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# Are French general practitioners consulted before travel to developing countries? A cross-sectional study conducted in a French airport

*Les médecins généralistes font-ils partis du parcours de soins avant un voyage vers un pays en développement ? Étude transversale dans un aéroport français*

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## Abstract

**Background.** – General practitioners (GPs) could play a central role in preventing travel-related health issues. The aim of this study was to assess, in travellers departing to developing countries from a French airport, the proportion of individuals having sought GP counseling before departure and to identify determinants for having consulted a GP.

**Methods.** – Cross-sectional study conducted between November 2012 and July 2013, in all adults living in France. Sociodemographic, health characteristics, type of travel and resources consulted before departure were collected. A descriptive analysis was performed. Determinants for having consulted a GP before departure were investigated using a logistic regression analysis.

**Results.** – Of the 360 travellers included, 230 (64%) sought health counseling before departure. GPs were the main source of information for 134 (58%) travellers having sought health information and the only one for 49 (21%). Almost half of the travellers (48%) departing to sub-Saharan countries did not seek health counseling from a medical doctor (GP, non-GP specialist, specialist consulted in an international vaccination center or occupational physician). Individuals significantly more likely to travel without having consulted a GP were young and male, held foreign nationality, had travelled more than five times before, rarely consulted their GP and were travelling to a non-malarious area.

**Conclusion.** – GPs were the main but not the only source of information and counseling before traveling to a developing country. This study helps identify the characteristics of individuals likely to travel without having consulted a GP before departure.

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**Keywords:** Developing countries; Counseling; Travellers; General practice

## Résumé

**Objectif.** – Depuis 60 ans, le nombre de voyageurs par vols internationaux suit une croissance exponentielle. Or la moitié des voyageurs présentent un problème de santé lié à leur voyage. Les médecins généralistes (MG) peuvent avoir un rôle central dans la prévention de ces problèmes de santé. L'objectif de cette enquête est d'évaluer, parmi les voyageurs en partance vers un pays en développement depuis l'aéroport de Roissy-Charles-de-Gaulle, la proportion de ceux ayant demandé conseil à un MG avant le départ et d'identifier les déterminants d'avoir eu recours à un MG.

**Méthodes.** – Étude transversale par hétéro-questionnaire, entre novembre 2012 et juillet 2013, auprès de tous les adultes résidant en France présents en salle d'attente. Les caractéristiques socio-démographiques et de santé, la nature du voyage et les ressources consultées avant le départ ont été recueillies. Une analyse descriptive a été effectuée. Les déterminants du recours aux MG ont été recherchés par régression logistique.

**Résultats.** – Parmi les 360 répondants, 230 (64 %) ont recherché des conseils pour leur santé avant leur départ. Les médecins généralistes ont été la principale source d'information pour 134 voyageurs (58 %) ayant recherché des conseils et ils étaient l'unique source d'information pour 49 d'entre eux (21 %). La moitié (48 %) des voyageurs vers l'Afrique sub-saharienne n'ont pas recherché de conseils auprès d'un médecin (médecin généraliste, autres spécialistes, médecins du travail et de centre international de vaccination) avant leur départ. Les personnes les plus à

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risque de partir en voyage vers un pays en développement sans avoir pris conseil auprès d'un médecin généraliste étaient des hommes jeunes, de nationalité étrangère, ayant voyagé plus de cinq fois antérieurement, consultant habituellement peu leur médecin généraliste et partant vers une zone non impaludée.

**Conclusion.** – Les MG sont la principale, mais non exclusive, source d'informations et de conseils avant un voyage en pays en développement. Cette étude a permis d'identifier des caractéristiques de voyageurs à risque de partir sans avoir bénéficié des conseils d'un MG avant le départ. © 2015 Elsevier Masson SAS. Tous droits réservés.

*Mots clés :* Pays en développement ; Médecine générale ; Conseils ; Voyageurs ; Parcours de soins

## 1. Introduction

For 60 years, the number of travellers on international flights has been rising exponentially: it reached 1.1 billion in 2013 [1]. About 50% of destinations concern developing countries [2]. However, travelling abroad, especially to a developing country, involves a health risk. Indeed, half of travellers experience a health problem during or after their trip [3]. In addition, these travellers could be a risk to the community by facilitating the dissemination of pathogens in the country visited as well as in their country of origin [4,5]. These health risks can be partly prevented through traveller information, explaining lifestyle and dietary rules, vaccination, prescribing appropriate antimalarial chemoprophylaxis and preparing a travel medical kit [6,7]. In this context, the general practitioner (GP), who is a proximate care and outreach prevention resource, plays an increasingly important role. Several European studies on sources of information and counseling for travellers have shown that GPs were the first source consulted before departure [8–11]. Facilitating access to care and preventive health through primary care and GPs are major objectives of European public health policies [12]. In France, a country with one of the highest densities of GPs in Europe [12], promoting prevention by GPs through a new organization of healthcare and financial benefits is being debated [13]. However, concerning risks related to travel, limited access to GPs or lack of counseling and information during contacts could have an impact on their prevention. To our knowledge, no study has focused specifically on determinants for consulting a GP before traveling to developing countries.

The aim of this study was to assess the proportion of travellers departing from Roissy-Charles-de-Gaulle (CDG) airport, Paris, France, having sought GP counseling before traveling to a developing country. The secondary objective was to identify the determinants for consulting a GP.

## 2. Methods

### 2.1. Population and study location

The study was conducted in the waiting rooms of CDG airport between November 2012 and July 2013. In 2013, CDG airport received about 35,000 travellers daily departing to developing countries. An investigator was randomly present in all airport terminals 15 times, corresponding to different days of the week, to question all travellers present in waiting rooms

using a hetero-questionnaire after oral consent, approaching a total of 1000 travellers. Inclusion criteria were: being older than 18 years, living in France and departing to a developing country. The exclusion criterion was: not speaking French.

### 2.2. Data collected

Sociodemographic and health characteristics, the type of travel and resources consulted before departure, were exhaustively collected by the investigator to avoid missing data. Data were anonymized. The French commission nationale de l'informatique et des libertés (CNIL) and ethics committee (CPP) issued a favorable opinion for conducting this study.

### 2.3. Analysis

A descriptive data analysis was performed. Continuous variables are presented as mean (standard deviation) and median [range]. Categorical variables are presented as frequencies (percentages).

Univariate and multivariate logistic regression analyses were performed to identify the determinants for consulting a GP before traveling. Explanatory variables included in the model were the traveller's characteristics, previous contacts with a GP and travel characteristics. Variables significantly associated using a univariate analysis with a *P*-value less than 10% (Chi<sup>2</sup> or Fisher exact test) were included in the logistic regression model. Statistical analysis was performed at the alpha risk of 5% using EpiInfo 7.0 software.

## 3. Results

### 3.1. Population characteristics

Of the 1000 individuals approached, 398 (40%) met the inclusion criteria and were invited to participate in the study. Finally, 360 (90.5%) of the eligible individuals accepted to answer the questionnaire.

The male/female ratio was 1.1, the median age was 40 years (18–84 years) and the mean age was 41.2 years (SD 12.6). Sixty-two percent of the participants were French. The travellers' characteristics are presented in Table 1. Most travellers were followed by a GP since 321 (89%) declared they consulted a GP once a year and 220 (62%) declared they consulted a GP more than once a year. Otherwise, 354 individuals (98%) declared having already travelled abroad at least

Table 1

Characteristics of individuals in the waiting room of Roissy airport (Paris, Île-de-France) traveling to a developing country.

Traveller characteristics	Missing data n (%)	n = 360 n (%)
<i>Gender: man</i>	0 (0)	189 (53)
<i>Age</i>	0 (0)	
18–29 years		60 (17)
30–49 years		234 (65)
50 years and older		66 (18)
<i>Nationality</i>	0 (0)	
French		223 (62)
<i>Occupation</i>	4 (1)	
Employees, artisans, intermediate professions		197 (55)
Managers and business heads		80 (22)
Workers		17 (5)
Students		26 (7)
Retired		28 (8)
Unemployed		8 (2)
<i>Family situation</i>		
Partnership	0 (0)	259 (72)
With children	0 (0)	249 (69)
<i>Having declared a family physician</i>	3 (1)	320 (89)
<i>Having consulted a general practitioner more than once in the year</i>	3 (1)	220 (61)
<i>Having private insurance</i>	7 (2)	290 (81)
<i>Taking treatment for chronic disease</i>	1 (0)	81 (23)
<i>Having already traveled more than five times abroad</i>	4 (1)	249 (69)

once and 249 (69%) declared having already travelled abroad more than five times before.

### 3.2. Travel characteristics

The main destination was sub-Saharan Africa. Two-thirds of travellers were departing to a malarious area (Table 2). The main reasons for travelling were tourism (51%) and visiting family and friends (44%). In 76% of cases, the planned trip duration was less than 1 month. In most cases, the travellers interviewed were not travelling alone (62%) and had organized their trip themselves (56%).

### 3.3. Traveller care pathway before departure

Two hundred thirty travellers (64%) sought health information before departure, including 160 (40%) who sought counseling from a medical doctor (GP, non-GP specialist, specialist consulted in a vaccination center or occupational physician). Of the travellers departing to a malarious area and particularly to sub-Saharan countries, 154 (67%) and 98 (56%), respectively, sought health information. Ninety (52%) individuals among those departing to sub-Saharan countries sought counseling from a medical doctor, 75 (43%) sought counseling from a GP, 45 (26%) consulted in an international vaccination center (ICV) and 13 (7%) consulted in an IVC but not a GP. Compared to travellers departing to other destinations, travellers departing to sub-Saharan countries were more likely

Table 2

Travel characteristics for individuals interviewed in the waiting room of Roissy airport (Paris, Île-de-France) traveling to a developing country.

Travel characteristics	Missing data n (%)	n = 360 n (%)
<i>Destination</i>	0 (0)	
Sub-Saharan Africa		174 (48)
North Africa		50 (14)
Asia		65 (18)
North America		52 (14)
South America		5 (1)
Eastern Europe		6 (2)
Oceania		6 (2)
Middle East		2 (1)
<i>Travel to malarious area</i>	0 (0)	237 (66)
<i>Planned trip duration</i>	6 (2)	
< 1 week		33 (9)
Between 1 and 2 weeks		136 (38)
Between 2 weeks and 1 month		104 (29)
Between 1 and 3 months		73 (20)
>3 months		8 (2)
<i>Travel purpose</i>	0 (0)	
Tourism		183 (51)
Visiting family or friends		158 (44)
Business		32 (9)
<i>Accommodation</i>	0 (0)	
Hotel/hostel		187 (52)
Stay with family or friends		154 (43)
Home-stay		4 (1)
Camping		2 (1)
<i>Accompanied trip</i>	0 (0)	224 (62)

to have consulted a GP (43% vs. 32%;  $P = 0.025$ ) or in an ICV before their travel (26% vs. 15%;  $P = 0.010$ ). However, travellers departing to sub-Saharan countries and having consulted a GP were less likely to have also consulted in an ICV (29% vs. 61%;  $P = 0.014$ ).

A GP was one of the health resources for 134 (58%) travellers having sought health information and the only source of health information in 49 (21%) travellers. Eighty-seven percent of travellers having consulted a GP reported having received counseling and/or a prescription for their trip. This percentage was 95% for travellers departing to a malarious area.

Other sources of information consulted by travellers are shown in Table 3. One hundred thirty-three (37%) travellers consulted several sources of information.

### 3.4. Determinants for having consulted a GP before departure

Travellers older than 50 years or having consulted a GP more than once in the year and those departing to a malarious area were more likely to have consulted a GP for health counseling before departure to a developing country. Conversely, determinants for not having consulted a GP were: being a man, being of foreign nationality and having already travelled abroad more than five times (Table 4).

Table 3  
Travellers' sources of information before departure.

Sources of health information consulted before travel (several sources were consulted by 130 travellers)	Missing data n (%)	n = 230 n (%)
General practitioner	0 (0)	134 (58)
Travel agency	0 (0)	74 (32)
Internet	0 (0)	74 (32)
Vaccination center	0 (0)	73 (32)
Relatives	0 (0)	35 (15)
Non-GP specialist	0 (0)	26 (11)
Pharmacist	0 (0)	17 (7)
Occupational physician	0 (0)	5 (2)

## 4. Discussion

### 4.1. Main results

Travellers to developing countries interviewed in the waiting rooms of CDG airport were relatively young and travelled abroad frequently. Almost two-thirds of them (64%) sought health information before departure. One-third (37%) consulted a GP who was the main health counseling resource (58% of travellers having sought health information) and one-third sought several sources of information. Focusing on travellers departing to sub-Saharan countries, one observes that almost half of them did not seek health counseling from a medical doctor before travel. Individuals travelling to developing countries were more likely to travel without having consulted a GP, were young men, held foreign nationality, had previous experience of more than five trips abroad, rarely consulted their GP, and were departing to a non-malarious area.

### 4.2. Previous studies on travellers seeking health information

In the present study, only 64% of travellers sought health information before departure. Slightly lower proportions (range, 52–60%) were found among travellers departing to developing countries from European airports [9–11]. Higher proportions of travellers departing to a malarious country were reported in previous studies conducted at CDG airport in 1998 and in two Spanish airports (77% and 73%, respectively) than in our study (65%) [8,14]. These differences may be related to increased travel and trivialization of travel, particularly to sub-Saharan countries.

### 4.3. GPs' role in traveller counseling

It should be noted, however, that a significant percentage of individuals were travelling without having received counseling from a health professional. This result is particularly worrying for travellers departing to a malarious area at high risk of health problems. According to these results, it is therefore a challenge for GPs who are frequently consulted for various health problems or follow-up visits, to explain and repeat (brief interventions) the advantages of preparing their upcoming trips

to patients born in a malaria-endemic country and likely to return to visit family.

In all studies conducted in European airports, GPs have been identified as the main source of information: 54–72% of travellers having sought counseling had consulted a GP [8–11]. The present results confirm these data, which place the GP at the forefront of pre-travel consultation. As in our study, the second source of information identified in these European studies was the ICV (22–35% of travellers consulted in an ICV) [8–11]. However, it is surprising that so few travellers to sub-Saharan countries had consulted in an ICV, even fewer than those who had consulted a GP, since yellow fever immunization can be obtained only in an IVC.

Finally, the infrequent consultation of a GP before travel (less than 40%) contrasts with the fact that 89% of travellers declared having a regular doctor and the fact that 90% of them declared having consulted their GP in the previous year. This highlights that there are still missed opportunities to pre-travel counseling in general practice.

### 4.4. Determinants for having consulted a GP

Departing to a malarious area was shown to be one of the main determinants for having consulted a GP before departure. This could reflect some awareness of the health risk associated with this type of travel as well as the need for a prescription of anti-malarial chemoprophylaxis before departure. Similarly, it was not surprising that more individuals regularly consulting their GP had also sought counseling before travelling, as well as individuals older than 50 years who are at greater risk of chronic diseases.

As in the present study, several studies having assessed the determinants for seeking counseling before traveling found that more older individuals and more individuals travelling to tropical (or malarious) countries consult before departure [15–17]. It is likely that older people perceive their travel in a developing country as taking a health risk. However, qualitative studies are needed to confirm this notion.

Other factors positively associated with seeking counseling have been identified previously but not in our study (leisure travel, duration longer than 1 month, travelling with one or more children). Otherwise, this study did not investigate the perception of the risk of infection whose association with seeking counseling has been studied elsewhere [9,17,18].

Conversely, we found that individuals with foreign nationality and those with previous experience of several trips were more likely to travel without GP counseling, confirming the results of previous studies [14,16,17,19]. It has been shown that individuals of foreign origin consult less than individuals born in France [20]. In addition, the frequency of such trips could contribute to reducing the perception of risk. In fact, it has been shown that immigrants visiting their family or friends in their country of origin were more likely to experience a health problem during their trip than the general population [21,22]. As in the recent chikungunya outbreak in Martinique, this may be due to cultural or behavioral familiarity and geographic proximity with the population of the country visited [23].

Table 4

Determinants for having consulted a GP before departure to a developing country: univariate and multivariate analyses ( $n = 360$  individuals in the waiting room of Roissy airport) (Paris, Île-de-France).

Population and travel characteristics	Univariate		Multivariate	
	OR 95%CI	<i>P</i>	OR 95%CI	<i>P</i>
<i>Sex: male</i>	0.55 (0.35–0.85)	0.007	0.52 (0.30–0.89)	0.017
<i>Age</i>				
Age ≤ 29 years	0.36 (0.19–0.72)	0.004		0.004
30–49 years	1.10 (0.70–1.73)	0.749	2.39 (1.32–4.33)	
≥50 years	1.91 (1.11–3.28)	0.025		
<i>Nationality</i>				
Non-French	0.45 (0.28–0.72)	<0.001	0.38 (0.18–0.79)	0.009
<i>Socioprofessional categories</i>				
CSP1 (manager, business head)	0.77 (0.46–1.31)	0.410		
CSP2 (employee, artisan, intern profession)	0.95 (0.62–1.47)	0.915	1.19 (0.95–1.50)	
Students	0.66 (0.28–1.54)	0.445		0.136
Workers	0.35 (0.10–1.24)	0.150		
Retired	2.44 (1.12–5.33)	0.037		
Unemployed	12.42 (1.57–564.2)	0.005		
<i>Family situation and travel experience</i>				
With partner or spouse	1.40 (0.86–2.28)	0.216		
With children	2.20 (1.34–3.61)	0.002	1.62 (0.78–3.38)	0.198
More than 5 previous trips	0.41 (0.26–0.65)	<0.001	0.24 (0.13–0.45)	<0.001
<i>Medical situation</i>				
With private insurance	0.89 (0.51–1.55)	0.787		
Having consulted a GP more than once in the year	3.08 (1.90–5.00)	<0.001	3.19 (1.78–5.71)	<0.001
Treatment for chronic disease	1.31 (0.79–2.17)	0.360		
<i>Destinations</i>				
Maghreb	0.19 (0.08–0.47)	<0.001	0.52 (0.16–1.69)	0.277
Malarious area	3.34 (2.00–5.55)	<0.001	6.18 (2.77–13.79)	<0.001
<i>Duration</i>				
<1 week	1.10 (0.53–2.30)	0.941		
1 week–3 months	0.73 (0.38–1.41)	0.447		
>3 months	2.86 (0.55–18.75)	0.155		
<i>Accommodation</i>				
Stay with family or friends	0.78 (0.51–1.21)	0.315		
Hotel/hostel	1.49 (0.97–2.30)	0.085		
Other	1.38 (0.63–3.05)	0.548		
<i>Travel purpose</i>				
Tourism	1.68 (1.09–2.60)	0.023	1.07 (0.46–2.47)	0.869
Visiting family or friends	0.62 (0.40–0.96)	0.040	0.66 (0.26–1.71)	0.397
Business	0.87 (0.41–1.87)	0.875		
Other	2.64 (0.92–7.59)	0.111		
<i>Other travel modalities</i>				
Accompanied trip	1.64 (1.05–2.59)	0.040	1.14 (0.62–2.12)	0.668
Organized tour	1.39 (0.90–2.13)	0.165		
Touring trip	0.84 (0.55–1.29)	0.492		

It has previously been shown that men were more likely to travel without having sought counseling from a health professional [16]. In addition, a study conducted by the National Institute of Statistics and Economic Studies (Insee) has shown that in general, women consulted their GP more than men, especially for prevention [24].

Finally, we did not find other determinants for not having sought counseling before travel identified in other studies such as traveling alone, traveling for less than 14 days or for leisure [19].

#### 4.5. Having received counseling and/or a prescription related to the travel from the GP

Our results showed that 87% of individuals having consulted a GP prior to departure to a developing country received

counseling and/or a prescription from their GP. This could reflect the GP's involvement in the prevention of diseases related to travel.

#### 4.6. Limitations and strengths

This study has some limitations. First, it was a monocentric study conducted in a single major European airport. However, the results were similar to those of other European studies. Second, despite the exhaustive data collection, it is possible that some travellers were not interviewed by the investigator and were therefore not included in the study. Similarly, the characteristics of the 38 travellers interviewed who did not accept to participate could not be investigated.



The population characteristics were comparable to those of the demographic study conducted in 2012 by the General Directorate of Civil Aviation (DGAS) [25]. However, in our study, the proportion of travellers who were visiting family and friends was higher (43.9% versus 23.2%) and the proportion of business trips was lower (8.9% versus 29.7%). These differences could be explained by the fact that the present study was limited to individuals traveling to developing countries. Finally, we sought a representativeness of travellers to developing countries from CDC airport through comprehensive data collection without preselecting travellers' destination.

Third, whether counseling and/or GPs' prescriptions were consistent with the travel destination was not assessed in this study. However, this study focused mainly on the determinants of a contact with a GP before travel, because this attitude could be the cornerstone of the prevention process before travel in a country with a developed primary care network.

Finally, this study, conducted on a large sample of travellers, has provided a better understanding of the role of the GP in the care pathway before travelling, which had not been sufficiently studied before. It could be useful to repeat this survey during and after the Ebola outbreak to assess the trend in the proportion of travellers visiting a GP before departing to developing countries. Moreover, it is necessary to conduct several studies assessing the actual impact of the pre-travel GP consultation on traveller morbidity.

## 5. Conclusion

French GPs are consulted by more than one-third of travellers to developing countries. They are the main but not the only source of health information before travel. This study identified the characteristics of individuals more likely to travel to a developing country without having consulted a GP (i.e., young men, those with foreign nationality, having a previous travel experience, rarely consulting their GP and departing to a non-malarious area). These patients should be followed by GPs with particular attention regarding the possibility of upcoming travel and more generally by all health professionals who could interact with them. Information and prevention remain the only approaches to avoid the morbidity and mortality related to travel.

## Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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