

A qualitative narrative review of protocols for women's health on short-term medical missions in Latin America and the Caribbean

Christopher Dainton^{a,b,c,*} and Charlene H. Chu^{c,d,e}

^aGrand River Hospital, 835 King St. West, Kitchener, ON N2G 1G3, Canada; ^bMichael G. DeGroot School of Medicine, McMaster University, 10-B Victoria Street South, 3rd Floor Kitchener, ON N2G 1C3, Canada; ^cMedical Service Trip, 1002-8 The Esplanade, Toronto, ON M5E0A6, Canada; ^dLawrence S. Bloomberg Faculty of Nursing, University of Toronto, 155 College St Suite 130, Toronto, ON M5T 1P8, Canada; ^eToronto Rehabilitation Institute, University Health Network, Toronto, ON, Canada

*Corresponding author: Tel: +1416 884 7231 1002-8; E-mail: christopher.dainton@gmail.com

Received 13 December 2019; revised 16 August 2019; editorial decision 1 October 2019; accepted 2 December 2019

Background: Women's health conditions are commonly encountered on short-term medical missions (STMMs) in Latin America and the Caribbean. There have been no previous attempts to describe women's health protocols used by volunteer clinicians. This qualitative study aimed to describe areas of agreement between unpublished women's health protocols from different North American STMM organizations and assess their concordance with published WHO guidelines.

Methods: A systematic web search was used to identify North American STMM sending organizations. Clinical protocols were downloaded from their websites and organizations were contacted to request protocols that were not published online. The protocols obtained were summarized, analysed thematically and compared to existing WHO guidelines.

Results: Of 225 organizations contacted, 112 (49.8%) responded and 31 of these (27.7%) had clinical protocols, of which 20 were obtained and analysed. Nine (45%) discussed sexually transmitted infections, six (30%) discussed pelvic inflammatory disease, two (10%) discussed prenatal care and two (10%) discussed menstrual disorders. None were the product of systematic literature searches and most were not referenced.

Conclusions: To avoid ineffective treatment and related harms to women, volunteer clinicians would benefit from the adaptation and distribution of guidelines for STMMs that are based on existing WHO guidance and acceptable to clinicians, patients and organizations.

Keywords: clinical guidelines, medical missions, medical service trips, primary care, women's health

Introduction

Short-term medical missions (STMMs) to low- and middle-income countries (LMICs) involve the provision of basic healthcare services to host communities by Western volunteer clinicians, often through mobile outreach clinics.^{1,2} The proximity and accessibility of Latin American and Caribbean (LAC) countries contribute to their popularity as destinations for North American volunteers. Challenges to clinical practice on such STMMs include resource constraints to diagnosis and treatment, as well as the lack of familiarity of Western volunteers with both the local epidemiology and the cultural milieu.^{3–5} The absence of quality control for the myriad STMM organizations is a problem well described by the global health community and at present there is no regulation to ensure that such STMMs provide evidence-based care.⁶

Young adult women are the demographic most likely to visit such STMM clinics,⁷ and women's health conditions ranged from 2.1 to 6.6% of all complaints assessed in one large epidemiological study of STMMs in five urban and rural regions in Ecuador, Guatemala and the Dominican Republic.⁸ Between 0.4 and 1.9% of patients were pregnant, depending on the location,^{7,8} and often gave birth in environments that put their health at risk. The prevalence of menstrual problems ranged from 0.6 to 1.1% of patients, and undifferentiated vaginal discharge ranged from 1.1 to 3.6%.^{7,8} Sexually transmitted infections (STIs) must be considered in the context of their variable regional epidemiology as well as from a public health and overall risk management perspective. Furthermore, the consequences of missing or mis-managing acute conditions such as gonorrhoea and chlamydia can be significant to women's reproductive health, as chronic infection can lead to pelvic inflammatory disease, chronic pelvic

pain and infertility.⁹ Ubiquitous chronic issues include reliable access to contraception and cervical cancer screening. Finally, women are more likely than men to experience physical and psychosocial trauma related to intimate partner and gender-based violence.^{10,11} A compassionate approach to supporting women is important and more challenging in a cross-cultural setting.

It is essential that providers on STMMs are equipped with evidence-based knowledge of common women's health conditions in order to ensure accurate reporting for public health planning and increase women's access to quality healthcare. Clinical practice guidelines are critical to help standardize the clinical care provided, promote interventions with proven benefit and discourage ineffective ones. Guidelines standardize clinical care, making it more consistent regardless of the provider. For providers themselves, guidelines improve confidence in decision making and challenge outdated practices. The quality of such guidelines is also of paramount importance, since flawed, inflexible or context-inappropriate guidelines may standardize the delivery of ineffective or inappropriate treatment.¹²

Despite this, a recent integrative review demonstrated a lack of evidence of guideline use in STMM practice in LAC.¹³ Many STMMs distribute unpublished protocols (also referred to as 'grey literature protocols') to provide direction to clinicians who travel with them. This initiative is the first to collect, summarize and consolidate such protocols, which may contain highly variable diagnostic criteria.

The aim of the following qualitative narrative review is to describe areas of agreement between unpublished protocols from different North American STMM organizations and assess their concordance with published WHO guidelines.^{14,15} This article describes protocols for the management of conditions specific to women's health and is positioned within a broader initiative to develop context-specific clinical guidelines for symptoms commonly managed by STMM clinicians.¹⁶

Methods

This descriptive study lies within the context of a larger initiative aimed at locating and describing unpublished clinical protocols utilized by STMMs in LAC. Clinical protocols related to general pain, gastrointestinal symptoms, respiratory symptoms, women's health, urinary symptoms, dermatological conditions, hypertension and diabetes were collected; however, this article presents only the findings related to protocols for women's health. The Standards for Reporting Qualitative Research checklist¹⁷ was used to guide the synthesis and reporting of results.

Sampling strategy

Our sampling frame included all STMMs with a web presence, and the details of our web search strategy are described in Appendix 1. Organizations were included if they facilitated North American clinicians (physicians, physician assistants, osteopaths or nurse practitioners) travelling to LAC and their website indicated that they had operated at least one STMM in the previous 12 mo. In keeping with the primary care focus of the study, exclusion criteria were organizations that exclusively performed speciality

or surgical trips, as well as trips that did not involve direct patient care by clinicians.

Data collection

We obtained the following information from each STMM website between June 2015 and December 2016: location of the base of operations in North America, countries served in LAC, frequency of trips to LAC each year, clinical setting (e.g., rural or urban) and diagnostic resources available during the STMM (e.g., point-of-care tests, imaging tests). We searched each website and downloaded any medical provider handbook, clinical protocol documents or descriptions of clinical management on an STMM.

If no clinical protocols were found, one attempt was made to contact the organization by e-mail, or by telephone if no e-mail address was available. A prepared e-mail asked: 'Do you have any specific training documents for clinicians working in low-resource settings?' We documented the number of organizations contacted and the reasons provided for lacking clinical protocols or for declining to share such protocols.

Data processing and analysis

Protocols for women's health were extracted to an Excel (Microsoft, Redmond, WA, USA) document by a research assistant (RH). The data from the received protocols were then systematically coded into categories related to clinical assessment, non-pharmacological management suggestions and pharmacological management suggestions. An Excel spreadsheet was used by CD to identify the most common protocol statements in each category and arrive at a consensus on their thematic organization. The protocol content was checked for the inclusion of supporting references. Flow charts were constructed, giving priority to the most common recommendations, and the recommendations were compared with the most recent WHO guidelines for common women's health conditions.

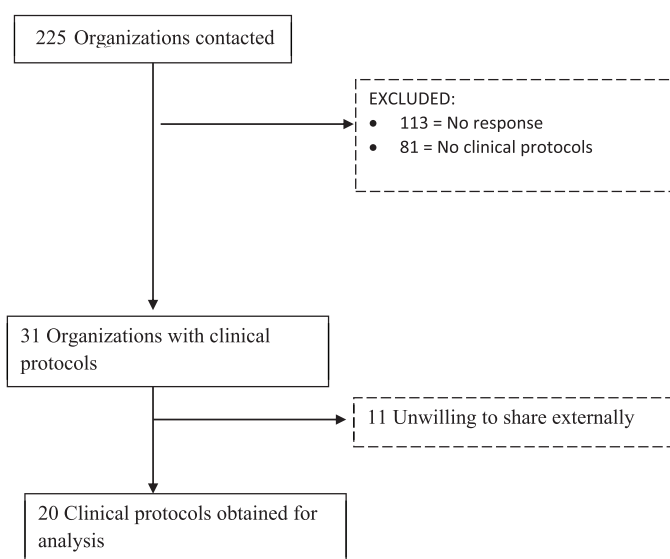


Figure 1. Flow chart of STMM organizations contacted to share unpublished clinical protocols for care on short-term medical missions.

Table 1. Summary of STMM organizations providing clinical protocols for review

| Medical service trip ID | Locations served | Trips per year | Type of NGO | Primary site type |
|-------------------------|--|-----------------------------------|-------------|--------------------------------------|
| A | Nicaragua | 4 | Secular | Rural |
| B | Guatemala | Variable | Secular | Rural |
| C | Haiti | Variable | Faith-based | Urban |
| D | Dominican Republic | 3 | Secular | Rural |
| E | Haiti | 7 | Secular | Rural |
| F | Honduras, Ecuador, Belize, Guyana, Guatemala | 5 | Faith-based | Rural and urban |
| G | Ecuador, Guatemala, Dominican Republic | About 100 (spread over six sites) | Secular | Rural and urban |
| H | Ecuador | 3 | Secular | Rural |
| I | Honduras | 1 | Faith-based | Rural |
| J | Jamaica, Haiti | 4 | Secular | Rural and urban |
| K | Haiti | 4 | Secular | Rural |
| L | Guatemala, Nicaragua | 3 | Faith-based | Rural |
| M | Nicaragua, Honduras | 51 | Faith-based | Rural (some urban hospital based) |
| N | Guatemala | 12 | Secular | Rural |
| O | Honduras | Up to 50 | Faith-based | Rural |
| P | Haiti | Variable | Secular | Urban and rural |
| Q | Dominican Republic, Haiti | 12–15 | Secular | Rural |
| R | Honduras, Nicaragua, Panama | >100 | Secular | Rural |
| S | Honduras | 4 | Secular | Rural (some hospital-based services) |
| T | Haiti | About 40 | Faith-based | Rural |

Results

The search strategy generated 225 unique organizations operating STMMs in LAC, and [Figure 1](#) indicates the number of protocols retrieved and responses to our attempt to obtain information. Of these organizations, 113 (50.2%) had no protocols available on their websites and did not respond to our attempt to contact them. Sixty-eight (30.2%) organizations responded that they did not use any clinical protocols, 31 organizations (13.8%) used clinical protocols and 13 (5.8%) responded that they had no specific protocols but recommended pre-departure readings for clinicians. Of the 31 organizations that used protocols, 11 either declined to share or did not respond to a request for further information. As a result, 20 (64%) protocols were obtained and included in this analysis ([Table 1](#)).

Of the 20 organizations, two conducted STMMs in South America and all the remaining groups operated in Central America and the Caribbean. The most common locations were Haiti (35% [n=7]), Honduras (25% [n=5]), Guatemala (25% [n=5]) and Nicaragua (20% [n=4]). The number of STMMs that each organization operated annually was highly variable, ranging from one to hundreds. Although they were not specifically asked for additional information, four of the 11 organizations that declined to share protocols stated that their protocols were developed by a medical director or veteran clinician, while two organizations stated that their protocols were aligned with WHO guidelines and two stated that they sought collaboration with local clinicians.

The most commonly described conditions were vaginal discharge and pelvic inflammatory disease, while other women's

health issues, like prenatal care and menstrual problems, were less common. The guideline contents for these conditions are further described below.

Protocols for the management of vaginal discharge

Nine (45%) of 20 protocols mentioned vaginal discharge, and their recommendations are summarized in [Table 2](#), comparing them with existing WHO guidelines.¹⁴ While pelvic examinations were not universally recommended, multiple protocols discussed the clinical and histological characteristics of bacterial vaginosis, candidiasis, trichomoniasis, gonorrhoea and chlamydia. Eight protocols discussed management options, including appropriate antimicrobial choices. Five encouraged practitioners to treat the sexual partners of affected patients. None mentioned signs or symptoms that would indicate the need for referral, nor did any protocol discuss an algorithm for the empiric treatment of vaginal discharge.

Protocols for pelvic inflammatory disease

Six (30%) of 20 protocols mentioned pelvic inflammatory disease, with four of these discussing some criteria for diagnosis. Their recommendations are summarized in [Table 3](#). Four protocols discussed antibiotic management options, which were generally consistent with WHO recommendations.¹⁴ No protocols discussed any red flags for urgent referral to a higher level of care or specialist.

Table 2. Most common recommendations for patients with vaginal discharge in LAC from the protocols of STMM organizations (n=20) and a comparison with WHO recommendations¹³

| Domain | Recommendations in protocols | WHO recommendations |
|--|---|--|
| Clinical assessment or case definition | <p>Clear, white odourless discharge is normal^E</p> <p>Discharge, burning and pruritus^{E,F,N} are common due to a lack of sanitation and douching^E</p> <p>Redness, erosions and friability are associated with infection^E</p> <p>Perform gynaecological examinations if pelvic inflammatory disease is suspected^E or in paediatric cases^F</p> <p>Gonorrhoea/chlamydia</p> <p>Malodorous purulent cervical or vaginal discharge,^{F,I} dyspareunia or dysuria^{I,T}</p> <p>Bacterial vaginosis</p> <p>Mild dysuria, vaginal discomfort or pruritus^{E,T} unrelated to menses^T</p> <p>Amsel criteria (3 of 4): thin grey or yellow vaginal discharge^{B,T}; vaginal discharge with pH > 4.5^B; 'fishy' odor if secretions are mixed with 10% potassium hydroxide solution^{B,E}; 'clue cells' on wet mount microscopy^{B,T}</p> <p>Trichomonas vaginitis</p> <p>Profuse malodorous yellow, frothy, adherent discharge</p> <p>Vulvar pain, pruritus and dysuria, new sexual partner^T</p> <p>Candida vaginitis</p> <p>White, odourless 'cottage cheese'-like discharge, pruritus, dysuria, redness of labia</p> <p>Correlated with menstrual cycle and antibiotic use^{E,I,T}</p> <p>'Buds' seen on potassium hydroxide microscopy^T</p> <p>STI-related cervicitis (treat for both)</p> <p>Gonorrhoea: ciprofloxacin 500 mg p.o., ceftriaxone 125-250 mg i.m. once^{B,F,I,S}, cefixime 400 mg p.o. or azithromycin 2 g p.o.^{F,K,S}</p> <p>Chlamydia: azithromycin 1 g p.o. single dose or doxycycline 100 mg p.o. twice a day × 7-14 d^{B,I,S,T} or erythromycin^B</p> <p>Provide empiric antibiotic treatment for partners^{B,F,G,S,T}</p> <p>Bacterial vaginosis</p> <p>Metronidazole 250-500 mg p.o. twice a day × 7-10 d^{B,E,I,T} or 2 g p.o. once^I or vaginal gel daily × 5 d^{E,T} or clindamycin 300 mg p.o. twice a day × 7 d^{B,T} or 2% cream 5 g vaginally at bedtime × 7 d^{B,T}</p> <p>Candida vaginitis</p> <p>Fluconazole 150 mg p.o. single dose^{B,E,I,I,T} (may repeat in 72 h) or miconazole 100 mg vaginally once a day or clotrimazole 100 mg once a day × 3-14 d^{B,E,F,I,T} or nystatin vaginally × 14 d^F</p> <p>Consider gentian violet^F or a barrier cream^F</p> <p>Trichomonas vaginitis</p> <p>Metronidazole 500 mg p.o. twice a day × 7-14 d or 2 g p.o. once^{B,F,G,T}; avoid alcohol until 5 d post-treatment and not in the first month of pregnancy^{B,T}</p> <p>Avoid using harsh soaps or douching^E</p> | <p>STI-related cervicitis</p> <p>If any of the following risk factors are present: age <30 y, >1 lifetime partner, self-reported difficulty with transportation</p> <p>Bacterial vaginosis or trichomoniasis if none of the above risk factors are present</p> <p>Candida vaginitis if erythema or curd-like vaginal discharge is present</p> |
| Management recommendations | <p>STI-related cervicitis</p> <p>Ciprofloxacin 500 mg p.o. single dose</p> <p>Azithromycin 1 g p.o. single dose</p> <p>Metronidazole 2 g p.o. single dose</p> <p>Bacterial vaginosis</p> <p>Metronidazole 2 g p.o. single dose</p> <p>Candida vaginitis</p> <p>Diflucan 150 mg p.o. single dose</p> <p>Follow-up in 7 d</p> <p>Educate and counsel</p> <p>Offer human immunodeficiency virus counselling and testing if facilities available</p> <p>Encourage condom use</p> | <p>STI-related cervicitis</p> <p>Ciprofloxacin 500 mg p.o. single dose</p> <p>Azithromycin 1 g p.o. single dose</p> <p>Metronidazole 2 g p.o. single dose</p> <p>Bacterial vaginosis</p> <p>Metronidazole 2 g p.o. single dose</p> <p>Candida vaginitis</p> <p>Diflucan 150 mg p.o. single dose</p> <p>Follow-up in 7 d</p> <p>Educate and counsel</p> <p>Offer human immunodeficiency virus counselling and testing if facilities available</p> <p>Encourage condom use</p> |

p.o.: by mouth.

Source: anonymised NGOs operating STMMs in LAC, data not in the public domain. Superscript letters indicate NGOs from Table 1.

Table 3. Most common recommendations for patients with pelvic inflammatory disease in LAC from the protocols of STMM organizations (n=20) and comparison with WHO recommendations¹³

| Domain | Recommendations in protocols | WHO recommendations |
|--|--|--|
| Clinical assessment or case definition | Pelvic pain, cervical motion tenderness ^{E,F,T} , fever ^E and adnexal tenderness ^{B,E} | Any lower abdominal tenderness |
| Severe clinical signs or red flags | None specified | Missed/overdue period Recent delivery, abortion or miscarriage Guarding, rebound tenderness or palpable mass on examination Abnormal vaginal bleeding |
| Management recommendations | Ceftriaxone 250–500 mg i.m. once plus metronidazole 500 mg p.o. twice a day ×14 d plus doxycycline 100 mg p.o. twice a day ×14 d ^{B,F,G,S} Alternative: ciprofloxacin 1 g single dose plus doxycycline ×14 d ^F Alternative: azithromycin 2 g p.o. single dose plus metronidazole 500 mg p.o. twice a day ×14 d plus doxycycline 100 mg p.o. twice a day ×14 d ^S Alternative: cefoxitin 2 g i.m. once and probenecid 1 g p.o. once plus doxycycline 100 mg p.o. twice a day ×14 d with or without metronidazole 500 mg p.o. twice a day ×14 d ^B Alternative: metronidazole 500 mg p.o. twice a day ×14 d and levofloxacin or ofloxacin ×14 d ^B | Ceftriaxone 250 mg i.m. single dose Doxycycline 100 mg p.o. Metronidazole 500 mg p.o. Follow-up in 3 d Educate and counsel Offer human immunodeficiency virus counselling and testing if facilities available |

i.m.: intramuscularly; p.o.: by mouth.

Source: anonymized NGOs operating STMMs in LAC, data not in the public domain. Superscript letters indicate NGOs from Table 1.

Other women's health conditions

Four (20%) of 20 protocols made mention of other health conditions, including pregnancy, contraception and menstrual problems. Recommendations for prenatal care are summarized in Table 5, comparing them with existing WHO recommendations.¹⁵ Two protocols made brief mention of the common use of Depo-Provera for parenteral contraception in the region served, as well as recommendations for the use of prenatal vitamins, including folate. The remaining two protocols made brief mention of treatment with ibuprofen, naproxen or the oral contraceptive pill for dysmenorrhoea and menorrhagia, and referral for ultrasound or to gynaecology if there was no improvement in bleeding.

Discussion

This review is the first to collect and consolidate unpublished clinical protocols for common women's health conditions seen on STMMs. Of note, nearly three-quarters of the sampled STMMs (72% [81/112]) reported that they did not use any clinical protocols. Despite increased attention to women's health globally with the Millennium Development Goals,^{18,19} our findings revealed that very few organizations discussed gynaecology or women's health at all, and those that did focused predominantly on STIs. The protocols were of variable quality, and their recommendations have important implications for women's health

and for practice by international volunteers, which are further discussed below.

Vaginal discharge and pelvic inflammatory disease

Recommendations for the antimicrobial management of vaginal discharge and pelvic inflammatory disease in the clinical protocols were brief, but otherwise paralleled existing WHO recommendations.¹⁴ As a form of episodic care provided by STMMs, syndromic STI treatment can provide cost-effective benefits in containing communicable diseases in populations that would otherwise have limited access due to socio-economic and geographic barriers.²⁰ However, unlike the clear algorithms described in international guidelines, the protocols reviewed provide no structure for distinguishing vaginal discharge related to cervicitis from non-STI-related vaginal discharge, nor do they suggest any red flags for more complicated illness that might indicate the need for referral to a higher level of care. Of note, one protocol suggested the use of betadine douching for the treatment of vaginal discharge, despite controversy in the literature over the relationship of such practices with reproductive tract infections.²¹

There is additional controversy regarding when and if a speculum examination is required for the assessment and management of such patients. Patient privacy is often limited on STMMs due to both physical (the absence of curtains to separate consultation areas) and social factors (stigma in

Table 4. Most common recommendations for prenatal care in LAC from the protocols of STMM organizations (n=20) and comparison with WHO recommendations¹⁴

| Domain | Recommendations in protocols | WHO recommendations |
|----------------------------|---|---|
| Management recommendations | Folic acid or prenatal vitamins if pregnant or breastfeeding ^{G,M} Check haemoglobin, glucose, human immunodeficiency virus, rapid plasma antigen for syphilis and refer to clinic ^G | Counselling about healthy eating and keeping physically active, including vitamin A, calcium and protein supplementation in undernourished populations Avoid tobacco and substance use and limit caffeine intake to <300 mg/d Daily iron 30–60 mg and folic acid 0.4 mg supplementation (ideally before conception to prevent neural tube defects) to prevent maternal anaemia, sepsis and preterm birth Intermittent supplementation with iron 120 mg and folic acid 2.8 mg once weekly if daily iron is not acceptable due to side effects and in populations with an anaemia prevalence <20% Haemoglobinometer or full blood count testing to diagnose anaemia Midstream urine culture or urine gram stain to diagnose asymptomatic bacteriuria. Treat with 7 d of antibiotics to prevent preterm birth and low birthweight Anti-helminth therapy after first trimester in endemic areas Tetanus toxoid vaccination One ultrasound scan prior to 24 wk to estimate gestational age, improve detection of anomalies, improve detection of multiple pregnancies and improve overall experience |

Source: anonymized NGOs operating STMMs in LAC, data not in the public domain. Superscript letters indicate NGOs from Table 1.

small communities where confidential information may quickly spread), and a speculum examination is highly invasive,²² with limited specificity in the absence of readily available cultures.²³ While far from ideal, a risk-based approach based on epidemiology and patient profile may be defensible in such cases, although it carries a tendency towards overdiagnosis and overtreatment.^{20,23} This may indicate a need for challenging conversations about whether suboptimal care is better than no care at all in remote communities where care would otherwise be unavailable.

Prenatal care and cervical cancer screening

The protocols reviewed also contained minimal discussion of prenatal care or cervical cancer screening (Table 4). Since these particular issues require specialized equipment, ongoing follow-up and integration with the local healthcare system, we can speculate that STMMs generally rely on local and public health authorities to perform these activities. To the extent that delegating such care to the local system encourages STMMs to work within that system, this may not be problematic. Since this review addresses only primary care STMMs, we cannot exclude the existence of high-quality dedicated missions that specifically manage such screening and prenatal care. However, we would also argue that it is contingent upon STMM providers and volunteers to be aware of the existing system so that they can adequately work within it, avoid conflict and duplication of services,

and ensure that women are correctly referred rather than simply forgotten.

Other women's health issues

Finally, we note that none of the protocols reviewed addressed the subject of intimate partner and family violence. We can speculate several potential reasons for this, including the challenges of language and cross-cultural issues, an absence of expertise and resources specific to the problem, and challenges with obtaining adequate follow-up once the subject is addressed. However, we note that violence is astonishingly prevalent in LAC, with a disproportionate number of female victims.^{10,11} With its attendant effects on mental health and overall well-being, it is contingent upon STMMs to have an approach to non-specific complaints of anxiety and depression, as well as to overt signs of intimate violence.

Strengths and limitations

A major strength of this study is its capture of the grey literature using a multipronged search strategy. Our findings provide a baseline understanding of STMM practices and how they compare with international guidelines. Limitations include the limited response rate (48%) among directly contacted STMM organizations and the restriction of our sample to those STMM organizations with a web presence, suggesting the possibility

of selection bias. Additional research is needed on the broader population of STMM organizations both within and outside of LAC, as well as on the extent to which clinical protocols are actually implemented. Although caution should be exercised in generalizing the findings of this study to STMMs operating outside LAC, it would be reasonable to speculate that the lack of clinical protocol use is a persistent problem across LMICs.^{24,25}

Conclusions

Practice guidelines for clinicians managing women's health are a key step in the consistent, effective treatment of gynaecological and obstetric conditions that lie within the scope of primary care. Despite increasing attention to issues affecting women's health, the clinical protocols obtained in this study provide only limited guidance to clinicians working on STMMs. As was the case more generally in the previous instalments of this review series,^{26–29} the protocols obtained in this study were poorly referenced, with unclear levels of evidence. Inconsistent care and departure from established guidelines can place women at risk of ineffective treatment, promote antibiotic resistance through the use of ineffective antimicrobials and erode the confidence of patients and communities in the expertise of their clinicians. Visiting volunteer groups can improve their practices by establishing formal pathways for communication and partnerships with local health authorities and by ensuring adequate awareness of current international guidelines where they are available.

This review series can be considered an entry point for the adaptation and distribution of guidelines for STMMs that are based on existing WHO guidance and acceptable to clinicians, patients and organizations. Ideally, such guidelines would suggest management options for the medical conditions most frequently seen by STMMs and would be modified to reflect local disease patterns and epidemiology. Any guidelines adaptation initiative should carefully consider and integrate input from local healthcare workers, which will maximize their implementation, presenting an opportunity for sustainable and positive changes in clinical practice.

Authors' contributions: CD conceived the study, carried out data collection and drafted the manuscript. CD and CHC designed the study protocol and critically revised the manuscript for intellectual content. Both authors read and approved the final manuscript. CD and CC are guarantors of the paper.

Acknowledgements: The authors would like to thank all participating STMM organizations for generously sharing copies of their treatment protocols for the purposes of this review. Raji Harish aided with extraction of the data from the protocol documents.

Funding: None.

Competing interests: None declared.

Ethical approval: Not required.

References

- Maki J, Qualls M, White B, Kleeffeld S, Crone R. Health impact assessment and short-term medical missions: a methods study to evaluate quality of care. *BMC Health Serv Res.* 2008;8:121.
- Caldron PH, Impens A, Pavlova M, Groot W. A systematic review of social, economic and diplomatic aspects of short-term medical missions. *BMC Health Serv Res.* 2015;15:380.
- Lasker JN. *Hoping to help: the promises and pitfalls of global health volunteering.* Ithaca, NY: Cornell University Press; 2016.
- Hawkins J. Potential pitfalls of short-term medical missions. *J Christ Nurs.* 2013;30(4):E1–E6.
- Bozinoff N, Dorman P, Kerr D, et al. Toward reciprocity: host supervisor perspectives on international medical electives. *Med Educ.* 2014; 48(4):397–404.
- Rowthorn V, Loh L, Evert J, Chung E, Lasker J. Not above the law: a legal and ethical analysis of short-term experiences in global health. *Ann Glob Health.* 2019;85(1):79.
- Martiniuk AL, Adunuri N, Negin J, Tracey P, Fontecha C, Caldwell P. Primary care provision by volunteer medical brigades in Honduras: a health record review of more than 2,500 patients over three years. *Int J Health Serv.* 2012;42(4):739–53.
- Dainton C, Chu C. Symptom clusters on primary care medical service trips in five regions in Latin America. *J Epidemiol Glob Health.* 2015;5(3):259–264.
- Kreisel K, Torrone E, Bernstein K, Hong J, Gorwitz R. Prevalence of pelvic inflammatory disease in sexually experienced women of reproductive age – United States, 2013–2014. *MMWR Morb Mortal Wkly Rep.* 2017;66(3):80–3.
- Bott S, Guedes A, Goodwin M, Mendoza JA. Violence against women in Latin America and the Caribbean: a comparative analysis of population-based data from 12 countries. Washington, DC: Pan American Health Organization; 2012.
- Garcia-Moreno C, Janssen HA, Ellsberg M et al. Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet.* 2006;368(9543): 1260–9.
- Woolf SH, Grol R. Potential benefits, limitations, and harms of clinical guidelines. *BMJ.* 1999;318:527–30.
- Dainton C, Chu C, Lin HL, Loh L. Clinical guidelines for Western clinicians engaged in primary care medical service trips (MSTs) in Latin America and the Caribbean: an integrative literature review. *Trop Med Int Health.* 2016;21(4):470–8.
- World Health Organization. *Guidelines for the management of sexually transmitted infections.* Geneva: World Health Organization; 2013.
- World Health Organization. *World Health Organization recommendations on antenatal care for a positive pregnancy experience.* Geneva: World Health Organization; 2016.
- Dainton C, Chu C, Lin HL, Cherniak W, Loh L. A protocol to develop practice guidelines for primary care medical service trips. *Ann Glob Health.* 2016;82(5):678–685.
- O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med.* 2014;89(9):1245–51.
- United Nations. *Millennium Development Goals report 2009.* New York: United Nations; 2009.
- Nour NM. Global women's health—a global perspective. *Scand J Clin Lab Invest.* 2014;74(Suppl 244):8–12.
- Chesson HW, Mayaud P, Aral SO. Sexually transmitted infections: impact and cost-effectiveness of prevention. In: Holmes KK, Bertozzi S, Bloom BR et al. (editors). *Major infectious diseases, Vol. 6, 3rd edn.* Washington, DC: World Bank; 2017, p. 203–323.
- Martino JL, Vermund SH. Vaginal douching: evidence for risks or benefits to women's health. *Epidemiol Rev.* 2002;24(2): 109–24.
- Lyimo FS, Beran TN. Knowledge, attitudinal, and accessibility factors associated with uptake of cervical cancer screening among women in a rural district of Tanzania: three public policy implications. *BMC Public Health.* 2012;12:22.

- 23 Henn EW, Kruger TF, Siebert TI. Vaginal discharge reviewed: the adult pre-menopausal female. *S Afr Fam Pract.* 2005;47(2):30–8.
- 24 English M, Irimu G, Nyamai R, Were F, Garner P, Opiyo N. Developing guidelines in low-income and middle-income countries: lessons from Kenya. *Arch Dis Child.* 2017;102(9):846–51.
- 25 Baradaran-Seyed Z, Nedjat S, Yazdizadeh B, Nedjat S, Majdzadeh R. Barriers to clinical practice guidelines development and implementation in developing countries: a case study in Iran. *Int J Prev Med.* 2013;4(3):340–8.
- 26 Dainton CD, Chu CH. A narrative review of dermatologic protocols for primary care medical service trips (MSTs) in Latin America and the Caribbean. *Int J Dermatol.* 2017;56(12):1425–31.
- 27 Dainton C, Truong J, Chu CH. A review of hypertension and diabetes protocols for medical service trips (MSTs) in Latin America and the Caribbean. *Ann Glob Health* 2018;84(4):563–70.
- 28 Dainton C, Chu CH. A narrative review of protocols for the management of respiratory illness on short-term medical missions (STMMs) in Latin America and the Caribbean. *J Glob Health Rep.* 2019; 3:e2019004.
- 29 Dainton C, Chu CH. A review of gastrointestinal protocols for primary care medical service trips in Latin America and the Caribbean. *Int Health* 2018;10(2):125.

Appendix 1. Search strategy

Self-described non-governmental organizations (NGOs) currently operating short-term (<1-mo duration) primary care STMMs in LAC were identified in three ways. First, several databases of NGOs were used (www.missionfinder.org, www.medicalmissions.org, www.mmex.org, www.globalhealth.arizona.edu, www.internationalhealthvolunteers.org) to identify organizations. Second, a systematic Google web search^{1,19} was conducted using the terms: ‘medical missions’, ‘short-term missions’, ‘medical mission organizations’, ‘international health volunteering’, ‘Christian health volunteering’, ‘religious health volunteering’, ‘corporate global health volunteering’, ‘international health fellowships’, ‘international health educational opportunities’, ‘global health director’, ‘international service learning’, ‘global health elective’, ‘medical school international internships’, ‘intercultural learning’, ‘global health volunteer projects university’ and ‘international volunteer organizations’. Third, organizations were located through the Twitter hashtags ‘medical mission’ and ‘global health’. The database was constructed between 17 April 2014 and 20 July 2015.