

## Health Problems Encountered by Short-Term European Volunteers in a Nongovernmental Organization in Cambodia

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**Abstract.** Short-term volunteers are susceptible to a wide spectrum of morbidities, mostly infectious diseases preventable with general hygiene and preventive measures. This study aimed to identify the health problems encountered by European short-term volunteers collaborating for 1 month with a nongovernmental organization (NGO) in Cambodia and to describe their characteristics. A prospective, descriptive observational study was conducted on short-term volunteers who collaborated with an NGO in Cambodia during August 2018. Informed consent and sociodemographic, clinical, and preventative health-related questionnaire data were provided by 198 volunteers. The health problems encountered were confirmed in a primary care consultation with healthcare professionals. Univariate and bivariate analyses were performed. The median age of the volunteers was 22 years (interquartile range = 21–24), and 64% were women. Some (18.2%) had allergies, 8.6% had preexisting health conditions, and 10.6% were under regular treatment. A total of 77.3% visited a pretravel consultation clinic, 39.9% completed a specific pretravel health course, 21.7% took malaria prophylaxis, 92.4% received hepatitis A vaccination, and 82.3% received typhoid fever vaccination. Medical assistance was sought by 112 (57.3%) of the volunteers. The average number of health problems was 2.5 (standard deviation = 1.5), and the total number of health problems attended by the medical team was 279. The most common health problems were upper respiratory infections (12.2 per 1,000 person/days), wounds (10.8 per 1,000 person/days), and diarrhea (6.3 per 1,000 person/days). Short-term volunteers experienced a high rate of health problems during their stay in Cambodia, but most of the problems were mild and preventable and resolved quickly. Pretravel consultation and specific pretravel health training seemed to increase disease awareness.

### INTRODUCTION

The number of volunteers working with nongovernmental organizations (NGOs) from European countries has been increasing in recent years.<sup>1–3</sup> This volunteering not only helps alleviate social inequalities, but also allows the volunteer to achieve personal and professional growth, a deeper empathy for other cultures, greater flexibility, better language skills, and even ideas for better organizational or clinical methods.<sup>4,5</sup> Short-term volunteers for NGO in tropical and subtropical countries are at risk for contracting diseases, as they work in countries with poorer hygiene and health conditions, where there is a higher prevalence of communicable diseases. Additionally, they are at risk because of changes in their risk-taking behavior when they are away from their usual settings.<sup>6–8</sup>

There is plenty of evidence on infectious diseases contracted by intercontinental travelers during their trips and after their returns,<sup>9–11</sup> but there is less evidence describing the health problems encountered by short-term volunteers in tropical countries.<sup>11,12</sup> This study aims to identify and describe the characteristics of the health problems that were encountered by European short-term volunteers collaborating for 1 month with an NGO in Cambodia.

### MATERIALS AND METHODS

This prospective, descriptive observational study was carried out in August 2018 at the facilities of the NGO Pour un

Sourire d'Enfant (PSE) in Cambodia. PSE is a French NGO that has been working in Cambodia since 1996. The European volunteers who go to Cambodia during the month of August every year are part of a program that aims to extend over the summer break the education, nutrition, and care that PSE offers during the school year, which is called the School Continuity Program (SCP). The NGO's headquarters are located in Phnom Penh, the capital and the most populated city of the country. In addition, the NGO has eight other offices distributed around the outskirts of Phnom Penh and in other cities, such as Siem Reap and Sihanoukville, thus covering the main centers of the population at risk.

The Camilo Jose Cela University (CJCU) Foundation collaborated with PSE to prevent disease and promote health among the volunteers during their stay in Cambodia; to that end, CJCU organized a semi-presential training program for the volunteers who were going to attend the SCP in 2018. This training program consisted of specific online travel-health material, which was prepared by professors from the Faculty of Health, together with a 6-hour theoretical-practical session held on the CJCU campus to enforce healthy behaviors and hygiene measures to prevent illness and to address any doubts the volunteers may have had related to their health during their work overseas. Camilo Jose Cela University's collaboration with PSE was complemented by their commitment of two of their family medicine doctors and two nursing students to the care of the volunteers' health in the field through primary care consultation; thus, the volunteers could be attended to and followed up if they had any health problems during or after their stay in Cambodia.

The study population included 204 volunteers who participated in the SCP carried out during August 2018 at the

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different PSE sites. Among those, 198 volunteers who signed informed consent and completed the baseline questionnaire were ultimately included in the study.

Volunteer data were collected through a baseline questionnaire completed by each volunteer at the beginning of the program. Health problem-related data were collected through a health problems questionnaire completed by CJCJ volunteer doctors and nurses after assessing the volunteers in a primary care consultation. These questionnaires were created with Google<sup>®</sup> Forms software. Variables collected were socio-demographic variables (sex, age, country of birth, university studies, and previous experience in overseas NGO work), clinical variables (allergies, preexisting health conditions, regular treatment, and updated vaccination calendar), health prevention variables (pretravel health consultation, malaria prophylaxis, travel vaccinations, and completion of the specific pretravel training course for volunteers), and health problem-related variables (presence and type of health problem, treatment prescribed, procedure required, and resolution).

A descriptive analysis of each variable was carried out, with frequencies and percentages for the qualitative variables and with the mean or median (standard deviation [SD] or interquartile range [IQR]) for the quantitative variables. The distribution of continuous variables was analyzed with the Kolmogorov–Smirnov test. For the bivariate analysis, the following tests were used:  $\chi^2$  or Fisher's test for contrasting qualitative variables, Student's *t* for dichotomous qualitative and quantitative variables, and ANOVA test for polytomous and quantitative variables. The results were considered statistically significant if  $P < 0.05$  and were processed using IBM SPSS Statistics version 25 software (Foundation for Biosanitary Research and Innovation in Primary Care, Madrid, Spain). For the calculation of incidence rates, the Epidat 4.2 program was used. As the denominator of incidence rates (person-time) is a fixed parameter, assuming the numerator follows a Poisson distribution, confidence intervals were constructed by means of the exact method. The exact method used is based on the Poisson distribution, and its use is recommended when the number of cases is small.

Subjects' consent was obtained according to the Declaration of Helsinki, and the study was approved by the CJCJ Ethics Committee. The current legislation on data protection was respected at all times.

## RESULTS

Among the 198 volunteers participating in the study, the median age was 22 (IQR = 21–24) years, and 64% were women. With respect to the nationality, 60.1% were Spanish, 35.4% were French, and the remaining 4.5% were of other nationalities such as British, German, Belgian, Dutch, or Italian. A total of 94.4% had or were undertaking university studies, and 43.4% reported that they had previous experience with volunteer work. Regarding the clinical-care variables, 18.2% had some allergies, 8.6% had some preexisting health conditions (predominately asthma and migraines), 10.6% were receiving regular treatment, and 93.4% had their vaccination status updated. Concerning health prevention variables, 77.3% had visited a pretravel health consultation clinic before coming to Cambodia; 21.7% took malaria prophylaxis during their stay; and 92.4% were vaccinated against hepatitis A, 82.3% against typhoid, 57.1% against tetravalent meningitis, 38.4% against rabies, 36.4% against Japanese

encephalitis, and 6.6% against cholera. A total of 39.9% completed the specific pretravel health course offered by the CJCJ Foundation for PSE volunteers. There were no statistically significant differences by sex among these variables, except for malaria prophylaxis, which was higher among women ( $P < 0.02$ ) (Table 1).

The number of volunteers who attended the primary care consultation for some health problems during their stay in Cambodia was 113 (57.1%). The average number of health problems was 2.5 (SD = 1.5), and the total number of health problems attended by the medical team was 279. Among the volunteers who presented with some health problems, 81.4% had attended a pretravel consultation, whereas that proportion was 71.8% among the volunteers who did not present with any health issues during the stay ( $P = 0.04$ ). Among the volunteers who presented with some health problems, 48.7% took the CJCJ-specific pretravel health course, compared with 28.3% of volunteers who did not present with any health problems ( $P < 0.01$ ) (Table 2). Volunteers who presented with some health problem did not differ significantly in terms of sex from those who did not (Table 3).

The most common health problems were upper respiratory tract infections, with an incidence rate of 12.2 per 1,000 person-days followed by wounds, with a p incidence rate of 10.8 per 1,000 person/days, which was higher among men (15.6) than women (8.3). Third, there was an incidence rate of 6.3 per 1,000 person/days for traveler diarrhea. All the incidence rates of the health events per 1,000 person/days identified among the volunteers who attended the primary care consultation and their breakdown by sex are shown in Table 4.

The most prescribed treatment provided by the primary care providers was nonpharmacological in 34.1% of the cases, followed by analgesics or nonsteroidal anti-inflammatory drugs (NSAIDs) in 22.9% of the cases, and oral rehydration salts (ORS) in 13.6% of the cases. There were no statistically significant differences by sex (Table 5). A total of 62.4% of the volunteers (67.4% of women versus 52.6% of men) did not need any procedure ( $P = 0.02$ ), whereas 30.1% required wound care, which was higher among men (41.1%) than women (24.5%) ( $< 0.01$ ). The resolution of the health problems was immediate in almost 75% of the cases, whereas 24.7% required continuity of care. Only three people (1.1%) needed a referral to the hospital (Table 5).

## DISCUSSION

There are no similar studies of volunteering conducted in Cambodia, except one on volunteering in a dental practice with noncomparable results.<sup>13</sup>

Our study found that volunteers had a median age below 25 years and were predominantly female, which is similar to other studies carried out among volunteers with an average age between 20 and 37 years and a predominance of women.<sup>1–3,14,15</sup> More than half of the volunteers were Spanish, which could be explained because, even though the NGO PSE is French, recruitment and hiring for the SCP is done from Spain. Most of these volunteers were university students. The majority were healthy adults, as  $< 10\%$  declared having some personal medical history requiring regular treatment, which is lower than the 15% rate for preexisting medical conditions observed in other studies of European travelers to tropical countries.<sup>16</sup> Almost half of the volunteers

TABLE 1  
Sociodemographic, clinical, and health prevention variables

Variables n (%)	Total 198 (100)	Female 128 (64)	Male 70 (35.9)
<b>Sociodemographic</b>			
Age*	22 (21–24)	22 (20–25)	22 (21–24)
Nationality Spanish	119 (60.1)	73 (57)	46 (65.7)
French	70 (35.4)	48 (37.5)	22 (31.4)
Others	9 (4.5)	7 (5.5)	2 (2.8)
University studies	187 (94.4)	120 (93.8)	67 (95.7)
Previous experience volunteering	86 (43.4)	50 (39.1)	36 (50.7)
<b>Clinical</b>			
Allergies	36 (18.2)	20 (15.6)	16 (22.9)
<b>Preexisting health condition</b>			
Asthma	17 (8.6)	12 (9.4)	5 (7.1)
Migraine	5 (2.5)	2 (1.6)	3 (4)
Anxiety disorder	4 (2)	4 (3.11)	0 (0)
Depression disorder	1 (0.5)	1 (0.8)	0 (0)
Hypothyroidism	1 (0.5)	1 (0.8)	0 (0)
Ventricular septal defect	1 (0.5)	0 (0)	1 (1.4)
Hyperlipidemia	1 (0.5)	0 (0)	1 (1.4)
Gilbert syndrome	1 (0.5)	1 (0)	0 (0)
Vitiligo	1 (0.5)	1 (0)	0 (0)
Asthma + Hashimoto + Psoriasis	1 (0.5)	1 (0.8)	0 (0)
Regular treatment	21 (10.6)	17 (13.4)	4 (5.7)
Updated vaccination record	185 (93.4)	66 (94.3)	119 (93)
<b>Health prevention</b>			
Pretravel health consultation	153 (77.3)	102 (79.7)	51 (72.9)
Malaria prophylaxis	43 (21.7)	34 (26.6)	9 (12.9)†
<b>Travel vaccinations</b>			
Vaccine Hepatitis A	183 (92.4)	121 (94.5)	62 (88.6)
Typhoid fever	163 (82.3)	106 (82.8)	57 (81.4)
Meningitis quadrivalent	113 (57.1)	70 (54.7)	43 (61.4)
Rabies	76 (38.4)	50 (39.1)	26 (37.1)
Japanese encephalitis	72 (36.4)	44 (34.4)	28 (40)
Cholera	13 (6.6)	6 (4.7)	7 (10)
CJCU pretravel health course	79 (39.9)	48 (37.5)	31 (44.3)

CJCU = Camilo José Cela University.

\* Median (interquartile range).

†  $P < 0.01$ .

had previously done some other type of volunteer work outside their country of origin, with this percentage higher among the men than among the women. Most of them undertook preventive measures before travel, such as attending pretravel clinic consultations or receiving travel vaccinations, as recommended. However, there was a low rabies vaccination rate, although rabies is present everywhere in Cambodia, so rabies vaccination should have been strongly recommended to volunteers before travel, even as short-term volunteers and even though they were not visiting rural areas.<sup>17,18</sup> Additionally, a low Japanese encephalitis vaccination rate was found among the volunteers, although this vaccine is recommended for Cambodia as well.<sup>19</sup> The low malaria prophylaxis rate could be explained because malaria is absent from Phnom Penh, Siem Reap, and Sihanoukville and has become rare in Cambodia, except in forested areas of some more distant provinces.<sup>20</sup>

More than a third of the volunteers took the previous travel health training course at the CJCU; most of the participants were Spanish, since the training course was held in Madrid and was not required prior to attending the SCP. In this training, volunteers were advised on malaria prophylaxis, the vaccinations required, and the first aid kits they should pack with ORS, povidone-iodine, oral antibiotics and ointment, and mosquito nets and repellent.

The percentage of health problems among volunteers was 57%, predominantly among women of Spanish nationality,

similar to other studies.<sup>2,3,9</sup> People who participated in the preparatory travel-health training course for volunteers presented almost twice as many health problems that those who did not participate in the course. The same happened with those who attended a pretravel consultation: they presented with 10% more health problems than those who did not attend such consultations. This difference may be due to the health advice they received in the pretravel consultation clinic and the travel-health knowledge they gained during the training course, which could make them more aware of the health problems, in line with other studies that showed the importance of predeparture health preparation for volunteers and of medical care and advice for volunteers.<sup>12</sup> Redman<sup>10</sup> concluded that despite attending a travel clinic for advice prior to departure, the majority of travelers experienced an adverse event while traveling abroad, most commonly diarrhea and respiratory conditions. However, studies have shown that effective communication of pretravel information and more specific training could help volunteers to respond better to health risks encountered during their stay and positively influence their use of prophylaxis and preventive measures.<sup>3,21–23</sup> If the volunteers had been better informed and prepared because of the travel consultation as well as the health travel-specific CJCU training course, it might have been less likely that they would have engaged in risky behaviors, and they might have been more likely to take steps to prevent illness (general hygiene, taking precautions

TABLE 2

Sociodemographic, clinical, health prevention, and health problems variables depending on the volunteers presented or not a health problem

Variables n (%)	Total 198 (100)	Volunteers who did not present any health problem 85 (42.9)	Volunteers who presented a health problem 113 (57.1)
<b>Sociodemographic</b>			
Age*	22 (21–24)	22 (21–25)	22 (20–24)
Sex Female	128 (64)	54 (63.5)	74 (65.5)
Male	70 (35.9)	31 (36.5)	39 (34.5)
Nationality Spanish	119 (60.1)	48 (56.5)	71 (62.8)
French	70 (35.4)	32 (37.6)	38 (33.6)
Others	9 (4.5)	5 (8.3)	4 (4.5)
University studies	187 (94.4)	80 (94.1)	107 (94.7)
Previous experience volunteering	86 (43.4)	38 (44.7)	48 (42.5)
<b>Clinical</b>			
Allergies	36 (18.2)	15 (17.6)	21 (18.6)
Preexisting health condition	17 (8.6)	6 (7.1)	11 (9.7)
Asthma	5 (2.5)	1 (1.2)	4 (3.5)
Migraine	4 (2)	2 (2.4)	2 (1.8)
Anxiety disorder	1 (0.5)	0 (0)	1 (0.9)
Depression disorder	1 (0.5)	0 (0)	1 (0.9)
Hypothyroidism	1 (0.5)	0 (0)	1 (0.9)
Ventricular septal defect	1 (0.5)	1 (1.2)	0 (0)
Hyperlipidemia	1 (0.5)	1 (1.2)	0 (0)
Gilbert syndrome	1 (0.5)	0 (0)	1 (0.9)
Vitiligo	1 (0.5)	0 (0)	1 (0.9)
Asthma + Hashimoto + Psoriasis	1 (0.5)	1 (1.2)	0 (0)
Regular treatment	21 (10.6)	8 (9.4)	13 (11.5)
Updated vaccination record	185 (93.4)	76 (89.4)	109 (96.5)
<b>Health prevention</b>			
Pretravel clinic consultation	153 (77.3)	61 (71.8)	92 (81.4)
Malaria prophylaxis	43 (21.7)	15 (17.6)	28 (24.8)
<b>Travel vaccinations</b>			
Hepatitis A	183 (92.4)	77 (90.6)	106 (93.8)
Typhoid fever	163 (82.3)	70 (82.4)	93 (82.3)
Meningitis quadrivalent	113 (57.1)	48 (56.5)	65 (57.5)
Rabies	76 (38.4)	31 (36.5)	45 (39.8)
Japanese Encephalitis	72 (36.4)	29 (34.1)	65 (57.5)
Cholera	13 (6.6)	5 (5.9)	8 (7.1)
CJCU pretravel health course	79 (39.9)	24 (28.3)	55 (48.7)‡
<b>Health problems</b>			
Number of health problems†	1.4 (1.6)	0 (-)	2.5 (1.5)‡

CJCU = Camilo José Cela University.

\* Median (interquartile range).

† Mean (standard deviation).

‡  $P < 0.01$ .

with food and water, mosquito bite prevention, malaria prophylaxis, administration of recommended vaccines, road safety actions, safe sex, etc.). Additionally, they could have asked for medical advice when they detected any health problem, regardless of the severity of the symptoms.

Nevertheless, despite the high number of health problems observed in the primary care consultation, aside from one case of dengue fever, none of the problems was serious. There were no cases of malaria, hepatitis A and/or E, Chikungunya virus, Japanese encephalitis, rickettsiosis, schistosomiasis, or HIV (diseases present in Cambodia<sup>24</sup>), and this may be related to the pretravel consultations attended, the high percentage of recommended vaccines administered before travel, and the correct implementation of preventive measures taught in the CJCU pretravel training course.<sup>24</sup>

Wounds were a common health problem among volunteers, with a higher incidence rate among men than among women. These wounds were mild and mostly skin lesions stemming from the volunteers working barefoot or in flip-flops and from scratching mosquito bites. This high incidence rate of wounds may have led to the high incidence rate of skin infections secondary to wound infection due to poor aseptic conditions. This presence of skin problems was

similar to that observed in the work of Portero,<sup>9</sup> with 15.4% of skin conditions, but less than the 52% reported by Küpper,<sup>3</sup> and unlike the incidence rates for upper respiratory infections, which in both studies were lower<sup>3,9</sup> than the incidence rate observed in our work. This could be due to the incorrect use of air conditioning systems.<sup>25</sup> Respiratory health problems were also high in Redman's study (23.7%).<sup>10</sup> The third most common health problem in our study was traveler diarrhea, a common problem when traveling to countries with less hygienic conditions and where travelers from developed countries are more likely to suffer from this type of disease. Our data on rates of traveler's diarrhea were lower than those observed in other studies: Küpper's study<sup>3</sup> reported almost 90% of travelers having diarrhea; rates of 79.9% were reported in a questionnaire study of voluntary service overseas;<sup>12</sup> rates of 55.5% were reported in a study by Redman;<sup>10</sup> and Portero<sup>9</sup> reported a rate of 32.9% for all symptoms or signs referring to the gastrointestinal tract. Hematological, neurological, osteoarthicular, urological-genital, otolaryngological, ophthalmic, and cardiovascular alterations were very rare in our study, which is similar to the low prevalence of Portero's and Küpper's experience.<sup>3,9</sup> We can highlight that one of the least

TABLE 3  
Sociodemographic, clinical, health prevention, and health problem variables depending on the volunteers presented or not a health problem by sex

Variables n (%)	Volunteers who did not present any health problem 85 (42.9)		Volunteers who presented a health problem 113 (57.1)	
	Female 54 (63.5)	Male 31 (36.5)	Female 74 (65.5)	Male 39 (34.5)
<b>Sociodemographic</b>				
Age*	22 (21–25)	22 (21–25)	22 (20–24)	22 (20–24)
Nationality Spanish	27 (50)	21 (67.7)	46 (62.2)	25 (64.1)
French	23 (42.6)	9 (29)	25 (33.8)	13 (33.3)
Others	4 (7.7)	1 (3.3)	3 (4)	1 (0.9)
University studies	49 (90.7)	31 (100)	71 (95.9)	36 (92.3)
Previous experience volunteering	21 (38.9)	17 (54.8)	29 (39.2)	19 (48.7)
<b>Clinical</b>				
Allergies	6 (11.1)	9 (29)‡	14 (18.9)	7 (17.9)
Preexisting health condition	5 (9.3)	1 (3.2)	7 (9.5)	4 (10.3)
Asthma	1 (1.9)	0 (0)	1 (1.4)	3 (7.7)
Migraine	2 (3.7)	0 (0)	2 (2.7)	0 (0)
Anxiety disorder	0 (0)	0 (0)	1 (1.4)	0 (0)
Depression disorder	0 (0)	0 (0)	1 (1.4)	0 (0)
Hypothyroidism	0 (0)	0 (0)	1 (1.4)	0 (0)
Ventricular septal defect	0 (0)	1 (3.2)	0 (0)	0 (0)
Hyperlipidemia	1 (1.9)	0 (0)	0 (0)	0 (0)
Gilbert syndrome	0 (0)	0 (0)	0 (0)	1 (2.6)
Vitiligo	0 (0)	0 (0)	1 (1.4)	0 (0)
Asma + Hashimoto + Psoriasis	1 (1.9)	0 (0)	0 (0)	0 (0)
Usual treatment	7 (13)	1 (3.2)	10 (13.5)	3 (7.7)
Updated vaccination record	48 (88.9)	28 (90.3)	71 (95.9)	38 (97.4)
<b>Health prevention</b>				
Pretravel clinic consultation	40 (74.1)	21 (67.7)	62 (83.8)	30 (76.9)
Malaria prophylaxis	12 (22.2)	3 (9.7)	22 (29.7)	6 (15.4)
Travel vaccinations				
Hepatitis A	50 (92.6)	27 (87.1)	71 (95.9)	35 (89.7)
Typhoid fever	46 (85.2)	24 (77.4)	60 (81.1)	33 (84.6)
Meningitis quadrivalent	21 (67.7)	21 (67.7)	43 (58.1)	22 (56.4)
Rabies	17 (31.5)	14 (45.2)	33 (44.6)	12 (30.8)
Japanese encephalitis	17 (31.5)	12 (38.7)	27 (36.5)	16 (41)
Cholera	2 (3.7)	3 (9.7)	4 (5.4)	4 (10.3)
CJCU pretravel health course	14 (25.9)	10 (32.3)	34 (45.9)	21 (53.8)
<b>Health problems</b>				
Number of health problems†	0 (0)	0 (0)	2.5	2.4

CJCU = Camilo José Cela University.

\* Median (interquartile range).

† Mean (standard deviation).

‡  $P < 0.05$ .

common problems was dehydration, and only one volunteer sought consultation for this problem, although he required hospitalization to receive intravenous fluids. In our study, no consultations were recorded for fever, a relatively common health problem in other studies<sup>6,9</sup> that reached a prevalence of 16%. This can be explained by the fact that in our study, fever was never the main reason for the consultation and it was, in some cases, associated with other health problems, which the volunteer considered the main reason for consultation.

Three quarters of the health problems were resolved immediately at the consultation, which is higher than the percentage reported in the data from the Alonso-Socas study.<sup>26</sup> The remaining 25% needed continuity of care to assess progression or improvement. Only three volunteers required a referral to the hospital, one following a traumatic crushing that required emergent surgery in the hospital to avoid amputation, and one who presented with moderate dehydration requiring

intravenous fluid therapy. There was only one reported health problem diagnosed in the volunteers after the travel, a case of dengue fever that presented during her first days after the return and for which hospitalization was needed, too. The 0.5% prevalence of volunteers who fell ill on their return was much less than that observed in Portero's<sup>9</sup> study, where 21.5% of travelers consulted after their return reported ongoing diarrhea, and it was < 9.4% of the ongoing diarrhea or change in normal bowel patterns reported by United Kingdom volunteers.<sup>2</sup> Other ongoing health concerns were reported after travel by 6.8% of these United Kingdom volunteers, as well, showing that posttravel consultation could be valuable to detect persistent health problems or infectious diseases developed in the last days of travel.<sup>2</sup>

Volunteers should pay particular attention and take appropriate preventive measures to protect themselves from water- and foodborne diseases, insect bites, and sexually

TABLE 4  
Incidence rates of health events per 1,000 person/days

Health problem <i>n</i> (%)	Total incidence rate	Poisson confidence interval	Female incidence rate	Poisson confidence interval	Male incidence rate	Poisson confidence interval
Upper respiratory infection	12.184	9.127–15.937	11.434	8.130–15.630	7.018	3.837–11.774
Wounds	10.846	8.193–14.085	8.318	5.528–12.023	15.582	10.354–22.520
Travelers' diarrhea	6.337	4.414–8.813	7.368	4.813–10.795	4.403	2.013–8.359
Skin infection	5.087	3.407–7.306	4.009	2.244–6.611	6.934	3.791–11.634
Trauma	3.349	2.016–5.230	3.296	1.703–5.757	3.550	1.427–7.314
Insect bite	2.439	1.333–4.092	2.442	1.116–4.635	2.434	0.790–5.681
Abdominal pain	1.359	0.587–2.677	1.847	0.743–3.806	0.481	0.012–2.680
Constipation	1.205	0.484–2.483	1.610	0.591–3.504	0.480	0.012–2.676
Eye problems	1.201	0.483–2.475	1.328	0.431–3.100	0.345	0.042–1.245
Dermatitis	1.190	0.479–2.453	1.323	0.429–3.087	0.952	0.115–3.440
Syncope/dizziness/ heat stroke	0.681	0.186–1.743	0.792	0.163–2.314	0.481	0.012–2.680
Urticaria	0.678	0.185–1.736	1.053	0.287–2.695	–	–
Headache	0.678	0.185–1.737	0.788	0.162–2.302	0.479	0.012–2.667
Anxiety crisis	0.509	0.105–1.486	0.790	0.163–2.308	–	–
Other infections	0.508	0.105–1.484	0.523	0.063–1.890	0.480	0.012–2.674
Urinary tract infection	0.339	0.041–1.223	0.262	0.007–1.459	0.479	0.012–2.671
Noninfectious genitourinary problem	0.338	0.041–1.221	0.262	0.007–1.460	0.471	0.012–2.6124
Burn	0.337	0.041–1.219	0.522	0.063–1.887	–	–
Asthmatic crisis	0.169	0.004–0.939	–	–	0.478	0.012–2.662
Dehydration	0.169	0.004–0.941	0.262	0.007–1.458	–	–
Dengue fever	0.168	0.004–0.938	0.260	0.007–1.451	–	–
Genital infection	0.084	0.004–0.941	0.262	0.007–1.459	–	–
Others	12.184	1.559–4.429	2.653	1.272–4.879	2.861	1.050–6.228

TABLE 5  
Management of the health problem attended in the primary care  
consultation

Treatment prescribed <i>n</i> (%)	Total 279 (100)	Female 184 (65.94)	Male 95 (34.05)
Nonpharmacological	95 (34.1)	57 (31)	38 (40)
Analgesic/NSAIDs	64 (22.9)	41 (22.3)	23 (24.2)
ORS	38 (13.6)	28 (15.2)	10 (10.5)
Topical antibiotic	22 (7.9)	15 (8.2)	7 (7.4)
Antihistamine	19 (6.8)	15 (8.2)	5 (5.3)
Topical corticosteroid	12 (4.3)	7 (3.8)	5 (5.3)
Oral antibiotic	8 (2.9)	3 (1.6)	5 (5.3)
Laxative	6 (2.2)	5 (2.7)	1 (1.1)
Eye drops	4 (1.4)	3 (1.6)	1 (1.1)
Anxiolytics/hypnotics	2 (0.7)	2 (1.1)	0 (0)
Not specified	1 (0.4)	1 (0.5)	0 (0)
Antiemetic	1 (0.4)	1 (0.5)	0 (0)
Antiacids	1 (0.4)	1 (0.5)	0 (0)
Oral corticosteroid	1 (0.4)	1 (0.5)	0 (0)
Other	5 (1.8)	4 (2.2)	1 (1.1)
Procedure required		Female	Male
<i>n</i> (%)	279 (100)	184 (65.94)	95 (34.05)
Not required	174 (62.4)	124 (67.4)	50 (52.6)*
Dressing	84 (30.1)	45 (24.5)	39 (41.1)*
Immobilization	13 (4.7)	10 (5.4)	3 (3.2)
Drainage	4 (1.4)	1 (0.5)	3 (3.2)
Other	1 (0.4)	1 (0.5)	0 (0)
Suture	3 (1.1)	3 (1.6)	0 (0)
Health problem resolution		Female	Male
<i>n</i> (%)	279 (100)	184 (65.94)	95 (34.05)
Immediate	207 (74.6)	142 (77.2)	65 (68.4)
Continuity of care	69 (24.7)	40 (21.7)	29 (30.5)
Hospital referral	3 (1.1)	2 (1.1)	1 (1.1)

NSAIDs = nonsteroidal anti-inflammatory drugs; ORS = oral rehydration salts.  
\*  $P < 0.01$ .

transmitted diseases.<sup>27</sup> They should also be extremely careful when traveling on foot or in a vehicle to avoid accidents. In addition, volunteers with specific health problems are at higher risk.<sup>3,28</sup> For these reasons, pretravel consultation can help volunteers take preventive measures to avoid developing health-related problems and illnesses that can negatively impact their volunteer work and travel experience.<sup>2,3</sup> Universities should offer additional health and psychological pretravel training to individuals in international short-term volunteer programs to prevent health problems during their overseas volunteering experience.<sup>29</sup>

#### LIMITATIONS

The health data in our study were clinically confirmed by family medicine doctors and not self-reported, as the data were in other studies; thus, we avoided recall bias, as the questionnaires were completed by the medical team during the volunteers' stay in Cambodia.

The chosen study design is a limitation because the nature of the associations should not be interpreted in absolute terms of cause and effect, and the follow-up after return was limited to one month, which did not allow us to control for the possible development of infectious diseases with a longer incubation period. Also, this was a single site study so the results may not be widely generalizable. Additionally, the demographic characteristics of these NGO volunteers could not be representative of the entire traveling population of the European short-term volunteers; therefore, the results need

to be interpreted with caution. In addition, laboratory tests and microbiological exams should have been performed to identify the most common pathogens that may have caused morbidity, but there was no etiological study of the different health problems the volunteers encountered because a laboratory was not available at the volunteer clinic; and as the symptoms were mild and resolved with empirical treatment, they were not referred to the hospital for further study.

### CONCLUSION

Volunteers have a risk profile for disease, as they work in tropical countries that have poorer hygiene and health conditions and a higher prevalence of communicable diseases. The participants of this study were mainly young people between 20 and 30 years old, predominantly women of Spanish nationality, most of whom reported some university-level studies and undertook some preventive health measures. The incidence rate of health problems was high, but mild, highlighting typical travelers' and preventable health problems such as wounds, travelers' diarrhea, and skin infections and other illnesses also common in Western countries such as upper respiratory infections. Except for one case of dengue case, there were no serious communicable diseases, such as malaria or hepatitis. They were more frequent health problem consultations among volunteers who had taken the pretravel health training course or who had attended the pretravel consultation session, which could have made them more aware of the health problems.

This research into the characteristics and health problems experienced by the European NGO volunteers in a tropical country could help to improve future NGO public health project planning and have a significant impact on the pretravel, travel, and posttravel recommendations and healthcare to prevent communicable diseases and promote the well-being of short-term volunteers.

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