



Travel and Tropical Medicine Practice Among Infectious Disease Practitioners

Judy A. Streit, MD,* Cinzia Marano, MD,[†] Susan E. Beekmann, RN, MPH,* Philip M. Polgreen, MD,* Thomas A. Moore, MD,[‡] Gary W. Brunette, MD,[§] and Phyllis E. Kozarsky, MD^{§||}

*Department of Internal Medicine, University of Iowa Carver College of Medicine, Iowa City, IA, USA; [†]GlaxoSmithKline Biologicals, Wavre, Belgium; [‡]Ochsner Health System, New Orleans, LA, USA; [§]Division of Global Migration and Quarantine, Centers for Disease Control and Prevention, Atlanta, GA, USA; ^{||}Department of Medicine, Emory University School of Medicine, Atlanta, GA, USA

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Background. Infectious disease specialists who evaluate international travelers before or after their trips need skills to prevent, recognize, and treat an increasingly broad range of infectious diseases. Wide variation exists in training and percentage effort among providers of this care. In parallel, there may be variations in approach to pre-travel consultation and the types of travel-related illness encountered. Aggregate information from travel-medicine providers may reveal practice patterns and novel trends in infectious illness acquired through travel.

Methods. The 1,265 members of the Infectious Disease Society of America's Emerging Infections Network were queried by electronic survey about their training in travel medicine, resources used, pre-travel consultations, and evaluation of ill-returning travelers. The survey also captured information on whether any of 10 particular conditions had been diagnosed among ill-returning travelers, and if these diagnoses were perceived to be changing in frequency.

Results. A majority of respondents (69%) provided both pre-travel counseling and post-travel evaluations, with significant variation in the numbers of such consultations. A majority of all respondents (61%) reported inadequate training in travel medicine during their fellowship years. However, a majority of recent graduates (55%) reported adequate preparation. Diagnoses of malaria, traveler's diarrhea, and typhoid fever were reported by the most respondents (84, 71, and 53%, respectively).

Conclusions. The percent effort dedicated to pre-travel evaluation and care of the ill-returning traveler vary widely among infectious disease specialists, although a majority participate in these activities. On the basis of respondents' self-assessment, recent fellowship training is reported to equip graduates with better skills in these areas than more remote training. Ongoing monitoring of epidemiologic trends of travel-related illness is warranted.

Over several decades, the number of US residents with international destinations has risen steadily to more than 60 million per year.¹ Increased travel correlates with a larger cohort of people who seek pre-travel medical care and who are at risk for travel-related infections.² Travelers may serve as unwitting sentinels for emerging infectious diseases and evolving antimicrobial resistance trends.³ Practitioners who care for travelers need current skills to prevent, recognize, and treat a broad range of infectious diseases, both for the well-being of their patients and for public health reasons.^{4–6}

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Corresponding Author: Judy A. Streit, MD, Department of Internal Medicine, University of Iowa Carver College of Medicine, 200 Hawkins Dr, Iowa City, IA 52242, USA. E-mail: judy-streit@uiowa.edu

Infectious disease specialists frequently provide care to travelers, although there is wide variation both in pre-travel and post-travel medicine expertise acquired during training and percentage effort dedicated to these functions after training. Current infectious disease fellowship programs must include formal instruction or clinical experience in travel medicine for accreditation.⁷ However, programs vary in their approach to this relatively new requirement. The purpose of this study was to: (1) evaluate the travel medicine practice patterns of US infectious disease physicians; (2) assess which travel-related diagnoses had been encountered by infectious disease physicians and query perceived trends of the frequency of particular travel-related illness; and (3) determine perspectives on training received in this subspecialty.

Methods

In March 2009, the 1,265 members of the Infectious Disease Society of America's (IDSA) Emerging

Infections Network (EIN) were sent a survey about their practice patterns regarding pre-travel consultations and evaluation of ill-returning travelers. The EIN is a voluntary network of infectious disease physicians who regularly engage in clinical activity and is funded through a cooperative agreement between the Centers for Disease Control and Prevention (CDC) and the Infectious Disease Society of America.⁸ Survey questions were developed through collaboration with GeoSentinel members. Survey goals were to better understand practice patterns of infectious disease specialists not currently part of the GeoSentinel Surveillance Program, which collects data from 53 clinical sites on six continents.^{9,10} The survey was piloted by a subset of EIN members involved in travel medicine.

The survey consisted of 13 questions sent by electronic mail or facsimile and the mailing was followed by two subsequent reminders for non-responders 1 week apart. We gathered data on the number and types of patients seen. The survey queried whether an antibiotic for self-treatment of travelers' diarrhea was routinely prescribed and if so, which type. Respondents indicated whether they had diagnosed any of 10 travel-related conditions in their practice and if so, whether the occurrence is increasing, stable, or decreasing. We did not ask respondents to report a time interval for these diagnoses-specific responses. Respondents provided how they acquired their skills in travel medicine, whether they were satisfied with their fellowship training in travel medicine, and their current travel medicine resources.

Data were analyzed using SAS version 9.2 (SAS Institute, Cary, NC, USA). Chi-square tests were used to compare proportions.

Results

Of the 1,265 infectious disease physicians, 701 (55%) (516 adult and 153 pediatric providers) responded to the survey. Responses were received from physicians in 48 states and all 9 US Census Bureau geographic divisions. Not all respondents answered all questions. A majority indicated that they provide care for travelers (445/701; 63%); 306 (69%) of the 445 respondents who provided care offered both pre-travel counseling and post-travel evaluation and care and 130 (29%) treated patients exclusively after travel. Only 2% (9/445) provided solely pre-travel care. Respondents who worked in a private/group practice (145/185) or for the military (10/12) were significantly more likely to practice travel medicine, while respondents who worked for the federal government (19/35) or a university/medical school (148/271) were least likely to practice any travel medicine ($p < 0.0001$). Those with at least 15 years of infectious disease experience were more likely to practice travel medicine (182/251) than those with fewer years of experience (191/331) ($p = 0.0004$).

A large proportion of infectious disease physician respondents saw either no (32%) or limited numbers

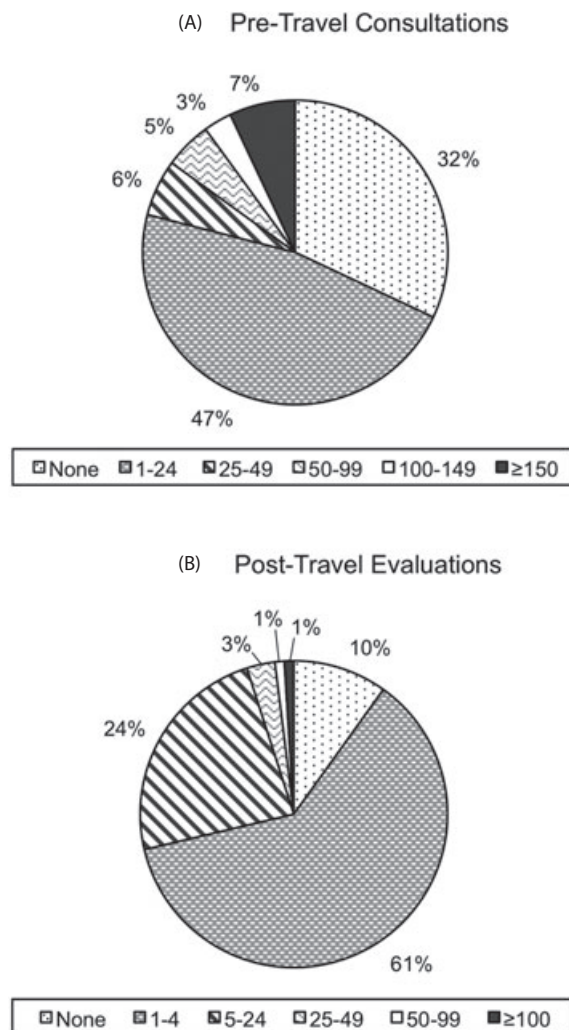


Figure 1 Percentage of respondents that saw high, low, or intermediate numbers of patients before (A) and after (B) travel in the 6 months preceding the survey.

(47%) of pre-travel patients (Figure 1A). Ninety percent had evaluated returning travelers within the previous 6 months (Figure 1B). A majority of respondents reported inadequate training in travel medicine during their fellowship years (262/432; 61%). Such reports differed significantly by years of experience in infectious diseases. Physicians with less than 5 years of experience (including fellows-in-training) were more likely to report adequate training (55%). Those with greater than 14 years of experience were less likely to report adequate training (32%, $p = 0.025$). Self-study provided the major source of training (397/437 respondents; 91%), followed by fellowship experience (266/437; 61%) and continuing education courses (189/437; 43%). Eleven percent (46/437) reported certification of advanced training in travel medicine.

The most prominent resource used to provide recommendations for travelers' health was the CDC Travelers' Health website, www.cdc.gov/travel (367/441;

83%), followed by Health Information for International Travel (the "Yellow Book") online (264/441; 60%) or by hard copy (139/441; 32%). Specialized online travel medicine subscription services and other sites were also used as resources (113/441; 26%).

A majority indicated an interest in further education in travel medicine (479/556; 86%) via online CME. Most respondents were interested in learning more about the GeoSentinel Network surveillance system (355/546; 65%).

Antibiotics for self-treatment of travelers' diarrhea were routinely prescribed during pre-travel consultations by 79% (332/420) of all respondents. Of those who prescribe antibiotics, fluoroquinolones were preferred (206/332; 62%), while macrolides were frequently chosen for some unspecified travel destinations (173/332; 52%). Pre-travel rifaximin prescriptions were provided by 33% (111/332).

Malaria (326/386; 84%) was the travel-related condition reported most frequently, followed by travelers' diarrhea (all causes) (277/386; 71%); typhoid fever (207/286; 53%); skin rash (201/386; 52%); intestinal protozoa (183/386; 47%); tuberculosis (178/386; 46%) (active vs latent tuberculosis was not specified); acute respiratory illness (151/386; 39%); intestinal helminths (149/386; 38%); *Clostridium difficile*-associated colitis (98/386; 25%); sexually transmitted infection (STI) (90/386; 23%); dengue (32/386; 8%); and leishmaniasis (10/386; 3%).

Discussion

Over the last decades, increasing numbers of travelers visit international destinations for which pre-travel counseling is recommended, and a subset then requires medical evaluation for illness acquired abroad. Studies have documented healthcare provider lack of knowledge in travel health advice,¹¹ as well as a lack of knowledge about post-travel care.¹⁰ In this survey, infectious disease experts who provide these consultations reported widely varying levels both of travel medicine training and clinical effort. Although only a small percentage of respondents provided a large number of travel medicine consultations, almost two thirds see some patients before and after travel.

A majority of infectious disease physicians who practice travel medicine reported that their fellowship training did not provide adequate preparation in this area. Our results suggest that the recent mandate for training in travel medicine during infectious disease fellowship is improving physician preparation. However, 45% of respondents with fewer than 5 years of infectious diseases experience still reported a perception of inadequate training. The relatively recent requirements for travel medicine training during fellowship may need to be enhanced in light of more than one third of recent program graduates reporting inadequate training. Our results suggest that practicing specialists and fellowship programs should avail themselves of opportunities

for further education. Options mentioned by survey respondents included participating in the International Society of Travel Medicine (ISTM) courses and meetings as well as those of the American Society of Tropical Medicine and Hygiene, by obtaining a Certificate in Travel Health (CTH) through the ISTM, and through accessing the CDC Travelers' Health website training (www.cdc.gov/travel) and informational tools.

Malaria and travelers' diarrhea were the travel-related diagnoses reported by the greatest number of respondents. Travel-related skin ailments and parasitic infections were also encountered by a high percentage of respondents. These are consistent with diagnoses reported through GeoSentinel.^{9,10} The number of respondents reporting travel-associated STIs was alarming. This problem has been recognized previously¹² and consideration should be given to further investigation to explore better prevention strategies. Our results suggest that infectious disease experts should take detailed exposure histories and keep STIs in the differential diagnosis for ill-returning travelers.

Our study has several limitations. First, although our response rate was relatively high and the results represent physician responses from 48 different states, our results are not population-based and thus may not be generalizable to the entire US population and are not directly comparable to the results of GeoSentinel. Infectious disease physician members of the EIN may not be representative of all infectious disease clinicians practicing travel medicine. EIN membership represents about 15% of IDSA membership. Respondents with a greater interest in travel medicine may have been more likely to participate in the survey, potentially introducing a form of responder and selection bias. Our survey method, which is not an audit, introduces the possibility of recall bias. Additionally, limiting our survey to infectious disease experts may introduce referral bias for both pre-travel and post-travel queries, as more severe or recalcitrant illness may have been encountered by these practitioners. Finally, the length of our survey was constrained by EIN policy and thus we were unable to explore many interesting topics including: diagnostic testing approaches, detailed traveler destination information, vaccination practices, and detailed background demographics concerning responding infection diseases specialists.

Infectious disease clinicians are a valuable population to engage further in the study and practice of the unique specialty of travel medicine. The relatively recent requirements for travel medicine training during fellowship may need to be enhanced in light of more than one third of recent program graduates reporting inadequate training.

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Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Declaration of Interests

The authors state that they have no conflicts of interest to declare.

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