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RESEARCH ARTICLE

Differences in use of high- and low-value health care between immigrant and US-born adults

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Abstract

Objective: To examine differences in the use of high- and low-value health care between immigrant and US-born adults.

Data Source: The 2007–2019 Medical Expenditure Panel Survey.

Study Design: We split the sample into younger (ages 18–64 years) and older adults (ages 65 years and over). Our outcome measures included the use of high-value care (eight services) and low-value care (seven services). Our key independent variable was immigration status. For each outcome, we ran regressions with and without individual-level characteristics.

Data Collection/Extraction Methods: N/A.

Principal Findings: Before accounting for individual-level characteristics, the use of high- and low-value care was lower among immigrant adults than US-born adults. After accounting for individual-level characteristics, this difference decreased in both groups of younger and older adults. For high-value care, significant differences were observed in five services and the direction of the differences was mixed. The use of breast cancer screening was lower among immigrant than US-born younger and older adults (−5.7 [95% CI: −7.4 to −3.9] and −2.9 percentage points [95% CI: −5.6 to −0.2]) while the use of colorectal cancer screening was higher among immigrant than US-born younger and older adults (2.6 [95% CI: 0.5 to 4.8] and 3.6 [95% CI: 0.2 to 7.0] percentage points). For low-value care, we did not identify significant differences except for antibiotics for acute upper respiratory infection among younger adults and opioids for back pain among older adults (−3.5 [95% CI: −5.5 to −1.5] and −3.8[95% CI: −7.3 to −0.2] percentage points). Particularly, differences in socioeconomic status, health insurance, and care access between immigrant and US-born adults played a key role in accounting for differences in the use of high- and low-value health care. The use of high-value care among immigrant and US-born adults increased over time, but the use of low-value care did not decrease.

Conclusion: Differential use of high- and low-value care between immigrant and US-born adults may be partly attributable to differences in individual-level characteristics, especially socioeconomic status, health insurance, and access to care.

KEYWORDS
high-value care, immigrants, low-value care, Medicare, US-born residents, value-based care

What is known on this topic

- Immigrant adults have lower health care use than US-born adults due to, in part, differences in demographic characteristics, socioeconomic status, and health needs.
- Limited evidence shows that the use of high- and low-value health care services differs between immigrants and US-born adults.

What this study adds

- Use of high- and low-value health care services was substantially lower among immigrant adults than US-born adults without accounting for individual-level characteristics.
- After accounting for individual-level characteristics, we did not find clear differences in the use of high- and low-value care between immigrant and US-born adults.
- The results demonstrate that socioeconomic status, health insurance, and care access are important factors associated with the differential use of high- and low-value care between immigrant and US-born adults.

1 | INTRODUCTION

Immigrants are a systematically disadvantaged population with an increased risk of poor health due to challenges related to immigration, acculturative stress, and financial and labor instability.[1,2] In 2021, approximately 46 million foreign-born residents lived in the United States (US), which represents nearly 14% of the US population.[3] The immigrant population size is projected to reach 78 million by 2065.[4] Prior research suggests that immigrant adults are less likely to use health care services than US-born adults.[5,6] Lower use of health care services among immigrants may be partly attributable to lack of or having limited health insurance coverage. Immigrants tend to lack or have limited health insurance coverage due to the fragmented and inequitable nature of the US health care system, where immigrants encounter policy exclusions, linguistic and cultural barriers, discrimination, mistrust, and legal concerns.

As the US health care system has focused on improving the value of care, understanding whether lower use of health care services among immigrant adults relative to US-born adults is driven by the use of high- or low-value care is of high policy relevance. Prior research shows that the use of high-value care among the entire US adult population is suboptimal with limited improvement over the past several decades.[7,8] In 2015, only 8% of adults received all of the recommended high-priority appropriate preventive services.[9] However, the use of low-value care is widespread.[10–13] Nearly one-third of older adults received at least one low-value service between 2014 and 2018.[13] This phenomenon may be more pronounced among minoritized populations, which raises concerns about the inequitable delivery of value-based care.[14] Research suggests that high-income adults were more likely to receive high-value cancer screening, diagnostic and preventive testing, and diabetes care and less likely to receive low-value medications than low-income adults,[15] which suggests inequities in the delivery of high- and low-value care by income levels.

To the best of our knowledge, the evidence showing whether the use of high- and low-value care differs between immigrant and US-born adults is limited. Several possible mechanisms other than lack of or having limited health insurance coverage are likely.[1,2,5,6] For example, immigrant adults may have less knowledge about the benefits of high-value care and the potential harms of low-value care due to linguistic and cultural barriers and difficulties in navigating the US health care system. Also, immigrant adults often lack a regular source of health care or may see health care providers who are less likely to recommend high-value care and avoid low-value care. Finally, individual providers may give different advice about high- and low-value care to different individuals due to implicit and explicit bias.[16] Studies have shown that compared with US-born adults, immigrants use less preventive care such as cancer screening.[17–20] However, little is known about other types of high-value care and overall low-value care among immigrant adults.

In this study, we examined differences in the use of high- and low-value health care between immigrant and US-born adults among younger adults (ages 18–64 years) and older adults (ages 65 years and over). Specifically, we examined whether the use of high- and low-value care differed between immigrant and US-born adults after adjusting for individual-level characteristics (demographics, socioeconomic status, health insurance, access to care, and health status). In addition, we examined which characteristics are critical in determining differences in the use of high- and low-value care between immigrant and US-born adults. Since national policy efforts to enhance health care value have been recently implemented,[21–23] we also examined trends in the use of high- and low-value care between immigrant and US-born adults.

2 | METHODS

2.1 | Data

We used data from the Medical Expenditure Panel Survey (MEPS) for 2007–2019. The data are from a nationally representative survey of the US civilian noninstitutionalized population and have

measures on participants' demographic and socioeconomic characteristics and health and health care outcomes. Specifically, we used five datasets from MEPS: the full-year consolidated data files, outpatient visit files, office-based medical provider visit files, prescribed medicine files, and medical condition files. As differences in types of health insurance coverage might lead to differences in access to and use of high- and low-value care, we separately analyzed younger adults (ages 18–64 years) and older adults (ages 65 years and over).

2.2 | Outcomes

Our outcome measures included the use of high-value care (eight services) and low-value care (seven services). Following prior research that identified high- and low-value care using MEPS,[12,24–26] we constructed binary measures of both high- and low-value services. For each outcome measure, we identified those who were eligible for the measure (the denominator) using age, sex, and health conditions based on the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) or the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM). Then, we determined whether eligible participants received specific services (the numerator). Definitions used to identify each outcome measure are presented in Appendix Table A. Due to changes in data collection across years, the years used for each outcome measure were subject to availability.

We included eight high-value services in three categories. We included two high-value cancer screenings (breast[27] and colorectal cancer screening[28]), three high-value diagnostic and preventive measures (blood pressure measurement,[29] cholesterol measurement,[30] and influenza vaccine[31]), and three high-value diabetes care measures (HbA1c, foot, and eye examinations).[32] We also included seven low-value services in three categories. We used two outcome measures of low-value antibiotic use (antibiotic for acute upper respiratory infection[33,34] and antibiotic for influenza[33]), three outcome measures of low-value medications (use of benzodiazepine for depression,[35] use of opioid for back pain,[36] and use of nonsteroidal anti-inflammatory drug [NSAID] for individuals with hypertension, heart failure, or chronic kidney disease[35]), and two low-value imaging tests (magnetic resonance imaging [MRI] or computed tomography [CT] for back pain and radiograph for back pain).[37] For the outcome measures in the antibiotic use and medication categories, we first used the medical condition files to identify those eligible for each outcome measure and then used the prescribed medicine files to identify the use of specific medications. We examined the use of prescription drugs through drug names or therapeutic drug classes. For outcome measures in the imaging test category, we used the medical condition files to include those eligible for each outcome measure and then used the outpatient visit files and office-based clinic visit files to study the use of imaging during a visit. For each outcome measure, we excluded those with some conditions associated with clinical red flags or with competing diagnoses.

2.3 | Independent variables

Our key independent variable was immigration status. We defined immigrants as foreign-born residents regardless of citizenship or documentation status; MEPS does not provide measures on citizenship or documentation status of immigrants. To adjust for differences in sample characteristics, we used the Andersen behavioral model of health care utilization and included individual-level characteristics (demographics, socioeconomic status, health insurance, access to care, and health status) based on prior research.[12,24–26] Specifically, the Andersen behavioral model of health care utilization has been used to examine the factors that lead to the use of health care services.[38] The model posits that health care use is determined by predisposing, enabling, and need factors. Thus, we categorized the individual-level characteristics into three categories: predisposing factors (age, sex, and race/ethnicity), enabling factors (employment status, marital status, education, family income as % of the federal poverty level [FPL], census region of residence, health insurance coverage [any, Medicaid, Medicare, and any private], and access to care [having a usual source of care, delay in getting necessary medical care, and unable to get medical care]), and need factors (health status [good perceived physical health status, good perceived mental health status, functional limitation, and limited activities of daily living]).

2.4 | Statistical analyses

We estimated sample characteristics between immigrant and US-born adults in both groups of younger and older adults. Then, we estimated adjusted outcomes. To quantify differences in the use of high- and low-value health care between immigrant and US-born adults, we ran a linear probability model with and without control variables described above and immigrant status. To examine which characteristics are critical in determining differences in the use of high- and low-value care between immigrant and US-born adults, we also ran the model while adjusting for each set of individual-level characteristics (demographics [age, sex, and race/ethnicity], socioeconomic status [employment status, marital status, education, family income, and census region of residence], health insurance, access to care, and health status). As national policy efforts to enhance health care value have been recently implemented,[21–23] we also examined trends in the use of high- and low-value care between immigrant and US-born adults using six composite outcome measures (high-value cancer screening, high-value diagnostic and preventive test, high-value diabetes care, low-value antibiotic use, low-value medication, and low-value imaging test). Specifically, we ran a linear probability model after controlling for all individual-level characteristics described above and immigrant status, including periods (2007–2009, 2010,2012, 2013–2015, and 2016–2019), and interaction terms associated with periods. Using the marginal effects from the linear probability models, we estimated the mean adjusted values of the outcomes for immigrant and US-born adults while holding all other variables constant except the variable of interest, which allowed us to compare the outcomes of interest between

immigrant and US-born adults. For all analyses, we included year-fixed effects. We also clustered standard errors within individuals as some individuals were included in the data over the course of multiple years. We used survey weights to adjust sample characteristics to be representative of the adult US population and tested for potential multiple comparisons using the Holm-Bonferroni method. The data were analyzed using Stata statistical software version 16.1 (StataCorp).

3 | RESULTS

Our sample included 182,762 younger adults (50,795 immigrant adults and 131,967 US-born adults) and 35,971 older adults (7306 immigrant adults and 28,665 US-born adults) (Table 1). Among younger and older adults, immigrants were more likely to be Latino or non-Latino Asian, to be married, to have a high school degree or below, to have family income below 200% of FPL, and less likely to have a usual source of care than US-born residents. Our findings showed different patterns in health insurance and health status between younger and older adults. Specifically, we found no or only small differences in health insurance and health status between immigrant and US-born younger adults. Compared with US-born older adults, however, immigrant older adults were less likely to have any insurance coverage (96.2% vs. 99.9%) and Medicare coverage (89.4% vs. 97.7%), and more likely to have Medicaid coverage (33.6% vs. 9.4%) and any private coverage (4.1% vs. 2.1%). Immigrant older adults were less likely to report good perceived physical health (67.9% vs. 77.6%) and good perceived mental health (83.5% vs. 88.4%) than US-born older adults. However, immigrant older adults were less likely to report any functional limitation (35.3% vs. 44.1%) than US-born older adults.

Before accounting for individual-level characteristics, the use of high- and low-value care was lower among immigrant adults than US-born adults, especially for younger adults. For younger adults, immigrants were less likely to use all high-value services than US-born residents (Table 2). The magnitude of the difference varied markedly by service, ranging from −0.8 percentage points (95% CI: −1.5 to −0.1) for foot exam to −17.2 percentage points (95% CI: −18.4 to −16.0) for colorectal cancer screening. Except for antibiotics used for influenza treatment and radiograph for back pain, immigrants were less likely to use all low-value services than US-born residents, ranging from −1.2 percentage points (95% CI: −2.2 to −0.1) for NSAID used for those with hypertension, heart failure, or kidney disease to −11.1 percentage points (95% CI: −12.6 to −9.6) for antibiotics used for acute upper respiratory infection. A similar trend was also observed among older adults, but the magnitude of the difference was lower among older adults than younger adults. For older adults, immigrants were less likely to use five high-value services than US-born residents, including breast cancer screening (−5.3 percentage points [95% CI: −7.8 to −2.9]), colorectal cancer screening (−11.7 percentage points [95% CI: −13.7 to −9.8]), influenza vaccination (−6.7 percentage points [95% CI: −8.3 to −5.1]), HbA1c test (−3.5 percentage points [95% CI: −6.6 to −0.4]), eye exam (−5.6 percentage points [95% CI: −8.6 to −2.5]) (Table 3). Also, immigrants were less likely to use three low-value services than US-born residents, including antibiotics used for acute upper respiratory infection (−7.9 percentage points [95% CI: −12.7 to −3.1]), opioids used for back pain (−3.1 percentage points [95% CI: −5.9 to −0.4]), and MRI/CT used for back pain (−4.3 percentage points [95% CI: −6.9 to −1.8]).

After accounting for individual-level characteristics, the difference between immigrant and US-born adults decreased in both groups of younger and older adults. In both groups, we found no clear and consistent patterns of differences in the use of high-value care between immigrant and US-born adults. For younger adults, immigrants were less likely to use colorectal cancer screening (−5.7 percentage points [95% CI: −7.4 to −3.9]), influenza vaccine (−4.0 percentage points [95% CI: −5.9 to −2.1]), and blood pressure measurement (−1.0 percentage points [95% CI: −1.6 to −0.5]), and more likely to use breast cancer screening (2.6 percentage points [95% CI: 0.5 to 4.8]) and cholesterol measurement (3.3 percentage points [95% CI: 2.2 to 4.3]) than US-born residents (Table 2). For older adults, immigrants were less likely to get screened for colorectal cancer (−2.9 percentage points [95% CI: −5.6 to −0.2]) and to receive an influenza vaccine (−5.7 percentage points [95% CI: −7.9 to −3.5]), and more likely to get screened for breast cancer (3.6 percentage points [95% CI: 0.2 to 7.0]), cholesterol measurement (1.5 percentage points [95% CI: 0.3 to 2.7]), and blood pressure (1.5 percentage points [95% CI: 0.3 to 2.7]) than US-born residents (Table 3). On the contrary, we found almost no differences in the use of low-value care except for antibiotics used for acute upper respiratory infection among younger adults (−3.5 percentage points [95% CI: −5.5 to −1.5]) and opioids used for back pain among older adults (−3.8 percentage points [95% CI: −7.3 to −0.2]). We found that differences in socioeconomic status, health insurance, and access to care between immigrant and US-born adults played key roles in accounting for differences in the use of high- and low-value care (Appendix Tables B and C). However, the magnitude of the change differed by outcome measure. Our results remain constant when we performed Holm-Bonferroni methods for multiple comparisons.

Our analyses showed that the use of high-value care among immigrant and US-born adults increased over time, but the use of low-value care did not decrease (Figures 1 and 2). Specifically, we observed increases in all high-value composite measures between 2007 and 2019. Particularly, immigrant younger adults were less likely to use overall high-value care than US-born younger adults in 2007–2009, but the difference diminished between 2010 and 2019. Moreover, we did not observe evidence that using overall low-value care decreased over time. By contrast, we observed an increasing trend in some low-value composite measures such as low-value antibiotic use in both groups of immigrant and US-born adults. Our interaction term between immigrant status and periods (2007–2009, 2010, 2012, 2013–2015, and 2016–2019) in almost all composite outcome measures was nonsignificant.

4 | DISCUSSION

Using a nationally representative sample of younger and older adults in the United States, we studied differences in the use of high- and

TABLE 1 Sample characteristics of immigrant and US-born adults, 2007–2019 from MEPS.

Characteristic	Age 18–64		Age 65+	
	Immigrants (N = 50,795)	US-born residents (N = 131,967)	Immigrants (N = 7306)	US-born residents (N = 28,665)
Demographics				
Age, mean (SD)	41.1 (11.9)	41.3 (13.4)	73.8 (6.4)	74.1 (6.6)
Female, N (%)	26,017 (52.4)	68,542 (53.5)	4104 (57.2)	16,147 (56.9)
Race/ethnicity, N (%)				
Non-Latino White	3427 (6.9)	71,030 (55.5)	1038 (14.5)	20,197 (71.2)
Latino	31,955 (64.4)	19,891 (15.5)	3491 (48.6)	1578 (5.6)
Non-Latino Black	3482 (7.0)	30,442 (23.8)	564 (7.9)	5598 (19.7)
Non-Latino Asian	10,244 (20.6)	2837 (2.2)	1981 (27.6)	442 (1.6)
Non-Latino other or multiple	511 (1.0)	3801 (3.0)	107 (1.5)	563 (2.0)
Socioeconomic status, N (%)				
Employed	34,634 (69.8)	88,525 (69.2)	1287 (17.9)	5124 (18.1)
Married	30,648 (61.8)	59,910 (46.8)	3992 (55.6)	14,504 (51.1)
Education				
High school or lower	16,257 (32.8)	14,082 (11.0)	3004 (41.8)	5513 (19.4)
College graduate	14,211 (28.6)	57,020 (44.5)	1575 (21.9)	11,989 (42.2)
Advanced degree	12,670 (25.5)	42,717 (33.4)	1569 (21.8)	7871 (27.7)
Family income				
<200% of FPL	24,370 (49.1)	46,226 (36.1)	3604 (50.2)	10,742 (37.9)
200–399% of FPL	14,694 (29.6)	38,891 (30.4)	1955 (27.2)	8408 (29.6)
>399% of FPL	10,555 (21.3)	42,884 (33.5)	1622 (22.6)	9228 (32.5)
US census regions				
Northeast	8964 (18.1)	18,942 (14.8)	1664 (23.2)	4321 (15.2)
Midwest	5071 (10.2)	28,802 (22.5)	479 (6.7)	6728 (23.7)
South	15,930 (32.1)	50,917 (39.8)	2189 (30.5)	11,579 (40.8)
West	19,654 (39.6)	29,340 (22.9)	2849 (39.7)	5750 (20.3)
Health insurance, N (%)				
Any coverage	30,974 (62.4)	107,077 (83.7)	6909 (96.2)	28,345 (99.9)
Medicaid coverage	6354 (12.8)	17,219 (13.5)	2415 (33.6)	2658 (9.4)
Medicare coverage	792 (1.6)	5849 (4.6)	6417 (89.4)	27,719 (97.7)
Any private coverage	24,230 (48.8)	86,428 (67.5)	295 (4.1)	586 (2.1)
Access to care, N (%)				
Having a usual source of care	28,929 (58.3)	92,458 (72.2)	6400 (89.1)	26,429 (93.1)
Delay in getting necessary medical care	1189 (2.4)	5703 (4.5)	176 (2.5)	945 (3.3)
Unable to get medical care	1445 (2.9)	4678 (3.7)	143 (2.0)	372 (1.3)
Health status, N (%)				
Good perceived physical health (including good, very good, or excellent)	42,103 (84.9)	109,926 (85.9)	4874 (67.9)	22,011 (77.6)
Good perceived mental health (including good, very good, or excellent)	46,880 (94.5)	117,371 (91.7)	5999 (83.5)	25,075 (88.4)
Functional limitation	3095 (6.2)	17,835 (13.9)	2533 (35.3)	12,509 (44.1)
Limited activities of daily living	863 (1.7)	5285 (4.1)	1314 (18.3)	4689 (16.5)

Abbreviation: FPL, federal poverty level.

TABLE 2 Use of high- and low-value health care between immigrant and US-born younger adults.

Outcome	Age 18–64					
	Immigrants		US-born residents		Adjusted difference, percentage points (95% CI)[a]	
					Before adjusting for individual-level characteristics	After adjusting for individual-level characteristics
	N	Mean	N	Mean		
High-value health care						
Cancer screening						
Breast cancer screening	7320	69.9	21,839	73.6	−4.7 (−6.2 to −3.1)	2.6 (0.5 to 4.8)
Colorectal cancer screening	13,760	33.3	40,786	50.6	−17.2 (−18.4 to −16.0)	−5.7 (−7.4 to −3.9)
Diagnostic and preventive testing						
Blood pressure measurement	31,403	65.3	73,373	73.1	−8.3 (−8.7 to −7.8)	−1.0 (−1.6 to −0.5)
Cholesterol measurement	48,864	80.6	128,058	89.6	−6.0 (−6.7 to −5.2)	3.3 (2.2 to 4.3)
Influenza vaccine	12,412	39.8	36,307	46.5	−6.9 (−8.2 to −5.6)	−4.0 (−5.9 to −2.1)
Diabetes care						
HbA1c measurement	2206	72.6	6135	79.1	−7.3 (−9.9 to −4.7)	−2.0 (−5.5 to 1.5)
Foot examination	3191	97.1	8347	97.0	−0.8 (−1.5 to −0.1)	−0.3 (−1.3 to 0.6)
Eye examination	3200	50.2	8388	56.9	−9.0 (−11.6 to −6.5)	−2.9 (−6.6 to 0.8)
Low-value health care						
Antibiotic use						
Antibiotics for acute upper respiratory infection	5436	14.3	22,706	24.8	−11.1 (−12.6 to −9.6)	−3.5 (−5.5 to −1.5)
Antibiotics for influenza	2153	9.4	5923	9.4	0.2 (−1.6 to 2.0)	0.3 (−2.1 to 2.6)
Medications						
Benzodiazepine for depression	1504	27.2	12,749	29.9	−4.2 (−7.3 to −1.1)	−2.8 (−6.4 to 0.9)
Opioid for back pain	3505	7.6	14,186	13.1	−4.1 (−5.4 to −2.8)	−0.8 (−2.5 to 0.9)
NSAID use in patients with hypertension, heart failure, or kidney disease	7777	13.7	28,226	14.6	−1.2 (−2.2 to −0.1)	−1.1 (−2.5 to 0.4)
Imaging						
MRI/CT for back pain	3505	4.8	14,186	7.1	−1.8 (−2.9 to −0.7)	0.4 (−1.1 to 2.0)
Radiograph for back pain	3505	10.2	14,186	11.1	−0.5 (−2.0 to 1.0)	1.2 (−0.9 to 3.2)

Abbreviations: CT, computed tomography; NSAID, nonsteroidal anti-inflammatory drug; MRI, magnetic resonance imaging.

[a]All adjusted regressions controlled for age, sex, race/ethnicity, employment status, marital status, education, family income, health insurance (any insurance, Medicaid, Medicare, and any private insurance), US census region of residence, access to care (having a usual source of care, delay in getting necessary medical care, and unable to get medical care), and health status (perceived physical health, perceived mental health, any functional limitation, and activities of daily living).

low-value health care between immigrant and US-born adults. Before accounting for individual-level characteristics, the use of high- and low-value care was lower among immigrant adults than US-born adults, especially for younger adults. After accounting for individual-level characteristics, however, this difference decreased in both groups of younger and older adults. For high-value care, significant differences were observed only in nearly half of the services we examined and the directions of the differences were mixed. For low-value care, we observed almost no differences between immigrant and US-born adults. While the use of high-value care among immigrant and US-born adults increased over time, the use of low-value care did not decrease.

We identified large disparities in the use of high- and low-value care between immigrant and US-born adults before accounting for

individual-level characteristics. This finding is consistent with other studies that observed the lower use of preventive services among immigrant adults compared with US-born adults.[17–20] Importantly, the magnitude of the difference was greater among younger adults than older adults. There may be several explanations for this finding. First, long-term immigrants who arrived in the United States as children or young adults tend to resemble US-born residents more closely in terms of culture, language, and familiarity with the US health care system, which possibly contributes to smaller differences in the use of high- and low-value health care between immigrant and US-born older adults. However, immigrants who migrate after age 60 are often a potentially disadvantaged population due to limited language proficiency, limited work experiences in the United States, and lack of familiarity with the US health care system, which could lead to

TABLE 3 Use of high- and low-value health care between immigrant and US-born older adults.

| Outcome | Age 65+ | | | | Adjusted difference, percentage points (95% CI)[a] | |
| | Immigrants | | US-born residents | | Before adjusting for individual-level characteristics | After adjusting for individual-level characteristics |
	N	Mean	N	Mean		
High-value health care						
Cancer screening						
Breast cancer screening	2458	70.9	8859	76.7	−5.3 (−7.8 to −2.9)	3.6 (0.2 to 7.0)
Colorectal cancer screening	4731	53.9	17,360	67.5	−11.7 (−13.7 to −9.8)	−2.9 (−5.6 to −0.2)
Diagnostic and preventive testing						
Blood pressure measurement	6788	91.7	26,950	92.4	−0.5 (−1.0 to 0.0)	0.8 (0.1 to 1.5)
Cholesterol measurement	7158	96.6	28,437	97.6	−0.2 (−1.1 to 0.6)	1.5 (0.3 to 2.7)
Influenza vaccine	6634	65.1	26,027	70.4	−6.7 (−8.3 to −5.1)	−5.7 (−7.9 to −3.5)
Diabetes care						
HbA1c measurement	1086	82.9	3916	86.1	−3.5 (−6.6 to −0.4)	−2.5 (−6.7 to 1.7)
Foot examination	1685	98.1	5755	97.2	0.4 (−0.3 to 1.2)	0.2 (−1.0 to 1.3)
Eye examination	1702	67.2	5786	72.1	−5.6 (−8.6 to −2.5)	−1.7 (−6.0 to 2.6)
Low-value health care						
Antibiotic use						
Antibiotics for acute upper respiratory infection	613	17.5	3216	29.9	−7.9 (−12.7 to −3.1)	−2.3 (−9.0 to 4.3)
Antibiotics for influenza	301	11.3	801	15.2	−2.4 (−8.2 to 3.5)	0.9 (−9.0 to 10.7)
Medications						
Benzodiazepine for depression	439	38.5	2908	39.2	0.9 (−4.9 to 6.7)	0.3 (−7.8 to 8.4)
Opioid for back pain	740	9.6	4087	13.6	−3.1 (−5.9 to −0.4)	−3.8 (−7.3 to −0.2)
NSAID use in patients with hypertension, heart failure, or kidney disease	4739	11.8	19,077	10.6	1.0 (−0.3 to 2.3)	1.5 (−0.5 to 3.4)
Imaging						
MRI/CT for back pain	740	5.8	4087	10.3	−4.3 (−6.9 to −1.8)	−3.0 (−7.0 to 0.9)
Radiograph for back pain	740	10.4	4087	13.2	−0.6 (−3.9 to 2.7)	1.2 (−3.7 to 6.1)

Abbreviations: CT, computed tomography; NSAID, nonsteroidal anti-inflammatory drug; MRI, magnetic resonance imaging.
[a]All adjusted regressions controlled for age, sex, race/ethnicity, employment status, marital status, education, family income, health insurance (any insurance, Medicaid, Medicare, and any private insurance), US census region of residence, access to care (having a usual source of care, delay in getting necessary medical care, and unable to get medical care), and health status (perceived physical health, perceived mental health, any functional limitation, and activities of daily living).

navigation challenges and different views on treatment preferences. An important explanation may also be that Medicare plays a critical role in improving access to and use of health care for older immigrants. For instance, evidence suggests that Medicare enrollment leads to increases in the use of high-value care and improvements in self-reported health among immigrants.[39]

We found no or only small differences in the use of high- and low-value care between immigrant and US-born adults after accounting for individual-level characteristics. There were significant differences in some outcome measures, but the magnitude of the difference was marginal. Thus, it is unlikely to be clinically meaningful. This finding suggests that differences in the use of high- and low-value care between immigrant and US-born adults are mainly attributable to differences in sample characteristics between immigrant and

US-born adults. Socioeconomic status, health insurance, and access to care play key roles in the associations. There is evidence that immigrant adults have social and economic disadvantages. For example, family income is markedly lower among immigrant adults than US-born adults. Immigrants also face limited occupational mobility and have a higher likelihood of being employed in lower-skilled or service-sector jobs, which affects their ability to get employer-provided health coverage. Lack of or having limited health insurance coverage can hinder access to and use of health care among immigrants.

Interestingly, the use of high-value care among immigrant and US-born adults increased over time, but the use of low-value care did not decrease. Federal and state health policies have tried to encourage the use of high-value care and discourage the use of low-value care. For example, the Patient Protection and Affordable Care Act
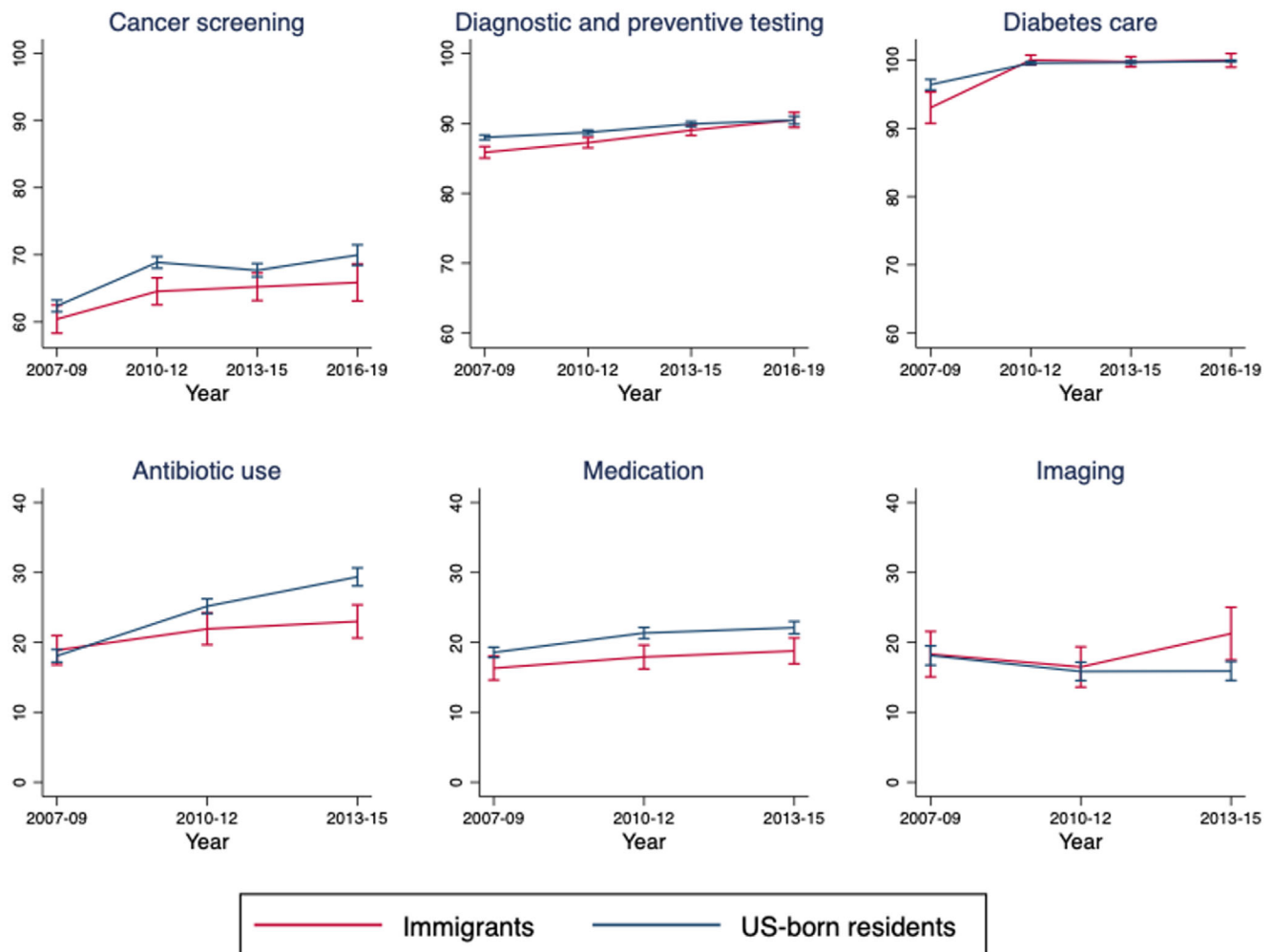
FIGURE 1   Trends in use of high- and low-value care (composite measure) between immigrant and US-born younger adults. Trends in the use of high- and low-value health care between immigrant and US-born adults were examined using six composite outcome measures (high-value cancer screening, high-value diagnostic and preventive test, high-value diabetes care, low-value antibiotic use, low-value medication, and low-value imaging test). A linear probability model was conducted after controlling for age, sex, race/ethnicity, employment status, marital status, education, family income, health insurance (any insurance, Medicaid, Medicare, and any private insurance), US census region of residence, access to care (having a usual source of care, delay in getting necessary medical care, and unable to get medical care), health status (perceived physical health, perceived mental health, any functional limitation, and activities of daily living), and immigrant status, including periods (2007–2009, 2010, 2012, 2013–2015, and 2016–2019), and interaction terms associated with periods. Using the marginal effects from the linear probability models, the mean adjusted values of the outcomes for immigrant and US-born adults were estimated while holding all other variables constant except the variable of interest, which allowed us to compare the outcomes of interest between immigrant and US-born adults. [Color figure can be viewed at wileyonlinelibrary.com]

(ACA) requires insurers to cover certain preventive health services at no cost, and thus, the use of high-value care has increased over time. This finding is consistent with prior research showing the increased use of preventive care services after the ACA was implemented.[40] In sum, we found that the use of high-value care was already high in both groups of immigrant and US-born adults. However, we also observed that the use of low-value care did not decrease. This finding is consistent with findings from prior research that low-value care is still widely provided in the United States,[12,24–26,41–43] despite growing efforts to reduce the use of low-value care. Nevertheless, it is notable that we found an increasing trend in some low-value composite measures such as low-value antibiotic use among immigrant and US-born

adults. This suggests the need for developing more actionable policies and programs to reduce the use of low-value care by redesigning care and payment models that prioritize and reward the value of care delivered.

Finally, we found service-specific variations in differences in the use of high-value care between immigrant and US-born adults. In both groups of younger and older adults, immigrants were less likely to use colorectal cancer screening and influenza vaccine and more likely to use breast cancer screening and cholesterol testing than US-born residents. We found significant differences in the use of high-value care, but the magnitude of the difference was small, which raises a concern about clinically meaningful effects. We did not examine why
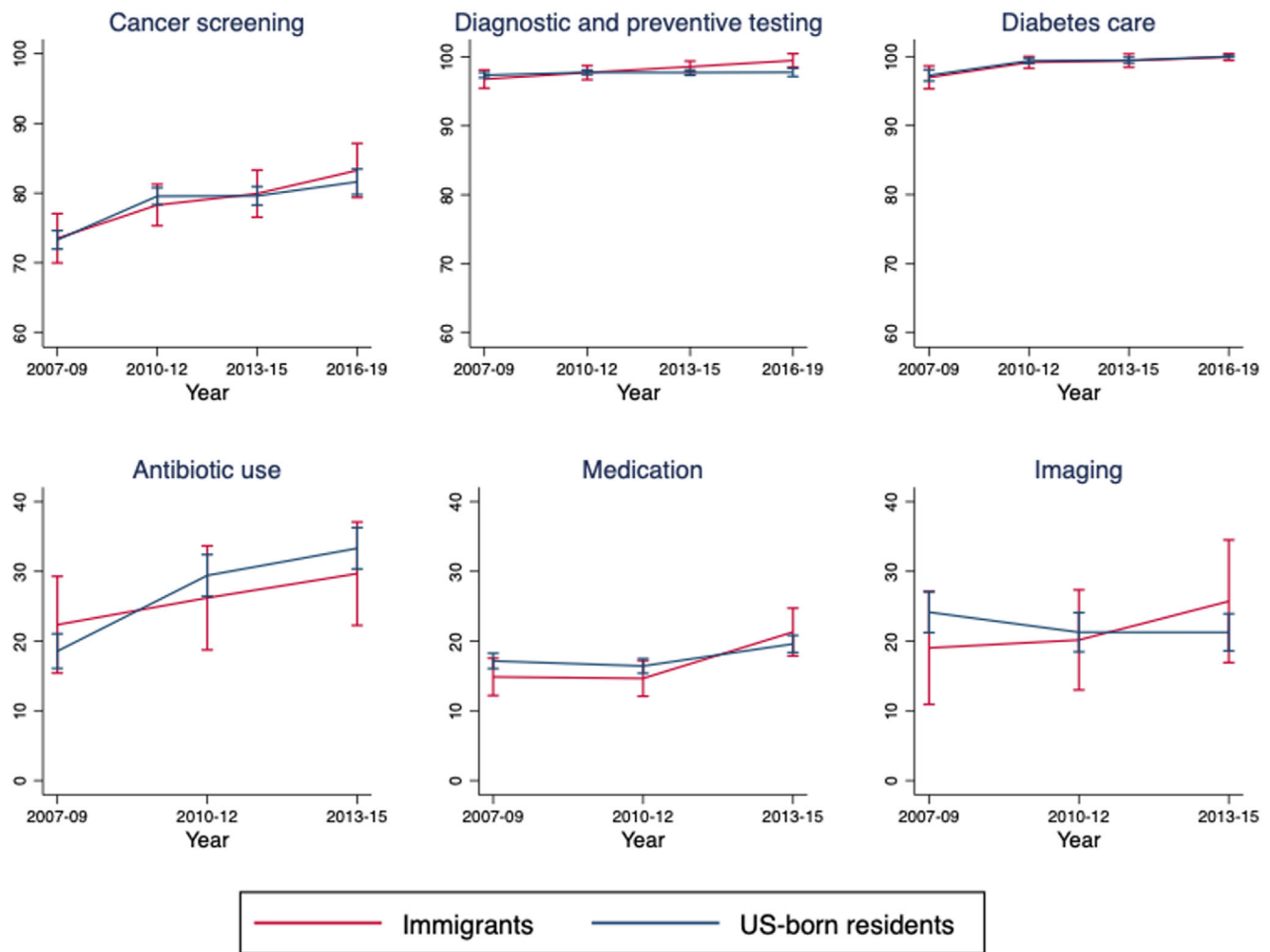
FIGURE 2 Trends in use of high- and low-value care (composite measure) between immigrant and US-born older adults. Trends in the use of high- and low-value health care between immigrant and US-born adults were examined using six composite outcome measures (high-value cancer screening, high-value diagnostic and preventive test, high-value diabetes care, low-value antibiotic use, low-value medication, and low-value imaging test). A linear probability model was conducted after controlling for age, sex, race/ethnicity, employment status, marital status, education, family income, health insurance (any insurance, Medicaid, Medicare, and any private insurance), US census region of residence, access to care (having a usual source of care, delay in getting necessary medical care, and unable to get medical care), health status (perceived physical health, perceived mental health, any functional limitation, and activities of daily living), and immigrant status, including periods (2007–2009, 2010,2012, 2013–2015, and 2016–2019), and interaction terms associated with periods. Using the marginal effects from the linear probability models, the mean adjusted values of the outcomes for immigrant and US-born adults were estimated while holding all other variables constant except the variable of interest, which allowed us to compare the outcomes of interest between immigrant and US-born adults. [Color figure can be viewed at wileyonlinelibrary.com]

differences in the use of high-value care between immigrant and US-born adults differed by type of service; thus, further research is needed for this inquiry. For instance, one potential explanation for this finding may be that the eligible population differed by type of service, and results were driven by heterogeneity among immigrant adults.

4.1 | Limitations

First, we examined a limited set of high- and low-value services, and thus, our findings may not be applicable to other outcome measures.

Second, our measures of high- and low-value care were self-reported, and thus, our results may be subject to reporting errors. Third, we could not identify all potentially relevant exclusions when measuring the use of high- and low-value care. MEPS reports health conditions based on 3-digit *ICD-9-CM* or *ICD-10-CM* diagnosis and procedure codes, so we could not precisely identify those with competing diagnoses or exclude all conditions associated with clinical red flags. Thus, our identification of high- and low-value care might have included some misclassified individuals and conditions. Fourth, our measure of immigration status was self-reported and subject to reporting bias, and we did not differentiate immigrants by citizenship or documentation status; the use of health care differs by immigration and

citizenship status and country of origin.[2,44] Unfortunately, MEPS does not provide identifiers among immigrants about citizenship and documentation status, among other relevant variables. We treated immigrants as a homogeneous population, which could lead to missing variation in the use of high- and low-value care by certain immigrant populations. Finally, MEPS is a repeated cross-sectional study, and thus, our findings should not be interpreted causally. We accounted for differences in sample characteristics between immigrants and US-born residents, but residual differences in individual-level characteristics may have remained.

5 | CONCLUSION

We found no or small differences in the use of high- and low-value health care services between immigrant and US-born adults after accounting for individual-level characteristics. While there were no consistent patterns of differences in the use of high-value care between immigrant and US-born adults, we observed almost no differences in the use of low-value care. These results suggest that individual-level characteristics, particularly socioeconomic status, health insurance coverage, and access to care, are critical factors that are associated with differential access to and use of high- and low-value care between immigrant and US-born adults, which indicates the need for addressing such factors to move towards value-based care.

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REFERENCES
1. Derose KP, Escarce JJ, Lurie N. Immigrants and health care: sources of vulnerability. *Health Aff*. 2007;26(5):1258-1268.
2. Bustamante AV, Chen J, Félix Beltrán L, Ortega AN. Health policy challenges posed by shifting demographics and health trends among immigrants to the United States. *Health Aff*. 2021;40(7):1028-1037.
3. Camarota SA, Zeigler K. *Immigrant population hits record 46.2 million in november 2021*. 2021 https://cis.org/Camarota/Immigrant-Population-Hits-Record-462-Million-November-2021
4. Budiman A. *Key findings about U.S. immigrants*. 2020 https://www.pewresearch.org/fact-tank/2020/08/20/key-findings-about-u-s-immigrants/
5. Derose KP, Bahney BW, Lurie N, Escarce JJ. Review: immigrants and health care access, quality, and cost. *Med Care Res Rev*. 2009;66(4):355-408.
6. Ku L, Matani S. Left out: immigrants' access to health care and insurance. *Health Aff (Millwood)*. 2001;20(1):247-256.
7. Ganguli I, Shi Z, Orav EJ, Rao A, Ray KN, Mehrotra A. Declining use of primary care among commercially insured adults in the United States, 2008–2016. *Ann Intern Med*. 2020;172(4):240-247.
8. Hawks L, Himmelstein DU, Woolhandler S, Bor DH, Gaffney A, McCormick D. Trends in unmet need for physician and preventive services in the United States, 1998–2017. *JAMA Intern Med*. 2020; 180(3):439-448.
9. Borsky A, Zhan C, Miller T, Ngo-Metzger Q, Bierman AS, Meyers D. Few Americans receive all high-priority, appropriate clinical preventive services. *Health Aff*. 2018;37(6):925-928.
10. Schwartz AL, Landon BE, Elshaug AG, Chernew ME, McWilliams JM. Measuring low-value care in Medicare. *JAMA Intern Med*. 2014; 174(7):1067-1076.
11. Charlesworth CJ, Meath TH, Schwartz AL, McConnell KJ. Comparison of low-value care in Medicaid vs commercially insured populations. *JAMA Intern Med*. 2016;176(7):998-1004.
12. Park S, Jung J, Burke RE, Larson EB. Trends in use of low-value care in traditional fee-for-service Medicare and Medicare advantage. *JAMA Netw Open*. 2021;4(3):e211762.
13. Mafi JN, Reid RO, Baseman LH, et al. Trends in low-value health service use and spending in the US Medicare fee-for-service program, 2014–2018. *JAMA Netw Open*. 2021;4(2):e2037328.
14. Gondi S, Joynt Maddox K, Wadhera RK. "REACHing" for equity—moving from regressive toward progressive value-based payment. *N Engl J Med*. 2022;387(2):97-99.
15. Park S, Wadhera RK. Association of income with delivery of high- and low-value health care in the United States. Unpublished manuscript.
16. Hoffman KM, Trawalter S, Axt JR, Oliver MN. Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proc Natl Acad Sci*. 2016;113(16):4296-4301. doi:10.1073/pnas.1516047113
17. Li Y, Toseef MU, Jensen GA, Ortiz K, González HM, Tarraf W. Gains in insurance coverage following the affordable care act and change in preventive services use among non-elderly US immigrants. *Prev Med*. 2021;148:106546. doi:10.1016/j.ypmed.2021.106546
18. Pylypchuk Y, Hudson J. Immigrants and the use of preventive care in the United States. *Health Econ*. 2009;18(7):783-806. doi:10.1002/hec.1401
19. Reynolds MM, Childers TB. Preventive health screening disparities among immigrants: exploring barriers to care. *J Immigr Minor Health*. 2020;22(2):336-344. doi:10.1007/s10903-019-00883-9
20. Bustamante AV, Chen J, Rodriguez HP, Rizzo JA, Ortega AN. Use of preventive care services among Latino subgroups. *Am J Prev Med*. 2010;38(6):610-619. doi:10.1016/j.amepre.2010.01.029
21. Ganguli I, Souza J, McWilliams JM, Mehrotra A. Association of Medicare's annual wellness visit with cancer screening, referrals, utilization, and spending. *Health Aff (Millwood)*. 2019;38(11):1927-1935. doi:10.1377/hlthaff.2019.00304
22. Rosenberg A, Agiro A, Gottlieb M, et al. Early trends among seven recommendations from the choosing wisely campaign. *JAMA Intern Med*. 2015;175(12):1913-1920. doi:10.1001/jamainternmed.2015.5441
23. Schwartz AL, Chernew ME, Landon BE, McWilliams JM. Changes in low-value services in year 1 of the Medicare Pioneer accountable care organization program. *JAMA Intern Med*. 2015;175(11):1815-1825.
24. Levine DM, Landon BE, Linder JA. Quality and experience of outpatient care in the United States for adults with or without primary care. *JAMA Intern Med*. 2019;179(3):363-372.
25. Levine DM, Linder JA, Landon BE. The quality of outpatient care delivered to adults in the United States, 2002 to 2013. *JAMA Intern Med*. 2016;176(12):1778-1790.

26. Park S, Wadhera RK, Jung J. Effects of Medicare eligibility and enrollment at age 65 years on the use of high-value and low-value care. *Health Serv Res*. 2023;58(1):174-185. doi:10.1111/1475-6773.14065

27. Siu AL. Screening for breast cancer: U.S. preventive services task force recommendation statement. *Ann Intern Med*. 2016;164(4):279-296.

28. Screening for colorectal cancer: an updated systematic review (Agency for Healthcare Research and Quality). 2008.

29. Screening for high blood pressure in adults: a systematic evidence review for the U.S. Preventive Services Task Force (Agency for Healthcare Research and Quality). 2014.

30. Screening for lipid disorders in adults: selective update of 2001 US Preventive Services Task Force review (Agency for Healthcare Research and Quality). 2008.

31. Grohskopf LA, Alyanak E, Broder KR, et al. Prevention and control of seasonal influenza with vaccines: recommendations of the advisory committee on immunization practices—United States, 2020–2021 influenza season. *MMWR Recomm Rep*. 2020;69(8):1-24.

32. American Diabetes Association. Standards of medical care in diabetes-2016 abridged for primary care providers. *Clin Diabetes*. 2016;34(1):3-21.

33. Cooper RJ, Hoffman JR, Bartlett JG, et al. Principles of appropriate antibiotic use for acute pharyngitis in adults: background. *Ann Intern Med*. 2001;134(6):509-517.

34. Harris AM, Hicks LA, Qaseem A. Appropriate antibiotic use for acute respiratory tract infection in adults: advice for high-value care from the American College of Physicians and the Centers for Disease Control and Prevention. *Ann Intern Med*. 2016;164(6):425-434.

35. Trangle M, Gursky J, Haight R, et al. *Adult depression in primary care*. Institute for Clinical Systems Improvement; 2016 https://www.icsi.org/guideline/depression/

36. American Society of Anesthesiologists. *Pain medicine*. Choosing Wisely. https://www.choosingwisely.org/societies/american-society-of-anesthesiologists-pain-medicine/

37. Chou R, Fu R, Carrino JA, Deyo RA. Imaging strategies for low-back pain: systematic review and meta-analysis. *Lancet*. 2009;373(9662):463-472.

38. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36(1):1-10.

39. Park S, Ortega AN, Chen J, Bustamante AV. Effects of Medicare eligibility and enrollment at age 65 among immigrants and US-born residents. *J Am Geriatr Soc*. 2023;1–10. doi:10.1111/jgs.18380

40. Simon K, Soni A, Cawley J. The impact of health unsurance on preventive care and health behaviors: evidence from the first two years of the ACA Medicaid expansions. *J Policy Anal Manage*. 2017;36(2):390-417. doi:10.1002/pam.21972

41. Mafi JN, Reid RO, Baseman LH, et al. Trends in low-value health service use and spending in the US Medicare fee-for-service program, 2014-2018. *JAMA Netw Open*. 2021;4(2):e2037328. doi:10.1001/jamanetworkopen.2020.37328

42. Schwartz AL, Landon BE, Elshaug AG, Chernew ME, McWilliams JM. Measuring low-value care in Medicare. *JAMA Intern Med*. 2014;174(7):1067-1076. doi:10.1001/jamainternmed.2014.1541

43. Ganguli I, Morden NE, Yang C-WW, Crawford M, Colla CH. Low-value care at the actionable level of individual health systems. *JAMA Intern Med*. 2021;181(11):1490-1500. doi:10.1001/jamainternmed.2021.5531

44. Park S, Stimpson JP, Pintor JK, et al. The effects of the affordable care act on health care access and utilization among Asian American subgroups. *Med Care*. 2019;57(11):861-868.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.