

# BMJ Open Cross-sectional analysis of pharmaceutical industry payments to authors of clinical practice guidelines for bipolar disorder and major depressive disorder in Japan

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## ABSTRACT

**Objective** Clinical practice guidelines (CPGs) are essential for standardising patient care based on evidence-based medicine. However, the presence of financial conflicts of interest (COIs) among CPG authors can undermine their credibility. This study aimed to examine the extent and size of COIs among authors of psychiatry CPGs in Japan.

**Methods** This cross-sectional analysis of disclosed payments from pharmaceutical companies assesses the prevalence and magnitude of personal payments for lecturing, consulting and writing to CPGs for bipolar disorder and major depressive disorder in Japan between 2016 and 2020.

**Results** This study found that 93.3% of authors received payments over a 5-year period, with total payments exceeding US\$4 million. The median payment per author was US\$51 403 (IQR: US\$9982–US\$111 567), with a notable concentration of payments among a small number of authors, including the CPG chairperson. Despite these extensive financial relationships, only a fraction of authors disclosed their COIs in the CPGs. These large amounts of personal payments were made by pharmaceutical companies manufacturing new antidepressants and sleeping aids listed in the CPGs.

**Conclusions** This study found that more than 93% of authors of CPGs for major depressive disorder and bipolar disorder in Japan received considerable amounts of personal payments from the pharmaceutical industry. The findings highlight deviations from international COI management standards and suggest a need for more stringent COI policies for psychiatry CPGs in Japan.

## INTRODUCTION

Clinical practice guidelines (CPGs) have been increasingly used as a tool to endorse evidence-based medicine for healthcare professionals in their clinical practice.<sup>1 2</sup> CPGs aim to summarise the best available evidence and often include recommendations for specific diagnosis and treatment of specific diseases. Nevertheless, the integrity and recommendations of CPGs are frequently compromised by conflicts of interest (COIs) between the

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study used a publicly accessible database containing all payments to physicians for lecturing, consulting and writing disclosed by over 70 pharmaceutical companies in Japan.
- ⇒ All authors of the clinical guidelines for major depressive disorder and bipolar disorder published by the Japanese Society of Mood Disorders were included in this study.
- ⇒ The study was unable to encompass other types of payments to the guideline authors, such as research, royalties, licensing fees, ownership interests and other miscellaneous fees.
- ⇒ There might be payments to the guideline authors that are under-disclosed and/or undisclosed by the pharmaceutical companies.

guideline authors and the pharmaceutical industry, spanning various medical specialties. In the field of psychiatry, there is documentation of ghostwriting by pharmaceutical industry<sup>3</sup> and widespread financial COIs between CPG authors and pharmaceutical companies.<sup>4–7</sup> Furthermore, studies showed that financial COIs are associated with a propensity for CPGs to make recommendations favourable to the healthcare industry in general.<sup>4 8</sup> This underscores the necessity for rigorous management of financial COIs among CPG authors, particularly in psychiatry.<sup>6 9 10</sup> A recent study demonstrated that 60% of panel members of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), fifth edition, text revision published by the American Psychiatry Association in 2022 received payments from the pharmaceutical industry.<sup>11</sup> As the DSM-5 is widely used as a standard for psychiatric disorders' definitions and symptom criteria, influencing treatment selection and approval of new drugs worldwide,<sup>11</sup> the widespread financial COIs among

the DSM-5 panel members are concerning. However, financial COIs among psychiatry experts are not unique to international criteria and CPGs: they may also be problematic among authors of regional or national CPGs, as these guidelines include specific treatment recommendations that can influence the clinical practice of clinicians in each country or region.

To enhance the transparency of financial relationships between healthcare professionals and pharmaceutical companies, members of the Japan Pharmaceutical Manufacturers Association have voluntarily disclosed their financial interactions with healthcare professionals and organisations.<sup>12</sup> Subsequent research using this disclosed information has revealed that the vast majority of CPG authors in Japan received personal payments during the CPG development across various medical specialties.<sup>12–22</sup> However, these financial relationships between pharmaceutical companies and Japanese CPG authors in psychiatry remain largely unexplored. Considering the patterns observed in previous studies, we hypothesised that financial COIs are widespread among psychiatry CPG authors in Japan.

## METHODS

### Study setting and participants

This cross-sectional analysis evaluated the extent and prevalence of financial interactions between pharmaceutical companies and authors of CPGs for major depressive disorder and bipolar disorder in Japan. Mood disorders, including bipolar disorder and major depressive disorder, are the most prevalent mental disorders in Japan. According to surveys conducted by the Japanese Ministry of Health, Labor, and Welfare, the number of patients with mood disorders has steadily increased over the past two decades, from 0.4 million in 1999 to 1.7 million in 2020.<sup>23</sup> The Japanese Society of Mood Disorders is responsible for the development of the sole CPGs for these conditions, namely Treatment Guideline I: Bipolar Disorder<sup>24</sup> and Treatment Guideline II: Major Depressive Disorder.<sup>25</sup> At the time of this study, the most recent versions were published in June 2020 and July 2019, respectively.

### Data collection

The Japan Pharmaceutical Manufacturers Association, representing over 70 major pharmaceutical companies, mandates the disclosure of payments for lectures, consultancy and writing to healthcare professionals, listing the recipients' names on company websites since 2013.<sup>26–28</sup> Despite annual updates and removal of previous years' data by these companies, the Medical Governance Research Institute has independently collected and disclosed this payment data on its public online database from 2016 to 2020, detailing individual physician and company names.<sup>29</sup>

Information about payments to CPG authors was extracted as follows. First, a list of the names of all CPG authors was created and saved as a comma separated

values (CSV) file. We then searched for their names in the payments database and extracted speaking, consulting and writing payments to physicians whose names matched the CPG authors' names from the database using Python programming code. After extracting the relevant payment information, a manual review was performed to identify and remove any payments made to physicians whose names were similar to those of the CPG authors but who were actually different individuals, as we previously noted.<sup>30–33</sup> Finally, we randomly selected five CPG authors (representing 11.1% of all authors) and manually searched the authors' names in the payments database to ensure that the payment data extracted using Python were accurate and complete.

As the pharmaceutical companies have not individually disclosed other categories of non-research payments such as travel and accommodation fees, food and beverage fees, royalties and licensing fees, and ownership interests, this study incorporated all personal payments for lectures, consultancy and writing from pharmaceutical companies to the CPG authors from 2016 to 2020, following the approach of prior studies.<sup>30 34–36</sup>

### Data analysis

The study calculated the proportion of CPG authors receiving personal payments and assessed per-author payment amounts, including median, IQR, mean and SD.

We performed a sensitivity analysis examining personal payments to the CPG authors from 2016 to 2019, to evaluate financial relationships between the CPG authors and pharmaceutical companies before the CPG publication.

Additionally, we also calculated the proportion of authors receiving payments, total payment amounts and median payment amounts by the roles of CPG authors.

Payments were converted from Japanese yen to US dollars using the 2020 average monthly exchange rate of 106.8 yen per US\$1. Data extraction and analyses were executed using Python V.3.9.12 (Python Software Foundation, Beaverton, Oregon, USA), Microsoft Excel, V.16.0 (Microsoft Corp., Redmond, Washington, USA) and Stata V.17.0 (StataCorp, College Station, Texas, USA).

### Patient and public involvement

No patients were involved in the preparation of this manuscript or the research project.

## RESULTS

The study included 33 authors for the bipolar disorder CPG and 42 for the major depressive disorder CPG. Of these authors, 30 individual physicians contributed to both CPGs. Consequently, a total of 45 unique CPG authors were analysed in this study.

Of all 45 authors, 42 (93.3%) received personal payments for lectures, consulting and writing from pharmaceutical companies between 2016 and 2020 (table 1). The total amount of personal payments received by the 55 pharmaceutical companies over the course of the

**Table 1** Summary of personal payments from pharmaceutical companies to psychiatry clinical practice guideline authors from 2016 to 2020

Variables	2016	2017	2018	2019	2020	4-year total amounts from 2016 to 2019	5-year total amounts from 2016 to 2020
Total amount of payments, US\$	959 289	872 245	769 649	743 295	697 170	3 344 478	4 041 648
Mean payments per author (SD), US\$	21 318 (27 281)	19 383 (24 380)	17 103 (24 797)	16 518 (21 363)	15 493 (22 353)	74 322 (93 767)	89 814 (111 760)
Median payments per author (IQR), US\$	11 992 (1877–24 498)	10 678 (2309–25 058)	5452 (1251–22 591)	4506 (834–26 830)	2701 (120–22 968)	44 688 (9325–93 393)	51 403 (9982–111 567)
Maximum payment amounts, US\$	120 927	100 635	114 153	107 553	94 362	411 745	506 108
Authors receiving personal payments (n=45), n (%)							
Any payments	39 (86.7)	41 (91.1)	36 (80.0)	37 (82.2)	34 (75.6)	42 (93.3)	42 (93.3)
>US\$10 000	24 (53.3)	23 (51.1)	20 (44.4)	22 (48.9)	19 (42.2)	32 (71.1)	33 (73.3)
>US\$50 000	6 (13.3)	5 (11.1)	4 (8.9)	2 (4.4)	3 (6.7)	21 (46.7)	23 (51.1)
>US\$100 000	1 (2.2)	1 (2.2)	1 (2.2)	1 (2.2)	0 (0)	10 (22.2)	15 (33.3)
>US\$250 000	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (4.4)	3 (6.7)

Japanese yen) were converted to US dollars (US\$) using the 2020 average monthly exchange rate of 106.8 yen per US\$1.

study period was US\$4041 648. The median payment per author was US\$51 403 (IQR: US\$9982–US\$111 567), and the mean payment was US\$89 814 (SD: US\$111 760), indicating a skewed distribution where a few authors received disproportionately high payments. Notably, 15 authors (33.3%) received in excess of US\$100 000 over the 5-year period. The majority of payments, constituting 65.8% (US\$2.7 million) of the total, were for lecturing fees, with consulting and writing compensations accounting for 25.8% (US\$1.0 million) and 8.3% (US\$337 255) in total, respectively. All two chairs of each CPG development committee received personal payments from pharmaceutical companies totalling US\$506 108 (the highest total) for the chair of the bipolar disorder CPG development committee and US\$97 288 for the chair of the major depressive disorder CPG development committee over the 5-year period.

Annual analysis revealed a decline in total payments to CPG authors from US\$959 289 in 2016 to US\$697 170 in 2020 (table 1). Correspondingly, the median annual payment per author decreased from US\$11 992 (IQR: US\$1877–US\$24 498) in 2016 to US\$2702 (IQR: US\$120–US\$22 968) in 2020. The proportion of authors receiving payments also fell from 91.1% in 2017 to 75.6% in 2020, yet a majority still received at least one personal payment annually. The sensitivity analysis of payments to the CPG authors from 2016 to 2019 showed that 42 (93.2%) authors received at least one payment from pharmaceutical companies. The total amounts of personal payments were US\$3 344 478 for the 4-year period. Median amounts of 4-year payments were US\$44 688 (IQR: US\$9325–US\$93 393) per author.

Payments from the top 5 and 10 pharmaceutical companies constituted 53.3% (US\$2.2 million) and 83.1% (US\$3.4 million) of the total payments from 2016 to 2020, respectively (table 2). Sumitomo Pharma made the largest total amounts of personal payments amounting to US\$695 031 (17.2%), followed by Eisai (10.1%, US\$408 323), MSD (8.8%, US\$357 526), Otsuka Pharmaceutical (8.8%, US\$354 638) and Takeda Pharmaceutical (8.3%, US\$337 370). Among these companies, MSD, Pfizer Japan and Meiji Seika notably reduced their personal payments from 2016 to 2020, whereas Eisai increased its payments from US\$45 779 in 2016 to US\$151 856 in 2020.

The two CPGs included three categories of author roles: writing authors, who were primarily responsible for developing the CPGs and making recommendations; supporting authors, who may have contributed to the CPG development in a limited capacity, such as identifying relevant evidence, performing literature reviews and making recommendations for specific situations; and guideline development committee authors, who did not directly contribute to the creation of CPGs and recommendations but critically reviewed the initial CPG drafts and revised the drafts and recommendations. The CPGs explicitly indicated that all of these authors were involved in the formulation of recommendations.

Table 2 Payment amounts by top 10 companies						
Variables	Payment amounts (%), US\$					
	2016	2017	2018	2019	2020	Overall
Total amounts of payments	959289 (100)	872245 (100)	769649 (100)	743295 (100)	697170 (100)	4041648 (100)
Top 10 companies making the largest payment amounts						
Sumitomo Pharma	180436 (18.8)	105531 (12.1)	127847 (16.6)	106975 (14.4)	174243 (25.0)	695031 (17.2)
	Effexor (venlafaxine, copromotion with Pfizer Japan) Erispan (fludiazepam) Excegran (zonisamide) Halomonth (haloperidol decanoate) Mystan (clobazam) Noritren (nortriptyline) Landosen (clonazepam) Latuda (lurasidone) Lonasen Tapes (blonanserin) Lullan (perospirone) Sediel (tandospirone) Serenace (haloperidol)					
Eisai	45779 (4.8)	78418 (9.0)	52244 (6.8)	80026 (10.8)	151856 (21.8)	408323 (10.1)
	Dayvigo (lemborexant) Spiropyran (spiperone)					
MSD	122880 (12.8)	83528 (9.6)	79420 (10.3)	57679 (7.8)	14020 (2.0)	357526 (8.8)
	Beisomra (suvorexant) Remeron (mirtazapine) Reslin (trazodone) Tetramide (mianserin)					
Otsuka Pharmaceutical	64794 (6.8)	73028 (8.4)	64161 (8.3)	86679 (11.7)	65976 (9.5)	354638 (8.8)
	Abilify (aripiprazole) Rexulti (brexpiprazole)					
Takeda Pharmaceutical	69017 (7.2)	78990 (9.1)	45019 (5.8)	71206 (9.6)	73138 (10.5)	337370 (8.3)
	Depas (etizolam) Eurodin (estazolam) Trintellix (vortioxetine)					
Pfizer Japan	78269 (8.2)	106973 (12.3)	65996 (8.6)	46086 (6.2)	14247 (2.0)	311571 (7.7)
	Amoxan (amoxapine) Desyrel (trazodone) Effexor (venlafaxin) Halcion (triazolam) Jzoloft (sertraline) Wypax (lorazepam) Mirtazapine (generic mirtazapine)					
Mitsubishi Tanabe Pharma	58501 (6.1)	47295 (5.4)	61056 (7.9)	59114 (8.0)	25789 (3.7)	251755 (6.2)
	Ciofektan (ciocapramine hydrochloride) Contomin (chlorpromazine) Levotomin (levomepromazine) Rize (clotiazepam)					

Continued

Table 2 Continued

Variables	Payment amounts (%), US\$					Overall	Major products used for bipolar and major depressive disorders (generic name)
	2016	2017	2018	2019	2020		
Eli Lilly Japan	56337 (5.9)	60899 (7.0)	59231 (7.7)	36314 (4.9)	38130 (5.5)	250910 (6.2)	Strattera (atomoxetine) Zyprexa (olanzapine) Zyprexa Zydis (olanzapine)
Meiji Seika Pharma	75608 (7.9)	53110 (6.1)	57841 (7.5)	27228 (3.7)	24235 (3.5)	238023 (5.9)	Depromel (fluvoxamine) Reflex (mirtazapine) Sycrest (asenapine) Aripiprazole (generic aripiprazole)
Mochida Pharmaceutical	35768 (3.7)	29405 (3.4)	31597 (4.1)	41378 (5.6)	17209 (2.5)	155356 (3.8)	Lexapro (escitalopram) Tecipul (setiptiline) Zolpidem (generic zolpidem)

Of three categories of author roles, all writing authors for both CPGs received personal payments from pharmaceutical companies between 2016 and 2020 (table 3), while lower proportion of supporting authors received payments than those for writing authors and guideline development committee authors in both CPGs. Median payment amounts were the highest for writing authors (US\$135 867 (IQR: US\$78 553–US\$187 806) for the bipolar disorder CPG and US\$87 610 (IQR: US\$16 945–US\$111 567) for the major depressive disorder CPG).

Disclosure of financial COIs in the CPGs was self-reported only by writing authors. There were no COI declaration statements for other types of authors. All authors (100%, 4 out of 4) of the bipolar disorder CPG and 85.7% (12 out of 14) of the major depressive disorder CPG authors declared financial COIs with pharmaceutical companies. Table 4 presents the types of financial COIs self-reported by the CPG authors within each respective guideline. Among the six categories extracted from the disclosure statements in the CPGs, compensation for lecturing was the most frequently declared (100% for the bipolar disorder CPG authors and 78.6% for the major depressive disorder CPG authors). This was followed by scholarship donations and participation in pharmaceutical company advisory boards. Although there were discrepancies in the number of writing authors receiving payments between industry-sponsored payment data and authors' self-declared COI statements by payment/declaration category (table 4), the lack of a specified declaration period precluded the assessment of the accuracy of each CPG author's self-reported COI statements against the payment data reported by the pharmaceutical companies.

## DISCUSSION

This cross-sectional analysis of publicly disclosed payment data from pharmaceutical companies provides a detailed examination of the extent and fraction of financial COIs among authors of the Japanese Society of Mood Disorders' Treatment Guideline I: Bipolar Disorder<sup>24</sup> and Treatment Guideline II: Major Depressive Disorder.<sup>25</sup> These CPGs are considered by physicians the authoritative and trustworthy sources for the treatment of bipolar disorder and major depressive disorder in Japan.<sup>37</sup> To the best of our knowledge, this is the first in-depth study to analyse the financial relationships between psychiatry CPG authors and pharmaceutical companies in Japan using pharmaceutical industry-disclosed data. The findings reveal that a large majority (93.3%) of CPG authors received personal payments for lecturing, consulting and writing, with a total sum of US\$4.0million between 2016 and 2020. The median payment per author was US\$51 403, with a minority, including the CPG chairperson, receiving substantial sums. Nearly all authors involved in writing the CPGs self-reported financial COIs with pharmaceutical companies. Notably, the bulk of personal payments to CPG authors came from companies that manufacture

**Table 3** Payments by author categories in the bipolar disorder and major depressive disorder clinical practice guidelines

Variables	Guideline disease category	
	Bipolar disorder	Major depressive disorder
Number of all authors, n	33	42
Role of guideline authors, n (%)		
Writing authors*	4 (12.1)	14 (33.3)
Supporting authors†	5 (15.2)	12 (28.6)
Guideline development committee authors‡	24 (72.7)	16 (38.1)
Payments by author roles		
Total payment amounts, US\$		
Writing authors*	532 717	1 659 595
Supporting authors†	12 140	930 986
Guideline development committee authors‡	2 548 718	1 448 508
Number of authors receiving payments by author roles, n (%)		
Writing authors*	4 (100)	14 (100)
Supporting authors†	4 (80.0)	10 (83.3)
Guideline development committee authors‡	22 (91.7)	16 (100)
Median payment amounts per author, US\$		
Writing authors*	135 867 (78 553–187 806)	87 610 (16 945–111 567)
Supporting authors†	1788 (715–1845)	60 120 (1573–142 732)
Guideline development committee authors‡	34 569 (11 588–184 068)	34 569 (14 331–149 624)

\*Writing authors directly contributed to the creation of guidelines.

†Supporting authors could have contributed to identifying relevant evidence and performing literature reviews.

‡Guideline development committee authors were not directly involved in the creation of the guidelines, but critically reviewed the contents and recommendations of the initial guideline draft and revised them if necessary.

antidepressants and sleeping pills in Japan. However, other CPG authors did not publicly disclose their financial COIs with these companies. When compared with previous studies and international COI policies for CPG authors, these findings raise concerns for physicians, patients, policymakers and other stakeholders within and beyond Japan.

The study highlights that over 93% of the authors of CPGs for bipolar disorder and major depressive disorder had financial relationships with pharmaceutical industry. Given the publication dates of the CPGs between 2019 and 2020, these financial relationships likely occurred during the development of the CPGs. This high percentage of authors receiving personal payments aligns with findings from other specialties within Japan,<sup>12–15 17–22 31 33 38–42</sup> where the proportion of CPG authors with personal payments ranged from 66.0% in obstetrics and gynaecology<sup>42</sup> to 96.3% in otolaryngology.

In contrast, research from other developed countries, such as the USA, reports lower proportions of CPG authors with financial COIs. For instance, 67% of authors for the DSM-5 mood disorders section disclosed financial COIs with the healthcare industry.<sup>9</sup> Additionally, a study by Cosgrove *et al* found that only 18% of major depressive disorder CPG authors across eight countries had financial COIs with

pharmaceutical companies.<sup>4 10</sup> In Canada, half of the authors of the CPG for depressive disorder developed by the Canadian Network for Mood and Anxiety Treatments reported financial COIs with the healthcare industry.<sup>43</sup> Other specialties in the USA also showed lower percentages, with 53% of gastroenterology CPG authors<sup>44</sup> and 59.3% of urology CPG authors receiving personal and/or research payments.<sup>45</sup> Moreover, Mooghami *et al* reported that 73.7% of physician CPG authors in the USA received personal and/or research payments from healthcare companies.<sup>46</sup> The higher proportion of CPG authors receiving payments in Japan can be attributed to the fact that most professional medical societies in Japan have implemented less transparent COI policies. This is in line with our previous studies reporting on the matter.<sup>18 20</sup>

Furthermore, this investigation revealed that a select group of CPG authors, including the chairperson, received substantial personal payments from pharmaceutical companies. Only authors involved in writing the CPGs were mandated to declare their financial COIs, while other contributors did not publicly disclose any financial COIs with these companies. These results indicate that authors of Japanese CPGs for bipolar disorder and major depressive disorder clearly violate international COI policies on CPG

**Table 4** Financial conflicts of interest self-declared by the guideline authors

Variables	Bipolar disorder (n=4)	Major depressive disorder (n=14)
Number of authors self-reporting conflicts of interest by category		
Speaking compensation	4 (100)	11 (78.6)
Scholarship donation	3 (75.0)	6 (42.9)
Consulting payments	0 (0)	4 (28.6)
Collaborative research funds	1 (25.0)	2 (14.3)
Advisory board	2 (50.0)	1 (7.1)
Contracted research funds	1 (25.0)	0 (0)
Any category	4 (100)	12 (85.7)
Industry-reported payments to authors		
Number of writing authors receiving payments from 2016 to 2020 by payment category, n (%)		
Lecturing payments	4 (100)	14 (100)
Consulting payments	4 (100)	12 (85.7)
Writing payments	4 (100)	9 (64.3)
Any payment category	4 (100)	14 (100)
Total payment amounts to writing authors from 2016 to 2020, US\$		
Lecturing payments	399929	1073071
Consulting payments	101805	430660
Writing payments	30983	155864
Proportion of authors reporting conflicts of interest were number of authors reporting conflicts of interest to the total number of writing authors.		

development in several respects. The US National Academy of Medicine's 2011 report and the Guidelines International Network advocate for a majority of CPG authors to be free from financial COIs.<sup>1 2</sup> These policies also stipulate that the chairperson of CPG development should not hold any COIs.<sup>1 2</sup> The Guideline Panel Review Working Group's criteria for red flags, as published in the *British Medical Journal* in 2013, indicate that financial COIs held by a CPG chairperson and multiple authors are significant concerns for the trustworthiness of the CPGs.<sup>47</sup> The prevalence of COIs exceeding 93% in this study is not a marginal discrepancy but a significant deviation from these standards, casting doubt on the objectivity and reliability of the guidelines.

Moreover, the study revealed that substantial payments were made by pharmaceutical companies marketing new antidepressants and sleep aids in Japan. For example, Sumitomo Pharma, the top payer, produces lurasidone (brand name: Latuda), which was approved for bipolar disorder and schizophrenia in 2020, and has been marketing venlafaxine hydrochloride (brand name: Effexor)

with Pfizer Japan since 2018. MSD, another major payer, produces suvorexant (brand name: Belsomra), the world's first orexin receptor antagonist used for insomnia. Otsuka Pharmaceutical is known as one of the major manufacturers of atypical antipsychotics, such as aripiprazole (brand name: Abilify) and brexpiprazole (brand name: Rexulti), which are the most widely prescribed atypical antipsychotics in Japan.<sup>48</sup> Despite these financial ties between CPG authors and pharmaceutical companies manufacturing relevant drugs, the Japanese Society of Mood Disorders actively endorses adherence to these CPGs.<sup>49 50</sup> Given that the CPGs for bipolar disorder and major depressive disorder include pharmacotherapy recommendations that include medications from these companies, it is imperative that the close financial ties between CPG authors and the pharmaceutical industry be addressed. We strongly recommend the Japanese Society of Mood Disorders to enforce more transparent and stringent COI management strategies in the CPG development process for bipolar disorder and major depressive disorder to ensure the integrity and credibility of these guidelines.

### Limitations

This study is subject to several limitations. Primarily, the study's focus on CPGs for bipolar disorder and major depressive disorder in Japan would limit the generalisability of our findings to other medical fields or countries. Additionally, the payment data were derived from a secondary source, the Medical Governance Research Institute's database, which contains payment information from member companies of the Japan Pharmaceutical Manufacturers Association for the period 2016–2020.<sup>27 51</sup> Absent legal mandates for precise payment disclosures in Japan, the potential for inaccuracies or under-reporting in the database cannot be discounted. Furthermore, the voluntary nature of these disclosures means that financial interactions between CPG authors and non-disclosing pharmaceutical entities may remain undetected. Nevertheless, given that the member companies account for 80% of the market share for drugs and medical products in Japan,<sup>52</sup> the impact of financial relationships between the CPG authors and uncovered companies would be minimised.

### Conclusions

More than 93% of the authors of the Treatment Guidelines for Bipolar Disorder and Major Depressive Disorder developed by the Japanese Society of Mood Disorders received personal payments for the reimbursement of their lecturing, consulting and writing activities from the pharmaceutical companies manufacturing related drugs. The total amounts of personal payments to the CPG authors were more than US\$4.0 million over the 5 years. Nevertheless, the financial COIs were only declared by the limited group of CPG authors. Further transparent and rigorous COI management strategies must be warranted in the Japanese Society of Mood Disorders.

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**Patient consent for publication** Not applicable.

**Ethics approval** As a retrospective analysis of publicly available data, this study was classified as non-human subjects research and did not require institutional review board approval in accordance with the Japanese Ministry of Health, Labor, and Welfare's Ethical Guidelines for Medical and Health Research Involving Human Subjects. This study was reported according to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available on reasonable request. All data used in this study are available from Yen For Docs database run by Medical Governance Research Institute (<https://yenfordocs.jp/>) and each pharmaceutical companies belonging to the Japan Pharmaceutical Manufacturers Association. Due to privacy protection, payment data of individual CPG authors will be available from the corresponding author on reasonable request.

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