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DATAWATCH

Medicare Beneficiaries' Exposure To Fraud And Abuse Perpetrators

In the period 2012–15, 1,364 fraud and abuse perpetrators (FAPs) treated over 1.2 million Medicare beneficiaries and received more than $630 million in Medicare payments. Compared to beneficiaries treated by non-FAPs, beneficiaries exposed to FAPs were more likely to be nonwhite, dually enrolled in Medicaid, and disabled and younger than age sixty-five.

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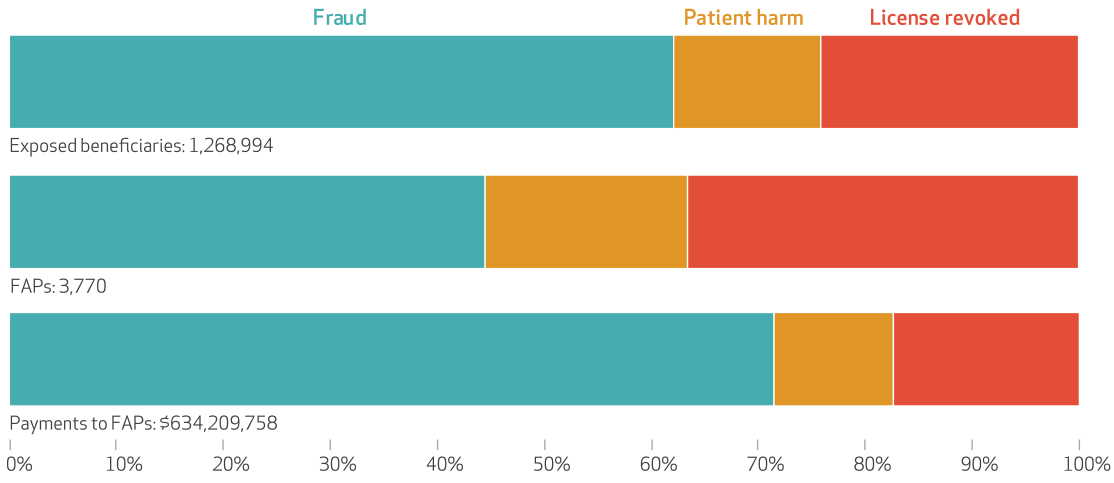
Fraud and abuse are widely recognized as avoidable drivers of health care spending, with annual financial costs of fraud in the US estimated to be between $90 billion and $300 billion.[1] The federal government has the authority to ban providers from receiving reimbursement from Medicare or Medicaid if they are convicted of fraud (including health care delivery fraud, embezzlement, and kickbacks) or of directly abusing or neglecting patients or illegally distributing controlled substances (that is, causing patient harm) or if their medical license was suspended or revoked as a result of competence, performance, or integrity violations.[2]

As shown in exhibits 1 and 2, in the period 2012–15 more than 1.2 million Medicare beneficiaries were treated by 1,364 individual health care providers (including physicians, physician assistants, nurses, and social workers) who were subsequently excluded from Medicare for one or more types of fraud or abuse. During this period Medicare reimbursed these providers more than $630 million, for both legitimate and fraudulent services.

Many acts of fraud and abuse—such as reselling Medicare-reimbursed prescription drugs for illicit use, performing contraindicated operations to maximize revenue, and using untrained personnel to deliver care—threaten patient

EXHIBIT 1

Percent of Medicare beneficiaries exposed to fraud and abuse perpetrators (FAPs), FAPs, and Medicare payments to FAPs, by type of action, 2012–15



SOURCE Authors' analysis of data for 2012–15 from the List of Excluded Individuals/Entities of the Office of Inspector General of the Department of Health and Human Services, merged with Medicare Physician and Other Supplier Public Use Files. **NOTES** The billing information was taken from Medicare records of individual Medicare providers (including physicians, nurse practitioners, chiropractors, and other providers eligible to bill for their own services) who were subsequently excluded from Medicare and Medicaid for fraud or abuse. Health care workers who did not directly bill Medicare (for example, home health aides) were excluded from this analysis because they could not be identified in Medicare Part B data. "Patient harm" is a subset of the broader category of "abuse."

EXHIBIT 2

Fraud and abuse perpetrators (FAPs) who treated Medicare beneficiaries, 2012–15

	FAPs				
	All	Who committed fraud	Who harmed patients	Whose license was revoked	Non-FAPs
2012–15					
Provider-years	3,770	1,730	690	1,350	3,743,568
Beneficiaries treated	1,268,994	787,444	175,573	305,927	1,428,508,113
Mean per provider-year	333	451	249	226	382
Provided services	30,915,025	26,700,000	1,575,482	2,834,095	10,425,810,675
Mean per provider-year	8,200	15,341	2,239	2,096	2,785
Mean per beneficiary	24.4	33.9	9.0	9.3	7.3
Payments ($)	634,209,758	453,167,964	70,874,040	110,167,520	361,373,806,691
Mean payment per provider-year ($)	168,225	261,947	102,716	81,606	96,532
Mean payment per beneficiary ($)	500	575	404	360	253
LAST CLAIM YEAR					
Unique providers in the study	1,364	606	253	505	1,135,241
Beneficiaries treated	336,900	203,010	48,323	85,345	384,018,768
Mean per provider	247	335	191	169	338
Provided services	7,587,561	6,463,232	368,115	755,985	2,916,331,957
Mean per provider	5,563	10,665	1,455	1,497	2,569
Mean per beneficiary	22.5	31.8	7.6	9.3	7.6
Payments ($)	133,231,919	197,419,495	91,277,993	77,225,397	96,495,882,334
Mean payment per provider ($)	97,677	144,736	66,919	56,617	85,000
Mean payment per beneficiary ($)	400	509	328	306	298

SOURCE Authors' analysis of data for 2012–15 from the List of Excluded Individuals/Entities of the Office of Inspector General of the Department of Health and Human Services, merged with Medicare Physician and Other Supplier Public Use Files. **NOTE** The billing information is explained in the notes to exhibit 1.

health and safety. If fraud and abuse perpetrators (FAPs) target specific patient subgroups and contact with these providers is harmful, fraud and abuse could exacerbate existing health disparities. Our study represents the first quantitative assessment of the characteristics of Medicare beneficiaries treated by FAPs.

Study Data And Methods

The Office of Inspector General (OIG) of the Department of Health and Human Services produces a monthly List of Excluded Individuals/Entities that name fraud and abuse perpetrators identified through audits and criminal justice activity.[3] We identified 4,250 unique providers excluded from Medicare in the period 2012–18 for fraud, patient harm, or license violations.

We used the Physician and Other Supplier Public Use Files for 2012–15 to link these FAPs to aggregate characteristics of the fee-for-service Medicare patients they treated before being excluded. We matched 1,186 FAPs using National Provider Identifiers reported by the Office of Inspector General. An additional 178 without identifiers were linked by probabilistically matching on first and last name, initials, and census region following Fellegi-Sunter guidelines, with individual matches verified by the authors.[4–6] See the online appendix for details about the methods.[7] We supplemented these data with information on credential and provider type from Physician Compare.[8]

We used our linked data set to characterize the population of beneficiaries treated by known FAPs and to compare these beneficiaries to those treated by nonexcluded clinicians. Because reports from the Office of Inspector General and the Department of Justice indicate that many fraud and abuse schemes go on for a number of years before the FAP's exclusion, we examined Medicare beneficiaries treated in the period 2012–15 period as well as those treated during the last year a provider participated in Medicare. We tested for mean differences in patient characteristics using univariate linear regression, weighting each provider by the number of beneficiaries treated, to adjust for providers who treated a large number of beneficiaries.

Next, we estimated ordinary least squares regressions in which the dependent variables were the percentages of a provider's patients that fell into three distinct populations associated with disproportionately high health care costs and challenges accessing care.[9–11] Specifically, we examined nonwhite patients, patients dually enrolled in Medicaid, and disabled patients youn-

ger than age sixty-five. Our key independent variable was an indicator for being an FAP or, in separate models, FAP type. We controlled for average beneficiary characteristics, provider sex and profession, and year and state fixed effects. Models were weighted by the number of beneficiaries treated. A two-sided p value of 0.05 was considered significant.

Our study had several limitations. First, since many FAPs engage in criminal behavior to obtain additional Medicare payments, it is possible that they bill under multiple names or National Provider Identifiers. Such duplicate billing would have led us to understate their total patient volume.

Second, we classified FAPs by their first reason for exclusion, though providers could be excluded for multiple reasons. Our data included thirty-five providers with multiple exclusions. Twenty-one of these initially had a license violation, followed by a fraud exclusion two to five years later, once they had been prosecuted for their crimes and misdemeanors. Our relatively short time window may have precluded us from fully accounting for other offenses committed by FAPs.

Third, because our study included only fee-for-service Medicare beneficiaries and known individual FAPs—but not patients exposed to organization-level fraud (for example, by home health agencies)—we understated the total number of Medicare beneficaries exposed to FAPs.

Study Results

In the period 2012–15, 1,364 fraud and abuse perpetrators treated 1,268,994 fee-for-service Medicare beneficiaries and received $634,209,758 in Medicare payments over an average practice period of 2.8 years (exhibits 1 and 2). Forty-four percent of FAPs were subsequently excluded for fraud, while 37 percent were excluded for suspended or revoked licenses and 19 percent for patient harm. This corresponds to 787,444 patients exposed to a provider excluded for fraud, 305,927 to a provider excluded for a suspended or revoked license, and 175,573 to a provider excluded for patient harm (exhibit 2). On average, FAPs received higher payments per beneficiary than non-FAPs ($500 versus $253) and treated fewer beneficiaries (333 versus 382), with fraud-excluded FAPs treating the most patients and receiving markedly higher payments than other providers. Relative to earlier years of practice, FAPs treated fewer patients during their last year before exclusion.

Twenty-five precent of FAPs were doctorally

EXHIBIT 3

Fee-for-service Medicare beneficiaries treated by fraud and abuse perpetrators (FAPs) and non-FAPs, by selected characteristics and conditions, 2012–15

	FAPs				
	All	Who committed fraud	Who harmed patients	Whose license was revoked	Non-FAPs
Beneficiaries treated	1,268,994	787,444	175,573	305,927	1,428,508,113
Disabled and younger than age 65, or with ESRD	28.0%***	26.3%***	30.0%***	30.9%***	17.3%
Race/ethnicity					
Black	16.4%***	18.8%***	12.5%***	13.1%***	10.3%
Asian	10.1***	10.9	9.2***	8.7***	6.6
Hispanic	5.0***	4.4***	6.1***	6.0***	3.8
Other minority group	6.9***	5.2***	8.7***	9.8***	5.5
Dual Medicaid enrollees	44.8***	49.7***	40.5***	35.5***	25.5
Condition					
Chronic kidney disease	25.2%***	26.3%***	25.6%***	22.0%***	22.1%
COPD	30.1***	31.7***	28.9***	26.8	33.3
Depression	36.8***	38.9***	33.3***	33.5***	28.5
Diabetes	42.0***	44.8***	39.0***	37.0	37.1
Ischemic heart disease	43.7***	46.2***	42.6	38.1***	42.5
Average HCC risk score	1.74***	1.85***	1.66***	1.53***	1.67
FAP-level observations	1,364	606	253	505	1,135,241

SOURCE Authors' analysis of data for 2012–15 from the List of Excluded Individuals/Entities of the Office of Inspector General of the Department of Health and Human Services, merged with Medicare Physician and Other Supplier Public Use Files. **NOTES** Since average beneficiary characteristics are reported at the provider level, observations were weighted by the number of beneficiaries each provider treated. ESRD is end-stage renal disease. COPD is chronic obstructive pulmonary disease. HCC is Hierarchical Condition Categories, a measure of health status based on utilization (higher scores indicate worse health). ***$p < 0.01$

trained—for example, as physicians, audiologists, or chiropractors. The remainder were nondoctoral FAPs such as physician assistants and social workers (36 percent) and clinical personnel with unknown qualifications (39 percent) (data not shown).

Compared to patients treated by non-FAPs, those treated by FAPs were more likely to be nonelderly and eligible for Medicare because of disability or end-stage renal disease (28.0 percent versus 17.3 percent) (exhibit 3). And compared to non-FAPs, FAPs saw higher percentages of beneficiaries who were black (16.4 percent versus 10.3 percent), Asian (10.1 percent versus 6.6 percent), Hispanic (5.0 percent versus 3.8 percent), or members of another racial/ethnic minority group (6.9 percent versus 5.5 percent) and a markedly higher percentage of patients who were dually enrolled in Medicaid (44.8 percent versus 25.5 percent).

We repeated these unadjusted comparisons for each type of exclusion and observed similar patterns. Compared to non-FAPs, all subgroups of FAPs saw greater proportions of patients from racial/ethnic minority groups, dually enrolled patients, and disabled patients younger than age sixty-five.

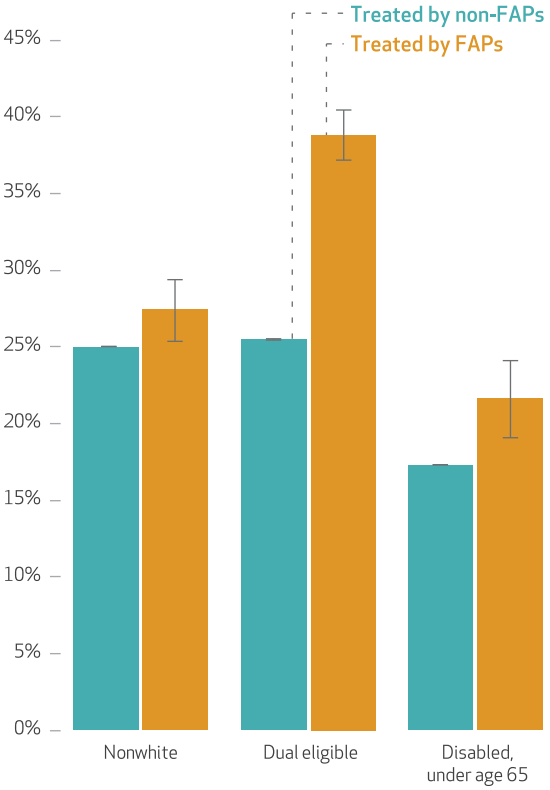
We estimated regression models to test whether the differences between FAP and non-FAP patients could be explained by other patient or provider characteristics, such as location and specialty. After our regression adjustment, we found that compared to non-FAPs, FAPs still saw a significantly larger percentage of patients who were nonwhite (27.4 percent versus 25.0 percent), dually enrolled in Medicaid (38.8 percent versus 25.5 percent), or nonelderly disabled (21.6 percent versus 17.3 percent) (exhibit 4).

FAPs who committed fraud saw the largest share of nonwhite patients (29.5 percent, versus 25.9 percent for FAPs who committed patient harm and 23.4 percent of FAPs with revoked licenses) (exhibit 5). Dual enrollees were particularly vulnerable to FAPs who committed fraud (accounting for 44.1 percent of those providers' patients), FAPs who committed patient harm (34.4 percent), and FAPs with revoked licenses (28.7 percent). We found that nonelderly disabled patients were also more likely to be treated by all types of FAPs: Only 17.3 percent of patients treated by non-FAPs were nonelderly disabled (exhibit 4), compared to 21.8 percent of patients treated by FAPs who committed fraud, 21.2 percent treated by FAPs whose licenses were revoked, and 21.3 percent treated by FAPs who harmed patients (exhibit 5). All differences were significant ($p \leq 0.01$). Since nonelderly disabled people make up only 17 percent of Medicare beneficiaries, these modest percentage-point differences translate into disabled patients being 23–26 percent more likely to be treated by an FAP than a nondisabled beneficiary is.

Our results were robust to using the first year the provider appeared in the 2012–15 Medicare Physician and Other Supplier Public Use Files, as opposed to using the last year and using all available years. We used counts of unique beneficiaries within a provider-year observation and may have counted more than once patients who saw the same FAP in multiple years or who saw multiple FAPs. On the assumption that the number of unique patients an FAP treated over time was

EXHIBIT 4

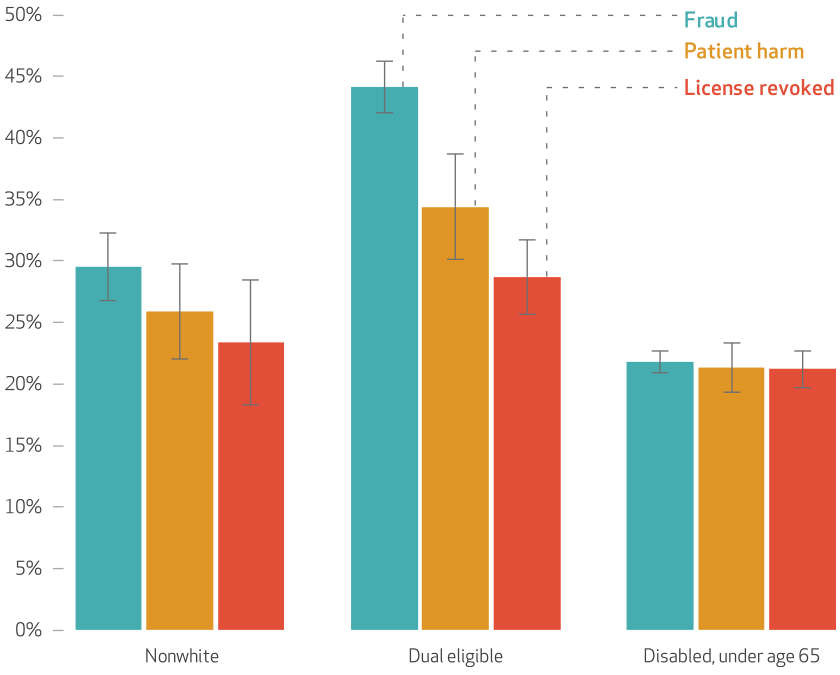
Percent of fee-for-service Medicare beneficiaries treated by fraud and abuse perpetrators (FAPs) and non-FAPs, by selected characteristics, 2012–15



SOURCE Authors' analysis of data for 2012–15 from the List of Excluded Individuals/Entities of the Office of Inspector General of the Department of Health and Human Services, merged with Medicare Physician and Other Supplier Public Use Files. **NOTES** The exhibit shows regression-adjusted values that represent the shares of patients treated by each provider type who were nonwhite, dually enrolled in Medicaid and Medicare, or disabled and younger than age sixty-five, after accounting for beneficiary demographic and health characteristic control variables, physician or nonphysician status, and year and state fixed effects. The error bars indicate 95% confidence intervals. Full regression results are available in online appendix exhibit A1 (see note 7 in text). All differences between FAPs and non-FAPs were significant ($p < 0.01$).

EXHIBIT 5

Percent of fee-for-service Medicare beneficiaries treated by fraud and abuse perpetrators (FAPs) who committed fraud or abuse or had their licenses revoked, by selected characteristics, 2012–15



SOURCE Authors' analysis of data for 2012–15 from the List of Excluded Individuals/Entities of the Office of Inspector General of the Department of Health and Human Services, merged with Medicare Physician and Other Supplier Public Use Files. **NOTES** The exhibit shows regression-adjusted values that represent the shares of patients treated by each provider type who were nonwhite, dually enrolled in Medicaid and Medicare, or disabled and younger than age sixty-five, after accounting for factors listed in the notes to exhibit 4. The error bars indicate 95% confidence intervals. Full regression results are available in online appendix exhibit A1 (see note 7 in text). "Patient harm" is a subset of the broader category of "abuse."

defined by the number of patients they saw in their single busiest year, the lower-bound number of Medicare patients treated in the study period was 509,075.

Discussion

Before their exclusion from Medicare, fraud and abuse perpetrators treated more than 1.2 million fee-for-service Medicare beneficiaries. Patients treated by FAPs excluded for fraud were disproportionally nonwhite, dually enrolled in Medicaid, and nonelderly disabled, compared to patients treated by non-FAPs. Patients treated by FAPs excluded for patient harm or revoked licenses were more likely to be dually enrolled in Medicaid and nonelderly disabled than those treated by non-FAPs were. In several cases, these differences were quite large: For example, 44 percent of Medicare patients treated by FAPs who committed fraud were dually enrolled, versus 26 percent of patients treated by non-FAPs.

While patient harm or abuse has a direct impact on patient health, the consequences of fraud exposure are less clear. There are several mechanisms by which fraud could affect patients. First, some fraudulent providers provide unnecessary or unsafe care to patients. Recent examples of cases prosecuted as Medicare fraud include physicians billing for care provided by unlicensed workers who impersonated physicians, unlawfully distributing controlled substances, and drugging patients to keep them in nursing homes. While these providers were primarily charged with defrauding Medicare, there was also clearly nonfinancial harm to the patients.[12,13] Second, patients may be exposed to financial harm from fraud in the form of additional copayments and coinsurance spent on unnecessary care. Last, all patients who receive unnecessary care at the direction of a fraudulent provider experience harm from lost time and, in some cases, from consuming additional care that was triggered as a result of FAP exposure. Thus, the increased rates at which FAPs treat potentially vulnerable populations should be concerning to policy makers.

Conclusion

Our study has produced the first estimates of the numbers and characteristics of Medicare beneficiaries exposed to fraudulent providers, though the full consequences of exposure are unknown. Future research should examine the health and financial effects of FAP exposure. That evidence, combined with the results of this study, would help inform decisions about whether additional resources should be used to identify and sanction fraudulent providers and whether interventions might be developed to protect vulnerable patients. ■

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NOTES

1 Berwick DM, Hackbarth AD. Eliminating waste in US health care. JAMA. 2012;307(14):1513–6.

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3 Office of Inspector General. Updated LEIE database [Internet]. Washington (DC): Department of Health and Human Services; 2018 [cited 2019 Apr 1]. Available for download from: https://oig.hhs.gov/exclusions/exclusions_list.asp

4 Blasnik M. RECLINK: Stata module to probabilistically match records. Statistical Software Components S456876. Boston (MA): Boston College Department of Economics; revised 2010 Jan 18.

5 Jaro MA. Probabilistic linkage of large public health data files. Stat Med. 1995;14(5–7):491–8.

6 Wasi N, Flaaen A. Record linkage using Stata: preprocessing, linking, and reviewing utilities. Stata J. 2015;15(3):672–97.

7 To access the appendix click on the Details tab of the article online.

8 Findlay S. Health Policy Brief: Physician Compare. Health Affairs [serial on the Internet]. 2015 Dec 11 [cited 2019 Mar 26]. Available from: https://www.healthaffairs.org/do/10.1377/hpb20151029.358498/full/

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APPENDIX

Methods Details

The Office of the Inspector General (OIG) produces a monthly List of Excluded Individuals/Entities (LEIE) naming fraudulent and abusive providers (FAPs) identified through audits and criminal justice activity.[1] To construct our study sample, we first narrowed the list to individual providers, removing entities such as Skilled Nursing Facilities and Clinics that billed Medicare under an organizational National Provider Identifier (NPI) number. We further narrowed the list of providers to healthcare professionals eligible to bill Medicare using an individual NPI, excluding individuals such as facility administrators and home health aides. We ultimately identified 4,250 unique, individual providers from the LEIE who were excluded from federal programs between 2012 and 2018 for financial fraud, patient harm or improper drug dispensing, or license suspension/revocation due to competence, performance, or integrity violations. Restricting to individual healthcare professionals enables us to link specific providers to two other provider-level publicly available Medicare data sources, the Physician and Other Supplier Public Use Files (PUFs) from 2012 to 2015 and the last archived Physician Compare dataset for each year from 2014 to 2016.[2] Both data sources identify unique providers via the NPI.

The Physician/Supplier PUFs contains the key variables for our analysis and include information on the services provided by physicians and other healthcare professionals to Medicare beneficiaries enrolled in fee-for-service (FFS) under Part B over the calendar year. It also includes data on the patient characteristics of the FFS beneficiaries receiving those services, and provider characteristics such as gender, specialty, and location. We supplemented this data with publicly available information on credential and provider type (physician specialty or type of non-physician healthcare professional) from Physician Compare. We used the profession and specialty listed on the LEIE, the credential variable from Physician Compare, and the provider type variables from both Physician Compare and the Supplier PUFs to create indicators for

[1] Department of Health & Human Services Office of Inspector General. Exclusions Program. [cited 19 Jun 2018]. Available from: https://oig.hhs.gov/exclusions/index.asp

[2] Physician/Supplier PUF available here: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Physician-and-Other-Supplier.html. Physician Compare Data available here: https://data.medicare.gov/data/physician-compare

whether a provider was a doctorally trained provider (including physicians, dentists, audiologists, chiropractors, and nurse practitioners), another non-doctorally trained health professional (i.e., physician assistant, clinical social worker), or of unknown profession.

We linked FAPs to the characteristics of the Medicare FFS patients they treated in the last year that they billed prior to their exclusion using the Physician/Supplier PUFs and closest corresponding year of Physician Compare. For 3,627 providers, the LEIE included an NPI, enabling a direct link between the LEIE file and the Medicare data for 1,186 providers active during our study period. For the remaining excluded providers in the LEIE, we used a probabilistic matching strategy based on physician first and last name, state, and census region, following Fellegi-Sunter guidelines to match FAPs from the LEIE to their (probable) record in the Physician/Supplier PUFs. [3-5] In order to be considered candidates for a match, we required an exact match between the census region and either the first or last name. Pairs that met that criterion were assigned a score from 0 to 1, and we accepted matches that were assigned the highest score, as long as the score was at least 0.8, following the guidelines referenced above with regards to probabilistic matching. We then hand verified each possible match meeting these criteria to ensure that professions and genders matched. We identified an additional 178 FAPs with this approach.

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[4] Blasnik M. RECLINK: Stata module to probabilistically match records. Statistical Software Components. 2010.
[5] Wasi N, Flaaen A. Record linkage using stata: Pre-processing, linking and reviewing utilities. Stata Journal. 2015;15(3):672-97.

Appendix Exhibit A1: Full Regression Results for Exhibit 4

	Non-White	Non-White	Dual Enrollment	Dual Enrollment	Under Age 65	Under Age 65
FAP	0.024***		0.133***		0.043***	
	(0.01)		(0.00)		(0.00)	
Fraud		0.045***		0.186***		0.045***
		(0.01)		(0.01)		(0.00)
Revoked License		-0.02		0.031***		0.039***
		(0.01)		(0.01)		(0.00)
Patient Harm		0.01		0.089***		0.040***
		(0.02)		(0.01)		(0.01)
HCC Risk Score	0.176***	0.176***	0.244***	0.244***	0.058***	0.058***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Beneficiary Age	0.073***	0.073***	0.127***	0.127***	0.050***	0.050***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Male Provider	-0.017***	-0.017***	-0.014***	-0.014***	-0.023***	-0.023***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Known Doctor	-0.048***	-0.048***	0.005***	0.005***	0.001***	0.001***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Known Non-Doctor	-0.023***	-0.023***	0.003***	0.003***	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year = 2013	-0.012***	-0.012***	0.042***	0.042***	0.012***	0.012***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year = 2014	0.00	0.00	0.005**	0.005**	0.004***	0.004***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year = 2015	0.012***	0.012***	0.030***	0.030***	0.012***	0.012***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	1,136,605	1,136,605	1,136,605	1,136,605	1,136,605	1,136,605

Source/Notes: Data from the CMS Office of the Inspector General List of Excluded Individuals and Entities merged to Medicare Part B Physician and Other Supplier Public Use Files from 2012 – 2015. Providers included in their most recent year treating patients. Models include state fixed effects (not shown) and are weighted by the number of beneficiaries treated. Statistical Significance: *** p<0.001, ** p<0.01, * p<0.05.