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Immunisations and Health Information for Travel

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Chapter 19 Immunisations and Health Information for Travel

Introduction

The increase in international travel has continued to grow over the past 20 years and current projections suggest that this pattern will be maintained for the foreseeable future. Data released by the World Tourism Organisation in 2002 showed international tourist arrivals amounted to 693 million despite economic downturns and terrorist attacks. The figures of 150 million arrivals in 1970 and 500 million in 1993 illustrate how rapidly the numbers in international passengers are growing.

Changes in travel patterns that have become apparent include a trend for visiting ever more remote destinations. Many young people travel to several countries or continents for months at a time either as part of their summer holiday or as a gap year. International corporations place travellers in diverse destinations for short visits on international assignments. Travel for medical care is a relatively new phenomenon and is likely to increase over the coming years. Other specialised groups are those seeking to adopt children abroad and immigrants who wish to return to their country of origin in order to visit family and friends.

Many people are unaware that exotic destinations include potential exposure to infections that are rare in their home environment and other infections such as malaria that they will never have encountered previously. The resurgence of malaria in many parts of the world, with an increasing pattern of drug resistance, has led to an increase in the number of cases of malaria presenting in non-endemic areas. The emergence of new infections such as SARS and the spread of dengue fever and West Nile Virus place an ever-increasing responsibility on the doctor to remain up-to-date with current practice. The advent of new chemoprophylactic agents and of new vaccines also presents exciting challenges in dealing with the traveller.

A pre-travel consultation needs to address what immunisations are recommended, their potential side-effects and suitability for each traveller. Knowledge of relative risks to particular destinations is essential, as is an assessment of the patient's overall medical health and current medications. Additional recommendations and advice for those with pre-existing chronic illness should be included. Patients who are very young, those who are pregnant and the elderly also warrant special considerations in many areas of the usual consultation.

The determinates of advice and immunisations to travellers depend on:

- Duration of visit

- Destination
- Purpose of visit
- Standards of accommodations and food hygiene
- Behavioural or lifestyle patterns of the traveller

Many major urban centres and well-developed tourist destinations pose small risks to the short-term tourist or business traveller. Travel to areas where water supplies are difficult, the general standard of hygiene is poor and medical services are difficult to access or non-existent can pose serious risks to travellers. Any special occupation or activity should also be taken into account, e.g. contact with fresh water in areas where schistosomiasis is endemic.

While immunisations represent an important part of the travel consultation it should be emphasised that advice on risk avoidance, chemoprophylaxis and in some cases methods of self-treatment all constitute an important role in the travel medicine consultation. Ideally short-term travellers should present for advice 4-6 weeks before travel; those travellers who are travelling for long periods or going to very remote regions may require 6-12 weeks for the full series of immunisations.

Travellers should be aware that many conditions may present after they have returned from their trip abroad. In general patients who encounter problems within 1 year of returning should inform a doctor that they have been abroad. Check-ups for disease should be considered in those who have suffered from any serious problem abroad, i.e. any medical problem that has not been self-limiting, potential exposure to a known medical risk or development of problems within a year of return.

It is also of note that tour operators, travel agents and airline and shipping companies have a responsibility to advise travellers to consult a travel medicine clinic as soon as possible after booking a trip to any destination where significant health risks may be encountered.

There are also responsibilities that any traveller needs to accept before travel, including seeking advice in good time, compliance with recommended vaccines and other medications and general health measures. They should also consider carrying a medical kit and obtain adequate health insurance cover. Regulations regarding entry requirements such as the need for yellow fever certificates can be obtained from organisations such as WHO whose website address is given at the end of the chapter.

Immunisations should be arranged at least several weeks before travel, where possible.

Vaccination is a highly effective way of preventing disease. However, not all vaccinations offer 100% protection against disease and all additional recommendations in preventing disease should be followed. In general travel vaccinations are both safe and effective. As most vaccines take some time to become fully effective they should be administered at least 2 weeks before travel, although the late-presenting traveller may still benefit from having vaccinations even at the last minute.

Multiple vaccines can be administered at different sites on the same day. However, certain vaccines commonly cause local reactions that may be accentuated if a number of these vaccines are given simultaneously. If possible these should be given on separate occasions unless time constraints dictate otherwise. This is important in aluminium-containing vaccines such as hepatitis A, hepatitis B, tetanus, diphtheria toxoids, IPV, and conjugate meningococcal C vaccines. Various combined vaccinations are now available and these offer travellers considerable advantage by reducing the number of injections involved and improving compliance.

Vaccines for global travellers

- 1 Those that are used routinely particularly in children
- 2 Those that may be advised before travel
- 3 Those that are mandatory

Many childhood vaccinations require periodic boosting to maintain immunity throughout life. Pre-travel precautions should include booster doses of routine vaccines if the regular schedule has not been followed or where travel occurs to countries where boosters, e.g. tetanus, may not be readily available should the need arise. Older travellers may never have received primary courses of routine vaccines. Immunisation history should be checked to confirm adequate protection, including need for appropriate booster doses. **It is recommended that each traveller should be up to date with his/her routine vaccine schedule including vaccines against influenza and pneumococcal vaccines for travellers who are in the appropriate age group or those who have indications for vaccines due to underlying medical conditions.** Other vaccines will be advised depending on the area visited, the type of travel, any special identified risks, and on age, health and vaccination history of each individual. Please note that some vaccines can appear in more than one group.

Table 19.1 Vaccines for travellers

Category	Vaccine
1. Routine vaccination – check status and update	DTaP/IPV or Td/IPV for adults
	Hepatitis B
	Hib
	MMR
	Influenza
	Pneumococcal
2. Recommended vaccines depending on itinerary, type and duration of travel	Cholera
	Hepatitis A
	Hepatitis B
	Japanese encephalitis
	Meningococcal ACWY
	Rabies
	Tick-borne encephalitis
	BCG
	Typhoid fever
	Yellow fever
3. Mandatory vaccination	Yellow fever
	Men A,C,W,Y (for Hajj, Umra)

Table: WHO, International Travel and Health 2006

Yellow fever vaccine should not be given to infants less than 9 months of age unless the risk of yellow fever is very high, as the vaccine may cause encephalitis.

Yellow fever (notifiable)

Yellow fever is an acute haemorrhagic fever spread by mosquitoes that occurs in Tropical South America and in many countries in sub-Saharan Africa. Generally presenting as an acute fever with jaundice and

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haemorrhage its mortality rate can be up to 50% in outbreaks. The risk of acquiring disease increases in patients who travel to jungle areas but also in urban centres reporting outbreaks. Areas where yellow fever occurs far exceed those officially reported.

The risk of infection can be reduced by taking precautions against mosquito bites. The species that transmits yellow fever also bites during day time. Vaccination is recommended for all travellers (for exceptions see below) who visit countries or areas within countries where there is a risk of yellow fever transmission. For in-country travel, vaccination is recommended outside urban areas of the endemic zone (see current WHO maps) even if these countries have not officially reported the disease. Vaccination for personal protection is not mandatory.

Mandatory vaccination against yellow fever is carried out to prevent the importation of yellow fever virus in countries where the potential for yellow fever exists because the vectors and primate hosts to support transmission are already present. In such cases vaccination against yellow fever may be an entry requirement for all travellers arriving from countries where there is a risk of yellow fever transmission. It does not generally apply to passengers from European countries unless the host country states that **all** travellers must have yellow fever as an entry requirement.

If yellow fever is contraindicated for medical reasons (see below) a certificate of exemption may be provided.

A yellow fever certificate only becomes valid after 10 days and is valid for 10 years from that date.

Vaccine

Yellow fever is a live viral vaccine. The dose is 0.5 ml subcutaneously, for both children and adults. One dose provides 10 years protection.

Tolerance of the vaccine is generally good; 2-5% of recipients have mild reactions including myalgia and headache. Up to 20% may report influenza like symptoms. Rarely encephalitis can occur at any age but has a higher incidence in infants under the age of 9 months. Infants less than 6 months should never receive yellow fever vaccine.

Contraindications to the vaccine include egg protein allergy, a confirmed serious reaction to a previous dose of any vaccine component, congenital or acquired cellular immunodeficiency, and symptomatic HIV infection. In cases where patients are under specialist care for immunodeficiency,

consultation with the patient's doctor may clarify matters for the travel advisor. Pregnant women should be advised not to travel where exposure to yellow fever may occur. There is a theoretical risk of harm to the foetus if the vaccine is given in pregnancy but that risk must be weighed against the serious risk of the mother travelling unvaccinated to a high risk zone.

Recently there have been reports of a small number of serious adverse reactions, including deaths, following yellow fever vaccine. This syndrome has been described as yellow fever vaccine associated viscerotropic disease (YEL-AVD); post-vaccinal encephalitis has been renamed as yellow fever associated neurotropic disease (YEL-AND). Most cases occurred in elderly people being vaccinated for the first time for yellow fever and there was an association with a history of thymectomy or disorders of the thymus. The risk to individuals travelling to areas where transmission is occurring is far higher than the risk of vaccination but it is important that yellow fever vaccination is not prescribed for individuals who are not at risk of exposure to infection.

Meningococcal infection (notifiable)

Meningococcal vaccine (see Chapter 9).

Indications

1. Travel to high-risk areas, particularly for those visitors who live or travel 'rough' such as hitchhikers or 'trekkers'. These areas include the meningitis belt of Africa (Southern sub-Saharan parts of Senegal, Mali, Niger, Chad and Sudan; all of Gambia, Togo and Benin; Northern parts of Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Central African Republic, Uganda and Kenya) where epidemics of Group A infections occur in the dry season (December-February)
2. Travel to areas where epidemics of meningococcal disease are occurring
3. Long-term and rural travellers to countries where outbreaks can occur. In the past these outbreaks have usually been due to Group A disease, especially in areas of Africa as above. Outbreaks have occurred in Saudi Arabia due to meningococcal A and to W_{135} in association with the Hajj and have led to mandatory requirements for meningococcal vaccine before entry to Saudi Arabia. W_{135} has also been reported from Burkina Faso. ACWY quadrivalent vaccine is the recommended vaccine for travellers.

Vaccine

The ACWY vaccine is a purified heat-stable lyophilised capsular

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polysaccharide from meningococci of the respective groups. Efficacy levels of 85-100% have been documented in older children and young adults but it is not as effective in children under the age of 2 years. The meningococcal C conjugate vaccine (MenC) is not suitable for travel to areas where group A types are dominant. There is no available vaccine against type B strains.

Adverse reactions

Local: Injection site reactions occur in approximately 10% of recipients and last for about 24-48 hours.

General: Generalised reactions are rare but pyrexia occurs in up to 2% of vaccines.

ACWY vaccine does not elicit a protective immune response to meningococcal serotype C antigen in children under the age of 2 years. Response to A, W and Y antigens may be achieved in children under the age of 2 years but are likely to be short-lived.

In adults and children over the age of 5 years immunity will persist for up to 5 years. Children who are vaccinated under the age of 5 years should receive boosters at 2-3 years. The mandatory booster interval for those travelling to Saudi Arabia is 3 years.

Cholera (notifiable)

Cholera is an acute diarrhoeal disease caused by an enterotoxin of *Vibrio cholera* which has infected the small bowel. The illness is characterised by the sudden onset of profuse watery stools and occasionally vomiting. Dehydration, metabolic acidosis and circulatory collapse may follow rapidly.

Two main serogroups occur: 01 and 0139. Cholera occurs mainly in countries where there is inadequate sanitation and where clean drinking water is difficult to obtain. The risk for most travellers is very low even in travellers where cholera epidemics occur. Simple precautions are usually sufficient to prevent cholera in most travellers. Workers in disaster areas and in refugee camps are at the highest risk. Cholera is easy to treat; the vast majority of patients will recover if adequate hydration is supplied. Vaccination is only advised for those at increased risk of the disease, particularly emergency relief and health workers in poor conditions.

Vaccine

Parenteral cholera vaccine is no longer recommended by WHO. Modern oral cholera vaccines have now been produced and are now the only recommended vaccines. The killed oral vaccine contains a heat-

inactivated *V. Cholerae* strain of both the Classic and el Tor biotypes but is not effective against O139 strains. It gives some cross-protection vaccine against some strains of enterotoxigenic *E. coli* by preventing a sub-unit from attaching to intestinal mucosal sites. The vaccine is two doses at 1-6 weekly intervals. It should be kept in a refrigerator and food should be avoided for an hour before and after a dose is taken. The level of protection is much higher than that of previous vaccines (85-90%) in the first 6 months, with antibodies persisting up to 3 years after the original vaccination.

Only evidence of a previous allergic reaction precludes administration of cholera vaccine (killed). Post-vaccine reactions are generally mild and of short duration.

Contraindication

Previous anaphylactic reaction to any component of the vaccine.

An EU licensed oral cholera vaccine has been added to the IMB list of vaccines that are authorised and marketed for use in Ireland.

Typhoid (notifiable)

Typhoid fever is a systemic infection caused by *Salmonella typhi*. Only humans carry salmonella typhi. Most of the approximately 2,000 serotypes in the genus salmonella cause only local infection of the gastro-intestinal tract (gastro-enteritis or 'food poisoning'). *S. typhi*, *S. paratyphi* A, B and C and occasionally other salmonella species may invade systemically to produce a serious illness with prolonged pyrexia and prostration. The likelihood of becoming a chronic carrier increases with age.

Typhoid/paratyphoid fevers are acquired mainly through food or drink contaminated with the excreta of a human case or carrier. It is therefore predominantly a disease of countries with poor sanitation and poor standards of personal and food hygiene. All travellers to endemic areas are at potential risk of typhoid fever; the risk of typhoid fever is lowest in tourist and business centres and rises as travellers enter more rural areas where standards of accommodation and food hygiene are not high. As typhoid vaccine is only partially effective, travellers should be advised to take precautions against eating or drinking potentially contaminated food and drink. Typhoid is particularly prevalent in the Indian sub-continent.

Vaccine – parenteral

Vi polysaccharide vaccine: parenteral capsular polysaccharide typhoid

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vaccine is available. Each 0.5 ml dose contains 25 mcg of the Vi polysaccharide antigen of *S. typhi* preserved with phenol. A single dose gives 70-80% protection for at least 3 years.

Typhoid vaccine should be stored at 2-8°C.

Dose and route of administration

Adults

- Vi polysaccharide vaccine: a single intramuscular or subcutaneous dose (0.5 ml) is given. Reimmunisation with a single dose every 3 years is recommended for those who remain at risk of infection.

Children

- Vi polysaccharide vaccine: the risk for children developing typhoid under one year is low. Children under 2 years may show a suboptimal response to polysaccharide antigen vaccines. Use of the vaccine in this age group should therefore be governed by the likely risk of exposure to infection. Children over the age of 2 years may receive the normal adult dose.

Indications

Typhoid immunisation is required for:

- Laboratory workers handling specimens which may contain typhoid organisms
- Travellers to countries in Africa, Asia, Central and South America and South East Europe, and to other areas where hygiene is likely to be poor. Vaccination is generally less important in areas where typhoid is not highly endemic and where visits are confined to urban centres with good accommodation
- Typhoid immunisation is not recommended for contacts of a known typhoid carrier or for controlling common-source outbreaks.

Contraindications

Previous anaphylactic reaction to any component of the vaccine.

Precautions

- 1 Acute febrile illness; defer until recovery.
- 2 As with other vaccines, typhoid vaccine should only be given to a pregnant woman if a clear indication exists.

Adverse reactions

Vi polysaccharide vaccine: Local reactions are reported to be mild and transient and systemic reactions are less common than with the older whole cell vaccine.

Japanese B encephalitis (notifiable)

This is predominantly a rural disease causing a potentially fatal encephalitis that is endemic in a large expanding swathe from northern Australia to India and Nepal. Epidemics are associated with the monsoon season. The majority of people who contract Japanese encephalitis virus will remain asymptomatic or suffer from a short acute viral illness. In 1 in 200 people the disease causes encephalitis that has a mortality rate of about 30%; many survivors have long-lasting severe neurological sequelae. The chance of permanent neurological disease increases with increasing age. The case fatality rate can reach 50%.

This *Culex* mosquito-borne viral disease is a zoonosis infecting pigs and wading birds, and humans are infected incidentally. The mosquito is a night feeder, biting especially in the cooler hours of dusk and dawn. Rice paddies are important breeding sites.

The risk of contracting the disease is estimated at 1:5,000 per month of travel in highly endemic areas. The risk to short-term tourists is low. The vaccine should be offered to expatriates who plan to reside in endemic areas and travellers spending more than 30 days in such areas or those whose type of activity places them at risk. If indicated, further detailed information should be sought from specialised centres or the WHO website.

Vaccine

The current vaccine is available on a named patient basis only. The vaccine is a solution of inactivated Nakayama-NH strain of the virus incubated with mouse brain. This produces a highly efficacious vaccine. The vaccine is administered at 0, 7 and 28 days using 1.0 ml of vaccine subcutaneously. Shorter, 2-dose schedules (day 0 and 14) can be used but efficacy is usually reduced in these cases to about 80%.

Localised pain and erythema occur in about 20% of recipients, with fever and pruritis occurring in 10%. Due to a number of cases of hypersensitivity reactions in the past it is advisable to keep patients for at least 30 minutes post-vaccine and advise them of potential late-onset allergic reactions up to 10 days post-vaccination. Patients should not travel abroad for at least 10 days after the last vaccination.

Tick-borne encephalitis (notifiable)

This viral disease occurs sporadically through parts of eastern and central Europe and the Asian part of the former USSR. Disease transmission primarily occurs during the spring and summer months in those exposed to tick bites. Travellers planning to camp or trek through forests or

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to walk along nature trails should consider having vaccination before travelling as currently no therapy exists for this disease. If indicated, further detailed information should be sought from specialised centres or the WHO website.

This flavivirus belongs to the same family as Japanese encephalitis, dengue and yellow fever viruses. The virus is transmitted by ticks that feed on wild and domestic animals that constitute the natural reservoirs for TBV. Once infected, the tick can then transmit the virus to humans. They are mainly to be found in spring and summer. The ticks wait for their prey on the underside of vegetation and attach themselves to passing animals or humans. After attachment the tick may not feed for up to 12 hours. Early removal of ticks can, therefore, prevent disease. The tick should be removed with tweezers, care being taken not to leave the head or mouth parts attached to the skin.

The disease is also transmitted by unpasteurised goat's milk or goat's milk products. It occurs in many countries in Central Europe and has spread to areas in Scandinavia and Switzerland. In Russia and across the former USSR it is known as Russian spring-summer fever. There is an initial viraemic phase, with a minority of those affected going on to develop encephalitis in about 20-30% affected. Similarly post-encephalitic sequelae are common and the disease has a mortality rate of 1%.

Vaccine

The vaccine is a suspension of purified inactivated TBV propagated on chick embryo cells. Three doses of 0.5 ml are given, the first two at an interval of 1 month with a booster at 12 months. A booster is given every 3 years for those who are exposed to the disease regularly. A shorter course of a 14-day interval can be used for rapid protection. The vaccine is currently unlicensed but is available in adult and junior forms.

Occasional local reactions may occur such as erythema and induration at the site of injection. In a small number of cases fever occurs and may persist. Contraindications include sensitivity to thiomersal, hypersensitivity to egg protein and severe reaction to a preceding dose.

Rabies (notifiable) (see Chapter 20)

Rabies, a viral disease transmitted by bites licks or scratches from infected mammals, is a very important cause of viral encephalomyelitis in many parts of the world. Travellers can be bitten in parts of the world where access to treatment is difficult and sometimes unavailable. For a

full discussion of rabies pre- and post-exposure vaccines see Chapter 20.

Diphtheria (notifiable) (see Chapter 3)

It should be re-emphasised that children aged 10 years and over and adults should not be given the higher strength childhood vaccine due to the possibility of anaphylactic reaction. An up-to-date list of licensed vaccines is contained in Appendix 1, or can be accessed on the IMB website, www.imb.ie.

Poliomyelitis (notifiable) (see Chapter 13)

Transmission of poliomyelitis in many regions of the world has been significantly lessened during the past 20 years and so the risk of infection for the international traveller is small. In most cases vaccination is no longer recommended for those visiting any region in the Americas and it is likely that the recommendations for SE Asia will also change during the next few years. Most disease risk currently occurs through the Indian and African Subcontinents.

Hepatitis A (notifiable)

Gammaglobulin provides passive immunity against Hepatitis A and has been used for this purpose since the early 1940s. Declining levels of hepatitis A antibodies in donor patients and the production of an effective vaccine mean that it is no longer used for routine protection against hepatitis A in travellers. If its use is indicated gammaglobulin is sometimes available. Current internationally accepted advice suggests that active vaccination against Hepatitis A (even at short notice before potential exposure) provides adequate protection. Travellers presenting within 10 days of travel should be advised of the potential risk of vaccine failure and the need to exercise extra precautions during this initial period.

Influenza (notifiable) (see Chapter 7)

All travellers are at some risk of acquiring a seasonal influenza during an outbreak. Tourists are at increased risk because they often travel in crowded conditions and visit very crowded locations. All groups at special risk due to age or chronic illness are at increased risk as per the chapter on influenza. Health-care workers are also at high risk.

Vaccine

Each year influenza vaccines change according to the change in their antigenic pattern. The vaccine contains 3 strains, with the composition changing each year to protect against the strains prevalent in any one season. There may be, in any given year, a significant difference between strains during the influenza seasons of the northern and southern

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hemispheres, which occur at different times of the year (November to March in the north and April to September in the south). Therefore influenza vaccine administered in one hemisphere may only offer partial protection to travellers to a different hemisphere. At-risk travellers who are going to another hemisphere just before or early on in the influenza season should arrange to have influenza vaccine as soon as possible after arriving at their destination.

Tuberculosis (notifiable)

See Chapter 16 for a full discussion on TB and the recommendations for BCG.

Tuberculosis occurs worldwide and the risk of infection varies from country to country (see map available on WHO website). BCG should be considered in the following groups of travellers. (Note: Mantoux testing should have been performed within the previous 3 months if BCG is to be recommended.)

1. Unvaccinated Mantoux negative persons intending to live or work with local people in high-incidence countries for more than 1 month. Vaccine may also be considered for shorter-stay travellers who are likely to be at increased risk.
2. Health-care workers who are Mantoux negative and have no history of vaccination and no scar to indicate previous vaccination and who have contact with patients or infectious material.

The degree of protection afforded to those over 16 years is not well documented but for the above groups it is considered to offer some protection. Individuals who are already vaccinated do not need repeat vaccination.

For travel purposes, the vaccine should be given at least 6 weeks before departure. Please note that live vaccines should be separated by at least 4 weeks and further vaccination in the arm in which BCG is given is not recommended for at least 3 months.

Travellers should avoid unpasteurised dairy products. If in doubt boil milk before drinking it.

For information on contraindications to BCG vaccine refer to Chapter 16.

Hepatitis B (notifiable)

Hepatitis B vaccine can be given as an accelerated course if the time to departure is short. The dose is 1.0 ml of vaccine given intramuscularly on

days 0, 7 and 21 or 28. A booster dose should be given 12 months after an accelerated schedule. Accelerated doses of the combined hepatitis A and B vaccine have also been shown to be effective. Other accelerated schedules are indicated in the main text.

Other Immunisations

Advice about other immunisations will always be tempered by the length of time to be spent abroad, the location, and if camping/trekking is intended. If more than 1 live vaccine is required, they should either be given at the same time in different sites, or at an interval of four weeks. (Check relevant Chapters within this book.)

Travel health: general information

It is important to remember that the commonest illnesses acquired abroad are preventable by measures other than vaccines.

Diarrhoea

Traveller's diarrhoea is one of the commonest problems in people travelling abroad. It is estimated that between 20-50% of travellers are affected by this self-limiting condition. The average duration of an attack is 2-5 days. Diarrhoea that continues for longer than 2 weeks is deemed to be persistent traveller's diarrhoea and is more likely to have an underlying parasitic cause. The main cause of acute traveller's diarrhoea is bacterial, although viruses may also be implicated. Organisms causing dysentery can present in well-fed travellers without blood appearing in the stool. The main causative bacterium tends to differ between the areas visited, and variation in the organisms most likely to cause diarrhoea can be seasonal.

All travellers should be made aware to avoid untreated water, avoid ice in their drinks and stick to hot, fresh, well-cooked food preferably eaten in well-maintained restaurants. Statistics do show that travellers rarely adhere to this regime. Apart from advice, most travel advisors will prescribe anti-motility agents and an appropriate anti-microbial for travellers as emergency self-treatment. The use of antibiotics as prophylaxis for diarrhoea is reserved for special cases where chronic disease may make the risk of diarrhoea considerably more serious for such individuals.

Malaria (notifiable)

Malaria is a common and life-threatening disease in many tropical and sub-tropical areas of the world. In general the number of malaria cases is

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increasing due to the increasing drug resistance of the parasite itself, the increasing resistance of mosquitoes to insecticides and the breakdown of public health measures against malaria in many parts of the world due to social and civil disruption.

Malaria is caused by a protozoan *plasmodium*. Four varieties are recognised of which *P. falciparum* is the most serious form. Malaria can be rapidly fatal and is especially serious in pregnant women and children under the age of 5 years. Small children and pregnant women are advised not to travel to areas where falciparum malaria occurs unless travel is essential.

There is ample evidence that strict adherence to mosquito bite precautions and taking appropriate malarial prophylaxis can considerably reduce the risk of acquiring malaria. All travellers to regions where malaria occurs should be informed of the level of risk involved and the types of malaria that occur. Appropriate chemoprophylaxis should be prescribed. Patients should be educated on how to take their medication and advised of any potential side-effects. It is also important to stress that travellers should take precautions against mosquito bites such as the use of repellents and of impregnated bed-nets. Anti-mosquito-bite protection regimes have been shown to provide a significantly cumulative protective effect with chemoprophylaxis.

No anti-malarial regime is 100% effective and travellers should be informed of the need to investigate any unexplained 'flu-like illness occurring more than 7 days after entering a malarious area and for up to a year after return from that area.

For long-term travellers to areas where medical care may be inaccessible, emergency stand-by medication may be appropriate.

It should also be noted that many arthropod viruses are also mosquito-borne and appropriate advice about mosquito avoidance is very pertinent in these diseases, some of whom have no available vaccine, e.g. dengue fever.

Acquired Immune Deficiency Syndrome (AIDS)

Travellers should be told that there are no AIDS-free areas of the world and advised of the dangers of unprotected casual sex. They should also be advised to be accident-wise because of the risk of AIDS transmission in many countries through blood transfusion. Tattoos, acupuncture, unsterile needles and body piercing can place travellers at risk from blood-borne viruses including HIV, hepatitis B and C. Sexually-transmitted

diseases are also an area where considerable risks are taken by travellers. All travellers should be made aware of the dangers of many diseases including bacterial and viral conditions, caused by having unprotected casual sexual intercourse and that the use of condoms while offering some protection is not always reliable.

Prolonged travel

Those planning to live overseas for prolonged periods of time should attend for medical advice regarding immunisations and general health-care advice in sufficient time before their departure. Generally periods up to 3 months may be required and this should be considered when booking their itinerary.

A dental check before travelling is recommended and it may be wise to carry sterile syringes/needles in case an injection is necessary.

Visiting friends and relations

This category of traveller is a new entity for Irish practitioners. Generally these patients will be visiting family and friends in their country of origin and in many cases they will be in rural regions where the risk of disease is high. If visiting highly endemic countries, they may also be resistant to the suggestion that malaria prophylaxis and vaccination cover will be required.

It should be remembered that natural immunity against a number of diseases drops rapidly once an individual is not continuously exposed. Thus following a stay in Ireland of over 6 months it should be assumed that an individual will have lost all natural protection against malaria and diarrhoeal diseases. Generally malaria prophylaxis and vaccination cover for this group should be the same as that suggested for any other traveller. Statistics show that this group is much less likely to seek advice and is many times more likely to present with malaria post-travel. Evidence also shows they are more likely to suffer from other preventable diseases such as typhoid.

Bibliography

World Health Organization (2006). International Travel and Health.

Further Information

The World Health Organization produces a yearly guide **International Travel and Health**, *Vaccination Requirements and Health Advice for the International Traveller*. Supplies are available through local medical bookstores or directly from WHO in Geneva (Tel +4122 791 2476 e-mail publications@who.ch). The WHO guidelines are available online and can be downloaded.

Useful websites

- Irish Travel Medicine Society www.istm.ie
- Centre Disease Control,
Atlanta Georgia,
USA www.cdc.gov
- WHO www.who.int
Geneva
Switzerland