MAJOR ARTICLE

Respiratory Tract Infections in Travelers: A Review of the GeoSentinel Surveillance Network

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Respiratory tract infections are common in travelers, and improving our knowledge of risk factors associated with specific types of respiratory infections should enable implementation of better preventive strategies. Data collected by the GeoSentinel surveillance network were analyzed, and the most significant predictors for developing specific categories of respiratory infections while abroad were age, sex, season of travel, trip duration, and reason for travel. In particular, influenza was associated with travel to the Northern Hemisphere during the period of December through February, travel involving visits to friends or relatives, and trip duration of >30 days. Lower respiratory tract infections were associated with male sex and increasing age. Knowledge of the respiratory tract infections that occur in specific groups of travelers allows for the development of targeted pretravel preventive strategies to high-risk groups.

It is estimated that >600 million people travel annually and that 15%–50% of travelers experience a health problem related to overseas travel [1–4]. Respiratory tract infections are the second most common cause of illness in travelers and of fever in returned travelers [5, 6].

Data accumulated from several geographically distinct sites, such as data collected by the GeoSentinel surveillance network, provide a global perspective on the spectrum and relative frequency of respiratory infections encountered during travel. GeoSentinel is a global surveillance network that was established in 1995 through the International Society for Travel Medicine (Stone Mountain, Georgia) and the Centers for Disease Control and Prevention (CDC; Atlanta) and that comprises 25 globally dispersed sentinel clinics [7]. GeoSentinel can be used to ascertain risk factors for diseases among travelers, to monitor geographic and temporal trends in infectious diseases globally, and to enable the early detection of infectious disease outbreaks [7]. We examined the GeoSentinel database to ascertain the relative frequency of respiratory tract infections in travelers and determine demographic features and travel characteristics associated with acquisition of specific infections.

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METHODS

Data Source

Demographic data (age, sex, birth country, country of residence, and country of current citizenship), travel history (countries visited in the 6 months before presentation and corresponding dates, plus a record of all countries visited in the 5 years before presentation), clinical symptoms, and diagnostic information are collected about patients who present to GeoSentinel sites and are faxed to the central site at the CDC in Atlanta. Data regarding patient classification, reason for most recent travel, major complaint(s), inpatient or outpatient status, and a pretravel encounter with a health care provider are recorded. Working and final diagnoses are assigned, and information is entered anonymously into an Access database (Microsoft).

Inclusion Criteria

To be eligible, patients must have crossed an international border ⩽10 years before presentation and to have been seeking medical advice for a presumed travel-related illness. Relevant travel details focused only on data from the 6 months before presentation.

Data entered into the GeoSentinel database from November 1997 through September 2001 were examined. Information about persons who had been assigned ⩾1 of 20 specific codes corresponding to respiratory tract infection was extracted and dichotomized into illnesses affecting the upper versus lower respiratory tract.

Upper respiratory tract infection included acute or chronic sinusitis, acute otitis media, pharyngitis (streptococcal, nonstreptococcal, or unspecified), tonsillitis or peritonsillar abscess, pertussis, and nonspecific upper respiratory infection. Lower respiratory tract infection included acute or chronic bronchitis, influenza (A, B, or unspecified), pneumonia (atypical/diffuse, bacterial/lobar, or acute respiratory distress syndrome), legionnaires disease, and pleurisy. Tuberculosis was not included.

Definitions and Groupings

Patient classifications. Patients were classified as "immigrants or refugees," "foreign visitors," "urban expatriates," "nonurban expatriates," "students," "military personnel," or "travelers." A person who traveled overseas and presented to a GeoSentinel site in his or her country of residence on return was classified as a "traveler." In contrast, a nonresident who visited a GeoSentinel site during his or her trip was referred to as a "foreign visitor."

Reason for most recent travel. The reasons for most recent travel included immigration, tourism, business, research or education, missionary or volunteer work, visit to friends or relatives, and expatriation. For this analysis, the classification was simplified into 4 categories: tourism, business travel, visit to friends or relatives, and "other," and each of the first 3 categories was compared separately with the "other" category.

Diagnoses. For crude and adjusted analyses, the diagnostic classifications analyzed included all types of pharyngitis, streptococcal pharyngitis, sinusitis or otitis, all upper respiratory tract infections, pneumonia, influenza, bronchitis, and all lower respiratory tract infections. Some persons received >1 diagnosis.

Regions. Individual countries are listed for birth country, country of current residence, and destination. Countries were then assigned to 1 of 9 regional classifications: North America/Canada, Latin America (Central and South America), Caribbean, Europe, Australasia (Australia, New Zealand, and the Pacific), Central Asia/Indian subcontinent, Southeast Asia, Middle East, or Africa.

Timing and duration of travel. For crude and adjusted ORs, duration was dichotomized into travel with a long duration of >30 days versus travel for ⩽30 days. The relative frequency of infections, according to the timing and season of travel, was analyzed according to the hemisphere of acquisition. Persons who lived in the Northern Hemisphere, who were reported by a GeoSentinel site in the Northern Hemisphere, and who had traveled only to countries in the Northern Hemisphere were assumed to have acquired their infection in the Northern Hemisphere. The same criteria were used for determining acquisition of infection in the Southern Hemisphere. For persons who traveled to countries in both hemispheres or who resided and/or presented to a clinic in the hemisphere opposite from their travel destination, the site of infection acquisition was deemed indeterminable.

Statistical Analysis

The relative frequency of selected types of respiratory tract infections and the associations between specific diagnoses and patients' demographic and itinerary characteristics were analyzed with SAS, version 8 (SAS Institute). Statistical significance for crude analysis of dichotomous variables was determined by use of χ^2 tests with calculation of ORs and 95% CIs. Crude ORs of categorical and continuous variables were calculated by logistic regression. Independent factors found to be significant for ⩾1 diagnostic outcome on crude analysis were subsequently included in multivariable logistic regression analyses. Tests for confounding and colinearity were done whenever crude and adjusted OR results were disparate. Confounding was identified by looking for a >10% change in the β estimate when variables were individually added into the model, and colinearity was identified by looking for a change in the SE.

RESULTS

A respiratory tract infection was diagnosed in 1719 persons who presented to a GeoSentinel site during the period of September 1997 through August 2001 (48 months) out of a total of 21,960 patient entries. Respiratory tract infections accounted for 7.8% of all infections in returned travelers reported to GeoSentinel.

Of the patients who had complete demographic data entered, 830 were male and 874 were female. The mean age of the patients was 34.2 years (range, 0–95 years).

The majority of respiratory infections were reported by the GeoSentinel site in Nepal (1100 cases [64%]). Two hundred sixty-one cases (15.2%) were reported from Germany, 115 (6.7%) were reported from the United States, 94 (5.5%) were reported from Australia, 57 (3.3%) were reported from Italy, 37 (2.2%) were reported from Switzerland, 32 (1.9%) were reported from Canada, 14 (0.8%) were reported from Israel, 5 (0.3%) were reported from the United Kingdom, and 4 (0.2%) were reported from New Zealand. The number of persons with a respiratory diagnosis who fell into each of the different travel groups is shown in table 1.

Overall, 1100 patients had a final diagnosis consistent with an upper respiratory tract infection. Nonspecific upper respiratory infection was the most common diagnosis (812 patients [47.2%]), followed by pharyngitis (227 [13%]); 99 (44%) of the patients with pharyngitis had streptococcal pharyngitis. A lower respiratory tract infection was diagnosed in 680 returned travelers. Bronchitis was present in 349 individuals (20.3%), pneumonia was diagnosed in 232 patients (13.5%), and influenza was diagnosed in 96 patients (5.6%) (table 2).

The reporting of cases to GeoSentinel increased during the period from November 1997 to September 2001. As a consequence, 88% of cases were reported in the latter 2 years, resulting in an overall rate of 63.4 respiratory diagnoses per month during the period of September 1999 through August 2001. During this period, the highest rate of reporting of respiratory infections occurred during the months of November through April, with a peak in November (mean of 91 cases/month, representing 13.2% of all presentations to GeoSentinel), and the lowest rate was in July (mean of 23 cases/month, representing 5% of all presentations to GeoSentinel; figure 1). Almost 95% of reported infections were from GeoSentinel sites in the Northern Hemisphere. When the numbers of respiratory tract infections were examined according to the season of presentation, 233 presentations (13.6%) occurred during summer months, 504 (29.3%) occurred during autumn, 514 (30%) occurred during winter, and 463 (27%) occurred during spring. The majority of cases of pneumonia were reported during the months of November through April, with a peak in November. Influenza was most frequently reported during the period of November through February, with a peak in February (figure 1).

Increasing age was significantly associated with a greater risk of acquiring lower respiratory tract infection (bronchitis and pneumonia). In contrast, the risk of pharyngitis, streptococcal

Table 1. Patient classification and reason for most recent travel among patients reported in the GeoSentinel surveillance network database.

	No. (%) of patients		
Characteristic	Nepal site	Non-Nepal site	Total
Patient classification			
Immigrant or refugee	8 (0.7)	140 (22.6)	148 (8.6)
Foreign visitor	759 (69)	19 (3.1)	778 (45.3)
Expatriate			
Urban	283 (25.7)	24 (3.9)	307 (17.9)
Nonurban	10 (0.9)	11 (1.8)	21 (1.2)
Student	4 (0.4)	12 (1.9)	16 (0.93)
Traveler	35 (3.2)	402 (64.9)	437 (25.4)
Military	0 (0)	1 (0.2)	1 (0.06)
Data missing	1	10	11
Reason for recent travel			
Immigration	0 (0)	64 (10.3)	64 (3.7)
Tourism	624 (56.7)	342 (55.3)	966 (56.2)
Business	244 (22.2)	88 (14.2)	332 (19.3)
Research or education	44 (4)	7 (1.1)	51 (3)
Missionary or volunteer	44 (4)	31 (5)	75 (4.4)
Visiting friends or relatives	41 (3.7)	83 (13.4)	124 (7.2)
Expatriates with no travel in 6 months before presentation[a]	99 (9)	0 (0)	99 (5.8)
Data missing	4 (0.4)	4 (0.6)	8 (0.5)
Total	1100	619	1719

[a] Kathmandu clinic.

Table 2. Number of patients reported in the GeoSentinel surveillance network database, by respiratory diagnosis.

Diagnosis	No. (%) of patients	Age, mean years
URTI		
Sinusitis[a]	28 (1.6)	35.7
Acute otitis media	38 (2.2)	20.4
Pharyngitis	227 (13.2)	28.5
Tonsillitis or peritonsillar abscess	71 (4.1)	28.5
Pertussis	1 (0.06)	NS
Nonspecific URTI	812 (47.2)	32.1
Total for patients with ⩾1 URTI diagnosis	1110	31.4
LRTI		
Bronchitis[a]	349 (20.3)	39.4
Pneumonia	232 (13.5)	41.1
Influenza	96 (5.6)	30.7
Legionnaires disease	2 (0.12)	63
Pleurisy	14 (0.81)	34.9
Total for patients with ⩾1 LRTI diagnosis	680	38.7

NOTE. Some patients received >1 diagnosis, and a total of 1870 respiratory diagnoses were given to 1719 patients. A total of 1177 upper respiratory tract diagnoses were made among the 1110 patients with an upper respiratory tract infection (URTI). A total of 693 lower respiratory tract diagnoses were made among the 680 patients with a lower respiratory tract infection (LRTI). In addition, 71 patients had both URTIs and LRTIs diagnosed. NS, not stated.

[a] Acute or chronic.

pharyngitis, and sinusitis or otitis media was significantly greater in younger persons. Influenza was not significantly associated with age. Male sex was associated with a 2-fold-increased odds of pneumonia compared with that for female sex and a lower risk of upper respiratory tract infection (tables 3 and 4).

The duration of travel was recorded for 1742 trips. The mean duration was 70.4 days (median, 27.0 days; range, 0–2555 days). Compared with shorter trips, travel duration of >30 days was associated with an increased risk of influenza and lower respiratory tract infection. A significantly increased risk of pharyngitis for travel duration of >30 days was seen only on univariate analysis (table 3).

Persons visiting friends and relatives were ~6 times more likely to acquire influenza than were other groups of travelers (table 4). Business travel was associated with a greater risk of upper respiratory tract infection and a reduced risk of pneumonia. Tourists, business travelers, and persons visiting friends or relatives were less likely to present with streptococcal pharyngitis than were expatriates and other types of travelers.

To determine whether the risk of acquiring specific respiratory tract infections was associated with travel to different geographic regions, we examined patients' travel destinations within the 6 months before presentation. A total of 2284 regions were recorded for 1527 patients for whom travel destinations were known (table 5). On crude analysis, travel to Africa was associated with an increased risk of influenza (OR, 1.81; 95% CI, 1.04–3.14) compared with other types of respiratory infections. Travel to East Asia was associated with a significantly increased risk of acquiring an upper respiratory tract infection (OR, 1.26; 95% CI, 1.01–1.57), whereas persons who had visited Central Asia or the Indian subcontinent were more likely to have bronchitis (OR, 1.39; 95% CI, 1.11–1.72) or a lower respiratory tract infection (OR, 1.27; 95% CI, 1.06–1.53) diagnosed. However, destination lost statistical significance on multivariate analysis.

By examining the country of residence and reporting site in addition to destination, it could be definitively determined that 1171 infections were acquired in the Northern Hemisphere (figure 2). Only 19 cases of respiratory infection were definitely acquired in the Southern Hemisphere, so a pattern regarding diagnosis and timing of infection could not be identified among this group (529 cases were indeterminable).

For 1412 persons whose travel included countries in the Northern Hemisphere, travel during the winter months of December through February showed a significant association with acquisition of influenza (OR, 2.34; 95% CI, 1.48–3.69). Travel during the autumn months of September through November was significantly associated with acquisition of a lower respiratory tract infection (OR 1.43; 95% CI, 1.14–1.81) and bronchitis (OR 1.63; 95% CI, 1.25–2.13).

Diagnoses of pneumonia (OR, 9.92; 95% CI, 6.77–14.57), influenza (OR, 5.88; 95% CI, 3.60–9.59), and lower respiratory tract infection (OR, 6.49; 95% CI, 4.22–9.99) showed significant association with admission to hospital compared with other diagnostic categories. In contrast, compared with patients who had other types of respiratory infection, persons who had bronchitis (OR, 0.15; 95% CI, 0.06–0.37) or upper respiratory tract infection (OR, 0.13; 95% CI, 0.09–0.20) were less likely to be admitted to the hospital.

Nine hundred fifty-four patients (55.5%) had a pretravel encounter with a health care provider, whereas 500 did not. For the remaining 265 travelers, this information was unknown. After adjusting for age and sex, a pretravel encounter was not associated with reduction in risk of any type of respiratory tract infection (data not shown).

DISCUSSION

In this study, we examined the influence of demographic and travel-related factors on the type of respiratory tract infection seen among returned travelers who presented to GeoSentinel sites. We were unable to calculate the absolute risk of acquiring specific infections, because we do not know how many people traveled during the same time period without developing an

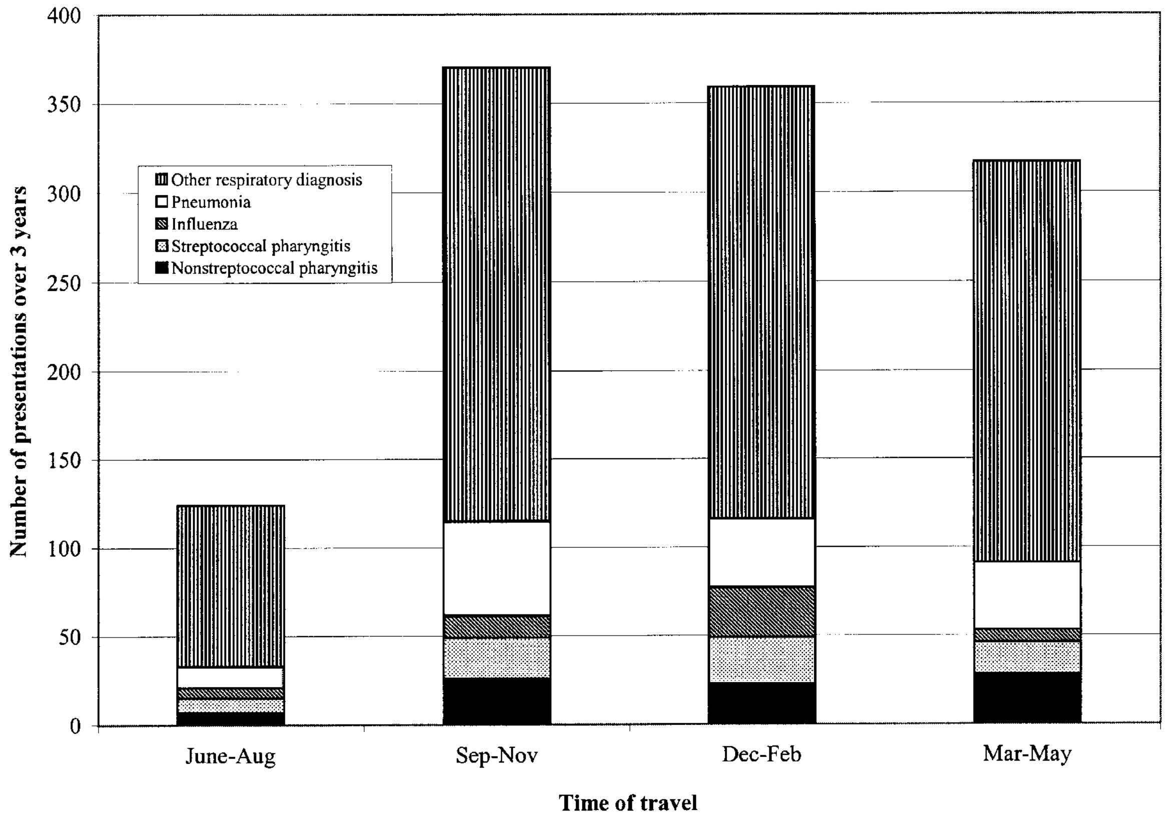

Figure 1. Number of presentations to GeoSentinel surveillance network clinics because of infections acquired in the Northern Hemisphere ($n = 1171$).

infection. The most significant predictors for developing specific respiratory infections were age, sex, trip duration, and type of traveler.

Acute respiratory tract infections have been reported to occur in 10%–20% of all travelers [4, 8–12], with rates as high as 1261 infections per 10^5 travelers for a 1-month stay in a developing country [3]. In outbreaks of infections on cruise ships, respiratory tract infections constitute the most common diagnosis [13]. The possible public health significance of imported infections includes the introduction and transmission of new strains of respiratory pathogens into susceptible populations on a traveler's return home [14].

Our results demonstrate that 7.8% of patients with data in the GeoSentinel network had a respiratory infection diagnosed. Previous studies have documented that respiratory tract symptoms occur in 26% of persons during travel and in 10% following travel [8] and that only 10%–20% of persons who become ill during travel seek medical advice [1, 12, 15]. As a consequence, it is likely that we have underestimated the number of travelers who developed a respiratory tract infection.

Almost two-thirds of the patients included in the study presented to the GeoSentinel clinic in Nepal. The clinic in Nepal sees a wide range of travelers, many of whom transit through other regions of Southeast Asia. The range of respiratory tract infections is thus representative of those encountered by travelers to Asia. As shown in table 1, the main difference in patient classification between persons presenting to the Nepal site and those seen elsewhere was that fewer of the Nepal group were classified as travelers (3% for Nepal group vs. 25% overall). Instead, a greater proportion were either expatriates (27% for Nepal group vs. 19% overall) or foreign visitors (69% for Nepal group vs. 45% overall). Table 1 also shows that the reason for recent travel was similar among patients presenting to the GeoSentinel site in Nepal or elsewhere, with tourism (56%) or business (19%) being the major reasons cited. Other characteristics of the Nepal and the "other" group were also similar, so it is unlikely that the large number of persons reported from the 1 site in Nepal significantly biased our results or explains the association we found between reason for travel and type of respiratory infection acquired.

Increasing age and male sex were associated with a greater risk of lower respiratory tract infection, particularly pneumonia and bronchitis. These results can be used to identify the group of travelers who would benefit most from antibiotics for prophylaxis or presumptive self-treatment.

Another notable finding was the significant influences of

Table 3. Findings of univariate analyses of types of respiratory infection, by demographic or travel characteristic.

	OR (95% CI)					
				Reason for travel		
Diagnosis	Age[a]	Sex[b]	Travel duration of >30 days	Tourism vs. other	Business vs. other	Visiting friends or relatives vs. other
Sinusitis/otitis	0.74 (0.63–0.86)[c]	0.66 (0.39–1.10)	1.28 (0.72–2.29)	0.37 (0.20–0.69)[c]	0.76 (0.38–1.52)	0.77 (0.30–1.98)
Pharyngitis	0.80 (0.73–0.87)[c]	0.84 (0.64–1.12)	1.57 (1.14–2.17)[c]	0.60 (0.42–0.86)[c]	0.75 (0.49–1.16)	0.53 (0.28–1.02)
Streptococcal pharyngitis	0.71 (0.62–0.80)[c]	0.89 (0.59–1.34)	1.80 (1.12–2.87)[c]	0.60 (0.36–0.99)[c]	0.67 (0.36–1.25)	0.37 (0.13–1.08)
URTI	0.77 (0.72–0.82)[c]	0.58 (0.47–0.71)[c]	0.95 (0.76–1.19)	1.05 (0.80–1.38)	1.47 (1.05–2.05)[c]	0.83 (0.54–1.27)
Bronchitis	1.24 (1.16–1.33)[c]	1.14 (0.90–1.44)	0.97 (0.74–1.26)	1.0 (0.73–1.38)	0.93 (0.63–1.37)	0.51 (0.28–0.95)[c]
Pneumonia	1.31 (1.21–1.41)[c]	1.95 (1.46–2.60)[c]	0.90 (0.65–1.24)	0.90 (0.62–1.29)	0.44 (0.26–0.74)[c]	1.34 (0.80–2.35)
Influenza	0.89 (0.78–1.00)	1.41 (0.93–2.15)	1.66 (1.04–2.64)[c]	1.13 (0.59–2.16)	1.64 (0.80–3.37)	3.67 (1.69–7.94)[c]
LRTI	1.29 (1.22–1.37)[c]	1.67 (1.37–2.03)[c]	1.08 (0.87–1.34)	0.98 (0.75–1.27)	0.72 (0.52–0.99)[c]	1.13 (0.74–1.74)

NOTE. LRTI, lower respiratory tract infection; other, immigration, research/education, missionary/volunteer, and expatriatism; URTI, upper respiratory tract infection.

[a] OR for age represents ratio associated with each 10-year increase in age. If the OR is >1, higher age represents increased risk.
[b] Male versus female.
[c] Statistically significant.

timing and reason for travel on the type of respiratory tract infection acquired, with travelers going to the Northern Hemisphere during the period of December through February being at greatest risk for influenza. Although our study had insufficient numbers for confirmation, we suspect similar benefit from vaccination of travelers to the Southern Hemisphere during the influenza season (June through August). In addition, persons visiting friends or relatives and those with a trip duration of >30 days were more likely to develop influenza than were other types of travelers. This is most likely to be the consequence of close contact between these travelers and the local populations.

Several outbreaks of influenza associated with travel have been reported previously [16–18]. Our results can be used to identify a specific group of travelers with a particularly high risk of developing influenza. Persons visiting friends or relatives and those planning to travel for >30 days are more likely to acquire influenza than are other persons. Therefore, these travelers should be specifically considered for pretravel influenza

Table 4. Adjusted ORs for types of respiratory infection, by demographic or travel characteristic.

	OR (95% CI)					
				Reason for travel		
Diagnosis	Age[a]	Sex[b]	Travel duration of >30 days	Tourism vs. other	Business vs. other	Visiting friends or relatives vs. other
Sinusitis/otitis	0.80 (0.66–0.96)[c]	0.59 (0.32–1.10)	1.08 (0.58–1.99)	0.44 (0.18–1.07)	0.89 (0.34–2.13)	0.92 (0.29–2.90)
Pharyngitis	0.75 (0.68–0.84)[c]	0.95 (0.68–1.34)	1.35 (0.96–1.90)	0.66 (0.40–1.11)	0.77 (0.43–1.39)	0.42 (0.19–0.98)[c]
Streptococcal pharyngitis	0.62 (0.52–0.73)[c]	0.94 (0.58–1.53)	1.37 (0.83–2.28)	0.50 (0.26–0.95)[c]	0.33 (0.15–0.76)[c]	0.19 (0.06–0.64)[c]
URTI	0.75 (0.70–0.81)[c]	0.60 (0.47–0.76)[c]	0.81 (0.64–1.04)	1.40 (0.92–2.12)	1.84 (1.14–3.00)[c]	0.93 (0.52–1.65)
Bronchitis	1.28 (1.17–1.38)[c]	1.06 (0.80–1.40)	1.06 (0.80–1.41)	0.61 (0.39–0.97)[c]	0.58 (0.34–0.98)	0.34 (0.16–0.73)[c]
Pneumonia	1.36 (1.23–1.51)[c]	2.0 (1.41–2.83)[c]	1.07 (0.76–1.52)	0.77 (0.41–1.43)	0.43 (0.20–0.90)[c]	1.20 (0.54–2.68)
Influenza	0.87 (0.75–1.00)	1.32 (0.81–2.15)	1.70 (1.04–2.78)[c]	1.98 (0.68–9.43)	3.06 (0.99–9.43)	6.11 (1.85–20.11)[c]
LRTI	1.33 (1.23–1.42)[c]	1.56 (1.24–1.96)[c]	1.27 (1.02–1.61)[c]	0.72 (0.48–1.08)	0.57 (0.36–0.90)[c]	0.93 (0.53–1.63)

NOTE. LRTI, lower respiratory tract infection; other, immigration, research/education, missionary/volunteer, and expatriatism; URTI, upper respiratory tract infection.

[a] OR for age represents ratio associated with each 10-year increase in age. If OR >1, higher age represents increased risk.
[b] Male versus female.
[c] Statistically significant.

Table 5. Number of patients in GeoSentinel surveillance network database who visited each region.

Region	No. of patients who visited region
North America/Canada	94
Latin America (Central and South America)	82
Caribbean	45
Europe	289
Australasia (Australia, New Zealand, and Pacific)	67
Central Asia/Indian subcontinent	925
Southeast Asia	529
Middle East	60
Africa	193
Total	2284

NOTE. Information regarding travel destinations was available for 1527 of 1719 patients. Many had traveled to >1 region.

vaccination, regardless of age, because this may significantly reduce morbidity associated with this infection [19]. In addition, vaccination may prevent travelers from becoming a source of infection for contacts on return [20, 21].

On multivariate analysis, we did not find a significant association between trip destination and acquisition of specific types of respiratory infection. This does not necessarily mean that no such relationship exists; a limitation of our study was that the exact place of exposure was unknown for most patients. The incubation period for most respiratory infections is generally up to 3 weeks, but for persons who had traveled to >1 region and whose trip spanned a period of >3 weeks, we were unable to separate those places visited during the 3 weeks before presentation from those visited in the prior 6 months. Therefore, by necessity, our analysis included all destinations visited in the 6 months before presentation, and this may have resulted in dilution of any true regional effect. It is also possible that, after adjustment for age, sex, trip duration, and reason for travel, our power to detect significant geographic associations was insufficient.

In conclusion, respiratory infections, such as pharyngitis, influenza, and pneumonia, are common in travelers. Among travelers with respiratory infections, age, sex, trip duration, and type of travel may help predict the type of infection acquired. Influenza vaccination should be considered for travelers, and the prompt institution of antibiotic therapy should be considered for older travelers who have a greater comparative risk of pneumonia. Further data collected by GeoSentinel may provide additional insights into groups who have particular risk factors for acquisition of specific diseases during travel and assist in formulating targeted preventative strategies for respiratory tract infections.

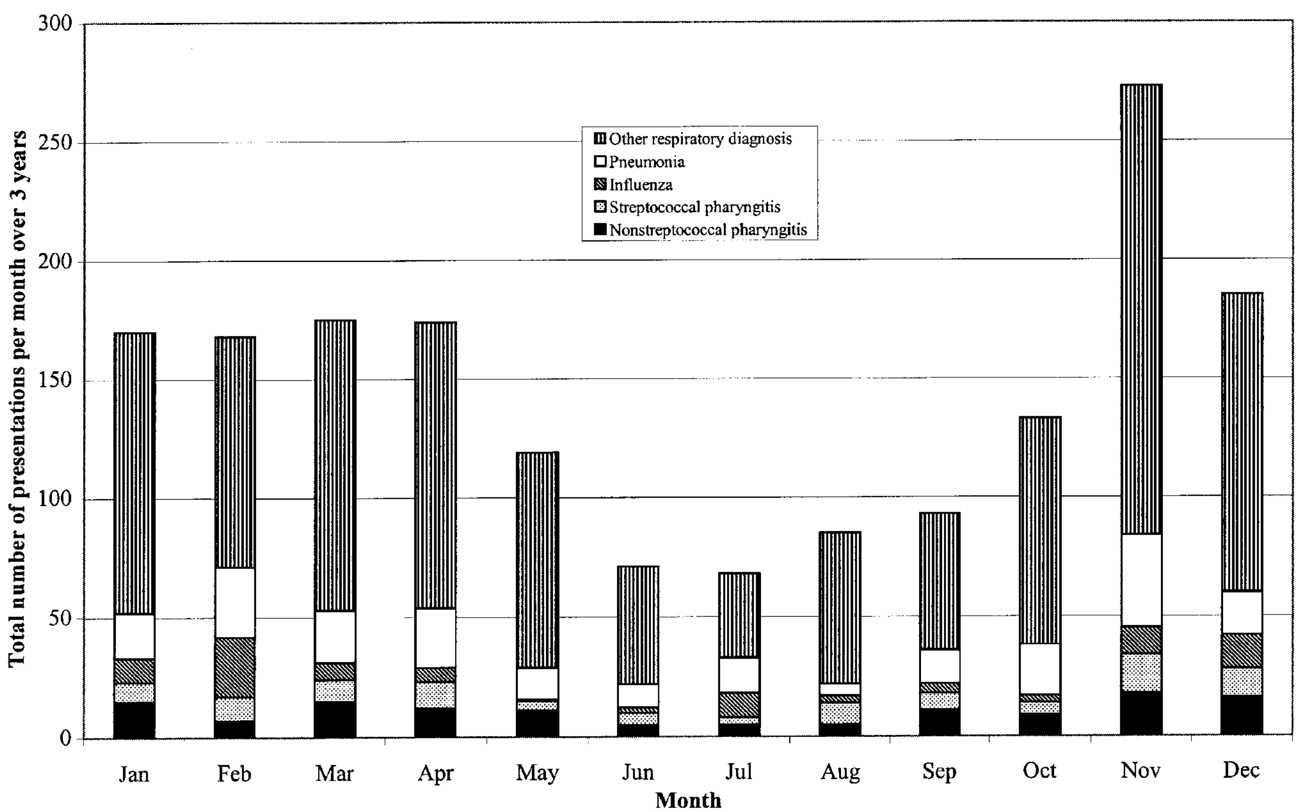

Figure 2. Number of presentations to GeoSentinel surveillance network clinics, by month of travel

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