

diagnosed as negative-smear/positive-culture encompassing respectively 35.4% (239/675) or 14.1% (12/85).

Conclusions: Foreign wives from endemic countries and their close contacts, had a relatively high TB risk. A regular annual TB screening for new-entrants within first-2-year from TB endemic regions is recommend, rather than being delayed until the application for citizenship. Reconsidering a more sensitive TB test could facilitate rapid diagnosis.

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**APTHC-0729
TRAVEL MEDICINE IN INDONESIA: A TIME FOR RE-APPRAISAL**

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Indonesia is a developing tropical country, which is considered as an exotic destination, yet possesses some health risks. The archipelago consists of >17,000 islands and spans 5120 km (west to east) and 1760 km (north to south). With around 237 million inhabitants, there were only about 7.5 million outbound travellers, but more than 240 million domestic travels.

More than 80% of outbound travel was to Malaysia or Singapore, which have no increased health risk. The most prominent travel risk figure is the Hajj pilgrimage to Saudi Arabia. Every year, >200,000 Indonesians go to Mecca. On average, there were 411 deaths between 2010 and 2012 Hajj season, mostly due to cardiovascular event and pneumonia.

Many Indonesians will travel to their hometown for celebrating holidays, especially around the Eid al-Fitr Festival, yearly. This kind of 'domestic' visiting friends and relatives (VFR) was associated with 3200 road accidents and 672 deaths, on average, between 2009 and 2012.

A dedicated pre-travel clinic is barely found in Indonesia. General practitioners and pediatricians provide routine childhood vaccinations. Indonesian adult immunization schedule includes more than a dozen vaccine products, including influenza, hepatitis A, and typhoid, the typical Western travel vaccines. Only port health officers authorize yellow fever and meningitis shots.

Most travel clinics are found in tourism areas providing only treatment for visitors.

To conclude, international travel health is increasingly an important issue. However, travel medicine in Indonesia was none close to the Western's type. Intra-regional travels to countries with similar health risk profile are probably safe and do not require special preventive measures. While being an endemic country for many vaccine-preventable diseases, many Indonesians are vaccinated without necessarily traveling anywhere. In this regards, the purpose of travel medicine should be re-evaluate and re-appraise to find their existence in Indonesia, or other developing countries as well.

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**APTHC-0781
CORRELATION BETWEEN MULTI-WAVE DENGUE OUTBREAKS AND CLIMATOLOGICAL EVENTS: A MODELING APPROACH**

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Objective of study

To ascertain the correlation between dengue outbreaks and climatological events, in particular relating to the occurrence of multi-wave outbreaks. The study will be illustrated with case studies of past multi-wave outbreaks in Taiwan and Cuba.

Method

A simple mathematical model, the Richards model, is proposed to elucidate the temporal changes that occur during an outbreak. Furthermore, statistical correlation analysis is performed to determine the most significant correlations between the time series of dengue incidence and climatological indicators such as temperature and precipitation.

Conclusions

Multiple turning points of multi-wave dengue outbreaks were pinpointed, when drastic weather changes in the form of typhoon (in Taiwan) and hurricane (in Cuba) was found to play a role in the occurrence of multiple waves of dengue cases. Furthermore, correlation analysis of 2007 Taiwan dengue outbreak

indicates a correlation with lags of 5-7 weeks between dengue case number and climate time series. The study illustrates the potential impact of climatological events on infectious disease spread, further highlighting the need to be well-prepared, especially in travel, for potentially worsening disease spread in the aftermath of natural disasters such as hurricanes/typhoons.

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APTHC-0711

SOCIO-ENVIRONMENTAL DETERMINANTS TO THE TYPES OF DENGUE IN CEBU CITY, PHILIPPINES

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Dengue is a pervasive infectious disease in the Philippines. This study determined the relationships between socio-environmental determinants and patients' types of dengue (dengue fever [DF] and dengue hemorrhagic fever [DHF]) in four randomly selected sites among the top ten sites with highest case fatality rate of dengue in Cebu City, Philippines. This retrospective study determined the associations between social (individual-level) or environmental (household-level) determinants and the patients' types of dengue in January 2012-August 2013 recorded by Cebu City Health Department by using questionnaires and interviews to patients' primary caregivers (n=187; 90.7% power). Case definition is based on the Manual of Procedures for the Philippine Integrated Disease Surveillance and Response in accordance to the revised international health regulations of the World Health Organization. Based on univariate analyses, female caregivers with at most high school education and

low income were associated ($p < 0.05$) with DHF patients; those with college education, DF patients. DHF patients' caregivers were associated ($p < 0.05$) with unscreened houses, non-use of insecticides, and awareness of discarded cans, flower vases and bamboo stumps as *Aedes* breeding sites. DF patients' caregivers were associated with non-awareness of banana leaf axils as such, and skin rash as dengue symptom ($p < 0.05$). Multivariate analysis showed that female caregivers of DHF patients had low income; those of DF patients were unaware of banana leaf axils as breeding sites and skin rash as a symptom. Not joining any anti-dengue environmental program was associated with DF patients. Better management of dengue control is discussed.

Symposium 2: Rabies

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APTHC-0804

Epidemiology & Travel Risk

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Rabies remains a neglected tropical disease in many countries. Most cases are reported from Asia, notably from India and China, and from Africa. In Asia, the rabies endemicity is very variable according to countries. Most cases of rabies in travelers are associated with dog bites, occur in adults who are commonly migrants. The cases are not necessarily associated with long-term travel or expatriation to endemic countries; moreover, cases are observed in travelers after short trips of two weeks or less. Cases from India and Philippines are frequent. In a significant proportion of cases, diagnosis is challenging, with multiple missed diagnoses and transfers from ward to ward before the final diagnosis of rabies. The incidence of injuries to travelers caused by potentially rabid animals is approximately 0.4% per month of stay. Dogs account for 51% of cases, but non-human primates are the leading animals responsible for injuries in travelers returning from Southeast Asia. Travel to Southeast Asia, India and North Africa, young age, and traveling for tourism are risk factors for potential exposure.