EMBO reports

analysis

Tropical travel medicine

A growing interest in tropical medicine reflects the increasing incidence of tropical disease in the Western world

Jason Toth is an emergency medicine and urgent-care physician at Providence Saint Joseph Medical Center in Burbank, CA, USA. From time to time, Toth gives medication, vaccinations and advice to patients who intend to travel to exotic—and not-so-exotic—places around the world. Increasingly, however, he also finds himself treating patients who have contracted tropical diseases in the jungles of Africa, South America and Asia. "If you're a doctor in any large medical center ER department, such as Los Angeles or New York, especially those that are portside, in a given day you see people who speak a half dozen different languages from all parts of the globe," he said. "They bring with them tropical and infectious diseases; dengue fever, malaria."

...primary-care physicians, not just infectious disease specialists, should sharpen their skills to identify tropical diseases...

Toth's patients should actually consider themselves lucky that he is able to correctly diagnose and treat tropical diseases. Many others suffer unnecessarily, simply because their primary-care physician has never seen a case of malaria or dengue and is unable to diagnose it. As Gerd-Dieter Burchard, head of the clinical department and head of clinical research at the Bernhard Nocht Institute for tropical medicine in Hamburg, Germany, commented: "Although you would suspect that every physician in Germany now knows something about malaria, we still have patients who come too late to our hospital because the general physician has not thought of malaria as the reason for the fever as the patient has just come back from Africa. This still happens."

There is a growing awareness among health-care professionals that, as people travel more frequently to remote places and as global commerce increases, more people will return home with infectious diseases that, so far, have only seriously plagued the developing world. European and American physicians, medical students and other health professionals have therefore developed an interest in tropical diseases—they increasingly need to be able to diagnose and treat them. Yet, this new interest also highlights a larger trend: developed countries are paying greater attention to world health for humanitarian, economic and political reasons.

The emergence of tropical and exotic diseases as a public health problem certainly affects the whole world. This became apparent again last summer in Italy, where there was a sudden outbreak of chikungunya—a relative of dengue fever—which is normally found in the Indian Ocean region (Rosenthal, 2007). Several hundred people developed high fevers, joint pain and exhaustion; summer vacations were cancelled and African immigrants were blamed. But the Africans were not the source of this outbreak. Public health officials eventually traced the epidemic back to an Italian citizen who had recently been visited by a relative returning from Kerala in India; the warming climate in Italy contributed to the spread of the disease as tiger mosquitoes—invaders from Albania that spread the infection—are able to survive during the mild winter months.

"There is quite an interest in tropical diseases because they could threaten Europe. If chikungunya is transmitted in Italy, why not in the southern parts of Germany?" Burchard noted. But European countries are certainly not the only ones facing this problem. In 1999, the mosquito-borne West Nile virus arrived in New York City having travelled all the way from Africa. It quickly spread westward across the country, where it is now responsible for thousands of infections and hundreds of deaths each year.

Pieter van Thiel, an infectious disease physician at the University of Amsterdam in the Netherlands, and a consultant on tropical medicine to the Surgeon-General of the Netherlands Armed Forces, said: "With the increasing global traffic, physicians are encountering more regularly problems of tropical origin. In the Western setting, physicians are not well trained to face these problems adequately." Both universities and private entrepreneurs are therefore finding a growing demand among physicians and health-care personnel to learn to diagnose and treat tropical diseases (Panosian & Coates, 2006). Van Thiel, who served in the 1980s as a district medical officer in Malawi, said his department now trains medical personnel to give correct health travel advice and to manage patients returning from the tropics with health problems.

David O. Freedman, a tropical disease expert and epidemiologist at the University of Alabama (Birmingham, AL, USA), observed that primary-care physicians, not just infectious disease specialists, should sharpen their skills to identify tropical diseases: "Patients can't get adequate care unless primary-care doctors recognize tropically acquired disease and make appropriate referral to experts early." Moreover, it also poses the question of legal responsibility. "You can be sure if a patient goes into a coma or dies from malaria in the United States that the doctor will be sued," Freedman said. He has testified as an expert witness in several such malpractice cases.

As a Canadian who trained in parasitic diseases at the US National Institutes of

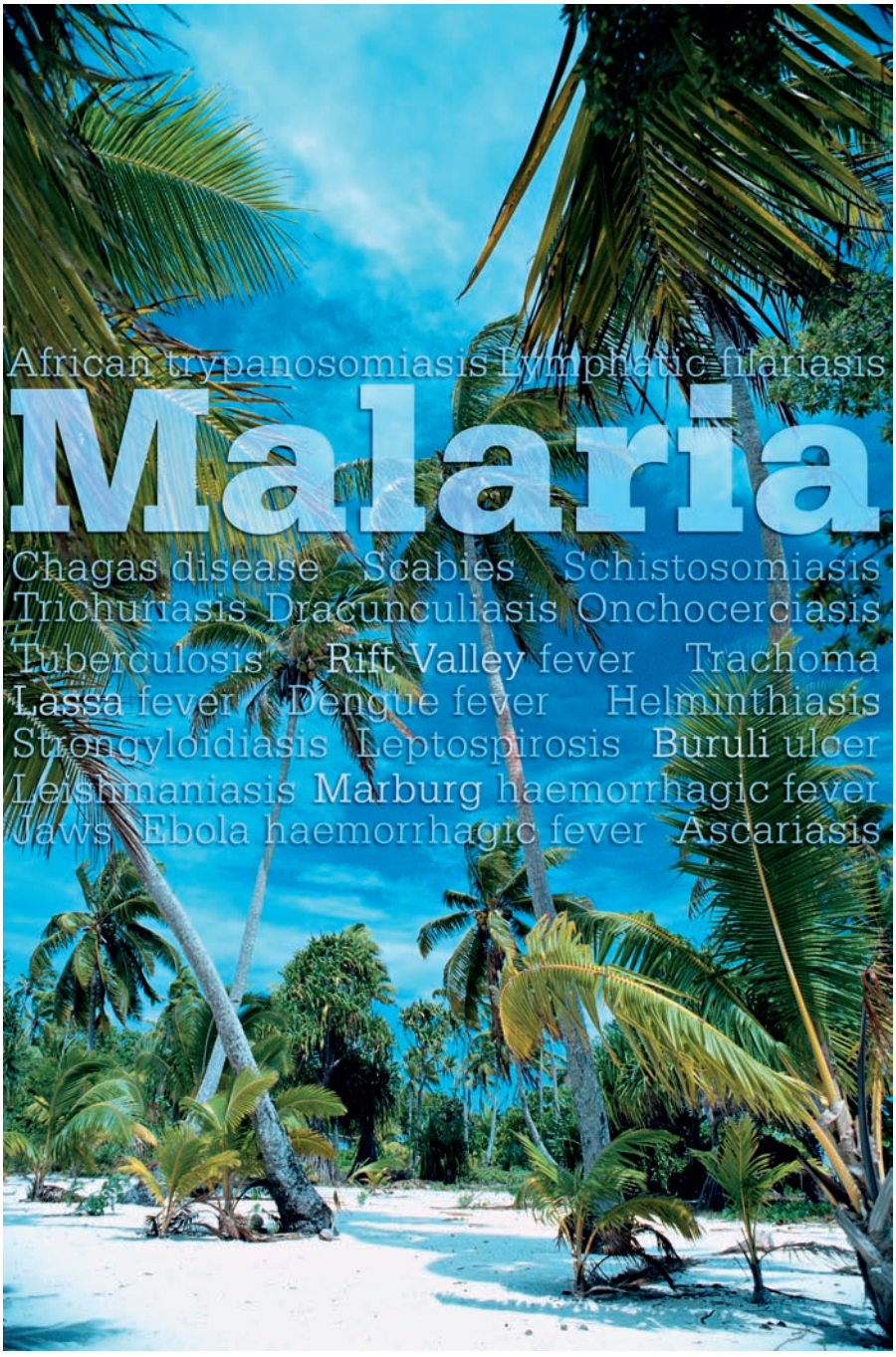
©2008 EUROPEAN MOLECULAR BIOLOGY ORGANIZATION

Health (Bethesda, MD, USA), Freedman noted that: "The best way to learn about tropical diseases isn't from books, but from being there and examining patients each day. Peru is a wonderful place to learn about tropical diseases. Almost all the typical tropical diseases—parasitic, bacterial and viral—occur there, along with some unique ones. There's malaria, yellow fever, leishmaniasis, typhoid, brucellosis, leprosy, intestinal worms."

He and his Peruvian colleague, Eduardo Gotuzzo, thus founded an annual nine-week diploma course: the Gorgas Course in Clinical Tropical Medicine, named after US Army Surgeon General William Gorgas, who controlled the transmission of yellow fever and malaria, and made building the Panama Canal possible. The course is based at the tropical disease unit at Cayetano Heredia National Hospital in Lima, Peru, and attracts participants from around the world, including infectious diseases specialists, missionaries, members of the armed forces, peacekeepers and non-governmental organizations such as Médecins Sans Frontières (Geneva, Switzerland). It includes diagnostic laboratory lectures and didactic presentations on helminthology, protozoology, bacteriology and mycology. Importantly, participants also spend more than two hours a day on ward rounds or in outpatient clinics. The fee to attend in 2009 will be US$6,000, including flights within Peru and accommodation for two four-day field trips to the Andes and the Amazon. Freedman commented that the course—which is limited to 32 practicing physicians and nurses—is so popular that only 25% of those who apply can be accommodated, and places are awarded one year in advance.

Similarly, Kay Schaefer, a tropical medicine consultant in Cologne, Germany, who practiced in Africa for many years, started his company Tropmedex—Tropical Medical Expeditions—in 1995 to educate doctors about tropical diseases; the programmes cost about €3,500. Schaefer said that he used to attract two or three clients per expedition, but now routinely fills them to the capacity of 14 twice a year. Schaefer, who has trained more than 200 doctors, with 70% coming from Europe and 20% from the United States and Canada, said his programmes are serious "working holidays" and the physicians put in six or seven hours a day learning tropical medicine.

Two years ago, Toth went on a two-week Tropmedex course in Uganda. He visited teaching hospitals, outpatient clinics and research projects. He went on a bush walk in the Mabiria rainforest, the habitat of antelopes, which are the reservoir of African trypanosomiasis. He received bedside instruction, including hands-on microscopy to see the parasites in the blood, stools and urine. His group also visited a leper's colony in southern Uganda.



"I saw dozens of cases of AIDS and tuberculosis, along with malaria and schistosomiasis," Toth said. "You learn about the tropical diseases in medical school, but you never put a face on these diseases until you see patients with them. Seeing the diseases first-hand reinforces the information." Toth commented that he regularly applies what he learned at the course to his practice and now has a better appreciation of how these diseases are acquired, what the risks are and how his patients can protect themselves.

©2008 EUROPEAN MOLECULAR BIOLOGY ORGANIZATION

However, not all of these types of course are prone to give physicians a thorough understanding of tropical diseases. Burchard, for example, dismissed some short courses as "safari medicine" and commented that some physicians in Germany are more interested in travel medicine than tropical medicine *per se*. "Travel medicine is not the same as tropical medicine of course, but there's a big overlap," he said. "Part of the interest in Germany has to do with the insurance system. General practitioners earn some extra money for travel recommendations and for vaccinations and for malaria prophylaxis."

> **"The best way to learn about tropical diseases isn't from books, but from being there and examining patients each day"**

Yet, Claire Panosian Dunavan, President of the American Society of Tropical Medicine and Hygiene (Deerfield, IL, USA) and Professor of Infectious Diseases at the University of California Los Angeles (CA, USA), believes that such short courses actually reflect a growing genuine interest. "Doctors, residents and medical students all want to be able to see more of what's happening on the ground in these developing countries. Many are truly humanitarian and they just want to see, become witnesses."

Moreover, "there is just a new pragmatic awareness of the impact tropical diseases have on the 'bottom billion' [of the world population]" Dunavan added. "At this point in history, I think what we've seen is a convergence of people coming from different fields, economics, especially, and people who are in public health and tropical medicine who understand that individual diseases need to be looked at in a larger context." She said that young physicians especially are taking an interest in "this small planet" and want to get involved in addressing health problems.

Fitzhugh Mullan, Professor of Health Policy and Pediatrics at George Washington University (Washington, DC, USA), notes that: "There is a real wellhead of interest among US health professionals in working abroad, particularly in the developing world and particularly in areas hard hit by HIV, TB and malaria."

Mullan sees a measurable increase in the number of medical students who take electives abroad, which has grown to 28% from 14% a decade ago. "This isn't going to save lives *per se*, but it's an indication of a real professional interest in the issues of global health equity," he said, adding that he observes a similar interest among young European health professionals. Mullan headed a taskforce in 2005, organized by the US National Institute of Medicine (Washington, DC, USA), which called for the creation of a Peace Corps-like programme to send health professionals to fight AIDS in impoverished tropical zones.

According to medical epidemiologist Christopher Braden, associate director for science at the US Centers for Diseases Control and Prevention's Division of Parasitic Diseases (Atlanta, GA, USA), this interest in tropical diseases goes far beyond concerns about travellers contracting exotic diseases. He said the problem has also caught the attention the US government, which launched in February a US$350 million five-year initiative to tackle "neglected" tropical diseases. Braden said the US government is taking notice for various reasons: "Number one, health affects the economy of nations; number two, the economy affects the stability, which takes us into the political realm. You put that on top of a straight forward humanitarian issue and then you have multiple factors at work."

Braden said these neglected diseases are not often fatal, so they have not received as much attention even though they affect around a billion people. But he said the morbidity is great: such as losing sight from onchocerciasis (river blindness) or being unable to move as a result of limbs swelling from lymphatic filariasis (elephantiasis). The programme also focuses on schistosomiasis (snail fever); trachoma (eye infection); and three soil-transmitted helminths (hookworm, roundworm and whipworm).

Although US$350 million for these neglected diseases seems tiny compared with the $15 billion for HIV/AIDs the US committed in 2003 and the $1.2 billion for malaria in 2005, the funding, along with drug donations from pharmaceutical companies, could have a major impact, Braden said. He said the seven neglected diseases could be largely controlled or eliminated through targeted mass drug administration: "We can do as much for these diseases with $350 million as you can do for HIV or malaria or others for much more."

In addition to government efforts, charities are also trying to make an impact on a larger scale, most prominently the Bill and Melinda Gates Foundation (Seattle, WA, USA), launched in 2002 to attack inequities such as malaria in the tropics. Sociologist Donald Light, a visiting professor at the University of Liverpool in the UK and a faculty member at Princeton University (Princeton, NJ, USA), said the efforts by the Gates Foundation and other charities have helped increase awareness of tropical health issues.

Light, who researches distributive justice issues concerning access to health-care services and pharmaceuticals, said: "The Gates Foundation has done a great deal to provide global focus and funding for eradicating diseases of the poor, which not only has a humanitarian goal, but [also] an economic goal of lifting the burden of disease from the economies of these countries." Yet he is concerned that the emphasis might be too much on technological solutions, which can draw attention away from simpler, low-tech approaches: "Almost everyone familiar with the major diseases in poor countries points out that a multi-faceted approach needs to be taken. And often there are existing, very inexpensive techniques that can be used."

> **…young physicians especially are taking an interest in "this small planet" and want to get involved in addressing health problems**

In any case, the reawakening interest in tropical diseases—be it for professional or humanitarian reasons—is inevitably good news for the developing world. "This is a globe in which both commerce and disease travel rapidly, and there is the notion that you're going to go to your private office in an American city and do technical medicine for the rest of your lives and the rest of the world doesn't matter. The level of humanitarian interest is quite high," commented Mullan.

REFERENCES

Panosian C, Coates TJ (2006) The new medical 'missionaries'—grooming the next generation of global health workers. *N Engl J Med* **354:** 1771–1773

Rosenthal E (2007) As Earth warms up, tropical virus moves to Italy. *The New York Times,* December 23rd

Howard Wolinsky

doi:10.1038/embor.2008.144

 ©2008 EUROPEAN MOLECULAR BIOLOGY ORGANIZATION