

TRAVEL INFORMATION

1 Information per region

1.1 SOUTH AMERICA

1.1.1 Country information

ARGENTINA: In most of Argentina there is no risk of malaria at all, and therefore no antimalaria precautions are necessary. There is only a limited risk of malaria from October to May in the extreme north of Argentina, and this only in a few low-lying rural areas (below 200 metres), and exclusively with the mild vivax form, namely:

- on the border with Bolivia, in the provinces of Salta (in the plains of the departments Iruya, Oran, San Martin and Santa Victoria) and Jujuy (in the plains of the departments Ledesma, San Pedro and Santa Barbara).
- on the border with Paraguay, in the plains of the provinces of Misiones and Corrientes. The precautionary measures discussed in NOTE 1 apply here.

BOLIVIA: There is no malaria in the larger towns, nor in the areas above 2500 m. This means that there is no risk in the following high areas in the south-west: *in the Oruro Department; *in a number of provinces in the south-western part of the La Paz Department: namely in the provinces Ingavi, Los Andes, Omasuyos, Pacajes; *in the southern and central part of the Potosi Department.

- There is Nivaquine-resistant falciparum-malaria on the border with Brazil in the northern departments Pando and Beni (in a strip of the tropical Amazon basin bordering on the Brazilian states of Acre and Rondonia, especially in the localities of Guayaramerin, Riberalta and Puerto Rico), for which the recommendations discussed in NOTE 3 apply.
- There is a limited to very limited malaria risk throughout the whole year in the areas below 2500 m (but of course not in the centres of the large towns) in the remaining areas of Bolivia (only the mild vivax-malaria) and the anti-mosquito precautionary measures suffice here. The recommendations discussed in NOTE 1 apply only in the low-lying rural areas on the border with Paraguay and Argentina.

BRAZIL: In many areas of Brazil there is no malaria risk at all.

- There is a malaria risk in most of the forested areas below 900 metres in the 9 states of the "*Legal Amazonia Region*": Acre, Amapà, Amazonia, Maranhão (only in the west), Mato Grosso (only in the north, not in Mato Grosso do Sul), Pará, Rondônia, Roraima and in

Tocantins (north of Goiás). The measures for the prevention of malaria discussed in NOTE 3 apply only in these areas. There is no risk in the town of Belem (Parà), but there is a low risk in the urban areas of large towns such as Pôrto Velho (Rondônia), Boa Vista (Roraima), Macapà (Amapà), Manaus (Amazonas), Santarém (Parà), Cuiaba (Mato Grosso), Rio Branco (Acre) and Maraba (Parà). When you are able to stay overnight in good conditions in the centre of Manaus and other large towns in the Amazon region, for a stay of at most four days, you should not have to take any tablets, and measures for protection against mosquito bites in the evenings and at night will suffice.

- As already said in the beginning, no measures against malaria are necessary in the remaining areas of Brazil. For a visit to the "Foz de Iguçu" waterfalls the measures for protection against mosquito bites in the evenings and at night are sufficient.

CHILE: No malaria risk.

COLOMBIA: There is no malaria risk in Bogota and its environs, nor in the other big towns. There is just as little malaria risk in the areas above 800 m on the Cordillera Occidental, Cordillera Central and Cordillera Oriental. There is no risk in most of the Caribbean coastal areas (except in Cordoba) and in the low plain of Colombia, towards the border with Venezuela. There is a malaria risk, varying greatly from place to place, throughout the whole year in many rural areas below 800 m.

- The recommendations discussed in NOTE 3 apply
 - in the area on the coast of the Pacific Ocean (Pacífico: in the departments Narino, Cauca, Valle del Cauca and Choco),
 - in the northern region Uraba-Bajo Cauca (departments Choco, Antioquia, Cordoba)
 - in the tropical rainforest area of the Amazon basin (departments Amazonas and Vaupés)
- The recommendations discussed in NOTE 2 apply for the remaining areas, to the east of the Andes (in the departments Arauca, Boyaca, Caqueta, Guaiana, Guaviare, Meta, Norte de Santander, Putamayo, Vichada).

ECUADOR: There is no malaria risk in the areas above 1500 m, nor in the large towns and on the Galapagos Islands. There is only a limited risk of malaria in

- the rural areas of the provinces Esmeraldas (the northern province bordering on Colombia), Manabi and El Oro, all of which are situated on the Pacific Ocean, and also in the province of Sucumbios, where NOTE 3 is applicable.
- in a narrow border area, along the entire border with Peru. The recommendations discussed in NOTE 2 apply here.

BRITISH GUYANA: There is no malaria risk in Georgetown and New Amsterdam. * There is a quite substantial malaria risk in all rural areas in the rest of the country, the recommendations discussed in NOTE 3 apply here.

FRENCH GUYANA: There is no malaria risk in the towns of Cayenne and Kourou, and the malaria risk is very limited in the rest of the coastal strip. No anti-malaria precautions are necessary here. – Especially in the border area with Brazil (Oiaopoque river valley) and Surinam (Maroni river valley) there is a substantial malaria risk, for which the guidelines discussed in NOTE 3 apply.

PARAGUAY: In most of Paraguay there is no risk of malaria at all, and therefore no antimalaria measures are necessary. There is no risk in the towns, nor in the tourist resorts and their environs, such as at the Iguazu waterfalls. - There is only a limited risk of malaria from October to May in some rural areas

- in the west, in the area bordering on Bolivia,
- in the east on the border with Brazil in the departments Caaguazu, Alto Parana (towards Foz do Iguazu), Amambay, and Canendiyu. The recommendations discussed in NOTE 1 apply here for overnight stays in adventure conditions

PERU: There is no risk of malaria in the large towns (hence also not in the capital Lima and environs), nor in all areas higher than 1500 m. No preventive antimalaria measures are therefore necessary here.

- In the coastal areas to the west of the Andes mountains (except for the northern provinces named below) the malaria risk is very low to negligible.
- In the northern provinces in the coastal area on the Pacific Ocean bordering on Ecuador (Tumbes / Piura / Lambayeque) and in the provinces in the Amazon region between Ecuador, Colombia and the Amazon region of Brazil to the north of 10° latitude (Amazonas / Loreto / Jaen / San Martino / Ucayali) the recommendations discussed in NOTE 3 (*Plasmodium falciparum*) apply.
- The recommendations of NOTE 1 (principally the mild *P. vivax*) apply for spending nights under primitive conditions in the rural areas of the rest of the country, except for the provinces in the southern Peruvian Amazon region (south of 10 degrees south latitude: southern half of Ucayali and Madre de Dios): there the recommendations of NOTE 2 apply.

SURINAM: There is no risk of malaria in Paramaribo and the coastal zone north of 5° latitude north. *- In the interior (south of 5° latitude north) there is substantial malaria risk, and the recommendations discussed in NOTE 3 apply.

TRINIDAD - TOBAGO: No malaria risk

VENEZUELA: Most of the land area is malaria-free. There is no malaria risk in the towns. There is no malaria risk on Margarita Island.

- There is a risk of (falciparum) malaria in a number of low-lying rainforest areas of the provinces of Amazonas (Atabapo) and Bolivar (Cedeno, Gran Sabana, Raul Leoni, Sifontes and Sucre) (situated south of the Orinoco River, on the border with Brazil), and Delta Amacuro (Antonia Diaz, Casacoima, Pedernales; around the delta of the Orinoco). The measures discussed under NOTE 2 may possibly apply here for overnight stays in rainforest areas under adventure conditions (not for the Angel Falls).
- NOTE 3 applies for the areas bordering on Brazil.
- In a number of rural areas of the provinces Apure, Barinas, Sucre and Tachira there is a limited risk of mild vivax malaria. The measures discussed under NOTE 1 may apply here for overnight stays in adventure conditions.
- In the remaining provinces there is thus no risk of malaria at all. This means that the taking of tablets is not necessary for most well organised tourist trips, even to some rainforest areas, and that measures for protection against mosquito bites in the evenings and at night are sufficient.

1.1.2 Malaria prevention

Measures for protection against mosquito bites in the evenings and at night are always essential for protection against possible malaria. Persons who visit a malaria area during the daytime and who stay in good hotels in the evenings and overnight run no risk, and do not need to take anti malaria tablets, though they should always have a mosquito-repellent product in their bag for application to the skin, in case they are not able to get back to the hotel in time in the evening, due for example to problems such as illness, car breakdown etc. Also, when you are on a trip or a safari in the early morning, in the evening or at night you should generously apply the mosquito-repellent product to the skin. When on an adventure-type trip in rural areas with overnight stays in primitive conditions you are also advised to impregnate the mosquito net with permethrine or deltamethrine, a chemical substance that provides an extra mosquito-repellent and mosquitocidal effect, and the taking of antimalaria tablets is also necessary:

NOTE 1

NIVAQUINE® 3 tablets per week, to be taken all in one dose, starting from 1 week before departure, and continuing until 4 weeks after returning home.

NOTE 2

The combination of NIVAQUINE® (3 tablets per week) and PALUDRINE® (2 tablets per day) from 1 week before departure, and continuing until 4 weeks after returning home.

NOTE 3

LARIAM® 1 tablet once per week is the first-choice medication, unless the doctor thinks there are contraindications (desire for pregnancy, first three months of pregnancy, epilepsy, depression or cardiac rhythm disorders for which certain medications such as beta-blockers, calcium antagonists or digitalis are necessary) or if you did not tolerate this medication on an earlier occasion. You start this medication at least 1 week before departure, but if there is sufficient time, and certainly if you have never taken the medication before, it is better for you to start 3 weeks before departure (in order to discover any side effects: dizziness, insomnia, nightmares, excitation, inexplicable anxiety, cardiac palpitations). You continue to take the medication until 4 weeks after returning home. If Lariam® is tolerated well, it can, however, if necessary continue to be taken for many months and even years. For a trip of at most 4 weeks the taking of MALARONE®, 1 tablet/day from 1 day before departure until 7 days after returning home, is also an excellent but expensive choice.

If there are contraindications, an alternative (though in this situation often a significantly less effective alternative) is the combination of Nivaquine® (1 tablet/day) and Paludrine (2 tablets/day), or else the taking of DOXYCYCLINE, 1 tablet/day, can be considered (100 mg/day, starting the day before departure, and taking it until 4 weeks after returning home; it should be taken when sitting down, together with plenty of liquid or with a meal). Doxycycline can sometimes give rise to phototoxicity and fungal infections of the mouth and genitals. Persons who take Nivaquine® and Paludrine® who stay for at least several weeks in a malarial area should often also have a full treatment for a possible malaria attack to hand. All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

1.1.3 Diarrhoea

DIARRHOEA is a frequent travel problem. It is not always possible to escape it, even when travelling in good conditions. Some advice and the correct medications from the travel pharmacy are very useful. In any case consult the text on travellers' diarrhoea, where the measures for preventing and if necessary correctly treating diarrhoea are discussed.

1.1.4 Vaccinations

- YELLOW FEVER vaccination is necessary (at any rate for a visit to certain countries) in Bolivia, Brazil, Colombia, Ecuador, Guiana (French and British), Peru, Surinam and Venezuela (not for Isla Margarita). In principle you are best always vaccinated for a visit to any of these countries. If you are starting your trip from another country where yellow fever can occur (Africa, South America), vaccination is certainly officially required, except for a trip to Venezuela, Chile and Argentina. Travellers to French Guiana are always required to be vaccinated.
- Going on a trip is furthermore an ideal opportunity to get up to date with the TETANUS-DIPHTHERIA- and POLIOMYELITIS VACCINATION. These infectious diseases are in any case fully preventable by means of vaccination. A repeat vaccination is effective for ten years. Poliomyelitis has been eliminated from the American continent for some years.
- Anyone who is travelling to Latin America, regardless of the duration and the circumstances of the trip, is advised to be protected against HEPATITIS A. Vaccination against hepatitis A is always advised for persons who (1) are travelling in poor hygienic conditions, or who stay abroad (2) frequently or (3) for long periods (e.g. for at least 2-3 weeks), even if in good hygiene conditions. In these cases vaccination against TYPHOID is also advised. For further details see VACCINATIONS text.
- In specific circumstances vaccination against HEPATITIS B, RABIES and MENINGOCOCCAL MENINGITIS should also be considered. All this should be individually discussed with your doctor or with the doctor at a travel advice centre.

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1.2 CENTRAL AMERICA – CARIBBEAN

1.2.1 Country information

BELIZE: There is no risk of malaria in the centres of the large towns. On adventure trips away from the centres of large towns and out in the countryside there is a risk of malaria and the

recommendations for prevention of malaria discussed in NOTE 1 apply.

CARIBBEAN: There is no malaria risk at all except in **HAITI** and to a very limited extent in the **dominican republic**.

COSTA RICA: There is no particular malaria risk in most areas of the country. There is no risk of malaria in areas above 500 m, nor in the towns. There is a moderate risk of malaria (almost exclusively the mild vivax-malaria) in the cantons Matina and Talamanca (in the Province of Limón) and the canton Los Chiles (in the Province of Alajuela); the risk is even smaller in the Provinces of Guanacaste, Heredia, and in the rest of the Province of Limón. The recommendations discussed in NOTE 1 apply here only for an adventure stay in the countryside.

DOMINICAN REPUBLIC: In most of the country there is no risk of malaria. There is a limited malaria risk in rural areas. No antimalaria measures are necessary for a well-organised tourist trip in first class hotels. The risk of malaria is higher in the provinces bordering on Haiti (especially in the Provinces of Castañuelas, Hondo Valle and Pepillo Salcedo). Application of the recommendations discussed in NOTE 1 should be considered for an adventure stay in the rural areas (throughout the whole country – but especially in the border provinces).

EL SALVADOR: There is practically no malaria risk in El Salvador any longer, and certainly not in the areas above 600 m, nor in the big towns. Only in the remote areas of the Santa Ana Province, on the border with Guatemala, is there a limited malaria risk (exclusively the mild vivax-malaria); the recommendations for prevention of malaria discussed in NOTE 1 apply here for an adventure stay in the countryside.

GUATEMALA: There is no malaria risk in the capital city, nor in the areas above 1500 metres. There is only a risk of malaria in the low-lying rural areas (below 1500 m):

- High risk in the departments of Alta Verapaz, Baja Verapaz, Ixcán, Petén, San Marcos.
- Moderate risk in the departments of Escuintla, Izabal, Huehuetenango, Quiché, Retalhuleu, Suchitepequez and Zacapa.
- The recommendations for the prevention of malaria discussed in NOTE 1 apply only for an adventure stay in the rural areas of the northern border area with Mexico and Belize (Petén).

HAITI: The malaria risk is absent or very low in areas higher than 300 metres, and is even less in the centres of the big towns. The risk of malaria is also minimal in the rest of the country. The malaria risk is, however, real in a number of forested regions in the cantons Gros Horne, Hinche, Maïssade, Chantal and Jacmel. Only here, for overnight stays under primitive

conditions, is it necessary to take the antimalaria measures and tablets as discussed in NOTE 1.

HONDURAS: There is no malaria risk in the big towns of Honduras. The greatest malaria risk exists in the rural areas of the departments of Choluteca, Cortès, Colon, Valle, and Yoro. The risk is lower in the departments of Atlantida, El Paraiso, Gracias a Dios and on the islands of La Bahia and Olancho. There is a minimal risk of malaria in the remaining departments. The recommendations discussed in NOTE 1 apply here for an adventure stay in the countryside.

MEXICO: There is no malaria risk in the areas above 1000 m and therefore also none in the district of Mexico City. In most of the tourist areas of Mexico the risk of malaria is very low to non-existent. The measures for protection against mosquito bites in the evening and at night are certainly sufficient for a well-organised trip, and there is no need to take antimalaria tablets. This also applies for the Yucatan Province and its principal town Merida.

In certain circumstances the malaria risk is definitely higher, especially during overnight stays under primitive conditions in areas outside the towns below 1000 metres, namely in the Campeche, Chiapas, Guerrero, Michoacán, Oaxaca, Quintana Roo, Sinaloa and Tabasco Provinces, and to a lesser extent in the Chichuahua, Durango, Hidalgo, Jalisco, Nayarit, Sonora and Veracruz Provinces. The recommendations for the prevention of malaria in NOTE 1 then apply. There is falciparum malaria in Chiapas, Tabasco (border with Guatemala) and Quintana Roo (border with Belize).

NICARAGUA: There is a risk of malaria in all rural areas, and also in the urban areas (principally in the outer suburbs). The risk is highest in Chinandega, Jinotega, Nueva Segovia, RAAN, RAAS and Rio San Juan. The recommendations for prevention of malaria discussed in NOTE 1 apply in Nicaragua.

PANAMA: There is no malaria risk in the capital Panama City, nor in the Canal Zone. There is a malaria risk in rural areas throughout the whole year in the following provinces, where the recommendations for prevention of malaria apply only for adventure trips.

- In Bocas de Toro (west of the Panama Canal), discussed in NOTE 1.
- In San Blas and Darién (east of the Panama Canal), discussed in NOTE 2.
- In the remaining provinces the risk is absent to very low.

1.2.2 Prevention of malaria

Measures for protection against mosquito bites in the evenings and at night are always essential for protection against possible malaria. Persons who visit endemic malaria areas

during the daytime and who stay in the evenings and overnight in good hotels run no risk, and do not need to take antimalaria tablets, but they should always have a mosquito repellent in their bag for application to the skin, in case they cannot get back to the hotel in time in the evening, due for example to problems such as illness, car breakdown etc. You should also generously apply the mosquito repellent to the skin when on a trip or safari in the early morning, in the evening or at night. When on trips of the adventure type out in the countryside with overnight stays in primitive conditions it is moreover advisable to impregnate the mosquito net with permethrine or deltamethrine, a chemical substance that provides an extra mosquito-repellent and mosquitocidal effect, and the taking of antimalaria tablets is also necessary:

NOTE 1

NIVAQUINE® 3 tablets per week, taken all in one dose, starting from 1 week before departure, and continuing dosing until 4 weeks after returning home.

NOTE 2

LARIAM 1 tablet once per week is the first-choice medication, unless the doctor thinks that there are contraindications (desire for pregnancy, first three months of pregnancy, epilepsy, depression, or cardiac rhythm disorders for which the taking of certain medications such as beta-blockers, calcium antagonists or digitalis is necessary) or if you did not tolerate this medication on an earlier occasion. You start this medication at least 1 week before departure, but if there is sufficient time, and certainly if you have never taken the medication before, it is better for you to start 2 to 3 weeks before departure (in order to discover any side effects such as dizziness, insomnia, nightmares, excitation, inexplicable anxiety, cardiac palpitations, etc). You continue to take the medication until 4 weeks after returning home. If Lariam is tolerated well it can, if necessary, be taken for many months and even years. The taking of Malarone®, 1 tablet per day from 1 day before departure until 7 days after returning home, is also an excellent but expensive choice for a trip of at most 4 weeks.

1.2.3 Diarrhoea

DIARRHOEA is a frequent travel problem. It is not always possible to escape it, even when travelling in good conditions. Some advice and the correct medications from the travel pharmacy are very useful. In any case consult the text on traveller's diarrhoea, where the measures for prevention and if necessary for correct treatment of diarrhoea are discussed.

1.2.4 Vaccinations

- YELLOW FEVER vaccination is NOT required if you depart from Belgium, unless you are on a visit to the provinces of Darièn, Chepo and/or San Blas in Panama. As many other countries regard Panama as a country where yellow fever actually occurs, it is safer (and we therefore advise it) for every traveller to Panama to be vaccinated against yellow fever, so that there are no problems when entering other countries. However, if you are travelling from another country where yellow fever can occur (Africa, South America), anyone over 1 year of age (for El Salvador from the age of 6 months) should certainly be vaccinated for Belize, Guatemala, Haiti, Honduras and Nicaragua.
- Going on a trip is furthermore the ideal opportunity to get up to date with the TETANUS, DIPHTHERIA and POLIO VACCINATION. These infectious diseases are in any case completely preventable by means of vaccination. A repeat vaccination is effective for ten years.
- Anyone travelling to Latin America, regardless of the duration and the circumstances of the trip, is advised to be protected against HEPATITIS A. Vaccination against hepatitis A is always advised for people who (1) are travelling in poor hygiene conditions, or who stay abroad (2) frequently or (3) for long periods (e.g. for more than 2 - 3 weeks), even if they do so in good hygienic conditions. Vaccination against TYPHOID is also advised in these cases. For further details see the text on VACCINATIONS.
- In certain circumstances vaccination against HEPATITIS B and RABIES should be considered. All this should be individually discussed with your doctor or with the doctor at a travel advice centre.

1.3 Africa

1.3.1 Country information

There is a substantial risk of malaria in Africa south of the Sahara (unless stated otherwise). For the protective measures see NOTE 2 (unless stated otherwise).

See also: [<http://www.mar.org.za> → maps → information on maps]

North africa

There is no risk of malaria and no preventive measures are necessary in **ALGERIA** (there is an extremely limited malaria risk due to *Plasmodium vivax*, especially in a remote, isolated,

hard to reach locality in Ihrir, in the Illizi Province), nor in **MOROCCO** (there is an extremely limited malaria risk in a few remote, isolated, hard to reach localities in the provinces of Al Hoceima, Taounate and Taza), nor in **LIBYA**, **TUNISIA** and the **WESTERN SAHARA**. In **EGYPT** there is no longer any risk of malaria for tourists and travellers. There is only an extremely limited risk of malaria in the Sennoris district in the El Faiyûm region, from June to October. For people spending the night in primitive conditions in the El Faiyûm region the standard precautionary measures against mosquito bites in the evening and at night are sufficient.

West and central Africa and Congo (Kinshasa)

Angola, Benin, Burkina Faso, Central African Republic, Cameroon, Chad, Congo-Brazzaville, Congo-Kinshasa (ex-Zaire), Equatorial Guinea, Gabon, Gambia, Ghana, Guinea (Conakry), Guinea Bissau, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo.

Mauritania: There is no risk of malaria in the northern provinces: Dakhlet-Nouadhibou and Tiris-Zemour. There is some malaria risk in the southern half of Mauritania, below the latitude of 20 degrees north, and in the province of Baie du Levrier. In the provinces of Adrar and Inchiri (situated between the northern and southern provinces) there is a malaria risk during the rainy season (from July to October). NOTES 2 or 3 are applicable.

Eastern half of Africa

Burundi, Comores, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Uganda, Reunion, Rwanda, Sudan, Somalia, Tanzania (and Zanzibar and Pemba), Zambia, Zimbabwe

Eritrea, Ethiopia: No risk at altitudes above 2000 m, hence also no risk in the capital cities.

Kenya: There is no risk in Nairobi. There is a substantial risk in all areas below 1500 m, and the risk is low (but not completely absent) above 1500 m. There is no risk in the high areas above 2500 m in the following provinces: Central, Rift Valley, Eastern, Nyanza and Western Provinces. Most travellers and tourists will, however, pass through a number of regions and will therefore have to take precautionary measures to protect themselves against malaria.

Malawi: Although there is a risk throughout the whole year and covering the entire country (according to the World Health Organization (WHO)), it is greatest from November to April in the areas below 500-1000 m along Lake Malawi.

Sudan: The risk is low in the northern part of the country. It is higher along the Nile south of Lake Nasser and is very limited on the Red Sea coast. There is substantial risk of malaria in the central and southern part of the country.

Tanzania: Malaria risk only below 1800 m. Most travellers will, however, pass through several regions and have to take precautionary measures to protect themselves against malaria.

Zimbabwe: There is risk of malaria throughout the whole year in the areas below 600 m (including the Zambezi valley and Victoria Falls). There is a risk of malaria from November to June in the areas up to 600-1200 m high. There is no risk in the cities of Harare and Bulawayo, nor on the high plateau between these two towns. For trips lasting a few days (with at most a few nights) in the region of the Victoria Falls, chemoprophylaxis may not be necessary, provided you stay in luxury hotels and measures are taken to ensure prevention of mosquito bites (certainly in the case of a night-time safari or an early morning walk). Most travellers will, however, pass through a number of regions and therefore have to take tablets to protect themselves against malaria.

Southern part of Africa

Botswana: Risk of malaria from November to June in the northern border provinces, north of the 21° south latitude, (especially in the districts/subdistricts: Boteti, Chobe, Ngamiland, Okavango, Tutume). Travellers to Maun (Okavango delta) are at risk. No risk of malaria in other areas. NOTE 2 is applicable.

Lesotho: No malaria risk.

Namibia: There is some risk of malaria: in the north along a narrow strip on the border with Angola; throughout the whole year along the Kavango and Kunene rivers; from November to May/June in the Northern Provinces (Ovambo and Caprivi); in Omaheke and Otjozondjupa. Both NOTES 2 and 3 may be applicable.

Swaziland: There is some risk of malaria in the low-lying areas in the eastern half of the country, especially in Big Bend, Mhlme, Simunye and Tshaneni.

South Africa: no risk in most of the country. There is a risk of malaria in the dry savanna areas (away from the big towns) in the extreme north and north-east of the country on the border with Botswana, Zimbabwe and Mozambique: this is in the low-lying regions in the

Northern Province, in the north-eastern part of Transvaal (now known as Mpumalanga Province and includes Krüger National Park), and the north-eastern part of KwaZulu/Natal (as far as the Tugela River south of the town of Richard's Bay). Both NOTES 2 and 3 apply from October to May. On trips with a few days' excursion (with at most 4 nights) in the aforesaid areas, chemoprophylaxis may not be necessary, provided good hotels are used and precautionary measures are taken against mosquito bites (certainly in the case of a night-time safari or an early morning walk). http://www.malaria.org.za/Malaria_Risk/Risk_Maps/risk_maps.htm

Islands

No precautionary measures are necessary ON THE FOLLOWING ISLANDS

Azores, Madeira, Canary Islands, Reunion, Seychelles, Saint Helena, Cape Verde Islands (there is a very limited risk from September to November on Sao Tiago Island), **Mauritius** (there is some risk of malaria only in a few low-lying rural areas: Nivaquine (NOTE 1) is advised only if the night is spent in primitive conditions in these areas; there is no risk on **Rodriguez Island**).

1.1.1 Prevention of malaria

To be optimally protected against malaria, it is essential to take protective measures against mosquito bites in the evening and at night. When on adventure trips with overnight stays in primitive conditions the best thing that can be done is to impregnate the mosquito net with permethrine or deltamethrine, mosquito-repellent and mosquitocidal substances. Taking antimalaria tablets is necessary.

NOTE 1

NIVAQUINE, 3 tablets per week, in one dose (e.g. with Sunday breakfast).

Begin one week before departure, continue administration until 4 weeks after returning home.

NOTE 2

LARIAM 1 tablet once per week is the first-choice medication, unless the doctor is of the opinion that there are contraindications (wanting a pregnancy, first three months of pregnancy, epilepsy, depression, or cardiac rhythm disorders for which certain medications such as beta-blockers, calcium antagonists or digitalis are being taken) or if you did not

tolerate this medicine on an earlier occasion. You start this medication at least 1 week before departure, but if there is sufficient time, and certainly if you have never taken the medication before, it is better for you to start 2 to 3 weeks before departure (in order to discover any side effects such as dizziness, insomnia, nightmares, excitation, inexplicable anxiety, cardiac palpitations, etc). You should continue taking the medication until 4 weeks after returning home. If Lariam is tolerated well, it can if necessary be taken for many months and even years. For a trip of at most 4 weeks, **MALARONE** 1 tablet per day from 1 day before departure to 7 days after returning home is also an excellent but expensive choice. If there are any contraindications to this, DOXYCYCLINE, 1 tablet per day (NOTE 4) is an alternative; otherwise the combination of NIVAQUINE and PALUDRINE can be considered (NOTE 3), though in this situation this combination is often significantly less effective to rather ineffective. All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

NOTE 3

NIVAQUINE, 1 tablet per day, every day of the week , together with **PALUDRINE**, 2 tablets per day taken in one dose or 1 tablet each morning and one each evening. You start this scheme from 1 week before departure, and continue until 4 weeks after returning home. Persons who stay for a long time in a malaria region should in certain cases also have a full treatment for a malaria attack to hand. All this should be individually discussed with your doctor or the doctor at the specialised travel advice centre.

NOTE 4

DOXYCYCLINE (100 mg per day, starting the day before departure, and continuing until 4 weeks after returning home). Doxycycline must be taken while sitting down, with plenty of liquid or during a meal. Doxycycline can sometimes give rise to phototoxicity and fungal infections in the mouth or genitals All this should be individually discussed with your doctor or with the doctor at the specialised travel advice centre.

1.1.2 Diarrhoea

DIARRHOEA is a frequent travel problem. Even when travelling in good conditions, it cannot always be avoided. Some advice and the correct medications from the travel pharmacy are very useful. In any case consult the general text on traveller's diarrhoea, where the measures for preventing, and if necessary for correctly treating diarrhoea are discussed.

1.1.3 Vaccinations

- YELLOW FEVER vaccination is required for all countries where yellow fever can occur (<http://www.who.int/ith/english/map1.htm>). Not all of these countries always demand this, though the measure – in addition to the protection that it offers – is also useful for avoiding any problems at border crossings or when in transit through another country. Vaccination is therefore necessary for: Angola, Benin, Burkina Faso, Burundi, Central African Republic, Cameroon, Cape Verde Islands, Chad, Congo-Brazzaville, Congo-Kinshasa, Ethiopia, Gabon, Gambia, Ghana, Equatorial Guinea, Guinea (Conakry), Guinea Bissau, Ivory Coast, Kenya, Liberia, Mali, Mauritania, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Zambia and Zanzibar.
- A number of countries where yellow fever does not occur require yellow fever vaccination only if travelling from or through any of the above-mentioned countries (hence not if arriving from Belgium):
 - Algeria, Djibouti, Egypt, Lesotho, Libya, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Reunion, Seychelles, Saint Helena, Swaziland, Zimbabwe, South Africa.
 - Going on a trip is also an ideal opportunity to get your TETANUS- DIPHTHERIA- and POLIOMYELITIS VACCINATIONS up to date. These infectious diseases are in any case totally preventable by means of vaccination. A revaccination is effective for ten years.
 - The WHO advises anyone who is travelling to Africa, regardless of the duration and the conditions of the trip, to be protected against HEPATITIS A. Vaccination against hepatitis A is always advised for people who (1) are travelling in not very good hygiene conditions, or who (2) stay abroad frequently or (3) for long periods (for example for more than 2 - 3 weeks), even if in good hygiene conditions. In these cases vaccination against TYPHOID is also advised. For further details see the general text on VACCINATIONS.
- In specific circumstances vaccination against HEPATITIS B, RABIES and MENINGOCOCCAL MENINGITIS should also be considered.

1.2 MIDDLE AND NEAR EAST

1.2.1 Country information

There is no malaria in **BAHRAIN, ISRAEL, JORDAN, KUWAIT, LEBANON or QATAR**. The malaria risk in **OMAN** is limited to a few remote areas, and hence in Oman prophylactic antimalaria tablets are not necessary.

AFGHANISTAN: There is malaria in Afghanistan in all areas below 2000 m, from May to

November (99% of the cases are caused by the benign vivax-malaria). There is no risk of malaria in the central and eastern part of the country, which lies above 2000 metres. There is no risk of malaria in the capital Kabul. The recommendations for prevention of malaria discussed in NOTE 2 apply for an adventure stay in the countryside.

IRAQ: There is some risk of malaria (exclusively due to the benign vivax-malaria) only from May to November in areas below 1500 m of the 5 provinces north of 35 degrees latitude north (Duhok, Erbil, Ninawa, Sulaimaniya and Ta'mim Prov.). There is also a risk in a few remote localities in the province of Basra in the extreme south, near the border with Iran. See NOTE 1.

IRAN: There is a risk of malaria from March to November in a number of provinces of Iran:

- In large parts of the provinces Lorestan, Khuzestan, Kohgiluyeh-Boyar, Chahar Mahal-Bakhtiari and Fars: see NOTE 1.
- In a few south-eastern provinces (tropical part of Iran), namely in Sistan & Baluchestan, Hormozgan and the southern part of Kerman. There is chloroquine-resistance here. See NOTE 2.

OMAN: Very limited risk in a few remote areas (in the province of Dofar in the south of the country). Application of the recommendations discussed in NOTE 1 should be considered for an adventure stay in the countryside.

PAKISTAN: There is no risk of malaria in the areas higher than 2000 m (situated mainly in the high mountains in the far north of the country), nor in the big towns. The recommendations for prevention of malaria discussed under NOTE 2 apply in the rest of the country.

SAUDI ARABIA: The risk of malaria (especially *P. falciparum*) is restricted to the south-west coast of the Western Province (including the border area with Yemen and the coastal area on the Red Sea). In this region there is however no risk in the towns of Jeddah, Mecca, Taif and Medina. There is no risk of malaria in the other provinces (Eastern, Northern and Central Provinces), nor in the highlands of the Asir Province. In the malaria areas the recommendations for prevention of malaria discussed in NOTE 2 apply for an adventure stay in the countryside.

SYRIA: There is only a very limited risk of malaria in a number of rural areas in the northern border strip with Turkey, and then only from May to October (exclusively due to the benign vivax malaria). There is otherwise no malaria risk at all. The recommendations for prevention of malaria discussed in NOTE 1 apply here for an adventure stay in the countryside.

TURKEY: There is a limited risk of malaria – exclusively of the benign vivax type - from April to October in rural areas restricted to a narrow strip in the south of Turkey, in the area on the border with Syria (South Anatolia): from the region around the coast town of Mersin and the region around Adana, the Çukurova/Amikova areas, to where the Iraqi border begins. The recommendations for prevention of malaria discussed in NOTE 1 apply here for an adventure stay in the countryside.

UNITED ARAB EMIRATES: No preventive antimalaria measures are necessary for a trip to the United Arab Emirates. There is only a very limited risk of malaria in a few emirates in the north-east, namely in the area on the border with Oman and on the Gulf of Oman. Here there is a risk of malaria only in rural areas, namely in the valleys and at the foot of the mountains (Hagar mountain range, East Coast and Central Plateau Regions). In the towns of Abu Dhabi, Dubai, Sharjah, Ajman, and Umm al Qaiwain, in the northern emirates, there is no malaria risk at all. There is no malaria risk in the Abu Dhabi Emirate.

YEMEN: There is no risk of malaria in the capital San'a and in a wide surrounding region, nor in Aden and around its airport. From March to August, the risk of malaria in the rest of the country is very low, so that measures for protection against mosquito bites in the evenings and at night are certainly sufficient. The recommendations for prevention of malaria outlined in NOTE 2 only apply for an adventure stay in the countryside between September and February.

1.2.2 Prevention of malaria

Measures for protection against mosquito bites in the evenings and at night are always essential for protection against malaria. Persons who visit a malaria area during the daytime and who stay in good hotels in the evenings and overnight run no risk, and do not need to take antimalaria tablets, though they should always have a mosquito-repellent for application to the skin in their bag, in case they are not able to get back to the hotel in time in the evening, due for example to problems such as illness, car breakdown, etc. You should also generously apply the mosquito-repellent to the skin when on a trip in the early morning, in the evening or at night. Persons on trips of the adventure type in the countryside who spend the night in primitive conditions are also advised to impregnate the mosquito net with permethrine or deltamethrine, a chemical substance that provides an extra mosquito-repellent and mosquitocidal effect; they must also take antimalaria tablets.

NIVAQUINE®, 3 tablets per week, taken all in one dose, starting from 1 week before departure, and continuing until 4 weeks after returning home.

NOTE 2

The combination of two antimalaria medications:

NIVAQUINE®, 3 tablets per week, taken all in one dose, and

PALUDRINE®, 2 tablets per day, taken all in one dose or 1 tablet in the morning and one in the evening. You start this dosage regimen from 1 week before departure, and continue until 4 weeks after returning home. Certain persons who stay for long periods in a malarial area should in exceptional cases also have to hand a full treatment for a possible malaria attack. All this should if possible be individually discussed with your doctor or with the doctor at the travel advice centre.

1.2.3 Diarrhoea

DIARRHOEA is a frequent travel problem. Even when travelling in good conditions it is not always possible to escape it. Some advice and the correct medications from the travel pharmacy are very useful.

In any case consult the text on travellers' diarrhoea, where the measures for prevention and, if necessary, for correct treatment of diarrhoea are discussed.

1.2.4 Vaccinations

- No vaccination at all is required.
- YELLOW FEVER vaccination is NOT required if you are departing from Belgium. If you are travelling from another country where yellow fever can occur (Africa, South America), you should be vaccinated from the age of 1 year, for Afghanistan, Iraq, Jordan, Lebanon, Oman, Saudi Arabia and Syria, and for Pakistan from the age of 6 months.
- Going on a trip is furthermore an ideal opportunity to get your TETANUS, DIPHTHERIA and POLIOMYELITIS VACCINATIONS up to date. These infectious diseases are in any case fully preventable by means of vaccination. A repeat vaccination is effective for ten years.
- VACCINATION against HEPATITIS A is also advised for people who (1) are travelling in not very good hygienic conditions, or who stay abroad (2) frequently or (3) for a long time (e.g. for at least 3-4 weeks), even if in good hygienic conditions. Vaccination against TYPHOID is also advised in these cases.
- Pilgrims to Mecca must be vaccinated against MENINGOCOCCAL A, C, W and Y MENINGITIS.

- In specific circumstances vaccination against HEPATITIS B and RABIES should also be considered.

All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

1.3 INDIA - SRI LANKA – MALDIVES - NEPAL – BANGLADESH - BHUTAN - MYANMAR (BURMA)

1.3.1 Country information

INDIA: There is no malaria risk in the mountainous areas above 2000 m of the northern provinces Kashmir, Jammu, Sikkim and Himachal Pradesh. No preventive measures are therefore necessary there.

In the rest of India there is some risk of malaria infection, but this varies greatly according to the area. The risk of malaria is very low to absent in the centres of the big towns and is also considerably lower at the southern tip of the Indian continent, namely south of the line connecting Madras, Bangalore and Mangalore. Here the protective measures against mosquito bites in the evenings and at night are sufficient.

In most of the rest of India (and also on the Andaman and Nicobar islands) the measures against mosquito bites in the evenings and at night suffice for travellers who spend the nights in very good conditions (luxury hotels) for a period of several weeks.

However, in the extreme eastern part of the country between Bangladesh, China and Myanmar, especially in the Assam region, there is a high risk of resistant malaria.

SRI LANKA: There is no malaria risk in the capital Colombo, nor in the Kalutara district to the south of Colombo in the coastal strip, nor in the central district Nuwara Eliya. Measures for protection against mosquito bites in the evenings and at night are sufficient here.

However, in the rest of the country in the areas below 800 m, there is a varying malaria risk, and the protective measures against mosquito bites in the evenings and at night suffice for travellers who spend the nights in very good conditions for a period of several weeks; however, the recommendations for prevention of malaria apply for other travellers.

MALDIVES: There is no malaria risk.

NEPAL: There is some risk of malaria in the Terai, namely the southern provinces in the narrow border strip with India, lying below 1200 metres. There is no risk of malaria in the rest of Nepal, and hence also not in the capital Kathmandu. The recommendations for prevention of

malaria apply in the cited districts of the Terai: Bara, Dhanukha, Kapilvastu, Mahotari, Parsa, Rautahat, Rupendehi, Sarlahi.

BANGLADESH: In Bangladesh there is a risk of malaria. There is however no or only an extremely low risk of malaria in the big towns (such as in Dacca, the capital, and Chittagong), and the measures for protection against mosquito bites in the evenings and at night suffice here.

In the border districts in the north and east (along the border with the Assam region of India and the border with Burma, especially in the forested regions and in the foothills of the mountains) there is a very high risk of malaria and resistance to Nivaquine has been reported. The recommendations for prevention of malaria apply here.

In the rest of Bangladesh (namely outside the capital Dacca, and outside the provinces on the border with Burma) there is a varying malaria risk, and the recommendations for prevention of malaria apply here.

BURMA (MYANMAR): There is no risk of malaria in the cities of Rangoon and Mandalay. There is a risk of malaria in the rest of the country in areas below 1000 m.

- The protective measures against mosquito bites in the evenings and at night suffice for travellers who spend the nights in the big tourist resorts in very good conditions for a period of at most a few weeks.
- Additional protective measures depending on the risk area are indicated for other travellers:
- Throughout the whole year in the Karen State, on the border with Thailand
- From March to December in the States of Chin, Kachin, Kayah, Mmon, Rakhine, and Shan, the provinces of Pegu and Hlegu, Hmawbi, and the Taikkyi municipal districts of the Yangon Province (formerly Rangoon).
- From April to December in the rural areas of Tenasserim Province
- From May to December in Irrawaddy Div. and the rural areas of Mandalay province
- From June to November in the rural areas of Magwe and Sagaing Provinces. The recommendations for the prevention of malaria apply here.

BHUTAN: There is no malaria in areas above 1700 metres, and therefore also none in the capital Thimbu. There is some risk of malaria in the rural areas of five southern districts (Chirang, Sarpang, Samchi, Samdrupjongkhar, Shemgang) bordering on India, below 1700 m, where the recommendations for malaria prevention apply.

1.3.2 Malaria prevention

Protective measures against mosquito bites in the evenings and at night are always essential for protection against malaria. Individuals who visit a malaria area during the daytime and who stay in a good hotel in the evening and at night run no risk and do not need to take any antimalaria tablets. A mosquito repellent (for application to the skin) should always be carried, in case returning to the hotel in time in the evening proves impossible i.e. due to problems such as illness, car breakdown, etc. The mosquito repellent should also be generously applied to the skin when going on a trip in the early morning, in the evening or at night. On adventurous trips in the countryside with overnight stays in primitive conditions it is moreover advisable to impregnate the mosquito net with permethrine or deltamethrine, a chemical substance that produces an extra mosquito-repellent and mosquitocidal effect. Taking antimalaria tablets is also necessary.

NOTE 1

The combination of

NIVAQUINE®, 3 tablets per week, taken in one dose, and

PALUDRINE®, 2 tablets per day taken in one dose or else 1 tablet each morning and one each evening. This medication regimen should be started from 1 week before departure, and continued until 4 weeks after returning home. People who spend a long time in a malaria area should have a full treatment stand-by in case of a malaria attack. LARIAM® should be considered for long, risky trips (see NOTE 2). All this should be individually discussed with your doctor or with the doctor at the specialised travel advice centre.

NOTE 2

LARIAM® 1 tablet once per week is the first-choice medication regimen, unless the doctor thinks this treatment is contraindicated (e.g. desire for pregnancy, first three months of pregnancy, epilepsy, depression, or cardiac rhythm disorders for which certain medications such as beta-blockers, calcium antagonists or digitalis are taken) or unless Lariam was not tolerated on an earlier occasion. This medication is started at least 1 week before departure, but if there is sufficient time, and certainly if you have never taken this medication before, it is better to start 2 to 3 weeks before departure (in order to discover any side effects, e.g. dizziness, insomnia, nightmares, excitation, inexplicable anxiety, cardiac palpitations). The medication should be continued for 4 weeks after returning home. If Lariam® is tolerated well,

it can if necessary be taken for many months and even years. MALARONE®, 1 tablet per day from 1 day before departure until 7 days after returning home, is an excellent but expensive alternative for a trip of at most 4 weeks. If there are contraindications, DOXYCYCLINE, 1 tablet per day (NOTE 3) is an alternative, or else NIVAQUINE® 1 tablet per day plus PALUDRINE® 2 tablets per day can be considered, though this combination is frequently significantly less effective and in many areas of Southeast Asia (e.g. Myanmar) it is almost totally ineffective. People who take Nivaquine® and Paludrine® and who stay for at least several weeks in a malaria area should carry stand-by treatment for any possible malaria attack. All this should be discussed with your doctor or with the doctor at the travel advice centre.

NOTE 3

DOXYCYCLINE (100 mg per day, starting the day before departure, and continuing dosing until 4 weeks after returning home). Doxycycline must be taken with plenty of liquid while sitting down or during a meal. Doxycycline can sometimes give rise to phototoxicity and fungal infections in the mouth or genitals. This should be discussed with your doctor or with the doctor at the specialised travel advice centre.

1.3.3 Vaccinations

- No vaccination whatever is strictly required.
- YELLOW FEVER vaccination is not required if you are departing from Belgium. If you travel from some other country where yellow fever can occur (Africa, South America), you should be vaccinated from the age of 1 year and upwards (for India from the age of 6 months and upwards).
- Going on a trip is furthermore an ideal opportunity for getting TETANUS, DIPHTHERIA and POLIOMYELITIS VACCINATIONS up to date. These infectious diseases are preventable by vaccination. A repeat inoculation is effective for ten years.
- The WHO advises anyone travelling to Asia/Oceania, regardless of the duration and the circumstances of their stay, to be protected against HEPATITIS A. Vaccination against hepatitis A is in any case advised for people who (1) are travelling in not very good hygienic conditions, or (2) who stay abroad frequently or (3) for long periods (e.g. for more than 2-3 weeks), even if in good hygienic conditions. Vaccination against TYPHOID is also advised in these cases.
- In specific circumstances vaccination against HEPATITIS B should also be considered.

- People on hikes lasting more than 4 weeks on adventure trips through the countryside should consider vaccination against JAPANESE ENCEPHALITIS and RABIES.

All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

1.4 BRUNEI – PHILIPPINES - INDONESIA – MALAYSIA – SINGAPORE – THAILAND – TIMOR – OCEANIA

1.4.1 Country information

THAILAND: There is no malaria risk in Bangkok and in the other large towns and cities, hence also not in Chiang Mai, Chiang Rai, Pattaya and Phuket, nor in the principal tourist resorts. The malaria risk is also very small in practically all tourist areas. The normal measures for protection against mosquito bites in the evening and at night are certainly adequate, even when travelling under good conditions in the region of the River Kwai. For the great majority of the organized tourist trips there is therefore no need to take antimalaria tablets. Taking tablets is even less necessary if trips into the rainforest in a malaria area are only made in the daytime, staying in good hotels in the evenings and nights (e.g. for a stay in Chiang Mai, Chiang Rai and their immediate environs). However, it is always advisable to have a mosquito repellent in your bag for application to your skin in the evening or in the early morning.

Adventure tourists who spend their evenings / nights (camping) primitively in remote areas must certainly take extra antimalaria precautions: see NOTE 2.

In a number of provinces, on the borders with Burma and Cambodia (Kampuchea) (especially in de Tak and Trat Provinces), a very high malaria risk can exist locally, and there is substantial resistance to the available antimalarial agents. Other measures are necessary for a longer stay under primitive adventure conditions in the countryside (e.g. hiking with overnight stays in small villages) in these areas with very high malaria risk: see NOTE 3.

MALAYSIA: There is no risk of malaria in the coastal regions, the towns and in most other tourist areas. There is malaria risk only in remote regions deep in the interior. For overnight stays exclusively in towns, or on a well-organized tourist trip with stays in luxury hotels, the measures for protection against mosquito bites in the evening and at night are certainly adequate here, especially if only daytime trips are made into the rain forest, (though it is always advisable to take a mosquito repellent for the skin with you in your bag for the evening or if you are out in the early morning.)

There is definitely a risk of malaria on adventure trips lasting longer than 2 weeks, deep in the rain forest of the interior, with overnight stays in primitive conditions:

- in the province of Sarawak (on the island of Borneo) and in the provinces of Kelantan and Kedah (on the Malakka Peninsula) the recommendations described in NOTE 1 apply.
- for an adventure stay in the rain forest of the province of Sabah (on the island of Borneo) see NOTE 2.

INDONESIA: There is no malaria risk in the big towns. For stays only in the big towns, no antimalaria measures are necessary. There is practically no malaria risk on Java, Bali and Southwest Sulawesi, certainly not in the tourist areas. In the rest of Indonesia there is a varying risk of malaria. For stays only in the tourist areas of Java, Bali and Southwest Sulawesi, or a well-organized tourist trip elsewhere (in luxury hotels) of less than 2 to 3 weeks, measures for protection against mosquito bites in the evening and at night are essential and adequate as protection against malaria.

For people who are staying for a long time in Indonesia, and/or staying overnight in more primitive conditions out in the countryside, it is advisable to use an impregnated mosquito net, and chemoprophylaxis is necessary. Nivaquine+Paludrine suffice for the greater part of Indonesia (see NOTE 1).

The measures outlined in NOTE 2 apply in the areas with a greater risk of malaria:

- for a stay of any duration in Irian Jaya (on the island of New Guinea)
- for risky adventure trips under primitive conditions longer than a few weeks in remote areas on the eastern islands such as Kilamantan (on Borneo), Flores, Moluccas, North Celebes (= Sulawesi), Timor, etc.

PHILIPPINES: There is no malaria risk on the central islands of Bohol, Catanduanes, Cebu, nor in the areas above 600 m and in Manila nor the other big towns. The risk is also low in the provinces of Aklan, Biliran, Camiguin, Capiz, Guimaras, Iloilo, Leyte del Sur, Northern Samar and Sequijor.

On the remaining islands there is a varying malaria risk: during a well-organised tourist trip (in luxury hotels), measures for protection against mosquito bites in the evening and at night are essential and adequate as protection against malaria. For other travellers (certainly for visits of more than 2 weeks) the recommendations in NOTE 1 apply.

For adventure trips longer than 2 weeks in remote / low-lying areas, off the tourist routes, Lariam can be considered after consultation with the doctor of the travel advice centre: see NOTE 2.

PAPUA NEW GUINEA: There is substantial malaria risk in the areas lower than 1800 m. See NOTE 2.

MELANESIA: VANUATU (there is substantial malaria risk, except on Futuna Island) and

SOLOMON ISLANDS (there is substantial malaria risk on most of the islands, with the exception of a few in the east and south). See NOTE 1.

There is no malaria risk in BRUNEI (Borneo Island), in SINGAPORE, nor on the rest of THE ISLANDS IN THE PACIFIC OCEAN, AUSTRALIA, NEW ZEALAND.

1.4.2 Malaria prevention

Measures to protect oneself against mosquito bites in the evening and at night are always essential for protection against possible malaria. Persons who visit a malaria area and who spend the evenings and nights in good hotels run no risk, and do not need to take any antimalaria tablets, though they should always have a mosquito repellent product to hand in their bag for application to the skin, in case they cannot get back to the hotel in time in the evening, for example because of problems such as illness, car breakdown, etc. The mosquito repellent should also be generously applied to the skin when on a trip or a safari in the early morning, in the evening or at night. When on trips of the adventure type and staying overnight in primitive conditions out in the countryside, it is also advisable to impregnate the mosquito net with permethrine or deltamethrine, a chemical substance which produces an extra mosquito-repellent and mosquitocidal effect. Dosing with antimalaria tablets is also necessary:

NOTE 1

The combination of NIVAQUINE®, 3 tablets per week, taken in one dose, and PALUDRINE®, 2 tablets per day taken in one dose or 1 tablet in the morning and one in the evening.

You start this scheme from 1 week before departure, and continue to take the tablets until 4 weeks after returning home.

Certain persons who stay for a long time in a malarial area should in exceptional cases also have to hand a full treatment for any malaria attack. FOR LONG RISKY TRIPS, LARIAM® should sometimes be considered (see NOTE 2). All this should be individually discussed with your doctor or with the doctor at the specialised travel advice centre .

NOTE 2

LARIAM® 1 tablet once per week is the first-choice medication, unless the doctor thinks this is contraindicated (desire for pregnancy, first three months of pregnancy, epilepsy, depression, or cardiac rhythm disorders for which certain medications such as beta-blockers, calcium antagonists or digitalis are being taken) or unless you did not tolerate this medication on an earlier occasion.. You start this medication at least 1 week before departure, but if there is

sufficient time, and certainly if you have never taken the medicine before, it is better for you to start 2 to 3 weeks before departure (in order to discover any possible side effects, such as dizziness, insomnia, nightmares, excitation, inexplicable anxiety or cardiac palpitations). You continue to take the medication until 4 weeks after returning home. If Lariam® is tolerated well, it can if necessary be taken for many months and even years.

LARIAM® is also the indicated prophylaxis for persons doing an organized hike from Chiang Mai en Chang Rai to the foothills with a few overnight stops in various places.

Prior to a trip of at most 4 weeks, dosing with Malarone®, 1 tablet per day from 1 day before departure until 7 days after returning home, is also an excellent but expensive choice. If there is any contraindication to this, dosing with DOXYCYCLINE, 1 tablet per day (NOTE 3) is the alternative; otherwise the combination of NIVAQUINE® 1 tablet per day and PALUDRINE® 2 tablets per day can be considered, though in this situation this combination is often significantly less effective and, in many areas of Southeast Asia, rather ineffective (in Thailand and Papua New Guinea, among others). Persons who take Nivaquine® and Paludrine® and who are staying at least several weeks in a malarial region, should in some cases also have a full treatment for a possible malaria attack to hand. In Thailand a quick diagnosis and adequate treatment of malaria can be obtained in several hospitals. All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

NOTE 3

DOXYCYCLINE 100 mg per day, starting the day before departure, and continuing the medication until 4 weeks after returning home. This is the first-choice chemoprophylaxis for adventure travellers who will be en route for at least several days in the hilly forested areas on the Thailand-Cambodia and Thailand-Myanmar borders, and who are camping overnight there in primitive conditions. Doxycycline must be taken while sitting down, with plenty of liquid or during a meal. Doxycycline can sometimes give rise to phototoxicity and fungal infections in the mouth or genitals. All this should be individually discussed with your doctor or with the doctor at the specialised travel advice centre.

1.4.3 Diarrhoea

DIARRHOEA is a frequently occurring travel problem. Even when travelling in good conditions, it is not always possible to escape it. Some advice and the correct medications from the travel pharmacy are very useful.

In any case consult the text on traveller's diarrhoea, where the measures for preventing and if

necessary correctly treating diarrhoea are discussed.

1.4.4 Vaccinations

- No vaccination is strictly obligatory.
- YELLOW FEVER vaccination is not required if you are departing from Belgium. If you travel from some other country, where yellow fever can occur (Africa, South America), you should certainly be vaccinated for Thailand, Malaysia, Indonesia, Papua New Guinea, Brunei and Singapore, from the age of 1 year and upwards.
- Going on a trip is furthermore an ideal opportunity to get yourself up to date with TETANUS-DIPHTERIA and POLIOMYELITIS VACCINATIONS. These infectious diseases are in fact fully preventable by means of vaccination. A repeated vaccination is effective for ten years.
- Anyone travelling to Asia/Oceania, irrespective of the duration and the circumstances of the trip, is advised to be protected against HEPATITIS A. Vaccination against hepatitis A is in any case advised for persons who (1) are travelling in poor hygiene conditions, or who stay abroad (2) frequently or (3) for long periods (e.g. for at least 2 - 3 weeks), even if in good hygiene conditions. Vaccination against TYPHOID is also advised in these cases. For further details see the general text on VACCINATIONS.
- In specific circumstances vaccination against HEPATITIS B should also be considered.
- People who are travelling around adventurously through the countryside for at least 4 weeks should consider vaccination against JAPANESE ENCEPHALITIS and possibly RABIES.

All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

1.5 Far East: CHINA - CAMBODIA - JAPAN - KOREA - LAOS – MONGOLIA – VIETNAM

1.5.1 Country information

CHINA: there is no risk of malaria in the big towns. In the tourist areas of China the risk of malaria is extremely low to non-existent: generally speaking, no antimalaria measures are necessary for tourists. Measures for protection against mosquito bites in the evenings and at night are certainly adequate for most regions.

There is no malaria risk for hikers along the silk route.

There is no malaria risk at all in the northern provinces: Heilongjiang, Jilin, Nei Monggol, Beijing, Shanxi, Ningxia, Qinghai, nor in the western provinces Gansu, Xinjiang (except in the valley along the Yili river), and Xizang (except for one focus in the extreme south-east in the

valley of the Zangbo river, towards the border with Myanmar (Burma)).

In the **Yunnan** Province (in the extreme south of China, in the border area with Laos-Vietnam-Burma) and on the island of **Hainan** there is a malaria risk throughout the whole year, but only in areas below 1500 m and away from the towns. In the Guangxi Province (to the east of the Yunnan Province) there is only a sporadic risk of malaria. The measures for the prevention of malaria discussed in NOTE 2 apply for an adventure stay in rural areas.

There is also a variable but limited malaria risk in the remaining part of south-east China, but only in areas below 1500 metres, away from the towns and off the tourist routes.

- above 33° north latitude there is a malaria risk only from July to November,
- between 33 and 25° north latitude there is a malaria risk only from May to December.
- below 25° north latitude, namely in the Guizhou and Guangdong Provinces, there is a risk of malaria throughout the whole year.

The recommendations for the prevention of malaria discussed in NOTE 1 apply in these areas.

CAMBODIA: there is a malaria risk throughout the whole country, except

- in Phnom Pehn and its environs; downstream along the Mekong river and its large tributary the Tonle Bassac (down to the border with Vietnam) and upstream along the Tonle Sap river and in the immediate environs around the Tonle Sap Lake. In these areas the risk is low,
- in most of the provincial capitals (exceptions are: Prey Vihar, Rattanakiri, Mondolkiri),
- in Siem-Riep (though there is a malaria risk in the neighbourhood of the temples, also in the region of Angkor Wat; extra measures are therefore advised for overnight stays in this area).

There is a risk on the coast: hence also in the evenings and at night on the beaches such as in Kep and Sihanoukville.

Measures for the prevention of malaria: see NOTE 2.

In the western provinces of Cambodia, bordering on Thailand, there is a resistant form of malaria: for the protective measures see NOTE 3

<http://www.cambodia.net/malaria/>

JAPAN: there is no malaria, not even in the Ryukyu archipelago, including Okinawa. There is no malaria in the Bonin Islands.

KOREA: there is only a very limited risk of *P. vivax* malaria in a few remote localities in the north of South Korea (north-west of the Imjin River in the northern border province of Kyonggi-do) and in the adjacent areas in the south of North Korea: no anti-malaria measures need to be taken.

LAOS: there is no malaria risk in the capital Vientiane. However, there is a malaria risk throughout the rest of the country. The recommendations discussed in NOTE 2 apply here.

MONGOLIA: there is no malaria.

VIETNAM: there is a risk of malaria throughout the whole country, but not in the big towns such as Hanoi, Danang, Nha Trang, Ho Chi Minh, etc. and also not in the delta of the Red River. There is a low risk in the Mekong delta.

There is also no risk in the coastal plains north of Nha Trang.

The risk is greatest in the areas to the south of the Mekong Delta (in the provinces of Ca Mau and Bac Lieu), on the plateaux below 1500 metres, and in the hilly forested areas in the interior south of 18 degrees latitude.

No tablets are therefore necessary for a well organised trip from town to town, but measures for protection against mosquito bites in the evenings and at night should be sufficient.

The recommendations for prevention of malaria discussed in NOTE 2 apply for other travellers.

1.5.2 Prevention of malaria

Measures for protection against mosquito bites in the evenings and at night are always essential for protection against malaria. Tourists who visit a malaria area during the daytime and stay in good hotels in the evenings and at night run no risk, and do not need to take any antimalaria tablets. However, everybody should always have a mosquito-repellent product (for application to the skin) in their bag, in case they cannot get back to the hotel in time in the evening, e.g. due to problems such as illness, car breakdown, etc. You should also apply the mosquito-repellent generously to the skin when on a trip or a safari in the early morning, in the evening or at night. Tourists on adventure type trips in rural areas who stay overnight in primitive conditions are also advised to impregnate the mosquito net with permethrine or deltamethrine, a chemical substance that provides an extra mosquito-repellent and mosquitocidal effect, and the taking of antimalaria tablets is also necessary:

NOTE 1

NIVAQUINE® 3 tablets per week, taken in one dose, starting from 1 week before departure, and continuing until 4 weeks after returning home.

NOTE 2

LARIAM® 1 tablet once per week is the first choice medication, unless your doctor thinks there are contraindications (desire for pregnancy, first three months of pregnancy, epilepsy, depression, or cardiac rhythm disorders for which medications such as beta-blockers, calcium antagonists of digitalis are being taken), or if you did not tolerate this medication on an earlier occasion. You start this medication at least 1 week before departure, but if there is sufficient time and certainly if you have never taken this medication before, it is better for you to start 2 to 3 weeks before departure (in order to discover any side effects: dizziness, insomnia, nightmares, excitation, inexplicable anxiety, cardiac palpitations). You should continue to take the medication until 4 weeks after returning home. If Lariam® is tolerated well, it can if necessary be taken for many months or even years. For a trip of up to 4 weeks MALARONE® 1 tablet per day from 1 day before departure until 7 days after returning home is an excellent but expensive alternative.

If there are contraindications, taking of DOXYCYCLINE, 1 tablet per day (NOTE 3) is an alternative; otherwise the combination of NIVAQUINE® 1 tablet per day and PALUDRINE® 2 tablets per day can be considered, though this combination is often significantly less effective, and in many areas of Southeast Asia it is rather ineffective. Tourists who take Nivaquine® and Paludrine® and stay for several weeks in a malaria area should always have a curative dose, in case of acute malaria attack.

NOTE 3

DOXYCYCLINE 100 mg per day, to be started the day before departure and to be continued until 4 weeks after returning home; it should be taken, with plenty of liquid or with a meal. Doxycycline can sometimes give rise to phototoxicity and fungal infections of the mouth and genitals. All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

1.5.3 Diarrhoea

DIARRHOEA is a frequent travel problem.

Even when travelling in good conditions, it is not always possible to escape its effects. Some advice and the correct medications from the travel pharmacy are very useful.

Always consult the section on traveller's diarrhoea where the measures for prevention and correct treatment of diarrhoea are discussed.

1.5.4 Vaccinations

- No vaccination at all is actually required.
- YELLOW FEVER vaccination is NOT required if you are departing from Belgium. If you are travelling from another country, where yellow fever can occur (countries in Africa & South America), you should certainly be vaccinated for China, Cambodia, Laos and Vietnam, and this applies from 1 year of age.
- Going on a trip is also an ideal opportunity to get up to date with the TETANUS-DIPHTHERIA- and POLIO VACCINATIONS. These infectious diseases are completely preventable by means of vaccination. A repeat vaccination is effective for ten years.
- Anyone travelling to Asia/Oceania, regardless of the duration and the conditions of the trip, is advised to be protected against HEPATITIS A. Vaccination against hepatitis A is always advised for people who (1) are travelling in not very good hygiene conditions, or who stay abroad (2) frequently or (3) for long periods (for example for more than 2 - 3 weeks), even if in good hygiene conditions. In these cases vaccination against TYPHOID is also advised. For further details see VACCINATIONS.
- In specific circumstances vaccination against HEPATITIS B should also be considered.
- If you intend to take hike for at least 4 weeks on adventure trips through the countryside you should consider vaccination against JAPANESE ENCEPHALITIS and possibly RABIES. All this should be individually discussed with your doctor or with the doctor at the travel advice centre.

1.6 NORTH AMERICA – CANADA – EUROPE – FORMER USSR

1.6.1 Malaria

There is in principle no risk of malaria.

There is a limited malaria risk in remote areas from June to October, exclusively due to the mild *P. vivax*-form in **Armenia** (in a few villages of the Masis district in the Ararat valley on the western border with Turkey), **Azerbeidjan** (in the rural areas in the region between the Kura- and the Arax rivers), **Georgia** (only in a few villages in the south-east of the country), **Tadjikistan** [southern border areas, (Khatlon region), in some central (Dushanbe), western (Gorno-Badakhshan), and northern areas (Leninabad region)] and **Turkmenistan** (Mary district). There is no risk in the tourist areas.

PREVENTIVE MEASURES in the risk areas:

Measures for protection against mosquito bites in the evenings and at nights are always

essential for protection against malaria if you are staying overnight outside of the big towns. Persons who visit a malaria area during the daytime and who stay in good hotels in the evenings and overnight run no risk and do not need to take antimalaria tablets, though they should always have a mosquito repellent in their bag in case they are not able to get back to the hotel in time in the evening, for example due to problems such as illness, car breakdown, etc. You should also generously apply the mosquito repellent when on a trip or a safari in the early morning, in the evening or at night.

On trips of the adventure type in the countryside with overnight stays in primitive conditions in the small villages the following additional measures are indispensable:

- Impregnate the mosquito net with permethrine or deltamethrine, a chemical substance that provides an extra mosquito-repellent and mosquitocidal effect.
- Take medications: NIVAQUINE®, 3 tablets per week, all taken in one dose. You start this dosing regimen from 1 week before departure, and continue dosing until 4 weeks after returning home.

1.6.2 Diarrhoea

DIARRHOEA is a potential problem when travelling in unhygienic conditions. Some advice and the correct medications from the travel pharmacy are very useful in this case. If possible, consult the TRAVELLER'S DIARRHOEA text, where measures for preventing and if necessary correctly treating diarrhoea are discussed.

1.6.3 Vaccinations

- No vaccination whatever is actually required. YELLOW FEVER vaccination is not required for any of these countries if you are departing from Belgium.
- Going on a trip is furthermore an ideal opportunity to get your TETANUS and DIPHTHERIA VACCINATIONS up to date. BOTH DIPHTHERIA and POLIOMYELITIS VACCINATIONS are advisable for a trip to the former USSR. These infectious are in any case totally preventable by means of vaccination. A repeated booster vaccination is effective for ten years.
- VACCINATION against HEPATITIS A is also recommended for persons who are travelling in poor hygienic conditions.

In exceptional cases vaccination against TYPHOID, HEPATITIS B and tick-borne encephalitis is also advised

2 Health risks

2.1 Altitude sickness

2.1.1 General

Any lowland inhabitant may be confronted with acute altitude sickness when staying even for a short time above 4000 meters. There is a 20% chance of getting altitude sickness when residing in areas above 2000 – 2500 m, and a 40% chance in areas of 3000-3500 m. People who fly directly to high areas, such as Cusco (Peru, 3225 m), La Paz (Bolivia, 3658-4018 m), Lhasa (Tibet, 3685 m), Leh (Ladakh, 3505 m) etc. should certainly be alerted to the possibility of altitude sickness. They are best advised to quietly rest at their destination for the first few days, and especially avoid sleeping pills (sedatives, narcotics) and excessive use of alcohol (in exceptional circumstances and in discussion with the doctor the combined ingestion of 125 mg Diamox® and 10 mg temazepam may be considered for severe sleeplessness). Sensitivity to altitude sickness varies from individual to individual, and is not dependent on the degree of physical fitness, nor on the previous number of visits to high altitude areas. The individual sensitivity is reasonably constant: if there were problems on a previous visit, these are likely to return on subsequent trips. Patients with heart and lung diseases run more risk at high altitude. The symptoms can persist for up to 72 hours after arrival and may continue for 2-5 days when remaining at high altitude. At first the symptoms of acute altitude sickness are mild: the patient complains of **headache**, fatigue and shortness of breath (dyspnoea) upon exertion, lack of appetite, nausea, insomnia, dizziness, general malaise, and sometimes swelling of hands, feet and face (first of the eyelids). The severity of symptoms depends on the altitude, the rapidity at which this altitude was attained, the effort expended in getting there and whether the visit is prolonged there overnight. The complaints can get worse (vomiting, dry cough and increasing shortness of breath), and can sometimes eventually develop into life-threatening conditions (this seldom occurs below 3000 m) due to high altitude lung oedema (fluid in the vesicles of the lung, with a worsening dry cough, fever and shortness of breath even when resting) and/or high altitude cerebral oedema (swelling of the brain, with headache that no longer responds to analgesics, unsteady gait, increasing vomiting and gradual loss of consciousness).

2.1.2 Prevention

Prevention is important and consists of the following measures:

- Staying for a few days at an intermediate altitude (about 2000 m); ideally, until the heartbeat-rate (pulse rate) when resting is reduced to less than 100 per minute.
- Once above 3000 m, daily ascent should be restricted to a maximum of 300-500 m (depending on the individual's symptoms).
- Above 4500 m altitude further ascent should be at most 150 m per day.

2.1.3 Treatment with medication

- If symptoms of altitude sickness do occur, it is better to rest for an extra day or longer, if possible. For headache 1 gr acetylsalicylic acid (aspirin) or paracetamol or 600 mg ibuprofen and for nausea metoclopramide or domperidone can be taken. Diamox® one 250 mg tablet, b.i.d. for 2-3 days can be started. These medications are prescribed by a doctor. If the complaints persist or get worse, descent by at least 500 m is absolutely essential, and overnight stays at higher altitude are forbidden. Diamox® does not mask the serious symptoms of altitude sickness!
- People who have suffered from altitude sickness before or who ascend in one day to over 3000 m should take Diamox® prophylactically, ½ to 1 tablet of 250 mg b.i.d., starting 1 day before the ascent and continuing for 2-3 days. Diamox® is not routinely given to everyone who goes on a high altitude hike, though it is advisable to carry some when hiking above 3000 m, so that it can be taken as soon as symptoms occur (250 mg, b.i.d. for 2-3 days or less if descent is imminent). Oxygen deficiency (hypoxia) at high altitude leads to acceleration of the respiration (tachypnoe) and thus to "respiratory alkalosis" (the blood becomes somewhat less acidic); the carbon dioxide level in the blood (pCO₂) decreases, slowing the respiratory automatism, which worsens the oxygen deficiency still more. After a few days the kidneys begin to compensate the alkalosis and symptoms disappear. Diamox® should counteract the respiratory alkalosis and permit the accelerated respiration to be maintained. There is possibly also a direct effect on the respiratory centre. Tingling sensations in the limbs and around the mouth and taste disturbances (e.g. when drinking beer) are frequent side effects. Diamox® must not be taken if there is allergy to sulphonamides or in pregnancy; it is seldom given to children (5mg/kg per day in two doses).
- An **adequate fluid intake** (at least 3 litres, though often even more; the urine should remain clear!) is absolutely necessary, even if you do not feel thirsty, as fluid loss via respiration increases substantially (e.g. through hyperventilation in a dry environment with a low atmospheric pressure). The use of Diamox® also leads to extra fluid loss (dehydration).
- Dexamethasone (Decadron® 4 mg every 12 hours) can be given prophylactically for an ascent above 2500 m, from one day before the climb until after return to below 2500 m,

and in exceptional circumstances, nifedipine (Adalat® 10 mg 4 x per day), but only after consultation with a specialist in this field (it reduces the risk of pulmonary oedema).

2.1.4 Treatment of life-threatening altitude sickness:

- A rapid descent is necessary for the survival of the affected person.
- It is also useful for medical personnel accompanying parties in high mountainous areas to have the following medications to hand: dexamethasone [Decadron®] for life-threatening cerebral oedema, 8 mg as starting dose, then 4 mg every 6 hours (or 32 mg in one dose in emergencies) and nifedipine [Adalat®] for life-threatening lung oedema, 10 mg sublingually together with Adalat® Retard 20 mg as a loading dose, followed by Adalat® Retard 20 mg every 6 hours. All this should **in no way delay a fast and life-saving descent to below 2500 m**. All the more so if the sick person is vomiting.
- The administration of oxygen is advisable, though oxygen is obviously difficult to carry around. Portable inflatable hyperbaric "chambers" (pressurised sack with footpump) exist for use at high altitude. These offer a temporary solution as the effect diminishes after a few hours. That is why this must always be combined with the administration of Diamox®, Adalat® and dexamethasone and it must always be ensured that a rapid descent is made.

2.1.5 Other problems at high altitude:

There is also a risk of hypothermia, freezing, frostbite, sunburn and snow blindness at high altitude. Any one of these is in itself sufficient reason for ensuring that you have made suitable medical preparation for high-altitude trips (consult experts for this). A well-stocked travel pharmacy/portable medical kit is of vital importance on trips through remote areas.

2.2 Chagas' disease (or American trypanosomiasis)

Hikers in rural areas in Latin America (except in the Caribbean) must be alerted to the risk of an infection due to a unicellular parasite, called *Trypanosoma cruzi*. The disease is transmitted via bloodsucking insects, related to bedbugs. In endemic areas you should certainly not stay overnight in primitive huts or in the open air. If you cannot or do not want to avoid this, and also if you stay overnight in small cheap hotels, you must always sleep under a mosquito net (preferably with a sheet over the mosquito net to prevent contact with the faeces dropping from the triatomas). You are advised to use an insecticide spray if there are any large insects in the room (usually hidden behind picture frames, in drawers, or even under the mattress). In the evenings you should also apply insect repellent to the exposed parts of the skin.

2.3 Dengue

Dengue is the most frequent tropical arbovirolosis (infectious viral disease) and is transmitted by the *Aedes* mosquito. Dengue occurs in Southeast Asia, the Caribbean, Central America, the northern half of South America and also sporadically in Africa. The disease is now widespread in many tropical areas. In contrast to malaria, the disease occurs just as frequently in the towns as in the countryside. There are four different dengue viruses (i.e. 4 serotypes).

In its typical classical course the infection is characterised by a sudden onset with fever, headache and aching joints (dandy fever or breakbone fever) and significant muscle pain (including lumbar or lower back pain and pain around the eyes). There is sometimes a dry cough, and relative bradycardia (slow heartbeat). The disease often displays a biphasic pattern: after 3-4 days of fever a temporary improvement occurs, and then the fever intensifies again around the 5th-6th day. At that time a red macular exanthema (skin rash) can appear. After a few days the temperature returns to normal, though this may be followed by a period of difficult recovery lasting for weeks, characterised by fatigue, muscle pains and neuralgias. No specific treatment exists and the disease resolves spontaneously. However, the clinical course is often atypical, such as a febrile influenza-like syndrome.

Occasionally, haemorrhagic forms can occur: around the 3rd to 4th day the condition deteriorates rapidly, with occurrence of haemorrhages and abdominal pain. Life-threatening gastrointestinal bleeding can occur and/or a state of shock can arise. These complicated forms are extremely rare in tourists. Young children of the indigenous population in the Far East are especially affected by it. The incidence of these life-threatening forms has definitely increased in the last 20 years. It is assumed that after an earlier infection with one of the 4 serotypes there is an increased risk of complications upon subsequent infection by another, different serotype. For three months after an infection with one serotype, there is cross-protection against the other serotypes. After that (some authors estimate for a period of 5 years) there is some risk of the haemorrhagic form or shock. It is impossible to say how great this risk is for an individual traveller. In practice the risk remains very small in absolute terms.

There is no vaccine. Protective measures against mosquito bites form the cornerstone of prevention. Protective measures against mosquito bites are especially important in the event of a local epidemic. The transmitting *Aedes* mosquito tends to bite in the morning (i.e. from 9 to 11 a.m.), and during the afternoon until just before sunset (i.e. from 13.00 to 17.00).

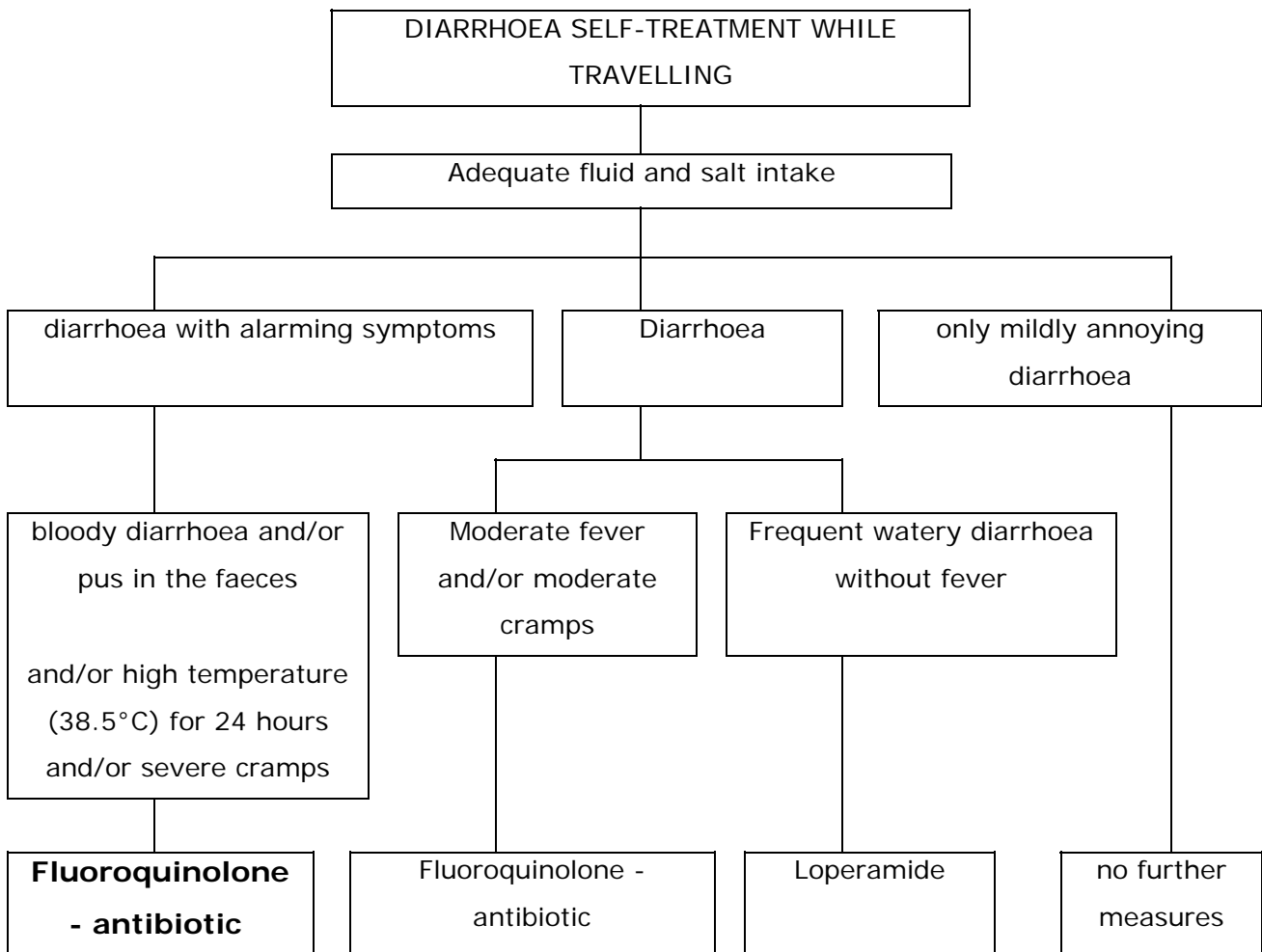
2.4 TRAVELLER'S DIARRHOEA

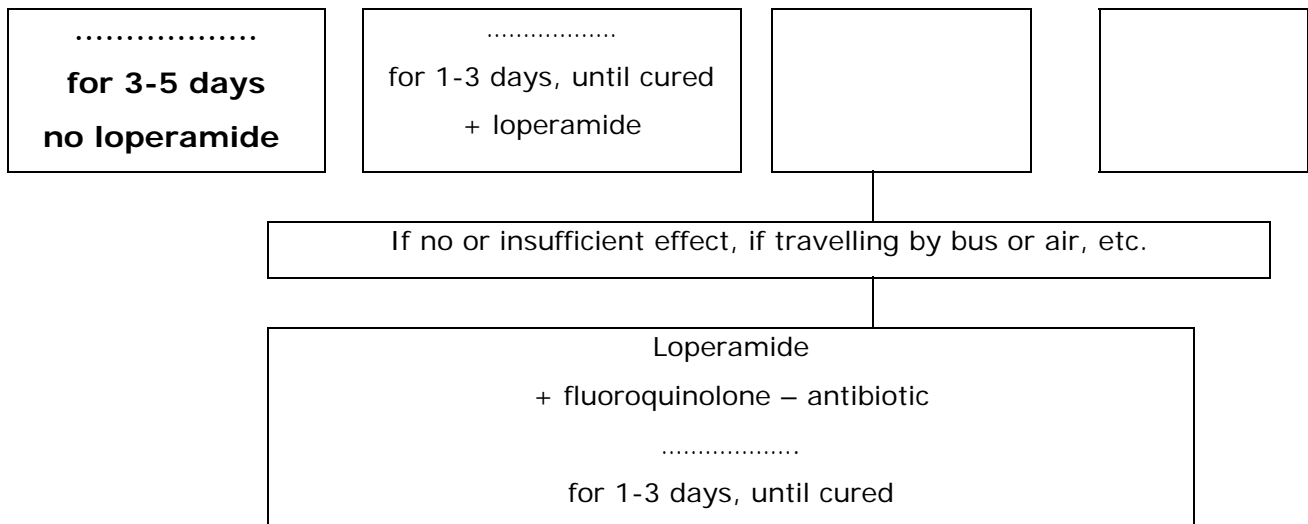
2.4.1 General

Diarrhoea occurs very frequently in travellers. It usually occurs as a mild condition, which can nevertheless be annoying, though it spontaneously resolves within a few days. The cause of such traveller's diarrhoea is usually an infection by a bacterium, occasionally by a virus and only seldom by an intestinal parasite. The great majority of cases (but unfortunately not all cases) of traveller's diarrhoea can be prevented with a few simple measures. However, no specific treatment is necessary for the vast majority of cases, apart from measures for preventing too great a loss of fluid, and perhaps a few others to alleviate the symptoms of illness such as fever, vomiting, intestinal spasms and the diarrhoea itself.

Occasionally there may be a more severe diarrhoea, for which treatment with antibiotics may well be indicated, or where admission to hospital for intravenous fluid administration may be indispensable. A quick, correct (self)treatment can shorten the duration of the illness and avoid an admission to hospital in a distant foreign country with less elaborate healthcare provisions.

Represented schematically:





This diagram is an emergency aid, only to be used when you can find no medical help in the foreign country within 24 hours. Do not use it on return to Belgium, but always consult your doctor !

2.4.2 Prevention of diarrhoea

Total prevention of diarrhoea is impossible.

It is however important to be aware that preventive use of antibiotics and other medications is not advisable!

By being careful of what you eat and drink you can substantially reduce the risk of getting serious diarrhoea.

Elementary hygiene (washing the hands) also substantially reduces the risk of infections!

Food

Avoid (as far as possible):

- Uncooked vegetables;
- fruit that cannot be peeled by yourself before eating;
- unpasteurized or unboiled milk / dairy products, or dairy product-based foods (puddings, ice cream);
- raw or insufficiently cooked fish, and especially seafoods such as oysters;
- raw or insufficiently cooked meat.

Avoid cold buffets, which are very tempting when the weather is hot, especially when the food has been directly cooled with ice.

The place where you eat can be important. A meal obtained from a street vendor may be more risky than in a restaurant, although well-cooked food that is eaten immediately on site can be safer than a meal served in an apparently clean restaurant.

Flies are major carriers of germs: food should be covered to protect it from flies; restaurants full of flies are best avoided.

Drinks

In countries with low hygiene standards you are best advised to drink only bottled water. Sparkling drinks are safer than plain mineral water, due to their higher acidity and especially in view of the very small chance of tampering with the crowncaps. Make sure the bottles are opened in your presence and watch out especially for soft drinks in bottles with recycled crowncaps or corks. Unfortunately, however, not all locally bottled mineral waters are safe. If no bottled water is available, tea or coffee are good alternatives. Ice cubes are to be avoided, even in alcoholic drinks, due to the uncertainty over the water that is used. A number of disease-inducing microorganisms can survive in ice. Cleaning your teeth with tapwater can pose a certain risk, though this is usually very small. Swallowing water while swimming is also a major source of infection. Rendering drinking-water completely free of bacteria and parasites is difficult. You can nevertheless substantially reduce the risk by taking the following measures:

2.4.3 Reducing risk

Boiling

It suffices to bring the water just to boiling temperature. None of the known disease pathogens survives this. The earlier rule that the water should be boiled for 10 minutes + 1 minute for every 300 metres above sea-level is outdated. Obviously, it is better to filter turbid water before boiling.

Disinfection:

Filtration of drinking-water before disinfecting (or boiling) it is necessary if the water contains a lot of organic material! The largest particles are readily removed by pouring the water through a coffee filter or, for example, a clean handkerchief.

There are various disinfectant products on the market. It is important to allow enough time for the agent to act (1 to 2 hours for the usual dose, which may be shortened with a dose):

- Chloramine-tablets: Chloramina Pura®, Chloraseptine®, Clonazone® (available from pharmacies)
 - Drinking-water: 1 x 250 mg tablet per 10 litres (dirty) to 50 litres (relatively clean) water
 - water for washing vegetables: 5 tablets per litre water, the vegetables must be immersed for 10 minutes in this water.
- Certisil Combina® (available from pharmacies): chlorine- and silver tablets, fluid or powder for 1, 5, 10 and 100 litres of water.

- Sodium hypochlorite solution:
 - 2 to 4 drops of concentrated sodium hypochlorite solution per litre of dirty water to 5 to 10 drops per 20 litres of clean water (slight chlorine taste)
 - water for rinsing vegetables: 5 ml per litre of water, the vegetables must be immersed for 10 minutes in this water.
- Commercial sodium hypochlorite solutions such as Drinkwell-chloor® (10 ml for 100 litres drinking-water) and Hadex® (50 ml for 250 litres drinking-water) are available from camping shops. These also produce a slight chlorine taste, which can then be removed by *passing* the water through an activated charcoal filter (advised for Hadex) or by adding Drinkwell®-*antichlorine drops* (based on the non-toxic sodium thiosulphate), allowing the necessary action time of 30-60 minutes (a longer contact time is required for cold water).
- 2% iodine tincture solution: 0.4 ml or 8 drops per litre of water. Iodine is more active against amoeba cysts, and should produce less unpleasant taste than chlorine. The aftertaste can subsequently be removed by *filtering* the water with an activated charcoal filter or by adding vitamin C. Prolonged use (more than 3 months) of iodine is generally not advised. Iodine should not be used if there is any suspicion of thyroid pathology or by pregnant women, or at any rate it should be used for at most 3 weeks in these cases.
- Silver salts are not active against viruses and are not really suitable for disinfecting water, rather they are more suitable for keeping disinfected water stored in water tanks bacteria-free for a long time (up to months). They are obtainable in specialist outdoor sport shops (Micropur®) and in pharmacies (Certisil Argento®).

Filtration:

Many different types of portable water filter systems are now available on the market. Expert advice and opinions on these is best obtained in the specialist outdoor sport shops. Individuals who go to live in the tropics are advised to obtain a large filter system (Berkefield®). It is important that such systems are well maintained. Gadgets such as drinking-straws with built-in filters are regarded as useless.

2.4.4 Treatment of diarrhoea

Rehydration:

If you get diarrhoea it is of vital importance to have an adequate fluid intake with an sufficient salt and sugar content to compensate for the fluid loss that has occurred.

This can be achieved in various ways:

- commercial salt-sugar solutions, e.g. O.R.S.®, Serolyte®, Soparyx®, Tropenzorg®, etc.: these are especially indicated for children and elderly people.

- solutions made up by yourself: 5 level coffee spoonfuls of sugar and half a coffee spoonful of salt per litre of fluid, preferably a mixture of pure water or weak tea with fruit juice or mashed banana. Because of the risk of making mistakes in the composition and the consequences of this it is not advisable to make up the fluid yourself for children, but instead you should always have the ready to use O.R.S.® preparations at hand.
- For adults there are more tasty alternatives: tea + lemon, broth, soft drinks and fruit juice with salted biscuits or crisps.

Fasting is not needed. If you are not vomiting you are advised to eat a normal quantity of easily digestible food, divided over more frequent but smaller meals.

The following measures are recommended for babies and young children:

Breast-feeding can be continued unchanged. Between the breast-feeds oral rehydration fluid (O.R.F.) can be given alternately with pure water.

Bottle-feeding is replaced for the first 6 hours by adequate O.R.F.: 10 - 15 ml per hour per kg bodyweight of the baby. After that normal feeding can be resumed, with addition of 20% fluid. This can be done by adding water to the milk or by administration of fluid between feeds. If vomiting occurs O.R.F. should be administered frequently and in very small quantities with a spoon.

It is important to be aware of the fact that ingestion of O.R.F. does not diminish the diarrhoea.

2.4.5 Ordinary diarrhoea

= no blood-containing faeces, no high temperature)

Treatment:

Rehydration

Intestinal transit inhibitors

- Loperamide, (e.g. Imodium®), 1 to 4 capsules per day. This can sharply reduce the number of defaecations, which means a substantial alleviation of the complaints. If this has no effect, it is not advisable to increase the dose! If there is a good effect, constipation must of course be avoided (by reducing or stopping the dose in time). The diarrhoea will nevertheless not necessarily disappear completely, as loperamide does not cure it, but merely alleviates the symptoms.
- NOTE! Loperamide is contraindicated for pregnant women.
- NOTE! Extreme caution should be exercised when administering loperamide to children, and it must not be administered to any child under 2 years of age.

Antibiotics are NOT indicated for ordinary diarrhoea, EXCEPT in certain circumstances:

Antibiotics can (in combination with an intestinal transit inhibitor) nevertheless rapidly alleviate the symptoms and shorten the duration of the illness from several days to only one day or even a few hours. For this reason a short antibiotic course may be indicated in a number of cases (e.g. **for travel by bus, boat or air**, for business trips, for sportspeople, and the like). Ordinary traveller's diarrhoea is a particularly annoying problem, and can spoil a trip, certainly on short journeys. Although an antibiotic should not be prescribed in normal situations, it may be justified to start a quick self-treatment. In some cases of previously existing disease conditions the doctor may also judge that a rapid intake of antibiotics is indicated for diarrhoea. It is not superfluous to point out to travellers to whom a self-treatment is given for an emergency situation that the treatment is exclusively intended for use during the journey. The risk of this diarrhoea treatment being used on one's own initiative for gastrointestinal problems or fever / high temperature or other symptoms after returning home is indeed not imaginary and can lead to dangerous situations.

2.4.6 Complicated diarrhoea

The following symptoms may indicate the presence of a more severe form of diarrhoea, namely

Bacterial dysentery

- diarrhoea with blood and/or mucus in the faeces.
- diarrhoea persisting for longer than 1 to 2 days:
 - with persistent presence of high temperature ($>38.5^{\circ}\text{C}$),
 - or accompanied by heavy abdominal cramps,
 - or if the defaecation frequency remains at more than 6 per 24 hours, and certainly if nocturnal defaecation occurs.

Treatment:

Rehydration

In these cases use of intestinal transit inhibitors (e.g. loperamide) is not advised.

A suitable **antibiotic** is indicated here:

- Adults:
 - Ofloxacin Tarivid® 400, 1 tablet per day for 3-5 days; ciprofloxacin Ciproxine® 500 2 tablets per day for 3-5 days or Zoroxin® or Norfloxacin EC®: 2 tablets per day for 3 days.
 - Azithromycin Zitromax® 500 mg per day for 3 days or 1000 mg in one dose (also for pregnant women)

- **Children and adolescents under 15 years old:** A reliable physician should be consulted. Rehydration is the cornerstone of the treatment. In children Azithromycin Zitromax® is administered at a dose of 10 mg/kg/day for 3 days (a syrup form exists). A ciproxine syrup for children under 15 years old is due to appear on the market in the future. Cotrimoxazole is no longer advised.

An adult can complete the self-treatment schedule. Medical assistance should be sought, if this is available, if the symptoms have not been alleviated within 48 hours. Medical help should be sought more quickly for children and elderly people.

Note:

- It is stated on the package insert of a number of these antibiotics that their use is indicated for urinary infections, without stating other indications. Do not let yourself be misled by this: these antibiotics have only recently been approved for the specific treatment of most of the bacteria that can be the cause of a severe bacterial dysentery.
- Watch out for possible hypersensitivity to exposure to the sun while these products are being taken.

Amoebic dysentery

Severe diarrhoea is only in rare cases due to **amoebic dysentery**.

In these cases one usually has

- normally formed faeces containing some mucous pus and/or blood, or else
- mucous bloody diarrhoea, but
- usually no fever
- one often has to defaecate small amounts of mucous stools, or else
- one has the feeling that one must defaecate, but no defaecation takes place.

Only for adventure travellers or tourists who are travelling for a long time is it really useful to have a treatment for amoebic dysentery with them !

Treatment:

Rehydration

Anti-amoeba treatment

- Fasigyn®: 2 x 500 mg tablets each morning and 2 x 500 mg tablets each evening for 3 days (alternatives: Flagyl® or Tiberall®). Consumption of alcohol with each of these medications is dangerous !!!
- Always followed by

- Gabbroral® 10 mg/kg 3 times per day for 8 days 3x2 tablets/day
- Or Furamide® 3 x 500mg tablets/day for 10 days.

If this treatment has no or insufficient effect, it is advisable to start administration of one of the above-named antibiotics, if this has not yet been done.

Giardia lamblia

- persistent diarrhoea
- without loss of blood or mucus
- without fever
- with upper abdominal complaints and loss of appetite.

Treatment

- Fasigyn® 4 tablets in one single dose is effective in the vast majority of cases (no alcohol must be taken for the next 48 hours).

2.5 Frühsommer Meningoencephalitis (FSME, tick-borne encephalitis)

2.5.1 General

This condition is a viral meningoencephalitis transmitted by ticks. The disease is endemic in the rural forested areas of many central European countries (Austria, Switzerland, Southern Germany, Hungary, the Czech Republic, Slovakia, Poland, ex-Yugoslavia, ex-USSR, Bulgaria, Rumania, etc.). The Austrian Government in fact officially alerts inhabitants and tourists via the pharmacists. In exceptional cases this disease is also transmitted by ingestion of unpasteurized goat's or cow's milk.

The risk is seasonal: from spring to autumn (from April to October).

The disease is usually mild. The risk of severe disease is estimated at 1 in 500-1200 infected tick bites. In severe disease, there is a possibility of fatal outcome (1%) and neurological sequelae (10%). In the ex-USSR, especially in Siberia, there exists a variant of this disease with a high mortality rate (i.e. R.S.S.E. or Russian Spring Summer Encephalitis).

2.5.2 Prevention

2.5.3 Vaccination

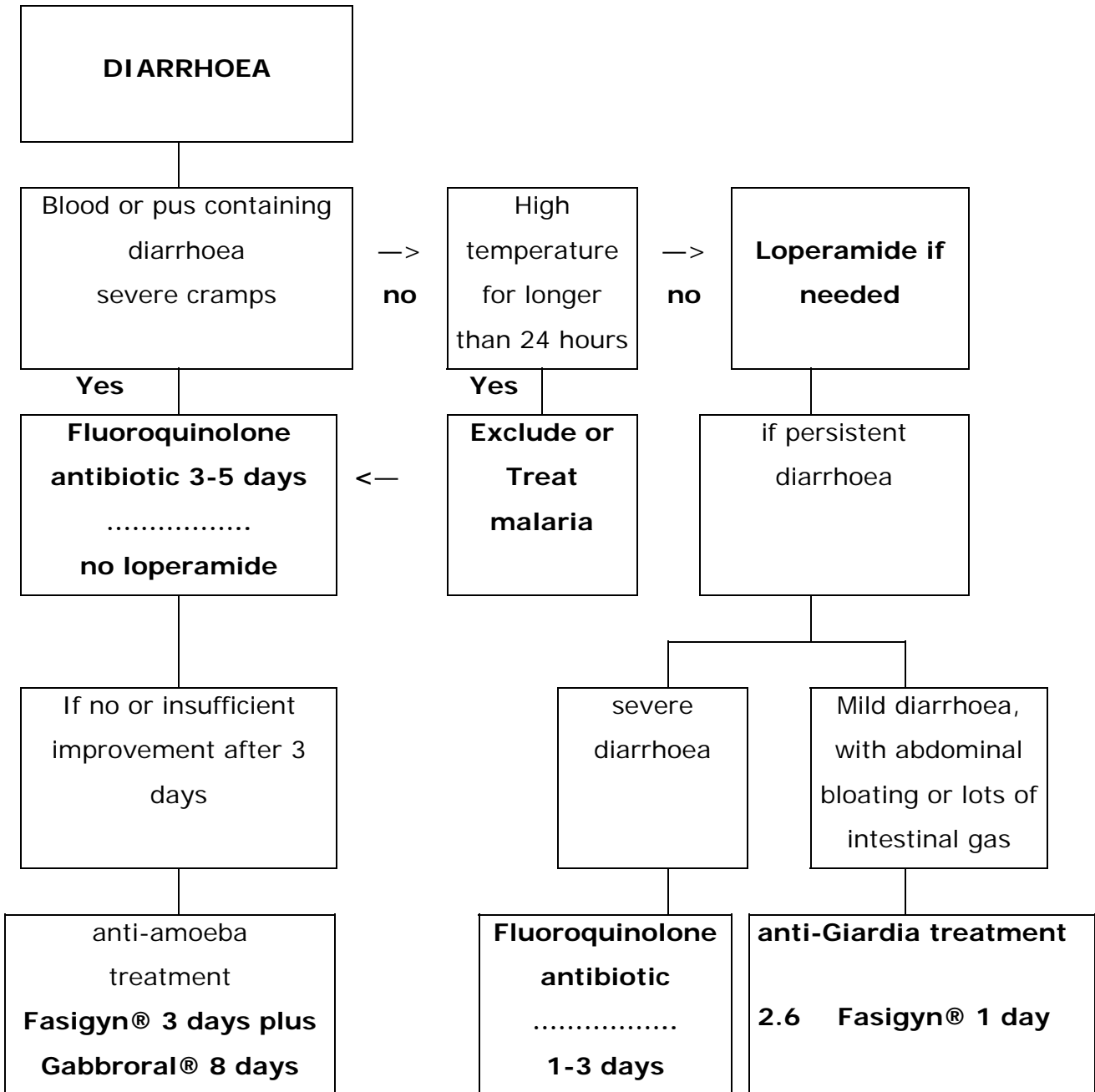
- The vaccine FMSE-Immun® is based on killed virus. Three intramuscular injections of 0.5 ml (1 to 3 months between the first injections, and 9 to 12 months between the last injections) give 98% protection. Repeat vaccination should take place every 3 years (1 booster injection).

- A single injection gives only 75% protection after 14 days, which is inadequate. It is therefore best to administer a minimum of 2 injections, normally with an interval of 1 to 3 months between injections, or if there is insufficient time, with an interval of 14 days (protection of 90%). The vaccine has to be ordered from the manufacturer. A certain delivery time must be reckoned with. The delivery time should be allowed for when calculating the injection schedule. The vaccine also gives protection against the Siberian variant.
- At present the indication for vaccination is very limited. Vaccination can be indicated for naturalists and tourists (campers, walkers and hikers) who go in endemic zones into wilderness areas for prolonged periods. It is best to first consult a vaccination centre about the indication.

2.5.4 Treatment

- Vaccination after a possibly infected tick bite can no longer prevent infection, and is therefore useless.
- It is often possible to get local treatment with specific immunoglobulins. Their efficacy is certainly not 100% but around 60-70%. They should be administered within 96 hours after infection. Later administration of gamma-globulins is useless and can even have a negative effect on the course of the disease. Immunoglobulins are contraindicated in children under 7 years of age.

FLOWCHART FOR ADVENTURE TRAVELLERS OR TOURISTS WHO ARE TRAVELLING FOR AT LEAST SEVERAL MONTHS



2.7 Hepatitis A

This viral hepatitis was previously known as “infectious hepatitis” because of its infectious and epidemic nature. Transmission takes place via food, drinks or objects directly or indirectly contaminated with faeces (faeco-oral infection). The incubation time is 2 to 6 weeks.

In countries with low hygiene standards practically everyone gets infected during childhood, whereupon the disease usually proceeds without or with minor symptoms. In industrialised countries the infection tends to occur in middle to old age. As a result of the good hygiene conditions in Western Europe the chance of getting hepatitis A has become rather small, so that at present most travellers have no antibodies and are unprotected.

Following infection of adults (e.g. while travelling) there is a greater risk of hepatitis with severe symptoms. Hepatitis A usually remains a mild disease. However, in adults, the disease can be prolonged and become life-threatening. In most cases, the acute disease lasts several weeks and is usually followed by a fairly long period of pronounced fatigue. Hepatitis with a prolonged and fluctuating course (up to 6 months) can occur. Fulminant hepatitis has a 30% mortality and occurs in 1 case in 1,000 rising to more than 20 times this level in those over the age of 40 years.

The risk of infection with hepatitis A while travelling in a (sub)tropical area is very real (1/300 to 1/600 per month for ordinary tourist travel) and can run up to 1/50 per month in very unhygienic conditions. Before the introduction of vaccination it was a frequent reason for interrupting a trip in the tropics or for repatriation of employees working abroad.

Vaccination

The hepatitis A vaccine (Havrix®, Vaqta®) is very effective, with rapid production of protective antibodies, which within a few weeks after the first injection offer total protection in almost 100% of the cases.

The **vaccination scheme** is: 2 intramuscular injections with an interval of 6 months to 1 year between injections. This second inoculation provides protection for at least 10 years. One dose costs approximately 43 €.

Tolerance of the vaccine is excellent. It may be given to small children and to pregnant women. Half a dose is sufficient for children up to and including 15 years of age (Havrix Junior 720 units – price: 28,83 €). The vaccine may be administered simultaneously with all other vaccines, as it is a killed vaccine. (A combined hepatitis A and B vaccine: Twinrix® exists - see below.)

Infection with hepatitis A virus gives protection for life so that no vaccination is required.

People who stay for longer than 1 year in the tropics or who have reached the age of 40-50 years may well have already had hepatitis A, which often occurs without symptoms. In these cases it is advisable to first test for the presence of protective antibodies before attempting vaccination. The presence of hepatitis A IgG antibodies (but not IgM) indicates prior infection.

Vaccination offers practically 100% protection for 10 years, and perhaps for much longer. It is undoubtedly a responsible investment for all who travel in unhygienic circumstances and for those who travel regularly or for long periods (several weeks) to endemic countries, even when this is in good hygienic circumstances. The occasional traveller who travels to a tropical

country for a short time and in good hygienic conditions must decide for him/herself whether to have the vaccination or not.

It must of course be realized that the terms "occasional traveller" and "good hygienic circumstances" are very relative:

- Inquiries show that more than half of travellers travel again to a risky country within the next few years.
- Even in luxury hotels there is no guarantee of freedom from hepatitis A (1 in 300 persons per month). The World Health Organization (WHO) advises every traveller to Africa, Latin America and Asia to be vaccinated.

Note: Gamma-globulins

At present there are quite expensive specific gamma-globulins against hepatitis A. Protection by gamma-globulins occurs quite quickly after intramuscular administration. They are best administered only days before or immediately before departure.

Gamma-globulins have a proven efficacy of 85%, though this remains limited in time (3 to 6 months).

Gamma-globulins may be given together with all killed vaccines, as well as with vaccination against yellow fever, oral typhoid vaccine and oral poliomyelitis vaccine. Other live vaccines against hepatitis A must be given at least 2 weeks before the gamma-globulins, or else 6 or preferably 12 weeks later.

Side effects are rare (e.g. local pain, arthralgias, urticarial rash, fever). An anaphylactic reaction can occur after repeated injections in people with an IgA deficiency.

There is no risk of transmission of AIDS (any HIV possibly present is killed during the preparatory procedure).

Now that a safe and effective vaccine against hepatitis A is available, gamma-globulins should be regarded as an outdated form of immunoprotection.

2.8 Hepatitis B

Hepatitis B is a viral liver inflammation, transmitted via contaminated blood and blood products (blood transfusion, contaminated needles, open wounds), or via sexual contact. "Vertical" transmission from mother to child (principally in the period around birth) is also a major transmission route. In addition to this there is also "horizontal" transmission, such as in children who live in institutions or children in developing countries. Here transmission takes place via minor wounds, scratch lesions or bites. The saliva of some virus carriers contains

infectious particles. Transmission from adopted children, who are carriers, to members of the receiving family, can happen via horizontal transmission. Most cases of hepatitis B infection proceed asymptotically (estimates vary from 50 to 90%). A symptomatic infection with hepatitis B usually signifies being very ill (with absence from work for several months). The risk of a fulminant course of the hepatitis is estimated at 1/100 to 1/1000, with mortality of 1 in 3 of such cases. If an adult is infected, there is approximately a 1 in 10 risk of becoming a chronic carrier, irrespective of whether the infection is asymptomatic. About 85% of babies infected at birth become chronic carriers.

However, the most insidious aspect for these carriers is the possibility of developing chronically aggressive hepatitis, which is estimated at 3% of all infections. In most cases chronic aggressive hepatitis eventually leads to liver cirrhosis and primary liver cell carcinoma albeit after a long delay.

The vast majority of the 350 million carriers of the hepatitis B virus live in third world countries. Worldwide the hepatitis B virus is therefore a major cause of liver cirrhosis and primary liver cell carcinoma. The World Health Organization puts hepatitis B in 9th place for the principal causes of death in the world. It is estimated that hepatitis B takes 1 million human lives per year.

In Italy, a country where hepatitis B is moderately endemic, it is estimated that the number of new cases per year is 300,000, and that there are probably 9,000 deaths per year due to cirrhosis and primary liver cell carcinoma. In Belgium approximately 7 to 8% of the population have been in contact with the virus, and 7 in 1,000 inhabitants are carriers of the virus.

However, it appears from a number of well documented studies that the ordinary tourist does not run any greater risk of an infection with hepatitis B than in his/her own country, unless he/she indulges in sexual promiscuity (the risk while travelling varies from 1/2,000 to 1/10,000 per month).

Vaccine

The present hepatitis B vaccine is very effective and 100% safe. An antibody response is obtained in 90 – 95% of vaccinated adults. This is even higher in children. Babies are now systematically vaccinated.

Basic scheme:

- **scheme:** 2 injections with one month between injections, **3rd injection** after 6 months (protection soon after third injection).
- **rapid scheme:** 3 injections with 1 month between injections, repeat injection after 1 year (protected after 2-3 months). If there is an urgent necessity for rapid immunity, the first 3 injections may be administered at intervals of only 1 to 2 weeks. A **4th** injection after 1 year is necessary.

One dose costs 26,87 €. A satisfactory immunological response is obtained in the majority (>90%) of patients after 3 inoculations. Booster vaccinations can be given every 5 to 10

years, though it is not certain whether these are really necessary. The vaccine may be administered together with any other vaccine. Half dose (= Junior form; cost price 15,46 €, which is reimbursed for children up to and including 12 years of age) suffices for children up to and including 15 years of age. If vaccination against Hepatitis A and B is indicated, the cheaper combined form Twinrix® (adult price = 40,08 €; paediatric dose up to and including 15 years = 26,99 €) should be used.

Indication

There is often no indication for vaccination for the ordinary tourist, or at any rate not more urgently than for someone who stays at home. However, the risk of infection during a stay in Africa, Asia or Latin America can significantly increase when the traveller belongs to one of the so-called higher risk groups. Vaccination is strongly advised for certain risk groups (WHO recommendation):

- People who regularly travel to Asia, Latin America, Africa.
- People who go to (sub)tropical areas for long periods (from 3-6 months) are likewise eligible for vaccination, even if the hygienic standard of living is high throughout the whole stay. Employers are obliged by law to provide the necessary information on hepatitis B infection to their employees who for professional reasons have to stay repeatedly or for long periods in areas where hepatitis B is widespread (Southeast Asia and Africa), and to offer the possibility of having themselves vaccinated (Belgisch Staatsblad of 10.02.1988). Hepatitis B vaccination is definitely recommended for children who are going to live in rather primitive conditions in developing countries and have regular contact with local children. Here there is a real risk of horizontal transmission. The same applies for children of immigrants from countries with a large number of virus carriers, when they spend their holidays in their motherland.
- All medical personnel and other health workers should be vaccinated (whether they travel or not).
- Hepatitis B vaccination is now routine for babies and infants. Children in the first year of secondary education are also vaccinated. Going on a trip is an opportunity for adolescents and young adults to be vaccinated and hence to be recruited into the WHO programme for universal hepatitis B vaccination for eradication of this disease. 75% of the cost of the vaccine for children 13 to 15 years of age is reimbursed (subject to presenting a certificate to the medical advisor).
- For travellers who may have sexual contacts, or who may have to undergo medical and/or dental surgery, hepatitis B vaccination should not give a false sense of security, as the risk of other sexually transmissible diseases and AIDS remains just as real. Furthermore, transmission is also possible via contaminated syringes and needles of intravenous drug users, tattooing with non-sterile instruments, acupuncture, etc.

For all these risk groups the argument of cost should not outweigh the benefit of being vaccinated and protected. At least 3 doses should be administered before departure, so that a satisfactory immunological response is obtained. For people who are going to live and work in the tropics it is certainly worth the trouble to at least start the vaccination, even if it is not possible to go through the whole series before departure. It is known from stability studies that Engerix-B® injection ampoules can be taken in hand-luggage during a flight, and can be kept in a refrigerator upon arrival at the final destination. As the vaccine is already packed in an injection syringe with needle, safe administration is possible, even in the (sub)tropics.

2.9 JAPANESE ENCEPHALITIS

2.9.1 General

Japanese Encephalitis is a serious viral disease in Asia. It presents as an influenza-like condition that after a few days can dramatically lead to cerebral inflammation (diminished consciousness, paralyses, coma). The ratio of symptomatic to asymptomatic infections varies between 1 in 50 and to 1 in 1000 infections. The mortality rate among the symptomatic cases with signs of inflammation of the brain amounts to approximately 25 %. If a patient survives the illness, there is a 30% chance of neurological and/or psychiatric residual damage. No antiviral treatment exists.

The infection is transmitted exclusively by *Culex mosquitoes* within the *Culex* genus. The transmitting mosquitoes bite from dusk until sunrise. In areas where Japanese encephalitis is endemic only 1 to 3% of the *Culex* mosquitoes are infectious. Pigs and various bird species form the reservoir of the virus.

The disease is endemic in the **rural** areas of **southern and Southeast Asia** (from India to Japan), especially in parts of Bangladesh, Burma (Myanmar), Brunei, Cambodia, China, India, Indonesia (Java, Bali, Irian Yaja and Borneo, but not on the other islands), Hong Kong, Japan, Thailand, Vietnam, Nepal (in the Terai, the lowland areas below 765 m), the Philippines, Korea, Laos, Singapore, Sri Lanka (only on the extreme northern tip of the island), Malaysia and a small region of Pakistan. The virus recently crossed the strait of Torres between Papua New Guinea and the extreme north of Queensland (Australia).

The infection occurs seasonally in most areas, mainly from April-May to October-December. The incidence reaches its peak in the temperate climate zones around the end of the summer and the beginning of autumn; in the tropical climate zones at the beginning of the monsoon. However, in a number of areas transmission is possible throughout the entire year, particularly in the three archipelagos (Philippines, Indonesia, Malaysia), but also elsewhere, depending on local ecological factors. The disease occurs especially in the rural areas, where humans and pigs live in close proximity, and particularly in areas where there are rice paddies, as these

make ideal breeding grounds for the mosquitoes. Infections can very occasionally occur on the outskirts of the big towns. In several endemic countries the number of cases has been reduced by a good vaccination policy and vector control.

In general terms, the risk for travellers to the Far East is extremely low (less than 1 in 1,000,000 tourists who have been travelling for 1 month). Depending on the season, the destination, purpose and conditions of travel, the risk can increase to up to 1 in 5,000 per month.

2.9.2 Prevention

Vaccination

A killed vaccine (obtained from mouse brain cells) of Japanese origin is available and can be administered by the Institute of Tropical Medicine. Supplies of this vaccine are rather limited. The vaccine is as yet used very little.

Adults: the vaccination schedule consists of 3 subcutaneous injections (1 ml) administered over a period of 30 days (day 0-7-30), where the last dose is administered not later than 10 days before departure. If there is not sufficient time a shortened schedule can be used: days 0-7-14. A single dose does not give any noticeable protection. Two doses provide a better immunity, but this amounts to no more than 80 % and is of short duration (6-12 months). To obtain complete and prolonged immunity it is therefore necessary to administer all 3 injections. It is advisable to repeat the vaccination every 3 years.

A half dose should be administered to **children from 1 to 3 years old**. We have no information on the use of this vaccine in children under one year old.

Allergic side effects lasting from a few minutes up to 2 weeks after the injection can occur in rare cases, with serious consequences in a few exceptional cases (of the order of 1/10,000). As these side effects can occur anything up to 10 days after the injection, the last dose should **always** be administered more than 10 days before departure.

Vaccination is not advised for ordinary tourists nor business travellers. Some controversy exists over the correct indication for other categories of travellers. Most specialists agree that vaccination is generally only recommended for individuals travelling for at least 4 weeks through rural areas where Japanese Encephalitis is endemic. Vaccination should be discussed in every case with people who are going to live in rural areas where the disease is endemic (e.g. development workers in Vietnam, Cambodia and Laos). It is therefore best to first consult the experts concerning the indication. For example, in the last few years there have been reports of an increase in cases of Japanese Encephalitis in the Nepalese Terai and even in the Katmandu valley. Vaccination has been advised by some authorities for a stay

between August and October (1997).

Protective measures against mosquito bites, such as for malaria, are an effective alternative.