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25th Annual Meeting of the German Society for Travel Medicine (DFR) Berlin, Germany, 15-17 September 2022

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Vice President of the Deutsche Fachgesellschaft für Reisemedizin (DFR)
The scientific management and Congress President

Conference reports

About the Meeting

This year the Annual Meeting in Berlin (September 15th to 17th) was the 25th one of the German Society of Travel Medicine and therefore it included some celebration. The scientific part included a wide variety of topics. Beside of 'typical' ones like malaria prevention and new vaccines there were lectures about space tourism (Prof. R. Gerzer), environmental risks (earthquakes – Dr. J. Lauterjung, altitude medicine – Dr. S. Baniya, and poisonous snakes – Dr. C. Pechmann). Prof. M. Tannheimer discussed quick ascents to extreme altitude by pre-acclimatized climbers while Dr. Kattner reported news about tick borne diseases. Yellow fever (Dr. K. Kling) and Hepatitis B in Nepal (Dr. A.S. Menner) were discussed intensively. Another topic was different aspects of cruise shipping (Prof. T.W. Heggie, C. Kopp, L. Damm). Prof. T. Küpper touched a 'hot iron': Ethical considerations in travel medicine. There was a special invitation to young scientists, students and clinicians with a specific event. Poster presentations added topics for discussions.

The presented abstracts include lectures and posters and are listed in alphabetical order of the first author.

Keywords

- German Society for Travel Medicine
- DFR
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- abstract

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Clinical experience: Working as a mountain medic

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Trekking and expedition is evolving every day and the number of travelers ascending to high altitude is only increasing. Similarly, high altitude physiology and medicine has been widely explored in last few decades and landmark discoveries in hypoxia and high altitude medicine has opened new dimensions in the field. Much has been discovered about the core aspects of altitude illnesses namely acute mountain sickness (AMS), high altitude cerebral edema (HACE) and high altitude pulmonary edema (HAPE). In addition, there has been vast development in mountain emergency medicine which has helped to keep travelers safe in high altitude. But, practical and predictable travel related health issues and ailments should be given properly addressed to make the travel to high altitude safe. This lecture will be focused in the actual aspect of expedition and trekking.

New vaccines of importance for travel medicine

Gerd Burchard

Bernhard-Nocht-Institute, Hamburg, Germany

There are some new vaccines with regard to the standard vaccinations in travel medicine: For example, the vaccine Vaxchora against cholera, which is an oral suspension of live vibrios of the serogroup O1, which lack the toxic B subunit of the cholera toxin due to mutation. However, there are neither studies on travelers nor in endemic areas. With regard to hepatitis B, two vaccines have been recently approved: Heplisav B consists of recombinant hepatitis B surface antigen and the adjuvant cytosine phosphoguanine. In a large US cohort study, CpG-adjuvanted hepatitis B vaccine was not associated with an increased risk of acute myocardial infarction compared to aluminum hydroxide-adjuvanted hepatitis B vaccine. PreHevBri is a new vaccine with three antigens: Antigen S, Pre-S1 antigen, Pr—S2 antigen. Concerning typhoid fever, a tetanus toxoid-conjugated vaccine against the Vi capsular polysaccharide of Salmonella Typhi has been approved India and some other countries (Typbar, TYPHIBEV). There are also new vaccines that are only indicated in exceptional cases in travel medicine: e.g. the vaccine IMVANEX (trade name outside the European Union: IMVAMUNE or JYNNEOS). It is an attenuated live vaccine that cannot reproduce in human cells and can therefore also be administered to people with an immune deficiency. The vaccine also protects against monkeypox - however, travel per se does not pose a risk of infection with monkeypox. DENGVAXIA is effective against dengue fever, after approval by the Food and Drug Administration (FDA) in May 2019, the US Advisory Committee on Immunization Practices (ACIP) recommended it in December 2021 for those children aged 9 to 16 who have already had dengue and live in endemic areas - but not for travellers. The position of the Hecolin vaccine developed in China against hepatitis E in travel medicine is unclear.

Space tourism

Rupert Gerzer

Prof. emeritus at DLR, Cologne, Germany and RWTH Aachen Technical University, Aachen, Germany

Since years, several companies promise to send tourists to space. Indeed, meanwhile the Company Blue Origin has started its suborbital flight program, whereas SpaceX even sends tourists in orbit for several days. Elon Musk, the founder of SpaceX, even plans the development of 'Starship', a fully reusable space transportation system, with a capacity of one hundred passengers!

Both companies work on environmentally friendly fuel systems (like hydrogen / oxygen or methane) to reduce the environmental footprint of their rockets. In contrast to governmental institutions, the private companies also concentrate on fully reusable systems that only cost fractions of non-reusable systems to be built and fly with artificial intelligence and thus do not need pilots to fly.

Currently, NASA, ESA, JAXA (Japan) and the CSA (Canada) plan to position the 'Lunar Gateway', in a Moon-orbit and to prepare for human landings on Moon. After the end of the ISS, life and material sciences research under microgravity as well as space tourism will therefore be organized by special companies. Thus, there will be several stations competitively offering lab space as well as place for tourist accommodation.

This will allow a fundamental change in human spaceflight; access to space will not be monopolized anymore, prizes will rapidly fall and this new market will be allowed to grow fast. It can therefore be expected that prices for trips to space will drop considerably in the coming decade. Thus, a new era of human

spaceflight is just at its beginning. Travel medicine should get ready for this new branch.

Medical expeditions: Challenge, organisation, realisation

Miriam Haunolder

Institute for Occupational, Social and Environmental Medicine, RWTH Aachen Technical University, Aachen, Germany

Medical expeditions – to some extent – lead us to beautiful locations but also very remote areas. Sometimes a complex thesis needs to be evaluated in a setting with scarcely any medical or logistical infrastructure. Testing conditions can be more than adverse.

The lecture at hand aims to give an account of some of the field studies within the ADEMED Expedition 2011 to the Solu Khumbu Region in Nepal, focussing on the preparation and planning.

Also, central elements in planning a medical expedition are to be discussed in a more general approach, exposing pitfalls and specifics. For this a literature search of more recent publications was conducted and the treasure trove of experience of members of the research group for travel medicine at RWTH Aachen University was exploited for additional case studies and advice.

Death at sea: Passenger and crew mortality on cruise ships

Travis W. Heggie

Bowling Green State University, Ohio, USA

Introduction: This study reports the global occurrence of passenger and crew mortality on cruise ships. To date, no comprehensive study of passenger and crew mortality has been published.

Methods: Data on passenger and crew mortality between 2000 and 2019 were obtained from 78 ocean and river cruise lines registered globally and analyzed by their age, gender, nationality, cruise line, and recorded cause of death.

Results: There were 623 reported deaths. Out of all deaths, 89% were passenger deaths and 11% were crew. United States residents accounted for 61% of passenger deaths and crew from India (18%) and the Philippines (17%) recorded the highest crew deaths. Falls overboard or onto lower decks (23%), suicide, murder, and a terror attack (19%), unspecified natural causes (18%), and cardiac incidents (16%) were the primary causes of passenger deaths. Suicide and murder (29%) and falls overboard or from height (24%) were the primary cause of crew member deaths. The most passenger deaths occurred on Carnival Cruise Lines (29%), Royal Caribbean Cruises (12%), and Norwegian Cruise Line (10%). The highest crew member deaths occurred on Carnival Cruise Line (19%) and Royal Caribbean Cruises (19%).

Conclusion: Falls overboard or onto lower decks, cardiac incidents, and suicides are the leading cause of passenger deaths. Suicide and murder and falls are the leading cause of death for crew members. Travel health advisories targeting US citizen passengers and crew members from India and the Philippines are warranted. The addition of mental health care to ship infirmaries is also suggested.

New guidelines on tick infections in the USA

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In the USA several tick species can transmit various tick-borne diseases to humans. For prevention of tick bites, repellents are recommended by the CDC, such as DEET, picaridin, permethrin, IR3535 and essential oils, such as citriodiol (leaves of lemon eucalyptus). There is a high recommendation for the simultaneous use of permethrin-treated clothing and topical agents. After exposure to tick areas, tick control of the body combined with bathing or washing and manual removal of ticks are necessary. Ticks in clothing can be removed by washing at a minimum of 54°C / 130°F or drying for at least 10 min (only investigated for Ixodes scapularis).

Antibiotic prophylaxis in case of tick exposure is only recommended by the CDC in Lyme disease endemic areas if the removed tick was Ixodes spp. and the tick has sucked for more than 36 h. In this case, a single dose of 200 mg doxycycline could be administered within 72 h after tick removal for adults and children over 8 years of age. If the tick species cannot be identified and the period of attachment cannot be estimated, no antibiotic prophylaxis is given. A 'watchful waiting' period of 30 days begins. Treatment with doxycycline should be started if fever, arthralgia or erythema migrans occurs.

[1] See: doi: 10.1016/j.wem.2021.09.001.

Duration of protection after vaccination against yellow fever: Results of a systematic review and meta-analysis of studies from endemic and non-endemic countries

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Background: In 2013, the World Health Organization decided that a single dose of yellow fever vaccine suffices to confer lifelong protection against yellow fever and that booster doses are not necessary. The duration of protection after a single dose of yellow fever vaccine is discussed controversially. In order to make a well-reasoned vaccination recommendation for Germany based on the best available evidence, we performed a systematic literature review with meta-analysis.
Methods: The literature on duration of protection after 1 and ≥2 doses of yellow fever vaccination was systematically reviewed (15 databases, last search: November 2021). Three groups were examined in the meta-analysis: healthy adults, healthy children and immunodeficient persons. Data were stratified according to post-vaccination follow-up: ≤3 months; >3 months to ≤5 years; >5 to ≤10 years; >10 to ≤20 years; >20 years.
Results: We identified 36 studies from 20 countries, which were conducted between 1993 and 2019 and comprised over 17,000 participants from endemic and non-endemic countries. In healthy adults, pooled seroprotection rates after single vaccination dose dropped significantly to 88% in the period >5 to ≤10 years years after the first vaccination. In children vaccinated before age 2, the seroprotection rate was 52% within 5 years after primary vaccination. For immunodeficient persons, data indicate a relevant waning.
Conclusion: For all groups analysed, evidence is lacking for lifelong protection against yellow dose after just one vaccine dose.

Tropical infections as occupational diseases among young volunteers in social projects

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Introduction: Volunteering overseas has become popular over the last decade. Participants are exposed to tropical infections like malaria, dengue, typhoid fever or schistosomiasis. Notifications indicate a high incidence of such infections among young volunteers.
Material and methods: The retrospective study included the diagnoses 290 volunteers of 'weltwärts'. The control group consisted of 167 professional aid workers.
Results: Only 37.9% of volunteers underwent a pre- and even less (22.8%) a post-travel medical examination in comparison to 95.2% ($p < 0.001$) and 85.6% ($p < 0.001$) among professional aid workers. A higher incidence for tropical infections was demonstrated for 'weltwärts' volunteers which was disproportionally higher especially for malaria in Sub-Saharan Africa. Generally, volunteers suffer significantly more often from malaria and typhoid fever while aid workers show more schistosomiasis and other diseases.
Conclusion: Specific regional risks need to be addressed in training seminars in order to raise awareness especially among volunteers through more adequate pre-travel advice. Medical follow-ups should be mandatory to recognize infections with long term consequences early on.

Harmful ship emissions: Cruise ships and air quality

Christian Kopp

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The shipping sector contributes around 3% of global CO_2-emissions, an amount similar to that of a highly industrialized country such as Germany. The impact on the climate is therefore enormous. But apart from CO_2 and other Greenhouse gases ships also emit other particles, many of which are harmful for both the environment and human health.

The cruise industry is of particular interest in this regard: while only representing a small part of global shipping, its close exposure to passengers and residents alike leads to a distinct responsibility for their health. As 'floating small towns' powered by the dirtiest heavy fuel oils, cruise ships contribute considerably to global and local emissions of sulfur dioxides (SO_2), nitrogen oxides (NO_x) and particulate matter (PM). The latter includes soot emissions (black carbon) which are particularly harmful to climate and health.

Studies estimate that in Europe alone ship emissions are responsible for up to 50,000 premature deaths every year. Among the harmful effects triggered by ultrafine particulate matter are heart and lung diseases, such as lung cancer, as well as chronic bronchitis and asthma. Dementia is also increasingly attributed to exposure to soot particles.

Measurements aboard a cruise ship in 2017 revealed concentrations of particularly harmful ultrafine particles around 200 times higher than the levels in natural ambient air. Aftertreatment measures and cleaner fuels such as low emission e-fuels are necessary to provide a suitable future for the cruise sector.

Are we allowed to do everything we could do? Some ethical considerations in travel medicine

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There is no doubt that there is an environmental impact by travelling. The question whether this impact is acceptable, can be minimized or avoided, or is not acceptable must be answered regularly. Sometime this is easy by alternative procedures, e.g. by new technologies. Sometimes it is more or less disputable and in rare cases the respective style of travelling should be stopped. Based on scientific data four examples will be discussed in detail:

1. Sun protection and its impact on coral reefs. Here products based on minerals (TiO, Fe_2O_3) should be preferred. In some regions other products are already forbidden because they damage reefs significantly.
2. Water hygiene. The advice to prefer industrial bottled water produces about 50 tons of plastic garbage per season in the Solu Khumbu / Nepal – but only about 10 tons are carried out. Halogens are not really an alternative, because this would induce an impact of about 500 kg chemical waste to a very sensitive environment. UV-C devices produce safe water very quickly without impact to the local environment.
3. Cruise ships may be called 'swimming incineration plants'. The immission of several environmentally toxic substances exceeds those of daily life by several hundreds. This should be considered when a cruise may be planned.
4. Because of the atmospheric and geographic conditions of Antarctica all released contaminants concentrate at a very small region which is exactly the region which is vitally important for fauna and flora of Antarctica. Since everything to be seen in Antarctica can be seen elsewhere in less critical environments there should be no cruise shipping or other tourism in Antarctica.

'Drink at least four gallons of water!' — really a good advice for travellers in hot climate?

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An adequate hydration status is important for health and performance of travellers – and sometimes even vital. However, hydration means also to keep the concentration of minerals in a physiological range. This is definitively not true when travellers follow the advice 'Drink at least 4 gallons of water!' as recently seen on a sign at Grand Canyon (Arizona, USA). Such amount of more than 15 litres would definitively cause significant hyponatremia and collapse.

The water and salt balance while travelling in hot climate will be discussed in detail and an impressive example of a total failure cardiac pacemaker caused by sodium deficiency will be given [1]. This patient only survived because NaCl 0.9% was given immediately which restored the water and the mineral deficiency.

[1] Schroder S, et al. Pacemaker failure caused by traveller's diarrhoea. *J Travel Med Inf Dis*. 2011;9(3):149-152.

Wild safe: Risk and prevention of animal accidents while traveling: General considerations

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Accidents with living creatures are quite common when traveling and some of them are fatal. More than 60.000 fatal incidences worldwide caused by snakes happen annually, 1000 by crocodiles, 800–1600 by tigers, 60–200 by lions, 200-500 by elephants, 200–300 by hippos, 30–125 by leopards, 20-104 by African buffalos, 20–50 by wolves, but less than 1 by bears (Grizzlies) [1]. However, all data must be interpreted with care and the circumstances of such incidences must be taken into account: Only some of the total accidents happen while travelling, many are rather a social or even an occupational problem. In a series of posters we'll inform about the risk for travellers, possibilities to reduce the risk and what to do in case something should have happen.

By the way: If you are afraid of risk by living creatures you should strictly avoid any contact with your own species! More than 200,000 individual murders take place annually (war or civil war not included) [1].

[1] Auerbach PS. *Wilderness Medicine*. St. Louis, Missouri: C.V. Mosby; 1989.

Geological risks (earthquakes, tsunami)

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The devastating tsunami of 2004 in the Indian Ocean with more than 230,000 victims has impressively shown us how vulnerable human society is to natural hazards. Strong tsunamis and earthquakes are rare events and usually result in high casualty figures. Statistics from the world's largest reinsurer, Munich Re, show this impressively. These hazards do not occur everywhere in the world, but are mostly connected to specific geological structures in the subsurface, namely plate tectonic boundaries and large fault zones. We know the so-called 'Ring of Fire' around the Pacific and in the Indian Ocean, which has the most volcanoes, is responsible for the strongest earthquakes and has also produced the largest tsunamis. Also the Mediterranean region is at high risk. Many vacation destinations of global tourism are located on coasts endangered by geological natural events, e.g. on the Mediterranean Sea, on dream beaches in the Indian Ocean, or in Central America and the Caribbean. To make matters worse, earthquakes and tsunamis are unpredictable. The only way to warn population and tourists are therefore early warning systems with sometimes very short warning times of a few seconds (earthquake) to a few tens of minutes (tsunami). After the 2004 tsunami in the Indian Ocean, increased efforts were made worldwide to establish early warning systems against geological natural hazards. The talk introduces the hazard and early warning systems and deals in particular with the observation of natural warning signs, behavioral handouts in case of warning and the available communication media used in the warning chain.

Prevalence and behavioural risk factors for hepatitis B in Upper Dolpo, Nepal

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Background: Nepal is a country of low endemicity for chronic hepatitis B (CHB) with a prevalence of 0.9%. However, in Dolpo District, higher prevalence of hepatitis B (HBV) was reported in small samples, anecdotal reports and recently among pregnant women. We determined data on HBV endemicity and risk factors among people from Dolpo (Dolpopa).
Methods: We conducted a cross-sectional HBV prevalence study among two separate convenience samples of overall 524 Dolpopa, assessing HBV-serology on a medical supply tour to Upper Dolpo (Group 1, n = 223) and assessing detailed HBV-serology, markers for hepatitis D (HDV)-co-infection and HIV, as well as a questionnaire-based survey of risk behaviour and alcohol consumption patterns in Dolpopa visiting the Dolpali 'Winter Clinic' in Kathmandu (Group 2, n = 301).
Results: The overall prevalence of hepatitis B surface antigen (HBsAg) was 18.7% (95% CI 15.6–22.3%). HBsAg prevalence was independent of age group and gender, but was significantly higher in the settlements lining the trading route between Nepal and China. From the HBsAg positive participants, 68.8% (95% CI 56.6–78.8%) also tested positive for HBeAg. Viral load among HBeAg positive samples ranged from 3.12 × 107 to 1.42 × 109 IU/ml. HDV- and HIV-(co)-infection was not found. Questionnaires confirmed 92% had never used a condom, and 27.6% showed a risky alcohol consumption pattern.
Conclusions: HBV prevalence in Dolpo is significantly higher than in the rest of Nepal. Targeted interventions are recommended to address liver and sexual health education, including introduction of birth dose HBV vaccinations, HBV screening, and HBV vaccinations for pregnant women in Dolpo.

A physiological device to measure human performance during environmental parachute jumping with and without oxygen supplementation

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Introduction: Present standard surface parachutes allow jumps from the height of more than 30.000ft. These possibilities expose jumpers to the extreme environment. Therefore, portable oxygen apparatus and protection against cold were created. The laboratory results were transferred into the real environment.
Methods: Based on the developed mobPhysioLab®, data were recorded in a real setting. After adaption for parachutists, it was feasible to test oxygen equipment for high-altitude jumps in its extreme conditions.
Results: Volunteers were included for several jumps (up to 25.000 ft) with and without oxygen supply (up to 12.000 ft). The results show that an oxygen supply could be already necessary for a height of 12.000 ft. The offered oxygen was always sufficient for the higher altitudes, and the saturation never reached to a critical value. The body surface temperatures showed a significant cooling of the extremities during freefall. The time of rewarming was much longer. A lower peripheral temperature of the extremities limits the ability to operate due to reduced motor skills during the jump and exposes skydivers to increased danger after landing.
Discussion: The results revealed that a high-quality continuous physiological data acquisition is complex. Further technical development is necessary. Nevertheless, oxygen supply for every jumper should already be provided at altitudes of 12.000 ft. An innovative development of clothing is required to counteract cooling more effectively because cooling down hampers oxygen transport into cells due to the left shift of the acid-base-curve. The mobPhysioLab® is an appropriate device with which such questions could be answered.

Venomous snakes — a problem when travelling? A challenge in advice of travel-medicine

Christian Pechmann

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About 2700 species of snakes are known on Earth. One fifth of them are venomous. With the exception of the permafrost areas, poisonous snakes are found in all regions of the world. The highlights the importance of dealing with this during a travel medical consultation. Far too little attention is paid to the matter of poisonous snakes in travel medicine and it is insufficiently incorporated into travel medical consulting practice.

Every year, 138,000 people die worldwide from the bite of poisonous snakes. Most cases occur in Africa and India. Most often the victims are the locals and mostly children. Additionally, up to 400,000 people retain permanent damage (physical or psychological damage) after a bite. The resulting injuries are significant and require complex medical treatment. Especially when traveling to tropical areas poisonous snakes pose a significant health risk.

Systematics of poisonous snakes: Poisonous snakes are divided into 4 large families: *Viperidae, Elapudae, Colubridae, Atractaspididae*.

There are also poisonous snakes in Europe, e.g. the aspis viper and the sand adder. They all belong to the viperidae family and show the typical features of a viper: wide, triangular-shaped, flat head with clearly visible venom glands on the lateral head. However, in Europe, deaths from these snakes are very rare.

On all other continents there are highly toxic representatives of poisonous, whose toxins can have highly complex effect as neurotoxins, as tissue scrotizing or blood clotting. Therefore, a consultation must be individually addressed to the local poisonous snakes of the destination country and travel route.

New developments in malaria prevention

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Over the last years, official recommendations concerning malaria chemoprophylaxis, self-administered emergency treatment and mosquito bite prevention have changed without prior communication. Until 2019, an annual falciparum index (AFI) of more than 10/100.000 in the local population resulted in chemoprophylaxis. This was replaced by the annual parasite index (API), which meant recommending chemoprophylaxis also for areas with high rates of vivax malaria 'only', like large parts of Brazil or India. This is the more unsatisfying as we know most drugs used in chemoprophylaxis cannot fully prevent vivax infection.

In a consensus process, an international working group discussed the development and decided to revert to the AFI index, which justifies chemoprophylaxis if >10/100.000. The annual vivax index (AVI) will be separately shown in malaria risk maps to guide protective behaviour and to make additional measures like examinations after long term exposure possible. These might then result in a recommendation of 'terminal prophylaxis', meaning the eradication of hypnozoites in the liver by drugs not commonly used in malaria therapy and currently unavailable in Germany.

Proposing a semiquantitative tool for exposure to Trypanosoma cruzi: The Chagas Exposure Score (CES)

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Trypanosoma (T.) cruzi infection leading to Chagas disease is considered endemic in 21 Latin American countries by WHO. Beyond vectorial transmission by reduviid bugs in rural settings, food contamination and vertical transmission from mother to child seem to play a larger part in recent years, moving the focus to urban settlements, rather. Another concern are infections due to blood or organ donations. Non-vectorial transmission also takes place in non-endemic countries, raising questions about screening individuals with a Latin American background. However, insecurity exists on the relative importance of episodes spent there, and of other criteria that may modify the risk of infection.

We therefore propose to develop and introduce a Chagas Exposure Score (CES) measured in 'bug years', which are calculated from the episodes spent in endemic countries. These will be multiplied by a modifying factor reflecting the relative endemicities of different countries and combined with other factors of personal history like rural dwelling, birth to an exposed mother, reception of blood or blood products. These can all be entered into a smartphone app and the resulting score calculated. There will be an option to enter serological test data, which serves to validate the exposure criteria.

Decrease of travel vaccinations in a family doctor's office in the pandemic years 2020–2021 compared to 2019

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Countless GP practices in Germany offer well-founded travel-related advice. In the years before the pandemic, practices, also acting as yellow fever vaccination sites, were very active and advised and vaccinated countless patients before and after long-distance travel.

However, due to the onset of the SARS-CoV-2 pandemic in March 2020, the number of consultations has decreased significantly. In this brief overview, the change in consulting services is assessed in a large practice on the basis of billing positions (Reiseberatungsziffern) that were used specifically for these consulting services and the decline in the number of vaccinations:

a) yellow fever,
b) hepatitis A
c) hepatitis B
d) Japanese encephalitis
e) meningococci quadrivalent
f) rabies
g) typhoid fever.

The results show a significant decrease in both billed positions and corresponding vaccinations in 2020 and 2021 compared to 2019.

Infectious diseases health risks and vaccination recommendation for the shipping industry

Clara Schlaich

Hafenpraxis Hamburg, International Maritime Health Association

Travel-related diseases in seafarers and passengers result from person-to person transmission of infectious agents and through vectors such as food, water or mosquitoes on board ships or in international ports. Driving factors are the mixing of people from high and low endemicity areas, crowding in a semi-closed environment and travel itinerary.

Traditionally there is a strict observance by shipping companies of vaccinations that are mandatory for entry to countries per International Health Regulation 2005 (Yellow fever).

Recommendations for immunisation and prophylaxis in seafaring will depend on an individual risk assessment, national and international requirements and company policies such as:

1. Individual immunity of a seafarer by natural immunity or childhood immunization (e.g. measles, hepatitis A, chickenpox.
2. Check for standard vaccination such as tetanus, however seafarers rarely carry documentation of childhood immunization with them.

3. Area of operations; Yellow fever vaccination a prerequisite in global shipping.
4. Specific occupational risks, e.g. Hepatitis A for sewage works, Hepatitis A / typhoid for food handlers and Hepatitis B for medical personnel.
5. Treatment availability on board or in ports, influenza and COVID-19 vaccination recommended.
6. Pre-existing conditions; consider vaccination against pneumococcal disease, influenza, COVID-19, shingles.
7. Extent of travel away from ship: consider rabies vaccination (dog bites my occur in port areas).

Company policy: Yellow Fever Vaccination for global travel and most recently COVID-19 immunization on cargo ships, some cruise ship companies require proof of immunity against measles, varicella, influenza and hepatitis A, B, typhoid fever and others in certain occupational groups.

Conclusion: Vaccinations as a preventative occupational measure in seafarers is not standardized and underused. Travel health physicians will need detailed information of type and extent of ship travel for comprehensive advise.

Scientific evaluation of the current commercially offered fast ascents of 8000 m peaks

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Background: An expedition to Mount Everest (8848 m) requires roughly 8 weeks. Therefore, it seems attractive to reach the summit within 3 weeks, which is currently promised by some expedition organizers. These rapid ascent expeditions (raEx) are based on two main components, normobaric hypoxic training (NHT) prior to the expedition and the use of high flow supplemental oxygen ($HFSO_2$). We attempted to assess the relative importance of these two elements.
Methods: We evaluated the effect of NHT on the basis of the available information of these raEx and our experiences made during an expedition to Manaslu (8163 m) where we used NHT. To evaluate the effect of $HFSO_2$ we calculated its effect at various activity levels at altitudes of 8000 m and above.
Results: So far raEx to Mount Everest have been successful. The participants carried out 8 weeks of NHT, reaching sleeping altitudes of 7100 m and spent at least 300 h in NH. At rest, a flow rate of 2 l O_2/min is sufficient to keep the PIO_2 close to 50 mmHg even at the summit. For activities of ~80% of $\dot{V}O_{2max}$ at the summit 6 l O_2/min are required to maintain PIO_2 above 50 mmHg.
Discussion: NHT for preacclimatization seems to be the decisive element of the offered raEx. An increased O_2 flow rate of 8 l O_2/min is not mandatory for climbing Mount Everest.
Conclusions: Preacclimatization using NH is far more important than the use of $HFSO_2$. The most effective regimen of preacclimatization in NH, the duration of each session and the optimal FIO_2 are still unclear.

Sociodemographic and clinical characteristics of women with advanced cervical carcinoma in Paraguay

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Background: Cervical cancer has the highest mortality of cancers in Paraguay. The prevention, diagnosis and early treatment of the preventable disease thus poses a major challenge for the country's health care sector. The study makes an important contribution in relation to public health interventions in Paraguay by examining what factors are associated with advanced cervical cancer and discussing measures to prevent it.
Purpose: This study uses novel data to provide vital descriptive evidence on the sociodemographic characteristics and clinical factors of women with cervical cancer in Paraguay.
Methods: This retrospective study collects, compiles, and examines medical records from the National Institute for Cancer (Instituto Nacional del Cáncer) in Paraguay. 440 patients were included in the data set. The descriptive analysis relies on parametric tests. In addition, Kaplan-Maier curves were used to supplement the descriptive data to decipher patterns in the data.
Results: 63.3% of patients from the data set already had locally advanced carcinoma at the first recorded stage in their medical file. Sociodemographic factors such as low education level and a high number of children (≥5) show a statistically significant association with a locally

advanced carcinoma stage. Patients who present later have higher stages at diagnosis and take longer to reach the reference center (INCAN) and die significantly earlier than patients without locally advanced cancer.
Conclusions: Educational status and a high number of children (≥ 5) are highly correlated with a diagnosis of locally advanced carcinoma. Patients who delay seeking medical advice are in higher stages at the time of diagnosis and pass away earlier. As many as 63.3% have locally advanced carcinoma at the first recorded stage in their medical file.

From professional parachuting service to sporty skydive: Aspects of tandem jumps taking into account passengers with pre-existing illness

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Introduction: In the military skydiving service, a medical certificate is mandatory, which exists during amateur jumping, but does not have this quality and may not always be considered so strictly. No medical examination seems to be a prerequisite for a passenger during the tandem jump, but this may pose a danger.
Methods: In PubMed and other libraries, a literature search was carried out with the keywords parachute, risk, tandem, and passenger – 55 mostly well evaluable papers were found.
Results: In most cases, military accidents and deaths are statistically reported or subordinate to civilian skydivers. For the tandem passenger, only rudimentary data are available, dealing only with the injuries and deaths, but not with the pre-existing diseases, which may not be statistically recorded.
Discussion: For passengers in tandem jumps, very few data are available. Pre-existing conditions are obviously not considered for this extreme strain. Without data collection, a statement on the actual risk cannot be made. Possibly the diseases and injuries become obvious even later after a tandem and do not flow into the statistics at all. Extreme loads, which a jump from an airplane indeed is, could also afterward and then, of course, escape these statistics, but are linked. To this end, there is a lack of research that should be followed up, perhaps results that make a medical examination more necessary.