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Defining humanitarian surgery: international consensus in global surgery

Gerard McKnight[1,2,3,4,*], Rocco Friebel[1,5], Isobel Marks[1,2,6], Ahmed Almaqadma[2,7], Mohamed Youssef Seleem[2,8], Tim Fabrice Tientcheu[2,9,10], Raoof Saleh[2,11], Marcella Ryan-Coker[2,12], Rosemary Emodi[1,2], Mai Seida[2], Jonathan Barden[2], Anthony Redmond[13], Mohana Amirtharajah[2,14], Sherry M. Wren[2,15], Andrew Leather[16] and Rachel Hargest[1,2,4]

[1]Global Surgery Policy Unit, LSE Health, London School of Economics and Political Science, London, UK
[2]Humanitarian Surgery Initiative, Global Affairs Department, Royal College of Surgeons of England, London, UK
[3]Academic Department of Military Surgery & Trauma, Royal Centre for Defence Medicine, Birmingham, UK
[4]School of Medicine, Cardiff University, Cardiff, UK
[5]Department of Health Policy, London School of Economics and Political Science, London, UK
[6]Department of Urology, Great Ormond Street Hospital for Children, London, UK
[7]Plastic Surgery Department, Alshifa Medical Complex, Gaza, Palestine
[8]Department of Surgery, Cairo University, Cairo, Egypt
[9]General and Digestive Surgical Unit, Central Hospital Yaounde, Yaounde, Cameroon
[10]Faculty of Health Sciences, University of Bamenda, Bamenda, Cameroon
[11]Médicins Sans Frontières, Kilo Project, Kilo Hospital, Ibb Governorate, Yemen
[12]Department of Surgery, University of Nairobi, Nairobi, Kenya
[13]Humanitarian and Conflict Response Institute, Ellen Wilkinson Building, University of Manchester, Manchester, UK
[14]Médicines Sans Frontières Operational Centre Amsterdam, Amsterdam, The Netherlands
[15]Department of Surgery and Center for Innovation in Global Health, Stanford University, Stanford, California, USA
[16]King's Centre for Global Health and Health Partnerships, School of Life Course and Population Sciences, King's College London, London, UK

*Correspondence to: Gerard H. O. McKnight, Global Affairs Department, Royal College of Surgeons of England, 38–43 Lincoln's Inn Fields, London, WC2A 3PE, UK (e-mail: ghomcknight@gmail.com)

Introduction

Global health has been described as one of the defining issues of our time[1]. Despite widespread attention on global health since the 1980s, it was not until 2009 that Koplan *et al.*[2] offered a common definition of the term. Agreeing on a definition ensured clarity on the aims, on how to achieve them, and the skills and resources required. More recently, Dare *et al.*[1] offered the following widely used definition of global surgery: 'an area of study, research, practice, and advocacy that seeks to improve health outcomes and achieve health equity for all people who require surgical care, with a special emphasis on underserved populations and populations in crisis'. This definition includes both underserved populations and populations in crisis, but did not define crises in the context of humanitarian medicine[3].

Frequently the term 'humanitarian surgery' is used to broadly describe surgical work undertaken for underserved populations, for example in charitable or disease-specific surgical missions, as well as disaster responses for populations in crisis[4,5]. Indeed, there have been over 45 different terms to describe short-term charitable surgical missions[6–9]. Without a clear definition of humanitarian surgery, it is difficult to interpret published data and analyses[6]. The lack of clarity and standardization was particularly apparent in the response to the 2010 Haiti earthquake where widespread concerns were raised about the variable capability and the quality of care provided by some organizations[10,11]. In an effort to move towards more professional delivery of care, the WHO developed the Emergency Medical Team (EMT) minimal technical standards (known as the 'Blue Book') and specific guidance for teams deploying into armed conflicts—the 'Red Book'[12–14]. Clarity on the terminology will help to identify the capabilities, experience, and qualifications required for teams and individuals to effectively deliver care in these very demanding environments. The authors present an international consensus drawn from experts in the fields of global surgery, conflict, and disaster response to define the term humanitarian surgery.

Methods

An online Delphi process was conducted and reported following the Standards for Reporting Qualitative Research (SRQR) guidelines—see *Table S1*[15]. Dedicated online software was used (Welphi, Lisbon, Portugal). Ethical review and approval was provided by the London School of Economics and Political Science (reference: 91957). Research was conducted in accordance with the principles of the Declaration of Helsinki[16]. Data were exported to Microsoft® Excel (Microsoft, Redmond, WA, USA; Version 16.67) for analysis and statistical analysis was conducted using SPSS® (IBM, Armonk, NY, USA; Version 27).

A broad, international, multidisciplinary group of stakeholders was identified through a literature review, personal contacts of the authors, and the Global Affairs Department of the Royal College of Surgeons of England (RCS England). In total, 157 respondents were invited to participate via e-mail and encouraged to invite

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colleagues who also met the inclusion criteria—see *Table S2* for full demographics and *Table S3* for the list of respondents. Snowball sampling was used through e-mails and social media channels to widen participation. The inclusion criteria used were: age greater than 18 years; ability to speak, read, or write any of the six official languages of the United Nations (English, French, Spanish, Arabic, Russian, and Chinese; and at least one of the following: active in humanitarian or global surgery/medicine/research/healthcare development or provision (within the past 5 years); currently (within the past 12 months) affiliated with an organization involved in global and/or humanitarian surgery; a patient or public representative with experience of a sudden-onset disaster; or a healthcare worker who works primarily in a low- or middle-income country.

Public involvement was carried out in accordance with the Guidance for Reporting Invovlement of Patients and the Public 2 - Short Form (GRIPP2-SF) framework and aimed to ensure that the voices of those who may receive humanitarian surgical care were represented—see *Table S4*[17].

The Delphi process was held over three rounds, followed by a definition workshop to agree on the final wording. Round 1 invited 10 global health researchers affiliated with the RCS England to an online focus group to answer the question 'What is humanitarian surgery?'; this same question was published on the RCS England's social media accounts. The responses were collected and analysed thematically to generate 25 separate statements. In rounds 2 and 3, respondents were asked to vote on their agreement with each of these statements using a seven-option Likert scale. In round 3, respondents were shown their previous response and the group median before voting. Further detail on the methodology can be found in the *Supplementary Methods*.

Agreement refers to the individual participant agreeing with a statement; this then provides group opinion, or central tendency, and can be measured by the group mean or median.

Consensus refers to the extent to which participants agree with each other; this is measured by the interquartile range (i.q.r.)[18].

Median and i.q.r. were selected as they are generally considered more robust than mean and standard deviation[19]. A group median of greater than 4 was decided as the group agreeing with the statement. Consensus was determined using i.q.r. to assess the variance of response; an i.q.r. of less than 2 was chosen as a cut-off to indicate group consensus.

Results

In total, 147 responses were recorded. After exclusions, 107 responses were recorded in round 2 and 65 responses were recorded in round 3—see *Fig. 1* for an overview. Responses came

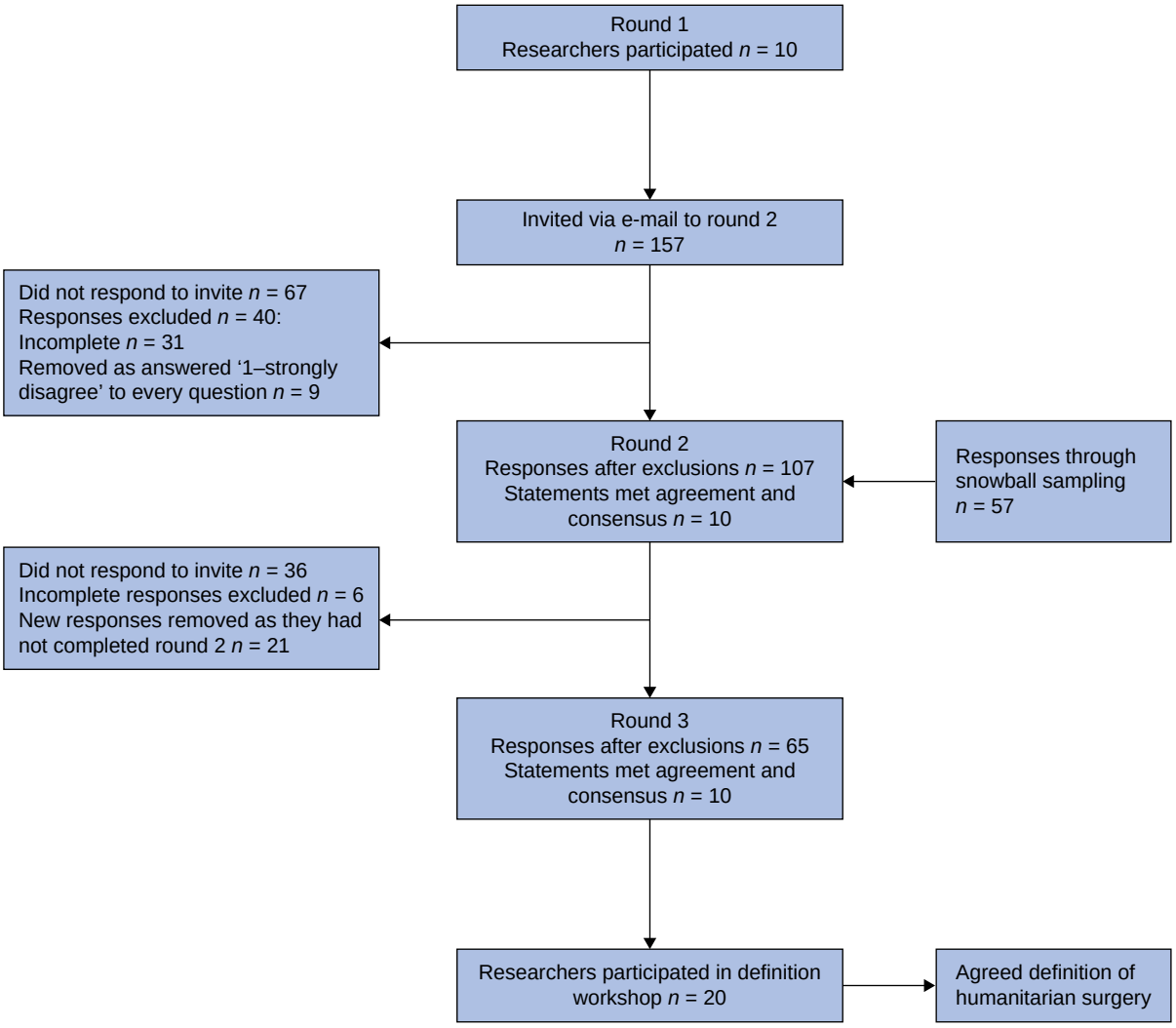

Fig. 1 Schematic overview of Delphi process

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Table 1 Number of participants by country of practice

Country of practice (income classification)	Round 1	Round 2	Round 3	Definition workshop
UK (high)	3	29	24	5
Yemen (low)	1	22	7	1
Kenya (lower middle)	1	5	1	1
India (lower middle)	–	4	3	–
Sierra Leone (low)	–	3	1	–
Palestinian National Authority (lower middle)	1	3	3	1
Syria (low)	–	3	1	–
Cameroon (lower middle)	1	3	1	2
Egypt (lower middle)	1	3	2	1
Australia (high)	–	2	1	–
Sri Lanka (lower middle)	–	2	2	–
Nigeria (lower middle)	–	2	2	–
Lebanon (lower middle)	–	2	1	–
Somalia (low)	–	1	–	–
USA (high)	–	1	1	1
Benin (lower middle)	–	1	–	–
Ireland (high)	–	1	1	–
Japan (high)	–	1	1	–
Ethiopia (low)	–	1	–	1
Jordan (upper middle)	–	1	1	–
United Arab Emirates (high)	–	1	1	–
Colombia (upper middle)	–	1	–	–
China (upper middle)	–	1	1	–
Libya (upper middle)	–	1	1	–
Spain (high)	–	1	1	–
Sudan (low)	–	1	–	–
Nepal (lower middle)	–	1	1	–
Uganda (low)	–	1	1	–
Democratic Republic of the Congo (low)	–	1	1	–
Norway (high)	–	1	–	–
Greece (high)	–	1	1	–
Brazil (upper middle)	–	1	1	–
Qatar (high)	–	1	1	–
Global	2	4	2	9
Total	10	107	65	2

from 6 countries in round 1, 34 countries in round 2, 27 countries in round 3; and 8 countries in the definition workshop (see *Table 1*).

During round 1, 50% (5) of responses came from respondents based in low- or middle- income countries; this was 53% (57) in round 2, 42% (27) in round 3, and 73% (16) in the definition workshop. A full breakdown of the demographics can be found in *Table S2*.

Statements

Round 1 generated 25 statements, these were separated into four themes: Who should deliver humanitarian surgical care?; What care should be delivered?; Where should humanitarian surgery be delivered?; and When should humanitarian surgery be delivered?

Of these statements, 10 reached agreement and consensus in round 2, all of which met agreement and consensus in round 3 (*Table 2*). For each of the 10 agreed statements, the median was either stable or increasing and the i.q.r. was either stable or narrowing, indicating a high degree of both agreement and consensus.

The final 10 statements are presented in *Table 2* along with the respective median and i.q.r. The trend of the median and i.q.r. across rounds 2 and 3 is shown in brackets after the values. The full list of the 15 statements that did not reach agreement can be seen in *Table 3*.

Full definition

Using the statements agreed within this study, the authors propose the following definition of humanitarian surgery. Humanitarian surgery is an area for study, research, and practice that focuses on surgical care in conflict and post-conflict zones, in areas of sudden-onset disasters, and when the local health system is overwhelmed. Emergency surgical care, including anaesthesia, should be provided to patients of all ages. Perioperative and follow-up care should be provided, although these may not be provided by the same clinician. Care should be delivered in line with the core humanitarian principles (humanity, neutrality, impartiality, and independence) and, wherever possible, in coordination with the local health system and government. Humanitarian surgery is a multidisciplinary field involving surgical and anaesthetic providers, nurses, rehabilitation specialists, and other healthcare professionals, including pharmacists, laboratory technicians, and specialists in policy, logistics, and security. Standardized data should be collected and standardized protocols or guidelines should be used, although these should be tailored to the individual circumstance.

Working definition

As the above definition is extensive, the authors have followed the example of Dare *et al.*[1] and propose the following shorter working definition of humanitarian surgery. Humanitarian surgery is an area for study, research, and practice that focuses on the coordinated provision of emergency surgical care, in accordance with the humanitarian principles, in conflict and post-conflict zones, in areas of sudden-onset disasters, and when the local health system is overwhelmed.

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Table 2 The 10 statements that reached agreement and consensus after two rounds of voting

No.	Theme	Statement	Median (trend)	Interquartile range (trend)
1	Who	Delivered by a multidisciplinary team of surgeons, anaesthesia providers, nurses, and other healthcare professionals, including, where practical, pharmacists, laboratory technicians, and specialists in policy, logistics, and security	4 (stable)	1 (stable)
2	Who	Delivered in coordination with the local health system and the local government	4.5 (increasing)	1 (stable)
3	What	Humanitarian surgery should be delivered in line with the humanitarian principles (humanity, neutrality, impartiality, and independence)	5 (increasing)	0 (narrowing)
4	What	Humanitarian surgery includes emergency adult and paediatric, surgical, anaesthetic, obstetric, and trauma care	5 (increasing)	0 (narrowing)
5	What	Humanitarian surgery should include preoperative, intraoperative, and postoperative care, and follow-up, *although these may not all be with the same provider*	5 (stable)	1 (stable)
6	What	Humanitarian surgery should collect standardized data for clinical governance	4.5 (stable)	1 (stable)
7	What	Humanitarian surgery should use standardized protocols *or guidelines* for care, *although these may need to be tailored to the individual circumstance*	4 (stable)	1 (narrowing)
8	Where	In conflict and post-conflict zones	5 (stable)	1 (stable)
9	Where	In areas of sudden-onset disasters	5 (increasing)	0 (stable)
10	When	When the local health system is, or is at risk of, being overwhelmed	4.5 (increasing)	1 (stable)

Italic text corresponds to text added after feedback from round 2.

Table 3 The 15 statements that did not reach either agreement or consensus after round 1

No.	Theme	Statement	Median	Interquartile range
11	Who	Relies on international and intersectional collaboration	3.5	2
12	What	Humanitarian surgery is a sub-specialty of 'global surgery'	3.5	2
13	What	The term humanitarian surgery is interchangeable with global surgery	3.5	3
14	What	Humanitarian surgery should build local capacity	3.5	1
15	What	Humanitarian surgery should provide preventative care such as contraception	3.5	2
16	What	Humanitarian surgery should provide rehabilitation	3.5	2
17	What	Humanitarian surgery should provide palliative care	3.5	1
18	What	Humanitarian surgery should provide non-emergency care such as elective hernia repair	3.5	3
19	What	Humanitarian surgery is not primarily intended to resolve the crisis but provide essential care	3.5	1
20	What	Humanitarian surgery should provide education, research, and/or advocacy expertise in addition to a clinical role	3.5	1
21	Where	Where there are failed or failing health systems	3.5	1
22	Where	Wherever it takes place, humanitarian surgery should be adapted to the local context, both in terms of human and material resources	3.5	1
23	When	For a defined interval of time	3.5	1
24	When	When invited by the local population or local government	3.5	2
25	When	Is a temporary necessity	3.5	1

Discussion

Defining the term humanitarian surgery has a number of benefits. First, it will allow comparison of humanitarian surgical activities against agreed standards[20–22]. Agreeing what 'is' considered humanitarian surgery also allows clarity on what should 'not' be considered humanitarian surgery. The current use of confusing and often contradictory terms prevents meaningful evaluation and quality assurance. Clarity about what is, and what should not be, considered as humanitarian surgery will allow more meaningful collection and comparison of data.

Second, agreeing on the definition helps move the discussion towards addressing diverse ethical and logistical challenges regarding the scope and the remit of humanitarian surgery. Key questions also need to be addressed: When should teams be deployed?; For how long should they deploy?; How, and when, do these teams handover to local health systems appropriately and safely?; and What are reasonable expectations from humanitarian surgical care and how should they be communicated to patients and the local health system? Attempting to answer these questions will be complex and may raise difficult practical or ethical dilemmas. Future work should focus on other qualitative research methods to explore key concepts in more depth.

The authors' definition of humanitarian surgery provides a framework that will allow more robust comparison of activities and encourage professional training. Humanitarian crises are complex situations, fraught with danger, and mistakes can have far-reaching and severe consequences for patients, communities, providers, and local health systems[11,23,24]. The teams who deploy into them must be suitably trained and experienced to provide a high standard of care for vulnerable populations.

Conflict and sudden-onset disasters have both been included in the authors' definition of humanitarian surgery. The determinants of conflict are dynamic and complex, and can be exacerbated by the effect of sudden-onset disasters, climate change, and urbanization[25,26]. Thus, making a distinction between humanitarian crises due to armed conflict or any other causes is unhelpful. Whilst the response to any crisis must be tailored to the individual situation, humanitarian surgical teams will be expected to respond to a wide variety of crises.

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The motivation of individuals, organizations, and funders to provide humanitarian surgery has not been addressed in this article. The reasons why an individual may offer their services (either with or without payment) to provide humanitarian surgery are complex and have been assessed elsewhere[27–31].

The scope of humanitarian surgery remains contentious. Statements suggesting that humanitarian surgery should build local capacity and include rehabilitation and palliative care failed to reach agreement. It is important to note that both rehabilitation and palliative care form an essential part of both the WHO EMT 2020 consensus framework and *The Sphere Handbook* minimum standards[13,21,22]. Thus, although not included in the consensus definition provided here, access to these services should be considered part of the continuum of care for surgical patients in humanitarian settings. Importantly, a review of the WHO-led trauma system set-up during the battle of Mosul identified that 'post-operative and rehabilitative care could have been anticipated sooner and better incorporated into planning'[32].

It is also important to note that the WHO EMT programme calls for all member states to develop national EMTs and this work should be strongly supported as part of the wider effort to 'decolonize' humanitarian aid through reducing the dependence on EMTs and Non-Governental Organisations (NGOs) based mainly in Europe and North America.

Despite the efforts made to ensure a representative group of respondents, surgeons were over-represented and this may have narrowed the scope of this Delphi study. However, there was a broad mix of respondents from a wide variety of disciplines. Additionally, there were no responses from non-physician clinicians such as Community Health Officers who provide a significant proportion of surgical care in many regions across the world; capturing their views should be the focus of further work in this area.

As in any qualitative research, there is bias within this study. The areas of highest responses were countries where the RCS England's Humanitarian Surgery Initiative (HSI) Fellows are based. The five Fellows based outside of the UK are primarily clinicians in their local health system and working part-time for the RCS England. This ensures that the voices of those working in low- and middle-income countries have been expressed, whilst ensuring that their time is appropriately remunerated. Additionally, all HSI Fellows undertook a funded research methods e-learning module to ensure a lasting benefit to research capacity within their health systems, see *Table* S5 for authorship reflexivity.

The UK was the country with the highest number of responses, which may also overemphasize a high-income country or donor perspective. However, overall, there was good geographical representation in each round of the study and at least 50% of responses were from low- or middle-income countries. Accessing patient or public representatives from low- or middle-income countries proved difficult. Although based in the UK, the patient representative did have direct experience of a sudden-onset disaster and gave a unique insight.

The dropout rate in-between rounds 2 and 3 was higher than expected. This is likely to be due to extending the initial data collection interval. This extension was decided to encourage greater participation from low- and middle-income countries. This did lead to significantly more responses from low- and middle-income countries, but likely at the cost of a higher attrition rate between rounds.

This is the first published study to agree on a definition of humanitarian surgery. This will help facilitate high-quality humanitarian surgical care and will provoke further debate and research in this area.

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Author contributions

Gerard H. O. McKnight (Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing—original draft, Writing—review & editing), Rocco Friebel (Conceptualization, Methodology, Supervision, Writing—review & editing), Isobel Marks (Conceptualization, Methodology, Writing—review & editing), Ahmed Almaqadma (Conceptualization, Methodology, Writing—review & editing), Mohamed Youssef Seleem (Conceptualization, Methodology, Writing—review & editing), Tim Fabrice Tientcheu (Conceptualization, Methodology, Writing—review & editing), Raoof Saleh (Conceptualization, Methodology, Writing—review & editing), Marcella Ryan-Coker (Conceptualization, Methodology, Writing—review & editing), Rosemary Emodi (Funding acquisition, Project administration, Resources, Writing—review & editing), Mai Seida (Project administration, Writing—review & editing), Jonathan Barden (Conceptualization, Methodology, Writing—review & editing), Anthony Redmond (Writing—review & editing), Mohana Amirtharajah (Conceptualization, Methodology, Supervision, Writing—review & editing), Sherry M. Wren (Conceptualization, Methodology, Supervision, Writing—review & editing), Andrew Leather (Writing—review & editing), and Rachel Hargest (Conceptualization, Methodology, Supervision, Writing—original draft, Writing—review & editing)

Disclosure

The authors declare no conflict of interest.

Supplementary material

Supplementary material is available at *BJS* online.

Data availability

All data collected are available on request by e-mailing the corresponding author.

References

1. Dare AJ, Grimes CE, Gillies R, Greenberg SLM, Hagander L, Meara JG *et al.* Global surgery: defining an emerging global health field. *Lancet* 2014;**384**:2245–2247
2. Koplan JP, Bond TC, Merson MH, Reddy KS, Rodriguez MH, Sewankambo NK *et al.* Towards a common definition of global health. *Lancet* 2009;**373**:1993–1995

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3. OCHA. *Humanitarian Principles, OCHA Annual Report*. 2012. https://www.unocha.org/sites/dms/Documents/OOM-humanitarianprinciples_eng_June12.pdf (accessed 5 January 2024)
4. Shrime MG, Sleemi A, Ravilla TD. *Specialized Surgical Platforms Essential Surgery: Disease Control Priorities, Third Edition (Volume 1)*. 2015. http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medp&NEWS=N&AN=26740994 (accessed 5 January 2024)
5. Lopez-Lopez V, Morales A, García-Vazquez E, González M, Hernandez Q, Baroja-Mazo A *et al.* Humanitarian surgical missions in times of COVID-19: recommendations to safely return to a Sub-Saharan Africa low-resource setting. *World J Surg* 2021;**45**:1297–1305
6. Shrime MG, Sleemi A, Ravilla TD. Charitable platforms in global surgery: a systematic review of their effectiveness, cost-effectiveness, sustainability, and role training. *World J Surg* 2015;**39**:10–20
7. Dainton C, Chu CH-L, Gorman C, Cherniak W. Assessing best practices on short-term medical service trips: an eDelphi-based theoretical model. *Lancet Glob Health* 2018;**6**:S41
8. Lasker JN, Aldrink M, Balasubramaniam R, Caldron P, Compton B, Evert J *et al.* Guidelines for responsible short-term global health activities: developing common principles. *Global Health* 2018;**14**:18
9. Sykes KJ. Short-term medical service trips: a systematic review of the evidence. *Am J Public Health* 2014;**104**:e38–e48
10. De Ville de Goyet C, Sarmiento JP, Grünewald F. *Health Response to the Earthquake in Haiti, Vol. 280, The Global Alliance on Accessible Technologies and Environments (GAATES)*. 2000 (accessed 5 January 2024)
11. Van Hoving DJ, Wallis LA, Docrat F, De Vries S. Haiti disaster tourism—a medical shame. *Prehosp Disaster Med* 2010;**25**:201–202
12. Norton I, von Schreeb J, Aitken P, Herard P, Lajolo C. *Classification and Minimum Standards for Emergency Medical Teams, World Health Organization*. 2013. http://apps.who.int/bookorders (accessed 5 January 2024)
13. World Health Organization. *Emergency Medical Teams: Minimum Technical Standards and Recommendations for Rehabilitation*. 2016 (accessed 5 January 2024)
14. World Health Organization. *A Guidance Document for Medical Teams Responding to Health Emergencies in Armed Conflicts*. Geneva, 2021
15. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* 2014;**89**:1245–1251
16. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA* 2013;**310**:2191–2194
17. Staniszewska S, Brett J, Simera I, Seers K, Mockford C, Goodlad S *et al.* GRIPP2 reporting checklists: tools to improve reporting of patient and public involvement in research. *BMJ* 2017;**358**:j3453
18. Becker GE, Roberts T. Do we agree? Using a Delphi technique to develop consensus on skills of hand expression. *J Hum Lact* 2009;**25**:220–225
19. Black N, Murphy M, Lamping D, Mckee M, Sanderson C, Askham J *et al.* Consensus development methods, and their use in creating clinical guidelines. *Adv Handb Methods Evid Based Healthc* 2013;**2**:426–448
20. World Health Organization. *Classification and Minimum Standards for Foreign Medical Teams in Sudden Onset Disasters*. 2021. www.who.int (accessed 11 February 2022)
21. The Sphere Project. *The Sphere Handbook*. 2018. https://handbook.spherestandards.org/en/sphere/#ch001 (accessed 13 January 2023)
22. Wren SM, Wild HB, Gurney J, Amirtharajah M, Brown ZW, Bulger EM *et al.* A consensus framework for the humanitarian surgical response to armed conflict in 21st century warfare. *JAMA Surg* 2020;**155**:114–121
23. Pan American Health Organization. *Health Response to the Earthquake in Haiti*. 2010 (accessed 5 January 2024)
24. Welling DR, Ryan JM, Burris DG, Rich NM. Seven sins of humanitarian medicine. *World J Surg* 2010;**34**:466–470
25. Wise PH, Shiel A, Southard N, Bendavid E, Welsh J, Stedman S *et al.* The political and security dimensions of the humanitarian health response to violent conflict. *Lancet* 2021;**397**:511–521
26. Brennan RJ, Nandy R. Complex humanitarian emergencies: a major global health challenge. *Emerg Med* 2001;**13**:147–156
27. Butler MW, Krishnaswami S, Rothstein DH, Cusick RA. Interest in international surgical volunteerism: results of a survey of members of the American Pediatric Surgical Association. *J Pediatr Surg* 2011;**46**:2244–2249
28. Dawson S, Jackson D, Elliott D. Understanding the motivation of nurses volunteering for non-disaster humanitarian service. *Collegian* 2021;**28**:645–651
29. Johnston PF, Scholer A, Bailey JA, Peck GL, Aziz S, Sifri ZC. Exploring residents' interest and career aspirations in global surgery. *J Surg Res* 2018;**228**:112–117
30. Asgary R, Lawrence K. Characteristics, determinants and perspectives of experienced medical humanitarians: a qualitative approach. *BMJ Open* 2014;**4**:e006460
31. Chetta MD, Shakir A, Paek LS, Lee GK. Evaluating resident perspectives on international humanitarian missions. *J Craniofac Surg* 2018;**29**:279–285
32. Spiegel PB, Garber K, Kushner A, Wise P. *The Mosul Trauma Response: A Case Study. Quality and Effectiveness Part 2 Summary*. February 2018. https://www.researchgate.net/profile/Adam_Kushner/publication/323342800_The_Mosul_Trauma_Response_A_Case_Study/links/5a8edf84a6fdccecffffc9d6/The-Mosul-Trauma-Response-A-Case-Study.pdf (accessed 5 January 2024)

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