

Assessing patterns of authorship of low- and middle-income countries in global commercial clinical trials in oncology

Received: 16 May 2025

Accepted: 14 November 2025

Published online: 22 November 2025

Cite this article as: Payedimarri A.B., Mouhssine S., Aljadeeah S. *et al.* Assessing patterns of authorship of low- and middle-income countries in global commercial clinical trials in oncology. *Global Health* (2025). <https://doi.org/10.1186/s12992-025-01167-8>

Anil Babu Payedimarri, Samir Mouhssine, Saleh Aljadeeah, Blaise Mwizerwa Nkubito, Gianluca Gaidano & Raffaella Ravinetto

We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.

If this paper is publishing under a Transparent Peer Review model then Peer Review reports will publish with the final article.

ARTICLE IN PRESS

Assessing patterns of authorship of low- and middle-income countries in global commercial clinical trials in oncology

Anil Babu Payedimarri¹, Samir Mouhssine¹, Saleh Aljaddeeah², Blaise Mwizerwa Nkubito³, Gianluca Gaidano^{1*}, Raffaella Ravinetto^{2,4*}

¹Division of Hematology, Department of Translational Medicine, University of Eastern Piedmont and AOU Maggiore della Carità di Novara, Novara, Italy

²Department of Public Health, Institute of Tropical Medicine, Antwerp, Belgium

³Independant researcher, Namur, Belgium

⁴School of Public Health, University of the Western Cape, Cape Town, South Africa

* Shared senior authorship

Corresponding author: Anil Babu Payedimarri; Email id- anil.payedimarri@uniupo.it

Abstract

Poor authorship practices in global health research may be a sign of unequal partnerships. Previous studies have shown that authors from low- and middle-income countries (LMICs) are frequently underrepresented in publications from global research collaborations between LMICs and high-income countries (HICs). To the best of our knowledge, the patterns of authorship from LMICs in international industry-sponsored clinical research on breast, lung and colon cancer have not yet been investigated. Therefore, as a spin-off to broader research on globalization of commercial clinical trials in oncology, we conducted an analysis of authorship in the publications from completed industry-sponsored therapeutic trials in breast, lung and colon cancer (from phase I to IV) that involved LMICs. Only articles published in a peer-reviewed journal in English by March 30, 2024 were included.

A total of 302 publications from 173 trials were analysed. 63% (n=191) of them have at least one author from a middle-income country (MIC); 14% (n=42) articles have the first author from a MIC; and 13% (n=39) articles have the last author from a MIC. Conversely, 37% (n=111) of articles had no author from MIC, including two trials conducted only in MICs.

In conclusion, our study found an imbalance in authorship, suggestive of significant inequalities, in collaborative research in industry-sponsored clinical trials for breast, lung and colon cancer. Industry sponsors need to work towards greater equity in authorship when collaborating with

39 researchers in (L)MICs, and oncology researchers and opinion leaders in
40 HICs should actively advocate for greater fairness to their colleagues in
41 (L)MICs.

42 **Key words:** HICs; LMICs; UMICs; authorship patterns; clinical trials;
43 global health; oncology; breast; lung; colon; trend; inequalities

44 **1. Introduction**

45 According to the International Agency for Research on Cancer
46 (IARC), breast, lung, and colon cancers were the three most frequent
47 cancers in 2022, accounting for more than 30% of new cases and about
48 34% of deaths each year (1). For this reason, they are referred to as the
49 “big killers” in oncology (2). Consistently, they represent a major topic in
50 cancer research globally.

51 The importance of building global health research capacity in low-
52 and middle-income countries (LMICs) is increasingly recognised (3, 4).
53 The World Health Organization (WHO) has made recommendations for
54 greater equity in health research, pointing to the unbalanced distribution
55 of power, money and resources globally (5). Although cancer is a relevant
56 health problem in LMICs, the inequalities in access to adequate diagnosis
57 and treatment are mirrored by inequalities in oncology research,
58 including research governance and ownership. For instance, between
59 2014 and 2017, almost 30% of randomized controlled trials (RCTs) in
60 oncology involved patients from LMICs, but only 8% of trials were led by
61 authors from LMICs, while the remaining 92% were led by authors from
62 high-income countries (HICs) (6, 7).

63 The number of clinical research collaborations between HICs
64 and LMICs has increased over time in different medical fields and

65 disciplines (8). However, disparities persist in professional recognition, as
66 shown by the publication patterns of research findings (3, 4, 9). In global
67 health research, fair research partnership is essential. First, the pursuit
68 of equity and inclusion is critical to ensure that research is impactful and
69 locally applicable (10, 11). Second, as highlighted in the Global Code of
70 Conduct for Equitable Research Partnerships (TRUST CODE),
71 recognising scientific credit to the investigators from LMICs is *per se* a
72 matter of integrity and fairness (“Article 4: Local researchers should be
73 included, wherever possible, throughout the research process, including
74 in study design, study implementation, data ownership, intellectual
75 property and authorship of publications”) (12). However, the unequal
76 power dynamics in global health research have been widely documented,
77 as well as their consequences (13-15).

78 A symptom of these inequalities is the unfair authorship pattern
79 frequently observed in publications in global clinical research, including,
80 but not limited to, in cancer research. Also in other international health
81 research projects involving LMICs, first and last authorship often
82 appears to be mainly allocated to HIC authors (16, 17). Authors of
83 research papers including LMICs and affiliated with institutions in
84 LMICs account for a fraction of all first authors (18-23), and are
85 underrepresented as first and last authors (3, 24). Some studies that
86 specifically analysed authorship practices in clinical trials have raised
87 concerns about the agency of local partners in global health
88 collaborations and the fairness of partnerships therein (25, 26). Few
89 other studies and reports investigating authorship practices in global

90 health research also pointed at imbalances in regional representation
91 and in the distribution by country income groups (15, 16, 27). These
92 findings highlight persistent inequalities in authorship practices in global
93 health research.

94 Some authors have explained this phenomenon with the lack of
95 economic resources and/or infrastructure, weak academic institutions,
96 lower experience in manuscript drafting, language barriers, and biased
97 judgement of LMIC authors and research topics by scientific journals
98 (28). The majority of governments in LMICs [and particularly in low-
99 income countries (LICs)] lack substantial resources towards research,
100 leading to insufficient strengthening and ownership of academic and
101 research institutions (29). As a result, local universities aiming to foster
102 a research-oriented environment must collaborate with HIC institutions
103 to obtain funding (9). Noormahomed et al. also suggested that only a
104 limited number of mentors possess a strong grounding in research
105 within LMIC institutions (30): hence, despite research methods being
106 included in curricula, and positive trends toward capacity
107 strengthening, a gap would persist between theory and practical
108 applications. Another challenge confronted by researchers from some
109 LMICs revolves around the fact that they may not be proficient in
110 English, that is the language commonly used in medical publications
111 (13). This limitation places them at a disadvantage when it comes to
112 effectively conveying their findings. Authorship of published research
113 has a direct impact on hiring, tenure, promotion, and award decisions in
114 academia (28). Especially first and last authors are sought after, as

115 these positions are associated with greater professional recognition,
116 which in turn leads to greater funding opportunities and career
117 advancement (31). The inequity in authorship practices thus contributes
118 to a vicious circle, where researchers from LMICs faces extra
119 challenges to emerge compared to their peers in HICs. A recent study
120 found that among 164 National Cancer Institute (NCI) funded grants
121 involving LMICs, 51% of all publications did not include any author
122 affiliated with an institution in an LMIC. Additionally, 78% and 83% of
123 publications had a first or last author, respectively, affiliated with a HIC
124 (32). Another cross-sectional study found that Sub-Saharan African
125 authors are underrepresented in global oncology articles (33).

126 All these facts contribute to explain why LMICs researchers may
127 have to rely heavily on industry sponsors to conduct and/or to participate
128 in the clinical trials (34), particularly in highly-specialised fields such as
129 oncology. Although oncology commercial clinical trials, e.g. oncology
130 trials sponsored by the pharmaceutical industry, frequently involve sites
131 and co-authors from LMICs, the leadership roles is mainly reserved to
132 the authors from HICs (34, 35). As discussed above, trends in authorship
133 have been described in other medical specialities (such as infectious
134 diseases and some oncologic diseases) (9, 35). To the best of our
135 knowledge authorship distribution assessment has not been done in
136 international industry-sponsored clinical research for breast, lung and
137 colon cancers. Since a recent study from our group documented the
138 globalization of breast, lung, and colon cancer interventional industry-
139 sponsored therapeutic clinical trials (36), we have now embarked on a

140 sub-analysis to describe the trends in the allocation of authorship in such
141 trials. In particular, we seek to characterise allocation of authorship [by
142 affiliation of the first, co-, and last author(s)] to investigators in LMICs
143 across breast, lung, and colon cancer industry-sponsored clinical trials,
144 as an indicator of fairness in research collaborations.

145 **2. Methods**

146 In our study, globalization of commercial clinical trials is defined as
147 clinical trials sponsored by a pharmaceutical industry and conducted as
148 part of multinational (multiple sites across more than one country)
149 clinical development for the regulatory approval of new medicines.

150 *2.1 Articles Search strategy*

151 As described elsewhere (36), we conducted a structured search in
152 ClinicalTrials.gov, an open-access trial registry
153 [<https://clinicaltrials.gov/>]. The advanced search strategy combined
154 the following fields: *i)* study type: interventional trials; *ii)*
155 condition/disease: breast cancer, lung cancer, colon cancer; *iii)* phases:
156 Phase I, II, III and IV; *iv)* Type of funder: industry; *v)* first posted: registry
157 start date. The main data extraction occurred on June 30, 2018. For the
158 scope of this follow-up study, we conducted a second data extraction on
159 September 30, 2022, adding the following fields: *vi)* study completion,
160 *vii)* study results-(with results, without results) and *viii)* publications.
161 After the second data extraction, we searched and downloaded all
162 articles (of each trial record) available in the registry for completed
163 trials, based on the registry field termed "Publications". Third, we
164 manually searched PubMed and Google Scholar using the trial identifier
165 (NCT number, which is the identification code in ClinTrial.gov) for any

166 other publications related to each trial. We searched for all articles
167 published (for each trial record) up to 30 March 2024.

168

169 *2.2 Inclusion and exclusion criteria*

170 We included all completed industry-sponsored therapeutic trials
171 involving LMICs that had publications (from phase I to IV), and tested
172 medicines in breast, lung, and colon cancers. For each completed trial we
173 included only the original research papers reporting the trial results and
174 articles reporting study design, such as the trial protocol. The search was
175 limited to publications in English in peer-reviewed scientific journals as
176 of 30 March 2024.

177 Completed trials conducted only in HICs (whether with publications or
178 not) and completed trials involving (also) LMICs that did not have
179 publications (yet), were excluded. Any case reports, reviews, systematic
180 reviews and/or meta-analysis articles, papers reporting cost-effectiveness
181 analysis, pooled analysis of multiple trials were also excluded.

182

183 *2.3 Articles selection and countries classification*

184 After selecting the eligible publications, we looked at authorship
185 patterns: *i)* whether researchers from each LMIC involved in the trial
186 were co-authors at all, and *ii)* whether they were co-authors, first
187 authors, or last authors.

188 The authorship allocation was categorized based on the “affiliation”
189 section of the article. The country's income status [High-income
190 countries (HIC), Upper-middle-income countries (U-MIC), Lower-middle-
191 income countries (L-MIC) or Low-income countries (LIC)] was

192 extrapolated from the World Bank's Country Income Classification status
193 (fiscal year 2019) (37). If an author was affiliated with both HICs and
194 LMICs, he or she was assigned and considered as an HIC affiliation, as it
195 has been done in previous bibliometric studies (9). The rationale for this
196 decision in our study is based on the theoretical resource advantages
197 that a HIC affiliation would provide. If an author had more than one
198 LMIC affiliation, the first affiliation listed was assumed to be the primary
199 affiliation.

200

201 *2.4 Data extraction and analysis*

202 Two independent evaluators (**ABP and BM**) screened all retrieved
203 publications according to the inclusion and exclusion criteria. For each
204 eligible article, the following variables were extracted as of March 30,
205 2024: Journal name, digital object identifier (DOI) number, total number
206 of authors by country group (HIC, U-MIC, L-MIC, LIC), and LMIC author
207 position (co-author, first author, and last author). For each article, the
208 section on “acknowledgement” was also considered, to see if/how MIC
209 investigators are acknowledged. The variables for articles that clearly
210 met the inclusion criteria and did not meet the exclusion criteria were
211 immediately recorded in a dedicated EXCEL database. Articles for which
212 one evaluator was unsure whether they should be included were
213 discussed by two evaluators, and disagreements were resolved by
214 involving a third evaluator (**SM**).

215 The analyses proceeded in two steps. First, we described and analysed
216 the proportion of articles from studies conducted (also) in LMICs that
217 involved at least one researcher with affiliation in a LMIC as a co-author

218 (LMIC author). Second, we analysed and described the proportion of
219 articles from studies conducted (also) in LMICs that had a LMIC first
220 author; the proportion of articles with at least a MIC middle author; and
221 the proportion of articles with MIC last author. The statistical analyses
222 were conducted in SPSS v.25.

223

224 **3. Results**

225

226 *3.1 Trials and publications selection*

227 We selected 4,177 records of therapeutic trials from the database. After
228 removing trial records with a different status (not yet completed at the
229 time of data extraction), 1,857 completed trials remained. After removing
230 the 1,424 trials conducted only in HICs, 430 trials involving sites in
231 LMICs were retained; all of them involved MICs only (and not any LICs).
232 Out of these 430 trials, 186 trials had publications that were eligible for
233 further screening. Out of these 186 trials, we identified and retrieved 428
234 publications. After full-text screening, we excluded 13 trials (because
235 that did not have publications) and 126 publications that did not fulfil our
236 inclusion criteria. For example, the excluded publications (in which trial
237 identifiers were cited within the article) were published as reviews,
238 systematic reviews and/or meta-analysis, papers reported on cost-
239 effectiveness analysis, and pooled analysis of multiple trials. Finally, we
240 included and analysed 302 publications (from 173 trials) (**Figure 1**). The
241 complete list with the number of trials and their clinical sites in which
242 MICs were involved are reported in **Supplementary Figure S1 (A-B)**.

243 Briefly, among the L-MICs, most trials were conducted in India (n=37),
244 followed by Ukraine (n=29), the Philippines (n=16) and Egypt (n=13).
245 Among the U-MICs, most trials were conducted in the Russian
246 Federation (n=81), followed by Brazil (n=76), China (n=59) and Mexico
247 (n=53).

248

249

250

251

252

253

254

255

256

257

258

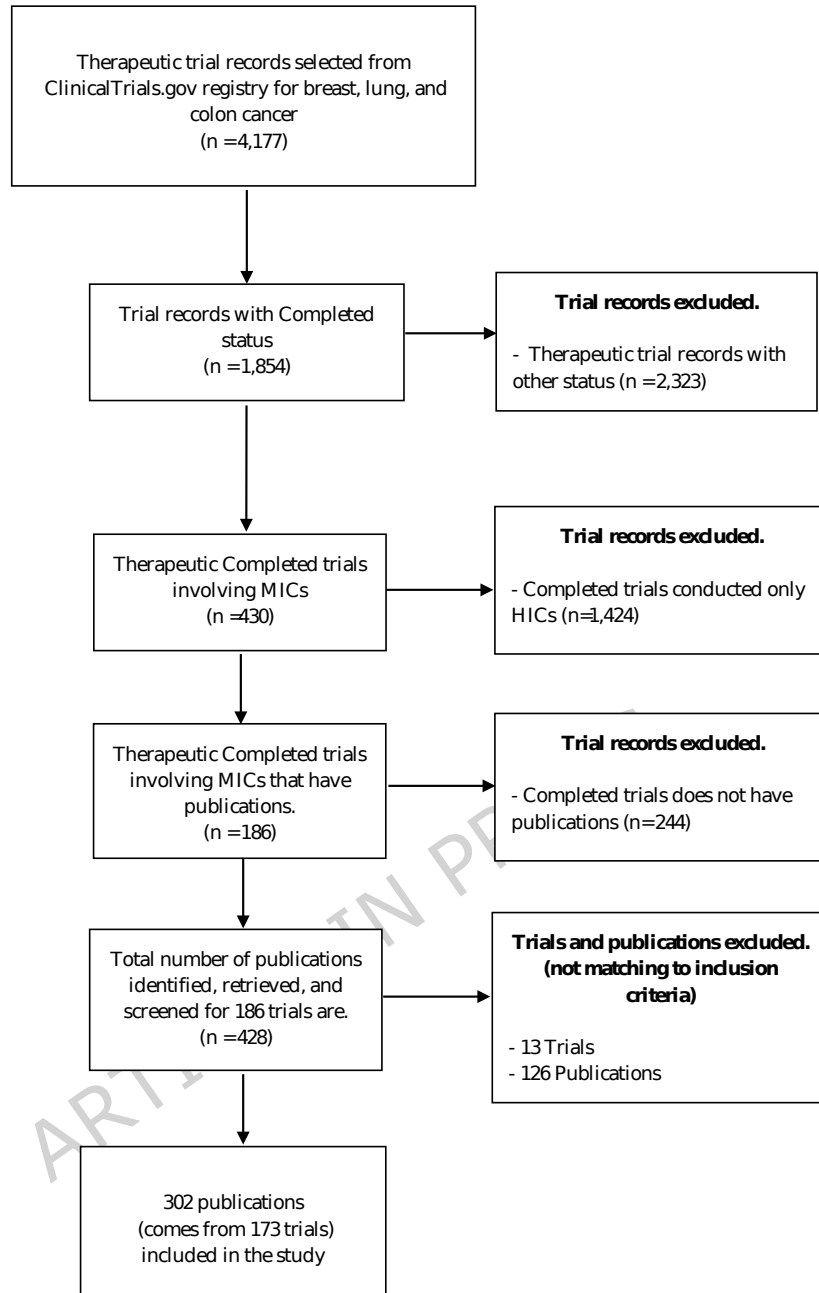
259

260

261

262

263 *Figure 1 Flow chart for the selection of trial records and publications*



264

265

266

267 As shown in **Figure 2**, the articles included in our study were published

268 between 2005 and 2022. The year with the highest number of

269 publications (n=38) was 2014, followed by 37 articles in 2013 and 31

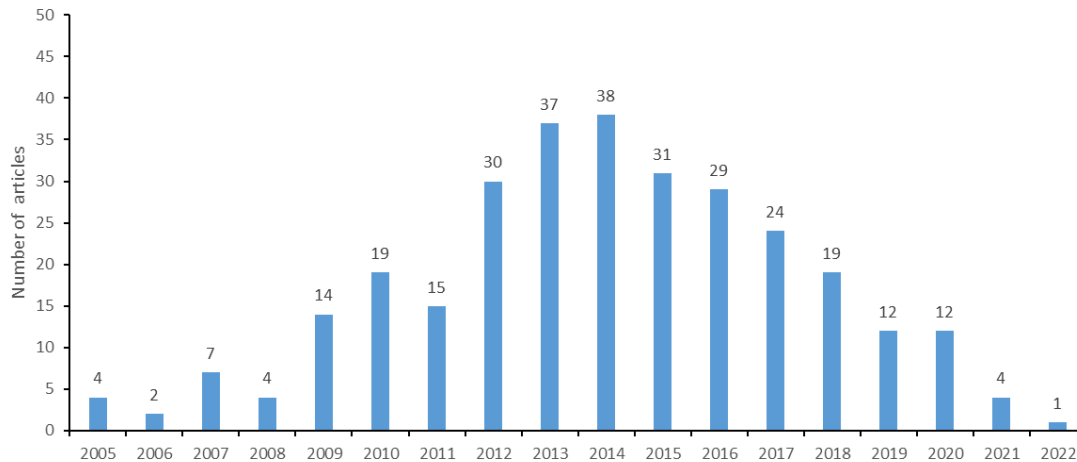
270 articles in 2015. A 'positive' trend in publication numbers over the period

271 2006-2014, in line with the general phenomenon of globalization of

272 clinical trials, was followed by a clear and constant decrease (2014-
273 2021).

274

275 *Figure 2 Number of articles published by year*



276

277

278 *3.2 Authorships trends in global oncology research*

279 **Table 1** shows the percentage of articles by authorship position. There
280 were no studies conducted (also or only) in low-income countries. Of 302
281 publications, 275 articles from 153 trials involving both HICs and MICs
282 were published in collaboration with authors from HICs and MICs. No
283 authorship position was assigned to MIC authors in 40% (n=109) of the
284 articles. Of 20 trials conducted exclusively in MICs, 27 articles were
285 published. Of these, 78% (n=21) had a first, middle and/or last MIC
286 author. In 7% (n=2) of the articles there were no MIC authors, although
287 the trial was conducted in MIC(s) only.

288

289

290

291

292 *Table 1 Proportion of articles segregated by authorship position: HICs + MICs trials vs*
 293 *Only MICs trials.*

MIC Authorship position	HICs + MICs 153 trials (n= 275 articles)	%	Only MICs 20 trials (n= 27 articles)	%	p-value
First author only	4	1	0	0	1
Middle author only	136	49	2	7	< 0.0001
Last author only	2	1	0	0	1
First, middle and last authors	7	3	21	78	< 0.0001
First and middle authors only	8	3	2	7	0.22
Middle and last authors only	9	3	0	0	1
No MIC authorship	109	40	2	7	0.0006
Total	275		27		

294 *MICs: Middle-income countries; HICs: High-income countries.*

295

296 Among the 302 publications included in our analysis, 63% (n=191)
 297 (**Figure 3A**) of the articles have at least an author from a MIC, out of
 298 which 42 articles included the first author and 39 articles included the
 299 last author. Of the 191 articles, 76% (n=146) had co-authors with
 300 affiliation in upper-MIC (UMIC) only, followed by 16% (n=31) with co-
 301 authors with affiliation in both U-MIC and low-MIC (L-MIC), and 7%
 302 (n=14) had co-authors with affiliation in L-MIC authors only (**Figure**
 303 **3B**).

304 Conversely, 37% (n=111) of the articles have no author from MIC,
 305 including two trials conducted in MICs only (Ukraine and Turkey
 306 respectively) (**Figure 3A**). In 10 of such 111 articles, MIC researchers in
 307 general (but no researcher's name) were quoted in the
 308 "Acknowledgments" section, and in five articles the name of the study
 309 group was mentioned in the "Affiliation" section of the article.

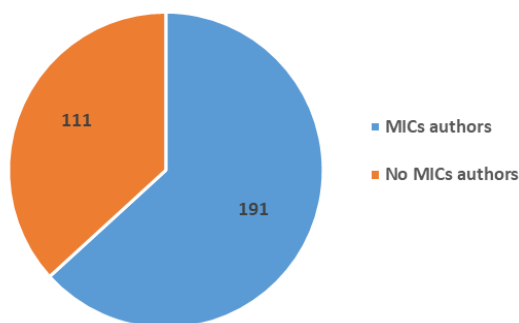
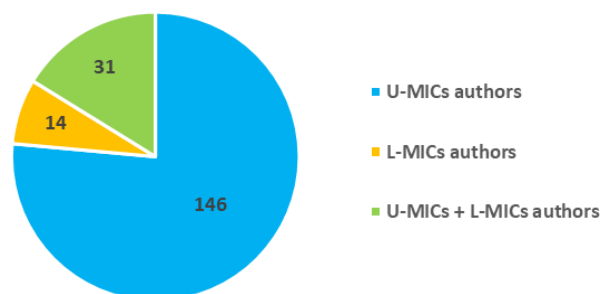
310

311

312

313 *Figure 3A Number of articles, authors with affiliations in MICs (n=302).*314 *Figure 3B Number of articles, authors with affiliation in U-MICs vs L-MICs authors*
315 *(n=191).*

316

317 **Fig 3A.**317 **Fig 3B.**

318

319 *MICs: Middle-income countries; U-MICs: Upper-middle-income countries; L-MICs:*
320 *Lower-middle-income countries*

321

322 *3.2.1 First Author*323 **Figure 4A** illustrates the temporal trend in the number of articles (n=42)

324 with a MIC researcher as first author. Noteworthy, 23 out of these trials

325 were conducted in MICs only. The highest number of articles with a MIC

326 researcher as first author was 7 (7/42, 17%) in 2013 and 2014, while it

327 was 6 (6/42, 14%) in 2015, followed by 5 (5/42, 12%) in 2012. Even if less

328 clear than in Figure 2.1, also in this case there was a 'positive' trend

329 (2009-2014), followed by a steady decrease (2014-2021).

330

331

332

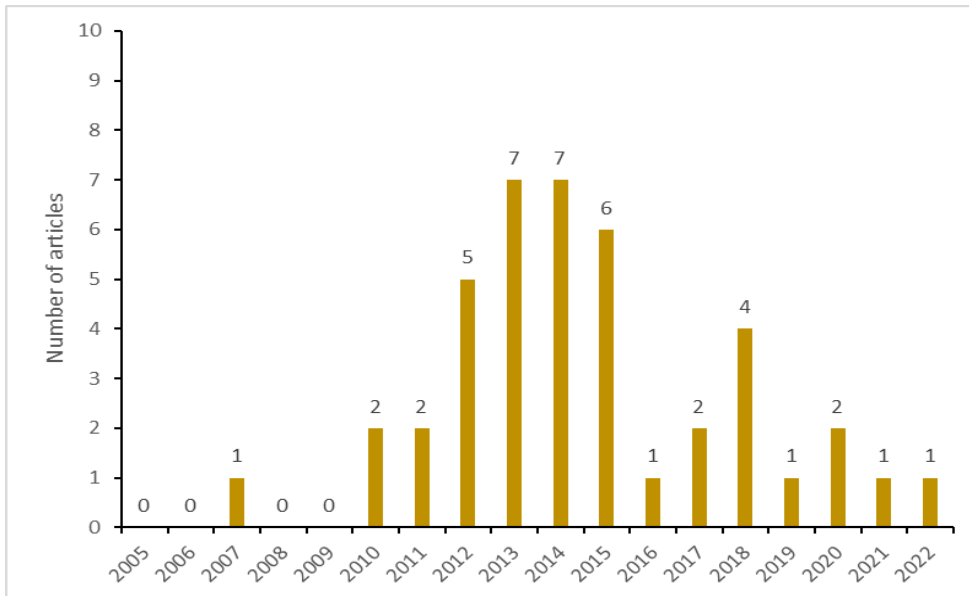
333

334

335

336

337

338 *Figure 4A Number of articles (n=42) with first author from an MIC: from 2005-2022.*

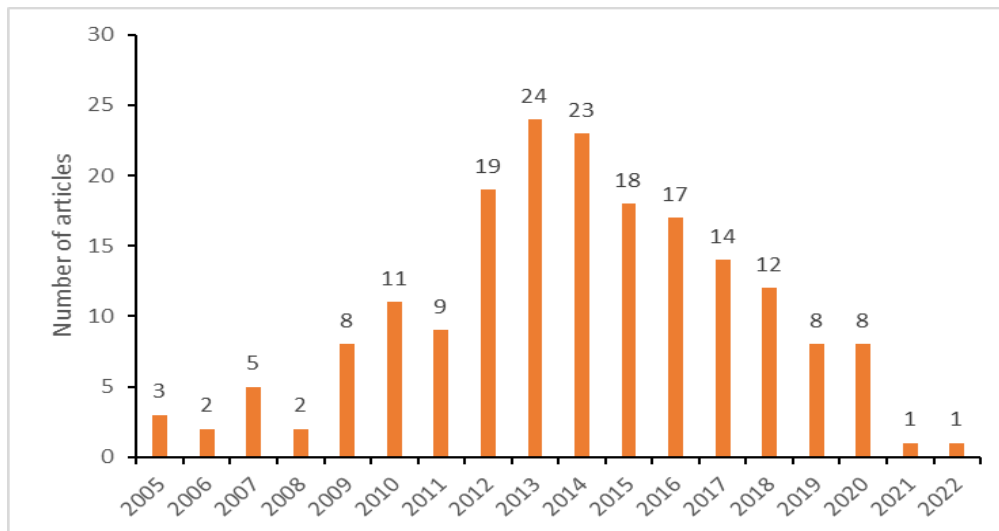
339

340

341 *3.2.2 Middle Author*

342 **Figure 4B** illustrates the number of articles (n=185) with a MIC
 343 researcher as a middle author between 2005 and 2022. The highest
 344 number of articles with a MIC researcher as a middle author was 24
 345 (24/185, 13%) in 2013, while it was 23 (23/185, 12%) in 2014, followed
 346 by 18 (18/185, 10%) in 2015. Again, a 'positive' trend (2006-2013) is
 347 followed by a clear and constant decrease (2014-2021).

348 *Figure 4B Number of articles (n=185) with middle author from an MIC: from 2005-*
 349 *2022.*



350

351

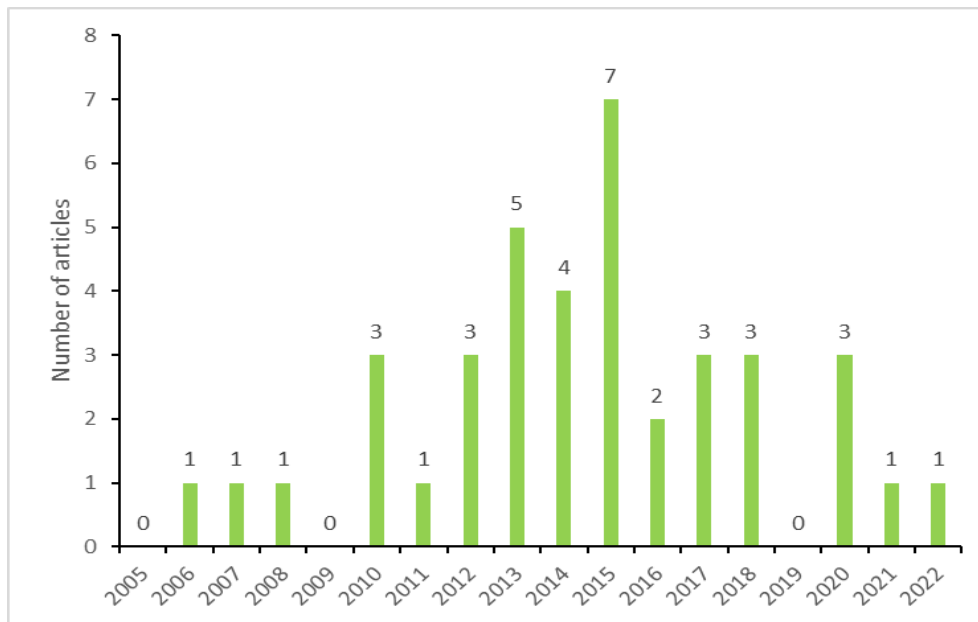
352

353 *3.2.3 Last Author*

354 **Figure 4C** illustrates the number of articles (n=39) with a MIC
 355 researcher as last author between 2005 and 2022. None of these trials
 356 were conducted in MICs only. The highest number of articles with a MIC
 357 researcher as last author was 7 (7/39, 18%) in 2015, 5 (5/39, 13%) in
 358 2013 and followed by 4 (4/39, 10%) in 2014. Temporal trends are less
 359 evident here, but one can observe highest levels around 2013-2015,
 360 followed by a steady decline in the following years.

361

362 *Figure 4C Number of articles (n=39) with Last author from an MIC: from 2005-2022.*



363

364

365 **4. Discussion**

366 In our study, we have explored the allocation of authorship of
367 international industry-sponsored trials on breast, lung and colon cancer,
368 including at least a site in LMICs. We have chosen to look at the issue of
369 research representation through the lens of authorship, as this serves as
370 a proxy for the research fair opportunities available as well as for the
371 recognition of the leadership role of the authors involved in the research-
372 in line with other authors (9). We have also chosen to focus particularly
373 on co-authorship and then first and last authorship, as these are
374 considered leading positions for published research; previous work on
375 this topic has also used this accepted convention (3, 24). In doing so,
376 several findings have emerged, that either confirm previous findings of
377 other authors, or point to new elements. Noteworthy, these findings only
378 concern clinical trials conducted in MIC, as we did not retrieve any

379 publications concerning research involving LICs, where the power
380 unbalance of local researchers might be greater.

381 First, our analysis revealed that MIC authors had no co-authorship at all
382 in (111 articles out of 302), including two studies conducted in MICs
383 only. The insufficient representation and inclusion of MIC authors seems
384 evident in our dataset of industry-sponsored clinical trials on breast, lung
385 and colon cancer, and it is suggestive of a structural imbalance in
386 authorship in global oncology.

387 Second, 57% (244/430) of completed clinical trials had not (yet)
388 published their results in peer-reviewed journals (as of 30 March 2024).
389 Even if for more recently-completed trials this is explained by the
390 insufficient time to get papers peer-reviewed and published, the high
391 percentage could also be suggestive of a possible publication bias (38,
392 39).

393 Third, in our analysis, we found that in the majority of published papers,
394 researchers from L-MICs and U-MICs are not generally represented in
395 the position of lead author (first or last), differently from their consortium
396 peers in HICs. This raises various questions, e.g. whether the research
397 findings truly reflect the priorities and needs of the local stakeholders in
398 MICs, if the lead authorship is elsewhere (3, 40, 41).

399 Other possible questions are whether there is sufficient awareness of/
400 commitment to global health equity in these research consortia, and
401 whether the positions of lead author are systematically determined in a
402 collaborative way, in line with the guidelines of the Committee

403 on Publication Ethics (COPE) and of the International Committee of
404 Medical Journal Editors (ICJME) guidelines (31, 42, 43). While commercial
405 sponsors have a substantial share of power, and thus play a key-role in
406 defining the publication and authorship practices, the
407 researchers/principal investigators from HICs involved in international,
408 industry-sponsored research consortia also need to critically consider
409 how and to which extent scientific credit is recognised to peers from
410 MICs (3, 40). Global research collaborations should build in key-aspects of
411 social justice, namely the avoidance of unequal power relations, the
412 promotion of group recognition, self-development and inclusive and
413 equitable inclusion in decision-making processes (44). We contend that
414 researchers and opinion leaders from HIC, including in oncology field,
415 can and should be vocal to promote equity in global health research.
416 Moreover, if higher representation is critical to realising global health
417 equity, regulators and other concerned policy-makers must also
418 encourage fair and more equitable representation (41, 45). Research
419 Ethics Committees (RECs) (both in the host countries and in the country
420 of the sponsor) may also play a role by requiring equitable representation
421 in research consortia, including authorship practices (46). The same
422 could apply to National Regulatory Authorities, who are responsible for
423 in-country trial oversight, and that could promote or require rigorous
424 measures for fair research partnership, including in data co-ownership
425 and in authorship practices. Similarly, academic journals should pursue
426 similar avenues to enhance fair authorship representation (47, 48), by
427 requiring and checking rigorous and substantial adherence to ICJME and

428 COPE guidelines, including in oncology, where knowledge and awareness
429 seem to be only recently emerged.

430 Previous studies have shown that research priorities in LMICs may be
431 better represented in investigator-initiated trials targeting cancer types
432 that are more prevalent in these countries (49, 50). Such trials may offer
433 greater opportunities for LMIC leadership and authorship, and more
434 accurately reflect local health priorities. However, LMIC investigator-led
435 cancer trials remain scarce for various reasons, including lack of funding
436 for investigator-initiated trials and a donors' focus on research in
437 infectious diseases (e.g. European and Developing Countries Clinical
438 Trials Partnership- for Africa). A recent survey conducted among
439 clinicians in LMICs indicates indeed a demand for increased funding and
440 capacity-building for local (clinical) researchers. But currently, with the
441 United States' withdrawal from global health initiatives and a decrease in
442 development cooperation elsewhere, there is a risk of further reductions
443 in funding for research on non-communicable diseases in LMICs, as the
444 focus shifts increasingly to health security (51).

445 One of the most striking, impactful and statistically sound findings of our
446 study is that 78% (21 out of 27 articles) of publications from trials
447 conducted exclusively in MICs had MIC first, middle, and last authors,
448 while 40% (109 out of 275 articles) of publications from trials involving
449 both HIC and MIC sites did not have a single MIC author. This
450 discrepancy suggests that MIC authors are more likely to hold lead and
451 senior roles when trials are geographically centered in MICs, and that

452 the inclusion of HIC sites ‘pushes’ partners apart and reduces MIC
453 authorship. These findings also challenge the assumption that MIC
454 investigators are uninterested in authorship and show that, when given
455 the opportunity, they do take key roles.

456 This has implications for authorship practices and the structure of global
457 partnerships. The comparison between MIC-only and HIC+MIC trials, in
458 particular, suggest the persistence of important power unbalances within
459 certain multinational collaborations.

460 In our study, we identified a substantial decline in published global
461 clinical trials over the past 10 years. This decline could be related to
462 increased regulatory scrutiny and a greater focus on the ethical
463 implications of trials in lower-resource countries, ; and/or to a gradual
464 disengagement of commercial sponsors in MICs. It is also possible that
465 trials are now increasingly being registered in other registries, such as
466 the Pan African Clinical Trial Registry (PACTR)
467 <https://www.edctp.org/pan-african-clinical-trials-registry/> , which are
468 included in the WHO portal, i.e. the International Clinical Trials Registry
469 Platform (ICTRP, <https://trialsearch.who.int/Default.aspx>).

470 Our study includes some limitations. Firstly, we included in our analysis
471 only industry-sponsored trials (breast, lung and colon cancer) with peer-
472 reviewed publications, thus excluding other forms of scientific
473 dissemination such as pre-prints and conference abstracts. Second, we
474 only retrieved publications for trials registered with ClinicalTrials.gov.
475 This may result in an incomplete database by excluding studies

476 registered in EUDRACT or other WHO-recognised registries. Third, we
477 checked whether a publication had at least one MIC co-author, but we
478 did not examine the specific MIC affiliation of those with authorship. On
479 the other hand, the size of our database -which includes 302 publications
480 from 173 trials- points to a good representativity of the filed over time.

481 Fourth, our study inclusion criteria might favour HIC authorship, since
482 prior research shows that many trials conducted in LMICs are not
483 industry-sponsored (7). Moreover, HIC-led trials tend to focus on a
484 limited set of cancer sites, while trials with LMIC-led articles tend to
485 focus on hematologic, gastrointestinal, and breast cancers (6). However,
486 since we included also breast cancers and colon cancer (which is the
487 most common gastrointestinal cancer), this issue might be a relatively
488 minor concern. Further research should investigate authorship patterns
489 for other cancer types, including some cancers that are highly prevalent
490 in the Global South such as Burkitt lymphoma, and for oncological non-
491 commercial studies. Furthermore, future studies should investigate
492 whether the research conducted in MICs has generated locally-relevant
493 knowledge and has adequately influenced local policies and practices
494 (52).

495 **5. Conclusions**

496 Overall, this study found an imbalance in authorship, suggestive of
497 inequities in research partnerships in industry-sponsored breast, lung
498 and colon cancer clinical trials. The sponsors need to work towards
499 greater equity in authorship when collaborating with researchers in

500 LMICs, and oncology researchers and opinion leaders in HICs should
501 actively advocate for more fairness toward their peers in MICs. As this
502 issue seems to have only recently been raised in the specific field of
503 oncology research, more research as well as awareness-raising is
504 needed, to gain further insight into the recognition of authorship and
505 equity in global oncology research partnerships between HICs and
506 LMICs, whether industry- or academia-sponsored.

507 **Author contributions**

508 GG and RR contributed equally.

509 **Contributors:** GG, RR and ABP conceptualised this research. ABP and
510 BM, supported by SM, did the data extraction. ABP and SM run the
511 analyses and wrote the draft manuscript. GG, RR and SA gave significant
512 inputs on the manuscript and discussion. All authors approved the
513 submitted manuscript. ABP is acting as a guarantor for this manuscript.

514

515

516

517 **Data availability**

518 Data is provided within the manuscript or supplementary information
519 files. Additional data are available on reasonable request. All data were
520 extracted from public registries & electronic databases, and do not
521 include any personal or medical data. Therefore, ethics review was not
522 needed.

523

524 **Declarations**

525 **Consent for publication:** Not applicable.

526 **Competing interests:** The authors declare no competing interests.

527 **Funding:** This research received no external funding

528

529 **Ethics statements**

530 **Patient consent for publication:** Not applicable.

531 **Ethics approval:** Not applicable.

532

533 **ORCID iDs**

534 Anil babu Payedimarri: <https://orcid.org/0000-0003-4298-1305>

535 Samir Mouhssine: <http://orcid.org/0000-0002-0389-3268>

536 Saleh Aljadeeah: <http://orcid.org/0000-0003-4035-4121>

537 Gianluca Gaidano: <https://orcid.org/0000-0002-4681-0151>

538 Raffaella Ravinetto: <http://orcid.org/0000-0001-7765-2443>

539 Twitter Raffaella Ravinetto @RRavinetto

540

541 **References**

542

543

- 544 1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2024;74(3):229-63.
- 548 2. Rossi A, Torri V, Garassino MC, Porcu L, Galetta D. The impact of personalized medicine on survival: comparisons of results in metastatic breast, colorectal and non-small-cell lung cancers. *Cancer Treat Rev.* 2014;40(4):485-94.
- 552 3. Hedt-Gauthier BL, Jeufack HM, Neufeld NH, Alem A, Sauer S, Odhiambo J, et al. Stuck in the middle: a systematic review of authorship in collaborative health research in Africa, 2014-2016. *BMJ Global Health.* 2019;4(5):e001853.
- 555 4. Cash-Gibson L, Rojas-Gualdrón DF, Pericàs JM, Benach J. Inequalities in global health inequalities research: A 50-year bibliometric analysis (1966-2015). *PLOS ONE.* 2018;13(1):e0191901.
- 558 5. Guidance for best practices for clinical trials. Geneva: World Health Organization; 2024. Licence: CC BY-NC-SA 3.0 IGO.
- 560 6. Rubagumya F, Hopman WM, Gyawali B, Mukherji D, Hammad N, Pramesh CS, et al. Participation of Lower and Upper Middle-Income Countries in Oncology Clinical Trials Led by High-Income Countries. *JAMA Network Open.* 2022;5(8):e2227252-e.
- 564 7. Wells JC, Sharma S, Del Paggio JC, Hopman WM, Gyawali B, Mukherji D, et al. An Analysis of Contemporary Oncology Randomized Clinical Trials From Low/Middle-Income vs High-Income Countries. *JAMA Oncol.* 2021;7(3):379-85.
- 567 8. Iyandemye J, Thomas MP. Low income countries have the highest percentages of open access publication: A systematic computational analysis of the biomedical literature. *PLOS ONE.* 2019;14(7):e0220229.

- 570 9. Kelaher M, Ng L, Knight K, Rahadi A. Equity in global health research in
571 the new millennium: trends in first-authorship for randomized controlled trials
572 among low- and middle-income country researchers 1990-2013. *Int J Epidemiol*.
573 2016;45(6):2174-83.
- 574 10. Theobald S, Brandes N, Gyapong M, El-Saharty S, Proctor E, Diaz T, et al.
575 Implementation research: new imperatives and opportunities in global health.
576 *The Lancet*. 2018;392(10160):2214-28.
- 577 11. Östlin P, Schrecker T, Sadana R, Bonnefoy J, Gilson L, Hertzman C, et al.
578 Priorities for research on equity and health: towards an equity-focused health
579 research agenda. *PLoS Med*. 2011;8(11):e1001115.
- 580 12. TRUST (2018). The TRUST Code - A Global Code of Conduct for
581 Equitable Research Partnerships.
- 582 13. Busse C, August E. Addressing power imbalances in global health: Pre-
583 Publication Support Services (PREPSS) for authors in low-income and middle-
584 income countries. *BMJ Glob Health*. 2020;5(2):e002323.
- 585 14. Abimbola S, Asthana S, Montenegro C, Guinto RR, Jumbam DT,
586 Louskieter L, et al. Addressing power asymmetries in global health: Imperatives
587 in the wake of the COVID-19 pandemic. *PLoS Med*. 2021;18(4):e1003604.
- 588 15. Odjidja EN. What is wrong with global health? So-called glorified data
589 collectors in low-income regions. *The Lancet Global Health*. 2021;9(10):e1365.
- 590 16. Mbaye R, Gebeyehu R, Hossmann S, Mbarga N, Bih-Neh E, Eteki L, et al.
591 Who is telling the story? A systematic review of authorship for infectious
592 disease research conducted in Africa, 1980-2016. *BMJ Global Health*.
593 2019;4(5):e001855.
- 594 17. Schneider H, Maleka N. Patterns of authorship on community health
595 workers in low-and-middle-income countries: an analysis of publications (2012-
596 2016). *BMJ Global Health*. 2018;3(3):e000797.
- 597 18. Jacobsen KH. Patterns of co-authorship in international epidemiology. *J*
598 *Epidemiol Community Health*. 2009;63(8):665-9.
- 599 19. Aluede EE, Phillips J, Bleyer J, Jergesen HE, Coughlin R. Representation
600 of developing countries in orthopaedic journals: a survey of four influential
601 orthopaedic journals. *Clin Orthop Relat Res*. 2012;470(8):2313-8.
- 602 20. Keiser J, Utzinger J, Tanner M, Singer BH. Representation of authors and
603 editors from countries with different human development indexes in the leading
604 literature on tropical medicine: survey of current evidence. *Bmj*.
605 2004;328(7450):1229-32.
- 606 21. Pastrana T, Vallath N, Mastrojohn J, Namukwaya E, Kumar S, Radbruch
607 L, et al. Disparities in the contribution of low- and middle-income countries to
608 palliative care research. *J Pain Symptom Manage*. 2010;39(1):54-68.
- 609 22. Chersich MF, Blaauw D, Dumbaugh M, Penn-Kekana L, Dhana A, Thwala
610 S, et al. Local and foreign authorship of maternal health interventional research
611 in low- and middle-income countries: systematic mapping of publications 2000-
612 2012. *Globalization and Health*. 2016;12(1):35.
- 613 23. Patel V, Kim YR. Contribution of low- and middle-income countries to
614 research published in leading general psychiatry journals, 2002-2004. *Br J*
615 *Psychiatry*. 2007;190:77-8.
- 616 24. Iyer AR. Authorship trends in *The Lancet Global Health*. *Lancet Glob*
617 *Health*. 2018;6(2):e142.
- 618 25. Dimitris MC, Gittings M, King NB. How global is global health research?
619 A large-scale analysis of trends in authorship. *BMJ Glob Health*. 2021;6(1).
- 620 26. Ghani M, Hurrell R, Verceles AC, McCurdy MT, Papali A. Geographic,
621 Subject, and Authorship Trends among LMIC-based Scientific Publications in
622 High-impact Global Health and General Medicine Journals: A 30-Month
623 Bibliometric Analysis. *J Epidemiol Glob Health*. 2021;11(1):92-7.

- 624 27. Naidoo AV, Hodkinson P, King LL, Wallis LA. African authorship on
625 African papers during the COVID-19 pandemic. *BMJ Global Health*.
626 2021;6(3):e004612.
- 627 28. Smith E, Hunt M, Master Z. Authorship ethics in global health research
628 partnerships between researchers from low or middle income countries and
629 high income countries. *BMC Medical Ethics*. 2014;15(1):42.
- 630 29. Shumba CS, Lusambili AM. Not enough traction: Barriers that aspiring
631 researchers from low- and middle-income countries face in global health
632 research. *Journal of Global Health Economics and Policy*. 2021;1.
- 633 30. Noormahomed E, Williams P, Lescano AG, Raj T, Bukusi EA, Schooley RT,
634 et al. The Evolution of Mentorship Capacity Development in Low- and Middle-
635 Income Countries: Case Studies from Peru, Kenya, India, and Mozambique. *Am*
636 *J Trop Med Hyg*. 2019;100(1_Suppl):29-35.
- 637 31. Albert T, Wager E. How to handle authorship disputes: a guide for new
638 researchers. *The COPE Report*. 2003(1):32-4.
- 639 32. Eldridge L, Garton EM, Duncan K, Gopal S. Authorship of Publications
640 Supported by NCI-Funded Grants Involving Low- and Middle-Income Countries.
641 *JAMA Network Open*. 2024;7(3):e243215-e.
- 642 33. Tuyishime H, Hornstein P, Lasebikan N, Rubagumya F, Mutebi M, Fadelu
643 T. Authorship Distribution and Under-Representation of Sub-Saharan African
644 Authors in Global Oncology Publications. *JCO Glob Oncol*. 2022;8:e2200020.
- 645 34. Wong JC, Fernandes KA, Amin S, Lwin Z, Krzyzanowska MK. Involvement
646 of low- and middle-income countries in randomized controlled trial publications
647 in oncology. *Globalization and Health*. 2014;10(1):83.
- 648 35. Rubagumya F, Fundytus A, Keith-Brown S, Hopman WM, Gyawali B,
649 Mukherji D, et al. Allocation of authorship and patient enrollment among global
650 clinical trials in oncology. *Cancer*. 2023.
- 651 36. Payedimarri AB, Mouhssine S, Aljadeeah S, Gaidano G, Ravinetto R.
652 Globalisation of industry-sponsored clinical trials for breast, lung and colon
653 cancer research: trends, threats and opportunities. *BMJ Oncol*.
654 2023;2(1):e000101.
- 655 37. The World Bank. World Bank Country and Lending Groups, fiscal year
656 2019 [Available from:
657 [https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-](https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups)
658 [country-and-lending-groups](https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups).
- 659 38. Scavone C, Concetta R, Liberata S, Liberato B, and Capuano A. Disclosing
660 negative trial results - procedure. *Expert Review of Clinical Pharmacology*.
661 2016;9(12):1517-9.
- 662 39. Ridker PM, Torres J. Reported Outcomes in Major Cardiovascular Clinical
663 Trials Funded by For-Profit and Not-for-Profit Organizations: 2000-2005. *JAMA*.
664 2006;295(19):2270-4.
- 665 40. Abimbola S, Pai M. Will global health survive its decolonisation? *The*
666 *Lancet*. 2020;396(10263):1627-8.
- 667 41. Eichbaum QG, Adams LV, Evert J, Ho MJ, Semali IA, van Schalkwyk SC.
668 Decolonizing Global Health Education: Rethinking Institutional Partnerships
669 and Approaches. *Acad Med*. 2021;96(3):329-35.
- 670 42. COPE Council. COPE Discussion Document: Authorship. September 2019
671 <https://doi.org/10.24318/cope.2019.3.3>
- 672 .
- 673 43. International Committee of Medical Journal Editors (ICMJE).
674 Recommendations for the Conduct, Reporting, Editing, and Publication of
675 Scholarly Work in Medical Journals. January 2025. [accessed on: 02 Apr 2025].
676 Available from: <https://www.icmje.org/recommendations/>.

- 677 44. Faure MC, Munung NS, Ntusi NAB, Pratt B, de Vries J. Mapping
678 experiences and perspectives of equity in international health collaborations: a
679 scoping review. *Int J Equity Health*. 2021;20(1):28.
- 680 45. Kwete X, Tang K, Chen L, Ren R, Chen Q, Wu Z, et al. Decolonizing global
681 health: what should be the target of this movement and where does it lead us?
682 *Global Health Research and Policy*. 2022;7(1):3.
- 683 46. Strauss DH, White SA, Bierer BE. Justice, diversity, and research ethics
684 review. *Science*. 2021;371(6535):1209-11.
- 685 47. Sharma D. A call for reforms in global health publications. *The Lancet*
686 *Global Health*. 2021;9(7):e901-e2.
- 687 48. Skopec M, Issa H, Reed J, Harris M. The role of geographic bias in
688 knowledge diffusion: a systematic review and narrative synthesis. *Research*
689 *Integrity and Peer Review*. 2020;5(1):2.
- 690 49. Pramesh CS, Badwe RA, Bhoo-Pathy N, Booth CM, Chinnaswamy G, Dare
691 AJ, et al. Priorities for cancer research in low- and middle-income countries: a
692 global perspective. *Nat Med*. 2022;28(4):649-57.
- 693 50. Eldridge L, Goodman NR, Chtourou A, Galassi A, Monge C, Cira MK, et
694 al. Barriers and Opportunities for Cancer Clinical Trials in Low- and Middle-
695 Income Countries. *JAMA Network Open*. 2025;8(4):e257733-e.
- 696 51. Ooms G, Assefa Y, Charalambous S, Dah TTE, Decoster K, de Jong B, et
697 al. Is global health security worth 0.01% of our gross domestic product? *PLOS*
698 *Global Public Health*. 2025;5(5):e0004491.
- 699 52. Trapero-Bertran M, Pokhrel S, Hanney S. Research can be integrated into
700 public health policy-making: global lessons for and from Spanish economic
701 evaluations. *Health Research Policy and Systems*. 2022;20(1):67.

702