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## TRAVEL MEDICINE (1)

- ➡ Increased international travel has resulted in greater exposure to tropical diseases
- ➡ Malaria is a major potential cause of travel illness requiring appropriate prevention measures
- ➡ Travellers' diarrhoea, the commonest travel related illness is self-limiting in most cases
- ➡ Dengue fever, for which there is no vaccine, is an increasing cause of illness in returned travellers

## INTRODUCTION

International travel has become increasingly popular with up to 700 million travellers crossing international borders annually<sup>(1)</sup>. There has also been a change in the pattern of travel with people visiting more remote destinations, young people visiting several countries for months at a time, an increase in business travellers and immigrants returning to their country of origin to visit friends and relatives (VFR)<sup>(2,3)</sup>. Many travellers are unaware that travelling to remote destinations may result in exposure to infections not present in Ireland and that they may become unwell while away or on their return. In one European study illness was reported in up to 43% of travellers with 10% reporting greater than one adverse event, of which the most frequent symptom was gastrointestinal (35%), followed by respiratory (14%)<sup>(4)</sup>.

This bulletin, the first of two dealing with travel medicine, focuses on some travel-related infectious diseases that frequently pose problems for the traveller. The second bulletin focuses on practical issues for the traveller prior to, and after travel.

## GENERAL CONSIDERATIONS

Any traveller going to tropical or developing destinations should seek a pre-travel consultation at least 4-6 weeks before travelling. Last minute travellers however may also benefit from a travel consultation. A recent study of European travellers to developing countries reported that only 52% of travellers had sought travel health advice and only 31% of those VFR sought advice<sup>(2)</sup>. The VFR group of travellers pose specific problems as many are sceptical about the need for travel advice and appropriate vaccination. It is important to note that an individual may lose protection against disease(s) when he/she moves to another area where that disease is not prevalent; the most serious example of this is malaria.

Each traveller requires an individual assessment. Table 1 lists the different factors, which need to be taken into account in assessing potential risk for the individual.

The travel medicine physician needs to have up to date information regarding emerging diseases in various regions and the availability of new vaccines / other prophylactic agents. [See Table 4 for a list of websites, that give access to up to date useful information on travel medicine].

Table 1: Key Factors determining medical risk for travellers<sup>(3)</sup>

- Destination
- Duration of visit
- Purpose of visit
- Standard of accommodation and food hygiene
- Health and behaviour of the traveller

## PREVENTION OF MALARIA

Malaria, which is transmitted by the female anopheles mosquito, is one of the commonest insect borne diseases. Malaria occurs following infection of the red blood cells by the parasite *Plasmodium (falciparum, vivax, ovale* and less commonly *malariae*), of which *P. falciparum* causes the most severe form of malaria and the most deaths<sup>(5,6)</sup>.

It affects up to 400 million people annually resulting in 1 million deaths, the majority in young children<sup>(5,6)</sup>. Malaria is endemic in over 100 sub-tropical and tropical countries<sup>(5)</sup>.

Worldwide up to 30,000 travellers become infected<sup>(5,7)</sup>, with up to 2,000 cases of malaria including 10 deaths reported annually in the UK<sup>(6,8)</sup>. In Ireland, reports of malaria have continued to rise in recent years: in 2005, 44 cases of malaria were notified, including one death due to *P. falciparum* (an increase of 62% from the previous year) and in 2006, 94 cases were reported (unofficial figures)<sup>(9)</sup>. The most common species identified was *P. falciparum* (75% of cases notified), which is similar to that seen in the UK and Europe<sup>(5,7)</sup>. Most of the illness and death from malaria in returning travellers should be avoidable - most people who fall ill have failed to take adequate precautions<sup>(5,8,10)</sup> and/or have used no or inadequate chemoprophylaxis<sup>(10)</sup>. **The most important preventive measures to be taken by the traveller are personal protection against mosquito bites and malarial chemoprophylaxis**<sup>(6,8)</sup>.

The **ABCD** of malaria prevention for the traveller is: **A**wareness of risk, **B**ite prevention, **C**hemoprophylaxis, and prompt **D**agnosis and treatment.

**Awareness of risk:** The risk of getting malaria depends on the country visited, the time of year, the number of mosquito bites received, pattern of activity (mosquitoes which transmit malaria bite between dusk and dawn), accommodation (backpackers have increased risk compared to tourists staying in accommodation with air-conditioning) and duration of stay (the longer the stay, the higher the risk of contracting malaria)<sup>(6,8)</sup>. Areas where malaria is considered high risk include sub-Saharan Africa, South and South-East Asia and parts of Oceania, Latin America and the Caribbean<sup>(7)</sup>. One of the highest risk areas is the rain forest of West Africa where an unprotected individual staying for one week has a 2-3% chance of

contracting malaria <sup>(6)</sup>. **The majority of malaria cases reported in Ireland in 2005 were associated with travel in Africa, with the remainder exposed in Asia** <sup>(5)</sup>.

**Bite prevention:** Effective bite prevention should be the first line of defence against malarial infection. This is one of the cornerstones of malaria prevention and will be covered in detail in the second bulletin.

**Chemoprophylaxis:** In addition to the risk factors for malaria, chemoprophylaxis also depends on the age of the traveller, previous experience/reactions to antimalarials, medical history and pregnancy/breast feeding status <sup>(6)</sup>. Studies suggest that up to 50% of travellers may be using the wrong prophylaxis <sup>(7)</sup> and reliable up to date advice is required to ensure appropriate chemoprophylaxis. [See Table 4]. The choice of regimen is largely dependent on the presence or absence of resistance to chloroquine or the chloroquine/proguanil combination <sup>(6)</sup>. There is widespread *P. falciparum* resistance to chloroquine and some *P. vivax* resistance to chloroquine depending on the country <sup>(6, 8)</sup>. Table 2 contains information on the commonest prophylactic agents used in malaria. The list is not exhaustive; there are other medications, which may also be used off-licence. **It is essential to consult the individual Summary of Product Characteristics before prescribing.**

**Table 2: Commonly Prescribed Chemoprophylactic Agents for Malaria**

Drug	Efficacy	ADRs	Contraindications	Common Cautions
<b>Mefloquine</b> <sup>(8, 11) *</sup> (Lariam®)	90% efficacy in Africa. Significant <i>P. falciparum</i> resistance in some areas of south-East Asia and sporadically in Amazon basin (Duration of prophylactic treatment on a case by case basis) (Ideally start 2-3 weeks before entering malarious area and for 4 weeks after)	Nausea vomiting dizziness, Headache, Neuropsychiatric reactions	Psychiatric illness Epilepsy Hypersensitivity to quinine Severe hepatic impairment	Caution in renal impairment Not recommended < 3 months old Use in pregnancy only if compelling reasons Avoid breast-feeding Problems with drug interactions – see SPC for full details
<b>Doxycycline</b> <sup>(8, 12) *</sup>	Comparable prophylactic efficacy to mefloquine (Start 24-48 hrs before entering malarious area and continue for 4 weeks after leaving area)	Photosensitivity Oesophagitis Vaginal candidiasis	Allergy to tetracyclines Pregnancy and breast feeding Children < 12 years	Hepatic impairment Myasthenia gravis SLE. Problems with drug interactions – see SPC for full details
<b>Atovaquone plus proguanil</b> <sup>(8, 13) *</sup> (Malarone®)	Efficacy against <i>P. falciparum</i> >90% (Start 24-48 hrs before entering malarious area, stay should not exceed 28 days and continue for 7 days after leaving the area)	GI disturbance Headache	Hypersensitivity to any component of formulation Severe renal impairment	Take with food/milky drink Pregnancy avoid unless essential Breast feeding avoid Paediatric formulation available – licensed in UK <sup>(14)</sup>
<b>Chloroquine</b> <sup>(8, 15) *</sup>	Use as a single agent for prophylaxis rarely appropriate Chloroquine-resistant <i>P. falciparum</i> is widespread.	Gastrointestinal disturbance, Headache Convulsions, Pruritus		Highly toxic in overdose Epilepsy Can exacerbate psoriasis and myasthenia gravis. Caution in hepatic, renal disease. Medical advice for first trimester. Regular eye exams for long-term use. Problems with drug interactions – see SPC for full details
<b>Proguanil</b> <sup>(8, 16) *</sup> (Paludrine®)	Use as a single agent for prophylaxis rarely appropriate as few regions where <i>P. falciparum</i> is fully sensitive	Gastrointestinal disturbance Mouth ulcers and stomatitis Rarely allergic reactions	Allergy to proguanil	Caution in renal impairment Pregnancy – requires folate supplements and medical advice for first trimester. Problems with drug interactions – see SPC for full details

\* check the individual SPC for further details on all drugs

Compliance is a major issue with anti-malarial drugs. Studies suggest that up to 59% of travellers are non-compliant with the advice given, the evidence suggesting that non-compliance is more likely in those <55 years, undertaking trips of long duration and/or non-package tours <sup>(6)</sup>. Travellers should be advised not to purchase anti-malarial drugs over the internet and they should also be warned that antimalarial drugs purchased in the tropics may be counterfeit <sup>(8)</sup>. **The traveller should be made aware that no antimalarial can offer complete protection and bite avoidance measures must always be taken** <sup>(6)</sup>.

**Diagnosis:** Suspected malaria is an emergency and any fever occurring in a traveller returning from the tropics should be considered malaria until proven otherwise <sup>(8, 17)</sup>. The incubation of malaria is variable depending on the parasite – the average is 10 -14 days but it can be as short as 7 days or in exceptional cases up to 20 years (*P. malariae*) <sup>(18)</sup>. **The greatest danger with malaria is that the early symptoms (including fever/sweats/chills, malaise, headache, diarrhoea and cough) tend to be non-specific <sup>(6)</sup> and the disease is often mistaken for influenza <sup>(17)</sup>.** Malaria attacks are classically described in **three phases:** coldness and rigors; feeling hot and flushed; and then intense sweating as the attack resolves <sup>(6)</sup>. In the case of severe *falciparum* malaria, the fever is irregular with coma and death sometimes occurring in as little as 24 hours from initial symptoms <sup>(6)</sup>. Malaria cannot be diagnosed by clinical criteria alone and requires prompt examination of thick and thin blood films <sup>(18)</sup>. One negative blood film does not exclude malaria and where it is suspected blood films should be examined every 12-24 hours for three days, while other diagnoses are considered. Once a definitive diagnosis of malaria is made, treatment with specific anti-malarial drugs and supportive measures should be initiated under specialist advice <sup>(18)</sup>.

#### Special groups:

**Pregnant women** should be advised to avoid travel to malarious areas if possible, as they are at increased risk of developing severe malaria and have a higher risk of mortality compared to the non-pregnant woman <sup>(7, 8, 17)</sup>. Pregnant women are particularly attractive to mosquitoes so they should remain indoors between dusk and dawn <sup>(8)</sup>. They are more prone to complications including: severe haemolytic anaemia, jaundice, renal failure with miscarriage, premature delivery, maternal

and/or neonatal death<sup>(8)</sup>. If travel is unavoidable the woman must be informed of the risks which malaria presents and the risks and benefits of anti-malarial treatment<sup>(8)</sup>. DEET (see bulletin 2) should be used in a concentration of not more than 50%. Chloroquine and proguanil (with folate supplements<sup>(8)</sup>) can be used in all trimesters (medical advice should be sought); caution is advised with the use of mefloquine. Doxycycline is contraindicated and there is lack of evidence in relation to the use of atovaquone/proguanil in pregnancy<sup>(8)</sup>. **Expert advice is required at an early stage if malaria is suspected in a pregnant woman.** **Children** are at particular risk of severe and fatal malaria and parents should be advised not to take them to malarious areas if possible. If travel is unavoidable parents should be aware of the importance of protecting them against mosquito bites and they should ensure that they take appropriate prophylactic drugs at the correct dose<sup>(8)</sup>.

**Elderly travellers** are at particular risk of malaria and it is important that they take appropriate prophylactic drugs, the doses of which may need to be reduced in renal impairment. Consideration should be given to drug interactions<sup>(8)</sup>.

**Epilepsy** For this group of travellers mefloquine is contraindicated<sup>(8)</sup>. Proguanil alone is recommended for areas where there is no chloroquine resistance. In chloroquine-resistance areas, such as sub-Saharan Africa, atovaquone/proguanil or doxycycline (half-life may be reduced by phenytoin, carbamazepine and barbiturates) may be used<sup>(8)</sup>.

**Visiting friends and relatives (VFR)** Half of those patients in the UK and Ireland who contract malaria are VFR<sup>(5)</sup>. Individuals in endemic regions build up immunity to malaria that fades rapidly while living in a malaria-free region like Ireland, therefore they may wrongly assume that they are still immune to the disease<sup>(5,6)</sup>. This group of travellers need to be aware that any immunity they may have acquired is rapidly lost and that second generation members of their family are particularly vulnerable, since they have had no immunity of any kind to malaria<sup>(8)</sup>. They should be encouraged to visit their doctors early after feeling unwell following any trip to tropical areas<sup>(8)</sup>.

## SUMMARY

Malaria is a potentially fatal, but treatable and preventable disease. With increasing foreign travel to malarious areas the diagnosis should be prominent in all healthcare workers minds, as delays in diagnosis and commencement of appropriate treatment are frequently associated with a fatal outcome. Awareness of the condition is the key to reducing deaths.

## TRAVELLERS' DIARRHOEA

Travellers' diarrhoea may be defined as the **passage of  $\geq 3$  unformed stools over a 24-hour period, plus at least one symptom of enteric disease, such as abdominal pain, cramps, nausea, vomiting, fever, blood / mucus in the stools or tenesmus**<sup>(19)</sup>. It is the commonest illness to affect travellers – it is estimated that 30 -50% of persons travelling from industrialised to developing countries will suffer from travellers' diarrhoea<sup>(20,21)</sup>. Destination is the single most powerful predictor of travellers' diarrhoea with the highest risk (20 - >60%) recorded for the Middle East, South/Southeast Asia, South/Central America and low-income African countries. Travellers on self-arranged itineraries (trekkers, campers) have increased risk, probably reflecting the hygiene standards of facilities they use<sup>(22)</sup>.

There are 3 overlapping patterns of illness described. Table 3 outlines the putative organisms for each category.

**Acute diarrhoea** accounts for the majority (up to 70%) of cases; this is usually self-limiting (lasting <14 days) and typically occurs at the beginning of a period of foreign travel. The causative organism (primarily bacteria such as enterotoxigenic *Escherichia coli* [ETEC]; rarely viruses) is identified in 50 -70% of cases; parasites may occasionally be identified.

**Prolonged diarrhoeal illness** lasts between 2 weeks and one month and accounts for up to 28% of cases<sup>(21)</sup>. It may present with fever, dysentery (blood / mucus in the stools) or microscopic features of invasive disease (e.g. presence of faecal leucocytes). It is frequently due to invasive bacterial infection with *Shigella* or *Campylobacter* species<sup>(23)</sup>.

**Chronic diarrhoea**, lasting >1 month, affects 1-3% of travellers. This is usually associated with several specific gut pathogens, particularly protozoa (such as *Giardia lamblia*, or *cryptosporidial species*); it may also be due to slow resolution of an acute infection or with some non-infective causes e.g. prolonged use of antimicrobials<sup>(21,22)</sup>.

**Table 3: Most Commonly Identified Organisms in Travellers' Diarrhoea**<sup>† (21,23)</sup>

Category	Classification	Organism
Acute diarrhoea (< 14 days)	Bacterial (comprises 75% of identified causes)	Enterotoxigenic Escherichia Coli [ETEC] Campylobacter Jejuni Salmonella, shigella
	Viral	Enteroviruses, rotaviruses Norwalk and Norwalk-like
	Parasitic	Giardia Lamblia, Cryptosporidium spp, Entamoeba histolytica
Persistent / chronic Diarrhoea (> 2 weeks)	Bacterial	ETEC Campylobacter Jejuni Salmonella, shigella
	Parasitic (accounts for <30% of chronic cases)	Giardia Lamblia (most commonly identified parasite) Cryptosporidium spp, Entamoeba histolytica

<sup>†</sup> This list of causative organisms is not exhaustive

**Consequences of Travellers' Diarrhoea:** For the vast majority of sufferers, the illness is self-limiting and there are no long-term sequelae. However, if the diarrhoea is severe, the sufferer may be at risk of dehydration; the very young and the elderly are especially at risk here. In addition, severe diarrhoea may interfere with absorption of necessary medicines, including malaria prophylaxis. In these cases, pharmacotherapy is recommended (see below). Bacterial invasive infection may trigger or exacerbate inflammatory bowel disease or cause extra-intestinal complications such as Reiter's arthritis (typically seen with *Shigella*)<sup>(21)</sup> or Guillain-Barré syndrome (typically seen with *Campylobacter jejuni*). Amoebic dysentery, caused by *E histolytica*, may be complicated by hepatic abscess formation<sup>(23)</sup>. It is estimated that up to 10% of sufferers will develop irritable bowel syndrome<sup>(22)</sup>.

**Treatment:** The main objectives include prevention of dehydration, amelioration of symptoms and reduction in the duration of the illness. All sufferers should ensure adequate intake of fluids during an episode. **Increasing standard fluids such as soft drinks (with added salt) may be adequate for adults** – e.g. 250 mls fruit juice or sweet drink with half a teaspoon of sugar and a pinch of salt<sup>(24)</sup>. **Oral rehydration therapy (using proprietary / WHO sachets) is recommended for infants,**

**young children, the elderly and those with severe diarrhoea** <sup>(22)</sup>. Young infants should receive breast milk or lactose-free formula. Sufferers on diuretics or antihypertensive agents may need to reduce or stop these medications temporarily. **Loperamide** is the anti-motility drug of choice as it has been shown to reduce the number of stools passed by 2/3 <sup>(22)</sup>. The standard dose of 2-4mg, followed if necessary by 2mg three times daily (max 10mg/day) should be sufficient <sup>(25)</sup>. However, it should not be used in children <2 years and should be used with caution in the presence of invasive bacterial infection because it may worsen the condition. In the majority of cases, the diarrhoeal episode will resolve with rehydration +/- loperamide. **Anti-microbial agents** +/- loperamide are effective in reducing the duration and severity of the illness. Fluoroquinolones are effective and can be given as a single dose or over 3 days (e.g. 750mg ciprofloxacin single dose or 500mg BD X 3d). Azithromycin (1g single dose or 500mg/d X 3d) may also be used. However, overuse of antimicrobials may result in development of resistance; in South East Asia, rates of *Campylobacter jejuni* resistance to fluoroquinolones approach 77% <sup>(24)</sup>.

**Prevention:** The cause of the problem is related to the ingestion of the causative organisms (or their toxins) in food and drink <sup>(20)</sup>. Therefore persons intending to travel to high-risk areas should be counselled about how to ensure ingestion of safe food and beverages. The advice **“boil it, peel it or forget it”** should be followed – only freshly cooked and hot food, or raw fruit and vegetables that have been peeled should be ingested. If using bottled water, it is essential to ensure the integrity of the cap. Personal water filters, especially those with iodinated cores are effective and intending travellers need to be reminded of the importance of regular hand-washing – commercially available hand sanitisers may be useful in areas where soap and water are not readily available <sup>(22,24)</sup>. The WHO’s website on international travel and health has useful information about the type of advice to be given for prevention of travellers’ diarrhoea [www.who.int/ith/index.html](http://www.who.int/ith/index.html).

**Diarrhoea in the Returned Traveller:** Although acute diarrhoea occurs more commonly in the traveller, chronic diarrhoea is the more likely reason for a traveller to seek medical care <sup>(22)</sup>. The history is vital and should include full details of the travel itinerary, including airport stop-overs in endemic areas <sup>(26)</sup>; types of meals eaten and where they were consumed; the frequency, appearance, consistency and odour of stools; whether the patient noticed blood, mucus (invasive bacterial pathogens); the occurrence of systemic symptoms such as fever, fatigue, weight loss or specific gastrointestinal symptoms such as flatulence, bloating (both commonly reported with *Giardia*), abdominal pain or cramps. Fresh stool samples should be sent for culture and for microscopic examination to look for ova and parasites and white blood cells – ideally, 3 samples collected on 3 separate days should be sent. Of particular importance, stool samples should also be cultured for *Clostridium difficile*, if the patient has received several courses of antibiotics. Full blood count, serum chemistry and liver function tests should be performed. Frequently, a causative organism will not be readily identified, therefore expert help should be sought in the management of the patient, especially if he/she is suffering from any of the above complications or has an unexplained systemic illness.

## DENGUE FEVER

**Background:** Dengue fever (DF) has become one of the most common viral diseases transmitted to humans by mosquitoes <sup>(27,28)</sup> and is increasing in incidence due not only to increased travel but also to urbanisation of the virus-carrying mosquito <sup>(29)</sup>. It is caused by one of four viruses and can produce a range of illness from mild to severe as well as fatal dengue haemorrhagic fever (DHF). DF (also known as break-bone fever <sup>(30)</sup>) affects ~ 50 million people each year of which 500,000 develop DHF <sup>(31)</sup>, which has a mortality of up to 44% <sup>(32)</sup>. Over half the world live in areas at risk of infection, including popular tourist destinations <sup>(32)</sup>, such as tropical areas of Asia, Oceania (including Australia) and the Americas. **The mosquitoes that transmit dengue, bite mainly during the daytime and the risk of contracting DF is greater in urban areas** <sup>(23)</sup>.

**Diagnosis:** The incubation period is from 4-7 days. DF is usually diagnosed clinically and confirmed by detecting a fourfold increase in dengue antibodies in samples obtained during the acute and convalescent phase <sup>(23)</sup>. The most common clinical manifestations of DF are non-specific and include fever, severe headache, retro-orbital pain, arthralgia and rash <sup>(23,32)</sup>. There may be a transient improvement in symptoms followed by a second stage with exacerbation or worsening of the illness during days 3-5 <sup>(21)</sup>. Approximately 50% of patients develop lymphadenopathy and diffuse erythema or a non-specific maculopapular rash <sup>(23)</sup> with leucopenia and mild thrombocytopenia also being frequent findings <sup>(23,32)</sup>. DHF is defined as DF with haemorrhagic manifestations, thrombocytopenia and evidence of plasma leakage such as haemoconcentration, pleural effusions, or hypoalbuminaemia; while dengue shock syndrome (DSS) is defined as DHF with signs of circulatory failure <sup>(21,32)</sup>. DHF and DSS usually develop between days 3-7 of the illness <sup>(32)</sup>. They are unlikely to occur in first-time travellers <sup>(21,23,33)</sup> however are more likely in those who live in endemic areas and experience a second dengue infection with a different serotype <sup>(30)</sup>. Children are particularly susceptible to severe DF and have the highest mortality <sup>(21,28)</sup>.

**Treatment:** Most cases of DF resolve without any specific treatment, however early detection and management of severe disease are essential to prevent death <sup>(28)</sup>. Patients with mild DF require rest, oral fluids, analgesics and antipyretics (not aspirin as there is an additional risk of DHF <sup>(34)</sup>) <sup>(32)</sup>. Specialist advice should be sought, especially because of the risk of DHF in severe DF. The administration of intravenous fluids has been associated with marked reductions in the rates of death due to DSS and DHF <sup>(23,28)</sup>. In addition to fluid replacement in severe disease, the patients require monitoring of blood pressure, haematocrit, platelet count, haemorrhagic manifestations, urinary output, and level of consciousness <sup>(32)</sup>. **Practical Advice:** The most recent reports of dengue fever are from South East Asia (including Thailand and Singapore), the Caribbean and parts of Brazil <sup>(35)</sup>. There is no vaccine available for dengue fever but travellers can reduce the risk of dengue fever by avoiding mosquito bites [see “Preventing Mosquito Bites” in bulletin 2]. **In patients presenting with an acute febrile illness, and a recent history of travel, dengue fever is an important differential diagnosis** <sup>(31)</sup>.

### Table 4: Useful websites providing information on travel medicine

<a href="http://www.tmb.ie">www.tmb.ie</a> : tropical medical bureau travel website with country specific and general travel advice
<a href="http://www.who.int/ith/">www.who.int/ith/</a> : WHO site which gives useful information on risk for international travellers, according to current geographical distribution, mode of transmission, symptoms, and level of risk. Updated regularly.
<a href="http://www.travmed.com">www.travmed.com</a> : provides comprehensive information for safe travel, both at home and abroad.
<a href="http://globalatlas.who.int/">http://globalatlas.who.int/</a> : WHO site that gives infectious disease data at country, regional, and global levels.
<a href="http://www.cdc.gov/travel/">http://www.cdc.gov/travel/</a> : Communicable Disease Centre in Atlanta Georgia which contains guidelines
<a href="http://www.who-rabies-bulletin.org">www.who-rabies-bulletin.org</a> Updated information on rabies by country.
<a href="http://www.ndsc.ie/hpsc/">http://www.ndsc.ie/hpsc/</a> Ireland’s specialist agency for the surveillance of communicable diseases (HPSC). Contains Irish Immunisation Guidelines (see section on travel medicine)
<a href="http://www.hpa.org.uk/infections/topics_az/malaria/guidelines.htm">http://www.hpa.org.uk/infections/topics_az/malaria/guidelines.htm</a> - Health Protection Agency UK – which includes new “ Guidelines for malaria prevention in travellers from the United Kingdom”. (January 2007)
<a href="http://www.medicines.ie">www.medicines.ie</a> / <a href="http://www.imb.ie">www.imb.ie</a> Access to SPCs for authorised vaccines and medicines
<a href="http://www.bnf.org">www.bnf.org</a> - British National Formulary

List of references available on request. Date of preparation: May 2007

Every effort has been made to ensure that this information is correct and is prepared from the best available resources at our disposal at the time of issue. Prescribers are recommended to refer to the individual Summary of Product Characteristics for specific information on a drug.