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## ORIGINAL ARTICLE

## Disparity in conference registration cost for delegates from low- and middle-income backgrounds



Marc-Eric Arend, Stevan R. Bruijns\*

Division of Emergency Medicine, University of Cape Town, Cape Town, South Africa

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## ABSTRACT

**Background:** Better access for clinicians from low- and middle-income countries to international conferences can improve collaborative opportunities and subsequently address the knowledge gap between the weaker and stronger knowledge economies. A better understanding of the cost of international conferences may help conference organisers improve access to their conferences. This study aimed to describe the expense-associated barriers to a selection of international emergency medicine and critical care conferences, in terms of registration cost and out-of-pocket expense.

**Methods:** A cross sectional, retrospective design was used. Registration cost variables (cost, waivers, discounts and scholarships) were collected from a cohort of international emergency medicine and critical care conferences held during 2016. The World Health Organization Purchasing Power Parity index was then applied to calculate an equitable registration cost for delegates from South Africa, Brazil, Turkey, China, Australia, Germany and the United States for each conference.

**Results:** Twenty conferences were included. Eight conferences (36%) offered discounted rates, and another eight offered scholarships for low- and middle-income country delegates. Calculated, equitable registration rates were 2.6, 1.9, 1.9, 1.7, 0.9, 1.1 times lower than quoted respectively for South Africa, Brazil, Turkey, China, Australia and Germany compared to the rate in United States dollar. Only one conference provided equitable registration rates for all test-countries.

**Discussion:** Current international conference registration costs (despite discounts, waivers and scholarships) are likely a barrier to including low- and middle-income delegates in the educational, networking and promotional opportunities that conferences provide. Conference organisers should consider restructuring registration costs to encourage more representative international audiences.

## African relevance

- Conferences provide educational, networking and promotional opportunities for delegates
- Delegates from weaker knowledge economies stand to benefit more from opportunities to improve collaboration, such as conferences
- Current registration costs (even where discounted) are likely to be a barrier to including low- and middle-income delegates

## Introduction

Academic conferences in emergency medicine and critical care provide educational, networking and promotional opportunities for those working within the two fields. The exchange of ideas, new information and advances in research among peers are important

enablers of innovation that support both the local and international knowledge economies. A key variable identified in strengthening young knowledge economies from low- and middle-income countries (LMICs), is collaboration with partners from high-income countries (with mature knowledge economies) [1]. The value of these collaborations is put into perspective when considering that LMICs make up close to 82% of the world's population [1]. It stands to reason that researchers from these countries have much to gain from the strong knowledge economies of their collaborators – but only if they are able to access it. In order to build collaborations and unlock the opportunities that these present, researchers require access to prospective collaborators. Although electronic means of collaboration have substantially increased over the last decade, it simply cannot replace the value of face to face interaction. However, given weak currencies and unfavourable purchasing power, researchers from LMICs can realistically only do so where financial

\* Corresponding author.

E-mail address: [stevan.bruijns@uct.ac.za](mailto:stevan.bruijns@uct.ac.za) (S.R. Bruijns).

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support can be offered.

Although not well-described, the majority of emergency medicine or critical care conferences take place in high-income countries [2]. This is, however, in keeping with high-income countries also producing the bulk of scientific literature [3]. The problem lies not so much in international conferencing itself, but in the inequitable cost thereof, which limits access for the global clinical population to these conferences. Although we acknowledge that costing conference registration is complex, the majority of international conferences are priced well above what clinicians outside high-income countries can afford. The ensuing selection bias prohibits access to the substantial population of clinicians and researchers from LMICs, limits their international visibility and reduces the potential value of including this cohort. Arguably waivers and discounts are applied by some international conferences. Scholarships provide a competitive, limited access strategy for essentially the largest cohort of potential delegates. Yet it is not clear if waivers, discounts and scholarships has a reasonable impact on cost to delegates from LMICs, nor if these strategies improve access equitably.

Better conference financial equitability would likely improve collaborative opportunities for clinicians from LMICs, which in turn may help address the knowledge gap between the weaker and stronger knowledge economies. A better understanding of the cost of international conferences may help conference organisers improve access to their conferences, through cost adjustments, to allow a truly representative international mix of delegates. This study describes the expense-associated barriers to a selection of international emergency medicine and critical care conferences for the year 2016, in terms of registration cost and out-of-pocket expense.

## Methods

A cross sectional, retrospective design was used to address the study aim. We collected registration cost variables from a cohort of international emergency medicine and critical care conferences. These were identified by the study investigators as conferences that attract delegates from outside its regional borders. We specifically sought to include conferences that attract a reasonable number of clinicians from middle- and high-income countries (at least 500 delegates). We first identified existing conferences of large national, regional and international emergency medicine and critical care societies. We then performed a Google search of all available conferences that were held during 2016, using the keywords “International”, “Emergency Medicine”, “Critical Care” and “Conference”. We applied a snowball technique by requesting conference organisers who replied to our data request to suggest further conferences to consider for our cohort.

Conference organisers were individually contacted via email and asked to provide details of the various categories of registration costs for the conference. Conferences were excluded after three reminders, should no response have been forthcoming. We specifically asked whether waivers or discounts applied for clinicians from low- or middle-income countries, and whether scholarships were offered. For practical purposes, we included only the early-bird, full conference, and daily conference registration rates for clinicians. We assumed the perspective of a low- or middle-income delegate, and included any waivers or discounts that may have applied in the cost calculation (including the reason why it would apply). A full breakdown of all cost categories (including these) are included as **Appendix A (data supplement)**. Where a society member discount applied, we used the full rate as would be payable by a non-member from another country. Unless included in registration, additional cost points (such as pre-conference workshops, or social functions) were not included. We also did not include travel or accommodation costs. Omission of these were a tactical, rather than a practical decision. Although it would have been nice to include the cost of these additional cost points, the variability in price would severely complicate calculations included. Registration costs presented a far more stable cost point to work from, and would

most likely be the first consideration for any prospective delegate.

Data were electronically captured using Excel (Microsoft Office, Redmond, USA). Costs were descriptively presented using tables, charts and proportions. Low- and middle- income countries were identified using the World Bank classification unless otherwise specified [4,5]. For practical purposes, the conference rates that applied on 1 January 2016 were used in purchasing power calculations, as this date fell within the early-bird registration for all included conferences. We also used this date for historical currency conversion calculations using <http://xe.com/ucc> (Newmarket, Ontario, Canada) [6]. The World Bank Purchasing Power Parity index was then applied to calculate a hypothetical, equitable registration cost for delegates from South Africa, Brazil, Turkey, China, Australia, Germany and the United States for each conference [7]. The countries were specifically identified through SciVal (Elsevier, Netherlands) as the top emergency medicine publishing countries in the following respective regions: Africa, South America, Middle East, Asia, Australia, Europe and North America. According to the World Bank classification, the first four countries are upper middle-income countries and the rest are all high-income countries [5]. Purchasing power parity is based on the hypothesis that similar items should cost the same, irrespective of currency differences, no matter where it is bought in the world. The index measures the difference in cost that applies in real life as a ratio to the United States dollar (USD) which serves as a reference. (7)

This study received ethics approval through the University of Cape Town's Human Research Ethics committee (HREC 440/2017).

## Results

We contacted the organisers of 22 conferences and 20 replied with the requested data. **Fig. 1** provides a representation of the data collection, exclusions and breakdown of the sample. **Table 1a** provides the data on the Emergency Medicine conferences included in the sample, the actual cost of full conference registration and discounted registration cost where conferences provided these. It also provides a hypothetical equitable registration cost for delegates from South Africa, Brazil, Turkey, China, Australia, Germany and the United States. **Table 1b** provides the data on the Critical Care conferences included in the sample, the actual cost of full conference registration, discounted registration cost where conferences provided these. The corrected registration costs are also provided in the table. **Fig. 2**. Represents the factor by which out-of-pocket cost differs in relationship to 1 United States Dollar (USD) for the countries included in the purchasing power calculation.

Regarding discounted rates, the European Society of Emergency Medicine Congress 2016 offered a reduced rate to non-member clinicians from a list of reduced fee countries, of which Turkey was one of them. Additionally, a reduced rate was offered to members from 34 affiliated societies, of which one is an emergency medicine society registered in Georgia, a lower-middle income country. The 36th Symposium on Intensive Care and Emergency Medicine offered a 30% reduction in registration cost for low- and lower-middle income country clinicians based on the United Nations classification. The 29th European Society of Intensive Care Medicine Annual Congress 2016 did not offer discounted rates based on income level, but offered reduced rates to member clinicians from associated societies, including societies from China, Brazil and Turkey. The 22nd Scientific Assembly of the American Academy of Emergency Medicine did not offer reduced rates. However, an international membership fee of US\$ 150 allowed clinicians free conference attendance. The World Interactive Network Focused on Critical Ultrasound 2016 conference (WINFOCUS) offered reduced conference rates for low- and lower-middle-income country clinicians based on the World Bank classification. World Interactive Network Focused on Critical Ultrasound members received a 15% discount on all rates, excluding already discounted and reduced fees. The Australasian College of Emergency Medicine Annual Scientific Meeting

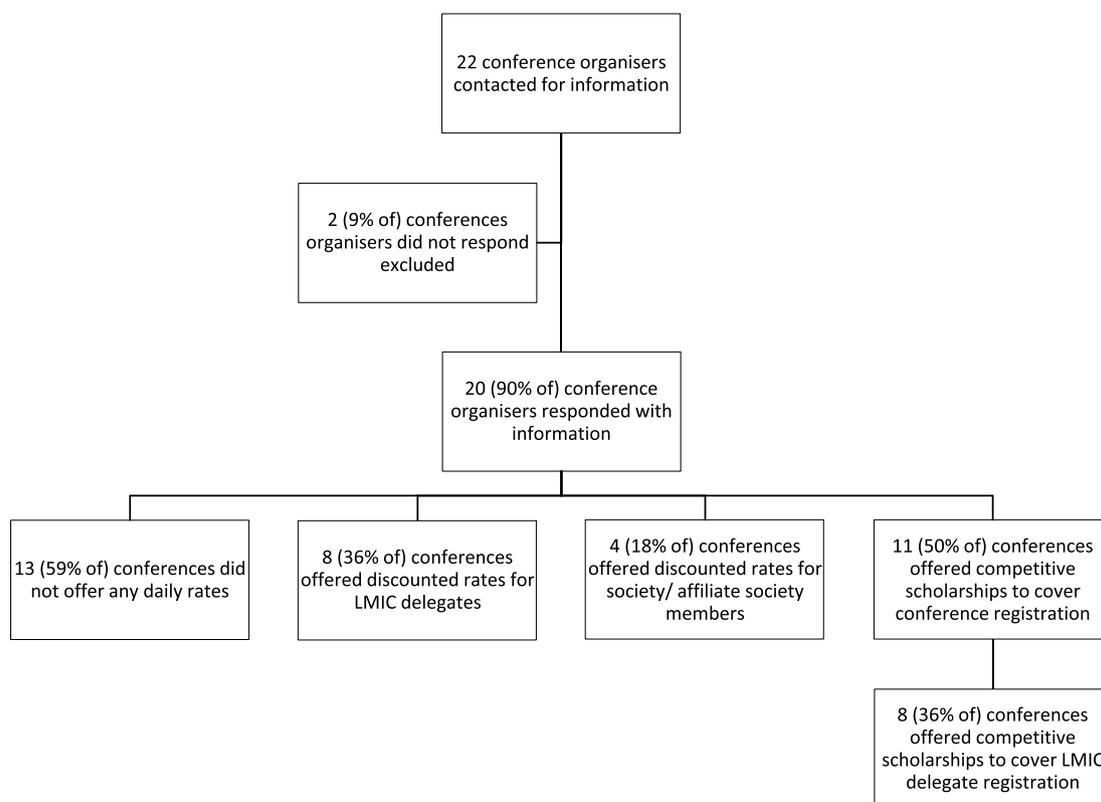


Fig. 1. Representation of the data collection, exclusions and breakdown of the sample.

2016 offered a 33% reduced rate for clinicians from low- and lower-middle income countries based on the World Bank classification. The American College of Emergency Physicians Scientific Assembly 2016 offered a 41% reduced rate for clinicians from low- and lower-middle income countries based on the World Bank classification. The African Conference on Emergency Medicine 2016 offered different cost tiers for low, lower-middle, upper-middle and high-income country clinicians. These fees were based on qualification and country of practice. The World Bank income classification system was used. The International Congress on Emergency Medicine 2016 offered a 33% reduction in fees for low- and lower-middle income clinicians.

Regarding scholarships, both the African Conference on Emergency Medicine and the International Conference on Emergency Medicine offered a dedicated scholarship for delegates from low and low-middle income countries (with the African Conference on Emergency Medicine restricting applications of the scholarship to African countries). The scholarships included registration, accommodation and selected workshop expenses, but not travel. The Sri Lanka 2016 Developing Emergency Medicine conference similarly provided a dedicated scholarship for delegates from low and low-middle income countries within the immediate region. This included registration, accommodation and travel expenses and were particularly aimed at delegates travelling from remote locations. The Social Media and Critical Care conference offered a discounted registration rate to 100 full-time students. Students could also apply for a travel scholarship that would cover travel expenses that ranged from approximately €200 to €1000 per student (depending on the distance the student would have to travel). The scholarships for these four conferences were funded through sponsorship model of donations contributed by peers and other delegates. The Australasian College of Emergency Medicine Annual Scientific Meeting offered six scholarships to healthcare delegates from developing nations (by their own definition) [8]. This included registration, accommodation and travel expenses. The 22nd Scientific Assembly of the American Academy of Emergency Medicine provided scholarships to mainly

international American Academy of Emergency Medicine members although non-members who were awarded scholarships were encouraged to become American Academy of Emergency Medicine members. Priority was further given to applications from LMICs in which there has not been an award granted in the previous three years. The American Academy of Emergency Medicine's International Committee had access to \$2000 to be split between successful applicants. The American College of Emergency Physicians Scientific Assembly offered scholarships to financially disadvantaged applicants. Disadvantaged was defined as the inability to fund attendance without at least partial financial support. International American College of Emergency Physicians members received priority consideration, and non-members who were awarded scholarships were encouraged to become American College of Emergency Physicians members. The scholarship included a tiered offering ranging from registration only for non-members through to accommodation and travel expenses. Three other conferences, the European Society of Intensive Care Medicine's Annual Congress, World Congress on Paediatric Intensive and Critical Care and the Paramedics Australasia International Conference offered scholarships not directly relevant to delegates from low and middle-income countries.

## Discussion

The sentinel finding of this study is that international conference registration costs appear very restrictive for delegates living outside Australia, Germany or the United States (i.e. high-income countries). Although one out of every five conferences sampled provided discounts, only one conference, the African Conference on Emergency Medicine provided an equitable registration rate. It is notable that discounts mainly applied for delegates from lower-middle and low-income countries. Ironically we did not include any countries in these income brackets in our sample. South Africa, Brazil, Turkey and China are all classified as upper-middle income countries. As a result delegates from South Africa, Brazil, Turkey and China would effectively be paying

**Table 1a**  
Emergency Medicine conferences included in the sample, actual cost of full conference, discounted cost where applied and corrected registration costs that would result in equal out-of-pocket expense for a selection of countries.

		Conference cost corrected for purchasing power parity									
		Conference cost corrected for purchasing power parity									
Conference name	Host City, Country	Conference Cost	Discounted cost	South Africa	Brazil	Turkey	China	Australia	Germany	United States	
African Conference on Emergency Medicine 2016 <sup>a</sup>	Cairo, Egypt	USD 350.00	USD 75.00	USD 134.48	USD 180.60	USD 185.63	USD 205.44	USD 402.87	USD 318.19	USD 350.00	
American College of Emergency Physicians Scientific Assembly 2016 <sup>a</sup>	Las Vegas, United States	USD 725.00	USD 425.00	USD 278.56	USD 374.16	USD 384.52	USD 425.55	USD 834.53	USD 659.11	USD 725.00	
Australasian College of Emergency Medicine Annual Scientific Meeting 2016 <sup>a</sup>	Queensland, New Zealand	NZD 1359.00	NZD 906.00	NZD 472.74	NZD 634.87	NZD 652.55	NZD 722.17	NZD 1416.23	NZD 1118.53	NZD 1230.36	
Canadian Association of Emergency Physicians	Quebec City, Canada	CAD 1075.00	-	CAD 431.62	CAD 579.65	CAD 595.79	CAD 659.35	CAD 1293.04	CAD 1021.24	CAD 1123.34	
European Society of Emergency Medicine Congress 2016 <sup>a</sup>	Vienna, Austria	EUR 540.00	EUR 325	EUR 228.22	EUR 306.50	EUR 315.03	EUR 348.65	EUR 683.72	EUR 540.00	EUR 593.99	
International Congress on Emergency medicine 2016 <sup>a</sup>	Cape Town, South Africa	USD 595.00	USD 400.00	USD 228.61	USD 307.02	USD 315.57	USD 349.24	USD 684.89	USD 540.92	USD 595.00	
Paramedics Australasia International Conference 2016	Auckland, New Zealand	AUD 620.00	-	AUD	AUD	AUD	AUD	AUD 620.00	AUD 489.67	AUD 538.63	
Resuscitation 2016	Reykjavik, Iceland	EUR 420.00	-	206.96	277.93	285.67	316.15	EUR 531.78	EUR 420.00	EUR 461.99	
Sri Lanka 2016 Developing Emergency Medicine	Colombo, Sri Lanka	USD 600.00	-	EUR 177.51	EUR 238.39	EUR 245.03	EUR 271.17	USD 690.64	USD 545.47	USD 600.00	
The 22nd Scientific Assembly of the American Academy of Emergency Medicine	Las Vegas, United States	USD 200.00	-	USD 230.54	USD 309.60	USD 318.22	USD 352.18	USD 230.21	USD 181.82	USD 200.00	

USD, United States Dollar; NZD, New Zealand Dollar; CAD, Canadian Dollar; EUR, Euro; AUD, Australian Dollar.

<sup>a</sup> Conferences offering discounted rates for low- and middle-income country clinicians.

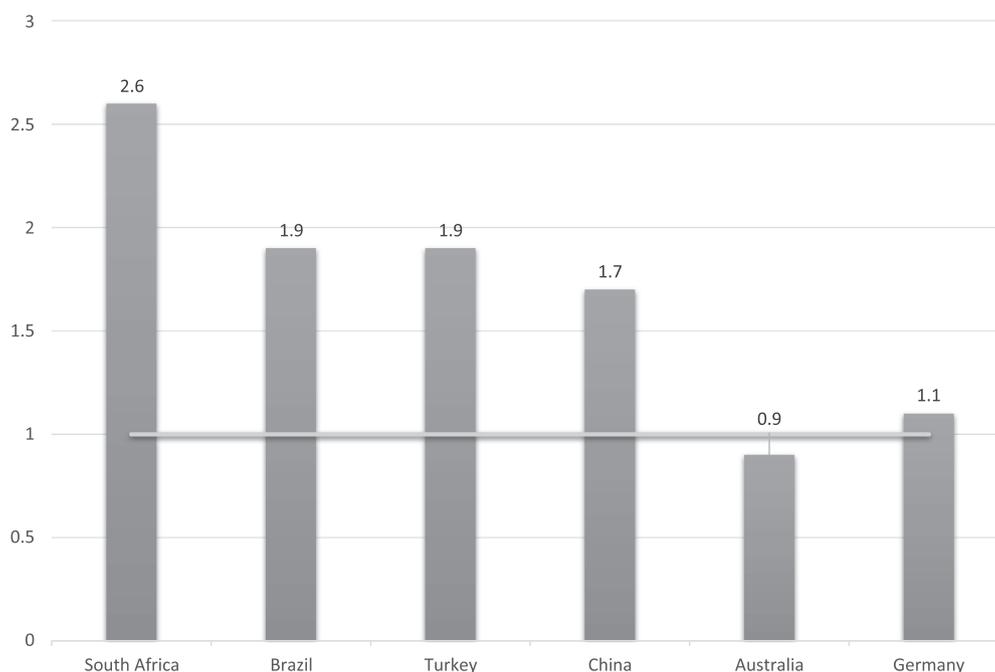
**Table 1b**

Critical Care conferences included in the sample, actual cost of full conference, discounted cost where applied and cost corrected for purchasing power parity for a selection of countries.

		Conference cost corrected for purchasing power parity									
		Conference cost corrected for purchasing power parity									
Conference name	Host City, Country	Conference Cost	Discounted cost	South Africa	Brazil	Turkey	China	Australia	Germany	United States	
Social Media and Critical Care (DASSMACC)	Berlin, Germany	EUR 970.00	-	EUR 397.28	EUR 533.54	EUR 548.39	EUR 606.90	EUR 1190.18	EUR 940.00	EUR 1033.97	
The 2nd International Conference on Critical Care and Emergency Medicine	Los Angeles, United States	USD 600.00	-	USD 230.54	USD 309.60	USD 318.22	USD 352.18	USD 690.64	USD 545.47	USD 600.00	
The 8th World Congress on Pediatric Intensive and Critical Care (PICC 2016) <sup>a</sup>	Toronto, Canada	CAD 850.00	CAD 565.00	CAD 341.28	CAD	CAD	CAD	CAD 1022.40	CAD 807.49	CAD 888.22	
The 13th Annual Critical Care Symposium	Manchester, United Kingdom	GBP 340.00	-	GBP 110.78	GBP 148.77	GBP 152.91	GBP 169.23	GBP 331.87	GBP 262.11	GBP 288.31	
The 15th International Conference on Complex Acute Illness	Pasadena, United States	USD 440.00	-	USD 169.06	USD 227.04	USD 233.36	USD 258.26	USD 506.47	USD 400.01	USD 440.00	
The 23rd Asia Pacific Symposium on Critical Care and Emergency Medicine 2016	Kuta, Bali	USD 200.00	-	USD 76.85	USD 103.20	USD 106.07	USD 117.39	USD 230.21	USD 181.82	USD 200.00	
The 29th European Society of Intensive Care Medicine Annual Congress 2016	Milan, Italy	EUR 420.00	-	EUR 177.51	EUR 238.39	EUR 245.03	EUR 271.17	EUR 531.78	EUR 420.00	EUR 461.99	
The 36th International Symposium on Intensive Care and Emergency Medicine <sup>a</sup>	Brussels, Belgium	EUR 315.00	EUR 220	EUR 133.13	EUR 178.79	EUR 183.77	EUR 203.38	EUR 398.84	EUR 315.00	EUR 346.49	
The Society of Acute Medicine Meeting	Belfast, Wales	GBP 270.00	-	GBP 87.97	GBP 118.14	GBP 121.43	GBP 134.39	GBP 263.54	GBP 208.14	GBP 228.95	
World Interactive Network Focused On Critical Ultrasound 2016 <sup>a</sup>	Ljubljana, Slovenia	EUR 195.00	EUR 170.00	EUR 82.41	EUR 110.68	EUR 113.68	EUR 125.91	EUR 246.90	EUR 195.00	EUR 214.49	

EUR, Euro; USD, United States Dollar; CAD, Canadian Dollar; GBP, Great British Pound.

<sup>a</sup> Conferences offering discounted rates for low- and middle-income country clinicians.



**Fig. 2.** Factor by which out-of-pocket cost differs in relationship to 1 United States Dollar (USD) for the countries included in the purchasing power calculation.

more (compared to delegates from Australia, Germany or the United States) because of their lower purchasing power. The factor by which out-of-pocket cost differs in relationship to USD 1 are even worse for lower-middle and low-income countries. Although described in terms of the cost of access to research articles the factor difference for delegates from Ghana (lower-middle income) and Tanzania (low-income) have been described as 3.5 and 2.8 [9]. If these ratios were applied to conference costs, the expense to delegates from these countries would be fairly disproportionate, even if a discount was applied. Include further accommodation, travel and subsistence costs and delegates from low- and middle income countries end up making a far greater out-of-pocket cost commitment than any of their high-income country peers.

Scholarships offered a welcome, but limited prospect at attendance. An interesting peer-to-peer model of sponsorship was employed by four conferences. Instead of sponsorship being funded by the conference's parent society, peers from high-income settings (usually delegates themselves) provide dedicated sponsorship that can be channelled through the conference organisers to successful applicants. It is worth noting that both the African Conference on Emergency Medicine and the International Conference on Emergency Medicine made use of the African Federation of Emergency Medicine's Supadel (or support-a-delegate) scheme. This peer-to-peer sponsorship model has been in use since 2009 [10]. The organisers of the Sri Lanka 2016 Developing Emergency Medicine conference employed a similar model. Largely based on the Supadel scheme, the Developing Emergency Medicine organisers have used the peer-to-peer sponsorship model since 2015 [11,13].

Philosophically one might argue that researchers, clinicians, educators, academicians, administrators, etc. from LMICs have no interest in attending international conferences and that as a result the out-of-pocket cost gap is irrelevant. We would argue, as we did earlier, that conferences provide educational, networking and promotional opportunities which would be invaluable to delegates from LMICs; that delegates would likely attend if they can afford to do so. A report by the World Bank estimated collaboration between the predominantly low- and middle-income sub-Saharan Africa and the West to be as high as 70% in some regions [1]. Irrespective of one's opinion on the conference preferences of researchers from low- and middle income countries stronger collaboration between weaker and stronger

knowledge economies are important for progress in the latter. Providing equitable access globally should be an important goal for any health care conference with an international footprint. As it stands, the relatively high registration costs of the conferences included in our cohort probably provided a substantial barrier to collaboration opportunities. This is likely to be the case for many other international conferences.

There are a number of limitations to this study. Although we did not describe alternative funding streams (personal or institutional study budgets, grants, etc.) it is probably safe to assume that given the lower expenditure of the gross domestic product (GDP) on research and healthcare, that these streams would be less accessible in low- and middle income settings [12]. In any event, where available, it is unlikely to fill the large out-of-pocket expense gap. It is likely that we did not include all relevant conferences in our cohort. Neither did we consider the registration cost of non-clinicians or other registration options such as single-day registration, early or late registration, etc. As much of the study results are relative to actual cost, we feel that this did not detract from the core message. Conference organisers can use the out-of-pocket factors we provided in Fig. 2 or the Purchasing Power Parity index to describe equitable registration costs. Besides conference registration, accommodation, travel, and subsistence would also contribute to the overall spend on attending conferences. Although the study focused on the financial disparity that exists for LMICs to attend specialty specific international conferences – and that by focusing on the one variable that can be controlled by conference organisers: conference cost – the financial disparity is likely even greater when considering these other cost variables. Detailing these as part of this study would have been beyond the resources available to us. What would have enhanced the findings of this study is a breakdown of delegate nationalities to determine whether an association between conference registration cost and delegate attendance from various income backgrounds existed.

## Conclusion

Conferences provide educational, networking and promotional opportunities for delegates irrespective of income background. Delegates from LMICs stand to benefit more from improved collaborative

opportunities. Current registration costs (even where discounted) are a likely barrier to LMIC delegates to participate in the educational, networking and promotional opportunities that conferences provide. Conference organisers should consider a more equitable approach to registration cost calculation, especially where an international audience is desired.

#### Author contribution

MA and SRB both contributed to the conception or design of the work. MA acquired the data. MA and SRB both analysed and interpreted the data for the work. MA wrote the first draft of the manuscript. SRB revised it critically for important intellectual content. Both MA and SRB approved submitted the version of the manuscript for publication and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

#### Conflict of interest

Prof Stevan Bruijns is an editor of the African Journal of Emergency Medicine. Prof Bruijns was not involved in the editorial workflow for this manuscript. The African Journal of Emergency Medicine applies a double blinded process for all manuscript peer reviews. The authors declared no further conflict of interest.

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