

Waste in the Medicare Program: a National Cross-Sectional Analysis of 2017 Low-Value Service Use and Spending



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INTRODUCTION

Low-value health care services offer patients little to no clinical benefit, increase spending, and may cause patient harm. The Choosing Wisely® campaign and other efforts to reduce health care spending have focused attention on reducing waste since low-value services were last cumulatively assessed in Medicare in 2009.¹ Other studies have addressed different populations or explored predictors of low-value service use and spending.^{2–6} In this analysis, we provide updated national estimates of low-value service use and spending in Medicare in 2017.

METHODS

We used Medicare claims and enrollment data for 100% of fee-for-service beneficiaries aged 65 and older continuously enrolled in parts A, B, and D for two years in 2017: 15,168,134 beneficiaries, requiring at least one and up to three years of claims history preceding the 2017 measurement year. We assessed 35 claims-based low-value service measures reflecting Choosing Wisely® recommendations and other professional guidelines using the Milliman MedInsight® Health Waste Calculator to categorize services as “wasteful,” “likely wasteful,” or “not wasteful.” We conservatively defined low-value services as “wasteful” services with sufficient claims history, excluding services billed in the inpatient claims file because we could not attribute spending to the low-value service itself. To provide a range, we calculated wasteful spending two ways: at the claim-line-level (allowed amount from only the claim-line or revenue center corresponding to a wasteful service, as applicable based upon the claim type) and at the claim-level (allowed amount from an entire claim with least one claim-line corresponding to a wasteful service).

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RESULTS

Among the included beneficiaries, 5,389,619 (35.5%) had at least one low-value service, accounting for 10 million distinct services (0.66 per capita) (Table 1). The three most frequent services were as follows: opioids for acute low back pain (2.8 million, 28.5%), preoperative baseline laboratory studies (2.6 million, 25.6%), and oral antibiotics for acute upper respiratory or external ear infections (1.4 million, 13.9%)—comprising over two-thirds of low-value services measured (68%).

Cumulative low-value service spending varied from \$723 million (\$48 per capita) at the claim-line-level to \$2.1 billion (\$140 per capita) at the claim-level (Table 2). Spending per service varied from \$6.32 for bleeding time testing at the claim-line-level to \$7344.39 for renal artery revascularization at the claim-level (Table 2).

At the claim-level, the three services representing the most spending were the following: preoperative baseline laboratory studies (\$980 million, 46.1%), opioids for acute low back pain (\$188 million, 8.8%), and unnecessary colorectal cancer screening (\$143 million, 6.7%)—comprising nearly two-thirds of wasteful spending (62%).

At the claim-line-level, the three services representing the most spending were the following: opioids for acute low back pain (\$188 million, 26.0%), concurrent use of two or more antipsychotic medications (\$94 million, 13.0%), and unnecessary colorectal cancer screening (\$79 million, 11.0%)—comprising half of wasteful spending (50%).

DISCUSSION

As of 2017, low-value services remain common and costly in Medicare. Over one-third of beneficiaries received at least one low-value service, resulting in excess spending and in potential patient harm (e.g., perforation, bleeding, or infection from unnecessary colorectal cancer screening). Utilization and spending are concentrated among a small subset of measured services, suggesting targeted opportunities for waste reduction. While the measures differ somewhat, our utilization and spending findings fall in a similar range to prior estimates in the Medicare population.¹

Table 1 Low-Value Service Utilization Among Medicare Fee-For-Service Beneficiaries in 2017

Measure	Distinct patients	Low-value services total	% of all low-value services	Services per 1000 patients
Opioids for acute low back pain	1,034,398	2,840,389	28.45	187.26
Preoperative baseline laboratory studies in patients without significant systemic illness before elective low-risk surgery	2,005,139	2,558,495	25.63	168.68
Oral antibiotics for acute upper respiratory or external ear infections	1,131,131	1,384,931	13.87	91.31
NSAIDs in patients with hypertension, heart failure or chronic kidney disease	698,609	914,874	9.16	60.32
Unnecessary colorectal cancer screening in adults 50–75 years	444,658	479,535	4.80	31.61
Concurrent use of two or more antipsychotic medications	38,944	444,505	4.45	29.31
Screening for vitamin D deficiency	304,184	326,161	3.27	21.50
Cervical cancer screening in women not at high risk with adequate prior screening	264,285	272,123	2.73	17.94
Annual EKGs or cardiac screening in asymptomatic patients without risk factors	225,372	256,102	2.57	16.88
Preoperative EKG, chest x-ray and PFTs in patients without significant systemic illness before low-risk surgery	128,395	136,516	1.37	9.00
Cardiac stress testing or advanced imaging for asymptomatic patients without risk factors	89,878	93,046	0.93	6.13
Carotid duplex ultrasound for simple syncope with normal neurological exam	49,704	51,073	0.51	3.37
Imaging for uncomplicated headache without neurological symptoms	29,920	30,793	0.31	2.03
Imaging for acute low back pain without red-flag signs	30,129	30,199	0.30	1.99
Imaging for uncomplicated acute rhinosinusitis	24,778	26,063	0.26	1.72
Coronary angiography in asymptomatic patients without risk factors	19,302	20,859	0.21	1.38
CT scans for emergency department evaluation of dizziness	18,407	18,577	0.19	1.22
Antidepressant monotherapy in bipolar disorder	9074	14,157	0.14	0.93
Brain imaging for simple syncope with normal neurological exam	13,570	13,791	0.14	0.91
PICCs in stage III-V chronic kidney disease patients without prior nephrology consult	12,689	13,465	0.13	0.89
Immunoglobulin G or immunoglobulin E tests in the evaluation of allergy	11,221	12,137	0.12	0.80
CT head/brain for sudden onset hearing loss	10,413	10,572	0.11	0.70
Electroencephalography for headaches	8767	9011	0.09	0.59
Vertebroplasty	5355	6264	0.06	0.41
Renal artery revascularization	3098	3596	0.04	0.24
Antibiotics for adenoviral conjunctivitis without secondary infection or other conditions	3492	3572	0.04	0.24
Coronary artery calcium scoring for patients with known coronary artery disease	2983	2994	0.03	0.20
Preoperative echocardiography or stress test before low- or intermediate-risk non-cardiac surgery	1997	2079	0.02	0.14
PFTs before cardiac surgery without respiratory disease or symptoms	1864	1922	0.02	0.13
Routine diagnostic testing for chronic urticaria	1654	1654	0.02	0.11
Arthroscopic lavage and debridement for knee osteoarthritis	1437	1442	0.01	0.10
Bleeding time testing	1160	1310	0.01	0.09
MRI of peripheral joints to monitor rheumatoid arthritis	903	936	0.01	0.06
Multiple palliative radiation treatments in bone metastases	481	493	< 0.01	0.03
DEXA screening for osteoporosis in women younger than 65 or men younger than 70	475	479	< 0.01	0.03
Total	5,389,619	9,984,115	100	658.23

Our study has limitations. Claims-based low-value service measures are inherently under-inclusive, capturing only the fraction of low-value services with professional consensus that are measurable via claims. They may be over-inclusive if claims cannot reflect the circumstances or history that make a given service high-value. We use two methods to calculate spending to present a potential range; both have limitations. Claim-line-level spending is specific but may miss related

services on other claim-lines, underestimating wasteful spending. Claim-level spending is more sensitive but may include unrelated services billed on the same claim, overestimating wasteful spending. Both methods miss related services or downstream events billed on other claims.

Our findings suggest that targeted interventions to reduce low-value services—particularly the narrow subset responsible for the majority of spending—could substantially reduce

Table 2 Low-Value Service Spending Among Medicare Fee-For-Service Beneficiaries in 2017

Measure	Claim-level spending (broad definition)				Claim-line-level spending (narrow definition)			
	Spending, total (\$1 mil)	% of all low-value spending	Spending per service	Spending per 1000 patients	Spending, total (\$1 mil)	% of all low-value spending	Spending per service	Spending per 1000 patients
Preoperative baseline laboratory studies in patients without significant systemic illness before elective low-risk surgery	979.72	46.09	382.93	64,590.37	40.81	5.64	15.95	2690.71
Opioids for acute low back pain	187.94	8.84	66.17	12,390.21	187.94	25.98	66.17	12,390.21
Unnecessary colorectal cancer screening in adults 50–75 years	142.54	6.71	297.25	9397.36	79.48	10.99	165.75	5240.20
Concurrent use of two or more antipsychotic medications	141.94	6.68	319.32	9357.68	94.22	13.02	211.96	6211.47
Cardiac stress testing or advanced imaging for asymptomatic patients without risk factors	81.51	3.83	876.04	5373.87	64.29	8.89	690.98	4238.69
PICCs in stage III-V chronic kidney disease patients without prior nephrology consult	79.96	3.76	5938.60	5271.79	53.90	7.45	4003.17	3553.68
Preoperative EKG, chest x-ray and PFTs in patients without significant systemic illness before low-risk surgery	78.44	3.69	574.59	5171.46	4.52	0.62	33.08	297.76
Coronary angiography in asymptomatic patients without risk factors	77.08	3.63	3695.09	5081.43	49.08	6.78	2352.84	3235.59
Annual EKGs or cardiac screening in asymptomatic patients without risk factors	68.51	3.22	267.52	4516.94	5.83	0.81	22.76	384.34
Screening for vitamin D deficiency	44.04	2.07	135.02	2903.30	6.39	0.88	19.58	420.95
Carotid duplex ultrasound for simple syncope with normal neurological exam	33.78	1.59	661.34	2226.81	9.37	1.30	183.51	617.91
Cervical cancer screening in women not at high risk with adequate prior screening	31.79	1.50	116.83	2096.04	16.05	2.22	59.00	1058.46
NSAIDs in patients with hypertension, heart failure or chronic kidney disease	28.57	1.34	31.23	1883.72	28.57	3.95	31.23	1883.72
Renal artery revascularization	26.41	1.24	7344.39	1741.18	21.61	2.99	6009.81	1424.78
Brain imaging for simple syncope with normal neurological exam	17.72	0.83	1284.94	1168.28	2.43	0.34	176.52	160.49
Imaging for uncomplicated headache without neurological symptoms	17.42	0.82	565.60	1148.23	7.71	1.07	250.53	508.61
Oral antibiotics for acute upper respiratory or external ear infections	16.98	0.80	12.26	1119.52	16.98	2.35	12.26	1119.52
CT scans for emergency department evaluation of dizziness	16.92	0.80	910.87	1115.57	3.23	0.45	173.73	212.78
Vertebroplasty	15.13	0.71	2415.53	997.54	12.43	1.72	1984.15	819.40
Imaging for uncomplicated acute rhinosinusitis	10.17	0.48	390.28	670.61	3.14	0.43	120.61	207.24
Imaging for acute low back pain without red-flag signs	6.40	0.30	211.91	421.91	2.82	0.39	93.50	186.15
Electroencephalography for headaches	6.35	0.30	704.43	418.49	4.30	0.59	477.12	283.45
CT head/brain for sudden onset hearing loss	3.37	0.16	318.55	222.02	1.64	0.23	154.74	107.85
Immunoglobulin G or immunoglobulin E tests in the evaluation of allergy	2.46	0.12	203.06	162.48	0.84	0.12	69.34	55.48
Arthroscopic lavage and debridement for knee osteoarthritis	1.88	0.09	1307.13	124.27	1.88	0.26	1307.13	124.27
Bleeding time testing	1.80	0.08	1376.75	118.90	0.01	<0.01	6.32	0.55

(continued on next page)

Table 2. (continued)

Measure	Claim-level spending (broad definition)				Claim-line-level spending (narrow definition)			
	Spending, total (\$1 mil)	% of all low-value spending	Spending per service	Spending per 1000 patients	Spending, total (\$1 mil)	% of all low-value spending	Spending per service	Spending per 1000 patients
PFTs before cardiac surgery without respiratory disease or symptoms	1.38	0.06	716.49	90.79	0.03	< 0.01	14.13	1.79
Multiple palliative radiation treatments in bone metastases	1.35	0.06	2730.37	88.74	0.91	0.13	1854.31	60.27
Preoperative echocardiography or stress test before low- or intermediate-risk non-cardiac surgery	1.30	0.06	625.76	85.77	0.96	0.13	464.13	63.61
Coronary artery calcium scoring for patients with known coronary artery disease	0.92	0.04	308.16	60.83	0.76	0.11	254.64	50.26
Antidepressant monotherapy in bipolar disorder	0.78	0.04	55.14	51.46	0.78	0.11	55.14	51.46
Routine diagnostic testing for chronic urticaria	0.71	0.03	429.80	46.87	0.13	0.02	76.77	8.37
MRI of peripheral joints to monitor rheumatoid arthritis	0.34	0.02	361.89	22.33	0.29	0.04	306.57	18.92
Antibiotics for adenoviral conjunctivitis without secondary infection or other conditions	0.08	< 0.01	23.56	5.55	0.08	0.01	23.56	5.55
DEXA screening for osteoporosis in women younger than 65 or men younger than 70	0.05	< 0.01	96.47	3.05	0.03	< 0.01	55.11	1.74
Total	2125.74	100	212.91	140,145.38	723.46	100	72.46	47,696.24

wasteful Medicare spending. Interventions focused on this subset of low-value services may allow greater near-term progress in reducing waste in the health care system.

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Rachel O. Reid, MD, MS^{1,2,3}
 John N. Mafi, MD, MPH^{4,5}
 Lesley H. Baseman, B.A.¹
 A. Mark Fendrick, MD^{6,7}
 Cheryl L. Damberg, PhD⁵

¹RAND Corporation,
 Boston, MA, USA

²Division of General Medicine and Primary Care,
 Brigham and Women's Hospital,
 Boston, MA, USA

³Harvard Medical School,
 Boston, MA, USA

⁴David Geffen School of Medicine, University of
 California,
 Los Angeles, CA, USA

⁵RAND Corporation,
 Santa Monica, CA, USA

⁶Department of Internal Medicine, University of
 Michigan,
 Ann Arbor, MI, USA

⁷Institute for Healthcare Policy and Innovation,
 University of Michigan,
 Ann Arbor, MI, USA

Corresponding Author: Rachel O. Reid, MD, MS; RAND Corporation
 Boston, MA, USA (e-mail: rreid@rand.org).

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Compliance with Ethical Standards:

Conflict of Interest: Dr. Fendrick is a co-developer of the Milliman MedInsight Health Waste Calculator and receives royalties from its sale. The authors have no other conflicts of interest to disclose.

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