Better Late Than Never - An Analysis of Last-Minute Travelers Attending a Specialist Travel Medicine Clinic in Ireland

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Abstract

Introduction: Last-minute travelers (LMTs) are a vulnerable group, because it may not be possible to adequately vaccinate them against exposure to infectious diseases. The purpose of this retrospective cross-sectional study was to describe the characteristics of LMTs attending a travel health clinic.

Methods: The following data was extracted from records of travelers attending the Tropical Medical Bureau (Galway, Ireland) over a 6-year period with less than 2 weeks remaining before their departure: gender, age, occupation, destination(s), purpose of travel, departure date, travel duration, travel group size, accommodation, past medical history, medications, and vaccination history.

Results: Of 7555 traveler records, 1296 (17.2%) were of LMTs, of whom 45 (3.5%) were recurrent LMTs. LMTs were equally likely to be male or female. The mean age of this cohort was 32.2 years. The most common travel destination was Asia, and holiday was the most frequent purpose of travel. The mean interval before departure was 7.54 ± 3.65 days, and the mean travel duration was 7.36 ± 2.3 weeks. The majority (n=454, 35.1%) of LMTs traveled in pairs. Approximately 2 in 5 (n=497, 38.4%) travelers reported a past medical history; over half (n=674, 52.0%) had previously received travel vaccinations. The majority (n=1202, 92.8%) of LMTs were unable to complete a scheduled course of pre-travel vaccines.

Conclusion: This study provides insight into the characteristics and travel patterns of LMTs. A large proportion of LMTs have pre-existing medical conditions. Further research should focus on the travel health risk-taking behavior of these individuals.

Keywords: Travel, Travel Medicine, Vaccination, Chronic Illness

offer other elements of pre-travel health counseling which form part of a normal personalized pre-travel risk assessment as a result of traveler uncertainty about the itinerary. Limited knowledge exists about their demographic characteristics and the features of their planned trips. LMTs comprised 16% of all travelers presenting to a network of US clinical practices over a 6-year period. Knowledge of these factors may enable travel medicine practitioners to design strategies to promote earlier pre-travel care and to better anticipate the needs of LMTs attending their clinics. This is among the first studies to analyze LMT patterns in clinical practice and the first to be conducted outside the United States.

Methods
A retrospective cross-sectional study was performed. Paper records of all travelers attending the Tropical Medical Bureau in Galway, Ireland (2013-2018) with less than 2 weeks remaining before departure were retrieved and interrogated. This clinic specializes in travel medicine with a focus on the pre-travel health preparation of travelers of all ages, many with complex itineraries and medical histories. While the majority of individuals self-refer to the clinic, they may also be referred by their general practitioner. Each individual traveler is allotted 20 minutes for a consultation. The time is increased to 30 minutes and above for a pair or group of travelers, depending on the complexity of their planned trip.

The clinic is staffed by multiple physicians with training in travel medicine. Vaccines are administered by specialist travel health nurses, and pre-travel advice is typically reinforced by the nursing staff on subsequent clinic visits when the traveler returns for booster vaccine doses. Approximately 1200 travelers attend the clinic each year. They complete a traveler registration card prior to their medical consultation, and data from that card is entered by the physician into an electronic health record. The travelers’ most recent clinic visit is linked to all of his previous consultations at this clinic. A printout of the electronic health record based on the consultation also accompanies each traveler’s record card and provides information on which vaccines, if any, were administered to the LMT.

The following anonymized data was extracted and entered into a database created in Microsoft Excel 2013: gender, age, occupation, destination(s), purpose of travel, departure date, travel duration, travel group size, accommodation, past medical history, medications, and travel vaccination history. Data was summarized as percentages and means with standard deviations for the purposes of descriptive analysis. This study satisfied the requirements of the local clinical research ethics committee.

Results
Of 7555 traveler records examined, 1296 (17.2%) were LMTs, of whom 45 (3.5%) were recurrent LMTs. The characteristics of the recurrent LMTs are summarized in Table 1. Of all the LMTs, 614 (8.1% of total number of travelers) were traveling within 7 days or less. LMTs were equally likely to be male (n = 655) or female (n = 641). The mean age of LMTs was 32.2 (+/- 13.8) years. Students (n = 261, 20.1%) and professionals (n = 269, 20.8%) comprised similar proportions of the overall group of LMTs. The remaining travelers belonged to other occupational groups, were unemployed or retired, but this data was not specifically captured in this study.

The most common travel destination was Asia (Figure 1). Holiday (n = 991, 76.5%) was the most frequent purpose of travel, but 15.8% (n = 205) of LMTs were engaged in business travel. The majority of LMTs planned to stay in hotel accommodations (n = 975, 75.2%), with 19.8% of LMTs (n = 256) staying in hostels and 1.5% (n = 19) exclusively camping on their upcoming trip. The mean interval before departure was 7.54 (+/- 3.65) days, and the mean travel duration was 7.36 (+/- 2.3) weeks. The majority (n = 454, 35.1%) traveled in pairs. The total annual number of LMTs peaked in 2016 with 308 travelers (Figure 2). The months with the highest incidence of LMTs (Figure 3) were June (n = 171), July (n = 153), and August (n = 116). A total of 497 (38.4%)
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travelers reported a past medical history (Table 2). The most commonly documented medical conditions were hay fever (n = 170), insect bite sensitivity (n = 104), cardiovascular disease (n = 95), respiratory disease (n = 91), and allergies (n = 70).

A total of 674 (52.0%) travelers had received previous travel vaccinations. Of the 1258 LMTS who were prescribed at least one travel vaccine at their most recent consultation, the vast majority (n = 1165, 92.6%) received single dose vaccines. Of the 528 LMTs planning to visit yellow fever-endemic countries, 231 (43.8%) were administered a yellow fever vaccine at the clinic. No data was recorded in relation to the requirement by International Health Regulations for yellow fever vaccine for the LMTs’ current trip. The vast majority (n = 1202, 92.8%) of LMTs were unable to receive a course of travel vaccines at their index consultation, because the time remaining before their planned departure date was insufficient.

Discussion

The current study focused on the characteristics of LMTs who referred to the clinic for a pre-travel health consultation with less than 2 weeks remaining before their departure date. Over 1 in 6 travelers at the clinic satisfied the criteria for last-minute travel, with just under 1 in 25 of these travelers having attended the clinic previously as an LMT. The Global TravEpiNet Consortium studied this phenomenon across their diverse network of clinics in the USA and reported a prevalence of last-minute travel of 16% using the definition of 7 days or fewer. Applying this definition to the sample in the current study, a lower prevalence of 8.1% was recorded. It would be of interest to investigate the occurrence of last-minute travel among general practices in Ireland, as this may differ from that observed in the specialist travel health clinic setting.

The motivation LMTs is likely to vary across different clinical practices. Clinics who advise a higher proportion of humanitarian aid workers or business travelers, for example, may expect to encounter more LMTs, as these individuals are often deployed to their destinations on shorter notice. The Global TravEpiNet Consortium showed a higher prevalence of last-minute travel among business and VFR travelers, while 3 in 4 of the LMTs in the current study were traveling for leisure purposes. Some recreational travelers may book holidays at short notice to avail themselves of last-minute commercial deals, and employees may not be able to confirm their annual leave with sufficient advance notice to enable earlier travel planning. With the greater use of self-booked travel using commercial websites rather than travel agents, the modern traveler may not benefit from the prompts which travel agents are more likely to provide in relation to pre-travel health care.

Student travelers were well represented in the current sample. They may be subject to restrictions on clinic attendance due to learning placements and examination schedules, making last-minute travel more likely. Students are a vulnerable group of often inexperienced travelers who may be less risk averse and more adventurous and whose study abroad activities may expose them to significant infectious risks.

Despite a mean interval before departure of just over a week in the present study, the LMTs were planning to stay for an average of nearly two months at their destination. This is in accordance with the findings of the American study which found that LMTs were more likely than non-LMTs to

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>No. (%)</th>
</tr>
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<tbody>
<tr>
<td>Hay fever</td>
<td>170 (13.1)</td>
</tr>
<tr>
<td>Insect bite sensitivity</td>
<td>104 (8.0)</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>95 (7.3)</td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>91 (7.0)</td>
</tr>
<tr>
<td>Allergies</td>
<td>70 (5.4)</td>
</tr>
<tr>
<td>Photosensitivity</td>
<td>38 (2.9)</td>
</tr>
<tr>
<td>Psychiatric disorder</td>
<td>18 (1.4)</td>
</tr>
<tr>
<td>Infectious jaundice</td>
<td>16 (1.2)</td>
</tr>
<tr>
<td>Previous surgery</td>
<td>10 (0.8)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>10 (0.8)</td>
</tr>
<tr>
<td>Thyroid disease</td>
<td>9 (0.7)</td>
</tr>
<tr>
<td>Neurological disorder</td>
<td>9 (0.7)</td>
</tr>
<tr>
<td>Skin condition</td>
<td>8 (0.6)</td>
</tr>
<tr>
<td>Gastrointestinal disease</td>
<td>7 (0.5)</td>
</tr>
<tr>
<td>Reproductive problems</td>
<td>5 (0.4)</td>
</tr>
<tr>
<td>Musculoskeletal condition</td>
<td>4 (0.3)</td>
</tr>
<tr>
<td>Ear, nose and throat disease</td>
<td>2 (0.2)</td>
</tr>
</tbody>
</table>
spend at least one month overseas. This extended exposure to destination travel health risks is of concern, given that LMTs may not be able to benefit from full protection against vaccine-preventable tropical infectious diseases. Most of the LMTs in the present study did not have a recurrent pattern in the studied clinic of last-minute travel, but analysis of this subgroup provided interesting observations. Recurrent LMTs in this study were more likely to be middle-aged males traveling to Africa for a holiday. Given the burden of health risks associated with travel to sub-Saharan Africa and the requirement in some African countries for evidence of Yellow Fever vaccine having been administered at least 10 days prior to arrival, even if traveling from non-endemic countries, this finding was unexpected. One approach to recurrent last-minute travel is to offer pre-emptive travel vaccinations to protect travelers against anticipated exposures during future trips. Some travelers may present as LMTs because they have previously received travel vaccines. In the current study, just over half of the LMTs had evidence of previous travel vaccines. Although it was not possible to record this data, it could be that these previous vaccines no longer provided cover if booster doses had not been received. In some cases, the traveler may have been under the false impression that having already received single dose vaccines appropriately for a previous trip, courses of vaccines against hepatitis B, rabies, and Japanese encephalitis were not indicated for the current trip. One of the authors (GTF) routinely counsels travelers to attend future pre-travel consultations with at least 4–6 weeks remaining before departure in order to allow enough time for protective immunity to develop from the primary administration of single dose vaccines and from a series of vaccines. This study was not designed to capture the individualized decision-making that applied in each consultation. It is conceivable that some LMTs appropriately attended with as little as a week or 2 remaining before departure, having been informed that only a booster dose of the hepatitis A or typhoid vaccine, for example, was recommended for their index trip. Travel medicine research has already embraced an intriguing era of vaccinomics where, based on an individual traveler’s specific genetic susceptibility to infectious diseases, some vaccines may be withheld if booster doses had not been received. In some cases, just over half of the LMTs had evidence of previous travel vaccines. Although it was not possible to record this data, it could be that these previous vaccines no longer provided cover if booster doses had not been received. 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challenge of leaving enough time to allow adjustments to their management to take effect and for identifying reliable sources of competent medical care before they travel abroad. LMTs with chronic conditions, those who are taking regular medications, and those who have complex itineraries involving exposure to high altitudes may not have adequate time to take a test dose of acetazolamide for prophylaxis of high-altitude illness, for example.20

In the clinic in this study, booster doses of vaccines are administered by a travel health nurse who reinforces the travel health advice given at the medical consultation. The LMT cannot benefit from this opportunity. A previous study of rabies prevention advice highlighted the rapid decay of information received at the initial consultation.21 This has implications for medication compliance and travel risk behaviors in LMTs.

Limitations of Study
This retrospective study is limited by its design. A future prospective study would be desirable. The researchers were constrained by the data included on the travel vaccination records, and the reasoning behind individual vaccine choices could not be captured. In the absence of reliable annual clinic attendance data, the researchers were unable to interpret the longitudinal trends in LMTs attending the studied clinic. Moreover, there was no intention to compare the non-LMTs with the LMTs in this study. A comparison may have yielded valuable additional information. Last-minute travel has been a neglected topic in the travel medicine literature despite being included in the ISTM Body of Knowledge.22 Future research should investigate the rationale and motivation of last-minute travel in an attempt to better understand the phenomenon and to design strategies which would discourage last-minute travel in a targeted campaign. Web-based travel companies should routinely remind clients at the time of booking to arrange a pre-travel health consultation and leave adequate time to complete all recommended and required vaccines.

Conclusion
In conclusion, LMTs are a vulnerable group who are at increased risk of vaccine-preventable diseases if they have insufficient time to develop protective immunity and, in particular, if they are unable to complete a vaccine series prior to travel. The current findings suggest that LMTs often have chronic medical conditions and embark on holidays of moderate duration to high-risk destinations, despite presenting late for pre-travel consultations. This study provides an insight into the characteristics and travel patterns of LMTs. The findings may help efforts to access travelers who might otherwise be unable to complete courses of travel vaccinations for diseases including hepatitis B, rabies, and Japanese encephalitis. Further research should focus on the travel health risk-taking behavior of these individuals.

Authors’ Contributions
GTF conceived the study in collaboration with LHS. GTF was responsible for the study design. MHH and GTF completed the data collection. Data interpretation and analysis was conducted by GTF and MHH with input from LHS. GTF prepared the first draft of the manuscript which was reviewed for significant intellectual content by MHH and LHS. All authors read and approved the final version of the manuscript.

Conflict of Interest Disclosures
The authors declare no conflicts of interest.

Ethical Approval
The protocol for this study was approved by the Research Ethics Joint Committee of the International Medical University, Kuala Lumpur, Malaysia.

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References


