Assessing the Short-Term Global Health Experience: A Cross-Sectional Study of Demographics, Socioeconomic Factors, and Disease Prevalence

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Abstract. Interest in short-term global health experiences to underserved populations has grown rapidly in the last few decades. However, there remains very little research on what participants can expect to encounter. At the same time, it has been suggested that in order for physicians and workers to provide safe and effective care, volunteers should have a basic understanding of local culture, health systems, epidemiology, and socioeconomic needs of the community before arriving. Our objective was to add to the limited literature on what short-term global health trips can expect to encounter through a cross-sectional study of patient demographics, socioeconomic markers, and the prevalence of diseases encountered on a short-term medical service trip to Lima, Peru. Descriptive analysis was conducted on clinic data collected from patients living in Pamplona Alta and Pamplona Baja, Lima, Peru, in July 2015. We found that volunteers encountered mainly female patients (70.8%), and that there were significant socioeconomic barriers to care including poverty, poor housing, environmental exposures, and lack of continuity of health care. Analysis of the disease prevalence found a high proportion of acute and chronic musculoskeletal pain in the adult populations (18.8% and 11.4%, respectively), and a high presentation of upper respiratory tract infections (25.4%) and parasites (22.0%) in the pediatric group. These findings can be used by future short-term medical service trips to address potential gaps in care including the organization of weekend clinics to allow access to working men, and the use of patient education and non-pharmacological management of acute and chronic disease.

INTRODUCTION

Interest in short-term global health experiences to developing countries has grown rapidly in the last few decades.¹ Physicians and volunteers from high-income countries are traveling to low and middle income countries to provide basic surgical or medical assessments and health care. However, in order for clinicians to provide safe and effective care, it has been suggested that volunteers should have a basic understanding of the local culture, health systems, epidemiology, and socioeconomic needs of the community they are serving.^{2,3} This is difficult to accomplish predeparture due to the lack of research on what clinicians can expect to encounter on these medical trips. A recent review by Sykes found only 67 papers on short-term medical service trips since 1993 that used critically reviewed data. Furthermore, most failed to include pediatric, demographic, or socioeconomic information.⁴ As well, 80% were from surgical trips, with only 13 papers on medical-intervention experiences.⁴ In Latin American literature, Mondragon and others⁵ reported on global health experiences in several countries including Peru, but also did not include epidemiological data on the visited communities. The lack of information on underserved areas is not unique to research on short-term medical service trips. Data from underserved areas are also often excluded from government epidemiological studies,⁶ or are combined with data from nearby urban and affluent populations, masking the true characteristics of the communities.⁷ This has led to a lack of knowledge of underserved communities' characteristics. Implications for visiting clinicians include safety and quality of health-care provided,⁸ the ethics of adequate cultural awareness and sensitivity to local community needs,⁹ and the

preparation of medication, supplies, and volunteer pre-departure training.

Our goal was to report and examine the demographics, socioeconomic markers, and disease patterns in the populations of Pamplona Alta (PA) and Pamplona Baja (PB), located on the outskirts of Lima, Peru. These communities are visited annually by McMaster University in cooperation with local partners, including Solidarity Experiences Abroad and Solidaridad en Marcha (SEM). Our findings help to answer the question of what clinicians can expect to encounter on short-term global health experiences, and contributes to the scarce literature on medical work in Latin America.¹⁰ Our findings can also be used in the development of evidence-based pre-departure planning and training for future short-term global health trips visiting communities in Peru.

MATERIALS AND METHODS

Clinical context. Data collection took place between June 30 and July 10, 2015, in the “pueblo jovenes,” or shantytowns, of PA and PB, Lima, Peru. Clinics operated on weekdays between 8:00 AM and 4:00 PM, with a total of eight clinics held over the course of the 2 weeks. Clinics were organized as part of an annual elective by the Michael G. DeGroote School of Medicine at McMaster University, in partnership with SEM and the local communities. The medical team that assessed patients consisted of five family physicians, six medical students, three family medicine residents, and 11 Peruvian medical students. Nursing students and volunteers were responsible for triaging patients and recording demographic information. The team was also assisted by local nurses from the nearest health clinic and were also joined by Peruvian gynecologists in PA. Prescriptions were handled by a Canadian pharmacy student under the supervision of a Peruvian physician. All Canadian team participants partook in pre-departure training which included sessions on general cultural

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competency for global health experiences. Diagnostic tests included limited point-of-care testing of blood sugar, urine-dip analysis, hemoglobin testing, and stool analysis for parasites. There was also limited access while in PB to radiographic and ultrasound modalities. At both clinic sites there was the potential for referral to the nearest health clinic for follow-up with a specialist if required.

Data collection. Patient encounters were recorded by health-care professionals on a medical record designed a priori, consisting of open-text fields for all components of a medical history, along with binary yes/no questions for social history. Qualitative data were collected through a meeting with local community members on the first day of arrival in PB. The meeting was attended by men, women, and children, with roughly equal gender representation. Translation at the meeting was provided by a SEM worker. Patient data extracted from the record included demographics, body mass index (BMI), blood pressure (BP), past medical history, current medications, social history, and allergies. Diagnosis was extracted from the assessment and plan fields. The remaining fields were read to ensure completeness of the medical encounter. Data were entered into a Microsoft Excel (2013; Microsoft Corp., Redmond, WA) spreadsheet designed a priori.

Data analysis. Descriptive statistics were analyzed using SAS software (SAS institute, Cary, NC), reported as frequency and proportion of participants in each category. Data were stratified by clinic location. Categorical variables were compared using the χ^2 test, and continuous variables using the independent *t* test. Significance was set at 95% ($P < 0.05$) a priori. Qualitative data were reviewed and common themes extracted using deductive thematic coding. Research ethics approval was obtained from the Hamilton Integrated Research Ethics Board (ref. 1113-C).

RESULTS

Demographics. A total of 753 patients were assessed by the medical team across all sites, with 59% (444) seen in PA, 36.8% (277) seen in PB, and 4.2% (32) of patients seen without site recorded. PA saw a comparatively younger population, with a mean age of 28.5 years versus the mean age of 35.1 years in PB ($P < 0.01$). Females accounted for 70.8% of clinic patients, and the average age of all patients was 30.8 years. Population demographics stratified by location are shown in Table 1.

Medical characteristics. Medical characteristics of the adult population are presented in Table 2. The mean BMI of patients was 29.0, and the BP was 123/73 (range = 80/50 to 192/102). Both BMI and BP were significantly different

between locations ($P < 0.01$). The most common preexisting medical diagnoses for adults were hypertension (10.2%), dyslipidemia (7.3%), and diabetes mellitus (6.6%), whereas 27.8% of adults had no previous medical history. Most adults had used some form of medication in their life, with 14.0% using medications for acute concerns and 40.6% reporting chronic use. Herbal remedies made up 4.2% of all medication use, and 41.2% of the population did not use any medications at all. The pediatric population did not have sufficient data collection for past medical history, and were thus excluded from social characteristics.

Socioeconomic characteristics. Socioeconomic characteristics of the adult population are presented in Table 3, showing low rates of smoking (6.9%) and a relatively higher rate of alcohol use (23.8%). Most patients were either married or in a relationship (67.3%), with the remainder single (24.0%), widowed (7.7%), or divorced (1.0%). Data show only 51.2% of the patient's attending the clinics could afford medications, 14.9% of patients were unemployed, and 36.5% were self-used.

Diagnosis. A total of 590 new diagnoses were made during the 8 days of clinic visits for the 753 individuals seen. The diagnoses of the adult population are presented in Table 4. The top five categories were acute musculoskeletal (MSK) pain (18.8%), chronic noncommunicable disease (18.1%), chronic MSK pain (11.4%), genitourinary infections (8.0%), and headache (7.6%). A chart containing the specific diagnoses encountered within these broader categories can be

TABLE 2
Medical characteristics of adult patients

Characteristics	All sites	PB	PA	P value
Health indices (mean)				
BMI (kg/m ²)	29.0	29.3	28.7	< 0.01
Systolic blood pressure (mmHg)	123.4	128.6	119.5	< 0.01
Diastolic blood pressure (mmHg)	72.9	75.7	70.8	< 0.01
Current medication use				0.6
None	41.2%	38.9%	43.4%	
Acute use	14.0%	15.4%	13.1%	
Chronic use	40.6%	40.3%	40.4%	
Herbal use	4.2%	5.4%	3.0%	
Past medical history				0.31
None	27.8% (144)	23.4% (54)	31.8% (85)	
Hypertension	10.2% (53)	10.4% (24)	9.7% (26)	
Cholesterol	7.3% (38)	7.8% (10)	7.1% (19)	
Diabetes mellitus	6.6% (34)	6.9% (16)	6.4% (17)	
Gastritis	4.1% (21)	4.3% (10)	3.4% (9)	
Osteoarthritis	3.1% (16)	4.3% (10)	1.9% (5)	
Gallstones	2.9% (15)	3.5% (8)	2.6% (7)	
Asthma	2.5% (13)	2.6% (6)	2.6% (7)	
Mental health	2.5% (13)	2.6% (6)	1.9% (5)	
Osteoporosis	2.3% (12)	1.3% (3)	3.4% (9)	
Anemia	1.5% (8)	2.6% (6)	0.8% (2)	
Cancer	1.4% (7)	2.2% (5)	0.4% (1)	
Coronary artery disease	1.2% (6)	1.3% (3)	1.1% (3)	
Other	26.6% (138)	26.8% (62)	27.0% (72)	

BMI = body mass index; PA = Pamplona Alta; PB = Pamplona Baja.

TABLE 1
Population demographics

Characteristics	All sites	PB	PA	P value
Total patients	753	36.8% (277)	59.0% (444)	
Female (%)	70.8% (507)	73.1% (201)	69.4% (306)	0.29
Age (%)				< 0.01
< 18 years	40.5% (292)	33.2% (92)	45.1% (200)	
19–64 years	46.9% (338)	52.7% (146)	43.2% (192)	
> 65 years	12.6% (91)	14.1% (39)	11.7% (52)	
Mean age—years	30.8	35.1	28.5	

PA = Pamplona Alta; PB = Pamplona Baja.

TABLE 3
Socioeconomic Characteristics of Adult Population

Characteristics	All	PB	PA	P value
Social factors (%)				
Married/partner	67.3	66	68.5	0.17
Single	24.0	24.5	23.0	
Widow	7.7	8.8	7.2	
Divorce	1.0	0.68	1.3	
Smoke	6.9	4.1	9.3	0.15
Drink	23.8	23.9	23.7	0.97
Economic factors (%)				
Used	85.2	80.0	89.5	
Employee	48.7	60.0	51.3	0.02
Self-used	36.5	20.0	38.5	
Unemployed	14.9	20.0	10.3	
Able to afford medications	51.2	45.6	55.2	0.3

PA = Pamplona Alta; PB = Pamplona Baja.

found in Supplemental Appendix Table 1. The prevalence of diagnoses was not significantly different between PA and PB ($P = 0.066$). The pediatric population diagnoses are also presented in Table 4, with top diagnoses including upper respiratory tract infections (URTIs) (25.4%), parasites (22.0%), dermatologic issues (13.0%), and anemia (10.7%). Again, there was no significant difference across the different clinic sites ($P = 0.85$).

Qualitative data. Qualitative data collection during the meeting with local community leaders in PB revealed four main socioeconomic themes: issues of poverty, housing, environmental exposures, and lack of continuity of health care.

"We live in severe poverty, with no means to improve these situations" (Female, Focus Group, Pamplona Baja).

It was noted that most families live on low incomes ranging between 300 and 500 sols/month (\$116–190 CAD) for a family of five to six individuals. Consequences of poverty mentioned by several attendees included malnutrition and the inability to afford medications that were prescribed by either a short-term medical service trip or a Peruvian health outpost.

"The first dose of the medication was covered for [my] child's anemia, but after that [I] must pay, and was unable to afford follow up" (Female, Focus Group, Pamplona Baja).

The issues with housing included poor infrastructure, lack of running water, and abodes made of plywood walls and zinc roofs which tend to oscillate between extremes of temperature depending on the valley's weather.

"[We] get our water from pipe trucks, which [we] must pay lots of money for. However, this water is still not clean, and [we] see feathers, feces, paper, [etc] in the water" (Male, Focus Group, Pamplona Baja).

Numerous environmental exposures included close proximity to pig farming and the dangers to children from falling rocks to the waste and garbage in the streets. Finally, it was stressed by almost all speakers that there was no immediately accessible medical care. The closest outpost is a few kilometers away, and is only open from 8:00 AM to 3:00 PM, which is

TABLE 4
Diagnoses encountered in PA/PB populations

Characteristics	All sites
Adult population	
Acute musculoskeletal pain	18.8% (111)
Chronic noncommunicable diseases	18.1% (107)
Chronic musculoskeletal pain	11.4% (67)
Genitourinary infection	8.0% (47)
Headache	7.6% (45)
Upper respiratory tract infection	6.1% (36)
Gastritis	4.6% (27)
Parasites	4.4% (26)
Dermatologic issue	4.4% (26)
Anemia	2.7% (16)
Mental health	2.4% (14)
Other	11.5% (68)
Pediatric population	
Upper respiratory tract infection	25.4% (102)
Parasites	22.0% (88)
Dermatologic issue	13.0% (52)
Anemia	10.7% (43)
Acute musculoskeletal pain	3.2% (13)
Mental Health	3.0% (12)
Genitourinary infection	2.0% (8)
Chronic noncommunicable disease	1.8% (7)
Headache	1.5% (6)
Other	17.5% (70)

PA = Pamplona Alta; PB = Pamplona Baja.

when most men are at work and cannot attend. The closest hospital is 15 km away, and many community members do not have the ability to call an ambulance or even afford a taxi. They have to walk, and are sometimes not in a condition to do so. It was expressed by several members that they hoped for a sustainable and accessible health clinic that could provide continuity of care.

"[I] hope that in time there will be a medical outpost that is more sustainable...the neighborhood would rally around this, and help to construct this". (Community leader, Male, Focus Group, Pamplona Baja).

One woman, who was the secretary for many of the leaders in the area, felt that the issues raised were common to all of the smaller communities in the area, not just PB. All members who spoke expressed appreciation and thanks for the medical team's help and support, and indicated their willingness to participate in improving their conditions and medical care.

DISCUSSION

The importance of cultural, geographical, and socioeconomic knowledge of the local populations visited during short-term medical service trips is crucial to providing safe and ethical care.² This study adds to the limited literature on these topics through analysis of the demographic, socioeconomic factors, and disease prevalence among patients accessing medical care through a short-term medical service trip in Lima, Peru.

Our study found 70.9% of patients accessing care in PA and PB were female. This is similar to the findings in the studies by both Ferrara and others and Dainton and others of five locations in Latin America, which found 67–70% attendance of short-term global health clinics by women.^{11,12} This difference between male and female attendance could simply be a result

of the universal tendency of women to seek health care more than men.¹³ However, it could also reflect the inaccessibility of clinic hours for men, as the clinics ran during the working hours of 8:00 AM to 4:00 PM. This is supported by community elders who independently spoke of the need for different hours to allow men to access the clinics' medical care. Furthermore, short-term medical service trips often focus on the most vulnerable populations such as children and pregnant women,⁸ which while important, can mean that men's health is often overlooked. However, men have a higher risk of developing many chronic diseases that carry high morbidity and mortality, and an overall shorter life expectancy.¹⁴ The men in Lima also have less access to health insurance than women, according to the 2014 national census by the Peruvian Instituto Nacional de Estadística e Informática.¹⁵ This identifies a gap in care for men, requiring collaboration with community leaders to identify culturally relevant and practical solutions to improve clinic access to all community members.

Discussion with community leaders during the short-term medical trip revealed important social determinants of health in PB and PA. This is an area of increasing study within Canada and abroad,^{16,17} with many factors combining to affect an individual's health.¹⁷ Despite the impact these characteristics can have on a patient's presentation and disease, Martiniuk and others¹ found that many health-care professionals working with short-term medical service trips have little or no knowledge of the level of poverty or local social and economic contexts of the communities they visit. Our study was not designed to look at the complexities of social determinants of health; however, we did collect qualitative and descriptive data on several socioeconomic markers of the populations, which help to depict the situations in which these patients live, while also suggesting that further study by short-term trips is necessary in this area.

We found that most patients were married or in a relationship (67.3%), did not smoke (93.1%), and were used either by an employer or self (85.2%). In PB, the meeting with local community members revealed socioeconomic concerns of poor nutrition, inadequate housing, exposed sewage, lack of play areas for children, and barriers to accessing health care. These factors can be linked to the top diagnoses found by our trip, such as anemia (10.7% of pediatric population) from poor nutrition, and high rates of parasites (22.0% of pediatric population) from exposed sewage. Furthermore, knowledge of these factors has implications for diagnosis in this resource poor setting. For example, in Peru a patient with a productive cough for more than 15 days is considered to have tuberculosis (TB) until proven otherwise.¹⁸ This is due to a high prevalence of risk factors for the contraction of TB, including poverty, malnutrition, young age, and crowded housing.¹⁹ There were in fact two patients found to have cavitary TB during the medical trip. This underscores the importance of understanding the social determinants of health and subsequent risk factors of the population being served to provide patients with better health care and accurate diagnoses.

When patients were asked if they could afford medications, 48.8% of patients responded that they could not, and this was corroborated by statements made during the community meeting. This poses a significant barrier to the long-term impact of short-term medical service trips as the primary intervention provided to patients is often medication in short 2–4 week supplies. If patients cannot afford the prescribed

medications after the volunteer teams have left, we must ask ourselves to what extent our work has impacted our patients' long-term health. This is one of the key ethical questions surrounding short-term global health work. Decamp described the basis of ethical dilemmas surrounding short-term trips when he wrote "we are tempted to act as if any benefit counts ethically in favour of the trip, or that simply intending to provide benefit is enough."²⁰ We must be cognizant of the risks of short-term work such as lack of patient follow-up, dependency on foreign aid, and the undermining of local health system.²⁰ Recognizing these risks, we must then ensure that our work provides tangible benefits, and if not, seek ways to balance the risk:benefit equation. A potential solution to patients' inability to afford medications would be to find new, sustainable ways of managing their health concerns. For example, pediatric anemia is often treated by short-term teams with a few weeks to months' supply of pediatric iron, but requires many more months of treatment which we now know parents often cannot afford to continue. Instead, affordable and sustainable treatments exist, such as the Lucky Iron Fish campaign. The campaign uses an iron ingot placed in a family's cooking pot to combat iron-deficiency anemia in Cambodia. Cooking with the fish provides 75% of recommended daily iron for the entire family, and is reusable for up to 5 years.²¹ The fish costs \$5.00 CAD, which works out to just \$0.0027 a day over the 5 years. Recognizing the prevalence of anemia, combined with the inability of patients to afford medications, we must acknowledge that alternative treatments like this should be implemented to provide ethically responsible care.

Carrying this concept further to our discussion on the top adult diagnoses seen in PA and PB, acute MSK pain (18.8%), chronic noncommunicable disease (18.1%), and chronic MSK pain (11.4%) accounted for the top three diagnoses, and yet are poorly managed with the short supplies of medication provided by short-term trips. Interestingly, the burden of chronic disease is a new phenomenon in Peru, as improvements in the health system reduced mortality from communicable diseases by 50% during 1986–1998.²² This allowed for the emergence of an aging population and thus chronic disease.²² With this in mind, we propose that short-term global health trips could adjust the medications assembled predeparture to reflect the diseases most commonly seen, allowing larger quantities to be given to patients in need of chronic disease management. This, again, would be an important improvement in a population where 48.8% cannot afford medications. Although many groups try to estimate necessary drug quantities, truly evidence-based medication procurement that would optimize short-term medical trip supplies, is not possible based on our or any other data. However, our work does forge the grounds on which we can build the accurate preparation for patient needs. Combining local disease prevalence data with the World Health Organization's essential medicine guidelines that list the most efficacious, safe, and cost-effective medicines for certain conditions, would be a huge step toward improving the safety and benefit of short-term care.²³

The high prevalence of chronic MSK pain also suggests the need for nonpharmacologic management strategies, as medical management itself is not always the best treatment of these conditions. Instead, allied health professions such as occupational therapy and physiotherapy could provide

strategies and education that could be used by patients long after the medical team has left. We therefore suggest that multidisciplinary teams consisting of allied health professionals in addition to physicians, nurses, and support staff, would be another way to provide effective and comprehensive care with long-term benefits to patients.

Last, patient education programs could play a role in providing safe and effective care, and promoting preventative medicine. It has been noted in a review by Martiniuk and others¹ that there is a lack of interest in delivering preventative programs by short-term global health trips, and thus missions are left treating illnesses rather than preventing them. Increasing medical trips' focus on patient education rather than diagnostic medicine might provide another way of improving long-term outcomes. For example, the top pediatric diagnosis was URTI (25.4%), which is responsible for high morbidity and mortality in children and is most commonly caused by Respiratory Syncytial Virus-A and Influenza A.²⁴ Management of viral URTIs is primarily supportive, involving adequate hydration, rest, and counseling on when to seek medical attention if symptoms worsen. Relaying this information properly and in adequate detail can be challenging in high-volume clinic where translation is also a barrier. Instead, providing dedicated education sessions on URTI management could improve parental confidence and subsequent quality of care. A similar method was used by Pantenburg and others in the management of pediatric diarrhea in peri-urban communities of Lima, Peru. Misconceptions about feeding during diarrhea fell from 71.9–25% with educational intervention, significantly changing parental practices.²⁵ This is an excellent example of the long-term impact education can have on patient outcomes, while also empowering communities and parents with information regarding their own health.

Strengths and limitations. There were several limitations to this study. Efforts were made to ensure complete medical records; however, there were some records that were incomplete on social characteristics. These included education and contraception use, which were felt to be too incomplete for analysis and were therefore excluded from the study. The remaining socioeconomic characteristics in Table 3 were missing 14–20% of the data, but were included as the incomplete records appeared random, and the conclusions were therefore felt to be representative of the overall population. Second, while confirmatory testing was available for parasites and other concerns such as anemia, the number of confirmatory tests was limited. Therefore, many diagnoses of parasites and anemia were made clinically, which could result in the over- or underdiagnosis of these conditions. Final, our study used qualitative interviews to elucidate the socioeconomic concerns most pressing to the community. Although this is a strength in that it reflects the community's priorities, it does not provide a direct link to the patients actually seen in clinic. Instead, qualifiers like “can you afford medications,” and employment status were recorded during the individual patient encounters. Therefore, our results on socioeconomic factors are illuminating, but further research is needed to better direct interventions to address the barriers to health.

Strengths of the study include the study design, as it was designed prior to departure, and participants were trained on data collection before clinics began. This is in contrast to many studies which use retrospective analysis. This therefore allowed for standardization of the form, efforts to decrease

interprovider variability such as binary yes/no socioeconomic questions, and more consistently complete records. As well, a major strength of the study is the more detailed evaluation of patients than what is typically reported in the literature,^{1,4,10} including demographics, socioeconomic factors, and disease prevalence of both adult and pediatric populations. This may help readers to consider gaps in care as well as underlying causes of disease. This is also the first study to our knowledge that looks at the “pueblo jovenes” populations surrounding Lima, Peru, and one of the few to study Latin America.¹⁰

CONCLUSION

Our findings reveal the patient demographics, socioeconomic factors, and disease prevalence that volunteers on short-term medical service trips can expect to encounter. Awareness of the needs and characteristics of a community before arriving is the first step to responsible short-term global health experiences. This data on the characteristics of PA and PB, Lima, Peru, will help to expand the limited evidence-based literature and can be used by future medical trips to close gaps in care. This could include the organization of weekend clinics to allow working men to access care, providing health education and allied health expertise to improve chronic disease management and long-term impact, and the use of disease prevalence to plan medication supplies predeparture. Work is still needed to examine the long-term impact of short-term medical trips and other ethical dilemmas, such as the undermining of the local health system and the lack of patient follow-up associated with short term global work. Such information would be important not only for pre-departure training, but for determining ethically responsible medical care.

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