# Prevalence of Articles With Honorary Authors and Ghost Authors in Peer-Reviewed Medical Journals

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**Context.**—Authorship in biomedical publications establishes accountability, responsibility, and credit. Misappropriation of authorship undermines the integrity of the authorship system, but accurate data on its prevalence are limited.

**Objectives.**—To determine the prevalence of articles with honorary authors (named authors who have not met authorship criteria) and ghost authors (individuals not named as authors but who contributed substantially to the work) in peer-reviewed medical journals and to identify journal characteristics and article types associated with such authorship misappropriation.

**Design.**—Mailed, self-administered, confidential survey.

**Participants.**—A total of 809 corresponding authors (1179 surveyed, 69% response rate) of articles published in 1996 in 3 peer-reviewed, large-circulation general medical journals (*Annals of Internal Medicine, JAMA,* and *The New England Journal of Medicine*) and 3 peer-reviewed, smaller-circulation journals that publish supplements (*American Journal of Cardiology, American Journal of Medicine,* and *American Journal of Obstetrics and Gynecology)*.

**Main Outcome Measures.**—Prevalence of articles with honorary authors and ghost authors, as reported by corresponding authors.

**Results.**—Of the 809 articles, 492 were original research reports, 240 were reviews and articles not reporting original data, and 77 were editorials. A total of 156 articles (19%) had evidence of honorary authors (range, 11%-25% among journals); 93 articles (11%) had evidence of ghost authors (range, 7%-16% among journals); and 13 articles (2%) had evidence of both. The prevalence of articles with honorary authors was greater among review articles than research articles (odds ratio [OR], 1.8; 95% confidence interval [CI], 1.2-2.6) but did not differ significantly between large-circulation and smaller-circulation journals (OR, 1.4; 95% CI, 0.96-2.03). Compared with similar-type articles in large-circulation journals, articles with ghost authors in smaller-circulation journals were more likely to be reviews (OR, 4.2; 95% CI, 1.5-13.5) and less likely to be research articles (OR, 0.49; 95% CI, 0.27-0.88).

**Conclusion.**—A substantial proportion of articles in peer-reviewed medical journals demonstrate evidence of honorary authors or ghost authors.

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USED APPROPRIATELY, authorship establishes accountability, responsibility, and credit for scientific information reported in biomedical publications. However, misappropriation of authorship undermines the integrity of the authorship system. Honorary authorship (guest or gift authorship) is defined as naming, as an author, an individual who does not meet authorship criteria.[1,2] Honorary authorship, for example, may be bestowed as a tribute to a department chair or to the person who acquired funding for the study.[1] Ghost authorship is defined as failure to name, as an author, an individual who has made substantial contributions to the research or writing of the article.[2]

Although the International Committee of Medical Journal Editors (ICMJE) established authorship criteria in 1985,[3] and many medical journals encourage their use,[4] authors often disregard or are unaware of these criteria.[5] A variety of misuses of the current authorship system have been described.[1,2,6] Although previous studies have examined the frequency of fulfillment of authorship criteria,[7-9] we know of no large-scale, multijournal study on the prevalence of articles with honorary authors and ghost authors or associated journal characteristics and article types.

In this study, we sought to determine the prevalence of articles with honorary authors and ghost authors in 6 peer-reviewed biomedical journals and to assess whether honorary authorship and ghost authorship correlated with specific types of journals or articles. We hypothesized that research articles in large-circulation, prestigious medical journals would be more likely to have honorary authors, whereas review articles in smaller-circulation journals that publish symposiums would be more likely to have ghost authors.

## METHODS

We selected the 3 large-circulation US general medical journals with the highest impact factors[10]: *Annals of Internal Medicine*, *JAMA*, and *The New England Journal of Medicine*. For comparison, we selected 3 smaller-circulation journals that previously were shown to publish symposiums[11,12]: *American Journal of Cardiology*, *American Journal of Medicine*, and *American Journal of Obstetrics and Gynecology*. All journals in this study follow ICMJE guidelines for authorship.

We classified all articles published in 1996 into 3 categories: original research reports (research), reviews and other articles not reporting original research (reviews), and editorials, commentaries, and opinion articles (editorials). We used a computer-generated random-number list to sample research articles from each journal to reflect the relative proportion of research articles published in that journal compared with that of all 6 journals in 1996. Because the 3 large-circulation journals published more reviews and editorials than the smaller-circulation journals, we sampled all reviews and editorials from the smaller-circulation journals and randomly selected a similar number of reviews and editorials from the large-circulation journals. We identified the corresponding author for each article.

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For individuals listed as corresponding author for more than 1 article, we randomly selected only 1 for inclusion. Articles with corresponding authors outside the United States were excluded.

We designed and pretested a 21-item, self-administered questionnaire to obtain the following information: data about the corresponding author (including demographic characteristics and experience with writing and publishing); data about individuals who provided writing assistance or made other contributions but were not authors; and data about the contributions and functions of coauthors. The questionnaire was mailed to corresponding authors in July 1996 with a cover letter signed by the editor of *JAMA* explaining that responses would be kept confidential and anonymous, a photocopy of the first page of the article, and a preaddressed, stamped return envelope. Data were abstracted, entered, and analyzed to maintain respondent anonymity.

Based on ICMJE criteria,[4] we defined an article as having an honorary author if the corresponding author (1) reported that he or she did not meet all of the following 3 criteria: (a) "conceiving and designing the work" or "analyzing and interpreting the data"; (b) "writing the manuscript or part of the manuscript" or "revising the manuscript to make important changes in content"; and (c) "approving the final version of the manuscript"; or (2) if the corresponding author indicated that he or she would not "feel comfortable explaining the major conclusions" of the article; or (3) if the corresponding author reported that a coauthor performed "only one function and nothing else" from a list of 17 activities (supervising work of coauthors; recruiting coauthors; recruiting study subjects; analyzing and interpreting data; conducting literature search; analyzing and interpreting literature; reviewing the manuscript; communicating with the journal editor; signing a copyright transfer statement; conceiving and designing the work; collecting data; obtaining funding or material support; performing statistical analysis; writing the manuscript or part of it; approving the manuscript before journal submission; revising the manuscript, making important content changes; and reviewing edited page proofs).

We defined an article as having a ghost author if the corresponding author reported that (1) an individual who was not listed as an author made contributions that merited authorship; or (2) an unnamed individual participated in writing the article. We also examined the acknowledgment section of articles meeting these criteria to determine if any individuals were acknowledged for writing or editing assistance.

Table 1.—Journal Circulation and Survey Response Rates

| Journal | Circulation* | No. of Surveys Sent | No. (%) of Surveys Returned |
|---|---|---|---|
| Smaller-circulation journals | | | |
| *American Journal of Cardiology* | 32 000 | 242 | 137 (57) |
| *American Journal of Medicine* | 52 000 | 170 | 113 (66) |
| *American Journal of Obstetrics and Gynecology* | 16 000 | 194 | 125 (64) |
| Large-circulation journals | | | |
| *Annals of Internal Medicine* | 96 000 | 134 | 104 (78) |
| *JAMA* | 334 000 | 235 | 194 (83) |
| *The New England Journal of Medicine* | 237 000 | 204 | 136 (67) |
| **Total** | **767 000** | **1179** | **809 (69)** |

*Data from Standard Rate and Data Service.[15]

Table 2.—Prevalence of Honorary Authors by Journal and Type of Article

| Journal | No. of Articles | Total Articles With Honorary Authors, No. (%) | Research Articles With Honorary Authors* | Review Articles With Honorary Authors* | Editorials With Honorary Authors* |
|---|---|---|---|---|---|
| *American Journal of Cardiology* | 137 | 22 (16) | 18/112 (16) | 4/15 (27) | 0/7 (0) |
| *American Journal of Medicine* | 113 | 26 (23) | 6/30 (20) | 18/73 (25) | 2/10 (20) |
| *American Journal of Obstetrics and Gynecology* | 125 | 14 (11) | 9/94 (10) | 3/16 (19) | 2/14 (14) |
| *Annals of Internal Medicine* | 104 | 26 (25) | 14/59 (24) | 8/29 (28) | 4/14 (28) |
| *JAMA* | 194 | 44 (23) | 20/114 (18) | 18/60 (30) | 6/19 (32) |
| *The New England Journal of Medicine* | 136 | 24 (18) | 12/76 (16) | 10/46 (22) | 2/13 (15) |
| **Total** | 809 | 156 (19) | 79/485 (16) | 61/239 (26) | 16/77 (21) |

*Data expressed as number of articles with honorary authors/number of surveys returned for each type of article for each journal, followed by percentage of articles with honorary authors.

The article served as the unit of analysis for determining the prevalence of honorary authors, ghost authors, or both and as a composite end point of articles with honorary authors, ghost authors, or both. Based on previously published reports of approximately 20% prevalence of honorary authors,[7,8] we estimated that 325 articles would be required in each group of journals to detect a 10% difference between groups with $\beta$ of .20 and 2-tailed $\alpha$ of .05. Frequencies were calculated using Statistical Program for the Social Sciences (SPSS) for Windows (6.1).[13] Differences in proportions between types of articles and groups of journals were compared with $\chi^2$ tests. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated using Epi Info (Version 6).[14]

## RESULTS

Usable questionnaires were returned by 809 (69%) of 1179 corresponding authors surveyed. The median age for respondents was 47 years (range, 29-77 years) and 654 (81%) were men. A total of 590 respondents (73%) described themselves as physicians and 318 (38%) reported an academic rank of professor. A total of 465 respondents (57%) rated their experience in writing medical articles as extensive, and 558 (69%) reported having published at least 10 articles in peer-reviewed journals during the previous 5 years.

Response rates by journal ranged from 57% for *American Journal of Cardiology* to 83% for *JAMA* (Table 1). The response rate for the group of large-circulation journals was greater than that for the group of smaller-circulation journals (76% vs 62%, $P<.001$). Of the 809 responses, 492 (60%) were from authors of research articles, 240 (30%) from authors of reviews, and 77 (10%) from authors of editorials. There were no statistically significant differences in response rates by article type (research, 67%; reviews, 69%; and editorials, 73%).

A total of 156 (19%) of 809 articles met our criteria for honorary authorship (Table 2), including 38 in which the corresponding author met the honorary authorship criteria. The prevalence of articles with honorary authors ranged from 11% to 25% among journals and was more common among reviews (26%) than research articles (16%) (OR, 1.8; 95% CI, 1.2-2.6). Prevalence of articles with honorary authors did not differ significantly between large-circulation journals (22%) and smaller-circulation journals (17%) (OR, 1.4; 95% CI, 0.96-2.03).

A total of 93 articles (11%) met our criteria for ghost authorship (Table 3), including 11 with an unidentified medical writer. Of these 93 articles, 82 had an individual who was not listed as an author but who made contributions that the corresponding author believed merited authorship, 7 had an unnamed individual who participated in writing the article, and 4 articles met both criteria. However, we do not have data on whether these individuals met the ICMJE authorship criteria. The prevalence of ghost authors ranged from 7% to 16% among journals, with no significant differences by type of

Table 3.—Prevalence of Ghost Authors by Journal and Type of Article

| Journal | No. of Articles | Total Articles With Ghost Authors, No. (%) | Research Articles With Ghost Authors* | Review Articles With Ghost Authors* | Editorials With Ghost Authors* |
|---|---|---|---|---|---|
| *American Journal of Cardiology* | 137 | 13 (9) | 10/112 (9) | 2/15 (13) | 1/7 (14) |
| *American Journal of Medicine* | 113 | 15 (13) | 3/30 (10) | 12/73 (16) | 0/10 (0) |
| *American Journal of Obstetrics and Gynecology* | 125 | 13 (10) | 9/94 (10) | 3/16 (19) | 1/14 (7) |
| *Annals of Internal Medicine* | 104 | 16 (15) | 12/59 (20) | 3/29 (10) | 1/14 (7) |
| *JAMA* | 194 | 14 (7) | 11/114 (10) | 2/60 (3) | 1/19 (5) |
| *The New England Journal of Medicine* | 136 | 22 (16) | 20/76 (26) | 1/46 (2) | 1/13 (7) |
| **Total** | 809 | 93 (11) | 65/485 (13) | 23/239 (10) | 5/77 (6) |

*Data expressed as number of articles with ghost authors/number of surveys returned for each type of article for each journal, followed by percentage of articles with ghost authors.

article (research, 13%; reviews, 10%; and editorials, 6%). Compared with the same type of articles in large-circulation journals, the prevalence of articles with ghost authors was higher for reviews in smaller-circulation journals (16% vs 4%; OR, 4.2; 95% CI, 1.5-13.5) and lower for research articles (9% vs 17%; OR, 0.49; 95% CI, 0.27-0.88). Of 93 articles that met criteria for ghost authorship, 79 had no acknowledgment section, 10 with acknowledgments did not mention writing or editing assistance, and 4 had incomplete data in our database.

Thirteen articles had both honorary authors and ghost authors. Using the composite end point, 236 articles (29%) were reported to have honorary authors, ghost authors, or both.

## COMMENT

Misappropriation of authorship (ie, awarding honorary authorship and concealing ghost authorship) is incompatible with the principles, duties, and ethical responsibilities involved in scientific publication. In this study, approximately 1 in 4 articles demonstrated misapplication of authorship criteria and inappropriate assignment of authorship.

Our findings are similar to those of Shapiro et al[7] who surveyed authors of 184 multiauthored research articles from 10 journals and found that at least 26% (268/1014) of authors reportedly failed to make sufficient contributions to the research or writing to merit authorship. In an analysis of 12 articles published in a general medical journal, Goodman[8] found that approximately one third of 84 authors had not contributed substantially to the intellectual content of the article. Likewise, Sloan[9] reported that 17% (149/884) of authors in 193 articles published in a specialty journal did not merit authorship.

We found that honorary authorship was more common among review articles and editorials than research articles. It is possible that the ICMJE criteria for authorship, specifically the criterion that requires participation in "conception and design or analysis and interpretation of data," may be difficult to apply to review articles and editorials. In a post hoc analysis in which this criterion for authorship was removed, the prevalence of articles with honorary authorship (involving the corresponding author or coauthor) decreased from 19% to 17% overall. This prevalence was 16% (79/492) for research articles, 20% (48/240) for reviews, and 17% (13/77) for editorials, with no statistically significant differences by article type.

Despite the large sample size of our study, the results are subject to several limitations. First, the information in this study was based on self-report from corresponding authors only. Second, despite assurances of confidentiality, the response rate to our survey was 69%. We are uncertain if nonrespondents differed systematically from respondents by demographics or if their articles differed in rates of honorary or ghost authors, but we suspect that underreporting is more likely than overreporting. However, even assuming that none of the articles from nonrespondents had honorary authors or ghost authors, a conservative estimate for the entire sample (N = 1179 articles) would place the lower bound of the prevalence rate at 13% for honorary authors, 8% for ghost authors, and 20% for the composite end point.

Third, we selected the 3 large-circulation journals based on circulation and impact factor and the 3 smaller-circulation journals based on their more specialized nature and history of publishing symposiums and supplements.[11] In 1996, the 3 smaller-circulation journals published 19 symposiums and supplements (*American Journal of Cardiology*, 7; *American Journal of Medicine*, 10; and *American Journal of Obstetrics and Gynecology*, 2), but 1 of the large-circulation journals, *Annals of Internal Medicine*, also published 1 supplement.

Fourth, 2 journals in our study (ie, *American Journal of Obstetrics and Gynecology*[16] and *The New England Journal of Medicine*[17]) limited the number of authors listed in the article byline in 1996. We are uncertain about how these limits may have affected our findings, although future analysis may explore the relationship between number of authors and evidence of authorship misappropriation.

Finally, we sampled only journals and corresponding authors from the United States and sent letters of invitation from a single journal. Somewhat different results might have been obtained if our study had included international authors and more diverse journals, if we had sent surveys from the editor of the journal in which the article appeared, or if we had sampled all named authors.

In conclusion, our study demonstrates that a substantial proportion of articles in peer-reviewed medical journals have honorary authors and ghost authors. The findings also suggest that the ICMJE authorship guidelines may not be well understood by all authors and may be difficult to apply to certain types of articles such as non–data-based reviews and editorials.

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