

Supplementary Online Content

Sun EC, Mello MM, Moshfegh J, Baker LC. Assessment of out-of-network billing for privately insured patients receiving care in in-network hospitals. *JAMA Intern Med*. Published online August 12, 2019. doi:10.1001/jamainternmed.2019.3451

eFigure. Sample Construction

eTable 1. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Emergency Room Visits

eTable 2. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Inpatient Admissions

eTable 3. Sensitivity Analyses for Annual Incidence and Magnitude of Out-of-Network Billing: Emergency Room Visits

eTable 4. Sensitivity Analyses for Annual Incidence and Magnitude of Out-of-Network Billing: Inpatient Admissions

eTable 5. Incidence and Magnitude of Out-of-Network Billing: Surgical vs. Medical Inpatient Admissions

eTable 6. Out-of-Network Billing for Emergency Room Visits (Including Visits Where Network Status Was Unknown)

eTable 7. Out-of-Network Billing for Inpatient Admissions (Including Visits Where Network Status Was Unknown)

eTable 8. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Emergency Room Visits (Including Visits Where Network Status Was Unknown)

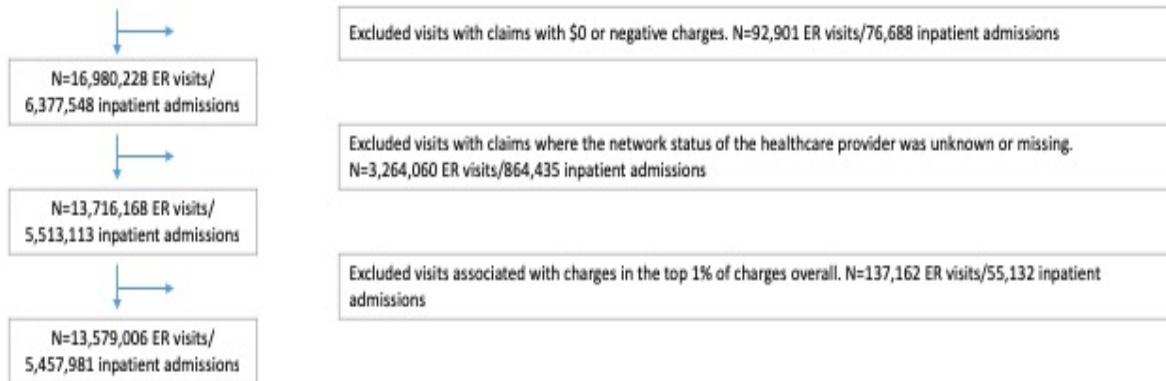
eTable 9. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Inpatient Admissions (Including Visits Where Network Status Was Unknown)

eTable 10. Annual Incidence and Magnitude of Out-of-Network Billing: Elective Inpatient Admissions

This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure. Sample Construction.

Initial Sample: All inpatient admissions and emergency room visits to an in-network hospital between January 1, 2010 and December 31, 2016.
N=17,073,129 ER visits/6,454,236 inpatient admissions



eTable 1. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Emergency Room Visits

	Specialty	Number of Visits ^a	Visits with Out-of-Network Bill ^b , N (%)	Potential Out-of-Network Responsibility ^c (\$)						
				Mean	SD ^d	10th	25th	50th	75th	90th
1	Emergency Medicine	11,811,471	3,853,305 (33)	396	382	19	117	292	576	910
2	Radiology	7,286,182	1,319,676 (18)	115	203	11	20	49	150	294
3	Ambulance	1,661,978	1,422,134 (86)	244	801	0	0	25	296	704
4	Cardiology	1,537,176	321,230 (21)	64	344	7	15	25	58	96
5	Internal Medicine	1,387,236	329,787 (24)	186	308	0	23	103	237	452
6	Family Practice	1,026,329	206,147 (20)	255	359	0	32	132	347	682
7	Unknown	774,159	149,746 (19)	284	425	9	81	181	372	682
8	Pediatrics	221,995	18,656 (8)	323	394	0	23	178	565	761
9	General Surgery^e	200,980	26,650 (13)	676	2,236	0	40	157	439	1,341
10	Anesthesiology	167,185	38,196 (23)	568	855	0	44	268	763	1,504
11	Pathology	164,711	46,769 (28)	107	221	3	21	55	118	226
12	Gastroenterology	108,735	8,772 (8)	266	864	0	22	83	229	615
13	Orthopedics	98,966	12,587 (13)	1,004	2,618	7	61	189	716	2,661
14	Neurology	92,838	12,811 (14)	231	877	0	21	97	225	423
15	Obstetrics and Gynecology	86,628	5,571 (6)	271	1058	0	0	41	246	584
16	Pulmonary Medicine	82,139	11,905 (14)	165	306	0	23	89	184	378
17	Psychiatry	78,970	22,255 (28)	162	300	0	20	78	159	417
18	Hematology and Oncology	63,557	6,156 (10)	279	1,223	0	41	107	231	454
19	Nephrology	60,009	11,441 (19)	178	534	0	32	106	179	389
20	Urology	58,514	3,581 (6)	404	1,146	0	34	118	301	880
21	Vascular Surgery	46,958	6,838 (15)	260	1,486	10	23	53	133	377
22	Infections Disease	33,187	6,001 (18)	153	261	0	39	99	193	289
23	Ophthalmology	27,371	2,825 (10)	336	914	0	0	86	347	781
24	Otolaryngology	25,303	2,026 (8)	317	1,557	0	17	78	235	575
25	Physical Medicine and Rehabilitation	20,064	3,958 (20)	212	942	0	27	61	169	475
26	Neurological Surgery	19,423	2,773 (14)	610	2,838	0	48	142	339	808
27	Thoracic Surgery	18,630	3,304 (18)	220	869	0	0	46	208	521
28	Dermatology	18,556	2,206 (12)	217	439	0	1	75	354	528
29	Endocrinology	15,222	2,452 (16)	130	439	0	17	45	127	267

30	Critical Care Medicine	11,194	1,022 (9)	372	530	0	63	224	455	834
31	Plastic Surgery	10,240	4,106 (40)	2649	4172	24	245	1304	3407	6,458
32	Therapeutic Radiology	9,382	1,549 (17)	199	496	23	30	56	202	370
33	Rheumatology	7,533	839 (11)	205	432	7	30	74	164	491
34	Colorectal Surgery	7,371	934 (13)	298	1,198	0	0	4	113	576
35	Allergy and Immunology	6,171	607 (10)	83	122	0	8	44	124	224
36	Obstetrics	4,869	253 (5)	367	279	42	155	338	523	728
37	Neonatology	4,551	223 (5)	550	792	37	168	349	710	1,109
38	Geriatric Medicine	1,951	188 (10)	280	244	14	96	261	356	533
39	Gynecology	1,854	728 (39)	585	518	0	0	605	1,037	1,252
40	Preventive Medicine	1,645	698 (42)	429	351	23	157	327	731	840
41	Osteopathy	1,514	1127 (74)	353	390	37	74	173	559	983
42	Hospice and Palliative Medicine	1,167	89 (8)	145	107	37	56	128	196	265
43	Gynecologic Oncology	924	21 (2)	128	207	0	0	33	173	223
44	Genetics	496	23 (5)	255	570	63	66	125	232	276
45	Podiatry	227	8 (4)	117	231	0	0	41	84	682

^aTotal emergency room visits with at least one claim submitted by the given provider category/specialty

^bTotal emergency room visits with at least one out-of-network claim submitted by the given provider category/specialty

^cPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^dStandard Deviation

^eBolded specialties are the specialties used to identify surgical admissions for subgroup analyses (i.e., eTable 5)

eTable 2. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Inpatient Admissions

	Specialty ^a	Number of Admissions ^b	Admissions with Out-of-Network Bill ^c , N (%)	Potential Out-of-Network Responsibility ^d (\$)						
				Mean	SD ^e	10th	25th	50th	75th	90th
1	Radiology	3,181,749	720,698 (23)	267	759	15	33	121	307	615
2	Emergency Medicine	2,132,940	908,430 (43)	595	575	44	203	477	858	1,267
3	Internal Medicine	2,00,7554	507,014 (25)	450	1,133	9	65	206	483	999
4	Anesthesiology	1,961,192	378,239 (19)	1,369	1,807	0	233	794	1,825	3,362
5	Cardiology	1,701,819	333,769 (20)	328	1,438	10	19	52	196	612
6	Unknown	1,115,844	214,992 (19)	544	1,489	29	106	265	614	1,136
7	Pathology	987,225	219,335 (22)	297	542	16	63	145	303	676
8	Ambulance Providers	947,744	773,218 (82)	424	2,176	0	0	44	365	832
9	Family Practice	783,703	142,455 (18)	384	1,330	0	49	148	364	798
10	Obstetrics & Gynecology	760,049	6,220 (1)	1,228	3,457	18	91	293	1,075	2,803
11	General Surgery	586,860	75,956 (13)	2,454	6,953	26	133	583	2,317	5,540
12	Orthopedics	522,857	52,109 (10)	5,043	10,241	85	470	2230	5,314	11,139
13	Pulmonary Medicine	495,637	72,948 (15)	452	1,242	0	54	183	458	1,012
14	Gastroenterology	414,692	39,199 (9)	695	1,613	9	73	264	734	1,568
15	Neurology	349,216	58,584 (17)	1,147	3,518	0	74	239	840	2,751
16	Pediatrics	318,516	5,782 (2)	294	676	6	49	126	285	665
17	Nephrology	306,740	43,945 (14)	326	704	0	46	155	378	766
18	Infectious Diseases	303,756	50,863 (17)	397	743	11	78	205	442	863
19	Hematology & Oncology	293,468	22,355 (8)	643	2,754	21	71	179	420	1,031
20	Psychiatry	206,442	41,160 (20)	288	820	0	51	139	306	629
21	Urology	187,587	12,793 (7)	1,122	3,682	7	57	198	768	2,583
22	Vascular Surgery	159,491	20,785 (13)	1,443	4,896	14	46	131	661	3,437
23	Neurological Surgery	150,963	15,376 (10)	6,886	16,561	21	130	609	5814	19,650
24	Thoracic Surgery	123,712	12,966 (10)	3,770	8,420	23	142	940	4,304	9,786
25	Neonatology	115,257	1,253 (1)	1,160	2,889	102	157	297	909	2,716
26	Physical Medicine And Rehabilitation	101,057	16,972 (17)	634	1,833	17	64	158	401	1,541
27	Endocrinology	68,420	9,734 (14)	441	2,620	7	42	109	274	589
28	Otolaryngology	57,770	4,208 (7)	1,346	5,379	3	53	194	686	2,630
29	Obstetrics	46,220	49 (0)	774	1,164	82	157	314	769	2,079
30	Critical Care Medicine	46,136	211 (0)	602	907	39	129	379	563	1,453

31	Colorectal Surgery	39,987	2,354 (6)	2,309	5,677	8	94	457	1,866	5,660
32	Plastic and Reconstructive Surgery	29,539	3,140 (11)	5,847	14,290	7	125	761	4,536	15,582
33	Therapeutic Radiology	18,116	1,438 (8)	410	958	30	37	161	370	908
34	Rheumatology	16,985	1,748 (10)	313	1,336	0	30	116	262	576
35	Ophthalmology	14,374	1,259 (9)	581	2,418	0	39	123	320	1,099
36	Gynecologic Oncology	13,029	10 (0)	327	319	63	198	209	304	861
37	Dermatology	9,276	1,216 (13)	330	1,362	0	20	106	306	627
38	Gynecology	8,762	153 (2)	621	1,004	57	115	229	566	2,032
39	Allergy & Immunology	5,629	699 (12)	180	491	0	18	84	179	372
40	Hospice & Palliative Medicine	4,736	19 (0)	202	211	59	69	135	264	492
41	Geriatric Medicine	4,165	55 (1)	291	154	10	210	329	336	362
42	Genetics	2,272	12 (1)	238	219	13	69	201	337	629
43	Preventive Medicine	1,680	7 (0)	161	119	0	75	155	204	385
44	Podiatry	970	39 (4)	627	860	14	55	191	1,173	1,792
45	Osteopathy	405	5 (1)	882	10	877	877	877	877	900

^aSpecialties in bold are the specialties that were considered surgical specialties for the purposes of differentiating between medical and surgical admissions.

^bTotal inpatient admissions with at least one claim submitted by the given provider category/specialty

^cTotal inpatient admissions with at least one out-of-network claim submitted by the given provider category/specialty

^dPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^eStandard Deviation

eTable 3. Incidence and Magnitude of Out-of-Network Billing: Surgical vs. Medical Inpatient Admissions^a

	Number of Admissions ^a	Number of Admissions With Out-of-Network Claim ^b , N (%)	Potential Out-of-Network Responsibility ^c (\$)					
			Mean (SD)	10th	25th	50th	75th	90th
Surgical	2,440,878	753,564 (31)	2,406 (6,108)	19	255	918	2,339	5,229
Medical	3,017,103	1,266,358 (42)	914 (1,962))	0	137	506	1,112	1,978
Overall	5,457,981	2,019,922 (37)	1,574 (4,382)	8	183	667	1,538	3,215

^aSurgical admissions were defined as admissions at least one claim that was submitted by a provider from a surgical specialty (one of the 15 bolded specialties in **eTable 1**); all other admissions were classified as medical admissions

^bTotal annual admissions to an in-network hospital

^cNumber of admissions to an in-network hospital with at least one claim submitted by an out-of-network provider. ^dPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

eTable 4. Sensitivity Analyses for Annual Incidence and Magnitude of Out-of-Network Billing: Emergency Room Visits

	Potential Out-of-Network Responsibility ^a (\$)					
	Mean (SD)	10th	25th	50th	75th	90th
<i>Sensitivity Analysis: Exclude Cases with Estimated Negative Responsibility</i>						
2010	289 (460)	25	73	183	376	661
2011	330 (516)	30	86	213	432	751
2012	382 (601)	34	105	250	508	859
2013	469 (672)	49	140	323	635	1,039
2014	528 (753)	63	171	375	710	1,139
2015	606 (826)	80	210	462	814	1,289
2016	676 (879)	90	245	524	922	1,404
<i>Sensitivity Analysis: Assign the Average Annual Financial Responsibility to Cases with Estimated Negative Responsibility</i>						
2010	289 (401)	34	103	288	301	574
2011	329 (466)	38	114	290	361	683
2012	382 (555)	41	123	325	448	795
2013	469 (635)	57	158	383	581	1,001
2014	528 (716)	69	185	434	658	1,108
2015	606 (793)	87	229	506	774	1,272
2016	676 (847)	97	265	574	891	1,364

^aPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

eTable 5. Sensitivity Analyses for Annual Incidence and Magnitude of Out-of-Network Billing: Inpatient Admissions

	Potential Out-of-Network Responsibility ^a (\$)					
	Mean (SD)	10th	25th	50th	75th	90th
<i>Sensitivity Analysis: Exclude Cases with Estimated Negative Responsibility</i>						
2010	1,000 (2,704)	46	158	436	954	1,998
2011	1,159 (3,080)	56	194	524	1,116	2,328
2012	1,437 (4,110)	71	232	630	1,327	2,814
2013	1,620 (4,351)	93	286	747	1,538	3,160
2014	1,871 (4,858)	115	341	864	1,800	3,675
2015	2,065 (5,320)	134	389	957	1,959	3,999
2016	2,178 (5,103)	141	435	1,088	2,196	4,298
<i>Sensitivity Analysis: Assign the Average Annual Financial Responsibility to Cases with Estimated Negative Responsibility</i>						
2010	1,000 (2,424)	61	214	643	1,000	1,684
2011	1,159 (2,846)	69	238	683	1,159	2,059
2012	1,437 (3,872)	83	274	756	1,437	2,569
2013	1,619 (4,163)	104	322	856	1,619	2,953
2014	1,871 (4,672)	126	377	975	1,871	3,474
2015	2,065 (5,130)	146	430	1,071	2,065	3,791
2016	2,177 (4,940)	149	472	1,199	2,178	4,112

^aPatient’s responsibility for out-of-network services, defined as the difference between the provider’s charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

eTable 6. Out-of-Network Billing for Emergency Room Visits (including visits where network status was unknown)

	Number of Visits ^a	Visits with at least one claim with unknown network status ^b , N(%)	Visits With Out-of-Network Bill ^b , N (%)	Potential Out-of-Network Responsibility ^c (\$)					
				Mean (SD ^d)	10th	25th	50th	75th	90th
2010	1,969,413	511,122 (26)	516,820 (26)	245 (968)	0	8	117	321	611
2011	2,163,069	506,200 (23)	634,033 (29)	294 (736)	0	27	164	392	716
2012	2,332,076	498,169 (21)	738,929 (32)	346 (777)	0	47	203	473	829
2013	2,389,672	466,467 (20)	816,186 (34)	441 (1,113)	0	89	282	604	1,027
2014	2,315,571	406,014 (18)	830,572 (36)	504 (1,291)	8	123	334	680	1,134
2015	2,599,246	452,495 (17)	893,711 (34)	589 (1,766)	18	160	422	790	1,287
2016	3,074,019	423,593 (14)	1,171,380 (38)	653 (1,986)	24	186	489	906	1,390
Overall	16,843,066	3,264,060 (19)	5,601,631 (33)	413 (1,413)	0	84	297	648	1,093

^aTotal annual emergency room visits to an in-network hospital

^bVisits where at least one claim was submitted by a provider whose network status was unknown

^cNumber of visits to an in-network emergency room with at least one claim submitted by an out-of-network provider. ^cPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^dStandard deviation

eTable 7. Out-of-Network Billing for Inpatient Admissions (including visits where network status was unknown)

	Number of Visits ^a	Visits with at least one claim with unknown network status ^b , N(%)	Visits With Out-of-Network Bill ^b , N (%)	Potential Out-of-Network Responsibility ^c (\$)					
				Mean (SD ^d)	10th	25th	50th	75th	90th
2010	721,332	114,172 (16)	159,965 (22)	807 (2,486)	0	30	286	795	1,689
2011	682,218	108,761 (16)	175,828 (26)	991 (2,878)	0	73	390	972	2,064
2012	968,958	138,134 (14)	301,817 (31)	1,278 (3,903)	0	125	508	1,195	2,572
2013	999,430	131,907 (13)	338,938 (34)	1,483 (4,190)	16	192	653	1,428	2,956
2014	917,511	114,086 (12)	327,681 (36)	1,731 (4,698)	25	245	761	1,682	3,474
2015	955,053	126,572 (13)	319,365 (33)	1,920 (5,157)	35	291	853	1,842	3,791
2016	1,077,914	130,803 (12)	397,502 (37)	2,041 (4,986)	44	324	984	2,083	4,112
Overall	6,322,416	864,435 (14)	2,021,096 (32)	1,575 (4,388)	8	183	667	1,538	3,216

^aTotal annual inpatient admissions to an in-network hospital

^bVisits where at least one claim was submitted by a provider whose network status was unknown

^cNumber of visits to an in-network emergency room with at least one claim submitted by an out-of-network provider. ^cPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^dStandard deviation

eTable 8. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Emergency Room Visits (including visits where network status was unknown)

	Specialty	Number of Visits ^a	Visits with at least one claim with unknown network status ^b , N(%)	Visits with Out-of-Network Bill ^c , N (%)	Potential Out-of-Network Responsibility ^d (\$)						
					Mean	SD ^e	10th	25th	50th	75th	90th
1	Emergency Medicine	14,662,016	2,116,680 (14)	3,963,829 (27)	396	382	19	118	292	576	909
2	Radiology	8,919,915	2,203,66 (2)	1,411,397 (16)	116	204	12	20	50	152	296
3	Ambulance	2,388,120	697,790 (29)	1,441,741 (60)	243	800	0	0	25	296	702
4	Cardiology	1,858,467	53,887 (3)	349,303 (19)	64	400	7	15	26	62	93
5	Internal Medicine	1,668,820	96,153 (6)	351,878 (21)	186	309	0	23	102	237	451
6	Family Practice	1,316,520	151,287 (11)	217,070 (16)	256	359	0	32	132	348	686
7	Unknown	1,024,528	140,513 (14)	159,010 (16)	285	448	11	82	184	373	682
8	Pathology	295,112	77,829 (26)	55,610 (19)	106	213	5	23	56	120	221
9	Pediatrics	281,774	24,830 (9)	20,387 (7)	325	397	0	25	182	565	767
10	General Surgery	278,420	21,257 (7)	30,189 (11)	782	2744	0	43	167	467	1519
11	Anesthesiology	230,959	14,006 (6)	42,813 (19)	581	879	0	44	278	778	1530
12	Gastroenterology	135,149	1,783 (1)	9,241 (7)	264	847	0	23	83	229	607
13	Orthopedics	128,919	5,474 (4)	13,331 (10)	1037	2681	8	62	197	763	2752
14	Neurology	115,568	2,314 (2)	13,506 (12)	236	884	0	22	98	226	425
15	Psychiatry	111,125	14,471 (13)	24,950 (22)	159	302	0	18	78	157	394
16	Obstetrics and Gynecology	109,805	3,948 (4)	6,057 (6)	269	1045	0	0	40	243	584
17	Pulmonary Medicine	99,676	2,002 (2)	12,612 (13)	166	306	0	23	89	188	381
18	Hematology and Oncology	75,531	1,607 (2)	6,383 (8)	279	1213	0	40	107	229	451
19	Urology	71,994	890 (1)	3,780 (5)	410	1163	0	33	118	302	888
20	Nephrology	71,916	2,370 (3)	11,909 (17)	178	526	0	31	106	179	394
21	Vascular Surgery	58,735	958 (2)	7,144 (12)	278	1519	9	23	54	139	388
22	Infections Disease	42,564	2,456 (6)	6,557 (15)	157	262	0	39	102	199	299
23	Ophthalmology	32,699	1,348 (4)	3,093 (9)	330	879	0	5	101	338	749
24	Otolaryngology	32,078	840 (3)	2,219 (7)	346	1815	0	17	85	242	575
25	Neurological Surgery	26,740	1,588 (6)	3,102 (12)	694	3076	0	52	144	364	823
26	Thoracic Surgery	26,608	2,708 (10)	3,689 (14)	255	1089	0	0	54	213	521
27	Physician Medicine & Rehabilitation	24,386	1,357 (6)	4,073 (17)	217	937	0	27	62	169	485
28	Dermatology	22,843	1,542 (7)	2,357 (10)	210	427	0	10	71	313	528

29	Plastic Surgery	20,509	7,535 (37)	4,816 (23)	2637	4262	24	258	1300	3374	6386
30	Critical Care Medicine	19,496	1,995 (10)	1,482 (8)	386	540	0	69	223	468	930
31	Endocrinology	19,231	730 (4)	3,011 (16)	152	442	0	19	57	150	303
32	Therapeutic Radiology	11,938	433 (4)	1,684 (14)	196	484	22	30	55	201	367
33	Rheumatology	9,741	912 (9)	883 (9)	210	434	7	29	74	168	496
34	Colorectal Surgery	9,283	163 (2)	979 (11)	382	1431	0	0	4	147	667
35	Allergy and Immunology	8,098	235 (3)	658 (8)	88	124	0	9	44	127	248
36	Obstetrics	6,178	333 (5)	286 (5)	385	372	42	144	321	562	757
37	Neonatology	5,883	339 (6)	291 (5)	602	769	43	180	413	761	1140
38	Geriatric Medicine	4,107	1,359 (33)	281 (7)	262	266	6	41	227	350	582
39	Preventive Medicine	3,189	1,293 (41)	780 (24)	416	346	18	132	327	720	830
40	Hospice and Palliative Medicine	2,909	1,002 (34)	351 (12)	89	110	37	42	50	91	196
41	Osteopathy	2,873	1,140 (40)	1,257 (44)	350	388	37	74	173	536	983
42	Gynecology	2,436	141 (6)	739 (30)	582	522	0	0	601	1036	1252
43	Gynecologic Oncology	1,345	38 (3)	31 (2)	1005	3572	0	21	130	223	672
44	Genetics	601	30 (5)	29 (5)	231	513	13	63	108	232	307
45	Podiatry	257	0 (0)	8 (3)	117	231	0	0	41	84	682

^aTotal emergency room visits with at least one claim submitted by the given provider category/specialty

^bVisits where at least one claim was submitted by a provider whose network status was unknown. Providers with unknown network status were counted as being “in-network” for the purposes of analyzing the incidence and financial liability associated with out-of-network billing.

^cTotal emergency room visits with at least one out-of-network claim submitted by the given provider category/specialty

^cPatient’s responsibility for out-of-network services, defined as the difference between the provider’s charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^dStandard Deviation

eTable 9. Incidence and Magnitude of Out-of-Network Billing for Commonly Seen Providers: Inpatient Admissions (including visits where network status was unknown)

	Specialty	Number of Admissions ^a	Visits with at least one claim with unknown network status ^b , N(%)	Admissions with Out-of-Network Bill ^c , N (%)	Potential Out-of-Network Responsibility ^d (\$)						
					Mean	SD ^e	10th	25th	50th	75th	90th
1	Radiology	3,720,098	77,213 (2)	720,896 (19)	267	759	15	33	121	307	615
2	Emergency Medicine	2,582,000	218,058 (8)	908,459 (35)	595	575	44	203	477	858	1,267
3	Internal Medicine	2,322,323	79,472 (3)	507,051 (22)	450	1,133	9	65	206	483	999
4	Anesthesiology	2,320,273	114,988 (5)	378,263 (16)	1,369	1,807	0	233	794	1,825	3,362
5	Cardiology	1,980,835	41,201 (2)	333,819 (17)	328	1,438	10	19	52	196	612
6	Unknown	1,358,874	83,590 (6)	215,039 (16)	544	1,489	29	106	265	614	1,136
7	Pathology	1,236,616	101,393 (8)	219,436 (18)	297	542	16	63	145	303	676
8	Ambulance Providers	1,186,611	220,565 (19)	773,242 (65)	424	2,176	0	0	44	365	832
9	Family Practice	906,991	29,513 (3)	142,522 (16)	384	1,329	0	49	148	364	798
10	Obstetrics & Gynecology	867,537	17,606 (2)	6,364 (0)	1,210	3,423	19	92	292	1034	2,763
11	General Surgery	732,764	32,853 (4)	75,981 (10)	2,454	6,952	26	133	583	2,317	5,540
12	Orthopedics	610,864	18,616 (3)	52,114 (9)	5,043	10,241	85	470	2,230	5,314	11,139
13	Pulmonary Medicine	588,123	8,379 (1)	72,951 (12)	452	1,242	0	54	183	459	1,012
14	Gastroenterology	499,758	5,068 (1)	39,202 (8)	695	1,613	9	73	264	734	1,567
15	Neurology	434,579	21,283 (5)	58,590 (13)	1,147	3,518	0	74	239	840	2,750
16	Infectious Diseases	373,852	14,566 (4)	50,867 (14)	397	743	11	78	205	442	863
17	Pediatrics	369,637	12,867 (3)	6,199 (2)	306	816	7	50	127	283	665
18	Nephrology	357,389	4,292 (1)	43,949 (12)	325	704	0	46	155	378	766
19	Hematology & Oncology	345,622	3,642 (1)	22,366 (6)	643	2,753	21	71	179	420	1,032
20	Psychiatry	268,929	22,320 (8)	41,163 (15)	288	821	0	51	139	307	629
21	Urology	217,008	2,635 (1)	12,799 (6)	1,122	3,681	7	57	198	769	2,584
22	Neurological Surgery	194,922	8,413 (4)	15,379 (8)	6,885	16,560	21	130	608	5813	19,650
23	Vascular Surgery	187,819	2,753 (1)	20,786 (11)	1,443	4,896	14	46	131	661	3,437
24	Thoracic Surgery	152,548	3,982 (3)	12,969 (9)	3,769	8,419	23	142	940	4,304	9,786
25	Neonatology	138,602	12,724 (9)	1,426 (1)	1,271	3,311	104	157	321	967	2,793
26	Physical Medicine And Rehabilitation	122,985	4,618 (4)	16,973 (14)	634	1,833	17	64	158	401	1,541
27	Endocrinology	83,977	1,992 (2)	9,734 (12)	441	2,620	7	42	109	274	589
28	Critical Care Medicine	83,374	5,133 (6)	217 (0)	601	898	39	129	379	563	1,477

29	Otolaryngology	70,677	1,508 (2)	4,222 (6)	1,342	5,371	3	53	193	682	2,615
30	Obstetrics	55,386	2,883 (5)	60 (0)	688	1,074	80	157	287	766	1,454
31	Colorectal Surgery	46,733	644 (1)	2,354 (5)	2,309	5,677	8	94	457	1,866	5,660
32	Plastic and Reconstructive Surgery	40,993	5,376 (1)	3,141 (8)	5,846	14,288	8	125	761	4529	15,532
33	Therapeutic Radiology	23,623	416 (2)	1,439 (6)	410	958	30	37	160	370	908
34	Rheumatology	21,410	586 (3)	1,748 (8)	313	1,336	0	30	116	262	576
35	Ophthalmology	19,218	552 (3)	1,259 (7)	581	2,418	0	39	123	320	1,099
36	Gynecologic Oncology	16,640	325 (2)	10 (0)	327	319	63	198	209	304	861
37	Dermatology	11,680	370 (3)	1,218 (10)	330	1,361	0	20	107	307	627
38	Gynecology	10,517	288 (3)	153 (1)	621	1,004	57	115	229	566	2,032
39	Hospice & Palliative Medicine	8,235	686 (8)	20 (0)	218	217	61	69	135	281	507
40	Geriatric Medicine	7,251	1,031 (14)	55 (0)	291	154	10	210	329	336	362
41	Allergy and Immunology	7,015	232 (3)	699 (10)	180	491	0	18	84	179	372
42	Genetics	3,109	107 (3)	18 (1)	352	292	13	101	265	629	802
43	Preventive Medicine	2,475	331 (14)	7 (0)	161	119	0	75	155	204	385
44	Podiatry	1,025	3 (0)	39 (4)	627	860	14	55	191	1,173	1,792
45	Osteopathy	832	201 (24)	5 (1)	882	10	877	877	877	877	900

^aTotal inpatient admissions with at least one claim submitted by the given provider category/specialty

^bAdmissions where at least one claim was submitted by a provider whose network status was unknown. Providers with unknown network status were counted as being “in-network” for the purposes of analyzing the incidence and financial liability associated with out-of-network billing.

^cTotal inpatient admissions with at least one out-of-network claim submitted by the given provider category/specialty

^dPatient’s responsibility for out-of-network services, defined as the difference between the provider’s charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^eStandard Deviation

eTable 10. Annual Incidence and Magnitude of Out-of-Network Billing: Elective Inpatient Admissions

	Number of Admissions ^a	Admissions With Out-of-Network Bill ^b , N (%)	Potential Out-of-Network Responsibility ^c (\$)					
			Mean (SD ^d)	10th	25th	50th	75th	90th
2010	262,480	34,267 (13)	635 (1,192)	0	27	195	730	1,770
2011	248,988	39,148 (16)	830 (1,414)	0	47	282	1,039	2,301
2012	341,502	60,082 (18)	1,001 (1,948)	11	72	362	1,280	2,762
2013	344,445	65,805 (19)	1,146 (1,806)	15	88	430	1,487	3,167
2014	303,844	55,775 (18)	1,339 (2,057)	17	106	532	1,800	3,623
2015	305,902	52,473 (17)	1,517 (2,203)	22	132	659	2,092	4,022
2016	342,732	70,380 (21)	1,501 (2,285)	23	127	631	2,078	3,994
Overall	2,149,893	377,930 (18)	1,190 (1,965)	13	85	431	1,557	3,283

^aTotal annual inpatient admissions to an in-network hospital

^bNumber of inpatient admissions with at least one claim submitted by an out-of-network provider.

^cPatient's responsibility for out-of-network services, defined as the difference between the provider's charge and the amount typically paid by the insurer for an in-network service. These amounts are in addition to any other out-of-pocket payments (e.g., payments for deductible and coinsurance). All dollar values are adjusted to 2018 dollars.

^dStandard deviation