (0.01)	0.91, 0.95	<.0001
300,000	0.90 (0.02)	0.86, 0.93	<.0001
400,000	0.86 (0.02)	0.82, 0.91	<.0001
500,000	0.83 (0.03)	0.78, 0.89	<.0001
Black beneficiaries			
100,000	1.00 (0.01)	0.97, 1.02	.90
200,000	1.00 (0.02)	0.95, 1.05	.90
300,000	1.00 (0.04)	0.93, 1.07	.90
400,000	0.99 (0.05)	0.90, 1.09	.90
500,000	0.99 (0.06)	0.88, 1.12	.90
Urban population (%)			
20	0.9998 (0.0001)	0.9997, 0.9999	<.0001
40	0.9996 (0.0001)	0.9995, 0.9998	<.0001
60	0.9995 (0.0001)	0.9992, 0.9997	<.0001
80	0.9993 (0.0002)	0.999, 0.9996	<.0001
100	0.9991 (0.0002)	0.9987, 0.9995	<.0001
Persistent poverty area			
NHW, black, Hispanic, AIAN, or Asian	1.03 (0.02)	0.99, 1.08	.09
Other race	0.84 (0.12)	0.64, 1.12	.24
Race unknown	2.26 (0.44)	1.54, 3.32	<.0001
Retirement destination	0.95 (0.01)	0.93, 0.98	0.0002

Generalized estimating equations regression. Outcome is no conservative therapy before MRI of lumbar spine for low back pain. Based on 90,423 outpatient MRIs during 2009 to 2014 of fee-for-service Medicare beneficiaries who did not have a prior excluding condition or procedure per CMS criteria for OP-8. Rate ratios greater than 1.0 are interpreted as higher utilization of MRI *without* prior conservative therapy, and rate ratios less than 1.0 are interpreted as higher utilization of MRI *with* prior conservative therapy. AIAN = American Indian or Alaska Native; CI = confidence interval; NHW = non-Hispanic white; SE = standard error; OP-8 = Medicare's Hospital Outpatient Imaging Efficiency Measure for MRI Lumbar Spine for Low Back Pain.

responsibilities to implement initiatives aimed at reducing disparities in health care and outcomes. CMS has a dedicated office of Minority Health tasked with reducing health disparities while improving the health of all minority populations. Despite this stated priority, many CMS programs ignore race and other sociodemographic factors in their evaluation, and health and health care statistics are rarely reported by both race and class in the United States, despite both being important codeterminants of disparities [23].

This study had several strengths; we used a nationally representative sample of FFS Medicare beneficiaries, we used the same criteria as CMS for coding the OP-8 metric, and our regression approach accounted for repeated measures of providers. The greatest limitation of our study design is the exclusion of beneficiaries who have not been enrolled in Medicare for at least 5 years; this means that our results may or may not be generalizable to people who are younger than 70 and aged into Medicare at age 65 (although those who enrolled at age 60 or younger because of disability or qualifying health condition are represented at younger ages). However, these exclusions were necessary to follow the exclusion criteria used by CMS for the OP-8 metric. Our findings might not be generalizable to the Medicare health maintenance organization (HMO) population. However, this is not a meaningful limitation because Medicare HMO enrollees represent a minority of the overall Medicare population and HMOs often have pre authorization or other front-end criteria that must be satisfied for diagnostic imaging to be approved (to discourage inappropriate use); the FFS population is the true population of interest when it comes to OP-8. Our estimates of differences in OP-8 by race, income, and education may underestimate the true effect sizes due to measurement error imposed by use of area-level measures of income and education and use of race reported by the Social Security Administration, which is subject to misclassification [24,25]. Racial misclassification is more likely to impact nonwhite and nonblack racial groups [25], although we also note that improvements have been made to these data that have increased the sensitivity to correctly classify Hispanic and Asian and Pacific Islander beneficiaries, and that these improvements occurred before our data were collected [26].

We found evidence that the proportion of Medicare beneficiaries receiving conservative therapy before undergoing MRI for uncomplicated low back pain is increasing in the outpatient setting, an encouraging finding. These increases were similar for outpatient hospitals that are subject to OP-8 reporting and for outpatient clinics that are not subject to OP-8 reporting, suggesting that OP-8 reporting is either ineffective or has spillover effects. We found that certain demographic and socioeconomic characteristics were associated with provision of conservative therapy before MRI. These findings highlight the need to ensure that provision of care is based on clinically relevant characteristics and not biased by sociodemographic factors. Disparities research in radiology and medical imaging should continue to explore opportunities to promote the equitable provision of imaging and radiologic care.

TAKE-HOME POINTS

- Receipt of conservative therapy before MRI of the lumbar spine for Medicare beneficiaries varied according to sociodemographic characteristics.
- Receipt of conservative therapy before MRI was lower for males and even more so for black males and also was lower for Hispanic and other race beneficiaries.
- Higher wealth was associated with higher rates of conservative therapy before MRI for most racial groups but not for black beneficiaries.
- After the initiation of public reporting of the imaging efficiency indicator OP-8, increases in the proportion of Medicare beneficiaries receiving conservative therapy before MRI of the lumbar spine occurred at both outpatient clinics and outpatient hospitals.
- The rates of change in use of prior conservative therapy before MRI were similar for outpatient hospitals (subject to public reporting) and for outpatient clinics.

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ADDITIONAL RESOURCES

Additional resources can be found online at: https://doi.org/10.1016/j.jacr.2018.12.047.

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