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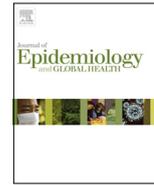
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Symptom clusters on primary care medical service trips in five regions in Latin America

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Abstract Short-term primary care medical service trips organized by the North American non-governmental organizations (NGOs) serve many communities in Latin America that are poorly served by the national health system. This descriptive study contributes to the understanding of the epidemiology of patients seen on such low-resource trips. An analysis was conducted on epidemiologic data collected from anonymized electronic medical records on patients seen during 34 short-term medical service trips in five regions in Ecuador, Guatemala, and the Dominican Republic between April 2013 and April 2014. A total of 22,977 patients were assessed by North American clinicians (physicians, nurse practitioners, physician assistants) on primary care, low-resource medical service trips. The majority of patients were female (67.1%), and their average age was 36. The most common presenting symptoms in all regions were general pain, upper respiratory tract symptoms, skin disorders, eye irritation, dyspepsia, and nonspecific abdominal complaints; 71–78% of primary care complaints were easily aggregated into well-defined symptom clusters. The results suggest that guideline development for clinicians involved in these types of medical service trips should focus on management of the high-yield symptom clusters described by these data.

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1. Introduction

The phenomenon of short-term medical service trips has grown substantially over the last several

decades [1]. Medical service trips, traditionally referred to as medical missions, medical brigades, or global health experiences, involve clinicians based in developed nations who travel to underserved communities in developing countries to provide limited primary health care [2,3]. Clinicians

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choose to participate in these trips for a variety of reasons: [4] from religious obligation, to professional and personal development, to altruistic instincts, to the desire for a working holiday that allows for a more authentic experience of the local culture than would be otherwise possible.

Resources on these trips are generally limited to point-of-care testing, including urinalysis, urine pregnancy testing, and glucometer testing. There is limited availability of advanced laboratory testing and imaging, and this generally requires referral to either a private hospital or to the public hospital, which may be a considerable distance from the community.

Considering the popularity and prevalence of these global health experiences, there have been limited descriptions in medical literature of the epidemiology that clinicians can expect to encounter on these trips. Previous studies have suggested that clinicians visiting Latin America see both symptomatology that are similar to that of primary care practice in North America, but also a greater prevalence of minor conditions that are endemic to tropical, rural, and under-resourced environments [5]. However, it is crucial to the preparation of Western clinicians that intend to deploy on a medical service trip to be informed of the symptomatology they are likely to encounter.

The objective of this article is to describe the common symptom clusters encountered by primary care mobile medical service trips in five distinct regions in Latin America. This descriptive study improves the understanding of the common symptomatology that Western clinicians assess and treat on primary care mobile medical service trips in underserved regions in Latin America and has implications for the preparation and appropriate training for these types of trips.

2. Methods

2.1. Data collection

Data collection was performed between April 8, 2013 and April 11, 2014, on medical service trips organized by Timmy Global Health, a secular NGO based in Indianapolis, Indiana. This NGO engages local partners and local community physicians at each service site in order to strengthen local health systems and their capacity. Patients requiring semi-urgent or urgent follow-up, as determined by their clinical assessments, are formally referred to an affiliated partner hospital, with transportation and costs covered by the NGO. Over the target time period, the NGO conducted 34 short-term medical service trips.

Medical service trips generally consisted of 4–6 medical providers (physicians, nurse practitioners, physicians' assistants), 1–3 nurses, and 1–2 pharmacists. Undergraduate students generally numbered 10–20 and came from affiliated universities in the United States. Residents and medical students were allowed on the trips if supervised by a responsible clinician. Trips were approximately one week each in duration at all sites, and a service trip visited each host community once every two months to ensure continuity of care. Trip volunteers lodged in the base community and left in the morning by bus or truck to a different host community each day. Patients were recruited in advance by a Community Health worker who was an elected member of the host community, and each patient was given a medical care ticket in advance of the trip visit. Approximately 100 tickets were distributed in each host community, which meant that each provider was expected to see and treat 20–25 patients each day.

These service trips were equipped with limited diagnostic testing that included urinalysis strips, urine pregnancy tests, and a glucometer. Typical flow involved community patients having a preliminary history taken by a health promoter in the village, followed by a triage assessment of vital signs (height, weight, heart rate, blood pressure, temperature) by a nurse. Patients then proceeded to a medical provider (physician, nurse practitioner, or physician assistant), who assessed the patient and provided medical advice and prescriptions. Finally, patients proceeded to the pharmacy station, where a pharmacist dispensed the prescribed medications, as well as multivitamins and anti-parasitics based on standard criteria. Students were present at all stations to provide logistical support, translation, and scribing. Timmy Global Health employs full time bilingual staff at each site to provide translation for cases in which medical staff were not fluent in Spanish.

All data were entered by clinicians or student scribes at the time of care on a dedicated electronic medical record developed specifically for use on medical service trips. This allowed tracking and comparison of all anonymized data and diagnoses made across all sites. All anonymized data were used with explicit permission from Timmy Global Health.

2.2. Participants and settings

Study participants included all the patients who were assessed and treated during each trip. Data were collected from 11 service trips in the Napo region, Ecuador; 8 served Quito, Ecuador; 5 served

Santo Domingo, Ecuador; 5 served Monti Cristi, Dominican Republic; and 5 served Quetzaltenango, Guatemala.

Napo region is located in the sparsely populated Oriente province of Ecuador and abuts the Amazon rainforest. The capital is Tena, and the rural communities visited by the service trips are located anywhere from 30 min to 2 h from the nearest major town. Most patients are indigenous subsistence farmers, and often speak Quechua as a first language and Spanish as a second language. In contrast, the service trips in Quito, Ecuador are located in an urban environment within the boundaries of the nation's second largest city, with a population of close to 3 million people. Finally, Santo Domingo, Ecuador is the newest trip site established by the organization and is a city with a population of 1 million people. Mobile clinics in Santo Domingo operated in a semi-urban environment.

Quetzaltenango (Xela) is the second largest city in Guatemala, with a population over 200,000. Medical service trips visited both indigenous communities in rural areas outside the city, and also operated occasional clinics out of the base site. The service trips in the Dominican Republic operated out of the small town of Monti Cristi, near the Haitian border, and visited regional rural plantations in which Dominican and Haitian seasonal workers harvest sugar cane and other subsistence crops.

2.3. Data analysis

The most frequent diagnoses were organized and categorized into the following rational diagnostic clusters (Table 1) by the principal investigators. Descriptive statistics were used to summarize the data. These data were displayed in percentages and the number of participants in each category.

3. Results

A total of 22,977 patients were assessed by clinicians across all sites, and 32.9% of these patients were male. The average age of all patients seen was 36 years. The number of service trips, number of patients, gender, and ages of patients assessed in each region are presented in Table 2. Most patients seen on the trips had multiple diagnoses.

The top diagnostic categories are presented for the five regions in Table 3. In all regions, general pain was the most common symptom category, and included general pain, back pain, and nonspecific headache. General pain was reported by 14.5–22.1% of all patients assessed, substantially higher than the other diagnostic categories. Upper respiratory complaints, not including asthma and COPD, made up the second most common complaint with 8.3–13.2% of patients presenting with this sign. The prevalence of diabetes and hypertension was substantially lower in the rural Napo region than on trips in Quito, Quetzaltenango, and Monti Cristi, whereas complaints like diarrhea, menstrual complaints, urinary complaints, pruritus, and anemia were similar across the five regions. Aggregated, the tracked diagnostic clusters accounted for 71–78% of all diagnoses made. All other diagnoses made by clinicians accounted for 22–29% of total diagnoses, and of these, no individual uncategorized diagnosis made up more than 1% of all diagnoses.

4. Discussion

The major strength of this study is its large data set, which allowed for the analysis of diagnoses from over 20,000 patients assessed on mobile medical service trips. The majority of symptomatology seen on primary care global health experiences in

Table 1 Definitions for each rational diagnostic cluster.

| Diagnostic category | Included clinician diagnoses |
|-----------------------|--|
| Nonspecific abdominal | Parasites, abdominal pain |
| Eye irritation | Dry/irritated eye, pterygium, allergies |
| Vaginal discharge | Vaginitis, yeast infection, bacterial vaginosis, pelvic inflammatory disease, sexually transmitted |
| Pruritis | Dermatitis, eczema, scabies, impetigo |
| Pregnancy | Prenatal, pregnant |
| Urinary complaints | Urinary tract infection, benign prostate hypertrophy |
| Tinea | Fungus, onychomycosis, other tinea |
| Menstrual complaints | Dysmenorrhea, menorrhagia, menopause |
| Upper respiratory | Cough, pharyngitis, URI, bronchitis/pneumonia, sinusitis, tonsillitis, laryngitis |
| Dyspepsia | GERD, gastritis, peptic ulcer disease |
| General pain | Back pain, nonspecific headache, general pain, nonspecific muscle strain, osteoarthritis |

Table 2 Age and gender of patients at each medical service trip site in Latin America.

| | Napo, Ecuador | Quito, Ecuador | Santo Domingo, Ecuador | Monti Cristi, Dominican Republic | Quetzaltenango, Guatemala |
|----------------------------|------------------|-------------------|---------------------------|-------------------------------------|------------------------------|
| Number of service trips | 11 | 5 | 5 | 5 | 5 |
| Total patients | 6799 | 4643 | 2840 | 2758 | 5937 |
| Male (%) | 2555 (38%) | 1326 (29%) | 1019 (36%) | 1066 (39%) | 1596 (27%) |
| Age <5 years | 1091 (16%) | 405 (9%) | 455 (16%) | 437 (16%) | 414 (7%) |
| Age 5–12 years | 1200 (18%) | 599 (13%) | 519 (18%) | 336 (12%) | 658 (11%) |
| Age 12–18 years | 571 (8%) | 278 (6%) | 445 (16%) | 242 (9%) | 298 (5%) |
| Age 18–50 years | 2546 (37%) | 1364 (29%) | 736 (26%) | 1140 (41%) | 1582 (27%) |
| Age >50 years | 1383 (20%) | 1997 (43%) | 685 (24%) | 603 (22%) | 2985 (50%) |
| Ave. Age years | 28 | 41 | 39 | 30 | 44 |
| Ave. Age (all sites) years | 36 | | | | |

Table 3 Number and percentage of patients diagnosed with each symptom cluster at each medical service trip site in Latin America.

| | Napo, Ecuador | Quito, Ecuador | Santo Domingo, Ecuador | Monti Cristi, Dominican Republic | Quetzaltenango, Guatemala |
|------------------------------|------------------|-------------------|---------------------------|-------------------------------------|------------------------------|
| General pain | 21.6% (4415) | 22.1% (5503) | 19.6% (3441) | 18.6% (719) | 14.6% (494) |
| Upper respiratory complaints | 11.6% (2383) | 8.3% (2065) | 9.5% (1677) | 13.2% (510) | 8.3% (283) |
| Asthma/COPD | 0.4% (84) | 0.5% (135) | 0.5% (80) | 1.2% (46) | 0.6% (19) |
| Dyspepsia | 7.5% (1532) | 7.4% (1852) | 6.7% (1175) | 8.1% (315) | 11% (375) |
| Diarrhea | 1.4% (289) | 1.1% (268) | 1.4% (241) | 0.9% (35) | 1.9% (63) |
| Nonspecific abdominal | 12.1% (2479) | 9.2% (2283) | 11.3% (1982) | 6.8% (263) | 8.7% (295) |
| Vaginal discharge | 1.3% (267) | 1.1% (269) | 1.3% (234) | 3.6% (141) | 2.3% (77) |
| Menstrual complaints | 0.6% (130) | 0.7% (165) | 0.8% (145) | 1.1% (41) | 0.4% (13) |
| Pregnancy | 0.6% (121) | 0.4% (99) | 0.7% (128) | 1.9% (72) | 0.5% (18) |
| Hypertension | 1.6% (318) | 7.8% (1934) | 2.7% (477) | 7.9% (305) | 4.7% (160) |
| Diabetes Mellitus | 0.3% (57) | 1.9% (479) | 0.7% (116) | 2.3% (90) | 4% (135) |
| Urinary complaints | 2.6% (539) | 2.1% (520) | 2.5% (446) | 1.8% (70) | 1.9% (66) |
| Tinea | 4.2% (860) | 2.5% (626) | 3.1% (548) | 1.4% (55) | 1.4% (48) |
| Pruritis | 4.3% (888) | 3.5% (876) | 3.6% (633) | 3.3% (129) | 3.9% (133) |
| Eye irritation | 6.4% (1313) | 5.7% (1409) | 5.4% (945) | 4.8% (186) | 8.4% (286) |
| Anemia | 0.6% (133) | 0.4% (110) | 1.3% (230) | 1% (37) | 0.5% (18) |
| Other | 22.7% (4655) | 25.4% (6337) | 29% (5093) | 22% (852) | 26.8% (911) |
| Total | 99.8% (20463) | 100.1% (24930) | 100.1% (17591) | 99.9% (3866) | 99.9% (3394) |

the five described regions was easily classified into the above symptom clusters. The most common six clusters were general pain, upper respiratory tract symptoms, skin disorders, eye irritation, dyspepsia, and nonspecific abdominal complaints. The most common complaints were similar at all sites, with the exception being that Quito and Monti Cristi brigades saw more hypertensive patients than Napo region. Other important conditions are specifically listed due to their importance to chronic disease management (hypertension, diabetes, and anemia) or public health importance (pregnancy, vaginal discharge and diarrheal disease), despite their overall low prevalence on the brigades.

There is little quantitative literature available concerning short-term medical service trips in

Latin America. It is useful, however, to compare these results to those described in a large longitudinal study of over 2500 patients seen on short-term medical service trips in Honduras [5]. The authors also clustered the diagnoses into similar categories: general pain (headache, back pain, body pain) accounted for 17.1%; upper respiratory complaints (fever, cough, cold) 22.3%; dyspepsia (stomach pain) 10.4%; nonspecific abdominal (parasites and worms) 19%; rash/itchy skin 8.1%; and eye symptoms 4%. These proportions are similar to those observed in this study. Together, these six symptom clusters in the Honduras study totaled 80.9% of the complaints assessed.

These results are also similar to those of an observational study of 788 patients seen on a

short-term service trip in rural Western Haiti [7]. Of those patients assessed, 39.8% were diagnosed with general pain or headache, 24% with “acid” (dyspepsia), 17.4% with parasites, 13.2% with eye symptoms, 8.2% with hypertension, and 7.4% with anemia. In this study, specific case definitions were used, and a diagnosis of parasites was defined by a patient’s complaint of passing worms, nonspecific gastrointestinal complaints (pain, bruxism, loss of appetite, insomnia), or clinical signs of malnutrition. General pain ranged from such complaints as joint pain, to generalized pain without evidence of serious disease, to apparent osteoarthritis.

The clustering of diagnoses into broad categories serves a valuable purpose. In most instances on low-resource mobile service trips, confirmatory testing is not available for pathologic diagnoses like gastritis, esophagitis, and peptic ulcer disease; or for microbiologic diagnoses like streptococcal pharyngitis, salmonella dysentery, giardia diarrhea, parasitic abdominal pain, or chlamydia cervicitis. Dermatologic diagnoses for scabies, tinea, and impetigo that are commonly seen on mobile medical service trips are either rarely seen in North American settings, or are outside of the scope of practice of clinicians who do not practice comprehensive primary care. Therefore, the diagnostic accuracy of a specific diagnosis is often in question. Previous studies of dermatologic diagnoses have shown diagnostic accuracy to be very poor when it has been specifically assessed [6,7].

In the absence of confirmatory diagnostic testing, the described results suggest that the approach of clinicians to patient management on low-resource medical service trips should tend toward syndromic management. This would mean movement toward an algorithmic diagnosis based on patient symptomatology, and toward the treatment that is most likely to be efficacious and reasonable given the epidemiology of the region. The above diagnostic categories represent a reasonable starting point, since these clusters encompass over 70% of the diagnoses encountered in these selected trips.

This descriptive study has several limitations. While our data involve five disparate regions in Latin America, one cannot therefore conclude that these results are generalizable to other parts of Latin America and the Caribbean. Furthermore, the diagnoses reported in this study are those of the independent clinicians participating in the service trips, and there were no case definitions or independent confirmation of their reported diagnoses. This further reinforces the choice to discuss broad categories of symptomatology, rather than

make false presumptions of the prevalence of specific diagnoses. There may also be overlap between certain reported symptom clusters, including dermatologic conditions, and abdominal conditions. In particular, this might occur when a diagnosis of “parasites” could be reasonably classified as diarrhea, nonspecific abdominal complaints, or dyspepsia. Finally, the symptomatology seen on medical service trips is unlikely to represent the epidemiology or demographics of the population as a whole. This is the case for a variety of reasons, including bias toward patients who are available during the day, access to a Community Health Promoter, access to transportation to the clinic site, and cultural factors influencing the likelihood of patients presenting for medical care.

It is worthwhile to discuss the gap in the literature regarding follow-up on patients seen and managed presumptively based on symptoms or a syndrome. While Timmy Global Health maintains a robust referral system to associated partner hospitals for semi-urgent and urgent conditions, there continues to be little data on the natural history and effectiveness of treatment for more benign conditions. Given the apparent differences in patient responses to history taking, medication-seeking behavior, treatment adherence, cultural challenges, and other epidemiological concerns, it cannot be assumed that conventional Western management of common primary care conditions will have the same effectiveness as in a North American setting. A search of the literature found no studies that quantitatively conducted follow-up assessments on patients seen and empirically managed on Latin American short-term medical trips.

Mobile medical service trips serving Latin America should have clear guidelines for treating common patient symptomatology. This framework should include, at a minimum, a rational algorithm for managing upper respiratory complaints, dyspepsia, nonspecific abdominal pain, dermatologic complaints, and general pain. The above results will be useful in training and educational programs for clinicians who are involved in global health experiences, as well as the creation of practice guidelines that are applicable in low-resource areas. As the literature on short-term medical service trips evolves, it is expected that appropriate guidelines for syndromic management will reflect the results of quantitative follow-up studies. Further research is needed to develop treatment and management protocols that will streamline and improve the quality of care of underserved patient populations in Latin America.

Conflict of interest

None declared.

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References

- [1] Maki J, Qualls M, White B, Kleefield S, Crone R. Health impact assessment and short-term medical missions: A methods study to evaluate quality of care. *BMC Health Serv Res* 2008;8:121–8. <http://dx.doi.org/10.1186/1472-6963-8-121>.
- [2] Dovlo D. Taking more than a fair share: the migration of health professionals from poor to rich countries. *PLoS Med* 2005;2(5):e109.
- [3] Stillwell B et al. Migration of health care workers from developing countries: strategic approaches to its management. *Bull World Health Organ* 2004;82(8):595–600.
- [4] Tiessen R. Motivations for learn/volunteer abroad programs: research with Canadian youth. *J Global Citizenship Equity Educ* 2012;2(1).
- [5] 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 2500 patients over three years. *Int J Health Serv* 2012;42(4):739–53.
- [6] Badame AJ. Incidence of skin diseases in rural Jamaica. *Int J Dermatol* 1988;27:109–11.
- [7] Mahé A, Thiam N'Diaye H, Bobin P. The proportion of medical consultations motivated by skin diseases in the health centers of Bamako (Republic of Mali). *Int J Dermatol* 1997;36:185–6.

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