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2 **Conference Equity in Global Health: A Systematic Review of Factors Impacting** 3 **LMIC Representation at Global Health Conferences**

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35 **Abbreviations**

36

37 LMIC – Low- and middle-income country
38 HIC – High-income country
39 AJOL - African Journals Online Library
40 WHOLIS - World Health Organization Library Database
41 IAS – International AIDS Society
N/A – Not applicable
AORTIC - African Organization for Research and Training in Cancer
NGO – Non-governmental organization

1 **ABSTRACT**

2

3 **Introduction:** Global health conferences are important platforms for knowledge exchange,
4 decision-making and personal and professional growth for attendees. Neocolonial patterns in
5 global health at large and recent opinion reports indicate that stakeholders from low- and
6 middle-income countries (LMICs) may be underrepresented at such conferences. This study
7 aims to describe the factors that impact LMIC representation at global health conferences.

8

9 **Methods:** A systematic review of articles reporting factors determining global health
10 conference attendance was performed using the Preferred Reporting Items for Systematic
11 Reviews and Meta-Analyses (PRISMA) guidelines. Articles presenting conference
12 demographics and data on the barriers and/or facilitators to attendance were included.
13 Articles were screened at title- and abstract level by four independent reviewers. Eligible
14 articles were read in full text, analyzed and evaluated with a risk of bias assessment.

15

16 **Results:** Among 8,765 articles screened, 46 articles met inclusion criteria. Thematic
17 analysis yielded two themes: “barriers to conference attendance” and “facilitators to
18 conference attendance”. In total, 112 conferences with 254,601 attendees were described,
19 of which 4% of the conferences were hosted in low-income countries. Of the 98,302
20 conference attendees, for whom affiliation was disclosed, 38,167 (39%) were from LMICs.

21

22 **Conclusion:** “Conference inequity” is common in global health, with LMIC attendees
23 underrepresented at global health conferences. LMIC attendance is limited by systemic
24 barriers including high travel costs, visa restrictions, and lower acceptance rates for research
25 presentations. This may be mitigated by relocating conferences to visa-friendly countries,
26 providing travel scholarships and developing mentorship programs to enable LMIC
27 researchers to participate in global conferences.

1 Summary box

2 What is already known?

- 3 • The majority of the global disease burden exists in low- and middle-income countries
4 (LMICs), yet decision-making in global health policy and research is often led by
5 high-income countries (HICs).
- 6 • Global health conferences are often located in and managed by high-income country
7 institutions.
- 8 • Factors impacting global health career opportunities, such as conference attendance,
9 exist at both the individual (geographic and socioeconomic) and organizational
10 (funding streams, political factors, historical/colonial) level.

11 What are the new findings?

- 12 • Based on the definition of conference equity as “attainment of an equitable level of
13 attendee active engagement, influence and access to a conference regardless of
14 country of origin, location, available funds or affiliation, through the mitigation of
15 known barriers and enhancement of efficacious facilitators”, the literature on global
16 health conference attendance and the associated barriers and facilitators is limited
17 and heterogeneous.
- 18 • This systematic review includes 46 articles describing 112 unique conferences with
19 254,601 attendees from the past three decades. Of these conferences, only 4% were
20 hosted in low-income countries and 39% of attendees were from LMICs.
- 21 • LMIC attendees most commonly perceived limited speaking opportunities at global
22 health conferences, indicating limited opportunities for active and meaningful
23 participation. The primary factor identified with potential for improving conference
24 equity included relocation to LMICs or “visa-friendly countries”.

25 What do the new findings imply?

- 26 • Global health conferences, in their current model, are not equitable. The
27 underrepresentation of LMIC attendees is a loss to the global health discourse.
- 28 • Conference attendees from LMICs face systemic barriers in traveling to and
29 participating in global health conferences, with low-income country attendees being
30 particularly vulnerable to exclusion.
- 31 • Global health conferences should be held in visa-friendly countries, provide travel
32 scholarships, and offer mentorship programs to promote attendance by LMIC
33 researchers and stakeholders.

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1 INTRODUCTION

2 Global health conferences are forums of decision-making, knowledge exchange, networking,
3 and personal development, pivotal to the field (1,2). Health conferences provide
4 opportunities that are highly beneficial for career development,(3–6), and attendees from low
5 and middle-income countries, regions disproportionately burdened by disease,
6 unquestionably have much to contribute and to gain from active participation at these
7 conferences. However, inequities in conference attendance, raised in recent opinion pieces,
8 have drawn light to an area that requires critical attention,(7–11).

9 The majority of the global disease burden occurs in low and middle-income countries
10 (LMICs) where 84% of the world's population resides,(12). Yet, decision-making and
11 research on global health are dominated by high-income countries (HICs). This parallels a
12 neocolonial trend, with the economic, political and cultural influence of former colonial
13 powers still shown (13) in the underrepresentation of local authors in global health research,
14 especially in the first and senior author position, on editorial boards,(14–16), and in the fact
15 that 85% of headquarters of global health organizations are located in the global north,(17).
16 Therefore, it is not surprising that the majority of global health conferences follow the same
17 geographical constellation. The skewness of these locations to the “global north” are
18 undeniably linked to a colonial history which continues to affront today as a complex
19 multitude of barriers to equity in global health,(13,18–22). Our preliminary study shows that
20 for the annual Consortium of Global Health (CUGH) in the USA, countries with higher US
21 visa rejection rates had lower number of representative speakers ($p=0.04$) and for each 10%
22 increase in the US visa rejection rate, the number of speakers decreased by 23%
23 ($p=0.01$),(23). Understanding the importance of such barriers, in the context of global health
24 conference attendance, and equally the strategies implemented to facilitate attendance is an
25 intentional first step towards establishing “conference equity”. We define “conference equity”
26 as: “*attainment of an equitable level of attendee active engagement, influence and access to*
27 *a conference regardless of country of origin, location, available funds or affiliation, through*
28 *the mitigation of known barriers and enhancement of efficacious facilitators”.*

29 This study aimed to describe the factors that impact LMIC representation at global health
30 conferences.

31

32 METHODS

33

34 Defining global health

1 Out of the multiple definitions for global health (24–26), we selected one by Koplan *et al*: “An
2 area of study, research, and practice that places a priority on improving health and achieving
3 equity in health for all people worldwide”,(27) as the definition most applicable to this study.
4 This definition includes all the primary factors deemed essential to global health, including
5 health equity and global conceptualization. Additionally, the majority of the secondary factors
6 are also detailed,(24).

7 **Hypothesis**

8 Utilizing our definition of conference equity, we hypothesized that the majority of global
9 health conferences would be located in HICs; the proportion of LMIC attendees would be
10 higher when held in an LMIC. We further hypothesized that financial subsidies to LMIC
11 attendees increase their participation.

12 **Search Strategy and Data Sources**

13 A systematic review of articles reporting inequities in global health conference attendance
14 was performed using the Preferred Reporting Items for Systematic Reviews and Meta-
15 Analyses (PRISMA) guidelines,(28). The search strategy (**Appendix 1**) was developed in
16 collaboration with and approved by an information specialist (SJ). A comprehensive,
17 reproducible search from the date of inception to 12 February 2020 of 7 electronic
18 bibliographic databases: Medline, Medline Daily, Medline Epub Ahead of Print and InProces,
19 and Other Non-Indexed Citations from OVID, Embase, PsycInfo, CINAHL, Scopus, and Web
20 of Science. Hand searches of African Journals Online Library (AJOL), World Health
21 Organization Library Database (WHOLIS), and grey literature were undertaken. All included
22 articles were hand-searched for additional articles to be included in the review and
23 collaborative partners were consulted for expert opinion in identifying additional literature.

24 To identify relevant grey literature, the search terms “Global Health”, “Conference” and
25 Participation” were entered into the Google search engine with file extensions ‘.com’, ‘.org’
26 and ‘un.org’. The first 10 pages were screened to identify publications related to conference
27 equity. To ensure the capture of a wide array of publications, both conference reports, and
28 written presentations were included. Results were imported into EndNote and combined with
29 the search results from the electronic databases. All duplicates were removed.

30

31 **Selection and appraisal of documents**

32

1 Inclusion criteria

2 Inclusion criteria (**Appendix 2**) consisted of points of interest (barriers or facilitators), setting
3 (global health conferences), and population (attendees). We considered facilitators as any
4 action or policy that mitigated the barriers to attending global health conferences. All study
5 designs (qualitative, quantitative randomized experimental, quantitative non-randomized
6 controlled, quantitative observation, and mixed methods) were included. Books and book
7 chapters, reports, commentaries, letters, editorials published in academic journals,
8 dissertations, and conference proceedings were also included.

9

10 Exclusion criteria

11 Papers that did not specify the location of a conference and did not include data on barriers
12 or facilitators to attending global health conferences were excluded (**Appendix 2**). Articles in
13 non-academic journals such as daily newspapers describing events related to visa rejections
14 were not included.

15

16 Article selection

17 All articles were screened using Covidence at a title- and abstract-level by four study
18 members (LV, JWL, USK, AZ), who randomly divided the papers so that two independent
19 study members reviewed each article. At the end of the initial screening, all conflicts were
20 discussed by the two investigators who had read the title and abstract. If the conflict could
21 not be resolved between the two, a third study member from the screening group made the
22 final decision. All articles included through the title- and abstract- screen were then reviewed
23 at full-text-level by two independent study members (LV and JWL), using the inclusion and
24 exclusion criteria previously agreed upon. All conflicts were resolved between the two
25 reviewers.

26

27 Data extraction and analysis

28 All eligible full-text articles were read and analyzed by two study members (LV and JWL).
29 For articles with missing information about the conference (for example the total number of
30 attendees or conference objectives), the conference website was consulted for information
31 retrieval. Two independent reviewers (LV and JWL) performed a risk of bias assessment
32 using the GRADE approach,(23). To our knowledge, no guidelines or validated framework
33 exists to address inequities in conference attendance. We used a bottom-up thematic
34 analysis approach to design a conceptual framework,(29). All relevant data were extracted
35 and then merged in conceptually related variables into sub-themes. Similar variables were
36 categorized under the same theme, which underwent thematic analysis and descriptive

1 statistics,(29). The World Bank Income Country Group classification system and the World
2 Health Organization regions were used to geographically classify countries,(30,31).

3

4 Risk of bias assessment and grading of evidence

5 We were unable to identify an appropriate risk of bias assessment model that explicitly fit our
6 aim and therefore we used the GRADE approach,(32), as it was considered the broadest.
7 Included articles were assessed for risk of bias, even though some of them (opinion pieces
8 for example) were expected to bear substantial bias by their nature. Therefore, we applied
9 an adapted GRADE approach to all included articles, separated by study type.

10

11 *Inconsistency* was defined as difference in outcome (attendance at global health
12 conferences) based on measures to mitigate barriers through facilitators. Potential sources
13 of *indirectness* were significant variations in the themes addressed (e.g. variables not fitting
14 the two themes) or lack of specification of the population, conference, barriers, and/or
15 facilitators and outcomes (attendance). *Imprecision* was defined as lack of evidence
16 supporting the effect of identified barriers and facilitators on attendance by LMIC attendees.
17 *Publication bias* was defined as the systematic over- or underestimation of the impact of
18 barriers or facilitators on attendance due to selective publication.

19

20 **Prospero registration**

21 The study was prospectively registered in Prospero with trial number CRD42020155645 on
22 July 7th, 2020.

23

24 **RESULTS**

25

26 Search results

27 In total, 13,989 articles, of which 8,765 were unique, were found in the academic database
28 searches (**Figure 1**). An additional 24 papers were added from hand searches (n=18,
29 01/02/2020, 05/05/2020), grey literature (n=3, 01/02/2020), and through expert opinion (n=4,
30 31/03/2020). At title- and abstract level, 8,769 articles were screened in Covidence, of which
31 8680 were excluded. Eighty-nine articles were assessed as full texts, of which 43 were
32 excluded due to ineligibility. In the final review, 46 articles were included.

33 Quality of evidence

1 Stratifying by study type, the evidence for each theme is very low (**Table 1**). This infers that
 2 there is limited supporting evidence demonstrating barriers and facilitators impact
 3 attendance at global health conferences.

4 **Table 1.** Risk of bias assessment of articles included in the systematic review.
 5

No. of Articles	Global health field(s) studied	Outcomes	Study Design Limitations	Inconsistency	Indirectness	Imprecision	Publication bias	Quality
Conference reports								
20	HIV/AIDS (14), Health Systems Research (2), Nutrition (1), Oncology (1), Mental Health (1)	Barriers	Yes	Yes	Yes	Yes	Unclear	Very low
		Facilitators	Yes	Yes	Yes	Yes	Unclear	Very low
Retrospective studies								
9	Emergency Medicine / Critical Care (1), Hematology (1), Infectious diseases (1), Health Systems Research (1), Oncology (1), Tobacco Control (1), Global Health (2)	Barriers	Yes	Yes	Yes	no	Unclear	Very low
		Facilitators	Yes	No	Yes	no	Unclear	Very low
Opinion pieces								
7	HIV/AIDS (1), Gender Equity (1), Health Systems Research (1), Infectious Diseases (1), Global Health (3)	Barriers	Yes	Yes	Yes	Yes	Yes	Very low
		Facilitators	Yes	Yes	Yes	Yes	Yes	Very low
Descriptive studies								
4	Oncology (1), HIV/AIDS (2), Rural Health (1)	Barriers	Yes	Yes	Yes	Yes	Yes	Very low
		Facilitators	Yes	Yes	Yes	Yes	Yes	Very low
Abstracts								
3	Hematology (1), Oncology (1), Infectious Diseases (1)	Barriers	Yes	Yes	Yes	Yes	Unclear	Very low
		Facilitators	-	-	-	-	-	-
Scientific letter								
1	Global Surgery (1)	Barriers	Yes	-	-	Yes	Yes	Very low
		Facilitators	Yes	-	-	Yes	Yes	Very low
Mixed-methods study								
1	Health Systems Research (1)	Barriers	Yes	-	-	Yes	Yes	Very low
		Facilitators	Yes	-	-	Yes	Yes	Very low
Newsletter								
1	HIV/AIDS (1)	Barriers	Yes	-	-	No	Yes	Very low
		Facilitators	Yes	-	-	Yes	Yes	Very low

- = Not assessed.

1 Article characteristics

2 Of the included articles 17 were peer-reviewed articles (37%) and 29 were other publications
3 (63%) (**Table 2**). The peer-reviewed journal articles included nine retrospective studies
4 (20%), four descriptive studies (8.7%), two scientific abstracts (4.3%), one scientific letter
5 (2.2%), and one mixed-methods study (2.2%). Non-peer-reviewed articles included
6 conference reports (n=21, 46%), opinion pieces (n=7, 15%), and one scientific newsletter
7 (n=1, 2.2%). Of the 25 articles with a first author with a country affiliation, seven (28%)
8 articles had a first author with an LMIC affiliation. Year of publication ranged from 1997 to
9 2019 with the median year being 2014.

10 Conference characteristics

11 The 46 eligible articles described 112 unique conferences that took place between 1997 and
12 2019 (**Appendix 4**). The conferences took place in 38 countries from all six WHO regions
13 (**Figure 2**). Of the 112 conferences, 71% took place in HICs, 26% in middle-income
14 countries (MICs) and 4% in low-income countries (LICs). The most commonly reported host
15 countries were USA (n=35, 31%), Canada (n=8, 7%) and South Africa (n=7, 6%). LMIC host
16 countries included South Africa (n=7, 6%), Thailand (n=3, 3%), China (n=3, 3%), Egypt (n=3,
17 3%), Mexico (n=2, 2%), India (n=2, 2%), Brazil (n=1, 1%), Serbia and Montenegro (n=1,
18 1%), Malaysia (n=1, 1%) Sri Lanka (n=1, 1%), Colombia (n=1, 1%), Venezuela (n=1, 1%),
19 Ghana (n=1, 1%), Senegal (n=1, 1%), Togo (n=1, 1%), Congo (n=1, 1%), Democratic
20 Republic of Congo (n=1, 1%), Tanzania (n=1, 1%) and Russia (n=1, 1%). The most common
21 global health field was HIV/AIDS (n=19, 41%), followed by overarching global health (n=6,
22 13%), oncology (n=4, 8.7%) and health systems research (n=4, 8.7%). More than half of the
23 conferences (n=27, 59%) reported the number of attendees, together making up a total of
24 254,601 attendees. The median number of conference attendees was 5,476 (3,378-14,022)
25 per conference. Of the conferences that reported the number of countries represented
26 and/or the number of HIC/LMIC attendees, the median number of countries per conference
27 was 136 (118.25-163) and the proportion of LMIC attendees was 39% (n=38,167).

28 Conference attendee demographics (age, gender, ethnicity, and institutional affiliation (non-
29 governmental organization, academia, government)) were discussed in 25
30 articles,(10,22,33–57). Women were in the minority in 10/15 (67%) conferences that
31 provided gender demographics,(35,37,39–41,43,44,46,49–53,57), and the age groups <25
32 years and >50 years were also constituted minorities in 8/8 conferences presenting data on

1 age groups, with the <25 years age group making up approximately 5-10% of conference
2 participants,(35,37,39,40,43,46,57,58). In two articles, post-conference survey responses
3 highlighted demographic diversity as a benefit of the conference and requested further
4 representation of minority groups such as women, indigenous groups, and LMIC
5 stakeholders,(36,39).

6 Thematic analysis

7 Thematic analysis of the articles yielded two themes: (1) barriers and (2) facilitators to
8 conference equity, with five and four subthemes respectively (**Table 2, Figure 3**).

9 **Table 2.** Emerging themes and sub-themes in included articles.

10

Author, Publication Year	BARRIERS					FACILITATORS			
	Limited speaking opportunities	Visa restrictions	Financial barriers	Political barriers	Discrimination/ racism	Scholarships	Administrative solutions/ advocacy	Research empowerment	Conference relocation
Total	26	13	12	6	8	27	17	17	33
Strasser, 1997									
AbdoolKarim, 2001									
James, 2002									
IAS, 2004									
McConachy, 2005									
WHO, 2006									
IAS, 2006									
Alsiraty, 2007									
IAS, 2008									
IAS, 2009									
IAS, 2009									
Singh, 2009									
Masmoudi, 2009									
IAS, 2010									
IAS, 2011									
Singh, 2011									
Le Duc, 2011									
Deckelbaum, 2011									
IAS, 2012									
van der Rijt, 2013									
IAS, 2013									
Rodriguez-Morales, 2013									
IAS, 2014									
Plotnikova, 2014									
Williams, 2014									
Milko, 2014									
IAS, 2015									
van der Rijt, 2015									
IAS, 2016									
IAS, 2017									
Sheikh, 2017									
Science-Metrix Inc., 2017									
IAS, 2018									
Plotnikova, 2018									
Hawkes, 2018									
Pai, 2018									
IAS, 2019									
Macarayan, 2019									
Vervoort, 2019									
Sidney, 2019									
O'Neil, 2019									
Khalek, 2019									
Gomez-DeLeon, 2019									
George, 2019									
Fisher, 2019									
Arend, 2019									

1

2

3 **Barriers**

4 Barriers to conference attendance for LMIC attendees were described in 38 articles
5 (83%),(7–10,22,33–38,40,43,45–47,49–51,53,55–57,59–71). We organized the identified
6 barriers into five categories: limited speaking opportunities, financial barriers, visa
7 restrictions, political barriers, and racism/discrimination.

8 Limited speaking opportunities

9 Limited speaking opportunities, defined as not being selected for presentations or speaking
10 roles at conferences, was cited as a barrier to active participation in 26 articles,(33–
11 36,38,40,43–47,49,51,55,56,59–62,65,67–70,72). For the 2009 IAS Conference in South
12 Africa, Uganda and Nigeria were two of the top five countries, together with USA, Australia,
13 and India, that submitted a high number of abstracts, 167 and 228, respectively,(60).
14 However, unlike the other three countries, they were not in the top five of accepted
15 abstracts. In the World Psycho-Oncology Congress, the world's largest conference on
16 psychosocial aspects of cancer care, hosted in Denmark in 2004 and Italy 2006, 90-92% of
17 accepted abstracts were found to have first authors from HICs, and 0.3% of first authors
18 were from the African region,(70). At the American Society of Clinical Oncology Annual
19 Meeting, a USA-based conference that strives to reach clinical professionals from
20 “worldwide”, authors from LMICs were represented in 15% of abstracts generated from
21 countries other than the USA (68). Four MICs (Brazil, China, India, and Turkey) accounted
22 for more than half of the LMIC contributions,(68). Abstracts from LMICs were less frequently
23 scheduled for oral and poster presentations (1.4% and 26.8% vs 8.8% and 52.8%,
24 respectively; P<0.001).

25 Financial barriers

26 Financial barriers to conference attendance were discussed in 12 articles,(8,10,37,44–
27 46,50,51,56,57,64,71). Specific barriers included high conference registration rates, travel
28 expenses, and visa fees.

29 Visa restrictions

30 Visa restrictions were mentioned in 13 articles that unanimously reported LMIC attendees
31 suffering disproportionately from complex visa processes and stringent requirements,(4–

1 8,30,33,41,43,54,63,68,70). The visa process costs money and takes time, however, there is
2 no guarantee that the visa will be granted,(8–10,66,71).

3

4 Political barriers

5 Political barriers were mentioned in four articles,(45,61,63,71). Examples of political barriers
6 reported were corruption at local embassies where embassy staff were asking for payments
7 to get documents processed,(71), regional terrorism and epidemic outbreaks,(63), and the
8 conference host country fearing LMIC attendees applying for refugee status upon
9 arrival,(71).

10

11 Discrimination and racism

12 Discrimination and racism were noted by seven articles with LMIC attendees expressing
13 denied visas and barriers to attendance as one of many symptoms of a larger societal
14 problem,(7–10,44,45,71).

15 **Facilitators**

16 The third theme was facilitators to conference attendance, which was reported in 43 articles
17 (93%),(7–11,33–57,59–64,66,68,69,71,73,74). Four categories of facilitators were
18 identified: relocating conferences to LMIC locations, scholarships, administrative/advocacy
19 solutions, and research empowerment.

20 Scholarships

21 Scholarships and other financial incentives were suggested in 27 articles,(11,33,35,36,38–
22 41,43,45–47,49,50,52,53,56–58,61–64,66,71,73,74). In a review by Arend *et al.* of 20
23 international emergency and critical care conferences, 50% offered competitive travel
24 scholarships and 36% offered competitive scholarships for LMIC attendees specifically,(64).
25 As an alternative to scholarships, delegates called for reduced rates for LMIC attendees in
26 three post-conference surveys,(33,35,40), and two opinion pieces,(11,38). Amongst,
27 international emergency medicine conferences, 41% offered daily rates, 36% offered
28 discounted LMIC rates, and 18% offered discounts for society members,(64). Other articles
29 suggested a holistic take - adopting a cost-saving mindset when planning the conference as
30 a whole,(47,71).

31 Administrative and advocacy solutions

1 Administrative and advocacy solutions, mentioned in 18 articles,(34–39,43–
2 48,50,53,57,59,61,71), included working with local embassies to facilitate visa processes,
3 using the conference website to publish information on which documents are needed for visa
4 applications,(71) and providing letters to facilitate visa applications,(48).

5 Research empowerment

6 To address poor acceptance rates of submitted abstracts and limited speaking opportunities
7 for LMIC researchers, research empowerment strategies were suggested in 17
8 articles,(11,34,36,45,46,48–53,60–63,68,69). The term “research empowerment” was
9 defined as “knowledge transfer or access to research training that promotes research
10 independence, first authorship, and access and opportunity to apply for grant funding”. For
11 the International AIDS Society (IAS) Conference in 2009, an online program to mentor LMIC
12 researchers in abstract writing was initiated, which was continued in consecutive
13 conferences,(52,60,69). In 2009, 50% of all mentored abstracts were accepted of which 93%
14 were from LMICs. From 2009 to 2010, the number of abstracts received for mentoring grew
15 from 118 to 900 abstracts. Other initiatives were to include research in other languages than
16 English and to develop information-sharing networks or programs for mentoring and
17 twinning,(61).

18 Relocating conferences

19 The overarching impact of the conference location was mentioned in 18
20 articles,(7,8,35,39,42,45,47,49,51–55,59,60,62). Increased representation of participants
21 from the host region was seen in seven articles, with Western Europe and North America
22 having high attendance rates, independent of geographic region,(37,45,49,52,58–60). One
23 article compared abstract submission rates from different regions between two conferences,
24 noting no difference in top submitting countries for abstract submissions, despite variations
25 in geographic location,(62). Nine articles mentioned a regional adaptation or impact of the
26 conference theme, such as sessions targeted to locally relevant topics, or noted that the
27 topic of the conference was put on the national agenda, resulting in increased governmental
28 commitments or sustained long-term projects in the host country,(35,39,44,46,52–54,57,74).

29 Considerations to host global health conferences in LMICs or “visa-friendly” countries were
30 suggested as a solution in 33 articles,(7–11,33,35,37–39,42,44–55,57,57,59–
31 63,68,69,73,74). Advantages and disadvantages, as perceived by both LMIC- and HIC-
32 stakeholders at an individual and organizational level, of hosting global health conferences in
33 LMICs were presented. Advantages were discussed in six articles,(9,39,42,54,55,74).

1 Disadvantages were mentioned in two articles,(42,54), and concerned The Ninth
2 International Conference of African Organization for Research and Training in Cancer
3 (AORTIC) in South Africa, 2013, and The 13th International AIDS Conference in South
4 Africa, 2000. As an alternative to relocating the entire conference, IAS arranged conference
5 “hubs” in other parts of the world,(46,53), with, for example, AIDS 2012 having 150 “hubs”.
6 These events, which related to the conference themes and in some instances included live-
7 streams from the conference, reached over 6,700 people from more than 41 countries,(46).

8

9 **DISCUSSION**

10 In this systematic review, we assessed factors, described as barriers or facilitators, that
11 impact LMIC representation at global health conferences. Although conference equity has
12 not been studied holistically before, phenomena mirroring our results, such as visa
13 restrictions primarily affecting LMIC researchers and stakeholders, have been reported in
14 global health and other arenas in society,(75,76). With recent calls to scrutinize historical
15 and structural inequities in the global health field, particularly regarding the power relations
16 between LMICs and HICs,(22,77), and the paradigm-shift in hosting conferences virtually
17 during the Covid-19 pandemic, there may be momentum for global health to consider the
18 role of conference equity.

19

20 The included articles covered three decades of global health conferences that took place in
21 38 countries. The majority (96%) of the conferences occurred in HICs or MICs, and 39% of
22 delegates were from LMICs. Two themes were found: barriers to conference equity and
23 facilitators to conference equity. Attendance at most global health conferences is still
24 inequitable with significant barriers for active participation for LMIC attendees resulting in
25 disproportional HIC attendance and speaking opportunities. However, some conferences
26 have implemented strategies to help overcome these barriers, such as scholarships,
27 research empowerment programs, or relocating the conference, striving towards global
28 health conference equity.

29

30 Diversity in global health conferences ensures a wide range of perspectives and that global
31 health efforts reflect the needs and realities of LMICs. Attendance at conferences is an
32 opportunity for LMIC researchers to partake in the networking, capacity-building,
33 professional growth necessary for career development, and influence policy-making in global
34 health,(8,33,36,39,44,45). It also represents an opportunity for HIC researchers to gain from
35 an increased diversity of perspectives. However, LMIC attendees are persistently under-
36 represented at global health conferences, with LMIC attendees constituting only 39% of

1 delegates. At the Conference of the Parties to the WHO Framework for Tobacco Control,
2 Plotnikova *et al.* found that 60% of LMIC delegates were from the national ministries of
3 health and tobacco control focal points, compared with 42% of HIC delegates,(45). This
4 suggests that the limited LMIC representation has additional consequences and that
5 representation from several sectors including civil society, government representatives, and
6 non-governmental organizations from LMICs is likely even further limited.

7

8 LMIC attendees face multiple barriers to attending global health conferences, with financial
9 barriers constituting one set of important obstacles to conference equity. Costs associated
10 with conference attendance tend to be higher for LMIC attendees as most global health
11 conferences take place in Europe or the USA and various barriers prevent LMIC participants
12 from registering or purchasing flight tickets early,(8). In a study of registration costs at
13 international emergency medicine conferences by Arend *et al.*, only one of the 20
14 conferences included, the African Conference on Emergency Medicine, offered “*equitable*
15 *conference fees*”, calculated as registration rates adjusted for Purchasing Power Parity,(64).

16 If overcoming the first set of obstacles, financial barriers, visa restrictions remain a second
17 major barrier. For the 2018 Women Leaders in Global Health Conference in the United
18 Kingdom, visa applicants had to demonstrate an employment contract, a bank statement
19 covering the previous six months, and an income tax return - conditions which could be hard
20 for some LMIC attendees to meet, especially those coming on a travel scholarship,(78).
21 Consequentially, 17 speakers and delegates were rejected visas and unable to attend the
22 conference, to which the director of the London School of Hygiene and Tropical Medicine
23 responded by writing to the Home Secretary sharing his concerns of visa barriers impacting
24 global health,(74). Previous literature indicates that visa barriers do not impact everyone
25 equally - a 2018 report found that 34% of academics from Africa and 40% of academics from
26 Asia had faced visa challenges, to be compared with 9% of academics in Europe and North
27 America, with the length of time needed to process applications being cited as the most
28 common challenge,(79). Fears of LMIC attendees applying for refugee status upon arrival in
29 the country host of a conference was cited as a reason for rejecting visas,(7), however, this
30 fear has been proved to be unfounded,(71). In addition to the academic literature assessed
31 in this study, rejected visa applications for conference attendees from LMICs have been
32 well-described in multiple news articles and blog posts, indicating the depth and breadth of
33 this issue,(75-77). The “*indignity*” of the process was noted by Georg *et al.*: “*you are*
34 *confirmed a supplicant at the mercy of these faceless bureaucrats and left wondering*
35 *whether you really want to go at all*”,(9). In response to denied visas to the AIDS 2002

1 conference in Barcelona, Spain, LMIC researchers and stakeholders expressed that this
2 may be a symptom of a larger societal problem of racism, where travelers from LMICs are
3 not welcomed in Europe or the U.S.,(71).

4 To achieve conference equity, financial, geographic, political, discriminatory, and visa-
5 related barriers have to be mitigated - if not deconstructed entirely. Strategies to facilitate
6 conference equity can be led both by conference organizers and conference attendees. For
7 example, Sheikh *et al.* suggested conference attendees could seize the power of social
8 media to advocate for equity, for example by “*calling out*” panels with only HIC
9 attendees,(38).

10 To achieve conference equity, addressing financial barriers will also be important. Various
11 models for scholarships exist - including sponsorship models consisting of donations by
12 peers and other delegates,(74), such as the “*Supadel*” (support-a-delegate) scheme used by
13 the African Conference on Emergency Medicine and the International Conference on
14 Emergency Medicine since 2009,(64). Other sources of scholarships include foundations,
15 Ministries of Health, and pharmaceutical companies,(66,74).

16 Another possible facilitator is to carefully consider the location and timing of conferences.
17 This could include arranging conferences in cheap or free university venues or to book hotel
18 space in low-season, which would otherwise be empty, allowing conferences to lower costs
19 and maximize the number of scholarship awards,(47,71). Pai,(8), suggested relocating
20 conferences to LMICs as a solution that could impact the tone of the conference:

21 *“Sitting in fancy hotels and resorts, it is easy to be disconnected from the reality of*
22 *the [tuberculosis] epidemic which affects the poorest communities in [LMICs]. Every*
23 *year, the richest people in the world meet at a ski mountain resort in Davos to talk*
24 *about poverty. [Tuberculosis] must avoid this Davos syndrome.”*

25 Hosting a global conference in an LMIC has substantial impact on both LMIC and HIC
26 attendees and reflects the priorities of the conference organizers. For the AIDS 2016
27 conference, the authors suggested that the return of the conference to South Africa, after the
28 landmark AIDS conference hosted there in 2000, was an opportunity to show the progress
29 that had been made since the previous conference, with “*the backdrop of returning to South*
30 *Africa after 16 years [building] a natural narrative on the progress made since the earlier*
31 *days of the epidemic*”,(39). Similarly, hosting this conference in South Africa brought
32 required contextual and cultural understanding with “*the success and spirit of the South*
33 *African antiapartheid struggle further infused hope and vibrancy*”,(54). Hosting global health

1 conferences in LMICs also adds the advantage of proximity to locations where the majority
2 of the disease burden exists. This has been stated to help overcome the schism between
3 research and affected communities as delegates at the AIDS 2000 conference “*experienced*
4 *a true understanding of the devastation and pain caused by AIDS*”,(54). Showcasing local
5 culture through traditional dances, music, and art and visits to local centers working with the
6 health matter in question were also highlighted as benefits, (11,43,55,74). Another
7 advantage of hosting conferences in LMICs may be sustained local or regional impact; we
8 term this phenomenon “*implementation effect*”,(46). One example of this was the University
9 of KwaZulu-Natal in Durban, South Africa, where hosting the 13th International AIDS
10 Conference led to the inauguration of an HIV/AIDS research chair, potentially leading to
11 advancement of research at the university,(54). Similarly, during AIDS 2012 in the USA,
12 bringing awareness and commitment to the HIV/AIDS epidemic in the USA was a specific
13 objective of the conference,(46).

14 Locating conferences in LMICs may also pose challenges,(42,54). Firstly, LMIC conferences
15 may not be exempt from barriers to accessibility, with some LMICs having strict visa
16 processes,(83), and flights between LMICs, particularly in Africa, being few and notoriously
17 expensive,(84). For example, 51% of Africans need visas to travel to other countries,(85).
18 HIC attendees may also perceive challenges, such as with the AIDS 2000 conference,
19 boycott threats were made by senior scientists and academics regarding the South African
20 government’s stance on HIV/AIDS in the months leading up to the conference, and some
21 questioned the ability of any LMIC to host the world’s “*premier AIDS conference*”,(54).
22 Concerns were also raised about the quality of the conference program, accommodation
23 availability, specifically the lack of five-star hotels, and the high rate of criminality,(54).
24 Despite these challenges, it is critical conference organizers work with sponsors and local
25 representatives to navigate the political climate and ensure conferences are held in diverse
26 locations.

27 Importantly, simply increasing the number of LMIC attendees does not equate to conference
28 equity. On the contrary, active participation is essential, yet LMIC attendees are frequently
29 underrepresented in speaking roles and research presentations. In academic conferences,
30 researcher empowerment strategies can play a key role since limited research infrastructure,
31 support, and mentorship are known barriers to engaging in research,(86) which, in
32 consequence, may limit the opportunities to be receive active speaking roles in such
33 conferences. Conference organizers can facilitate equity through using selection criteria to
34 ensure diverse representation amongst speakers, ensuring access to active participation to
35 those non-proficient in English, and using innovative programs facilitating active participation

1 in a non-hierarchical manner and by arranging pre-symposium activities such as regional
2 events to increase the participation of previously underrepresented regions,(33,36,38).
3 Importantly, research empowerment strategies facilitate achieving conference equity; making
4 conferences more equitable could also be another empowerment strategy by providing
5 access and opportunities for LMIC attendees,(36).

6
7 Providing data on the demographics of global health conferences may be an important step
8 in establishing conference equity. Publicly available conference reports, such as those by
9 IAS and HSR,(33,35–37,39–41,43,44,46,49–53,57,62,63,73), detailing conference
10 attendance demography (categorized by region, gender, age, and affiliation), summaries of
11 participant survey findings, and conference program details including strategies undertaken
12 to increase diverse representation (such as scholarships, mentorship programs, and
13 community engagement) can serve as a way for conferences to share best practices. It may
14 also be beneficial in research endeavors and can help conferences create a baseline for
15 implementing strategies that promote conference equity.

17 **Study limitations**

18 The majority of included articles were conference reports and retrospective studies, with
19 specific global health conferences such as large HIV/AIDS conferences disproportionately
20 represented, possibly skewing the study findings. It is unclear to what extent the results from
21 one global health field or conference type may be extrapolated to other global health
22 conferences of a different size, location, or focus. The authors, holding a strong belief in
23 conference equity, likely conferred an unconscious bias. To limit bias in our search results,
24 we worked with an information specialist to develop the search strategy and did a
25 complementary, standardized hand search of grey literature to identify non-academic
26 literature from a wider selection of conferences.

27
28 Addressing the issue of conference equity holistically requires an intersectional perspective
29 on accessibility and inclusion. The lack of consistent reporting of disaggregated data on
30 attendance or speaking roles based on gender identity, age, ethnicity, and ability prohibits
31 detailed understanding of the accessibility of global health conferences. Persons with
32 disabilities may face unique challenges in conference settings which can be overcome with
33 thoughtful planning and providing support and resources to make the event accessible to all,
34 including those with physical as well as audiovisual disabilities.

35
36 Due to the limited literature on this topic and the data heterogeneity, we were unable to
37 perform a meta-analysis. Using the modified GRADE approach, the evidence in the articles

1 included were all of very low quality. However, this tool was adapted to accommodate the
2 range of literature in this study which may have compromised the validity of the tool and
3 therefore the conclusions drawn. Despite these limitations, this study provides the foundation
4 for further research on conference equity.

7 **CONCLUSION**

8 This review is the first study to date, to thoroughly describe the barriers and facilitators that
9 influence LMIC representation at global health conferences. Our results show that
10 conference inequity limits representation and hinders active participation by LMIC
11 stakeholders at global health conferences. This results in missed opportunities for
12 participation in decision-making, networking, advocating, capacity building, and professional
13 career development. This is also a loss for HIC stakeholders who miss the chance to learn
14 from LMIC attendees and to build and consolidate equitable bilateral partnerships. The
15 inequities result from systemic barriers including cost of travel, visa processes, and lower
16 acceptance rates for research presentations. A recommended first step towards equity is for
17 conference organizers to conduct independent conference equity evaluations and to publish
18 this data in publicly available annual conference reports. Relocating conferences to LMICs,
19 offering scholarships, and enabling LMIC researchers through mentorship can help
20 overcome these barriers and take us one step closer to achieving conference equity.

22 **AUTHORS' CONTRIBUTION**

24 **Lotta Velin:** Conceptualization, Design, and Validation of methodology, Data collection,
25 Visualization of tables and figures, Formal analysis, Writing of original draft, and Editing.

26 **Jean Wilguens Lartigue:** Conceptualization, Data collection, Visualization of tables and
27 figures, Formal analysis, Writing of original draft, and Editing. **Samantha Johnson:**
28 Conceptualization, Design, and Validation of methodology, Reviewed the writing and Editing.

29 **Anudari Zorigtbaatar:** Conceptualization, Data collection, Visualization of tables and
30 figures, Reviewed the writing, and Editing. **Ulrick Sindy Kanmounye:** Conceptualization,
31 Data collection, Reviewed the writing, and Editing. **Paul Truche:** Conceptualization,
32 Reviewed the writing and Editing. **Michelle Joseph:** Conceptualization, Design, and
33 Validation of methodology, Supervision, Reviewed the writing and Editing.

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4

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7

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10

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12 None declared.

13

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15 Not required.

16

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18 Not commissioned; external peer-reviewed.

19

20 **DATA SHARING STATEMENT**

21 All data relevant to the study are included in the article or uploaded as supplementary
22 information. No unpublished data is available following this review.

23

24 **PATIENT AND PUBLIC INVOLVEMENT**

25 Patients and the public were not involved in the development of the research question,
26 choice of outcome measures, or the design and conduct of this systematic review.

27

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14 **FIGURE LEGENDS**

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16 **Figure 1.** PRISMA flow chart for the systematic review.

17

18 **Figure 2.** World map showing the distribution of global health conferences, the mean
19 number of participants at conferences, the number of countries represented and the
20 proportion of participants from low- and middle-income countries (LMICs).

21

22 Legend: The depth of the color signifies the number of conferences hosted in the country.
23 Only the conferences presenting data on the proportion of participants being from LMICs
24 have data presented in the form of bubbles. The bubble size is proportional to the mean
25 number of participants in the conference(s) hosted in each country. The two smallest
26 bubbles have been magnified on the side for increased legibility.

27

28

29 **Figure 3.** Bar charts showing the proportion of the different barriers and facilitators in regard
30 to the number of articles on each barrier or facilitator. The y-axis represents the number of
31 articles that discuss each barrier or facilitator to conference equity.