Travel Illness and the Family Practitioner: A Retrospective Assessment of Travel-Induced Illness in General Practice and the Effect of a Travel Illness Clinic

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**Background:** As the recognition of the discipline of Travel Medicine grows with increased international travel, an examination of both the value of pretravel advice as well as the general practitioner’s role in preparation for, care during, and diagnosis and treatment after travel is necessary. This study was conducted to determine the incidence of travel-related illness in a typical urban population in Scotland and to examine the efficacy of our pretravel clinic related to reduction of illness, preparedness of our patients for travel, and the effects of our travel clinic on the workload generated by the returning ill in our practice.

**Methods:** In this retrospective study, 1568 patients, presenting within a 1-year period from 1992–1993 at a medical practice and 100 patients at a travel clinic were studied. Their morbidity rates and, therefore, the effect of the travel clinic on prophylaxis and pretravel advice were determined.

**Results:** In the practice sample, 42% of travelers became ill while abroad, with 48% of ill travelers returning to consult their family doctor at home. Travelers to Africa and Asia were shown to have the highest rates of illness. Travel clinic attendees were more likely to be traveling to high-risk destinations, but were better prepared, experiencing a significantly lower rate of illness during travel (22%). Clinic attendees were less likely to consult their doctor on return home, preferring instead to resolve their illness by self-medication.

**Conclusions:** The results suggest that travel clinics significantly reduce the morbidity of illness for travelers and that the burden on general practices could be reduced with the pretravel advice and prophylaxis that travel clinics provide. (J Travel Med 1:192–198, 1994)

The prevalence of travel-acquired illness is likely to rise considerably by the end of the century. The International Airline Travel Association (IATA) estimates that the number of scheduled international passengers will increase by 200 million (43%) in the decade 1990–2000.1 This is set against an increase of 55% in the total number of air travelers worldwide in the decade 1980–1990.2 The number of British people traveling to tropical countries, that are associated with a higher risk of illness has risen from 700,000 in 1975 to 1.6 million in 1986.3

The amount of illness related to overseas travel has been difficult to establish. Cossar et al,4 in a cumulative 10-year study, describe an overall illness attack rate of 36% in British overseas travelers returning to Scottish airports. However, this survey relied on the return of a questionnaire in a prepaid envelope, and the response rate averaged only 32% (20–77%), implying a certain amount of self-selection bias. Moreover, the predominant destination reported was Europe, suggesting a lack of data on long-haul destinations such as Australasia, United States, Africa, and Asia. Other studies give broadly similar illness attack rates for British travelers, with McEwan5 quoting 41% of travelers succumbing to illness and McIntosh6 suggesting that the overall illness rate among 175 over-65-year-old travelers in a general practice setting was 45%.

This amount of illness contracted while abroad must reduce the enjoyment of travel and has implications for the family doctor when the patient returns home. Cossar et al4 found that 14% of all those that became ill abroad needed to consult a doctor—9% abroad and 5% at home, whereas McIntosh6 found that 58% of over-65-year-olds who had been ill abroad required further help from their own General Practitioner (GP).

The value of pretravel health advice and its role in reducing the incidence of illness in travelers has been examined by several people. Porter7 calls for the identification of the “high risk” traveler and states that the family doctor could be the principal point of advice for potential travelers. He states further that the discipline of Travel Medicine can only gain credibility if the benefits of health intervention are well defined.
Carosi et al. call for targeted health education before travel and suggest that it may reduce the incidence of diarrhea in travelers, although this is not proven. Others have acknowledged that the family doctor is ideally placed to give advice on travel health issues and in fact, travelers have shown a preference for this. Certainly Gorman and Smyth found that travel agents themselves consider their training in travel health matters to be deficient. He surveyed 87 travel agencies in Northern Ireland and found that agents often failed to highlight travel health issues for clients and made little use of available sources of information. Reid et al. sampled 64 travel brochures available in Britain and discovered that travel health advice given in brochures was generally inadequate with one-third not containing any advice at all. Altogether 56% of brochures carried general health information and only 11% carried specific health advice. Specific advice was mainly found in brochures covering worldwide travel.

However, there is evidence that advice given by doctors is not always appropriate, and its benefit in preventing illness can be questioned. Campbell found that only 79% of people who had seen their family doctor prior to travel to an area where malaria was a risk had actually received advice about malaria, and only 46% of those who received advice were aware of such measures as bed screens and repellants. Mott and Kinnersley found that, in a survey of 113 general practitioners, which questioned their advice regarding cholera vaccination (response rate = 80%), the advice given was confusing and often inappropriate. In 1987, Mott identified a potential saving of £0.65 million if cholera vaccination had been more appropriately administered. Mott also cited the potential dangers of inappropriately vaccinating nearly one-quarter of a million people against cholera in 1987.

Cossar et al. in a study of Scottish holiday makers returning from abroad, found that people who had received pretravel advice from a doctor were more likely to succumb to a travel-related illness (n = 66 in a subgroup from a study of 13,816). However this could have been due to preexisting illness or travel to a higher risk destination. Berger and Dan found that a certain amount of self selection for pretravel advice occurred. This was demonstrated by the fact that of 2250 consecutive consultations at an Israeli travel advisory clinic in 1992, most were intending to travel to exotic locations in the Far East, areas associated with a higher risk of illness.

As the recognition of the discipline of Travel Medicine increases, there are calls for further examination of the value of pretravel health advice. Peppiatt describes three potential roles for a family doctor in travel medicine: preparation for travel; care during travel; and posttravel diagnosis and treatment. Little is known of the effect of pretravel health advice on the incidence of illness experienced while traveling abroad, but some have argued that travel medicine in a general practice setting does need further audit.

### Aims and Objectives

The aims of this study are twofold. The first objective is to determine the rate of travel-induced illness among a typical urban general practice population based in Stirling, Scotland. An attempt is also made to establish the outcome of illness contracted overseas, as well as to quantify the subsequent workload in the general practice setting. Carriage and use of medication, insurance, and vaccination status are also examined among those travelers studied.

The second objective of the study is to examine the effect of a pretravel clinic provided by the practice, specifically whether attendance at the clinic conferred any benefits to the overseas traveler in terms of a reduction in illness experienced; whether or not those attending the travel clinic were better prepared for travel by way of vaccination or carriage of medication; and what effects the travel clinic had on the workload generated by the “returning ill” in the practice.

### Study Method and Design

All patients 16 years and over, who attended their GP for any reason, were included in the study until a 20% age- and sex-stratified quota sample of the practice population was achieved. This resulted in 1,568 people being questioned over the course of approximately 1 year. The practice is based in Viewfield Medical Centre, in Stirling, Scotland. In the United Kingdom, families register with a particular medical practice, which deals with all primary care requirements. The association is usually lifelong, providing the patient does not leave the area. Each patient was presented with a questionnaire relating to travel in the previous 12 months. Those that admitted travel within this time were then asked to continue with another questionnaire that covered the following aspects of their travel: destination, illness experienced, outcome of illness, need to seek medical advice, use of self medication, vaccination status, insurance status, preexisting health status, and pretravel health advice. For administrative reasons the study was split into two parts, with the over 65s being questioned at a separate time than the rest of those surveyed.

In order to assess the effectiveness of the travel clinic, an identical questionnaire was given to those attending the clinic, and each attendee was asked to
return a further questionnaire immediately following the planned travel abroad. This allowed a comparison to be made between the travel clinic population results and the results obtained from both the general practice population and an age- and sex-matched comparison group selected at random from the larger practice-based sample.

The results of the questionnaires were entered into a computer database for analysis. Where appropriate, results were analysed primarily by use of the chi-square test with support from the Department of Psychology, University of Stirling.

**Results**

**General Practice Population Not Attending Travel Clinic**

*Illness and Outcomes:* The response rate among the general practice population sample of 1568 people was 98.3%, with 27 refusing to participate. Of the remaining 1541, 691 (44.8%) were male and 850 (55.2%) were female. The mean age of the sample was 42.0 years with the age range being 16–81 years. There was no significant difference in age between males and females.

Of the 1541 respondents, 651 (42%) had traveled abroad in the past 12 months, with no significant difference in the proportion of males and females traveling abroad ($x^2 = 0.01, df = 1, NS$). Of the 651 who had traveled abroad, 273 (42%) reported an illness while abroad, there being no difference in the rate of illness reported by males and females ($x^2 = 2.08, df = 1, NS$).

The outcomes of travel-acquired illness were analyzed, and the following was discovered. Significantly more males (27%) than females (14%) who experienced illness indicated that the illness had resolved without any self medication or medical intervention ($x^2 = 7.93, df = 1, p < .005$). Of the 220 remaining individuals who required further intervention, 22% of males and 28% of females stated that the illness settled with self medication, whereas 42% of males and 44% of females whose illness did not settle by self remedy saw a doctor while abroad. Of the 164 individuals whose illness did not settle with self medication, 80% of males and 81% of females consulted their GP about their travel-related illness.

Of the 273 people who became ill while abroad, 66 (24%) saw a doctor abroad while 132 (48.4%) saw their GP on return. This equates to 20.3% of all returning travelers (n = 651) consulting their GP on return. Travel- and illness-related characteristics of the GP patient sample by sex are illustrated in Table 1 and by destination in Table 2.

**Destination and Illness:** In an attempt to establish the relative risks of destination with regard to incidence of illness, destinations were grouped into three broad groups as follows:

- Group 1 included Northern Europe, North America, and Australia.
- Group 2 included the Mediterranean mainland Europe, and the Mediterranean islands.
- Group 3 included mainland Africa and Asia.

The justification for the groupings described is based on findings of previous studies. Cossar et al describe an increased risk of illness associated with traveling further south and east from Britain, which implies that travel to Mediterranean Europe and North Africa carries a higher risk of illness. Carosi et al found that travelers to Africa and Asia had a higher incidence of diarrhea than travelers to other destinations. Steffan also notes that Africa and Asia carry a greater risk of gastrointestinal infection for travelers,
whereas McIntosh and MacPherson found that travelers to these destinations were more likely to suffer illness than travelers to Europe. Therefore the groupings chosen allow a comparison of illness rates to be made between the traditional destination groupings as defined by convention in established literature.

Although the proportion of individuals becoming ill in Mediterranean destinations (Group 2: 39%) was higher than in Northern Europe/United States/Australia (Group 1: 34%), the difference was not significant. However, Group 3 destinations had significantly higher rates of illness than both Groups 1 and 2 ($x^2 = 29.53, df = 1, p < .001$). Combining all European/Mediterranean/American/Australian destinations (Groups 1 and 2) ($n = 563$) gave an overall incidence of illness of 37.5% ($n = 211$). This compares to an illness rate of 68% for all Group 3 travelers ($n = 88$).

The outcomes of illness were examined in relation to destination. Travelers to Africa/Asia (Group 3) were no more likely than those to Europe/Mediterranean/United States/Australia (Groups 1 and 2) to have more severe outcomes to their illness. This was demonstrated by the finding that a proportion that settled with self-remedy ($x^2 = 0.73, df = 1, NS$), who saw a doctor while abroad ($x^2 = 0.06, df = 1, NS$), or who saw a GP on return ($x^2 = 0.34, df = 1, NS$).

The remaining results relate to 601 travelers, as they exclude 50 patients over 65 years old who were not asked specifically about pretravel health advice, vaccination uptake, or travel insurance cover. Travelers to Africa or Asia (Group 3) were more likely to seek pretravel advice (68%) compared to those traveling to destinations perceived as having less risk (14%) ($x^2 = 112.45, df = 1, p < .0001$). Seventy-two percent of those who sought pretravel advice ($x^2 = 189.98, df = 1, p < .0001$).

The travelers who sought pretravel advice (apart from the travel clinic) were more likely to have had vaccinations ($x^2 = 19.08, df = 1, p < .001$) and were more likely to carry medicine while abroad ($x^2 = 27.99, df = 1, p < .0001$). The sources of travel advice quoted were GP, travel agent, or other (included were books, leaflets, and pharmacists). Those that had received pretravel advice from a GP were more likely to receive a vaccination ($x^2 = 8.33, df = 1, p < .005$) and to carry medication ($x^2 = 6.12, df = 1, p < .01$) than those who had received advice from another source. However, of all 123 individuals who had received some form of travel advice, a higher proportion became ill while abroad compared to those that sought no advice ($x^2 = 13.23, df = 1, p < .005$), despite there being an overall increase in use of vaccination and carriage of medication in this group.

Seventy-three percent of those who sought pretravel advice carried medication compared to 46% of those who had received no pretravel advice. The most common medication carried was antidiarrheals, which were carried by 56% of those that were equipped with medication. Fifty-two percent of people carried analgesics.

### Table 2 Travel and Illness-Related Characteristics of General Practice Patient Sample by Destination

<table>
<thead>
<tr>
<th>Destination</th>
<th>1 and 2 (%)</th>
<th>Destination</th>
<th>3 (%)</th>
<th>Total (%)</th>
<th>p &lt;</th>
</tr>
</thead>
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<tr>
<td>Illness abroad</td>
<td>Y 211 (37)</td>
<td>60 (68)</td>
<td>271 .0001</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>N 352 (63)</td>
<td>28 (32)</td>
<td>380</td>
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<td></td>
<td>563</td>
<td>88</td>
<td>651</td>
<td></td>
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<tr>
<td>Settled no treatment</td>
<td>Y 44 (21)</td>
<td>9 (15)</td>
<td>53 NS</td>
<td></td>
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<tr>
<td></td>
<td>N 167 (79)</td>
<td>51 (85)</td>
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<td></td>
</tr>
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<td>211</td>
<td>60</td>
<td>271</td>
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<tr>
<td>Settled self-remedy</td>
<td>Y 42 (20)</td>
<td>15 (25)</td>
<td>57 NS</td>
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<td></td>
<td>N 169 (80)</td>
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<td>211</td>
<td>60</td>
<td>271</td>
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<tr>
<td>Saw doctor abroad</td>
<td>Y 57 (27)</td>
<td>15 (25)</td>
<td>72</td>
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<tr>
<td></td>
<td>N 154 (73)</td>
<td>45 (75)</td>
<td>199 NS</td>
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<td>211</td>
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<td>271</td>
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<tr>
<td>Saw GP on return</td>
<td>Y 100 (47)</td>
<td>31 (52)</td>
<td>131 NS</td>
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<td></td>
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<td>60</td>
<td>271</td>
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<tr>
<td>Pretravel advice</td>
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<td></td>
<td>N 460 (86)</td>
<td>23 (32)</td>
<td>483 .0001</td>
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<tr>
<td></td>
<td>534</td>
<td>71</td>
<td>603</td>
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<tr>
<td>Vaccination</td>
<td>Y 47 (9)</td>
<td>53 (73)</td>
<td>100 .0001</td>
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<tr>
<td></td>
<td>N 487 (91)</td>
<td>20 (27)</td>
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<td>534</td>
<td>73</td>
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### Population Attending Travel Clinic

The first 100 people attending the clinic completed a pretravel questionnaire. A total of 76 out of 100 travel clinic attendees completed both questionnaires. This response rate of 76% was achieved after two written reminders to secure post-holiday returns.

A comparison group of 76 age- and sex-matched individuals was selected at random from the 651 travelers who had not attended the clinic. This enabled a comparison to be made with a more accurately
matched population as well as with the larger population of 651 individuals.

**Destination:** Of the 76 clinic attendees, 50 (66%) were traveling to either mainland Africa or Asia, areas associated with a higher risk of illness. This compares to 25 (32%) of the 76 age- and sex-matched comparison group and 88 (13.5%) of the general practice population traveling to similar destinations. Clinic attendees were therefore more likely to travel to destinations associated with higher risks of illness than age- and sex-matched comparisons ($x^2 = 16.45, df = 1, p < .0001$).

**Illness:** Seventeen (22%) of the clinic attendees reported illness while abroad, compared to 31 (41%) in the age- and sex-matched population who did not attend the clinic. This compares to 42% overall incidence of illness among the 651 travelers in the general practice population. The clinic attendees were therefore less likely to succumb to illness than the comparison group ($x^2 = 5.9, df = 1, p < .05$).

**Carriage of Medication:** Fifty-nine (78%) clinic attendees carried medication for self-remedy while abroad, whereas 31 (43%) of the comparison group did likewise. Of those clinic attendees who had traveled abroad in the year previous to the clinic (i.e., previous travel without pretravel advice) ($n = 54$), 32 (59%) had carried medication. This shows that clinic attendees were more likely than before to carry medication ($x^2 = 5.07, p < .05$). Also, clinic attendees were more likely to carry medication while abroad than a comparison group ($x^2 = 21.36, df = 1, p < .001$).

**Vaccinations:** Following attendance at the travel clinic, the uptake of vaccinations increased when a comparison was made between the 76 travelers from the clinic population and the 54 who had traveled in the previous year before clinic attendance ($x^2 = 64.1, p > .0001$). The clinic attendees were also more likely to receive vaccination than the comparison group of travelers ($x^2 = 65.9, df = 1, p < .001$).

**Illness Outcomes:** Those travel clinic attendees who became ill were more likely than comparison groups to resolve the illness by self medication ($x^2 = 9.87, df = 1, p < .002$). This is perhaps reflected by the fact that the travel clinic attendees were less likely to seek the advice of a doctor while abroad ($x^2 = 5.99, p < .02$) compared to the comparison group and were less likely than comparisons to seek further advice from their General Practitioner.

**Discussion**

It could be argued that the population studied (i.e., all those attending a general practice surgery) is not entirely representative of the general population and could have a higher incidence of illness associated with travel than the general population. However, people attend their family doctor for many reasons, by no means do all visits relate to ill-health, and the authors feel that this population is as close to the general population as could possibly be studied in that 20% of each sex and age range was represented. The problems of memory recall inherent in a retrospective study were probably minimal in the areas specifically relating to illness experienced, as any disturbance to the enjoyment of a vacation would be expected to be clearly remembered. The authors accept that smaller details, such as which vaccines were taken and which medications were carried, could suffer from recall difficulties.

The overall incidence of illness in the practice population of 42% is close to that reported by Reid et al (36%)\(^5\) and McEwan and Jackson (41%).\(^6\) Those attending the travel clinic appear to have a significantly lower rate of illness while abroad compared to both the larger practice population and the age- and sex-matched comparison group. This lower rate of illness was all the more interesting as the predominant destinations of the travel clinic attendees are associated with a higher risk of illness in the general practice population. In the practice population, as in other studies,\(^4\) travelers who take pretravel advice are associated with a higher incidence of illness compared to those that take no pretravel advice. This could partly be explained by the fact that travelers visiting areas associated with higher risks of illness were shown to be more likely to request pretravel advice than those visiting destinations traditionally associated with a lower risk of illness. The findings in relation to the travel clinic clearly show the opposite is possible. This is demonstrated in this population having a reduced incidence of illness. This may be explained by the quality of advice given in a dedicated travel clinic compared to that given by brochures, travel agents, and even doctors, as was outlined in the introduction. However, there may have been differences in the motivation and self-discipline of clinic attendees, and it is possible that more experienced travelers, who are associated with a lower incidence of travel induced diarrhea,\(^4\) tended to make use of the clinic. It is also possible that clinic attendees were more likely to comply with advice as they were aware that they were likely to be questioned about their behavior on return.

In the practice population, it was shown that those who attended a doctor for advice prior to travel were more likely to receive vaccination or carry medication than those who had received advice from other sources. This may just reflect the fact that the doctor is the only point of contact for vaccinations and
prescription medication, but it could also relate to the quality and completeness of advice given by doctors compared to nonmedical sources.

Despite the increased incidence of illness shown to be associated with travel to mainland Africa or Asia, episodes of illness contracted in these destinations were not shown to need more intervention than those contracted in destinations associated with less risk. Those attending the travel clinic were shown to be more likely to settle an episode of illness with self medication when compared to the comparison group, which may well explain why fewer travel clinic attendees required the services of a doctor while abroad. It may be that pretravel education, resulting in an increased awareness of illness abroad and an increased carriage of medication, has a direct effect on the traveler. These travelers may be less likely to contract an illness in the first place, and if they do contract an illness, they may manage the illness more effectively.

Cossar et al. states that 5% of travelers who became ill while abroad needed to see their own doctor on return, which contrasts greatly with the 48% of ill travelers in this survey who needed to see their own GP. However, Cossar admits that the outcome of illness was known in only 61% of those studied. This study appears more in line with the figures of McIntosh et al. who found that 58% of the over 65s needed to see a GP on return if they had suffered illness while abroad.

Our results suggest that the workload on general practice generated by returning-ill travelers is greater than previously reported, with approximately 1 in 5 of all travelers not attending the travel clinic returning to see their GP after a holiday. These estimates of the workload on general practice are likely to be a more accurate appraisal of the situation as the figures were drawn from a primary care setting. Other authors have to date been unable to obtain the degree of follow up required to comment accurately upon the extent of primary care follow up required for returning travelers.

The travel clinic appears to have had an impact on the amount of the “returning ill”, with only 4% of those attending requiring to see their GP on return. However, the numbers are small, and further study would be required to establish whether this trend continues with further use of the travel clinic.

From the data collected, it appears that mainland Africa and Asia can be justifiably regarded as “high risk” destinations for illness. The illness incidence in these destinations is almost double that of the Mediterranean islands, Europe, America, and Australasia. This finding supports previously published work. Cossar and Reid, in a cumulative 10-year study from 1977, found that the risk of illness did increase the further south traveled, but they had few figures for illness rates in Northern Europe, United States, and Australasia for any comparison to be made. This lack of difference in illness rates between northern and southern Europe may be a reflection of greater general awareness of health risks in recent travelers or of improvements in sanitation in southern Europe over the past 5–10 years.

Travelers who visited Africa and Asia were shown to be more likely to seek pretravel advice, and the travel clinic data supported this finding as it catered to a very high proportion of people intending travel to high risk destinations. It seems reasonable to suggest that the relatively small proportion of travelers visiting these destinations could be targeted for specific pretravel advice, as there appeared to a significant reduction in the incidence of illness encountered by those who had attended the clinic. It is possible that this reduction in illness related to the increased uptake of vaccination or that the simple advice sheets had an impact on behavior while abroad. It is unclear whether the benefits accrued by these “high-risk” travelers could be transferred to the bulk of travelers visiting lower risk destinations, but further study should be pursued.

References


The Cathedral, Guadalajara, Mexico (Submitted by Charles D. Ericsson, MD)