Supplementary file 1

Methods

We considered two sets of top journals in health and medical sciences. The first set comes from Google Scholar’s two sets of rankings of top 20 health and medical sciences journals in April 2018, of which 32 unique journal names were present and considered for the analysis (Table S1). The second set comes from four sets of rankings of the Web of Science’s InCites Journal Report Citation website, including 1) medicine (general and internal), 2) public, environmental, and occupational health, 3) healthcare science and services, and 4) health policy and services. These four sets of rankings included 47 unique journal names, all of which were included in the analysis.

For all 79 journals, we downloaded the metadata on all editorial materials published between 2008 to April 2018 from Thomson Reuters’ Web of Science database. Journals not listed in Web of Science, as well as journals with less than 100 editorial materials during the study period were excluded, the latter due to small numbers of editorials published each year, making the estimation of the ratios unreliable. Editorial materials are listed under different sections in each journal, such as “Comment” in the Lancet, “Commentary” in the New England Journal of Medicine, and “Opinion” and “Viewpoint” in JAMA. To ensure consistency, we searched for articles classified under “editorial materials” under Web of Science, which editorial materials to include editorials, interviews, commentary, and discussions between individual, post-paper discussions, round table symposia, and clinical conferences, but not letters or correspondences from the readers to the journal editor concerning previously published articles. To ensure that the metadata includes primarily editorial materials and not clinical case reports (papers that describe clinical cases that may be of interest to the clinical community), we first downloaded the metadata of case reports from the Web of Science and removed listed articles from our data. 52 of the 79 journals matched our inclusion criteria and were included in this analysis, listed in Table S1.

For each journal, we first assigned a country of origin based on information provided on the journals’ or publishers’ websites. For many, the websites did not specify the country of origin, so we used the country in which the publisher is based instead (see Table S1). We determined whether
the journal is a medical, public health, life sciences, or healthcare/other journal based on the journal’s own description or Wikipedia, which specifies whether the journal is a “medical,” “scientific,” “public health,” or “healthcare” journal. We then collected the list of all editors from the journals’ respective websites. We extracted the names of editors in chief and all editors who likely have decisive functions regarding manuscript acceptance. This includes senior (executive) editors, acting chief editor, executive editors, deputy editors, associate editors, regional editors, research editors, (senior) managing editors, scientific editors, and section-specific editors (such as healthcare policy and law editors, news editors, perspective editors, letters editors, editorials editors). We excluded editorial staff members, such as editorial assistants, technical editors, images editors, digital content editors, assistant web editors, multimedia editors, and statistical editors, as well as honorary editors such as editors emeritus, honorary deputy editor, senior guest editor, and founding editors. Editorial materials with any of the journal editors listed as the first author were excluded (see list of journal editors in Supplementary file 1).

We extracted the first names of the first authors from all papers included in the dataset. We estimated authors’ gender using the gender package in R, which relies on U.S. Census or Social Security datasets. To quantify uncertainty in our automated gender classification, we selected a random sample of 100 names from the articles, assigned gender for each based on Google search results, and assessed the performance of the gender classifier on this sample. We found 86% to be accurately classified, and 14% to remain as unclassified. This suggests that, when a gender is assigned to a name by the classifier, we can be highly confident about the result. Among papers with names that were not assigned a gender, we randomly selected 10% of papers and manually searched for the gender of the author based on the full name and the institution to which the author belongs through Google.

Limitations
First, this study is descriptive in nature, and we cannot determine the factors that lead to the findings of higher male-to-female first authors. Second, we were unable to find the exact processes in which journal editors determine the content of the editorials: who decides the topics of the editorials, whom to invite, and which editorials to publish. The instructions listed on most journals’ websites state that most editorials are invitation-only or not, but do not discuss which route is more
common. Third, we only looked at the years 2008-2018 and not earlier years because the metadata from Web of Science did not include full first-names in prior years. We were only able to obtain the names of journal editors in April 2018 and not prior years, therefore limiting our study to recent years reduces the possibility that previous editors authored some of the editorials. Fifth, we only analyzed the gender of the first author, who we assumed is the main author of the article, instead of the senior author or all co-authors.
**Table S1. Summary Statistics**

| Source | Journal ¹ | Research field ² | Number of editorial materials included in analysis ³ | Editor-in-chief/editor | Journal’s country of origin | Estimated percentage of gender of first author unknown | Estimated ratio of male-to-female first authors |
|--------|-----------|------------------|-----------------------------------------------------|-------------------------|---------------------------|-----------------------------------------------------|-----------------------------------------------|
| Health care Sciences & Service (WoS) | Academic Medicine | Medicine | 1,163 | David P. Sklar | US | 9.2 | 1.56 |
| Public, Environmental & Occupational Health (WoS) | American Journal of Epidemiology | Public Health | 412 | Moyses Szklo | US | 13.8 | 1.38 |
| Medicine -- General & Internal (WoS) | American Journal of Medicine | Medicine | 1,063 | Joseph Alpert | US | 18.2 | 2.56 |
| Medicine -- General & Internal (WoS) | American Journal of Preventive Medicine | Medicine | 378 | Matthew L. Boulton | US | 7.1 | 1.93 |
| Public, Environmental & Occupational Health (WoS) | American Journal of Public Health | Public Health | 1,294 | Alfredo Morabia | US | 9.0 | 1.06 |
| Medicine -- General & Internal (WoS) | Annals of Family Medicine | Medicine | 466 | Kurt C. Stange | US | 7.1 | 1.53 |
| Health & Medicine (Google Scholar) | Annals of Internal Medicine | Medicine | 2,420 | Christine Laine | US | 14.4 | 2.99 |
| Health & Medicine (Google Scholar) | Blood | Medicine | 2,721 | Bob Lowenberg | US | 16.2 | 2.88 |
| Health & Medicine (Google Scholar) | BMC Medicine | Medicine | 343 | Lin Lee | UK | 18.3 | 2.87 |
| Health care Sciences & Service (WoS) | BMJ Quality & Safety Healthcare Other | 267 | Kaveh G Shojania Mary Dixon-Woods | UK | 8.6 | 1.49 |
|-------------------------------------|--------------------------------------|-----|------------------------------------|----|-----|-----|
| Health & Medicine (Google Scholar) | British Medical Journal Medicine | 4,555 | Fiona Godlee | UK | 14.7 | 1.88 |
| Public, Environmental & Occupational Health (WoS) | Bulletin of the World Health Organization Public Health | 535 | Laragh Gollogly | Switzerland | 22.0 | 1.65 |
| Medicine -- General & Internal (WoS) | Canadian Medical Association Journal Medicine | 1,829 | Diane Kelsall | Canada | 14.4 | 1.81 |
| Health & Medicine (Google Scholar) | Cell Life sciences | 1,502 | Emilie Marcus ² | US | 16.1 | 2.10 |
| Health & Medicine (Google Scholar) | Cell Host & Microbe Life sciences | 523 | Lakshmi Goyal | US | 17.2 | 1.80 |
| Health & Medicine (Google Scholar) | Cell Metabolism Life sciences | 550 | Nikla Emambokus | US | 15.1 | 2.18 |
| Health & Medicine (Google Scholar) | Circulation Medicine | 2,698 | Joseph A. Hill | US | 15.3 | 3.47 |
| Medicine -- General & Internal (WoS) | Deutsches Arzteblatt International Medicine | 180 | Egbert Maibach-Nagel | Germany | 13.3 | 9.00 |
| Public, Environmental & Occupational Health (WoS) | Environmental Health Perspectives Public Health | 640 | Sally Perreault Darney | US | 5.8 | 0.86 |
| Public, Environmental & Occupational Health (WoS) | Epidemiology Public Health | 299 | Timothy L. Lash | US | 12.7 | 2.65 |
| Public, Environmental & Occupational Health (WoS) | European Journal of Epidemiology Public Health | 140 | Albert Hofman | Germany ² | 25.7 | 2.41 |
| Health care Sciences & Service (WoS) | Health Affairs | Healthcare /other | 404 | Alan Weil | US | 6.9 | 0.99 |
| Health & Medicine (Google Scholar) | Immunity | Medicine | 650 | Peter Lee | US | 18.9 | 2.13 |
| Public, Environmental & Occupational Health (WoS) | International Journal of Epidemiology | Public Health | 822 | Stephen Leeder | UK | 17.8 | 2.17 |
| Health & Medicine (Google Scholar) | JAMA – Journal of the American Medical Association | Medicine | 3,758 | Howard Bauchner | US | 7.8 | 2.45 |
| Health & Medicine (Google Scholar) | JAMA Internal Medicine | Medicine | 961 | Rita F. Redberg | US | 7.8 | 1.56 |
| Public, Environmental & Occupational Health (WoS) | Journal of Adolescent Health | Medicine | 326 | Charles E. Irwin, Jr. | US | 11.4 | 0.84 |
| Public, Environmental & Occupational Health (WoS) | Journal of Clinical Epidemiology | Public Health | 233 | Andre Knottnerus, Peter Tugwell | US | 20.2 | 2.53 |
| Health & Medicine (Google Scholar) | Journal of Clinical Oncology | Medicine | 1,633 | Stephen A. Cannistra | US | 11.3 | 1.93 |
| Public, Environmental & Occupational Health (WoS) | Journal of Epidemiology and Community Health | Public Health | 254 | Martin Bobak, James R. Dunn | UK | 26.8 | 1.65 |
| Medicine -- General & Internal (WoS) | Journal of General Internal Medicine | Medicine | 1,211 | Steven M Asch, Carol Bates, Jeffrey L Jackson | US | 11.1 | 1.55 |
| Medicine -- General & Internal (WoS) | Journal of Internal Medicine | Medicine | 174 | Ulf de Faire | US | 91.4 | 1.29 |
| Journal/Conference/Book                                      | Title/Author/Series | Volume/Issue/Year | Country | Impact Score |
|-------------------------------------------------------------|---------------------|-------------------|---------|--------------|
| Public, Environmental & Occupational Health (WoS)           | Lancet Global Health, The | Public Health     | UK      | 18.8         |
| Health & Medicine (Google Scholar)                          | Lancet Oncology, The | Medicine          | UK      | 15.0         |
| Health & Medicine (Google Scholar)                          | Lancet, The         | Medicine          | UK      | 13.8         |
| Medicine -- General & Internal (WoS)                        | Mayo Clinic Proceedings | Medicine      | US      | 11.7         |
| Medicine -- General & Internal (WoS)                        | Medical Journal of Australia | Medicine | Australia | 7.9         |
| Health care Sciences & Service (WoS)                        | Milbank Quarterly   | Healthcare/other  | US      | -            |
| Public, Environmental & Occupational Health (WoS)           | MMWR-Morbidity and Mortality Weekly Report | Public Health | US      | 19.0         |
| Health & Medicine (Google Scholar)                          | Nature Genetics     | Life sciences     | UK      | 17.7         |
| Health & Medicine (Google Scholar)                          | Nature Medicine     | Medicine          | UK      | 13.8         |
| Health & Medicine (Google Scholar)                          | Nature Neuroscience | Life sciences     | UK      | 16.8         |
| Health & Medicine (Google Scholar)                          | Neuron              | Life sciences     | US      | 17.1         |
| Health & Medicine (Google Scholar)                          | New England Journal of Medicine, The | Medicine | US      | 12.0         |
1. The following journals were excluded from the analysis due small numbers of editorial materials (less than 100) during the study period: AIDS Patient Care and STDs, Amyloid – Journal of Protein Folding Disorders, Annual Review of Public Health, Cancer Epidemiology Biomarkers & Prevention, The Cochrane Database of Systematic Reviews, Cold Spring Harbor Perspectives in Medicine, Epidemiologic Reviews, Environmental Research, The FASEB Journal, Implementation Science, Indoor Air, International Journal of Hygiene and Environmental Health, International Journal of Molecular Sciences, JMIR mHealth and
uHealth, Journal of Cachexia Sarcopenia and Muscle, Journal of Clinical Medicine, Journal of Global Health, Journal of Medical Internet Research, Journal of Toxicology and Environmental Health – Part B – Critical Reviews, Nicotine & Tobacco Research, Translational Research, Palliative Medicine, PLOS One, Value in Health.

The following journals were excluded from the analysis due to lack of data availability in Web of Science: Journal of the American College of Cardiology, The Journal of Clinical Investigation.

2. Research field was determined based on the journals’ own descriptions or Wikipedia.
3. Excluding editorials with any of the editors as the first author and case reports.
4. Emilie Marcus was editor in chief until December 2017.
5. The journal’s country of origin was not listed on its website. We instead assigned the publisher’s country of origin.
Figure S1. Average Ratio of Male-to-Female First Authors Between 2008 and April 2018, by Country.
Figure S2. Ratio of Male-to-Female First Authors in 2017 (the Most Recent Full Year), by Country.