

Ghostwriting prevalence among AMWA and EMWA members (2005 to 2014)

Cindy W. Hamilton¹ and Adam Jacobs²

¹ Virginia Commonwealth University School of Pharmacy, Richmond, VA, USA and Hamilton House Medical and Scientific Communications, Virginia Beach, VA, USA

² Premier Research, Wokingham, UK

Correspondence to:

Cindy W. Hamilton, 844 Quail Point Cove, Virginia Beach VA 23454 USA; Phone: (757) 481-2799; Email: cindy@hamiltonhouseva.com

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Abstract

Introduction: Ghostwriting, defined as undisclosed substantial contributions by medical writers, is considered to be unethical by the American Medical Writers Association (AMWA), EMWA, and other professional associations.

Methods: To determine the prevalence of ghostwriting among medical writers coincident with educational campaigns, we initiated a Web-based, self-administered, confidential survey of AMWA and EMWA members in 2005 and repeated it in 2008, 2011, and 2014. We focused on manuscripts to which survey participants had made substantial contributions and now report final findings from all surveys.

Results: The number of participants with valid data was 843 in 2005, 773 in 2008, 620 in 2011, and 410 in 2014. The mean weighted percentage of manuscripts with undisclosed contributions was 61.8% (95% confidence interval [CI], 59.0% to 64.6%) in 2005, 41.7% (95% CI, 38.6% to 44.7%) in 2008, 33.0% (95% CI, 29.7% to 36.3%) in



2011, and 34.4% (95% CI, 30.2% to 38.5%) in 2014. In univariate analyses, participants familiar with more authorship guidelines were less likely to have undisclosed contributions; regression coefficients ranged from -6.6% (95% CI, -8.5% to -4.8%) in 2005 to -10.6% in 2014 (95% CI, -13.1% to -8.0%); all *P* values <0.001.

Conclusions: The 44% decrease in the rate of manuscripts with undisclosed contributions between 2005 and 2014 is encouraging, but the 34% rate of ghostwriting among medical writers remains unacceptable. While these findings

should *not* be generalised to the overall prevalence of ghostwriting in the literature (because survey participation was restricted to AMWA and EMWA members who made substantial contributions to manuscripts), our findings suggest the need for further collaborative efforts to promote transparency and to conduct research about how to achieve best practices in medical publication.

“A lack of transparency results in distrust and a deep sense of insecurity.”
– Dalai Lama

Ghostwriting, defined as undisclosed substantial contributions by medical writers to manuscripts published in medical journals, has long been recognised as unethical.¹ Without transparency, readers are denied the opportunity to judge the potential influence by groups with special interests and other conflicts. Allegations of bias and other transgressions have a domino-like effect and tarnish not only the reputations of medical communicators but also the entire profession of medical communication as well as their sponsors.²⁻⁴

During the last 10 to 15 years, professional and trade organisations representing medical writers, journal editors, and the pharmaceutical industry have attempted to clarify and expand authorship guidelines, including how to distinguish the legitimate role of professional medical writers from that of ghostwriters. For example, the American Medical Writers Association (AMWA) adopted a position statement on the contributions of medical writers to scientific publications in 2002,⁵ and the European Medical Writers Association (EMWA) published more detailed guidelines in 2005.⁶ In 2005, the International Society of Medical Publication Professionals (ISMPP) was founded to enhance medical publication integrity and transparency and to improve standards and best practices. Recently, ISMPP supported the development and publication of the third version of the Good Publication Practice (GPP3) for communicating industry-sponsored research.⁷ The International Committee of Medical Journal Editors (ICMJE) increased the number of authorship criteria and made them more specific.⁸⁻¹² The Pharmaceutical Research and Manufacturers of America (PhRMA)¹³ also updated their guidelines. These professional organisations now agree that medical writing assistance is acceptable provided that both substantial contributions to manuscripts and any potential conflicts of interest are disclosed.

Coincident with efforts to clarify guidelines, medical writing organisations launched campaigns to educate stakeholders about transparency and other best practices. For example, AMWA appointed a task force in 2001,¹⁴ which recommended a stepwise

process beginning with publications and presentations to educate the medical community about the contributions of medical writers to scientific communications.¹⁵ To further improve awareness among members, AMWA subsequently developed new ethics workshops and, in 2010, began requiring an ethics workshop for completion of each AMWA certificate. EMWA and ISMPP also undertook educational campaigns.

Ghostwriting is presumed to be widespread, but a recent systematic review has shown that estimates have often been based on anecdotal evidence, statements taken out of context, and confusion about authorship criteria.¹⁶ Furthermore, the prevalence was unknown among medical writers in the early 2000s. To determine the prevalence of ghostwritten manuscripts among AMWA and EMWA members before, during, and after implementation of educational initiatives, we initiated a series of surveys in 2005. Our secondary objective was to determine the prevalence of medical writers' requests for acknowledgment and variables associated with acknowledgment. The preliminary results from each survey have been previously presented, usually as conference posters or presentations.¹⁷⁻²⁰ The purpose of this article is to report complete and final findings from all four surveys.

Methods

The methods have been reported previously¹⁸ and are reproduced with modifications as needed to accommodate more recent surveys. A series of surveys was conducted over 3-week periods in October or November of 2005, 2008, 2011, and 2014, using an Internet survey tool (Survey Monkey; www.surveymonkey.com). Survey methods were identical, apart from the addition of a single question from 2008 onward as described in the next paragraph. All AMWA and EMWA members were invited by email to participate in the survey; one or two email reminders were sent. No incentives were offered. To encourage participation, we promised that responses would be anonymous and the survey would take only 5 min to complete.

We developed the survey instrument

using repeated rounds of pilot testing among groups of medical writers. The 2005 survey instrument comprised 13 multiple-choice questions and one open-ended question about the practices and experiences of medical writers who make substantial contributions to manuscripts intended for submission to medical journals (see Supplementary Material). Subsequent surveys were identical to the 2005 survey, except for the addition of a question about the type of manuscript to which participants had made substantial contributions (question 11). Some questions allowed for internal validation of responses. For example, participants were considered to have invalid data if they indicated that 90% or 100% of manuscripts did not disclose their substantial contributions (question 3), that they always or usually requested acknowledgment when they made substantial contributions (question 7), and that this request was always or usually granted (question 8). In other words, contradictory responses to question 3 compared with questions 7 and 8 were considered to be invalid. Participants with invalid data were excluded from the analyses. If participants answered any parts of question 5 about familiarity with relevant guidelines but did not answer whether or not they were familiar with any specific guideline, then we assumed that they were not familiar with that guideline. Otherwise, missing data were ignored with no attempt at imputation.

All statistical analyses were done using Stata version 8.2 or later (StataCorp, College Station, Texas). The primary analysis was calculation of mean percentage of manuscripts containing undisclosed contributions in the last year (question 3) weighted in proportion to the number of manuscripts to which participants had made substantial contributions and that were intended for submission to medical journals during an average year (question 2). The response category >20 manuscripts/year was assumed to be 25 manuscripts/year. The 95% confidence interval (95% CI) was calculated assuming that responses were normally distributed. An unweighted mean and 95% CI were also calculated similarly. The assumption behind the calculation of 95%



CIs was checked by calculating bootstrap confidence intervals as a sensitivity analysis. Because there was good agreement between the normal distribution CIs and the bootstrap CIs, the bootstrap CIs are not presented here.

Secondary analyses were done to test the null hypothesis that familiarity with relevant guidelines (question 5) was not associated with frequency of undisclosed contributions. Linear regression analysis was used to test whether the percentage of undisclosed contributions was associated with the number of guidelines with which the participant was familiar (maximum 5, minimum 0).

Further exploratory analyses investigated the potential association between undisclosed contributions and other variables (i.e., number of manuscripts to which participants had made substantial contributions during an average year, familiarity with each of the five guidelines specifically, type or place of employment, number of years of experience in medical communication, and membership in professional organisations). These associations were investigated in an exploratory sense in both univariate and stepwise multivariate analyses, with thresholds of $P > 0.1$ for removing variables and $P < 0.05$ for re-entry.

Results were analysed in an identical manner for all surveys, except that the proportion of review papers was included in

the multivariate analyses as an extra independent variable in the 2008, 2011, and 2014 data. No formal statistical comparisons were made between surveys because this was not a pre-specified objective when the 2005 survey was planned.

Results

The survey participation rate ranged from 28% (1537 participants/5463 email invitations) in 2005 to 8% (464/5664) in 2014, which suggests that both the percentage and number of survey participants decreased over time (Table 1). Participants represented a wide variety of types of employment, years of experience, and numbers of manuscripts – with no obvious changes over time (Table 2). In each survey year, the largest single employment category was freelance. Consistent with the relative sizes of the organisations, more participants were members of AMWA than EMWA. In

2014, 52 participants reported that they were not members of either organisation and were excluded from further analysis.

The mean, weighted percentages of manuscripts with undisclosed contributions were 61.8% (95% CI, 59.0% to 64.6%) in 744 participants in 2005 and 34.4% (95% CI, 30.2% to 38.5%) in 354 participants in 2014, for an overall decrease of 44.3% (Figure 1). The mean, unweighted percentages of manuscripts with undisclosed contributions were 58.8% (95% CI, 55.8% to 61.8%) in 750 participants in 2005 and 26.4% (22.4% to 30.4%) in 355 participants in 2014.

Survey participants' experience of and practice in requesting acknowledgment were generally consistent with trends in the percentages of manuscripts with undisclosed contributions (Table 3). For example, the percentage of participants who reported a decreased prevalence of ghost-

Table 1. AMWA and EMWA members who participated in the surveys

Participants	Number (%)			
	2005	2008	2011	2014
Invitations sent by email	N = 5463	N = 6563	N = 6084	N = 5664
All participants	1537 (28)	929 (14)	725 (12)	464 (8)
Contributing participants	943 (17)	839 (13)	658 (11)	437 (8)
Participants with valid data	843 (15)	773 (12)	620 (10)	410 (7)
Member of AMWA or EMWA ^a	843 (15)	773 (12)	620 (10)	358 (6)

^a Participants could be a member of both AMWA and EMWA.

Our survey findings provide unique insights into the
prevalence of ghostwriting among medical writers
during the last decade.

writing was 39% (270/688) in 2005 and 64% (217/339) in 2014. The percentage of participants who requested disclosure of their contributions was 50% (370/747) in 2005 and 79% (282/357) in 2014. The percentage whose requests for disclosure were granted was 83% (304/365) in 2005 and remained high in 2014 (95% [267/281]). The percentage of participants who encouraged authors and other contributors to follow ICMJE guidelines was 55% (332/609) in 2005 and 81% (276/341) in 2014.

Reported familiarity with guidelines appeared to increase over time (Figure 2). For example, the percentage of participants who were familiar with ICMJE guidelines was 54% (399/735) in 2005 and 85% (304/356) in 2014.

In univariate analyses of data from each survey year, participants who were familiar with more guidelines were less likely to have undisclosed contributions. Specifically, the

regression coefficients for the change in percentage of undisclosed contributions for familiarity with each additional guideline was -6.6% (95% CI, -8.5% to -4.8%) in 2005, -7.7% (95% CI, -9.6% to -5.8%) in 2008, -7.7% (95% CI, -9.5% to -5.8%) in 2011, and -10.6% in 2014 (95% CI, -13.1% to -8.0%; all P values <0.001; data not shown in tables). This means that writers made, on average, 10.6% fewer undisclosed contributions for each guideline with which they were familiar in 2014, and the interpretation of the regression coefficients is similar in other years.

In the stepwise multivariate analyses, ghostwriting or disclosures were associated with eight variables in at least two survey years (Table 4). Ghostwriting was associated with making substantial contributions to more than 10 papers per year (relative to only one to two papers per year; $P < 0.05$ in 2005, 2011, and 2014) and to review-type articles (relative to original-research articles;

$P < 0.05$ in 2008 and 2011). Similarly, ghostwriting was associated with being a freelance writer (relative to being employed by a hospital, university, or medical school; $P \leq 0.01$ in 2005 and 2008). Disclosure was associated with familiarity with guidelines from AMWA, EMWA, GPP, ICMJE, and PhRMA. Of these, ICMJE was significant in all four survey years ($P < 0.001$), with regression coefficients ranging from -14.0% (95% CI, -20.4% to -7.6%) in 2005 to -20.5% (95% CI, -31.5% to -9.4%) in 2014.

Discussion

Our survey findings provide unique insights into the prevalence of ghostwriting among medical writers during the last decade. The mean, weighted percentage of manuscripts with undisclosed contributions was 62% in 2005, fell sequentially in the next two surveys to a low of 33% in 2011, and persisted at 34% in 2014. While the rate remained unacceptably high in 2014 and

Table 2. Characteristics of participants with valid data across survey years

Characteristic	Number of Responses (%)			
	2005 N = 746	2008 N = 662	2011 N = 523	2014 N = 358
Employment				
Self-employed or freelance	289 (39)	260 (39)	240 (46)	158 (44)
Pharmaceutical, biotech, or medical device company	208 (28)	154 (23)	106 (20)	69 (19)
Medical communication, medical education, or PR	112 (15)	131 (20)	67 (13)	52 (14)
Hospital, university, or medical school	77 (10)	57 (9)	62 (12)	49 (14)
Contract research organization	32 (4)	32 (5)	21 (4)	14 (4)
Other	28 (4)	28 (4)	27 (5)	16 (4)
Years of experience	N = 737	N = 657	N = 514	N = 350
0–2	85 (12)	87 (13)	49 (10)	41 (12)
3–5	158 (21)	157 (24)	88 (17)	66 (19)
6–10	208 (28)	160 (24)	117 (23)	77 (22)
11–15	106 (14)	115 (18)	99 (19)	56 (16)
16–20	71 (10)	55 (8)	61 (12)	42 (12)
>20	109 (15)	83 (13)	100 (19)	68 (19)
Number of manuscripts in an average year	N = 776	N = 691	N = 559	N = 356
1–2	169 (22)	131 (19)	95 (17)	41 (12)
3–5	275 (35)	229 (33)	189 (34)	133 (37)
6–10	184 (24)	188 (27)	154 (28)	93 (26)
>10	148 (19)	143 (21)	121 (22)	89 (25)
Membership	N = 736	N = 647	N = 520	N = 358
AMWA	631 (86)	500 (77)	424 (82)	252 (70)
EMWA	127 (17)	166 (26)	110 (21)	121 (34)

PR, public relations

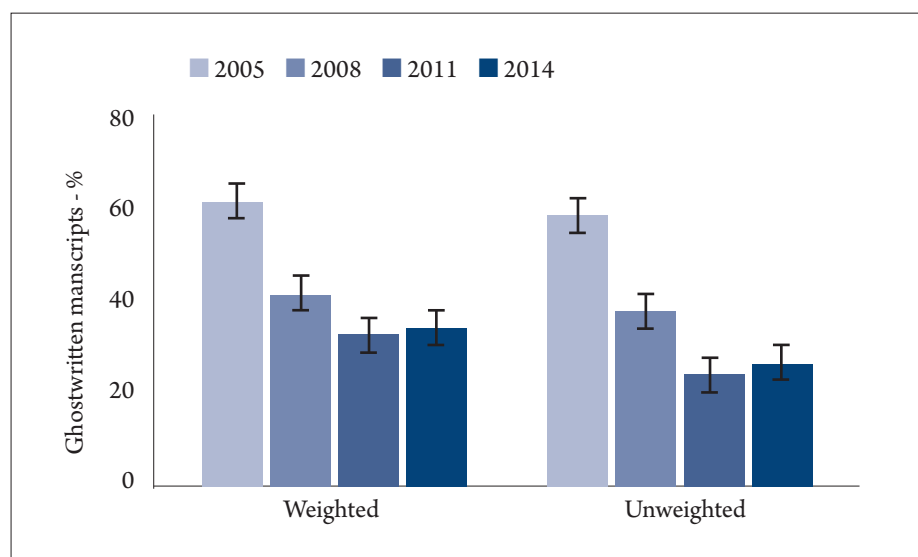


Figure 1. Prevalence of ghostwriting across survey years. Error bars represent 95% CIs.

failed to sustain the improvement seen in the first three surveys, the overall decrease was 44% between the first and last surveys. This drop is noteworthy, particularly when combined with the results of regression analyses. There were strong correlations between disclosures and familiarity with guidelines in both univariate and stepwise multivariate analyses, some of which persisted throughout the four surveys. For example, disclosure was associated with familiarity with ICMJE guidelines, with regression coefficients suggesting that participants familiar with ICMJE guidelines had 14% to 21% fewer undisclosed

contributions compared with those who were not familiar with these guidelines. Decreases in the rates of undisclosed contributions between 2005 and 2008 and again between 2008 and 2011 coincided with international efforts to clarify publication guidelines^{5,6,8-11,15,21} and increase awareness of them.^{14,15,22}

The high level of guideline awareness in our 2014 survey is consistent with that in other recently reported surveys.^{23,24} For example, the Medical Publishing Insights and Practices Initiative (MPIP) evaluated familiarity with and reliance on authorship guidelines among four stakeholder

groups.²³ Nearly 500 people, with good representation in each group, participated in the online survey. Most medical writers (88%), publication professionals (97%), and journal editors (89%) were aware of ICMJE authorship criteria; however, only 49% of clinical investigators were familiar with these guidelines. Also, medical writers (51%), publication professionals (70%), and journal editors (59%) were more likely to rely on these guidelines than clinical investigators (28%).²³ Like MPIP, the Global Publication Survey studied current practices and implementation of publication guidelines among nearly 500 stakeholders,²⁴ especially employees at medical communication agencies (51%) and at pharmaceutical or device companies (30%). Again, the majority of both agency and industry participants routinely referred to ICMJE for guidance on ethical practice (93%).²⁴ In 2014, 85% of our survey participants were familiar with ICMJE guidelines. Also in our 2014 survey, 79% of participants requested disclosure of their contributions and 95% reported that their requests for disclosure were granted.

It is intriguing that writers who contributed to larger numbers of manuscripts

Table 3. Experience of and practice in requesting acknowledgment

Type of experience or practice	Number (%)			
	2005	2008	2011	2014
Perceived change in prevalence of ghostwriting in last 5 years	N = 688	N = 651	N = 526	N = 339
Decreased to none	20 (3)	72 (11)	95 (18)	51 (15)
Decreased but still occurs	250 (36)	340 (52)	275 (52)	166 (49)
No change	360 (52)	198 (30)	137 (26)	107 (32)
Increased	58 (8)	41 (6)	19 (4)	15 (4)
Request acknowledgment	N = 747	N = 665	N = 533	N = 357
Always	187 (25)	288 (43)	309 (58)	205 (57)
Usually	183 (24)	168 (25)	118 (22)	77 (22)
Rarely or never, but I am not opposed	354 (47)	194 (29)	99 (19)	73 (20)
Rarely or never because I am opposed	23 (3)	15 (2)	7 (1)	2 (1)
Requests for acknowledgment granted	N = 365	N = 466	N = 424	N = 281
Always	127 (35)	224 (48)	257 (61)	173 (62)
Usually	177 (48)	185 (40)	142 (34)	94 (33)
Rarely or never	61 (17)	57 (12)	25 (6)	14 (5)
Encourage others to follow ICMJE guidelines	N = 609	N = 598	N = 495	N = 341
Yes	332 (55)	426 (71)	401 (81)	276 (81)
No	277 (45)	172 (29)	94 (19)	65 (19)

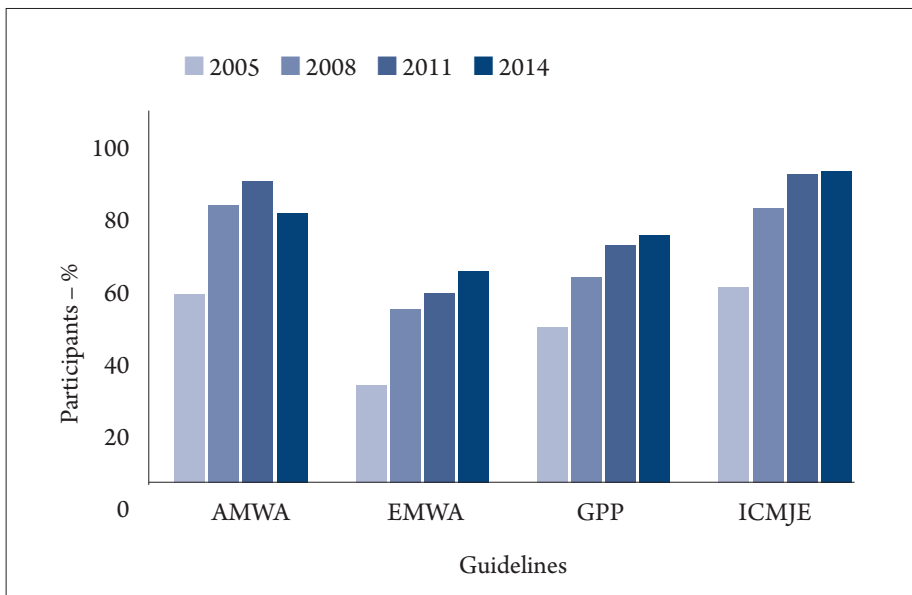


Figure 2. Increased familiarity with guidelines across survey years^a

^a Survey question: "Are you familiar with the content of the following guidelines? Check all that apply."

were more likely to have undisclosed contributions than less prolific writers. This explains why the weighted proportion of undisclosed contributions was slightly higher than the unweighted proportion, as participants' responses were weighted in proportion to the number of manuscripts. It is possible that some contributions made by prolific writers were not substantial and, for example, were limited to copy editing. As such, those contributions may have been less deserving of acknowledgment than

more substantial contributions and perhaps may not have met the traditional definition of ghostwriting. Substantial contribution, however, is undefined in most guidelines, so interpretation can often be a grey area. Alternatively, contributing to larger numbers of manuscripts may indeed be correlated with ghostwriting.

While our survey findings do not prove cause and effect, the evidence can be used to generate hypotheses that merit further evaluation and that might have practical

implications. For example, a recent survey²⁵ indicates that the Certified Medical Publication Professional (CMPP) credential is a surrogate marker for broader and more current knowledge of medical publication guidelines. This is not surprising because medical writers would be expected to be aware of guidelines if they had invested in the certification examination, achieved a passing score, and maintained the credential. If future research confirms that certification and other variables are associated with transparency and other types of ethical behavior, then employers, contractors, and authors could use these findings to enhance their criteria for selecting medical writers. In addition, these findings may inspire companies to encourage or even require their writers to take advantage of educational opportunities and to audit freelance writers for awareness of and compliance with best practices.²⁶

Our findings have additional implications for different stakeholders. Professional organisations should escalate their efforts to educate members about the dangers of ghostwriting and other unethical practices that can damage the entire profession and can embroil authors and funders in

Table 4. Stepwise multivariate linear regression analysis^a

Variable	2005		2008		2011		2014	
	PE (95% CI)	P value	PE (95% CI)	P value	PE (95% CI)	P value	PE (95% CI)	P value
>10 papers/year ^b	11.4 (2.2 to 20.5)	0.02	9.6 (-0.6 to 19.7)	0.06	26.2 (16.4 to 36.1)	<0.001	23.9 (10.5 to 37.2)	<0.001
Mostly reviews ^c	Not included ^d	NA	14.1 (5.0 to 23.1)	0.002	12.0 (2.2 to 21.8)	0.02	Not included	NA
Freelance ^e	27.8 (17.6 to 38.0)	<0.001	14.9 (3.2 to 26.6)	0.01	5.3 (-4.3 to 15.0)	0.28	10.0 (-1.7 to 21.7)	0.09
Familiarity with the following guideline								
AMWA	Not included	NA	-8.8 (-16.0 to -1.6)	0.02	Not included	NA	-8.7 (-16.9 to -0.5)	0.04
EMWA	-8.2 (-15.0 to -1.4)	0.02	-6.5 (-13.4 to 0.4)	0.07	-7.5 (-13.6 to -1.5)	0.02	Not included	NA
GPP	Not included	NA	-14.0 (-21.6 to -6.4)	<0.001	Not included	NA	-18.4 (-27.2 to -9.6)	<0.001
ICMJE	-14.0 (-20.4 to -7.6)	<0.001	-17.1 (-24.7 to -9.5)	<0.001	-15.7 (-23.6 to -7.9)	<0.001	-20.5 (-31.5 to -9.4)	<0.001
PhRMA	-7.3 (-14.4 to -0.1)	<0.05	Not included	NA	-15.4 (-21.8 to -9.0)	<0.001	Not included	NA

NA, not applicable; PE, probability estimate, where positive values indicate the variable is associated with ghostwriting and negative values indicate the variable is associated with disclosure.

^a $P < 0.05$ in at least two surveys.

^b Relative to one to two papers/year.

^c Relative to contributions to manuscripts conveying original data; this question was not included in the 2005 survey.

^d Not included in multivariate analysis usually because not significant ($P > 0.1$) in univariate analysis (see footnote c).

^e Employment type with hospital, university, or medical school as the reference value.

controversy and potential legal action. Members should commit to lifelong learning practices as guidelines are likely to continue evolving. Medical writers who refuse to ghostwrite can take heart in knowing that their requests for acknowledgment are likely to be granted.

Our findings should *not* be generalised to the overall prevalence of ghostwriting in the medical literature because survey participation was restricted to AMWA and EMWA members who had made substantial contributions to manuscripts. Although the proportion of this subset to the overall prevalence is unknown, we can make an estimate based on another survey in which medical writing assistance was declared in 6% of publications in 1000 high-ranking journals.²⁷ If we assume that medical writers do not disclose one-third of their contributions and that the ratio of undisclosed to disclosed contributions is therefore 1:2, then the combined findings from our survey and the previous survey²⁷ suggest an overall ghostwriting prevalence of approximately 3% (9% – 6%). This estimate, however, should be interpreted with caution because it is based on data from different sources. On the other hand, this estimate is closer to that reported in previous, well-designed, serial surveys of authors who had published in six prestigious, peer-reviewed journals; the prevalence was 1.4% in 1996 and 0.16% in 2008.^{28,29}

Our survey had additional limitations. The most important limitation is the potential for selection bias of both participants (e.g., self-selection) and their survey responses. Although respectable for an email survey without incentives, our response rate was low enough that participants might not be representative of all AMWA and EMWA members, who in turn might not be representative of all medical writers. The low response rate is partly attributable to the previously mentioned restriction to a subset of AMWA and EMWA members. The proportion of AMWA and EMWA members who make substantial contributions to manuscripts is unknown; however, 26.8% (108/403) of AMWA members reported that their

primary area of work was scientific publications in a recent survey (data on file). If this proportion is generalisable to EMWA and is extrapolated to the entire sample, then 1518 medical communicators (5664 x 26.8%) were eligible for our survey in 2014. This estimate suggests a participation rate of 28.8% (437/1518 x 100%), which is better than the rate derived from the entire membership of AMWA and EMWA (see Table 1). The large decrease between 2005 and 2008 is probably due to clarification of the survey invitation to better define target participants. We cannot explain further decreases in response rates in 2011 and 2014. The number of participants probably would have been higher if ISMPP members had been invited, but our first survey predated that organisation. To maintain consistency and allow for comparison across survey years, we did not invite ISMPP to participate in subsequent surveys. As the survey was anonymous, we do not know how many respondents in more recent surveys had also participated in previous surveys. Therefore, it is not possible to know whether the observed decrease in ghostwriting represents individual writers changing their practices, a new cohort of writers who are less likely to make undisclosed contributions than writers working in earlier years, or a combination of both.

Another limitation is that data were self-reported and based on recall. As such, participants familiar with ethical guidelines may have been tempted to answer survey questions in way suggesting ethical practices, or participants may have forgotten times when they did not observe ethical practices. It is possible that AMWA and EMWA members are more likely to follow guidelines than medical writers who are not members of these organisations and that those who devote time to survey participation are also more likely to devote time to learning ethical guidelines and complying with them. These hypotheses suggest that our results might underestimate the prevalence of ghostwriting.

Another limitation is the deliberate avoidance of the word “ghostwriting”, which

was excluded from the survey invitation to prevent being trapped by email security filters. Another reason for avoiding this word was an attempt to prevent confusion because the term is frequently misunderstood and potentially ambiguous. Unfortunately, these efforts necessitated the use of lengthy, often awkward wording, which might have led to unintended answers to survey questions about the prevalence of ghostwriting. At the same time, our survey included questions designed to identify inconsistent responses; fewer than 2% of participants were eliminated because of invalid responses.

Author comments

Our survey findings are bittersweet. The 44% decrease in the rate of manuscripts with undisclosed contributions between 2005 and 2014 is encouraging, but the 34% rate of ghostwriting remains unacceptably high. Furthermore, the failure to sustain the improvement seen in the first three surveys is not only disappointing but also perplexing. Clearly, there is no room for complacency. We challenge our medical writer colleagues and professional organisations to intensify collaborative efforts to promote transparency and to conduct research about how to achieve best practices in medical publication.

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Declarations

Both authors declare that we: 1. have provided or do provide ethical medical writing services to academic, biotechnology, or pharmaceutical clients, 2. have no financial relationships that may be relevant to the submitted work; and 3. are active in national and international not-for-profit associations that encourage ethical medical writing practices. No external sponsors were involved in the preparation of this manuscript, and no external funding was used.

Author information

A medical writer since 1982, Cindy Hamilton, PharmD, ELS was President of AMWA from 2008 to 2009. She has promoted ethics within the profession by developing and leading ethics workshops, conducting research, and being a founding member of the Global Alliance of Publication Professionals (GAPP; www.gappteam.org). Adam Jacobs was previously a medical writer, and was president of EMWA in 2004 to 2005. He now works as a medical statistician at Premier Research. He still teaches regular workshops for EMWA on statistical topics.

Supplementary Material Survey Instrument

1. Do you contribute substantially to the writing or editing of manuscripts prepared on behalf of authors and intended for submission to medical journals? ☐ yes ☐ no

[If the answer to question 1 is yes, the participant will be routed to question 2. If the answer is no, the participant will be routed to question 14.]

2. During an average year, to how many manuscripts intended for submission to medical journals do you make substantial contributions? _____ (1, 2, 3, ... , >20)
3. In the last year, what percentage of manuscripts submitted for publication did not contain disclosure of your substantial contribution as a medical writer or editor, either in a byline, as an author, or in an acknowledgment? _____ % (0% – 100%, increments of 10)
4. In your experience, how has the frequency of undisclosed substantial contributions changed during the last 5 years?
☐ decreased to none
☐ decreased but still occurs
☐ no change
☐ increased
5. Are you familiar with the content of the following guidelines?
 American Medical Writers Association's (AMWA's) Position Statement (www.amwa.org)
☐ yes ☐ no
 European Medical Writers Association's (EMWA's) Guidelines (www.emwa.org/Mum/EMWAguidelines.pdf)
☐ yes ☐ no
 Good Publication Practice (GPP) for Pharmaceutical Companies (<http://www.gpp-guidelines.org/>)
☐ yes ☐ no
 ICMJE Uniform Requirements (www.icmje.org)
☐ yes ☐ no
 PhRMA's Guidelines (<http://www.phrma.org/publications/publications/2004-06-30.1035.pdf>)
☐ yes ☐ no

6. Do you encourage authors and other contributors to follow these guidelines?
 AMWA's Position Statement ☐ yes ☐ no
 EMWA's Guidelines ☐ yes ☐ no
 GPP for Pharmaceutical Companies ☐ yes ☐ no
 ICMJE's Uniform Requirements ☐ yes ☐ no
 PhRMA's Guidelines ☐ yes ☐ no

7. Do you request acknowledgment when you make substantial contributions to manuscripts submitted to medical journals?
☐ always
☐ usually
☐ rarely or never, but I am not opposed to the practice
☐ rarely or never, because I am opposed to the practice
[If the answer to question 7 is always or usually, the participant will be routed to question 8. If the answer is rarely or never, the participant will be routed to question 9.]

8. How often is your request granted for acknowledgment of your substantial contributions to manuscripts submitted to medical journals?
☐ always
☐ usually
☐ rarely or never

9. Do you disclose your pertinent professional or financial relationships (e.g., receipt of funding from a manufacturer or other organisation associated with the product mentioned in the manuscript) when you are acknowledged for substantial contributions to manuscripts submitted to medical journals?
☐ always
☐ usually
☐ rarely or never
[If the answer to question 9 is always or usually, the participant will be routed to question 10. If the answer is rarely or never, the participant will be routed to question 11.]

10. How often is your request granted for disclosure of your professional or financial relationships?
☐ always
☐ usually
☐ rarely or never

11. During an average year, how many of your manuscripts convey original data?^a
☐ Most manuscripts convey original data.
☐ Most manuscripts are review-like articles.
☐ Manuscripts are approximately evenly divided between original data and review-like articles.

12. By what kind of organisation are you employed? (Select only one.)
☐ medical communication, medical education, or public relations company
☐ contract research organisation (CRO)
☐ hospital, university, or medical school
☐ journal office or publisher
☐ pharmaceutical, biotech, or medical device company
☐ professional society or association
☐ self-employed or freelance
☐ other _____

13. How many years have you been employed in medical communication? (Insert the number of years as a whole numeric value, not as a fraction or decimal.) _____ years

14. To which organisations do you belong? (Check all that apply.)
☐ American Medical Writers Association (AMWA)
☐ Board of Editors in the Life Sciences (BELS)
☐ Council of Science Editors (CSE)
☐ Drug Information Association (DIA)
☐ European Medical Writers Association (EMWA)
☐ International Society for Medical Publication Professionals (ISMPP)
☐ National Association of Science Writers (NASW)
☐ Other (please specify) _____

15. Please use the space below to add comments and to elaborate on any of your answers to this questionnaire.

^a Question 11 was added in 2008 (i.e., not included in the 2005 survey).