International Journal of Public Health (2019) 64:333–342
https://doi.org/10.1007/s00038-018-1199-y

ORIGINAL ARTICLE

Development of a theoretical framework for assessment of quality of primary care medical service trips in Latin America

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Received: 23 August 2018 / Revised: 8 December 2018 / Accepted: 19 December 2018 / Published online: 8 January 2019

Abstract

Objectives Short-term medical service trips (MSTs) are a controversial modality for addressing the health of marginalized populations. Despite their prevalence, there are no routinely used evaluative frameworks. This study used stakeholder consensus to validate a literature-based framework for MST best practices.

Methods A recent systematic review was used to construct a preliminary list of best practices for short-term MSTs. We then recruited a multidisciplinary panel of academics, medical professionals, program coordinators, and non-medical volunteers for a three-round e-Delphi consensus-building exercise to review the list. A 7-point Likert scale was used, with mean scores 4–7 representing rejection, scores < 2 representing acceptance, and elements scoring in between being redistributed for discussion.

Results The literature review identified 30 best practices. Twenty-six stakeholders were recruited for the e-Delphi panel, with 73.1% responding to all three rounds. Eighteen elements were accepted into the final framework.

Conclusions This framework identifies essential MST best practices and enables volunteers to compare organizations. Future research should translate this framework into an assessment tool and initiate dialogue between host communities, local clinicians, and sending organizations.

Keywords Medical missions · Global health · Primary care · Medical service trips · Medical education · Medical volunteering

Introduction

16.5% of American physicians volunteered on a short-term, primary care medical service trip (MST) in 2012 (Caldron et al. 2015). Underserved countries in Latin America and the Caribbean (LAC) are frequent destinations for these MSTs (Dainton and Chu 2015). Such trips aim to fill an immediate health-care need for host communities, but their quality standards and impact are of increasing concern to global health advocates (Dainton et al. 2016). Academic literature has been slow to provide meaningful data to support specific practices, with one review (Sykes 2014)

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indicating that quantitative studies make up only 5% of the 1100 publications on MSTs over the last 20 years.

The Haitian earthquake and the resulting influx of poorly prepared MSTs brought additional attention to the challenges of short-term medical volunteering for recipient countries. In response to this challenge, the World Health Organization (WHO) has recently proposed minimum standards for foreign relief teams in the context of disasters (WHO 2013), providing an example of an oversight agency providing guidance on how to structure humanitarian aid. Such a mandate must be partnered with consistent local enforcement, but limited government oversight of the conduct of NGOs in low- and middle-income countries (LMICs) makes the feasibility of this goal in the immediate future unclear.

Given that many stakeholders seem to agree on the desirable elements of a high-quality volunteer project (Seager 2012; Lasker 2016) and are motivated to achieve positive outcomes for host communities, self-regulation of MSTs remains a viable option. A previously developed self-assessment tool attempted to measure the quality of care on MSTs using a subjective numerical rating scale for various elements, with the goal of promoting internal improvement within the sending organizations (Maki et al. 2008). Despite its growing recognition in the academic literature (Seager 2012; Lasker 2016), the tool is lengthy, and as a self-report measure, vulnerable to response bias. This is reflected in that most NGOs rated themselves 80% or greater in all categories, supporting the authors' concerns that conflicts of interest may obscure attempts by program administrators to evaluate their own projects (Maki et al. 2008). However, the original tool identified six useful *quality domains* (preparedness, sustainability, cost-effectiveness, efficiency, impact, and education) (Maki et al. 2008), which provide a context-specific starting point for comparing subsequent research that addresses best practices by MSTs.

Building on Maki's seminal work, a recent systematic review by Roche (Roche et al. 2016) identified and categorized 92 descriptive and theoretical papers describing best practice recommendations for MSTs, using the World Health Organization Health Systems Framework (WPRO 2010). Similarly, a recent book (Lasker 2016) provides nine specific recommendations for increasing the effectiveness of MSTs, many of which substantially overlap those found in the systematic review.

Against the backdrop of expanding surveillance of MSTs, increased attention to ethical issues including sustainability, and incipient concerns about practice standards (Ahmed et al. 2017), there is a need for a consistent and objective theoretical framework to evaluate service quality delivered to patients and host communities (Maki et al. 2008; Langowski and Iltis 2011). The purpose of this study is to adapt and validate a literature-based framework for MST best practices via practical consensus among a panel of international stakeholders. This will create a practical, actionable set of consensus guidelines to aid in the evaluation of MSTs.

Methods

This study used theory synthesis to develop a preliminary framework, followed by an e-Delphi process to build consensus and provide content validation of the findings. Ethics exemption was sought and received through the Markham Stouffville Hospital.

Phase 1: development of the preliminary framework

Theory synthesis methodology was used to bring together what is known about best practices on MSTs and provide a concise view of its associated factors (Walker and Avant 2011). Given that the primary goal of this study was stakeholder validation, an adapted theory synthesis methodology was used based on a recent comprehensive systematic review of 92 descriptive and theoretical papers describing best practice recommendations for MSTs (Roche et al. 2016). The systematic review described each best practice recommendation according to the frequency of its appearance in the peer-reviewed literature. This material was supplemented by recommendations found in two contemporaneous books (Seager 2012; Lasker 2016).

The material was reviewed by CD and CG, and then, recommendations were extracted into an Excel file. In keeping with the presumption that the benefits of short-term volunteering should accrue to host communities and patients, only recommendations that focused on practices relevant to host community outcomes were extracted.

Duplicate recommendations were removed, and those remaining were adapted for clarity by CD and CG. The lead authors merged similar recommendations and further refined each recommendation through discussion and consensus building to ensure the preliminary best practice statements were clear, discrete, objective, short, and unambiguous, in order to improve their acceptability as potential guidelines (ADAPTE 2009). As a scaffolding for this preliminary framework, the literature-based MST recommendations were broadly categorized by theme into the six major quality domains (preparedness, impact and safety, efficiency, cost-effectiveness, sustainability, and education) (Maki et al. 2008).

The 30 final statements were then presented in a *SurveyMonkey* questionnaire with a 7-point Likert scale ("1 = agree to 7 = disagree") used to facilitate structured

feedback from participants. The questionnaire was beta tested with the lead authors to ensure content and face validity.

Phase 2: content validation via international e-Delphi consensus exercise

The goal of the electronic-Delphi (e-Delphi) panel was to represent a wide variety of stakeholder perspectives on MST practice and to achieve buy-in from diverse groups with potentially competing goals (Hasson et al. 2000). An e-Delphi uses electronic communication to facilitate rapid feedback from panelists over multiple rounds and has the additional benefit of being more economical than the tradition Delphi method. This process was used to assess content validity (i.e., the degree to which the items represent the full domain of content that they are intended to characterize) (Lynn 1986) of the preliminary framework developed in Phase 1.

Recruitment for the e-Delphi panel

Four stakeholder groups were represented on the panel, based on the experience of the lead authors: recognized academic and public health experts, MST program administrators, medical professionals (doctors, nurse practitioners, physician assistants, nurses, pharmacists), and student or non-medical volunteers. We aimed to recruit one to five members from each stakeholder group. The panel was restricted to no more than three panelists from the same organization to prevent overrepresentation of any one organization. Panelists were excluded if they had no experience on an MST in LAC.

The authors of the seminal publications used to construct the preliminary framework (Maki et al. 2008; Seager 2012; Lasker 2016; Roche et al. 2016) were directly recruited to serve as academic experts. A convenience sample of program administrators and clinicians were obtained through email contact with 97 MST organizations listed in a public not-for-profit database of MSTs (online database found at www.medicalservicetrip.com). A scripted email was used to contact MST organizations requesting their participation. An additional convenience sample of clinician and student volunteers were drawn from personal contacts with previous experience with multiple NGOs, specifically Timmy Global Health, Global Brigades, Solidaridad en Marcha, and Three Fold Ministries.

e-Delphi procedures and analysis

Participants who agreed to serve on the panel were sent an email with an embedded hyperlink to the *Survey Monkey* questionnaire created at the end of Phase 1. An a priori goal of a 70% response rate was selected based on the previous literature (AmeriCares 2013; Caldron et al. 2015). To maximize response rates, the Dillman approach (Dillman et al. 2014) to internet surveys was used, which relies on personalized, repeated contact at timed intervals. Two reminder emails were sent, with personalized links, to partial and non-respondents five and 10 days after the initial survey was sent. Demographic information about the panelists was collected including name, gender, age, MST experience, organizational affiliation, geographic location, and a classification of the member's stakeholder role. A declaration of conflicts of interest was requested for each panelist. No compensation was offered for completion of the survey.

Panelists assessed each e-Delphi statement with a 7-point Likert scale (1 = strongly agree, 7 = strongly disagree) to describe their level of agreement with the prompt: "I am satisfied that this represents a core element of a high-quality medical mission." Each statement also contained space for the panelists to write any comments, and they were invited to suggest additional statements during the first round of the e-Delphi (Meshkat et al. 2014). Participants were allocated 3 weeks to submit their responses for each of the three rounds. The algorithm for distributing best practice statements during the e-Delphi process is described in Fig. 1.

Descriptive statistics were used to calculate the mean score, central tendency, and interquartile ranges (IQR), with an IQR of one or less selected as secondary evidence of consensus for each statement.

Panelist statements for and against inclusion of the rejected recommendations were qualitatively analyzed using content analysis (Hsieh and Shannon 2005). The comments were reviewed, similar comments were categorized, and themes were generated. After a final comprehensive discussion of the results, the principal investigators made final revisions to the original best practices framework to create a final version.

Results

The theory synthesis methodology resulted in 30 unique best practice recommendations, which were categorized into six major quality domains (preparedness, impact and safety, efficiency, cost-effectiveness, sustainability, and education), as displayed in Table 1.

Composition of the e-Delphi panel

The e-Delphi panel (n = 26) consisted of eight program administrators, seven medical professionals, seven academic public health experts, and four non-medical or

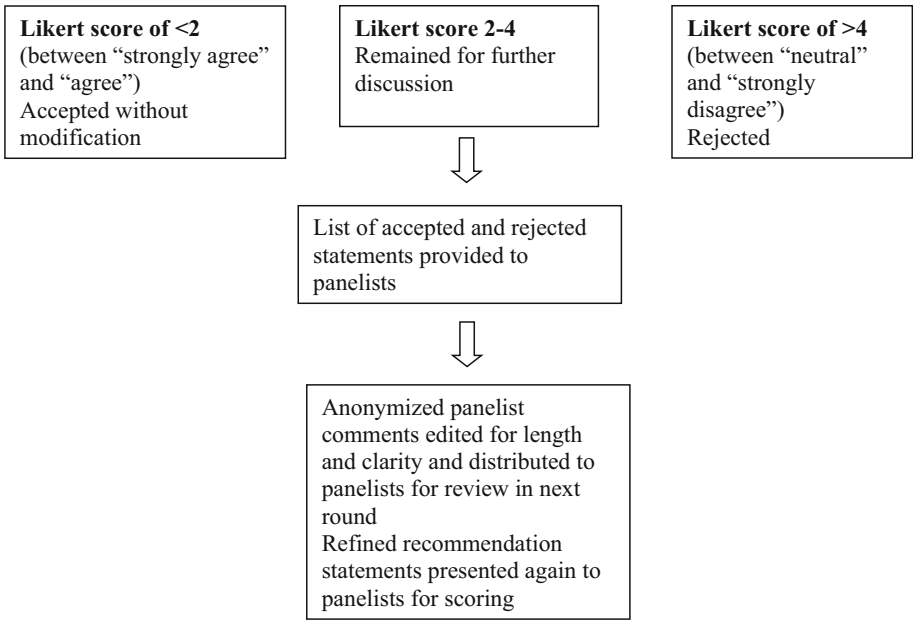

Fig. 1 Flow for an e-Delphi process for stakeholders to assess agreement with best practice recommendations for medical service trips serving Latin America

student volunteers (Table 2). Of the nine stakeholders who were directly invited, seven agreed to participate in the e-Delphi panel, including three of the four authors of publications used to develop the preliminary framework (Maki et al. 2008; Seager 2012; Lasker 2016). The rolling recruitment of MST program administrators yielded nineteen sending organizations who contributed a panelist (19/97, 19.5% response rate).

The panelists had experience in 15 different countries across LAC. The most commonly visited countries were the Dominican Republic, Ecuador, Guatemala, Honduras, Haiti, and Nicaragua. Panelists were based in North America, except one physician panelist in Nicaragua.

e-Delphi process results

The response rate for the survey was excellent, with 100% (26/26), 84.6% (22/26), and 73.1% (19/26) response in rounds 1, 2, and 3, respectively. Table 3 indicates the statements from the preliminary list of recommendations that were accepted and rejected in each e-Delphi round. Table 4 presents all the rejected statements and the qualitative themes identified by dissenting panelists. Recommendations accepted into the final framework are listed in Table 5.

Discussion

For the first time that we are aware, existing literature-based recommendations for best practices on MSTs have been validated through a consensus of international MST stakeholders. This study is unique in its focus on practices that are relevant to host communities, rather than on volunteer-oriented goals and outcomes, in keeping with the presumption that the benefits of short-term volunteering should accrue to host communities and patients, rather than predominantly to volunteers (Crump and Sugarman 2008; Lasker 2016). This framework assumes a high level of engagement by conscientious medical volunteers who are interested in taking part in an opportunity that maximizes benefit and minimizes harm to the existing health-care systems in LMICs. The specific educational goals of trainees and volunteer-oriented safety considerations should be considered separately and are outside the scope of this framework.

A similar undertaking, the Working Group on Ethics Guidelines for Global Health Training (WEIGHT), focused on global health training electives and not the broader MST environment, and involved a 13-member panel which met in person (Crump and Sugarman 2008). Many of its recommendations parallel those approved by this e-Delphi panel, including the importance of establishing long-term partnerships, minimizing costs to host communities, ensuring adequate pre-departure training and volunteer screening, and soliciting post-trip feedback.

The items that were included in the final framework generated the strongest agreement among the stakeholders, but this should not discount the potential importance of the more controversial items. Some items that did not reach the approval threshold were often considered desirable, but not essential. These items included language proficiency, clinician credentialing, community-based research, and various measurements of MST-related costs, as well as

Table 1 Thirty literature-based best practice recommendations for short-term, primary care medical service trips

Domain	Recommendation	Description
Sustainability	1. Continuous presence	There are permanent organizational staff (i.e., health worker, pastor, permanent clinic), or a permanent partner organization in the host community
	2. Local leadership	The short-term medical team is directed by a local/host country provider (Seager 2012, Meshkat et al. 2014)
	3. Exit strategy	There are a clear exit strategy and criteria for success, developed in partnership with the host community (Maki et al. 2008)
	4. Continuity of care	There is a clear referral process for patients requiring higher level of care in partnership with local system or another non-government organization (Lasker 2016, Seager 2012, Meshkat et al. 2014)
	5. Collaboration and partnership	There is partnership/collaboration between the sending organization and local health services (Lasker 2016, Seager 2012, Meshkat et al. 2014)
Education	6. Public health	The organization performs year-round public health work to address the community's self-described health concerns (Lasker 2016, Seager 2012, Meshkat et al. 2014)
	7. Community-based research	The organization's goals are driven by formal or informal community-based research or surveys with clear outputs (Lasker 2016, Seager 2012)
	8. Capacity building	The organization provides training for host providers, local health workers, or community health workers (Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
Efficiency	9. Wait times/productivity	There is a knowledge of typical wait times for clinic patients (Maki et al. 2008)
	10. Publicity	There is advance promotion of visiting clinics to the host community (by mouth, advertisement), or a clinic location that is well known to locals (Maki et al. 2008)
	11. Staffing plan	A formal staffing plan describes future MST needs and a recruitment strategy (Maki et al. 2008)
	12. Triage	A formal triage, priority, appointment, or ticketing system exists for clinic patients (Maki et al. 2008, Meshkat et al. 2014)
	13. Integration of multiple disciplines	There is integration of multiple disciplines (dental, physical therapy, eye care) into a single clinical site (Lasker 2016, Maki et al. 2008)
Impact and safety	14. Evidence-based guidelines	Evidence-based practice guidelines are provided to clinician volunteers, describing an approach to common diseases in the host community (Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
	15. Electronic medical records	Electronic records exist and are accessible from previous visits (Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
	16. Medical records availability	Medical records from previous community outreaches are easy to obtain for current volunteers and local programs (Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
	17. Patient-reported experience	Data are collected on patient satisfaction with clinical care (Lasker 2016, Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
	18. Post-trip feedback	Written post-trip feedback is solicited from volunteers (Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
	19. Patient safety officer	A patient safety officer exists for ongoing risk management (Seager 2012)
Preparedness	20. Volunteer screening	There is a pre-screening process for volunteers (Lasker 2016, Seager 2012, Meshkat et al. 2014)
	21. Clinician credentialing	Clinicians are appropriately credentialed by the host country Ministry of Health (Lasker 2016, Seager 2012, Meshkat et al. 2014)
	22. Pre-departure training	The organization conducts pre-departure training
	23. Clinical scope protocols	The organization has written clinical protocols for volunteer scope of practice (Lasker 2016, Seager 2012, Maki et al. 2008, Meshkat et al. 2014)
	24. Language proficiency	There is a requirement for conversational proficiency in the language of the host country (Maki et al. 2008)
	25. Adequate resources	Urine dip, pregnancy test, glucometer, and blood pressure cuffs are all available, and there is a clear pathway to obtain advanced tests (Maki et al. 2008, Meshkat et al. 2014)
Cost-effectiveness	26. Knowledge of cost of patient care	The organization has working knowledge of the cost of care per patient (Maki et al. 2008)
	27. Flexible fee for patients	The organization charges a flexible fee to patients according to ability to pay (Seager 2012, Meshkat et al. 2014)
	28. Transparency on costs	There is transparency on the total financial costs faced by the organization (Maki et al. 2008, Meshkat et al. 2014)
	29. Assessment of cost to volunteers	The cost per volunteer is within 1 standard deviation of the average for medical missions operating in that country (Meshkat et al. 2014)
	30. Cost to community	The organization has knowledge of community expenses associated with hosting volunteers (Maki et al. 2008, Meshkat et al. 2014)

Table 2 Categorization and related experience of medical service trip stakeholders participating in an e-Delphi panel

Stakeholder category	Panelist	Affiliation	Related experience
Academic or public health experts	1. Dr. Judith Lasker	Lehigh University	Author of "Hoping to Help" (Lasker 2016)
	2. Greg Seager	CEO of Christian Health Service Corps	Author of "When Healthcare Hurts" (Seager 2012)
	3. Dr. Jesse Berry (Maki)	University of Southern Carolina	Author of original best practices framework (Maki et al. 2008)
	4. Dr. Kevin Sykes	University of Kansas Medical Centre	Author of systematic review of evidence behind MSTs (Sykes 2014)
	5. Dr. Michael Soderling	The Centre for Health in Mission	Leader of Best Practices in Global Health Missions initiative
	6. Dr. Patti Tracey	Trent University	Author of numerous articles concerning global health experiences with nursing focus
	7. Dr. Chantal Camden	Sherbrooke University	Author of scoping review of best practices for pre-departure training for global health experiences
Medical service trip program administrators	6. Kate Schedel	Timmy Global Health	Director of Programming and Evaluation
	7. Chris Zawacki	Carolina Honduras Health	Program administrator
	8. Meghan Knight	Foundation for International Medical Relief of Children	Global Health Volunteer Program Manager
	9. Sophia Newman	DOCARE	MPH; DOCARE secretariat
	10. Robert Orlando	HELPS International, Cascade Health Foundation	Team leader; board member
	11. Sarah Ehlers	A Broader View Volunteers Corp	Co-founder and general manager
	12. Shelley Peters	Friends of the Children of Haiti	Executive director
	13. Carole Wakefield	Haiti Medical Mission of Wisconsin, Inc.	Executive director
Medical professionals	14. Dr. Henry Lin	The 53rd Week	Physician; co-founder of The 53rd Week
	15. Dr. Brett Hesse	Timmy Global Health	Physician; Co-chair of medical executive committee
	16. Dr. Kathleen Bracio	AMOS Health and Hope	Physician volunteer
	17. Dr. Laura Chanchien Parajon	AMOS Health and Hope	Physician; co-founder of AMOS Health and Hope
	18. Devin Hudson	Timmy Global Health (Ecuador) and Healing Hands Global (Honduras)	Registered nurse; volunteer
	19. Dr. Isaac Egbewole	Caribbean Lifetime Missions Medical Outreach	Physician; Director of medical outreach
	20. Angela McCaskill	Hombro a Hombro, Timmy Global Health	Registered nurse; medical brigade coordinator
Student or non-medical volunteers	21. Olivia Geen	Solidaridad en Marcha; Three Fold Ministries	Medical student; volunteer
	22. Nadine Narain	Global Brigades	Volunteer; member of chapter executive
	23. Orianna Mak	Global Brigades	Volunteer; member of chapter executive
	24. Nicole Schwab	Global Brigades	Volunteer; member of chapter executive

description of an exit strategy for volunteer teams. Other items (i.e., multidisciplinary teams) were considered useful for certain types of MSTs, but not a universal necessity. Nonetheless, we believe it would be unreasonable to judge the quality of an NGO project based on items that generate legitimate debate, or to base a best practices framework on items that are not immediately acceptable to most stakeholders.

To facilitate the future translation of this framework into real-world settings, the final recommendations are short,

Table 3 Flow of 30 best practices for medical service trips through a three-round e-Delphi process

Domain	Recommendations	Round 1 (mean)	Round 2 (mean)	Round 3 (mean)
Sustainability	1. Continuous presence	A (2.0)		
	2. Local leadership	A (1.7)		
	3. Exit strategy	D (2.3)	D (2.2)	X (2.5)
	4. Continuity of care	A (1.2)		
	5. Collaboration and partnership	A (1.7)		
Education	6. Public health	A (2.0)		
	7. Community-based research	D (2.5)	D (2.2)	X (2.5)
	8. Capacity building	A (1.9)		
Efficiency	9. Wait times/productivity	D (2.7)	D (3.4)	X (4.3)
	10. Publicity	A (1.9)		
	11. Staffing plan	A (1.8)		
	12. Triage	A (1.7)		
	13. Integration of multiple disciplines	D (2.9)	D (3.0)	X (3.7)
Impact and safety	14. Evidence-based guidelines	D (2.1)	D (2.7)	A (1.7)
	15. Electronic medical records	D (3.0)	X (4.5)	
	16. Medical record availability	D (2.7)	D (2.1)	A (1.8)
	17. Patient-reported experience	D (3.1)	D (3.1)	X (3.6)
	18. Post-trip feedback	A (1.9)		
	19. Patient safety officer	D (2.7)	D (3.5)	X (3.4)
Preparedness	20. Volunteer screening	A (1.9)		
	21. Clinician credentialing	D (2.8)	D (2.4)	
	22. Pre-departure training	A (1.8)		
	23. Clinical scope protocols	A (2.0)		
	24. Language proficiency	D (3.9)	X (4.0)	
	25. Adequate resources	A (1.6)		
Cost-effectiveness	26. Knowledge of cost of patient care	D (2.4)	D (2.5)	X (3.7)
	27. Flexible fee for patients	D (3.4)	D (3.7)	X (3.5)
	28. Transparency on costs	A (1.4)		
	29. Assessment of cost to volunteers	D (2.8)	D (3.7)	X (4.8)
	30. Cost to community	A (1.9)		

Mean scores on a 7-point Likert scale are presented in brackets

A recommendation is accepted into the final framework, *D* recommendation is presented in the following round for further discussion, and *X* recommendation is rejected from the final framework

binary (e.g., present or absent), pragmatic, and relevant to volunteer clinicians and sending organizations. This framework may serve as a starting point for MST program administrators and potential volunteers to evaluate MST projects, and will support internal quality improvement and volunteer recruitment for well-conceived MSTs. Such self-auditing has the potential to create dialogue that focuses on the time-honored directive to "do no harm" in host communities. Possible barriers to implementation of the best practice elements relate to the priorities of sponsor organizations, and the financial costs of changing established practice, which may prevent MST organizations from implementing change.

Strengths and weaknesses

The 18 consensus elements are pragmatic, can be feasibly assessed by past and current volunteers, and provide clear discussion points for MST program administrators. The strengths include a development process that considers the values and priorities of four key groups involved in driving the momentum of the MST movement, and establishes consensus areas to initiate incremental program improvements. The low response rate among NGOs solicited to contribute e-Delphi panelists (19.5%) is nonetheless consistent with previous studies which achieved similar response rates despite use of the Dillman survey methodology. The study initiates an important dialogue between

Table 4 Mean scores for 12 recommendations not included in the final best practices framework, and qualitative themes discussed by dissenting panelists

Recommendation	Mean score	IQR	Themes identified by dissenting panelists
1. Exit strategy	D (2.3)	2	May not be a useful sweeping statement applicable to all areas
2. Community-based research	D (2.5)	2	Formal community-based research or surveys would be difficult to obtain
			Goals may be driven by direction from local health-care partners, who know and represent community health-care needs
			Most organizations are neither equipped nor positioned to develop or interpret this sort of research
			Could be beneficial but could also be biased and difficult to manage. The cost may outweigh the benefits
3. Wait times/productivity	X (4.2)	4.5	Patient commute times may be long and unpredictable
			Quality of care outweighs the importance of wait times
4. Integration of multiple disciplines	D (2.9)	2	Ultimately depends on host community needs
			The goal of the MST (overall health vs. a more focused group) varies between organizations
5. Electronic medical records	X (4.5)	3	Electronic medical records are difficult to put in practice in low-resource settings
			Records need to be available, but they do not need to be electronic
6. Patient-reported experience	D (3.1)	3.5	Patient satisfaction is secondary to clinical outcomes
			Patients may mistake an exit survey as a government document, creating positive responses that result from fear of penalty and social desirability bias
7. Patient safety officer	D (3.5)	2.75	Only of value if those duties are within the scope of practice for the individual holding that role
			Difficult to appropriately judge safety in a cross-cultural setting
8. Clinician credentialing	D (2.8)	2	Approval processes in host countries are inefficient, lengthy, and would be limiting
			Bureaucratic delays would lead to cancellation of trips
			Not likely to lead to a difference in the care provided
9. Language proficiency	X (4.0)	4.5	Interpreters are sufficient
			The presence of multiple indigenous languages make such a requirement impossible
			A requirement for language proficiency would effectively discourage volunteer participation
10. Knowledge of cost of patient care	D (3.4)	2	Not the best measure; depends on donations, type of care, and could fluctuate
			Not important at the team member level
11. Flexible fee for patients	D (3.9)	3	May create or extend barriers to care to those who need it the most
			May reduce the number of patients that would attend clinics
12. Assessment of cost to volunteers	X (4.6)	2	Volunteer costs necessarily vary between different MSTs, based on travel time, scope of practice, and airfare

A recommendation is accepted into the final framework, *D* recommendation is presented in the following round for further discussion, and *X* recommendation is rejected from the final framework

global health experts and non-academic MST stakeholders, given knowledge translation literature that suggests a need for buy-in from the stakeholders who will be affected by a quality improvement initiative (Straus et al. 2013). Finally, the attrition rate of our e-Delphi panel was low, and although we cannot rule out the possibility that some items may have achieved eventual consensus if discussion was continued, previous literature supports the adequacy of our completed three rounds (Akins et al. 2005).

This study is not without limitations. As has been the case with most evaluations of the MST phenomenon to date (Rozier et al. 2017), this process remained Western-driven, and the e-Delphi participants (although having many years of experience working in LAC) were mostly based in North America. Further, the stakeholders were predominantly physicians, with an absence of pharmacists and nurse practitioners, and most students came from a single organization. The current extension of this initiative aims to validate and expand the framework based on the perspectives of local stakeholders based in Latin America, to ensure that the quality improvement priorities identified by North American MST stakeholders align with those of patients, host communities, and relevant health authorities. As well, the failure of certain elements, such as clinician credentialing, to achieve consensus, suggests the possibility that pragmatism rather than merit may have influenced the decisions of members of the e-Delphi panel to accept or reject certain elements.

Table 5 Mean Likert scores and interquartile ranges for eighteen agreed upon medical service trip best practice recommendations based on three rounds of e-Delphi discussion

Domain	Recommendation	Mean score	Interquartile range
Sustainability	1. Continuous presence	2.00	1
	2. Local leadership	1.55	1
	3. Continuity of care	1.25	1
	4. Collaboration and partnership	1.71	1
Education	5. Public health	2.00	1
	6. Capacity building	1.88	1
Efficiency	7. Publicity	1.96	1
	8. Staffing plan	1.83	1
	9. Triage	1.74	1
Impact and safety	10. Evidence-based practice guidelines	1.79	1
	11. Medical record availability	1.78	1
	12. Written post-trip feedback	1.96	1
Preparedness	13. Pre-screening process	1.92	1.75
	14. Pre-departure training	1.79	1
	15. Clinical protocols	1.68	1
	16. Adequate resources	1.63	1
Cost-effectiveness	17. Transparency on budget/costs	1.38	1
	18. Cost to community	1.92	1

Future directions

While individual items in the framework might be discrete and measurable, this process does not consider the relative importance of each factor beyond the stipulation that it be considered a "core" element of a high-quality MST. Further refinements to the framework could seek to establish consensus on the relative importance of each element.

This framework serves as the foundation for a future tool targeting both program administrators and volunteers, aiming to assess adherence to consensus best practices. While the current study focused on the experience of stakeholders with experience in LAC, the findings are likely generalizable to MST contexts in other regions. Subsequent studies examining the utility and pragmatism of the tool in rural settings will provide valuable information on the translation of the tool into practice. Such a tool might operate in parallel with other attempts to regulate the practice of MSTs abroad, which might range from self-governance by an independent regulatory body, to regulation within host countries served by MSTs, to oversight by a group like the WHO.

Conclusions

We have successfully developed a consensus, literature-based quality framework for MSTs. The use of this framework will help organizations understand the performance of their peers and will allow external stakeholders to assess adherence to best practices. While broader questions regarding the overall value of international volunteering as a mechanism for addressing health disparities remain, we ultimately hope that this framework will result in higher-quality global health initiatives and improved health outcomes for the populations they serve.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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