Factors Influencing Standard Pretravel Health Advice—A Study in Belgium

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Background. Travelers with risk factors, medical conditions such as immunosuppression, medication intake, pregnancy, or elderly age, need adaptation or reinforcement of pretravel health advice. The literature provides little data on the frequency of these risk groups in the travel population. This study intended to investigate whether risk factors influencing standard travel advice are common in the population attending our travel clinic.

Methods. A prospective survey was carried out over a 2-month period in 2004 at the travel clinic of the Institute for Tropical Medicine in Antwerp, Belgium. A list of risk factors focused on the following three important advice categories: malaria prophylaxis, yellow fever vaccination, and travelers' diarrhea or other enteric infections. We counted how frequently a risk factor was observed for each advice category (potential influence) and, after considering the travel characteristics, how often a real adaptation of advice was necessary (actual influence).

Results. Of 2,227 travelers, 276 were found to have a possible influencing factor (12.4%). The potential influence was 10.9% (243/2,227) for malaria prophylaxis advice, 6.1% (136/2,227) for yellow fever vaccination, and 1.9% (43/2,227) for travelers' diarrhea advice. The actual influence was lower 8% (184/2,227), 5% (109/2,227), and 1.2% (27/2,227), respectively. The main interfering factors were as follows: for influence on malaria advice, age ≥60 years (44%) and neuropsychiatric disorders (15.6%); for yellow fever vaccination, age ≥60 years (63.2%) and immunosuppression (10.3%); and for influence on travelers' diarrhea advice, decreased gastric acidity (44.2%) and immunosuppression (32.6%).

Conclusion. Travelers with risk factors are not infrequently seen at our travel clinic. Some groups are more prominently present and could be the focus of travel group–specific instructions. The study suggests that being informed about risk groups is essential for advising travelers.

In the past few years, we have seen several patients with stable Crohn's disease taking cyclofosfamide or with rheumatoid arthritis treated with methotrexate or even anti-tumor necrosis factor (TNF) medication, who walked in at our pretravel practice, not expecting the unwelcome surprise of a refused yellow fever vaccination.

How frequently do we face this type of travelers, going to (sub)tropical regions, who have an increased risk or need adjustment of pretravel advice because of a medical condition, medication intake, pregnancy, or age.

In a process to improve the services at our travel clinic, we wanted to increase our knowledge about the size and the spectrum of these groups of travelers and investigate how frequent their condition influenced the advice given by the travel health advisor. Three principal fields of possible interaction were selected: advice about malaria prevention and yellow fever vaccination, which are key to safe travel to the tropics (possibly lethal diseases), and preventive measures for travelers' diarrhea and other enteric infections because of the high probability of contracting these ailments.

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World Tourism Organization data show a vast increase of tourist arrivals from 565 million in 1995 to 700 around the year 2000 and an increase by 42% is expected by 2010.[1] In Belgium, the same upward trend has been recorded, a doubling of travelers going to (sub)tropical regions from 1986 to 650,000 in 1998, increasing further by 30% to 840,000 in 2004.[2,3] Are persons with underlying medical conditions also traveling more? A search of publications in Ovid/Medline, PubMed, Google Scholar, and in the main travel medicine reference books revealed only few data on the frequency of (medical) conditions in travelers in the overall traveling population. They mainly mention the traveling frequency within groups with a certain (medical) condition or risk factor.

Therefore, we organized a survey that aimed at (1) counting the travelers with one or more possible influencing medical conditions and/or medication intake or at risk by pregnancy or age (≥60 to <1 y) attending our travel clinic during the study period; (2) quantifying the number of different potential risk factors and those actually influencing three advice categories (malaria prophylaxis advice, yellow fever vaccination, and preventive measures for travelers' diarrhea and other enteric infections); and (3) estimating at the end of the consultation the compliance of the traveler and/or the willingness to comply with the advice given.

Methods

A prospective study was carried out during October and November 2004 at the Institute of Tropical Medicine Antwerp, Belgium (ITMA), a private institution of public interest. The travel clinic receives both primary level and referred patients. In 2004, 13,735 pretravel consults were recorded.[4]

We counted all travelers with at least one potential factor possibly influencing standard pretravel advice.

We call "influence on standard pretravel advice," (1) changes to the normal travel immunizations' schedules, the recommended malaria (chemo-) prophylaxis or other pretravel recommendations; (2) reinforcement of advice; or (3) recommended changes in itinerary or destination. Reasons for influence are the travelers' medical conditions, medication use, pregnancy, or age (>60 and <1 y). "Standard pretravel health advice" is defined as the recommendations that normally apply to the average traveler with a blank medical history, respecting national guidelines (www.itg.be or www.travelhealth.be), and taking into account expected type of travel, risks, costs, and expected compliance.

To assure that no risk factors were overlooked and to make the inclusions consistent among the different consulting doctors, we made a list of all possible influencing factors based on a search of the literature (Tables 1–3). When travelers attend our clinic, they have to fill in without assistance the routine intake form that asks about travel characteristics and risk factors, such as any medical condition or medication intake. If a risk factor was present, the traveler was included in the study and the doctor would fill in a questionnaire designed for this purpose. It inquired more extensively (1) about age, sex, ethnic origin, travel destination, special activities, and transport at destination; (2) allergies, intolerances, diseases, medication intake, recent surgery, pregnancy, intended conception, lactation, and contraception; (3) the vaccination status and vaccines given during this consultation; and (4) malaria chemoprophylaxis and protective measures proposed during this consultation.

We counted how many times a possible influencing factor (potential influence) was observed for three important advice categories, namely malaria prophylactic advice, yellow fever vaccination, and travelers' diarrhea and other enteric infections (Tables 1–3). We then computed correlations between risk factors. We also measured how often a real adaptation of advice was necessary, taking into account all the travel characteristics (actual influence). Finally, we observed in how many cases the traveler showed the intention to follow the reinforced or altered advice at the end of the consultation.

The encoded data were entered in a Microsoft Access database (Microsoft Access 2003). PH stat 2 (a Microsoft Excel add-in program v 2.2.0, 2004), Epi Info 3.3.2 (CDC/WHO, February 2005), and SPSS14.0 (September, 2005) were used for analysis. For the 95% confidence intervals, we preferred the exact binomial. Correlations between risk factors were analyzed with Pearson's chi square.

Included travelers with missing data on travel characteristics were excluded on a case-by-case basis (destination unknown <1%, type of travel unknown 1%, type of accommodation unknown 3%, and duration of travel unknown 5%).

Results

Of the 2,227 travelers that consulted our pretravel clinic during the study period, 276 were found to have a possible influencing factor, resulting in an overall proportion of 12.4%. The characteristics of

Table 1 Factors influencing malaria prophylaxis advice and consequences or reason why

Factors influencing malaria prophylaxis advice	Consequences or reason why	Reference
Allergy to doxycycline	Doxycycline contraindicated as chemoprophylaxis	13
Former intolerance to specific antimalarials	Choice of chemoprophylactic agent is narrowed	
Epilepsy	Avoid mefloquine or chloroquine—diphantoin and phenytoin reduces level of doxycycline in serum	14
Neuropsychiatric disorder	Avoid mefloquine	13, 14
Heart rhythm and conduction disorder	Avoid mefloquine	11, 13
Generalized psoriasis	Avoid chloroquine	14, 15
Intake of oral anticoagulants	Dose adjustment needed when using mefloquine–proguanil–doxycycline	16
Severe renal failure	Adjust dosage mefloquine—avoid atovaquone/proguanil	17
Severe hepatic failure	Adjust dosage mefloquine—avoid doxycycline	17
Pregnancy	Increased risk for severe malaria: reinforcement of protective measures needed or change of itinerary or destination—contraindication for doxycycline and for atovaquone/proguanil—avoid mefloquine in first trimester	14, 18
Intended conception	Avoid pregnancy until 3 mo after mefloquine use—until 10 d after atovaquone/proguanil use and until 7 d after doxycycline use	15, 19
Age younger than 1 y	Reinforcement needed because of increased risk for severe or fatal outcome if *Plasmodium falciparum* infection	18
Age older than 60 y	Reinforcement needed because of increased risk for severe or fatal outcome if *P falciparum* infection	9, 10
Last-minute travel	No time for mefloquine tolerance testing	
Asplenic person	Reinforcement is needed: presumed risk of more severe disease (still under discussion)	9, 20–25

the included travelers are shown in Table 4: 130 (47%) men and 146 women, 235 (85%) of Belgian origin and 41 of foreign origin, and 138 (50%) travelers aged ≥60 y or 6.2% of the total population.

Within this group of 276 travelers with at least one condition, 184 travelers had one influencing factor for malaria prophylaxis advice, 118 for yellow fever vaccination, and 42 for diarrhea and enteric infections recommendations.

For malaria prophylaxis, 130 had only one, 47 had two, 5 had three, and 1 traveler had four influencing conditions. For yellow fever vaccination, 102 had one, 14 patients had two, and 2 had three risk factors. For travelers' diarrhea and enteric infections advice, only one patient had more than one influencing condition.

The total number of factors with potential influence on malaria prophylaxis advice was 243 of 2,227 (10.9%), for yellow fever vaccination was 136 of 2,227 (6.1%), and for preventive and stand-by measures for travelers' diarrhea and other enteric infections was 43 of 2,227 (1.9%) (Table 5). The actual influence was lower: 184 of 2,227 (8%), 109 of 2,227 (5%), and 27 of 2,227 (1.2%), respectively.

The main influencing factors were as follows: for malaria prophylactic advice, age ≥60 years (107/243; 44%) and neuropsychiatric disorders (38/243; 15.6%); for yellow fever vaccination, age ≥60 years (86/136; 63.2%) and immunosuppression (14/136; 10.3%), additionally within this group, there were 26 of 136 presenting less than 10 days before departure (19.1%); and for travelers' diarrhea advice, decreased gastric acidity (19/43; 44.2%) and immunesuppression (14/43; 32.6%) (Table 6).

A neuropsychiatric history, possibly influencing mefloquine prescription, is present in 1.7% of our total study population (38/2,227), constituting 15.6% of the malaria prophylaxis advice influencing factors. For heart rhythm disorders, this is 1% (23/2,227). For immunosuppression, which can have influence on yellow fever vaccination and enteric infections prevention, this is 0.63% (14/2,227).

For malaria prophylaxis advice, we tested for correlation between older age and anticoagulant use, heart rhythm disorders, intolerance for antimalarials, last-minute travel with a condition (supposing an inverse relation), and neuropsychiatric disorders (Table 7). In the older age group (≥60 y), we found significantly less antimalarial intolerance, less last-minute travel, and less neuropsychiatric conditions compared with the younger age groups. In the group "pregnancy or intended conception," we also found significantly more last-minute travel compared with the remainder of the travelers.

For yellow fever vaccination advice, we tested for correlation between older age and last-minute

Table 2 Factors influencing yellow fever vaccination and the consequences or reason why

Factors influencing yellow fever vaccination	Consequences or reason why	Reference
Allergy to eggs (anaphylaxis)	Administer vaccine after testing and in a facility where treatment of anaphylactic shock is immediately available	13, 26
Immunocompromised travelers by medication and/or disease		
Immunosuppressives—glucocorticoid use (dependant on dose)	Live vaccines can cause dissemination of the virus and severe adverse effects and/or	13, 27, 28, 29
Rheumatic disorder immunosuppressive medication	response to the vaccine may be decreased resulting in poor protection	13
Organ transplant immunosuppressive medication		13
Immunosuppressive medication for cancer treatment		13
Generalized eczema or psoriasis immunosuppressive medication		13
HIV/AIDS $CD4^+$ below 200		15, 27
Thymoma–thymectomy		30
Pregnancy	Live vaccines are best avoided during first and second trimester	15, 31, 32
Intended conception	Pregnancy is best avoided until 1 mo after yellow fever vaccination	13, 33
Last-minute travelers: primary vaccination <10 d before departure	Additional mosquito protective measures during daytime until 10 d after vaccination	13, 15
Infants younger than 1 y	Severe adverse effects seen in infants below 4 mo—usually not administered below 9 mo	13
Age older than 60 y	Increased risk for severe adverse reactions	12, 13, 34–36

HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome.

travel (supposing an inverse relation) and immunesuppression, and between last-minute travel and pregnancy or intended conception. Again the older age group (≥60 y) had less last-minute travel and also less immunosuppressed conditions.

For travelers' diarrhea and enteric infections advice, no correlation between risk factors had any logical sense.

For malaria prophylaxis advice, 17 of 184 (9.2%) travelers did not agree with the proposed measures; all recommendations concerning yellow fever vaccination were followed; for the recommendation concerning extra typhoid vaccine, 4 of 26 (15.4%) did refuse (mostly people with decreased gastric acid).

Discussion

The study suggests that the majority of travelers (87.6%) can be given standard pretravel advice on malaria prophylaxis, on yellow fever vaccination, and travelers' diarrhea and enteric infections. However, more than one tenth of the travelers report at least one risk factor for which adjusted advice may be necessary.

Table 3 Factors influencing advice for TD and other enteric infections and the consequences or reason why

Factors influencing or interfering with advice for TD and other enteric infections	Consequences or reason why	Reference
Decreased gastric acid by surgery or by use of medication (proton pump inhibitors or H_2 antagonists as treatment for gastroesophageal ulcerations)	Reinforcement needed—increased risk for (severe) TD and other enteric infections, eg, typhoid	37, 38
HIV infection/AIDS	Reinforcement needed—increased risk for (severe) TD and other enteric infections, eg, typhoid	22, 39, 40
Pregnant women	Reinforcement needed—increased risk for (severe) TD and other enteric infections, eg, typhoid	40, 38
Crohn's disease—ulcerative colitis	Increased risk for severe TD and/or exacerbation of the disease	15, 21
Allergy to fluoroquinolone antibiotics	Contraindication: alternative stand-by treatment needed	—

HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome; TD = travelers' diarrhea.

Table 4 Characteristics of the travelers with risk factors ($N = 276$)

Characteristic	*n* (%)
Gender	
Male	130 (47)
Age	
Median	59 y
≥60 y	138 (50)
Origin	
Belgian	235 (85)
Foreign	41 (15)
Type of travel	
Tourism	135 (49)
Adventurous	46 (17)
Visiting friends/relatives	48 (17)
Pilgrimage	21 (8)
Business	14 (5)
Living/working/studies	8 (3)
Unknown	4 (1)
Type of accommodation	
Luxury hotels	128 (45)
Budget hotels	64 (22)
Camping	11 (4)
Private houses	65 (23)
Unknown	9 (3)
Days before departure	
<10	37 (13)
Duration of travel (wk)	
<1	25 (9)
>1 and ≤3	160 (58)
>3 and ≤8	59 (21)
>8	17 (6)
Unknown	15 (5)
Destination	
Africa	168 (61)
Asia	61 (22)
Central and South America	41 (15)
World trip	5 (2)
Unknown	1 (<1)

Existing Literature

This study adds to the existing knowledge on risk factors' frequency in the travel population, as we could find only few direct data in the literature.

Stauffer and colleagues mention that "it is estimated that 4% of overseas travelers are infants and children," but infants are not counted separately.[5] As for the aged, in a population that visited a travel clinic prior to travel, 14% were above 55 years.[6] In a recent study in a Spanish travel clinic, we found an interesting proportion: highly vulnerable travelers (infants, pregnant women, and immunesuppressed travelers) made up 47 of 2,622 (1.8%).[7] Human immunodeficiency virus (HIV) frequency in European travelers in the beginning of the 1990s was estimated to range between 0.25% and 8.5%.[8]

In our study, we found 138 of 2,227 (6.2%) travelers to be above 60 years old. For the highly vulnerable travelers, the result is a bit lower, though comparable with the Spanish data: 26 of 2,227 (1.14%). And only 3 of 2,227 (0.13%) HIV patients were seen (see Limitations of the Study).

Limitations of the Study

During data collection, bias may have occurred because travelers had to fill in the routine intake form without assistance. If the following interview did not include additional inquiry about medical conditions or medication intake, this might have led to recording fewer patients at risk. In contrast, when risk factors were reported, there was a 100% response rate and the doctor carefully inquired further for confirmation. No traveler refused to give additional details when the doctor asked for it.

The length of the study period could be under debate, as travel advice is influenced by the seasons or time of the year at destination. The accuracy of the measurements would have been enhanced if the study would have been conducted over a period of a full year, which we were unable to do. This study was conducted as the research part of a course, allowing only for a 2-month data-collecting period. Nevertheless, of the conditions mentioned in the list of risk factors, all had at least one inclusion during the 2-month inclusion period, except for thymoma/thymectomy, which is extremely rare.

Furthermore, the choice of the included influencing factors has an impact on the frequency counts (Tables 1–3). For example, the factor "influence of

Table 5 Frequency measurements of risk factors in travelers attending the ITMA travel clinic ($N = 2,227$)

Measure	Proportion/percentage (95% confidence interval)	
Overall frequency of influencing conditions is equal to number of travelers with risk factors on total of travelers	276/12.4 (11.1–13.8)	
Risk factors on total of travelers	Potential influence	Actual influence
Malaria prophylaxis advice	243/10.9 (9.7–12.3)	184/8.3 (7.2–9.5)
Yellow fever vaccination	136/6.1 (5.2–7.2)	109/4.9 (4.0–5.9)
Travelers' diarrhea and enteric infections recommendations	43/1.9 (1.4–2.6)	27/1.2 (0.8–1.8)

ITMA = Institute of Tropical Medicine Antwerp.

Table 6 Frequency of influencing factors with three major advice categories: comparison between potential and actual advice change, and answer of the patient

	Potential		Actual		Followed	
	n	*n*/243, %	*n*	*n*/243*, %	*n*	*n*/184, %
Influencing factor malaria prophylaxis advice						
≥60 y	107	44.0	80	32.9	75	93.8
Acne minocyclin	2	0.8	1	0.4	1	100.0
Anticoagulants	5	2.1	5	2.1	3	60.0
Epilepsy	4	1.6	4	1.6	3	75.0
Heart rhythm disorders	23	9.5	20	8.2	20	100.0
Former intolerance to antimalarials	14	5.8	10	4.1	10	100.0
Last minute <10 d and condition	32	13.2	25	10.3	17	68.0
Liver failure/transplant	2	0.8	1	0.4	1	100.0
Neuropsychiatric disorders	38	15.6	30	12.3	30	100.0
Plaquenil therapy (analogue of chloroquine)	2	0.8	0	0	0	
Pregnancy first trimester	1	0.4	1	0.4	1	100.0
Intended conception	7	2.9	6	2.5	5	83.3
Psoriasis	4	1.6	0	0	0	
Renal disease	2	0.8	1	0.4	1	100.0
Total	243	100	184	75.7	167	90.8
Yellow fever vaccination	*n*	*n*/136, %	*n*	*n*/136*, %	*n*	*n*/109, %
<12 mo	1	0.7	1	0.7	1	100
≥60 y	86	63.2	75	55.1	75	100
Allergy to eggs (anaphylaxis)	2	1.5	1	0.7	1	100
Immunosuppression/medication	14	10.3	4	2.9	4	100
Last minute <10 d and condition	26	19.1	22	16.2	22	100
Pregnancy first trimester	1	0.7	0	0	0	
Intended conception	6	4.4	6	4.4	6	100
Total	136	100	109	80.1	109	100
Travelers' diarrhea	*n*	*n*/43, %	*n*	*n*/43*, %	*n*	*n*/27, %
Allergy to fluoroquinolones	2	4.7	2	4.7	2	100
Crohn's disease/ulcerative colitis	4	8.9	3	7.0	3	100
Decreased gastric acid	19	44.2	13	30.2	11	84.6
HIV/AIDS and medication	3	7.0	2	4.7	2	100
Immunosuppression/medication	14	32.6	7	16.3	5	71.4
Pregnancy first trimester	1	2.3	0	0	0	
Total	43	100	27	62.8	23	85

HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome.

age (≥60 y) on malaria prophylaxis advice" is arguable. The reason why we included this factor is not that it is a risk factor for contracting malaria or for intolerance for prophylactic antimalarials, but for severity of the disease, if contracted.[9,10]

The HIV travelers' group is underrepresented because a separate clinic for HIV patients is operational in our center and they are counseled by their own experienced HIV/acquired immunodeficiency syndrome physician when these patients travel.

The question arises if our results are exportable to general practice. On one hand, it should be stressed that no reference gatekeeper is used in our institute; the travel clinic is in part a first line service, hence comparable with the private practice of a general practitioner, except for yellow fever vaccination, which is bound to accredited travel clinics in our country. In contrast, travelers who are aware of their (medical) condition might prefer a specialized center for advice.

Risk Factors for Advice Categories

The interpretation of the frequency of risk factors for advice categories should take into account three features: the frequency of the risk factor, the frequency of the target condition, and the impact of this condition. For travelers' diarrhea, on the one hand, the frequency of the risk factors is low (1%); in contrast, the risk of acquiring travelers' diarrhea is very high (30%–80%); however, the impact is minimal: travelers' diarrhea can be invalidating, but is rarely severe.[11] This is in contrast with a higher frequency of risk factors, which influence malaria prophylaxis advice (8%) and yellow fever vaccination advice (5%), which additionally have a much greater impact (possible lethal diseases and/or more

Table 7 Correlation between risk factors

	Odds ratio	*p*
Risk factors for malaria advice		
Elderly age and		
Antimalarials intolerance	0.1026	0.001
Last-minute travel	0.1769	<0.000
Neuropsychiatric disorder	0.1553	0.001
Pregnancy/intended conception		
Last-minute travel	9.0741	<0.000
Risk factors for yellow fever vaccination		
Elderly age and		
Last-minute travel	0.0718	<0.000
Immunosuppression	0.1200	<0.000
Pregnancy/intended conception		
Last-minute travel	5.3939	0.04

severe adverse reactions in the presence of a risk factor) Here, however, the risk of getting infected with malaria (1.5%–2.4%) or yellow fever (<0.1%) is much lower, although not negligible.[11,12]

A substantial number of influencing factors concern only the higher theoretical risk for adverse reactions to yellow fever vaccine. One might think that this is a minor issue. However, if those (extremely rare) adverse reactions occur without warning and informed consent, travelers might be angry and blame or sue the practitioner.

For malaria advice, we found an inverse relation between older age and either last-minute travel, antimalarial intolerance, or neuropsychiatric conditions (Table 7). This could mean that older people with known risk factors present themselves much less frequently as last-minute travelers and refrain from traveling to hazardous destinations.

For yellow fever, an inverse relation was found not only for older age and last-minute travel but also for immunosuppression. Here, the same comment applies as for malaria advice.

For both malaria and yellow fever advice, the positive relation between pregnancy or intended conception and last-minute travel is surprising, as one could assume that pregnant travelers or travelers wishing to become pregnant would refrain from visiting risky countries, especially without sufficient preparation time. In contrast, some couples may wish to travel before a child is born or while intending to get pregnant, but do not realize the risk of becoming pregnant while on antimalarials or receiving live yellow fever vaccine while being pregnant.

Implications for Practice

It is obvious that novice travel health advisors who counsel their own patients must be aware of the potential influence of their patients' medical conditions on the travel advice recommendations.

Our study suggests an additional need for emphasizing the specific recommendations for the observed traveler groups (older, pregnant and immunecompromised travelers, and those with a neuropsychiatric history). It could help the writing of guidelines and handout leaflets for specific travelers at risk (see, eg, www.travelhealth.be for leaflets for children and pregnant women).

The high-risk group, comprising the travelers with immunecompromising conditions or medication, is well represented in the study with 14 inclusions in the 2-month period. This is more than three immunecompromised travelers a week. It would be useful to organize an awareness campaign for specialist doctors, such as dermatologists, rheumatologists, pneumonologists, oncologists, and gastroenterologists, who regularly prescribe immunesuppressive medication without realizing that travel might call for live vaccines, such as yellow fever vaccine, which can be contraindicated for immunosuppressed persons. They should encourage their patients to take advice in a specialized travel clinic before booking a holiday to tropical regions, to avoid cancellations.

Future Research

Future studies could investigate changes in patterns of possibly interfering conditions. By looking at the frequencies, we can distinguish new risk groups. We observed, eg, many diabetic patients in the Hajj pilgrim population.

A similar study could be carried out in a sample taken from a sufficient large number of general practices because frequency of risk conditions might be considerably different. Also useful would be a study to detect the reasons why patients are not willing to comply with a proposed change of the standard advice. Finally, in this study, we only investigated three advice categories. This could be expanded to advice on air travel, high-altitude travel, wound management advice, etc.

Conclusions

Travelers with increased health risk, because of a medical condition, medication intake, pregnancy, or age, are not infrequently seen at our travel clinic. The data provide evidence on which risk factors are most frequently observed and what consequences they have on the travel advice given. Specific instruction sheets might be useful and help to improve our services.

Our study underscores the importance of being informed about risk groups and highlights the target fields of alertness, probably especially pertinent for health advisors who are infrequently giving pretravel advice. Although their probability to face rare influencing factors is low, not recognizing and considering these can have major implications.

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Declaration of Interests

The authors state that they have no conflicts of interest.

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