

Risk Assessment in Travel Health

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The presence of a disease in a country or a region of a country does not necessarily imply that the traveller is at risk of developing the disease. In order to carry out a risk assessment for a traveller it is necessary to understand the concept of hazard and risk. A **hazard** is an untoward event which could occur, and **risk** is the degree of chance that it will occur.

As a simple example a hole in a particular road in a particular town is a **hazard** which is potentially there for everyone visiting the town, but what would affect the **risk** of falling down it? The first and obvious risk factor would be walking down that particular road. The hole would not constitute a risk in any other part of the town. Other factors that would increase the risk may include being a child, being very old, being blind or being drunk. Any combination of these factors would increase the risk further. The risk is therefore dependent on a traveller's precise destination when visiting the town and on the traveller's personal characteristics rather than simply on the visiting a town which has a hole in one of its roads.

Similarly a traveller's disease risk when visiting a country does not necessarily depend on the presence of a disease in the country but on a combination of other factors. Disease hazards in a country depend on factors such as its climate, its infrastructure of water supply and sanitation, the presence of disease vectors such as insects and the presence of human or animal carriers of the disease, but the levels of risk to a traveler are determined by other factors.

What influences health risks for travellers?

Personal characteristics of the traveller such as age and sex may influence risk. Elderly travellers are more prone to infection because of reduced function of the immune system. They may also be living on the edge of normal function in any of their other organ systems and may be tipped over the edge into abnormal function by the physical or mental stresses of travel. Children are more at risk from a variety of infections, notably malaria, and not all vaccinations and antimalarial drugs are appropriate for children, depending on their age. Pregnancy may also cause problems when assessing the suitability of vaccinations and antimalarial drugs, and pregnant women are not allowed to travel on international flights after 34 weeks of pregnancy. The availability of suitable facilities in the event of complications of pregnancy or premature labour must be considered.

Previous medical history must be taken into account. Pre-existing medical conditions may be exacerbated by the physical and mental stress of travel, and previously pre-symptomatic conditions may become symptomatic during travel. The management of diabetes, for example, during travel may pose problems of control, adjustment of insulin dosage, management of hypoglycaemia and proneness to infection. Some medications may not be compatible with some antimalarial drugs, and adherence to dosage regimes may be poor during travel. Medications such as diuretics may be omitted because of unwanted effects on the traveller, with resultant exacerbation of the underlying condition. Immunisation records, important for the traveller, may be absent or incomplete.

Previous travel history may reveal evidence of problems which have occurred on previous trips. Experienced travellers may be better informed than their travel advisers on some aspects of travel, but they may also have absorbed myths and misconceptions about health risks and precautions from other travellers.

Time of travel & length of stay are important factors in assessing risk. Some problems, such as malaria, are more likely to occur in the wet season, while others may be more likely in the hot dry season, for example meningococcal infection in the “meningitis belt” of sub-Saharan Africa. Longer stays than the usual two weeks holiday increase the traveller’s exposure to insect and animal vectors of diseases such as e.g. malaria and rabies, food and water-borne infections and risks from trauma and the need for treatment in less than ideal medical facilities. Loneliness in long stay travellers may lead to an increased risk of sexually transmitted infections, and the potential psychological effects on long stay travellers are well documented.

The precise itinerary of the traveller may sometimes be difficult to obtain, especially with backpackers who may make spur of the moment decisions while travelling, but it is of great importance. Whilst there are some disease risks that may occur in specific countries they may not occur in all areas of those countries. Examples are malaria and yellow fever, which are likely to occur in tropical rain forest areas of countries in Africa and South America, but are unlikely to be found in high altitude areas of the same countries, and Japanese encephalitis, which is found predominantly in rural areas of South and Southeast Asia but is less likely to be found in cities. Whilst high altitude may avoid the risk of diseases such as malaria it may bring problems of its own such as altitude sickness and pulmonary and cerebral oedema. Travel to remote areas is more likely to persuade the travel adviser to give rabies vaccination as it may be difficult to obtain the necessary post-exposure vaccination quickly after an animal bite.

The mode of travel to be used may be associated with specific problems for some travellers, whether by air, sea or overland travel. Air travel is unlikely to cause hypoxic problems for most travellers due to the reduced air pressure in the aircraft cabin, but those with severely compromised cardiopulmonary function may suffer exacerbation of their problems. The problems of thromboembolic disease, especially for the elderly and those with pre-existing medical conditions, is well documented, as are methods of reducing the risk.

Budget & accommodation are important factors for some travellers. The lower the traveller’s budget and standards of accommodation and food, the more likely is the traveller to encounter disease risks from food and water-borne infection and person to person transmission of infection. Backpackers are at particular risk, but five star travellers are not devoid of risk from poor food handling methods in their hotels.

The traveller’s proposed activities may place him or her at increased risk. Exposure to sunlight or to extremes of heat and/or cold carry their own risks, whilst water-based activities may expose the traveler to risks ranging from immersion and hypothermia to leptospirosis. Alcohol and drug use are likely to increase the risk from all types of activity. Volunteers and health care workers, being exposed to prolonged and close contact with potential human carriers of infection are at particular risk from person to person transmission of infections such as meningococcal infection, tuberculosis and diphtheria in addition to hepatitis B and HIV infection. Sex tourism is the term often applied to those who travel for the purpose of sexual activities, some of which may be outside the law in their own countries. Other travellers may be tempted into unwise sexual contact with local people or fellow travellers. The risk of acquiring HIV or other sexually transmitted infection is high for both groups.

How important is vaccination for travellers?

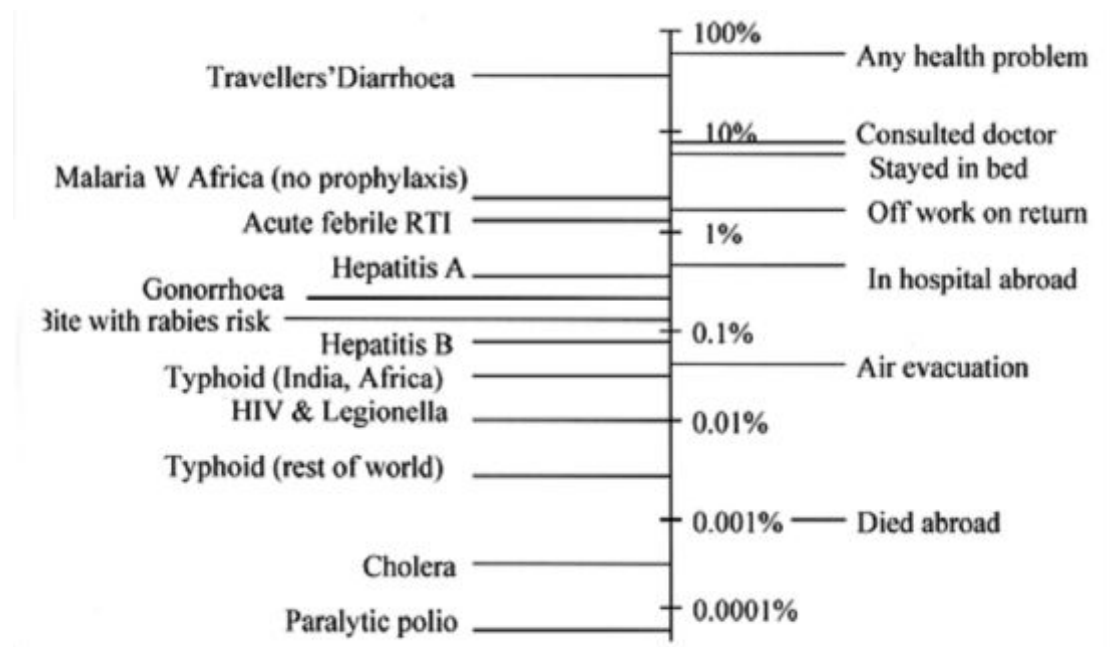
Vaccine preventable disease is responsible for approximately 5% of all health risks for travellers. It is therefore of the greatest importance for the travel adviser to take all the risks into consideration and not simply to give vaccinations.

Levels of risk for travellers

Steffen *et al*¹ have estimated the levels of risk for

travellers per month of travel to developing countries from developed countries. They expressed their findings in a logarithmic chart which has been re-drawn according to their figures in Figure 1.

Figure 1
Risk per month of travel (after Steffen et al, 1997)



This is a logarithmic chart. Each graduation represents a 10-fold difference in risk. 100% would imply that all travellers would be likely to develop the problem, 1% that 1 in 100 travellers would be likely to develop it and 0.0001 that 1 in 1 million would be likely to develop it.

What do travellers die from?

On the whole travellers do not die from tropical diseases. Cardiovascular disease is the commonest cause of death,² and it is therefore of the greatest importance to carry out a pre-travel medical assessment, especially from the middle years of life onwards. Accidents are the second most common cause and are the commonest cause in younger travellers. Road traffic accidents involving badly maintained or badly driven vehicles, badly maintained motor cycles hired without helmets and different or non-existent rules of the road all contribute to a high accident rate in travellers. Swimming and diving accidents and accidents involving unsafe balconies or fire are also sadly not uncommon. Violence, robbery, civil unrest and military or guerilla action are hazards in some parts of the world, and it is wise to consult the Foreign and Commonwealth Office website (www.fco.gov.uk) before travelling to such areas.

Sources of information on health risks

Wall charts are a frequently used resource but they may not be up to date, do not give sufficiently comprehensive information and do not allow an individual risk assessment to be made.

Computer databases on the other hand are updated regularly, carry more comprehensive information and enable a more individual risk assessment to be made. The author's preferred information source is the Travax website³ operated by Health Protection Scotland. It is a subscription service for health care professionals but there is a less comprehensive version, Fit for Travel⁴ available for public access free of charge. Travax is provided free of charge by some PCTs.

How to assess & manage travel health risks

- A 20 minute consultation allows time for information gathering and allows time for giving advice
- A printed or computer-based questionnaire as an aide-memoire ensures that no relevant details are overlooked and provides a record of what has been covered. It allows recording of all relevant factors such as
 - o personal information and medical history
 - o itinerary, length of stay and time of year traveling
 - o modes of travel to be used
 - o type of trip, e.g. backpacking, hotel holiday, safari, business trip
 - o activities planned
 - o advice & vaccinations given
- Discuss levels of risk with the patient
 - o what level of risk is he/she prepared to accept?
 - o what level of precautions is he/she prepared to accept?
- Give advice on precautions and immunizations
- Give written advice/leaflets as there may not be enough time to give all necessary information verbally, and record that they have been given.
- Record everything that has been done. This is essential for medicolegal as well as practical reasons.

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References:

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- 2 Paixao MTD'A, Dewar RD, Cossar JH, Covell RG, Reid D. What do Scots die of abroad? *Scottish Med J* 1881;36:114-116.
- 3 <http://www.travax.nhs.uk>
- 4 <http://www.fitfortravel.nhs.uk>
- 5 Raeside F. Risk assessment. In Lockie C, Walker E, Calvert L et al (eds). *Travel Medicine and Migrant Health*. London, Churchill Livingstone 2000.