

Supplementary Online Content

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

eFigure 1. Study population selection criteria

A. National Plan & Provider Enumeration System (NPPES) study population

NPPES records		
n=4,977,051		
		Organizations with records (e.g. hospitals, pharmacies)
		n=1,254,905
Unique NPPES providers		
n=3,722,146		
		Providers with practice location outside the US:
		Non-US: n=3,107
		Territories/outlying minor US islands: n=11,026
US providers		
n=3,708,013		
		Physicians with enumeration date in 2016 or deactivated before 2015
		n=162,308
US providers in 2015		
n=3,545,705		
		Non-allopathic and non-osteopathic US providers
		n=2,611,452
US allopathic and osteopathic physicians in 2015		
n= 934,253		
		US allopathic and osteopathic physicians without a zipcode-matched HRR
		n=958
US allopathic and osteopathic physicians in 2015 with matched HRR		
n=933,295		

Abbreviations: NPPES, National Plan & Provider Enumeration System; US, United States; HRR, Hospital Referral Region

B. Open Payments physicians used in matching algorithm^a

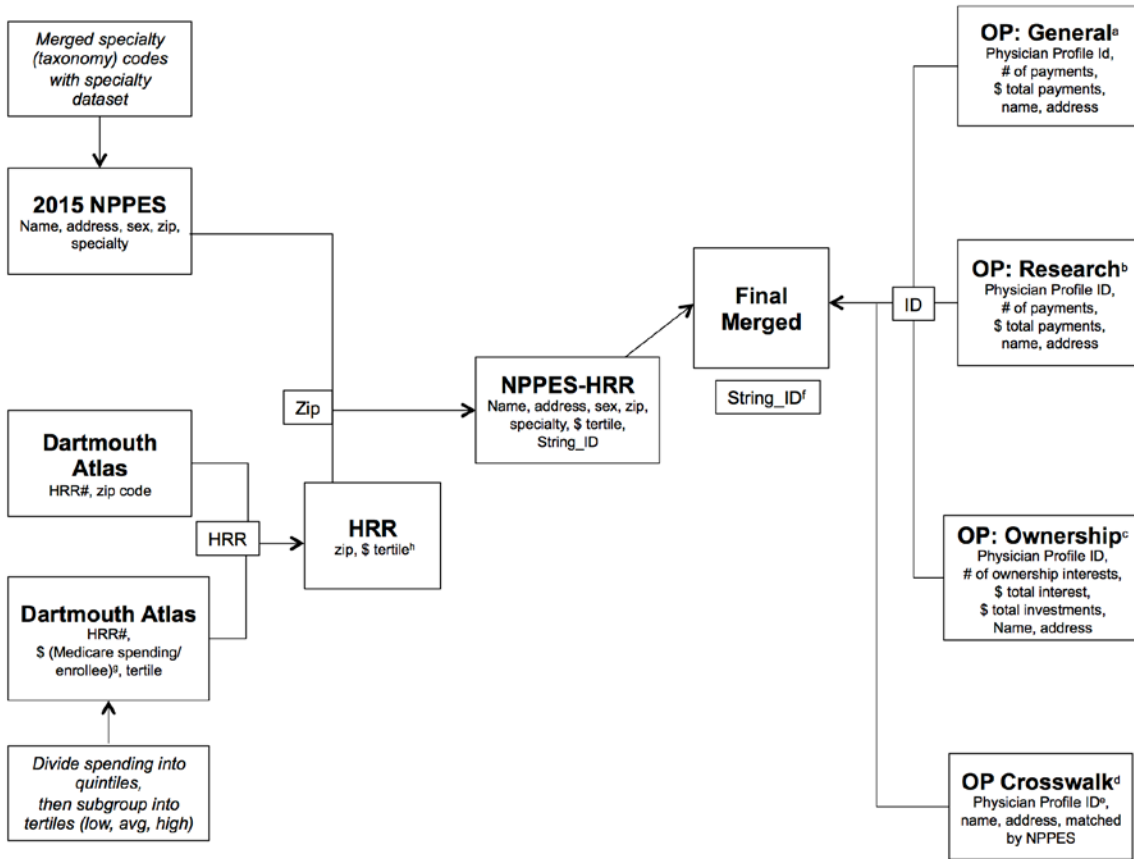
Total Open Payment records	
n=11,901,001 (G=11,132,000; R=764,679; O=4,322)	
	Records for non-physician recipients (e.g. family member or institution)
	n=755,532 (G=38,998; R=716,329; O=205)
Total Open Payment records attributable to physicians	
n=11,145,469 (G=11,093,002; R=48,350; O=4,117)	
	Records for providers with practice location outside the US or US Territories:
	n=419 (G=415; R=1; O=3)
Open Payment records for allopathic and osteopathic US physicians	
n=11,145,050 (G=11,092,587; R=48,349; O=4,114)	
	Records for non-allopathic or osteopathic physicians
	n=515,600 (G=512,646; R=2,817; O=137)
Open Payment records for allopathic and osteopathic US physicians	
n=10,629,450 (G=10,579,941; R=45,532; O=3,977)	
	Multiple payment records for one physician
	n=10,153,445
US allopathic and osteopathic physicians receiving a payment	
n=476,005	
	Physicians in Open Payments without a matched NPPES record (confirmed by 2 text string identifiers)
	n=22,993
US allopathic and osteopathic physicians receiving industry payments in 2015	
n=449,864	

Abbreviations: US, United States; NPPES, National Plan & Provider Enumeration System; G, General Payment; R, Research payment; O, Ownership Interest or Investment

^aIncludes any physician with a record in Open Payments, not exclusive of those receiving a payment in 2015

^bCrosswalk file refers to the “PY2015 – Covered Recipient Physicians – NPPES data” file provided by Open Payments that contains crosswalk of all covered recipient physicians and physician principle investigators that have been against NPPES

C. Overall Merging Algorithm to Match National Plan & Provider Enumeration System (NPPES) data with Open Payments



Abbreviations: NPPES, National Plan & Provider Enumeration System; HRR, Hospital Referral Region; OP, Open Payments; ID, identification

^aGeneral payments include all forms of payments other than those classified for research (including, but not limited to, consulting fees, honoraria, gifts, entertainment, food and beverages, travel and lodging, education, charitable contributions, and other compensation).

^bResearch payments include all forms of payments for research activities pursued under a written contract or protocol, such as publications or medical research writing.

^cOwnership interests include stocks/stock options, partnership shares, or other financial instruments secured by the reporting entity held by the physician.

^dCrosswalk file contains covered recipient physicians crosswalked against NPPES, including Physician Profile ID, Data Source, Physician Name Information, Address, and Primary Taxonomy. This file does not include National Provider Identifiers (NPIs).

^ePhysician Profile ID is a number assigned to each physician in Open Payments used in this data preparation to merge all reported Open Payments for a single physician.

^fString_ID refers to a concatenated string used for merging Open Payments data to provider identifying information in NPPES. Specifically, two String_IDs were created: the primary consisted of “FirstName_LastName_Address” and the backup identifier consisted of “FirstName_LastName_ZipCode”

^g\$ refers to Medicare spending/enrollee in the HRR. This monetary value was used to separate spending into quintiles based on spending/enrollee amount.

^h\$ tertile” refers to the spending tertile assigned based on amount of Medicare spending/enrollee for the HRR. The tertiles were grouped based on the original quintiles (lowest, highest, and grouped middle three).

eTable 1. Nature of Identified General Payment(s) to Allopathic and Osteopathic Physicians by Specialty Type and Gender in 2015					
	Specialty Category				
	Male Recipients <i>N=315,974</i>	Surgery <i>N=85,142</i>	Primary Care <i>N=129,962</i>	Specialists <i>N=54,174</i>	Interventionalists <i>N=45,973</i>
MALE PHYSICIANS					
Total Value, USD (%)^a	1,586,083,451	726,052,771	374,348,380	244,213,458	241,468,841
Charitable Contribution	3,666,404 (0.2)	3,490,910 (0.5)	105,070 (0.0)	28,362 (0.0)	42,062 (0.0)
Services ^c	412,403,471 (26.0)	63,050,119 (8.7)	160,229,455 (42.8)	96,713,437 (39.6)	92,410,461 (38.3)
Faculty or Speaker (Accredited) ^d	20,042,947 (1.3)	3,306,500 (0.5)	3,491,805 (0.9)	5,949,606 (2.4)	7,295,037 (3.0)
Faculty or Speaker (Non-Accredited) ^e	1,073,668 (0.1)	197,511 (0.0)	139,961 (0.0)	286,219 (0.1)	449,977 (0.2)
Consulting Fee	267,190,922 (16.8)	113,342,526 (15.6)	68,248,144 (18.2)	41,536,329 (17.0)	44,063,923 (18.3)
Ownership or Investment Interest ^f	40,421,236 (2.5)	27,939,560 (3.9)	3,313,900 (0.9)	919,183 (0.4)	8,248,594 (3.4)
Education	26,453,816 (1.7)	18,339,419 (2.5)	4,326,198 (1.2)	1,917,367 (0.8)	1,870,831 (0.8)
Entertainment	142,410 (0.0)	54,195 (0.0)	15,259 (0.0)	41,735 (0.0)	31,222 (0.0)
Food and Beverage	161,069,886 (10.2)	34,930,708 (4.8)	71,093,891 (19.0)	22,843,297 (9.4)	32,201,990 (13.3)
Gift	1,479,603 (0.1)	805,393 (0.1)	224,774 (0.1)	288,940 (0.1)	160,496 (0.1)
Grant	10,283,471 (0.6)	2,132,428 (0.3)	2,750,327 (0.7)	2,570,238 (1.1)	2,830,478 (1.2)
Honoraria	26,519,308 (1.7)	7,046,999 (1.0)	6,654,258 (1.8)	6,728,645 (2.8)	6,089,406 (2.5)
Royalty or License	472,315,328 (29.8)	405,086,208 (55.8)	11,001,512 (2.9)	39,142,563 (16.0)	17,085,045 (7.1)
Travel and Lodging	143,020,981 (9.0)	46,330,296 (6.4)	42,753,828 (11.4)	25,247,537 (10.3)	28,689,320 (11.9)
<i>P</i> ^b	<.001	<.001	<.001	<.001	<.001
FEMALE PHYSICIANS					
Total Value, USD (%)^a	185,471,166	34,755,180	84,081,522	49,476,913	17,157,551
Charitable Contribution	443,411 (0.2)	434,997 (1.3)	5,914 (0.0)	0 (0.0)	2,500 (0.0)
Services ^c	59,431,147 (32.0)	5,553,054 (16.0)	29,035,270 (34.5)	20,175,714 (40.8)	4,667,109 (27.2)
Faculty or Speaker (Accredited) ^d	3,377,972 (1.8)	367,657 (1.1)	1,087,022 (1.3)	1,585,187 (3.2)	338,105 (2.0)
Faculty or Speaker (Non-Accredited) ^e	150,294 (0.1)	17,578 (0.1)	56,700 (0.1)	45,016 (0.1)	31,000 (0.2)
Consulting Fee	32,922,668 (17.8)	5,161,822 (14.9)	15,264,858 (18.2)	9,443,690 (19.1)	3,052,298 (17.8)
Ownership or Investment Interest ^f	2,654,103 (1.4)	140,264 (0.4)	53,423 (0.1)	98,067 (0.2)	2,362,349 (13.8)
Education	3,667,415 (2.0)	1,772,243 (5.1)	1,102,138 (1.3)	644,558 (1.3)	148,475 (0.9)
Entertainment	15,885 (0.00)	2,245 (0.0)	6,040 (0.0)	5,909 (0.0)	1,691 (0.0)
Food and Beverage	43,179,381 (23.3)	6,162,221 (17.7)	25,755,275 (30.6)	8,347,704 (16.9)	2,914,181 (17.0)
Gift	289,224 (0.2)	94,156 (0.3)	119,708 (0.1)	70,725 (0.1)	4,635 (0.0)
Grant	3,551,003 (1.9)	457,288 (1.3)	1,214,424 (1.4)	1,493,275 (3.0)	386,016 (2.3)
Honoraria	3,943,624 (2.1)	650,357 (1.9)	1,130,003 (1.3)	1,690,357 (3.4)	472,908 (2.8)
Royalty or License	11,436,212 (6.2)	9,713,544 (28.0)	340,224 (0.4)	822,035 (1.7)	560,409 (3.3)
Travel and Lodging	20,408,826 (11.0)	4,227,753 (12.2)	8,910,524 (10.6)	5,054,675 (10.2)	2,215,874 (12.9)

Abbreviations: USD, United States dollars; N, analytic population

^aPercent (%) of all general payments within column

^bThe proportion of general payments in each nature-of-payment category was statistically significantly different between men and women when compared within all specialties combined and within each specialty type (Chi-squared test, *P*<.001, two-sided test).

^cCompensation for services other than consulting, including serving as a faculty or as a speaker at a venue other than continuing medical education

^dCompensation for serving as faculty or as a speaker for accredited or certified continuing medical education

^eCompensation for serving as faculty or as a speaker for non-accredited or non-certified continuing medical education

^fOwnership or investment interests currently held by physicians, as well as ownership interests or investments that physicians have not yet exercised

eTable 2. Physicians Receiving General Payments, Holding Ownership Interests, and Receiving Royalty or License Payments in 2015 by Gender Within Specialty Category

		Physicians receiving general payments		Total per-physician annual value of payments		Total per-physician number of payments	
	Analytic Population, No.	No. Physician Recipients, No. (%) ^a	Absolute Rate Difference, % (95% CI)	Mean Value Per-Physician, USD (95% CI)	Absolute Difference, USD (95% CI)	Mean No. Per-Physician, No. (95% CI)	Absolute Difference, No. (95% CI)
<i>Specialty Category</i>							
<i>Surgery</i>							
Male	136,327	85,142 (62.5)	5.9 (5.4, 6.5)	8,528 (7,257, 9,798)	7,163 (4,827, 9,498)	14.2 (14.0, 14.3)	4.4 (4.1, 4.7)
Female	45,045	25,462 (56.5)	0 (referent)	1,365 (921, 1,809)	0 (referent)	9.8 (9.6, 9.9)	0 (referent)
<i>Primary Care</i>							
Male	255,564	129,962 (50.9)	7.8 (7.4, 8.1)	2,880 (2,751, 3,010)	1,772 (1,593, 1,951)	32.3 (32.0, 32.6)	12.6 (12.1, 13.0)
Female	176,255	75,868 (43.0)	0 (referent)	1,108 (1,036, 1,181)	0 (referent)	19.7 (19.4, 20.0)	0 (referent)
<i>Specialists</i>							
Male	149,115	54,174 (36.3)	2.9 (2.5, 3.4)	4,508 (4,040, 4,976)	2,455 (1,743, 3,167)	20.8 (20.4, 21.2)	4.2 (3.5, 4.8)
Female	72,140	24,100 (33.4)	0 (referent)	2,053 (1,871, 2,235)	0 (referent)	16.6 (16.2, 17.1)	0 (referent)
<i>Interventionalists</i>							
Male	79,160	45,973 (58.1)	17.4 (16.6, 18.2)	5,252 (4,895, 5,609)	3,111 (2,217, 4,005)	31.1 (30.7, 31.5)	15.3 (14.2, 16.3)
Female	19,689	8,013 (40.7)	0 (referent)	2,141 (1,515, 2,768)	0 (referent)	15.8 (15.2, 16.4)	0 (referent)

Abbreviations: CI, confidence interval; No., number

^aPercent (%) represents proportion of physicians receiving payment of all physicians in the subcategory's analytic population

eTable 2 Continued. Physicians Receiving General Payments, Holding Ownership Interests, and Receiving Royalty or License Payments in 2015 by Gender Within Specialty Category

Specialty Category	Analytic Population, No.	Physicians with ownership interests		Physicians receiving royalty or license payments	
		No. Physician Recipients, No. (%) ^a	Absolute Rate Difference, % (95% CI)	No. Physician Recipients, No. (%) ^a	Absolute Difference, USD (95% CI)
Surgery					
Male	136,327	1,533 (1.1)	0.92 (0.85, 0.99)	1,634 (1.2)	1.2 (1.1, 1.2)
Female	45,045	94 (0.21)	0 (referent)	13 (0.03)	0 (referent)
Primary Care					
Male	255,564	701 (0.27)	-0.06 (-0.09, -0.02)	45 (0.02)	0.02 (0.01, 0.02)
Female	176,255	585 (0.33)	0 (referent)	4 (0.002)	0 (referent)
Specialists					
Male	149,115	182 (0.12)	0.08 (0.05, 0.10)	115 (0.08)	0.07 (0.05, 0.08)
Female	72,140	32 (0.04)	0 (referent)	6 (0.01)	0 (referent)
Interventionalists					
Male	79,160	168 (0.21)	0.18 (0.14, 0.22)	103 (0.13)	0.09 (0.06, 0.13)
Female	19,689	7 (0.04)	0 (referent)	7 (0.04)	0 (referent)

Abbreviations: CI, confidence interval; No., number

^aPercent (%) represents proportion of physicians receiving payment of all physicians in the subcategory's analytic population