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Authorship Diversity in Global Evidence Synthesis in Urology: 1998-2022 Analysis of Cochrane Reviews

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Research Letter

Authorship diversity in global evidence synthesis in urology: 1998–2022 analysis of Cochrane reviews

Female authors and authors from low- and lower-middle-income countries (LMICs) have been historically underrepresented in the urology literature [1–3]. Women comprised <20% of co-authors and 15% of senior authors across 18 urology-related journals during 2015–2020 [1]. Women have also been underrepresented as panel members at major urology meetings [3]. A significant academic disparity for women in urology thus exists that likely affects professional success. Meanwhile, LMIC clinicians face multifaceted barriers to conducting and publishing original research that impacts clinical practice in their respective countries. They also face challenges related to the visibility and recognition of their expertise, leading to difficulty in having review articles accepted by high-impact journals. Cochrane, a non-profit collaboration, publishes high-quality systematic reviews that impact policy and practice globally. Unlike systematic reviews and guidelines published by the AUA or the European Association of Urology (EAU), authors worldwide can potentially participate in Cochrane Reviews, including those lacking institutional infrastructure for high-impact primary research. This potentially promotes inclusive academic involvement. However, the state of authorship diversity in urology-related Cochrane Reviews, a somewhat representative sample of global evidence synthesis efforts, is unknown, which this study sought to determine.

A two-phase methodology for public data extraction was utilized. First, we used the filter 'Topic: Urology' in the Cochrane Library on 20 June 2020 to identify and extract data from all currently listed reviews. The search was later updated to 1 January 2023. Then, we manually extracted data from withdrawn, older versions of reviews since several had different author groups compared to their current versions. Given the significantly higher accuracy of manual search for ascertaining gender compared to the algorithmic estimation methods used in several prior works [1,2], we used the former to achieve ≥95% ascertainment. We endeavoured to capture at least one publicly available webpage listing authors' personal pronouns or picture such as institutional profile, Google Scholar or LinkedIn. We used historical gender conventions, dichotomizing authors into male or female. A second reviewer cross-verified extracted data for accuracy.

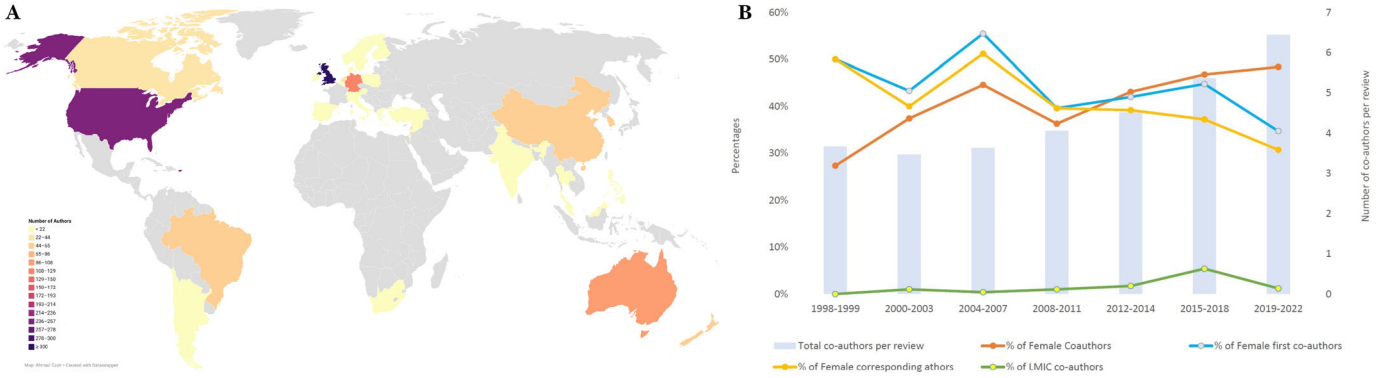
We analysed authorship data using GraphPad (GraphPad Software, San Diego, California) and performed the social network analysis through VOSViewer (Leiden University, Leiden, the Netherlands). For reviews which had collaborative groups as authors, we treated these groups (e.g., the MRC Clinical Trials Unit or the Advanced Bladder Cancer Meta-Analysis Group) as belonging to one country (UK) as one author to avoid data skewing by large number of collaborators. Collaborative groups were excluded from gender-based analyses. We dichotomized authors' national affiliations into LMICs and non-LMICs based on the World Bank 2022–2023 income classification. Ethical approval was not warranted since this work analysed only publicly available data. We followed Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines.

A total of 317 urology-related reviews, co-authored by 1443 authors, were included. Only 28 co-authors (1.94%) were from LMICs (Fig. 1A), with 16 from the Philippines, nine from India, and three from Syria. High-income countries were overrepresented, with the top 10 countries that had the highest proportion of co-authors being the UK (37.3%, $N = 539$), the USA (16.3%, $N = 236$), Germany (7.5%, $N = 109$), Australia (6.8%, $N = 98$), South Korea (4.0%, $N = 58$), New Zealand (3.9%, $N = 57$), Brazil (3.7%, $N = 53$), China (3.7%, $N = 53$), the Netherlands (2.8%, $N = 41$), and Canada (2.8%, $N = 40$). The UK, the USA, and Germany together comprised >60% of all co-authors. Countries with the highest proportion of first authors were the UK (41.3%, $N = 131$), the USA (11.0%, $N = 35$) and Australia (9.5%, $N = 30$), with these three countries together contributing over 60%. Amongst the first and corresponding authors, only 3.15% (10/317) each came from LMICs, with nine from the Philippines and one from India. The representation of LMIC authors was consistently ≤2%, except during 2015–2018 when it was 5.4% (Fig. 1B).

There were 190 currently listed reviews in the Cochrane Library, along with 127 older versions. The number of publications varied across years, being just 2 in 1998, 6 in 2000, 13 in 2005, 10 in 2010, 11 in 2015, 14 in 2020, and 4 in the entirety of 2022. However, the number of co-authors per publication increased gradually, being 3.5 in 1998, 4.33 in 2000, 4.2 in 2010, 4.9 in 2015, 6.8 in 2020, and reaching 7.0 authors per review in 2022 (Fig. 1B).

After excluding four collaborative groups, gender could be manually ascertained for 96.6% (1390/1439) of co-authors. Overall, women made up 41.4% (576/1390) of co-authors, 44.8% (137/306) of first authors, and 40.4% (126/312) of corresponding authors. These proportions saw temporal fluctuations between 35% and 55% across various periods but

Fig. 1 Country and gender diversity in the authorship of Cochrane reviews related to urology. Data for all co-authors included in reviews published up until 1 January 2023 are included. **(A)** Contribution of different countries in co-authorship of urology-related Cochrane Reviews, as depicted in a choropleth-style map. **(B)** Trends in country and gender diversity over time. Years were grouped to reduce the high variation observed year to year due to low sample size in a single year. LMIC, low- and lower-middle-income country.



did not demonstrate increasing trends of female authorship (Fig. 1B). Female authorship rates were historically high, being nearly 50% for first or corresponding authorship in 1998–1999. In 2019–2022, females comprised 48.4% of co-authors, 34.7% of first authors, and 30.7% of corresponding authors. Notably, the proportion of female co-authors was significantly higher amongst contributors from the UK (50.3%, 271/539) compared to the USA (20.8%, 49/236). Amongst LMIC contributors, women comprised 50.0% (14/28) of co-authors. Notably, 47% (271/576) of female contributors came from the UK alone.

The gender ascertainment rate was 94.7% (610/644) for co-authors of Cochrane Urology Group (CUG)-published reviews and 98.1% (780/795) of co-authors of non-CUG-published reviews, including those by the Cochrane Incontinence and Renal Groups. A total of 37.5% of reviews (119/317) had been published by the CUG, while 62.5% (198/317) of urology-related reviews had been published by other groups. After excluding collaborative groups and authors with unknown gender, female authors comprised 25.2% (154/610) of co-authors of CUG-published and 54.1% (422/780) of non-CUG-published reviews (chi-squared = 118.4, two-tailed $P < 0.0001$). As first authors, females comprised 17.0% (19/112) of CUG-published and 60.8% (118/194) of non-CUG-published reviews (chi-squared = 55.2, two-tailed $P < 0.0001$). Given software-related considerations, we performed authorship network analyses based only on current versions of included reviews ($N = 190$). Global patterns of collaboration and the most productive authors over time are demonstrated in the supplementary material.

This work represents the first reporting of authorship diversity of urology-related Cochrane reviews. Its primary strengths are the authorship network analyses and the accuracy of manual gender determination, compared to similar works in other urology journals using name-based algorithmic prediction [1,2]. The work was limited by determination and classification using historic gender conventions, as publicly available data did not permit the exploration of other gender conventions.

In this study, LMICs were found to contribute <2% of authors, while the USA and UK together provided over half the authors of one of the highest-quality evidence sources in urology. This is consistent with contemporary citation analysis, as 80% of the top 100 most-cited articles in urological surgery, during 1989–2016, were from the USA [4]. The disparity in female authorship in CUG- and non-CUG-published reviews may have been secondary to author specialty, with CUG review authors more likely to be urological surgeons. Women were better represented in this study compared to their involvement in other avenues of academic urology, particularly amongst practising urologists and authorship in urology-specific journals [1,2,5]. Female speakers in high-profile urology conferences have been reported to comprise just 13.7–19.3% between 2014 and 2019 [6], with lower proportions for speakers at AUA annual meetings [7]. Female representation here was also more inclusive compared to urological guidelines, where only 17% of AUA guideline panellists and 12.2% of EAU panellists have been reported to be female [8].

Equitable and inclusive authorship representation may lead to considerations of questions and priorities relevant to resource-limited settings in outputs by high-impact urology evidence synthesis groups. This may help expand their utilization and global relevance. Further capacity-building efforts are warranted for enhancing the global involvement of LMIC urologists with evidence synthesis, via Cochrane and other organizations, through methodological training programmes, longitudinal mentorship, and long-term collaboration.

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Abbreviations: CUG, Cochrane Urology Group; EAU, European Association of Urology; LMIC, low- and lower-middle-income country.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Fig. S1. Global patterns of collaboration among authors, as depicted in a social network analysis.

Fig. S2. Network analysis weighted on the number of publications per author, also showing changes in the prominent authors over time.