



## Original article

## Pre-travel advice at a crossroad: Medical preparedness of travellers to South and Southeast-Asia - The Hamburg Airport Survey



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## ABSTRACT

**Background:** Specific travel-related recommendations exist for the prevention or self-treatment of infectious diseases contracted by travellers to the tropics. In the current study, we assessed the medical preparedness per these recommendations, focusing on whether travellers carried antidiarrheal and antimalarial medication with them stratified by type of pre-travel advice.

**Methods:** We surveyed travellers departing from Hamburg International Airport to South or Southeast Asia, using a questionnaire on demographic, medical and travel characteristics.

**Results:** 975 travellers were analysed – the majority (817, 83%) being tourists. A large proportion packed any antidiarrheal medication (612, 63%) – most frequently loperamide (440, 72%). Only 176 of 928 (19%) travellers to destinations with low-to medium risk for malaria packed a recommended antimalarial medication. The majority (162, 17%) of them carried antimalarials as stand-by emergency treatment (SBET). 468 (48%) travellers had a pre-travel medical consultation. This led to higher odds of carrying SBET– with the highest odds associated with a consultation at a travel medicine specialist (OR 7.83 compared to no consultation).

**Conclusions:** Attending a travel medicine specialist was associated with better adherence to current recommendations concerning the carriage of stand-by emergency treatment of malaria. However, the proportion of travellers seeking pre-travel health advice was overall low in our population. Promoting pre-travel consultations may, therefore, lead to higher adherence to the current recommendations in travel medicine

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## 1. Introduction

International travel has been increasing steadily over the last decades [1]. While travellers to exotic destinations are generally younger and healthier than the general population, still a large proportion of travellers experience health problems during their travels [2–4]. Some travel-related diseases are preventable, either by vaccination or application of other prophylactic measures. Prevention of mosquito-bites for example is one of the key strategies to

reduce the risk of contracting arthropod-borne viruses or malaria. By using malaria chemoprophylaxis for regions of high malaria endemicity the risk of contracting malaria can be lowered further [5]. For other travel-related diseases, the duration and burden of symptoms can be reduced, as for example by self-treatment with loperamide for traveller's diarrhea [6,7]. A prerequisite for prophylaxis and the adequate response in the case of disease is appropriate awareness of the risks and knowledge in travellers. Besides providing necessary vaccinations and travel-related medication during the visit, a pre-travel health consultation may help improving this knowledge.

The aim of the Hamburg Airport Survey was to assess the medical preparedness of German travellers to South- and Southeast Asia and their demand for pre-travel advice with a special focus on antidiarrheal and antimalarial medication.

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## 2. Material and methods

### 2.1. Survey

The survey was conducted between November 2014 and April 2015 at the Hamburg International Airport. Hamburg International Airport is the 5th largest airport in Germany and the major airport catering the northern part of Germany and neighbouring regions of The Netherlands and Denmark with 15.61 million passengers in 2015 [8]. A trained member of the study team screened travellers in the departure hall for their final destinations. If the final destinations included the target countries in South and Southeast Asia (India, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, Indonesia, The Philippines, and Sri Lanka) they were approached at the gate to anonymously complete a standardized questionnaire on a voluntary basis. Participants additionally had to be older than 18 years, travel for a duration between 1 and 14 weeks and be a legal resident of Germany.

### 2.2. Questionnaire

The questionnaire included items on demographic and travel characteristics, as well as items on prior medical history, as described before [4]. In addition, participants were asked about carriage of antimalarial and antidiarrheal medication as well as about pre-travel medical consultations. An English version of the questionnaire can be found in the [supplementary material \(S1\)](#).

### 2.3. Analysis

Data was entered into a Microsoft Excel spread sheet (Version 2016, Microsoft Corporation, Redmond, USA) and double-checked on all items for all participants for errors and completeness by a separate team member. Further data processing and analyses were performed in Stata IC 13 (Stata Corp, College Station, USA). Participants not fulfilling the inclusion criteria as well as those without data on age and sex were excluded from the analyses. Demographic, health and travel characteristics of participants were described by using median and interquartile range for nonparametric data and by using percentages for categorical data.

To assess whether carriage of stand-by-emergency treatment (SBET) varied by the type of pre-travel consultation a logistic regression model was built. Travellers visiting regions in Indonesia east of Bali (i.e. those for which the German Society for Tropical medicine recommended malaria chemoprophylaxis in 2014 and 2015) and travellers using their antimalarial drugs as a prophylactic regimen in regions for which the German Society of Tropical Medicine recommended SBET were excluded from the analyses. Carriage of SBET was defined as the outcome and the type of pre-travel consultation (none, by a travel medicine specialist, by a general practitioner, or by other means) as the exposure variables. To assess age as a potential confounder, five age groups were formed (18–30 years, 31–40 years, 41–50 years, 51–60 years, over 60 years) and the final model was adjusted by age groups.

## 3. Results

A total of 1009 travellers were recruited. After excluding participants with incomplete data on age or sex ( $n = 9$ ) and those not fulfilling all inclusion criteria ( $n = 25$ ), 975 participants were included in the analyses. Age distribution of participants showed a bimodal distribution with one peak at 30 years of age and a second peak at 55. Sex was equally distributed (Table 1). 218 travellers (22%) stated a pre-existing medical condition with 237 (24%) taking any medication. The most common medical conditions were

**Table 1**

Characteristics of study participants.\* Highest educational degree has been classified according to the International Standard Classification of Education 2011 [43].

N	975
Female sex	446 (46%)
Age (years), median (IQR)	46 (31–57)
Highest educational degree*:	
Tertiary degree	401 (40%)
Upper secondary degree	273 (28%)
Lower secondary degree	285 (30%)
Primary	12 (1%)
No answer	14 (1%)
Pre-existing medical condition:	
None	748 (78%)
Hypertension	91 (9%)
Thyroid disease	42 (6%)
Diabetes	25 (3%)
Respiratory	31 (3%)
Cardiovascular disease	22 (2%)
Malignant disease	16 (2%)
Rheumatological disease	10 (1%)
Other	25 (1%)
No answer	9 (1%)
Concurrent medication:	
None	720 (74%)
Antihypertensive	72 (7%)
Thyroid	36 (4%)
Contraceptive	23 (2%)
Antidiabetic	15 (2%)
Antiplatelet agent	10 (1%)
Other	60 (6%)
No answer	18 (2%)

hypertension and thyroid disease. Accordingly, the most common medication classes were antihypertensives and thyroid hormone replacement therapy. The vast majority of travellers were tourists (817, 83%) and travelled to Thailand (469, 48%; Table 2). Only 154 travellers (16%) had never travelled to South or Southeast Asia before, while 393 (40%) had a considerable prior travel experience to Southeast Asia with more than 5 trips in the past.

Most travellers (612, 63%) carried a medication against diarrhea – the most frequent one being loperamide (440, 72%; Table 3). More frequent travellers were less likely to carry an antidiarrheal agent

**Table 2**

Travel characteristics of study participants.\* Multiple answers possible.

Median duration of travel (weeks, IQR)	3 (2–4)
Previous travel experience to SSEA:	
None	154 (16%)
1–2 times	235 (24%)
3–5 times	179 (18%)
>5 times	393 (40%)
No answer	14 (1%)
Countries visited*:	
Thailand	469 (48%)
Sri Lanka	150 (16%)
India	144 (15%)
Malaysia	111 (11%)
Indonesia	101 (10%)
Vietnam	83 (9%)
Philippines	54 (5%)
Cambodia	44 (5%)
Lao	21 (3%)
Myanmar	14 (1%)
Reason for travel:	
Tourism	817 (83%)
Business	85 (9%)
Visiting friends and relatives	60 (6%)
Volunteer/aid worker	7 (1%)
Student	10 (1%)
No answer	4 (<1%)

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