



Self-reported illness among Boston-area international travelers: A prospective study

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Summary *Background:* The Boston Area Travel Medicine Network surveyed travelers on travel-related health problems.

Methods: Travelers were recruited 2009–2011 during pre-travel consultation at three clinics. The investigation included pre-travel data, weekly during-travel diaries, and a post-travel questionnaire. We analyzed demographics, trip characteristics, health problems experienced, and assessed the relationship between influenza vaccination, influenza prevention advice, and respiratory symptoms.

Results: Of 987 enrolled travelers, 628 (64%) completed all surveys, of which 400 (64%) reported health problems during and/or after travel; median trip duration was 12 days. Diarrhea

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affected the most people during travel (172) while runny/stuffy nose affected the most people after travel (95). Of those with health problems during travel, 25% stopped or altered plans; 1% were hospitalized. After travel, 21% stopped planned activities, 23% sought physician or other health advice; one traveler was hospitalized. Travelers who received influenza vaccination and influenza prevention advice had lower rates of respiratory symptoms than those that received influenza prevention advice alone (18% vs 28%, $P = 0.03$).

Conclusions: A large proportion of Boston-area travelers reported health problems despite pre-travel consultation, resulting in inconveniences. The combination of influenza prevention advice and influenza immunization was associated with fewer respiratory symptoms than those who received influenza prevention advice alone.

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1. Introduction

Global travel continues to grow, with international tourist arrivals reaching 1.1 billion in 2014 [1]. With increasing international travel, the number of travelers becoming ill during or after travel could also increase.

Over the past three decades, several studies have evaluated health issues encountered during and after travel. These include a survey of Swiss travelers and one of American travelers whose trips were up to 3 months, and analyses from GeoSentinel, a worldwide network of specialized tropical and travel medicine clinics that collect data on travel-related illnesses [2–5]. Health problems occurred during 15% of journeys undertaken by 10,524 Swiss short-term travelers surveyed from 1981 to 1984; 8% consulted a doctor and 3% were unable to work for an average of 15 days [2]. A survey of U.S. travelers found that 64% of 784 reported a health problem, particularly those who undertook longer trips; 8% needed medical evaluations and 26% were ill after return [3]. Two GeoSentinel analyses that examined 17,353 ill returned travelers seen from 1996 to 2004 and 42,173 ill returned travelers seen from 2007 to 2011 found the most commonly reported disorders were gastrointestinal, systemic febrile illness, dermatologic, and respiratory problems [4,5]. In the latter study, 41% of travelers sought pre-travel medical consultations [5].

Pre-travel medical consultations are recommended by the medical community, national agencies such as the U.S. Centers for Disease Control and Prevention (CDC), and professional organizations such as the International Society of Travel Medicine to prepare travelers on how to prevent or manage health problems associated with travel. However, airport-based surveys of outbound U.S. travelers conducted in 2003 and 2009 found that only about 36–54% of travelers to low- or low-middle-income countries had sought health information [6,7].

1.1. Study objectives

Given increased international travel, changes in traveling populations, the evolving risk of disease, and ubiquitous infections like influenza, there is a need to re-evaluate the occurrence of illness associated with travel and to use the results to inform health recommendations. In international

travelers attending pre-travel health consultations in three Boston-area travel medicine clinics, we sought to: 1) describe the types, frequency, and impact of health problems occurring during and after travel; 2) assess possible associations of underlying health conditions and trip characteristics with travel-related health problems; and 3) assess the association of influenza vaccination and pre-travel health advice with respect to travel-associated respiratory symptoms, because respiratory infections are among the most common health problems that travelers encounter [2–5] and influenza is the most common vaccine-preventable disease in travelers [8].

2. Materials and methods

2.1. Sample description

We recruited participants aged ≥ 18 years attending a pre-travel health consultation at three clinics: two in urban, academic hospitals and one in a suburban hospital in the Boston-Area Travel Medicine Network (BATMN) from 2009 through 2011. Written consent was obtained from all participants and Institutional Review Board (IRB) approvals obtained at all clinic sites.

2.2. Measures

At the pre-travel health consultation, travelers were invited to participate and were encouraged to complete a during-travel weekly diary for each week of travel and a post-travel survey upon return. Information collected at baseline (pre-travel) included demographic and trip characteristics, underlying health conditions and medications, immunizations administered, medications prescribed pre-travel, and information received during the pre-travel health consultation. Underlying health conditions included diabetes mellitus, asthma, heart disease, HIV/AIDS, solid organ or bone marrow transplantation, cancer, autoimmune disease, pregnancy, and unspecified chronic medical conditions (including chronic kidney disease on dialysis, cirrhosis, and other diagnoses that did not fit into one of the above-mentioned categories). Specific immune suppressive or immune modulating medications, including prednisone or other steroids, ≥ 20 mg daily, methotrexate, cancer

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