

RESEARCH LETTER

Payments by Drug and Medical Device Manufacturers to US Peer Reviewers of Major Medical Journals

Although conflicts of interest of journal editors and authors have been investigated,^{1,2} the traditionally opaque nature of peer review has hindered their evaluation among peer reviewers, despite their crucial role in academic publishing. While most journals have established conflict of interest policies for authors, fewer extend these policies to peer reviewers.³ In many cases, journals or editors may inquire about reviewer conflicts of interest and consider these while managing the peer review process, although publicly available reviewer conflict of interest disclosures are rare. Reviewers of leading medical journals may have industry ties due to their academic expertise.

We sought to characterize payments by drug and medical device manufacturers to US peer reviewers of major medical journals.

Methods | We identified peer reviewers for *The BMJ*, *JAMA*, *The Lancet*, and *The New England Journal of Medicine (NEJM)* using each journal’s 2022 reviewer list. These journals were selected for their high impact factor and reputation as leading publications of original general medical research. Because reviewer lists did not include affiliations, identification was conducted using Scopus and the National Plan and Provider Enumeration System, which also provided sex and specialty information. We limited our cohort to US-based physicians due to use of the Centers for Medicare & Medicaid Services Open Payments database. Two independent abstractors (A.-L.N., L.M.) performed the search strategy for each reviewer, with discrepancies resolved by a third author (D.-D.N.).

We extracted general and research payments to the identified peer reviewers between 2020 and 2022 from the Open Payments database, capturing payments from drug and medical device manufacturers to US-licensed physicians.⁴ We excluded ownership and investment interests because they are not equivalent to financial transfers and are less reliable than other general payments. Research payments included payments to individual physicians and institutional payments for research where they served as principal investigators. Institutional payments were divided by the number of principal investigators. Inflation-adjusted payment amounts in 2022 US dollars were calculated among those receiving payments.

We compared industry payments by sex and specialty using the Mann-Whitney *U* test and Kruskal-Wallis test with subsequent Dunn pairwise testing accounting for multiple testing, respectively. Analyses were performed using Stata MP version 17.0 (StataCorp). Statistical significance was defined as a 2-sided *P* < .05.

Table 1. Industry Payments to US Physician Peer Reviewers (N = 1962) From 4 Major Medical Journals, 2020-2022

Characteristics	Value
Reviewers accepting payments, No. (%)	
General payments	1060 (54.0)
Research payments ^a	623 (31.8)
Any payments	1155 (58.9)
Total payments, \$	
General payments	64 181 780
Research payments ^a	1 004 488 143
Overall	1 068 669 920
Payment received per physician, median (IQR), \$ ^b	
General payments	7614 (495-43 069)
Research payments ^a	153 173 (29 307-835 637)
Overall	31 254 (2000-276 958)
Total payments by category, \$ (%)	
Research payments via institutions (associated research funding) ^c	999 197 635 (93.5)
Consulting fees	34 313 903 (3.2)
Speaking compensation not related to CME program	11 801 491 (1.1)
Royalty and licensing fees	8 872 007 (0.8)
Direct research payments ^d	5 290 510 (0.5)
Travel and lodging fees	2 667 538 (0.2)
Grants not related to research	2 172 550 (0.2)
Honoraria	1 473 286 (0.1)
Food and beverage	1 436 042 (0.1)
Speaking compensation related to CME program	663 737 (0.1)
Education fees	334 314 (<0.1)
Charity	276 746 (<0.1)
Ownership or investment interest	80 270 (<0.1)
Debt forgiveness	75 514 (<0.1)
Gift	7240 (<0.1)
Long-term medical supply or device loan	5619 (<0.1)
Acquisition fees	1497 (<0.1)
Entertainment fees	25 (<0.1)

Abbreviation: CME, continuing medical education.

^a Research payments included both research payments directly made to individual physicians and payments related to research where a physician was registered as a principal investigator (PI; defined as associated research funding in the Centers for Medicare & Medicaid Services [CMS] Open Payments database).

^b Median payment amounts were calculated for reviewers receiving industry payments.

^c Research payments via institutions are payments related to research where a physician was registered as a PI (defined as associated research funding in the CMS Open Payments Database). When more than 1 physician was registered as a PI for research payments, the payment amounts were assumed to be distributed equally among the PIs, divided by the number of PIs, and assigned to each physician PI.

^d Direct research payments are research payments directly provided to individual physician reviewers.

Table 2. Industry Payments to US Physician Peer Reviewers, 2020-2022, by Reviewer Sex and Specialty

Characteristics	Payments							
	All categories				General			
	Eligible reviewers, No. (%)	Reviewers receiving payments, No. (%)	Total payment amounts, \$	Payments per reviewer, median (IQR), \$ ^a	Reviewers receiving payments, No. (%)	Total payment amounts, \$	Payments per reviewer, median (IQR), \$ ^a	Research Reviewers receiving payments, No. (%)
Sex								
Female	565 (28.8)	284 (50.3)	125 561 923	19 586 (1032-188 517) ^b	257 (45.5)	7 651 914	4183 (173-23 241) ^c	145 (25.7)
Male	1397 (71.2)	871 (62.4)	943 107 997	38 959 (2616-308 526) ^b	803 (57.5)	56 529 866	8663 (701-51 720) ^c	478 (34.2)
Specialty ^d								
Primary care ^e	522 (26.6)	196 (37.6)	112 673 661	12 833 (522-162 841) ^f	170 (32.6)	6 984 980	2658 (124-30 295) ^f	96 (18.4)
Hospital-based specialty ^h	215 (11.0)	102 (47.4)	43 905 519	5211 (344-87 484) ^f	94 (43.7)	2 152 447	2123 (149-12 960) ^f	38 (17.7)
Medical specialty ^j	747 (38.1)	549 (73.5)	790 331 563	86 392 (8663-523 047) ^f	507 (67.9)	36 372 862	15 971 (2997-73 117) ^f	360 (48.2)
Surgical specialty ^j	225 (11.5)	161 (71.6)	67 223 575	4834 (276-44 997) ^f	158 (70.2)	14 853 239	2130 (207-15 862) ^f	46 (20.4)
Obstetrics and gynecology	120 (6.1)	61 (50.8)	15 226 223	3726 (134-85 823) ^f	55 (45.8)	1 210 510	800 (97-12 303) ^f	25 (20.8)
Psychiatry and neurology	133 (6.8)	86 (64.7)	39 309 378	42 417 (4975-266 595) ^f	76 (57.1)	2 607 742	10 539 (1673-29 109) ^f	58 (43.6)
Overall	1962	1155 (58.9)	1 068 669 920	31 254 (2000-276 958) ^f	1060 (54.0)	64 181 780	7614 (495-43 069) ^f	623 (31.8)

^a Median payment amounts were calculated for reviewers receiving each category of industry payments.

^b $P < .01$.

^c $P < .001$.

^d Reference group for pairwise testing for specialties was primary care. P values were calculated with Dunn pairwise testing with Bonferroni adjustment.

^e Primary care includes family medicine, general internal medicine, geriatric medicine, pediatrics, and preventive medicine.

^f $P < .001$ for differences between the specialty groups.

^g $P < .01$ for differences between the specialty groups.

^h Hospital-based specialty includes anesthesiology, critical care medicine, emergency medicine, medical genetics, nuclear medicine, pain medicine, pathology, physical medicine and rehabilitation, and radiology.

ⁱ Medical specialty includes addiction medicine, allergy and clinical immunology, cardiology, dermatology, endocrinology, gastroenterology, hematology, infectious diseases, nephrology, oncology (medical oncology and hematology/oncology), pulmonology, rheumatology, and sleep medicine.

^j Surgical specialty includes colon and rectal surgery, general surgery, neurological surgery, ophthalmology, orthopedic surgery, otolaryngology, plastic surgery, surgical oncology, thoracic surgery, transplant surgery, trauma surgery, vascular surgery, and urology.

Ethics review was not required based on University of Toronto policy. Additional methods are available in the eAppendix in [Supplement 1](#).

Results | Among 7021 reviewer names, including duplicates, we excluded 332 reviewers who were not searchable in Scopus, 3257 non-US reviewers, and 1325 nonphysicians. This left 1962 unique reviewers, of whom 145 (7.4%) had performed peer reviews for more than 1 journal.

Between 2020 and 2022, 1155 peer reviewers (58.9%) received at least 1 industry payment (**Table 1**). More than half (54.0%) of reviewers accepted general payments, while 31.8% received research payments.

Reviewers received \$1.06 billion in industry payments between 2020 and 2022, including \$1.00 billion (94.0%) to individuals or their institutions and \$64.18 million (6.0%) in general payments. Consulting fees and speaking compensation unrelated to continuing medical education programs accounted for \$34.31 million and \$11.80 million, respectively. Over the 3 years, the median general payment was \$7614 (IQR, \$495-\$43 069) and the median research payment was \$153 173 (IQR, \$29 307-\$835 637) among reviewers receiving such payments.

Male reviewers had significantly higher median total payments (\$38 959 vs \$19 586) and general payments (\$8663 vs \$4183) than female reviewers. Statistically significant differences in payments existed between specialties (**Table 2**).

Discussion | More than half of the 1962 US physicians included in this study who peer reviewed for the most influential medical journals received industry payments in 2020-2022, with most payments for research. Research payments, especially those provided to an institution, may have different implications than general payments for conflicts of interest. Peer reviewers in this study received \$64.18 million in general payments between 2020 and 2022, representing a median general payment of \$7614, larger than the median general payment to all physicians in 2018 of \$216.⁵ Additional research and transparency regarding industry payments in the peer review process are needed. Limitations include that it was not known if existing relationships were relevant to the reviewed articles; that reviewers who were not US-based physicians and payments from other entities such as insurance and technology companies were not captured, underestimating industry payments to reviewers of these major journals; and that the findings may not be generalizable to other journals.

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1. Liu JJ, Bell CM, Matelski JJ, Detsky AS, Cram P. Payments by US pharmaceutical and medical device manufacturers to US medical journal editors: retrospective observational study. *BMJ*. 2017;359:j4619. doi:10.1136/bmj.j4619
2. Baraldi JH, Picozzo SA, Arnold JC, Volarich K, Gionfriddo MR, Piper BJ. A cross-sectional examination of conflict-of-interest disclosures of physician-authors publishing in high-impact US medical journals. *BMJ Open*. 2022;12(4):e057598. doi:10.1136/bmjopen-2021-057598
3. Cooper RJ, Gupta M, Wilkes MS, Hoffman JR. Conflict of interest disclosure policies and practices in peer-reviewed biomedical journals. *J Gen Intern Med*. 2006;21(12):1248-1252. doi:10.1111/j.1525-1497.2006.00598.x
4. Centers for Medicare & Medicaid Services. Open Payments. Accessed June 1, 2024. <https://openpaymentsdata.cms.gov/>
5. Marshall DC, Tarras ES, Rosenzweig K, Korenstein D, Chimonas S. Trends in industry payments to physicians in the United States from 2014 to 2018. *JAMA*. 2020;324(17):1785-1788. doi:10.1001/jama.2020.11413