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Preparedness of adolescents departing from Athens International Airport to Africa or Asia: A five-year airport-based prospective study

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ABSTRACT

Background: The number of adolescents who travel has increased. We estimated the preparedness of adolescents (12–18 years) departing from Athens to Africa and Asia.
Methods: An airport-based survey was conducted from 2011 to 2015.
Results: Sixty-eight adolescents participated; 27/68 (40%) had the Greek nationality. Their main destinations were the Indian subcontinent (37%) and South-East Asia (32%). Most adolescents planned to stay for <1 month (69%) or for 1–3 months (22%). Their main purpose for travel was to visit friends and relatives (VFRs) (60%). Compared to non-VFR adolescents, VFRs more frequently travelled to sub-Saharan Africa and Southeast Asia, stayed in local residences and for longer periods. Twenty-one (31%) adolescents sought pre-travel counseling (in 57% of cases 8–14 days before departure). Having the Greek nationality was the only significant factor associated with an increased probability for seeking pre-travel counseling. Vaccination against rabies, typhoid fever, Japanese encephalitis and meningococcus was highly inadequate for adolescents travelling to endemic areas. Significant gaps in malaria chemoprophylaxis were found in those travelling to the Indian subcontinent.
Conclusions: Less than one third of adolescents travelling to Africa and Asia seek counseling. There is a need to access adolescent travellers in Greece and improve pre-travel vaccinations and malaria chemoprophylaxis.

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1. Introduction

International travels have increased considerably the last decade. In accordance with the World Tourism Organization, international tourist arrivals steadily increased by 4% or more each year the past five years, while more than 1.1 billion arrivals were recorded in 2015 [1]. The number of children and adolescents who travel also increased dramatically. In the United States it has been estimated that 2.2 million resident children and adolescents <18 years travelled to international destinations in 2010 [2]. In Greece, a country with 10.8 million residents including 708,000 non-EU/EFTA immigrants, the number of children and adolescents ≤15 years who travelled to international destinations for ≥4 nights ranged from 66,513 to 92,607 annually from 2012 to 2015. At the same time, the number of children and adolescents ≤15 years who travelled to international destinations in order to visit friends and relatives (VFRs) was 32,040–55,490 annually, which represents 44,5–69.7% of all travellers ≤15 years (Hellenic Statistical Authority; personal communication). Despite these numbers, there are very few studies of adolescent international travellers globally, whereas to the best of our knowledge, there are no airport-based studies focusing on this age group.

Adolescence is a transitional developmental stage between childhood and adulthood, characterized by biological, psychological, cognitive and societal changes. An increase in independence, in association with limited parental surveillance and tendency for risk behavior, are common in this age group. A United States Youth-Styles survey among 1704 youths 9–18 years revealed an association between risk-taking attitudes and youth travel behavior [3]. In particular, male gender, age 14–18 years or a travel history were

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associated with higher mean sensation-seeking scores compared to female gender, age 9–13 years and absence of travel history, respectively [3]. Furthermore, the travel-associated morbidity of adolescents differs from the morbidity of pediatric and adult travellers. In accordance with the 1997–2007 GeoSentinel Surveillance Network data, adolescent international travellers 12–17 years had a significantly higher proportionate morbidity rate for systemic febrile illness but lower for diarrheal and respiratory illnesses after travelling mainly to Asia, sub-Saharan Africa or Latin America [4]. Age and travel destination were the most significant determinants of morbidity in a 10-year study of imported infectious diseases among 890 children and adolescents returning from tropical and subtropical destinations to Germany [5]. In this study, dengue fever was significantly more common in adolescents compared to children (6.6% and 0.3%, respectively) [5]. A three-fold travel-associated morbidity after travelling to Asia, sub-Saharan African or Latin America was found in adolescents 12–18 years compared with their parents in a study from the Netherlands [6].

This is an five-year airport-based prospective study of the characteristics and the level of pre-travel preparedness of adolescents 12–18 years departing from Athens, Greece to Africa and Asia.

2. Methods

During the study period there were six flights from Athens Eleftherios Venizelos International Airport to Africa or Asia (excluding Japan) daily. In particular, there were four flights to Asian destination via a connection at the airports of Dubai and Abu-Dhabi, United Arab Emirates, and Doha, Qatar, and two flights to African destinations via a connection at the airport of Cairo, Egypt. In September 2011 the Hellenic Center for Disease Control and Prevention (HCDCP; Athens, Greece) contacted the airport authorities and received their permission to conduct the study. The study was approved by the HCDCP.

Travellers departing from Athens International Airport to Africa or Asia from 2011 through 2015 were asked to participate in the survey. We excluded travellers whose final destinations were Australia, New Zealand or Japan, travellers who could not understand or communicate in Greek or English and travellers who were not permanent residents of Greece. Consent was requested from adults and the parents or guardians of children and adolescents. Four trained healthcare professionals collected the data through personal interviews. A standardized questionnaire was used for each traveller. Interviews took place two days per week. Approximately 10–20 travellers from 1 to 3 flights were interviewed per day.

The following vaccines are included in the National Vaccination Program of Greece: tetanus-diphtheria-acellular pertussis-inactivated poliomyelitis-*Haemophilus influenzae* type B vaccine, measles-mumps-rubella (MMR) vaccine, varicella vaccine, hepatitis A vaccine, hepatitis B vaccine, pneumococcus (10-valent or 13-valent) conjugate vaccine, meningococcus serotype C conjugate vaccine, meningococcus tetravalent (A,C,W135,Y) conjugate vaccine, human papilloma virus vaccine, and seasonal influenza vaccine (for high-risk groups) [7]. Routine vaccines are fully reimbursed. Routine vaccinations are provided by paediatricians and primary health-care professionals in the public and private sector. In accordance with the HCDCP guidelines, all travellers should have been up-to-date in accordance with the National Vaccination Program of Greece. The following travel vaccines are administered exclusively at the 57 Public Health Departments across Greece: yellow fever vaccine, rabies vaccine, typhoid vaccine and cholera vaccine. Until December 2012 travel vaccines were provided at the Public Health Departments free-of-charge. From December 2012 there is a fee for all travel vaccines.

Until 2012, mefloquine, chloroquine and primaquine were provided at the 57 Health Departments (chloroquine is available exclusively there). Mefloquine, doxycycline and atovaquone/proguanil could be prescribed in public or private healthcare facilities. From 2013 all antimalarial agents are prescribed at the public or private sector. Regarding the costs of antimalarial agents, 75% is covered by the travellers insurance (if available), otherwise 100% of the cost is paid by them. Guidelines for malaria chemoprophylaxis are in accordance with the United States Centers for Disease Control and Prevention guidelines.

Children, adolescents and adults were defined as persons <12 years old, 12–18 years old and >18 years old, respectively. Urban areas were defined as towns or cities with ≥5000 residents, whereas rural areas were defined as villages or towns with <5000 residents or staying in the countryside. Short-term travel was defined as a trip of <1 month duration and long-term travel was defined as a trip of ≥1 month. Activities were defined as adventure sports, outdoor activities, and/or contact with stray animals. Outdoor activities include backpacking, hiking, and remote expedition. Travellers VFRs were defined as travelers whose primary purpose was to VFRs, where there is a gradient of epidemiological risk between home and destination [8]. High risk travellers in terms of exposure to malaria were defined based on travel characteristics (e.g. destination, visited areas, seasonality, type, length and purpose of travel, accommodation, and involvement in outdoor activities).

Only travellers with a known age and travel destination were included in the analysis. Numbers and percentages were rounded to the nearest integral number. The chi-squared test was used for comparing categorical variables. A logistic regression analysis (stepwise regression) was applied in order to identify independent factors significantly associated with seeking pre-travel consultation. Odds ratios (ORs) were calculated. P-values of 0.05 or less were considered statistically significant. The R version 3.2.5 software was used for the statistical analysis.

3. Results

During the study period 3508 travellers participated in the study. Of them, 222 (6%) were children, 68 (2%) were adolescents and 3508 (92%) were adults. Table 1 shows the characteristics of the 68 adolescent travellers, as well as those of children and adults. The Indian subcontinent was the prevalent travel destination of adolescents (25/68 adolescents; 37%), followed by Southeast Asia (22/68 adolescents; 32%). Regarding travel duration, 47/68 (69%) adolescents planned to stay for <1 month and 15/68 (22%) for 1–3 months. Compared with children and adult travellers, adolescents more frequently planned to travel to Southeast Asia, East Asia and South Africa (p-value <0.001), for short term (p-value <0.001) and for recreational purposes (p-value <0.001) and more frequently planned to stay in rural areas (p-value = 0.007). In contrast, adults and children more frequently travelled to sub-Saharan Africa, the Indian subcontinent and North Africa (p-value <0.001).

In our study, 21/68 (31%) adolescents sought counseling before departure, compared to 43/222 (19%) children and 1009/3508 (29%) adults (p-value = 0.009). Pre-travel counseling was provided 8–14 days before departure in 12/68 (57%) adolescents, 15–28 days before departure in 8/68 (38%) adolescents and >28 days in 1/68 (5%) adolescents. Moreover, more adults received pre-travel counseling >28 days before departure compared with adolescents and children (28%, 5% and 5%, respectively; p-value <0.001). Logistic regression analysis revealed that having the Greek nationality was the only statistically significant factor associated with an increased probability for seeking pre-travel consultation among adolescents (OR = 3.048; p-value = 0.041). In particular, 12/68 (44%) adolescents with the Greek nationality sought pre-travel counseling compared with 9/68 (22%) non-Greek adolescents.

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