

Abstracts - Invited Speaker

Debate

Clots or Shots: Heparin for Travelers, Pro and Con

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Venous thromboembolism (VTE) is a serious, potentially lethal complication of long-haul flights. A direct relation between VTE incidence and long-distance flights was documented in multiple epidemiological studies. The risk for asymptomatic deep vein thrombosis (DVT) is 3-12%, while symptomatic VTE occurs in 0.2% of adults over 50 years of age, following a long-haul flight (≥ 12 hours). Considering the number of travelers, millions of passengers are exposed annually to the risk of VTE development.

The pathophysiologic changes increasing VTE risk at flight are: stasis (sitting in crowded condition), hypoxia and dehydration in the airplane cabin. Individual risk factors for air travel related VTE include: age over 40, female gender, hormonal therapy, varicose veins, obesity and genetic thrombophilia. Risk assessment is based on the combination of individual risk factors and the length and frequency of long-haul travel.

Preventive measures against VTE during flights are:

1. **Environmental protection** - keeping the inside cabin air pressure at minimal hypobaric conditions; avoiding dehydration by supplying adequate humidity via the air conditioning units and encouraging passengers to drink water or light non-alcoholic drinks; improving sitting position and space between rows, so that leg stretching, movements and easy walking in the aisles are possible. Likewise, oxygen support may be useful in patients with chronic lung disease or heart failure.

2. **Venous stasis prevention** - wearing graduated elastic stockings, which have been demonstrated to reduce VTE incidence by almost 90% in standard risk patients.

3. **Thromboprophylaxis** - based on the efficacy of anti-thrombotic prophylaxis, documented in medical patients, it is likely that such interventions would be beneficial in long-haul adult travelers. However, data on pharmacological prophylaxis in this setting are scanty. Anti-aggregating agents (aspirin, clopidogrel) have not been proven to reduce VTE incidence in high-risk patients. Enoxaparin, an LMWH, at a dose of 1 mg/kg 2-4 hours prior to long haul flights significantly decreased VTE incidence.

Conclusion: As air travel is becoming more accessible and flight duration is increasing, the burden of air travel-induced risk of VTE is expected to increase. Prospective randomized studies on thromboprophylaxis are highly warranted to optimize management of the population at risk.

Abstracts - Invited Speaker

LB1.2

Arboviruses in Europe, an Increasing Threat

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Background: Globally the number of travelers has risen from 450 million in 1990 to nearly 950 million in 2010. 90% of Dutch travelers remain within Europe for vacation and work; 5-10% of travelers report to a medical caretaker after travel. Consequently, doctors are increasingly confronted with travel-related diseases, stressing the need for awareness within the medical profession and general population.

Objective: The magnitude of travel within Europe and beyond and the constantly changing dynamics of arbovirus diseases across the globe demands up-to-date information about arbovirus threats to travelers and the countries they visit.

Method: Establishing a solid differential diagnosis involves not only the evolution of the patient's symptoms, travel history, specific background information on possible exposures and test results, but also the latest information on current medical (arboviral) threats. We systematically reviewed current knowledge on medically important travel-related arboviruses in Europe, and ranked the arboviruses by geographic region, clinical syndrome, and probability of occurrence.

Results: The majority of clinically important arboviruses belong to the *Flaviviridae*, *Bunyaviridae* or *Togaviridae* families. In Northern and Eastern Europe, tick-borne encephalitis is one of the most important endemic arboviruses, but West Nile virus and Sandfly fever viruses may produce comparable clinical symptoms. For Southern and Eastern Europe, Sandfly fevers (including Toscana fever) are the most commonly diagnosed arboviruses that cause febrile disease and meningitis/encephalitis, but West Nile is being detected in an expanding geographic area. Febrile disease, arthritis and rash may be caused by a range of arboviruses, including Sindbis in Northern and Eastern Europe, Tahyna and - rarely - Chikungunya and Dengue in Southern Europe. Additionally, outside of Europe there are a large variety of clinically important arboviruses that overlap in geographical region as well as primary clinical syndrome with European arboviruses.

Conclusion: Diagnosing endemic or travel-associated arboviral disease requires knowledge about geographic distribution, travel- and exposure history. Differential diagnosis requires testing for multiple arboviruses as clinical syndromes and geographic distributions are largely overlapping.

Abstracts - Invited Speaker

MTH1

From House of God to Academic Hospital: History of Medicine in Maastricht

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The history tells about pilgrims, garrisons, public anatomy lessons, nuns and monks, the first X-rays in the Netherlands, brave surgeons, and the ideas underpinning the eighth Dutch faculty of medicine in the Netherlands. The history is also the story of saints and the statutes of the Sint-Servaas hospice, the oldest hospice in the Netherlands dating back as far as the tenth century. For centuries travel has been an important driving force for the history of medicine in Maastricht.

Abstracts - Invited Speaker

MTH2

Malaria in Belgium, the Netherlands and Elsewhere in Europe: A Forgotten History!

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Malaria had a long history in southern Europe and the occurrence of thalassaemia and G-6-PD deficiency in people of Mediterranean origin is a scar of high burden rate in the past. However, northern European countries were not spared of the disease particularly during the Little Ice Age (16th to 18th centuries). Increased land exploitation around brackish water swamps (polders) was responsible for this malaria upsurge. Moreover micro-environments, such as overcrowded poor housing habitats close to animal sheds, were in favor of the parasite development in the vector and this even during the winter months. Burial rates (1551-1750) reported by parishes in Kent and Essex were two to three times higher in villages surrounded by brackish water, the breeding site of *Anopheles atroparvus*, vector of *Plasmodium vivax*. Descriptions of the marsh inhabitants resemble those of stable malaria area populations in the tropics today. Between 1846 and 1847 crude mortality in Belgium was the highest in East and West Flanders' Polder areas. In the Flanders malaria started to decrease in the second half of the 19 century as consequence of swamp draining (sanitation) and new agriculture practices. Malaria became than epidemic, instead of endemic, after coming generations fail to develop immunity. In The Netherlands, the last indigenous case of malaria was observed in 1961 and the country was officially declared free of malaria in 1970! In Finland, malaria strongly declined in the 30ties but a brief recrudescence of malaria was observed in 1941 among soldiers and transmission occurred indoors during the winter period. Environmental changes (i.e. drainage, new agronomic practices), improved housing conditions, separate cattle sheds, urbanization and improved medical care eliminate malaria in Europe in the late 1950s. Nowadays malaria vectors are still present and autochthonous malaria transmission can not be excluded. *An. atroparvus* is nowadays not common and generally not in close contact with humans. Moreover this vector can only transmit *Plasmodium vivax*. However *An. plumbeus*, a potential vector of *P. falciparum*, is nowadays very abundant in tire stocks and abandoned piggeries and can be a real risk for autochthonous malaria transmission in specific settings. Under current economic circumstances it is unlikely that endemic malaria will be reintroduced in Europe.

Abstracts - Invited Speaker

PL2.1

Malaria Maps: Relevance for Travel Recommendations

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Background: Almost a billion international journeys were made globally in 2012. Approximately 20% of these were to the 87 countries where malaria transmission occurs. Current travel recommendations, such as the use of malaria chemoprophylaxis, are based on maps developed from national surveillance reports of varying quality and for most countries contain assessments of endemicity at national or regional level. High-resolution empirical global maps of malaria have, however, recently become available. The resolution of maps that describe the seasonality of malaria transmission is also improving.

Objectives: Here we explore the potential and limitations of using these maps in formulating travel recommendations to malaria endemic countries.

Methods: The main malaria maps currently used to provide travel recommendations are reviewed. Recently developed, and more accurate, high-resolution empirical malaria endemicity and seasonality maps are assembled. Travel recommendation scenarios based on these empirical maps are compared to those that rely on main map applications presently in use. The potential and limitations of the empirical high-resolution malaria endemicity and seasonality maps are explored.

Summary of results: The analysis shows that, based on various thresholds of endemicity, the empirical high-resolution maps define fewer areas in malaria endemic countries as having no or very low malaria risk compared to main maps currently used for travel recommendations. For such areas malaria chemoprophylaxis during travel is not recommended.

Conclusion: The high-resolution empirical maps enhance our understanding of micro-level variations in transmission and have the potential to improve current malaria travel recommendations. However, they require careful interpretation, especially in areas where reductions of malaria transmission has been achieved due to recent extensive malaria control and which, if interrupted, may suffer resurgence of transmission.

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PL3.1

Animals as Origins for Human Disease in a Rapidly Changing World

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Our ancestors originally were hunters and gatherers but this lifestyle changed about 13 000 years ago with a transition to farming. As a result, contacts between animals and men became more intense and the population density increased. This domestication is generally considered as an accelerating factor in the transmission of microorganisms from animals to men. Phylogenetic studies using molecular clock analysis have not always confirmed this theory. A molecular study showed that measles virus diverted from rinderpestvirus - a pathogen of cattle - about 1000 years ago which corresponds well with the first clinical description of measles in the 9th century. And genetic studies indicate that *Bordetella pertussis* which is closely related to *B. bronchiseptica* - a pathogen of dogs, cats and pigs - was transmitted from animals to men several hundred thousand years ago. Apparently, the emergence of zoonotic infections is more complex and influenced by many different factors. In the past decades hundreds of zoonotic infections emerged and there is good evidence that these events increase in recent times. Socio-economic, environmental and ecological changes appear to drive this acceleration. There is also evidence that reduced biodiversity may increase pathogen transmission as has been shown for Hanta virus and Lyme disease in the US. The emergence of Ebola virus and other hemorrhagic fevers in the seventies of 20th century sparked a discussion on the role of travelers in the importation and spread of these infections with high mortality in industrialized countries but this fear appeared to be unfounded. On the other hand travel and migration did play an important role in the spread of HIV throughout the world and more recently with SARS .

Most of emerging zoonotic infections came as a surprise and were not predicted. HIV/AIDS which originated from chimpanzees in the beginning of the 20th century in central Africa and spread silently for many decades before it was recognized as a clinical entity is a well-known example. Early detection of emerging (zoonotic) infections is crucial for control and necessitates worldwide surveillance and open reporting. Such surveillance should be done worldwide but concentrate on hotspots for emerging infections originating from wildlife and intensive livestock farming.

Abstracts - Invited Speaker

PL3.2

Travelers and Zoonoses: What Does One Health Have to Do With It?

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Travelers represent an at risk group for zoonotic disease. Such zoonotic infections can lead to both acute and chronic illnesses, and for some agents there is potential for a traveler to spread a disease to others.

The One Health Concept stresses the interdependence of humans, animals, and environments. Travelers experience the nexus of these spheres:

Co-dependence on water

Vectors

Changes in agriculture,

Since animals travel too, we can learn from how they control disease.

Likewise, vets can learn from travel medicine docs

In addition, animals that travel may serve as “sentinels” for risks in the environment, such as leishmaniasis.

Bacterial zoonoses of concern include leptospirosis and rickettsial diseases especially R, africae. Less common rickettsioses include Q fever and murine and scrub typhus. Other bacterial zoonoses to consider in a febrile traveler include brucellosis.

Viral zoonoses of concern include rabies and animal influenza, as well as herpes B and simian viruses after contact with non-human primates.

Zoonotic parasitic disease of travelers include Giardia and cutaneous larva migrans

Risk factors for zoonoses in travelers include:

1) Exposures:

Travel to farms- agro tourism

Live animal markets

Stray dogs

Temple monkeys

Bites: ticks and others

Fresh water

Walking barefoot on beaches

2) Vulnerabilities:

Immune compromise

Children

Ignorance about animals

The Pre- travel consultation should include preventive education about zoonoses. Finding good information about zoonotic risks in a particular area may be difficult. Travelers with immune compromise may require extra counseling.

The evaluation of a returning traveler with fever or diarrhea should include a good history of zoonotic exposures.

Abstracts - Invited Speaker

PL3.3

One Health in Traveling: Disease Concerns from the Four-legged or Winged Perspective

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One Health involves working to ensure the well-being of humans, animals and the environment. Travelers are often advised of One Health regarding the potential dangers they could be exposed to that would harm the health of themselves or their communities. But what about the other two parts of the One Health equation?

In recent years, human travelers have moved diseases around the world to negatively impact animals and the environment. Chytridiomycosis, a fungal disease affecting the skin of frogs, has been taken to many new locations, probably on the gumboots of dedicated adventurers and ecotourists. The result has been drastically dwindling frog populations, and outright extinction of at least a dozen different species of frogs. White nose syndrome of bats is decimating bats in North America, and the disease came from Europe, carried on a spelunker's clothing or equipment. And for primate populations, ecotourists and other well-meaning humans have been responsible for numerous anthroponotic disease agent events, including respiratory syncytial virus, metapneumovirus, Giardia, and measles, which have caused serious illness and death in monkeys and apes.

And what about animals themselves moving around the world to bring disease to their conspecific partners in other lands? For our domestic species, both food and companion animals, there are multiple rules and regulations followed to help prevent introduction of disease to a new country or continent. But occasionally a disease will slip through anyway. Pets traveling to the Mediterranean have been known to return with an undiagnosed Leishmania infection, endangering both animal and human health back home. A new strain or emerging disease may not be recognized prior to exportation of an affected animal. Bovine spongiform encephalopathy is a case in point, which was globally disseminated before recognition of the disease occurred. As for imported wildlife, the control often rests with multiple national and international agencies making effective screening complicated. As a result agents can slip undetected into a new area, maybe even a new species, and possibly even create a zoonotic problem. Monkeypox from prairie dogs which got the virus from Gambian giant rats has demonstrated this concept well.

Abstracts - Invited Speaker

PL4.1

Non-communicable Health Risks during Mass Gatherings

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Mass gatherings (MG) are events attended by at least 1,000, usually over 25,000 people in a specific location for a variety of purposes. Among the largest were the Kumbh Mela 2013 in Allahabad for 55 days with 120 million of devotees, the World Expo 2010 in Shanghai, which welcomed 73 million visitors in 6 months, while up to 3 million pilgrims join the annual Hajj to Mecca. Unplanned MG, e.g. funerals or political rallies are of concern, as the infrastructure is ill prepared for millions who gather.

Usually there are no major public health incidents at MG, but there is a higher incidence of injury and illness as compared to the general population. During the last Olympic Games and the European Football Champions League UEFA 2012 medical interventions were required by 0.1% of visitors. Non-communicable health problems accounted for 70 to 99% of those consultations. Among the non-communicable health problems accidents tend to be more frequent than illnesses. Since no standard definitions have been used in the past, comparison is often difficult. Although the vast majority of these problems are trivial, the sheer numbers result in stress for the health facilities.

The identified risk factors for visitors can be divided into

- Personal: Age, gender; particularly pregnancy, pre-existing diseases
- Emotional / psychological: Type of event, duration, supply with alcohol, drugs; aggressions may develop
- Environmental: Temperature, air pollution; infrastructure

The most frequent disasters at MG are stampedes; they are often associated with excessive crowd density at an 'eye of the needle', but sudden panic may also result in such tragedies.

The conceptual MG model developed by the WHO bases on health security and health promotion; there should not only be a legacy for the event, but also one for the host population. Planning includes risk analysis, surveillance, and response. Risk factor calculation allows the calculation of a score to conclude on the health infrastructure needed at a specific site. There are many unusual challenges in the health sector to be prepared for — an interdisciplinary approach is essential. International visitors need to be informed about 'clever behavior' at MG.

Abstracts - Invited Speaker

SY1.1

Jet Lag: Chronobiology, Travel, and Treatment - Part I. The Circadian Clock

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This is the first presentation in a symposium on the chronobiology of jet lag and will provide basic understanding of the biological clock system and its functions. The audience will learn about the principal components of the intrinsic circadian clock, their sophisticated interactions within the organism and entrainment to periodically changing environment. We will discuss the role of the light-entrainable and food-entrainable clock counterparts in normal physiology and impact that alterations in these oscillators have on sleep, cognitive, immune and metabolic processes. To allow for better understanding of the other two lectures of the symposium, addressing therapeutic interventions attenuating the effects of jet lag, the role of the circadian phase at which a therapeutic stimulus is administered will be detailed. This phenomenon, known as “phase-response curve”, is critical to jet lag therapy, especially when several concurrent therapeutic strategies are used, including behavioral, light and pharmacological interventions.

Abstracts - Invited Speaker

SY1.2

Jet Lag: Chronobiology, Travel, and Treatment - Part II. Behavioural Interventions

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This is the second presentation in the symposium and will address the use of behavioural methods to counteract the symptoms of jet lag and accelerate resetting of the biological clock. All long journeys produce "travel fatigue". This is due to changes in routine, the hassles of travel and dehydration. Appropriate planning of the journey, together with drinking sufficient fluid, can alleviate the problems. Travel fatigue is substantially over by the following day. By contrast, jet lag is longer lasting and ways to reduce it have been sought. Three main behavioural approaches have been: altering the composition of meals; taking exercise at specific times of the day; and light exposure/avoidance at specific times of the day. None of these has been fully tested in the field; most studies have employed a mixture of interventions (so making scientific assessment of an individual intervention impossible). Therefore, advice must be based upon laboratory-based studies of a single intervention.

Light exposure/avoidance has a firm scientific rationale. The intensity and timing of light exposure after arrival at a new destination is presumed to be critical in determining the speed and direction of re-entrainment. Unplanned exposure to natural daylight in the new location generally facilitates circadian adaptation to local time after flights to the west. A motivated traveller can accelerate re-entrainment after both westward and eastward flights by intentionally seeking out (and/or avoiding) bright light at the optimal times of the day but the regimen can be inconvenient to implement - both with regard to finding bright light (at night or when the person needs to be indoors) and being able to avoid it (in the daytime or when the person needs to be outdoors).

Abstracts - Invited Speaker

SY1.3

Jet Lag: Chronobiology, Travel, and Treatment - Part III. Pharmacological Interventions

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This is the third presentation in a symposium that will address the use of hypnotic medications (sleeping pills) to counteract jet lag induced insomnia, as well as melatonin administration to accelerate resetting of the biological clock. Hypnotics can be justified for jet lag related insomnia as the condition is transient, efficacy has been demonstrated in double-blind trials, and the newer hypnotic drugs are relatively safe (although some important cautions need to be taken into account). Guidelines for the appropriate prescription of hypnotic medications will be discussed.

Melatonin is a hormone secreted nightly by the pineal gland. Melatonin tablets are widely available in the U.S. as "nutritional supplements," and available in many other countries by prescription. Although melatonin has not undergone the rigorous testing required for FDA approval as a drug, it has been proven to have biological clock-resetting effects in humans, and has been shown in some double-blind trials to ameliorate symptoms of jet lag. Because melatonin can have an opposite effect if taken at the "wrong" time of the 24-cycle, the timing of administration is very important.

The presentation will conclude with examples of treatment strategies that take into account the direction, distance, and timing of travel.

Abstracts - Invited Speaker

SY3.3

Helping the Professional Communicate Risk

J. Chiodini¹

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'Gut feelings about risk work most of the time, but individuals sometimes need to weigh things up carefully and it is hoped that policy-makers do this for populations' (Spiegelhalter 2011). The positive impact of an effective consultation and its outcomes, plus the components of effective communication are well documented. However, in the field of travel medicine, guidelines available can at times be inconsistent. Although evidence is increasing on the knowledge of travel related risks and adherence to preventative strategies (Nobel et al 2012), there is a paucity of information and research about means of communicating risk and methods that are the most effective. This presentation will address the barriers to effective communication within a travel health consultation, consider styles and techniques from the effective communication skills literature that may be adapted to the field of travel medicine and demonstrate some methods the author personally uses within her own travel medicine practice.

Abstracts - Invited Speaker

SY5.1

Pre-travel Vaccination against Rabies Who Should Be Vaccinated? - Difficult Vaccine Decisions

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Rabies vaccine is an excellent vaccine, but paradoxically, few travelers are vaccinated before travel although exposure to potentially rabid animal is frequent during travel. On the basis of global data, the incidence of injuries to travelers caused by potentially rabid animals is approximately 0.4% per month of stay which is more than the estimated risk for hepatitis A and typhoid fever. The main reason provided by travelers for not getting vaccinated is the high cost of vaccination.

Intra-dermal (ID) route is safe, immunogenic and economical and has been used in Asia among local population for decades and more recently among travelers in clinics in Australia, New Zealand and Europe. It is urgently needed that large scale trials in travelers, be conducted. Pharmaceutical industries should make available ampoules of 0.1 mL for direct ID injection, with special ID needles.

Several studies have been conducted during the last decade to investigate the efficacy of abbreviated schedules, including 3 in the setting of travel clinics. Adequate response to booster administered 6 to 12 years after pre-exposure prophylaxis was demonstrated both IM and ID, even after a single dose. Abbreviated schedules allows fewer clinical visits, lower dose and therefore lower cost and could be useful for last-minute travelers.

Immunologic memory is long-lasting after the full primary series of the modern tissue culture vaccines. Therefore, especially for those travelers who are going to be making repeated trips to rabies endemic regions, giving a primary series at an early age could be considered a good investment for future travel.

Abstracts - Invited Speaker

SY6.2

Immunosuppressed Travellers: Safe Preparation

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Background: Over the past decade, remarkable drug developments have lead to the availability of highly effective therapies for prevention of rejection following organ transplantation and for the treatment of chronic inflammatory disorders and autoimmune diseases. As international travel becomes more commonplace, patients being treated with these medications will be more regularly seeking evaluation for pre-travel care by travel medicine providers. These immunosuppressed travelers are potentially at higher risk for complications of travel-related infections, reduced efficacy of immunization, and for vaccine-related complications.

Summary of the presentation: We will review the current knowledge of basic immunology in relation to immunosuppressive drugs, both traditional medications used in organ transplantation and immune-mediated disease and monoclonal antibodies used for treating chronic inflammatory conditions. Then, we will focus this knowledge on how vaccine response may be altered by different diseases and therapies. These scientific findings will ultimately be incorporated into case presentations that include discussion of vaccine safety, vaccine efficacy, and the risk for infection. The symposium will focus on available studies with the aim to provide, when it is possible, recommendations for travel vaccinations in this growing group of patients.

Abstracts - Invited Speaker

SY7.2

Diarrhea in Child Travelers

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Diarrhea is a major cause of morbidity and the second most common cause of childhood deaths worldwide. Travelers' diarrhea is considered the most common condition affecting individuals from industrialized countries traveling to developing countries. Among children < 2 years old traveling to the tropics, the 14 days incidence rate of diarrhea reaches 40% and among children traveling to India and North Africa 14 days incidence rates exceed 60%. Geosentinel data showed that compared with adult travelers, children suffering from travel related illness lack pre travel health advice, more often travel for the purpose of visiting friends and relatives and more frequently require hospitalization.

Contrary to adult travelers in whom acute diarrhea is a relatively mild self-limited condition, infants and young children suffering from acute diarrhea may be at risk for severe disease. In young children diarrhea rapidly causes dehydration and in remote destinations with limited healthcare resources complicated disease may not be uncommon.

Despite the high incidence of travelers' diarrhea among children traveling to developing countries there is little data regarding the etiology and epidemiology of pediatric travelers' diarrhea. Most recommendations for prevention and treatment of pediatric travelers' diarrhea are based on expert opinion and evidence derived from adult travelers' diarrhea studies.

Discussion will focus on current evidence regarding the epidemiology, prevention and treatment of pediatric travelers' diarrhea. Highlighted issues include: population at risk, the role of viral gastroenteritis, prevention of diarrhea in pediatric travelers, antibiotic treatment and possible risks associated with empiric treatment. Possible areas for future research will be mentioned.

Abstracts - Invited Speaker

SY7.3

Use of Newer Vaccines in Children

S. Hagmann¹

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Background: With an increasing number of children traveling internationally the administration of travel-related vaccines are frequently considered. Beside geographic and seasonal criteria, clinical questions of safety and efficacy arise when vaccinating young travelers.

Methods: The specific controversies related to providing hepatitis A, meningococcal, typhoid fever, Japanese Encephalitis, and yellow fever vaccine to traveling children are being reviewed.

Summary of the results: Hepatitis A vaccine is considered useful to avoid the disease in both the vaccinee and contacts. In addition to routine immunization with hepatitis A vaccine at age 1 year in many countries, hepatitis A vaccine is recommended to children traveling to countries with lesser hygiene standards. Use of hepatitis A vaccine in children < 1 year old is commonly discouraged because its efficacy may be compromised in the presence of maternal anti-hepatitis A antibodies. Several quadrivalent, bivalent and monovalent meningococcal conjugate vaccines for most disease-relevant serogroups except serogroup B are available in various countries. The ultimate goal is to develop a vaccine to protect infants that carry the greatest burden of meningococcal disease. In addition to the live attenuated oral Ty21a vaccine (as capsules for children >6 years, or as lyophilized preparation for children >3 years), the injectable killed Vi polysaccharide vaccine is poorly immunogenic in children < 2 years old. The development of a conjugated Vi antigen vaccine promising improved immunogenicity to infants is ongoing. Japanese encephalitis vaccination may be considered in children with plans for long-term travel in endemic Asian countries. A new inactivated vero-cell based vaccine (IC-51) with good efficacy and safety data is undergoing evaluation to be licensed for use in children. The live attenuated yellow fever vaccine (17D) is an important vaccine for children traveling to tropical Africa and South America. With the vaccine-associated encephalitis syndrome predominantly described in young infants, this vaccine is contra-indicated in infants < 6 months old, and may be given to infants 6-9 months old only after a thorough risk-benefit assessment.

Conclusions: Questions of both safety and efficacy need to be considered when providing young children with travel vaccines.

Abstracts - Invited Speaker

SY9.2

Virtual Tools in Travel Medicine

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Background: International travel has steadily trended upward, with over one billion international arrivals recorded in 2012 [1]. Research has found that more than half of international travelers will experience some illness or injury during travel [2]. Virtual tools in travel medicine may assist in the prevention or monitoring of illness during travel. Further, they may assist clinicians in supporting patients during travel.

Social Media in the Practice of Travel Medicine: Presentation about the history, popularity and use of some popular social media platforms; Twitter, Facebook, LinkedIn, Tumblr, Wordpress, Youtube, SurveyMonkey, ProProfs, Odesk, Bitly, etc. - as relevant to a travel medicine clinic setting. Examples will be given of their successes and failures. Also a brief overview of the logistics of app development for a travel medicine clinic.

Development of In-Travel Surveillance Methods: Past and present studies monitoring traveler morbidity were reviewed, including provider-, hotel-, and clinic-based data collection. In addition, current travel health smart phone and tablet applications were examined. Survey tools and smart phone/tablet applications are being developed that address a number of travel-related illnesses. New approaches for epidemiologically assessing conditions and behaviors of travelers during their trips may include such applications. However, there may be challenges in data collection, privacy, and traveler use of these tools.

Support for Travelers Abroad by the Travel Clinic: Healthcare providers are currently challenged with finding efficient and effective ways of providing care to individuals traveling overseas. The advantages and disadvantages of email, telephone, and web-based support for acute and chronic medical problems for travelers was examined. In addition, methods for delivering ongoing health messages for the traveler and the development of online personal health spaces to support resilience during overseas travel and postings were explored.

References

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Abstracts - Invited Speaker

SY10.3

Who Is Giving Travel Advice? An International, Multi-professional Perspective

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Background: The provision of travel health advice and vaccination is an area of health care that has grown and developed internationally over the past two decades. Travellers are now actively encouraged to consult with a health care provider prior to their departure to an international destination. While standards, recommendations and guidelines have been developed to facilitate the provision of travel health care, the responsibility for giving basic care and advice to the traveller varies from country to country.

Objectives: To discuss international variations in the provision of travel health care services and to discuss the different contributions physicians, nurses and pharmacists make to this field of health care

Methods: This session has been designed to illustrate international variations and to discuss why they may occur. Three short presentations will be made to summarise the findings of the authors in response to a questionnaire that was sent to representatives from several countries, examining the roles taken by pharmacists, nurses and physicians. These presentations will be followed by an open debate and discussion designed to share information, views and concerns.

Results: to be presented

Conclusions: to be presented

Discussion:

- Do your travellers have a choice of travel health care providers?
- Why is the majority of travel health care in the UK provided by nurses?
- Are pharmacists more accessible to travellers seeking advice?
- Do economics play a part in the decision to provide vaccines and advice?

Please join us to share your thoughts, views and information.

Abstracts - Invited Speaker

SY11.1

Mental Health in Expatriates

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Expatriates are a heterogeneous group with diverse health risks. Nonetheless they face some common issues and are known to be at risk for mental health problems. Internalizing problems (depression, anxiety, sleep issues, PTSD, suicide), externalizing problems (conduct disorders, impulsivity, gambling, promiscuity) and substance abuse are all more common among expatriates. Issues around "expat failure", culture shock, reverse culture shock and third culture kids will be explored. Practical suggestions for prevention and management of expatriate mental health problems include pre-travel assessment, pre-travel preparation, ensuring adequate access to resources while overseas, and post-travel assessment and debriefing.

Abstracts - Invited Speaker

SY11.2

Preparing Expatriates for Health Problems Abroad

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Background: An estimated 50 million individuals reside abroad for work, volunteer or other reasons, usually long-term (defined as over 6 months). Expatriates may become acutely ill during their stay abroad with implications for those with co-morbidities and vulnerable populations including pregnant women and young children, especially in settings with suboptimal access to medical care. Expatriates who become ill after returning to their home countries may encounter clinicians less familiar with the management of conditions acquired during residence abroad, due to epidemiologic differences. It is therefore important for travel medicine practitioners to gain experience with common health problems expatriates will be exposed to, in order to better prepare them before travel, and to adequately manage them after return from travel.

Objective: We will review the most common health problems expatriates may be exposed to during or after their residence abroad, and how these may vary by the type of expatriate. We will also review specific interventions to minimize the risk or mitigate the impact of these health problems acquired abroad.

Method: Findings from the medical literature of the past 10 years will be covered to provide a sound evidence base for the advice presented, in addition to expert reviews & guidelines.

Discussion: We will discuss clinical problems by destination (Africa, Asia-Pacific, Latin America, others), and type of expatriate (business expatriates versus volunteers or missionaries or diplomats versus others), which are the predominant determinants of exposure. We will also cover pre-travel consultation to prepare expatriates before travel for issues ranging from malaria to recommended vaccines, with practical advice for common and challenging clinical scenarios.

Abstracts - Invited Speaker

SY11.3

The Family Cycle Abroad

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Background: Expatriates often travel after developing long term partnerships, are planning pregnancy, or already have young children.

Long term partnerships: Both partners may not have a defined role at appointment although agencies now often recognise the importance of this. Low overlap relationships become high overlap relationships, increasing the area in which conflict can occur, and where work roles intermingle, role conflict may add to relationship stress.

Pregnancy: Planning is essential. All couples anticipating pregnancy whilst abroad should know their blood groups, be aware of whether anti-D will be required, take advice about which anti-malarial prophylactics carry the least risk and be appropriately immunized. Their choice of place of residence should take account of the location and quality of obstetric services. Couples should carefully consider the risks of local birth versus return to home country.

Children abroad: Developing countries are often excellent places in which to bring up young families, exposing their children to a wide range of cultural and geographical stimulus. Young children however are particularly at risk of rapid development of acute illness after the onset of malaria, and gastro-enteritis and are as prone to serious injury as a result of motor vehicle accidents as adults. Protection against sunburn can be achieved with potent sunscreen. Young mobile children are at risk of infections from pet animals and should be rabies protected. As children move into teenage, risk taking behaviour sometimes becomes an issue and this includes substance misuse, and the risk of exposure to blood borne viruses associated with sex and body piercing.

Education: Many expatriate parents decide on location of residence having already made decisions about the availability of schooling. Those particularly committed to rural locations may face role conflict as they become teachers for home schooled children or face painful decisions about boarding school. Strategic survival personalities have been described in some boarding school students.

Final return: Most children reared in a different cultural environment being third culture kids (TCKs) a privilege, but return may be a painful experience as they integrate into the alien culture of their parents. TCKs can be prepared for return and supported by TCK peers and understanding adults during adaptation into the parental culture.

Abstracts - Invited Speaker

SY12.1

Interferon-Gamma Release Assays for Latent Tuberculosis Infection in Travelers and Migrants

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Background: Interferon-gamma release assays (IGRAs) are increasingly used to diagnose latent tuberculosis (TB) infection, as an alternative or supplement to the tuberculin skin test (TST).

Objectives:

- 1) To review the potential advantages and disadvantages of IGRAs for the diagnosis of latent TB infection, and those of the TST;
- 2) To review indications for testing for latent TB infection in travelers and migrants;
- 3) To discuss the potential application of IGRAs in this context.

Method: Review of primary literature and guidelines addressing these topics.

Results: As compared with the TST, IGRAs appear to have enhanced specificity for the diagnosis of latent TB infection when used once. This is particularly relevant in individuals with a high probability of sensitization to mycobacteria other than *Mycobacterium tuberculosis*, or to the bacille Calmette-Guérin vaccine. Positive IGRA results also correlate with risk of subsequent TB disease in contacts of contagious cases. However, the IGRAs have demonstrated substantial test-retest variability, and unexpectedly high rates of apparent “conversions” on serial testing of low-risk health care workers. These findings raise concern about the suitability of IGRAs for serial testing of travelers. In addition, before recommending any test for latent TB infection, travel health providers must carefully consider the risks of baseline and newly acquired infection, according to country of origin, travel destination, length and type of trip (e.g. health care work). For migrants, testing for latent TB infection should be part of a coherent TB control program with appropriate priorities.

Conclusions: For travelers for whom testing is indicated, providers may consider a single post-travel test (e.g. an IGRA) if the baseline risk of infection is low, and/or if the distinction between baseline and newly acquired infection is not important for treatment decisions. Conversely, providers may recommend testing before and after travel, in situations where the distinction between baseline and new infection is important, or where repeated future testing is anticipated (e.g. health care workers). For serial testing, the TST may be preferable. Finally, when a single test is used to identify migrants with latent TB infection, IGRAs may be preferred when there is concern about the potential for false-positive TSTs.

Abstracts - Invited Speaker

SY12.3

Pitfalls and Practice of Rapid Diagnostic Tests in Travelers

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In returning travelers, several infectious diseases need to be timely diagnosed to prevent serious morbidity and mortality. Conventional microbiology and classic serological testing often provide etiological results within days or weeks, and empirical treatment has to be initiated meanwhile. This strategy requires comprehensive epidemiological information, good clinical skills, adequate laboratory facilities and leads unavoidably to missed diagnosis on one hand and unnecessary prescription on the other hand. In the past decade major efforts have been undertaken by the scientific community and the industry to bring diagnostics closer to the care provider and to the patient. The concept of point-of-care (POC) testing has emerged, referring to any diagnostic technique providing results “during the same clinical encounter” to allow immediate decision-making. POC testing may therefore comprise diverse technologies, but for the time being refers mostly to lateral-flow immunochromatographic assays in tropical medicine. Indeed, the so-called “rapid diagnostic tests” (RDTs) should fulfil the stringent “ASSURED” criteria (affordable, sensitive, specific, user-friendly, rapid and robust, equipment-free and delivered) in order to be deployed in low-resource tropical settings. In the past decade, RDTs have been developed for major conditions such as HIV and malaria and have greatly simplified patient care in remote settings. In parallel, other RDTs have emerged for general and emergency practice in high resource settings as well, and new RDTs are continuously evaluated or entering clinical care for various cosmopolitan and tropical infections such as influenza, syphilis or dengue to name a few.

This lecture aims at reviewing the recent advances of RDTs which may be useful for travel practitioners and travelers (for screening, referral, targeted therapy or treatment withholding). Beyond the undeniable progresses, many pitfalls and challenges persist in terms of pathogen detection, clinical use and operational implementation. For travel physicians, it will be important to continuously integrate new RDTs in well-validated diagnosis-treatment pathways. For travelers, major educative efforts will be required to avoid oversimplification and misinterpretation of RDT results for self or peer diagnosis. It is however expected that the pertinent use of relevant quality RDTs should help improving clinical care for the whole travel community in the next future.

Abstracts - Invited Speaker

SY13.1

Polypharmacy and Travel Medications

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Background: Most of the leading causes of death in older adults are due to chronic conditions, such as diabetes, cardiovascular disease, and cancer. Over 50% of older adults have three or more chronic diseases (e.g. multi-morbidity). In the context of travel, those with advancing age will experience greater risks based on their underlying chronic conditions. As a result of the increased use of medications in the older population for disease prevention and management, drug-related problems, such as adverse drug events, have become more prevalent. Inappropriate medication use and polypharmacy are particularly problematic in older persons, and pose challenges in preparing older travelers. To add to this dilemma, evidence-based prescribing guidelines utilized by clinicians are mainly based on results of clinical trials that exclude older persons with multiple co-morbidities.

Objectives: This session will address four key areas that are essential in preparing the older traveller:

- 1) Pharmacokinetic/Pharmacodynamic changes related to ageing;
- 2) Medication-related risk factors that should be considered such as anticholinergic activity of drugs;
- 3) Strategies to reduce the risk of dehydration and approaches to prevent severe adverse events of diuretics, NSAID, ACE-inhibitors and statins during dehydration;
- 4) Applying tools to tackle polypharmacy.

Summary: Overall, there is a progressive reduction in homeostatic mechanisms as a consequence of ageing. Physiologic changes due to ageing result in pharmacokinetic changes; in addition, pharmacodynamics changes in older persons tend to alter sensitivity to drugs. Key pharmacokinetic changes including drug absorption, drug distribution, renal drug excretion, and drug metabolism, will be discussed with a focus on travel-related considerations. Decisions regarding prescription and over-the-counter drugs must be made with careful understanding of the specific agent, drug classes, and the impact of combinations of drugs, which can be particularly hazardous in frail older persons. Strategies and tools to tackle polypharmacy in the older traveler will be emphasized. Criteria including STOPP/START and Beers, as well as the Anticholinergic Risk Scale are available to assist clinicians. Resources including databases and electronic tools will be discussed with pragmatic strategies to best prepare the older traveller.

Abstracts - Invited Speaker

WS5

Refresh! What's New in Travel and Tropical Medicine Literature

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The goal of this workshop is to present several important publications in the field of travel and tropical medicine published within the last 12 months. Articles will include new scientific research as well as relevant publications on pertinent clinical topics. These articles will cover a broad range of topics such as meningococcal disease in Africa, viral hemorrhagic fevers, and updates on insect transmitted pathogens such as Dengue. In addition, several publications on the role of international travel in the development of antibiotic drug resistance will also be discussed, as well as, some novel innovations in diagnosis of *M. tuberculosis* and *C. difficile*.

Abstracts - Invited Speaker

WS9

How to Prevent and Manage Acute and Chronic Diarrhea in Travellers

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There is a decreasing trend in the incidence of travelers' diarrhea. Nevertheless, it remains a common travel-related illness, which affects approximately 30% per two-weeks stay. Bacterial infection is the most common cause. Pathogen- and host-related factors are responsible for the fact that some travelers are severely affected, whereas others experience only minor inconvenience.

Treatment has become more complex, due to increasing resistance to antimicrobial agents. Examples are fluoroquinolon-resistant *Campylobacter jejuni* and metronidazole-resistant *Giardia lamblia*. Knowledge of the basic mechanism of antimicrobial resistance and of the geographical distribution of resistance is essential to guide treatment. Antimicrobial resistance is also relevant for the discussion on the need for stand-by treatment.

In this workshop, the speakers discuss how the clinical presentation of travelers' diarrhea may differ, depending on the causative agent. They focus on epidemiological trends and "new" causative agents of acute- and chronic diarrhea, such as norovirus genogroup 2 genotype 4, Enteroaggregative *E. coli* and community acquired *Clostridium difficile*. Furthermore, they discuss the background- and the practical implications of antimicrobial resistance and provide an appraisal on the need for stand-by treatment. The last part of the workshop is on the diagnostic work-up of chronic diarrhea, and includes a discussion on the value of modern laboratory methods such as PCR.

Abstracts - Invited Speaker

WS10

Safe Transport: Carrying Meds and Needles and Accessing Medications Abroad

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Objectives:

(1) Review the problems associated with carrying and acquiring medications abroad;
(2) Discuss ways in which travel medicine professionals can adequately prepare a traveler who takes chronic medications;
(3) Using a case-based approach, create a plan to ensure a patient with diabetes minimizes possible disruptions in treatment while traveling abroad. When people travel abroad, they often need to carry their chronic medications as well as various non-prescription products. For someone being treated with insulin for diabetes, it is critical that they are able to have their medication with them at all times. However, airlines and destination country customs may present challenges in the form of transport issues as well as unfamiliar rules for importation. Some countries may impose special regulations or ban controlled substances, such as opiates and psychotropics, even those contained in non-prescription products. Long stay travelers and those who lose their medication while traveling, can discover new challenges in acquiring medications. Problems related to legality of mailing medications, where to acquire medications, variable similarity of available medications and unknown counterfeit products leave travelers struggling to acquire their often critical medications. Travel medicine professionals need to educate their patients on how to prepare their medications for safe transport, such as appropriate labeling, letters of authority and storage. Travelers should also be aware of what to expect at the destination country customs and how to minimize having their medications confiscated; and what are more reliable ways to acquire medications abroad to avoid non-equivalent or dangerous replacement drugs. This work shop will explore the published and unpublished literature related to the problem of transiting and acquiring necessary medications while traveling abroad and present expert opinion on the preparation of the traveler with a medical condition, such as diabetes that requires chronic medication.

Abstracts - Invited Speaker

WS11

Workshop: Malaria: Common Problems, Possible Solutions Advising Special Travelers on Malaria Chemoprophylaxis

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Background: Caused by the protozoan *Plasmodium* and transmitted by the bite of the female *Anopheles* mosquito, malaria poses a major threat to travellers' health. Despite a trend of declining malaria incidence, more than 200 million cases of malaria still occur worldwide every year, recent data show increasing levels of imported malaria in travelers. In the US, about 1500 cases are reported annually, where the highest risk is associated with travel to sub-Saharan Africa. The WHO, CDC and many national health authorities have published malaria chemoprophylaxis recommendations, and some specify recommendations for special travelers. However, these recommendations are often general and can be difficult to apply to special groups such as infants, pregnant women and long-term residents.

Objective: We review malaria prevention strategies in infants (repellents and chemoprophylaxis), in long-term residents (practices of long-term travelers and their chemoprophylaxis approaches), in pregnant women (safety of chemoprophylaxis agents during pregnancy), and focus on a variety of chemoprophylaxis issues.

Method: We will discuss case scenarios with the afore-mentioned special risk groups. We highlight the problems, the knowledge gaps and propose evidence based solutions. We aim to have an interactive session and welcome participation by attendees to the workshop.

Results: Chemoprophylaxis in infants is challenging, especially those under 5 kg. Long-term travelers may adhere poorly to continuous chemoprophylaxis. Limited data exist regarding the safety of chemoprophylaxis agents during pregnancy.

Conclusion: Chemoprophylaxis choices in special travelers should be individualized, taking into consideration the particular traveler, the feasibility of possible options and the likelihood of safety, tolerability, and adherence to the medication.

Abstracts - Invited Speaker

WS12

ABC Workshop Safe Shots: Practical Aspects of Vaccine Administration

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Ever wanted reassurance about your injection technique? Are you confident about what to do if your vaccine storage system is compromised? Would you like to better understand the types of vaccines available and their indications for use in the uncomplicated traveler, and those with more complex medical histories? Need to share some thoughts on how to avoid or deal with vaccine administration errors?

Aimed at those new to travel medicine (but not exclusively so), we invite you to listen and contribute to discussion and share experiences in an interactive workshop. Clinical scenarios will be presented, chosen to illustrate some challenging situations that can arise when providing vaccines. Best practice and practical strategies to increase patient safety and reduce health care errors will be our focus.

Abstracts - Invited Speaker

WS13

Sex Tourism: What Travel Medicine Practitioners Need to Know

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Sex during travel is a frequent event. Casual sex with fellow travelers or local people often happens unexpectedly. In contrast, sex tourists travel for the express purpose of engaging in sexual activities with local women, men and children.

The overall aim of this workshop is to offer some insight into the highly complex and multi-faceted issue of sex tourism and its implications for tourists and their sex partners at home and on location. By the end of the session, participants should be able to

- Describe the phenomenon sex tourism, including social and health impacts on the local population;
- Discuss sexually transmitted infections as they relate to sex tourism; and
- Design appropriate health advice for travelers to sex tourism destination.

After introducing some historical background of travel for sex, the often invisible context and implications will be explored. Selected scenarios will form the basis for discussions on a number of relevant issues. We encourage participants to contribute to this session with their comments, questions, suggestions and expertise to make this workshop a valuable learning opportunity for all present. A reference list for further reading will be available at the end of this session.

Abstracts - Invited Speaker

WS15

Pox, Pustules and Lumps: Skin Lesions in Returned Travellers

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Skin problems in returned travelers are the 3rd most common cause of illness in a returned traveller. These “exotic conditions” may be as innocuous as the migration of a dog/cat hookworm larva under the skin of a lounging beach bunny/bum in Jamaica, or the extrusion of a live maggot from its breathing hole on the arm of an adventurous traveler in Belize. On the other hand, more serious infections such as cutaneous leishmaniasis, typhus are being recognized increasingly among eco-tourists to Central and South America and game park voyeurs to Southern Africa, respectively. STI's are a risk in all locations of the tropics. This interactive, non-threatening, somewhat fun-filled session on the approach to skin problems in returned travelers will feature a variety of excellent, yet unpleasant and occasionally disgusting photographs of common skin disorders seen in returned travellers and immigrants. In addition, key diagnostic features and management approaches will be emphasized. According to most clinicians, dermatologists excepted, you don't have to be smart to know tropical dermatology, you only have to recognize the condition and look up the treatment.

Abstracts - Invited Speaker

WS17

Babes on the Road: Pregnant and Infant Travellers

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Background: Travel medicine providers are often unsure or uncomfortable in making recommendations regarding infants, pregnant women and breastfeeding mothers.

Objective: To give practitioners some basic guidelines to follow when advising these patients by illustrating the principles with some specific examples.

Format: This is an interactive workshop where input and opinions will be requested from the audience regarding the management of specific cases. Case presentations will involve pregnant patients, breastfeeding mothers, and infants up to one year of age. Discussion will include such matters as contraindications to travel, pretravel preparation, the use of vaccines and travel-related medicines, traveler's diarrhea, environmental hazards, other non-infectious risks, expatriate health and medical evacuation