



INTERNATIONAL ASSOCIATION
FOR MEDICAL ASSISTANCE
TO TRAVELLERS

IAMAT

World Schistosomiasis Risk Chart

2010 EDITION

Canada: 1287 St. Clair Avenue West, Toronto, Ontario M6E 1B8
New Zealand: 206 Papanui Road, Christchurch 5
U.S.A.: 1623 Military Road, #279, Niagara Falls, NY 14304-1745
E-mail: info@iamat.org Website: www.iamat.org

World Schistosomiasis Risk Chart

2010 EDITION

For the description of the disease see IAMAT's publication BE AWARE OF SCHISTOSOMIASIS.










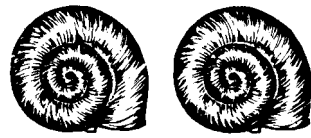





ALGERIA	S.h., d 1, I	GUADELOUPE	S.m., a 23, VII	OMAN	S.m., d 46, XIII
ANGOLA	S.h., S.m., a 2, II, V, IX	GUINEA	S.h., S.m., e 24, II, IX	PHILIPPINES	S.j., c 47, XVI
ANTIGUA and BARBUDA	S.m., g 3, VII	GUINEA-BISSAU	S.h., c 25, II	PUERTO RICO	S.m., a 48, VII
BENIN	S.h., S.m., a 4, I, II, IX	INDIA	S.h., d 26, VI	RWANDA	S.m., e 49, VI, IX, XII
BOTSWANA	S.h., S.m., c 5, II, V, IX	INDONESIA	S.j., d 27, XV	SAINT LUCIA	S.m., g 50, VII
BRAZIL	S.m., c 6, VII, X, XI	IRAN	S.h., d 28, I	SAO TOME and PRINCIPE	S.h., S.i., f 51, VI
BURKINA FASO	S.h., S.m., a 7, I, II, IX	IRAQ	S.h., e 29, I	SAUDI ARABIA	S.h., S.m., e 52, I, VI, XIII
BURUNDI	S.m., c 8, VI	JAPAN	S.j., g 30, XVII	SENEGAL	S.h., S.m., a 53, IV, VI, IX
CAMBODIA	S.me., d 9, XIX	KENYA	S.h., S.m., c 31, II, II, V, VI, IX, XII	SIERRA LEONE	S.h., S.m., e 54, II, IX
CAMEROON	S.h., S.i., S.m., a 10, I, II, III, IV, IX	LAOS	S.me., d 32, XIX	SOMALIA	S.h., c 55, VI
CENTRAL AFRICAN REPUBLIC	S.h., S.i., S.m., a, I, II, III, IX	LEBANON	S.h., g 33, I	SOUTH AFRICA	S.h., S.m., S.ma., c 56, II, V, IX
CHAD	S.h., S.m., f 11, I, III, IX	LIBERIA	S.h., S.m., c 34, II, IX	SUDAN	S.h., S.m., a 57, I, II, IX, XII
CHINA	S.j., c 12, XV	LIBYA	S.h., S.m., d 35, I, II, VIII	SURINAME	S.m., d 58, VII
CONGO (Dem. Rep.)	S.h., S.i., S.m., e 13, II, V, VI, IX	MADAGASCAR	S.h., S.m., e 36, VI, IX	SWAZILAND	S.h., S.m., a, II, V, IX
CONGO (Republic of)	S.h., S.m., a 14, I, II, VI	MALAWI	S.h., S.m., a, II, IX	SYRIA	S.h., c 59, I
COTE d'IVOIRE	S.h., S.m., a, I, II, IX	MALAYSIA	S.j., d 37, VI	TANZANIA	S.h., S.m., a 60, I, II, V, VI, IX, XII
DJIBOUTI	S.m., 15	MALI	S.h., S.m., f 38, I, XIV	THAILAND	S.me., c 61, XIX
DOMINICAN REPUBLIC	S.m., c 16, VII	MARTINIQUE	S.m., g 39, VII, X	TOGO	S.h., S.m., a, II, III, IX
EGYPT	S.h., S.m., c 17, I, VIII	MAURITANIA	S.h., f 40, IV, VI	TUNISIA	S.h., c 62, I
EQUATORIAL GUINEA	S.i., f 18, III	MAURITIUS	S.h., g 41, VI	UGANDA	S.h., S.i., S.m., a 63, II, VI, IX, XII
ERITREA	S.m., c 19, XI, XII	MONTSERRAT	S.m., g 42, VII	VENEZUELA	S.m., d 64, VII
ETHIOPIA	S.h., S.m., e 20, VI, IX, XII	MOROCCO	S.h., c 43, I	YEMEN	S.h., S.m., a 65, I, VI, VIII, IX, XIII
GABON	S.h., S.i., f 21, I, III	MOZAMBIQUE	S.h., S.m., a, II, V, IX	ZIMBABWE	S.h., S.m., a, II, IX
GAMBIA	S.h., S.m., a 22, IV, VI, IX	NAMIBIA	S.h., S.m., c 44, II, V, IX		
GHANA	S.h., S.m., a, I, II, IX	NIGER	S.h., S.m., e 45, I, XIV		
		NIGERIA	S.h., S.m., a, I, II, IV, IX		

Schistosomiasis Risk Code

S.h. = Risk of Schistosomiasis caused by *Schistosoma haematobium*
S.i. = Risk of Schistosomiasis caused by *Schistosoma intercalatum*
S.j. = Risk of Schistosomiasis caused by *Schistosoma japonicum*
S.m. = Risk of Schistosomiasis caused by *Schistosoma mansoni*
S. ma. = Risk of Schistosomiasis caused by *Schistosoma mattheei*
S. me. = Risk of Schistosomiasis caused by *Schistosoma mekongi*
a = present in the whole country, including urban areas
b = present in the whole country, excluding urban areas

c = present in the country, areas of risk are specified
d = absent from most of the country, risk exists only in restricted areas
e = present in most of the country, except the areas specified
f = present in the country. Since research data is still fragmentary, the extent of the infection cannot be determined; the whole country should be considered infected
g = infection under control; possible risk of re-infection

Roman numerals refer to the principal specific snail acting as intermediate host (illustrations actual size unless specified):

I	Bulinus truncatus		XI	Biomphalaria tenagophila	
II	Bulinus globosus (<i>Physopsis globosa</i>)		XII	Biomphalaria sudanica	
III	Bulinus forskalii		XIII	Biomphalaria arabica (No illustration available)	
IV	Bulinus senegalensis		XIV	Biomphalaria, species unknown	
V	Bulinus africanus (<i>Physopsis africana</i>)		XV	Oncomelania hupensis (x 2.4 natural size)	
VI	See text for intermediate snail host		XVI	Oncomelania quadrasi (x 2.4 natural size)	
VII	Biomphalaria glabrata (<i>Australorbis glabrata</i>)		XVII	Oncomelania nosophora (x 2.4 natural size)	
VIII	Biomphalaria alexandrina		XVIII	Ferrissia tenuis (x 6.5 natural size)	
IX	Biomphalaria pfeifferi		XIX	Tricula aperta (No illustration available)	
X	Biomphalaria straminea				

1 = ALGERIA

Public health control programs have reduced the incidence of Schistosomiasis, however two active localized infections are present in the municipality of Khemis el Khechna (El Hamiz River dam) in the province of Boumerdès, and in the oases of Djanet, Iherir, and Tamadert (Tassili-n-Ajjer National Park) in the province of Illizi.

2 = ANGOLA

Infection with both *S. haematobium* and *S. mansoni* is endemic throughout Angola. A recent outbreak has been reported in the area of Kindege (N'zeto district) in the northern province of Zaire. *S. haematobium* is predominant in the western half of the country while *S. mansoni* is more prevalent in eastern regions.

3 = ANTIGUA AND BARBUDA

Antigua has only seasonal streams; however, the intermediate host is present in human built pools, canals and reservoirs and potentially infected with *S. mansoni*. Public health authorities report no human cases from the known foci of infected areas of Sweet's, Liberta, Bendals and the areas surrounding the settlement of John Hughes.

4 = BENIN

S. haematobium is endemic throughout Benin. *S. mansoni* is present in the areas of Bénassi, Parakou (Bourgou region), Natitingou (Atakora region), Savalou (Zou region), and Cotonou on the Atlantic coast.

5 = BOTSWANA

Infection with *S. haematobium* is present along the Limpopo River valley and its tributaries. Localized infections with *S. haematobium* exist in Mabule (on the Molopo River, Southern district), Francistown (North-East district), Xhumo and Nata (Lethakane district), Pandamatenga, Kasane, and Kavimba (Chobe district), as well as Maun, and Tsao (Ngamiland).

Infection with *S. mansoni* is endemic in the northern districts of Okavango and Chobe, particularly along the Okavango River and marshlands, and in the villages along the Chobe River.

Note: The districts of Kgalegadi, Ghanzi and Central—Serowe (Kalahari Desert) are risk free.

6 = BRAZIL

Although public health control programs are ongoing and infection rates have been reduced, endemic areas with *S. mansoni* are present in rural and suburban areas of the following states - especially around the numerous human-built water bodies and irrigation systems:

Northern region: Rondônia, Pará.

Northeastern region: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe.

Central-West region: Federal District (Brasília), Goiás.

Southeastern region: Espírito Santo, Minas Gerais, Rio de Janeiro.

Southern region: Paraná (including localized risk of infection at Iguaçu Falls), Santa Catarina.

7 = BURKINA FASO

S. haematobium infection is endemic throughout Burkina Faso. *S. mansoni* infection is present in the southwestern regions of Hauts-Bassin and Sud-Ouest, and isolated infections exist in Volta Noire, as well as Centre-Ouest and Est.

8 = BURUNDI

S. mansoni is endemic along Lake Tanganyika and the plain Rusizi, including the capital Bujumbura. Infection is also present in all villages situated around Lake Cyohoha and Lake Rwiwinda. Additional snail intermediate hosts: *Biomphalaria choanomphalia* and *Biomphalaria stanleyi*.

Note: The highlands of central, eastern and southern Burundi are risk free.

9 = CAMBODIA

Known endemic areas are present in the northeastern part of Cambodia affecting the province of Stung Treng in the Stung Treng District (Mekong River areas), and in the province of Kracheh (Kratie): in towns and villages along the Mekong River. Public health treatment programs have reduced infection rates, however, the lack of improved sanitation and living conditions makes re-infection a continuous problem.

- 10 =CAMEROON
S. haematobium is highly endemic in the two northern provinces (Sahel regions) with localized infections present in all other provinces (except in Northwest province). Similarly, *S. mansoni* is highly endemic in the northern provinces with localized infections existing in all provinces.
 Localized infections with low incidence rates of *S. intercalatum* are present in the provinces of Centre and Littoral.
- 11 =CHAD
S. haematobium and *S. mansoni* are endemic throughout the southern half of Chad. In the arid north, *S. mansoni* infection is present in and around the oasis of Faya-Largeau. High prevalence of infection occurs in all highly populated areas of the south and southwestern districts.
Note: The status of Schistosomiasis infection in many areas of the east and north of the country is unknown, therefore, travellers should consider all oases, temporary, and permanent water bodies as infected.
- 12 =CHINA
 Extensive control programs have successfully eradicated *S. japonicum* from many previously endemic areas.
 Risk of infection is present in the following areas:
Central and lower Chang (Yangtze) River valley (including tributaries and adjacent lakes) - The area extends from the city of Yicheng in Hubei province to the rural areas surrounding Shanghai in the east on the mouth of the river. To the north, this endemic area extends in Jiangsu province to the areas of Lake Gaoyou, in Anhui province to the area of Lake Chao (south of Hefei).
Hubei - The area surrounding Wuhan, including all lakes and rivers are infected as far north as Xiangfan. In the south, Lake Dongting and the area of Changsha in Hunan province are affected.
Jiangxi - The infection is present around Lake Poyang, along the valleys of the Gan river and extending as far south as Fengcheng and Fuzhou.
Zhejiang - The infection is present in the northern three-quarters of the province, including the area of the bay of Hangzhou.
Fujian - Localized infection exists in the area of the coastal town of Xiapu (Sandu Bay).
Sichuan - The infection is present in a large area surrounding Chengdu (approximately 200km radius), and along the lower Yalong river valley in the areas surrounding Zhaojue, Xichang, and Hexi.
Yunnan - The risk of infection is present in the northwestern corner of the province, including the Jinsha (Yangtze) and the Lancang (Mekong) river valleys, as well as the area of Er Lake and as far south as the area of Weishan.
- 13 =CONGO, Dem. Rep.
 High rates of infection with *S. mansoni* (prevalent species) are reported from all provinces except in Bandundu and Kasai Oriental provinces. Additional snail intermediate hosts for *S. mansoni*: *Biomphalaria choanomphala*, *Biomphalaria smithi* and *Biomphalaria stanleyi*.
- 14 =CONGO, Republic of
S. haematobium and *S. mansoni* are endemic throughout the country, with *S. haematobium* being predominant. Snail intermediate host for *S. mansoni*: *Biomphalaria camerunensis*.
- 15 =DJIBOUTI
 Refugee movements and population displacements in the Horn of Africa introduced intestinal schistosomiasis to Somalia and to Djibouti.
- 16 =DOMINICAN REPUBLIC
 Risk is present throughout the country with the highest infection rates reported from the eastern interior regions in the provinces of Hato Mayor, El Seibo, and Altigracia (in the area of Higüey).
- 17 =EGYPT
 Infection with *S. haematobium* is endemic throughout southern Egypt, including the El Faiyum area. In northern Egypt, including the Suez Canal zone, *S. mansoni* infections are endemic with localized transmission occurring in southern Egypt.
 Egypt is one the most highly infected countries and although public health control programs are ongoing, and have reduced infection rates, re-infection is a continuing problem in rural areas due to lack of improvement in sanitation conditions.
- 18 =EQUATORIAL GUINEA
S. intercalatum infection is present in the area of Bata.
- 19 =ERITREA
S. mansoni is endemic in the regions (zobas) of Gash Barka, Anseba (especially the irrigation projects), Debub and Maekel. Only rare cases are reported from the Northern and Southern Red Sea regions. Public education programs are ongoing.
- 20 =ETHIOPIA
 The capital Addis Ababa and the surrounding highland area is risk free.
S. mansoni infection is widespread throughout Ethiopia, including the Awash, Blue Nile, and Omo valleys, but is not present in the Ogaden region. *S. haematobium* is present in the lower Awash valley, in some localized areas in western Ethiopia, and along the Sebele River in southern Ethiopia (Ogaden). Additional intermediate host for *S. haematobium*: *Bulinus abyssinicus*.
- 21 =GABON
 Infection with *S. haematobium* and *S. intercalatum* occurs in all populated regions of Gabon. *S. haematobium* is more prevalent in the western half of the country while *S. intercalatum* is predominant in the eastern half. No data is available from the northeastern interior.
- 22 =GAMBIA
S. haematobium is endemic along the Gambia valley. Snail intermediate host for *S. haematobium*: *Bulinus jousseaumei* and *Bulinus guernei*. *S. mansoni* is present in some villages south of Banjul along the border with Senegal.
- 23 =GUADELOUPE
 The entire island of Grande Terre is infected. All densely populated coastal areas of Basse Terre are also infected, with only the interior highland forest areas free of risk. No data is available from the islands of Marie-Galante and La Désirade.
- 24 =GUINEA
S. haematobium and *S. mansoni* are endemic throughout Guinea except for the administrative regions of Conakry, Boffa, Dubréka, Téli-mélé, and Pita (coastal and western part of the country).
- 25 =GUINEA-BISSAU
S. haematobium is highly endemic throughout the northern half of the country, particularly in the valleys of the Cacheu and Gêba rivers, and along the border with Guinea.
Note: Risk is not present along the saltwater marsh and mangrove areas of southwestern Guinea-Bissau and the outlying islands.
- 26 =INDIA
 Risk is limited to the area around Gimvi in Ratnagiri district (Maharashtra) in the hills along the Konkan coast south of Mumbai (approximately 16km from shore). Snail intermediate host: *Ferrissia tenuis*.
- 27 =INDONESIA
 Only the centre of Sulawesi is considered endemic. Risk is present in the Lindu valley and localized around Lake Lindu (villages of Anca, Langko, Tomado, and Puroo), and in the Napu valley (about 50km southeast of Lindu valley) affecting Wuasa, Maholo, Winowanga, Alitupu, and Watumaeta. Snail intermediate host is a subspecies: *Oncamelania hupensis lindoensis*.
 Public health control programs are ongoing and have reduced infections rates, however re-infection remains a continuous problem.
- 28 =IRAN
 Public health control programs are ongoing and have interrupted transmission, but continuous vigilance is needed to prevent re-infection since the host snail continues to exist in formerly infected areas.
S. haematobium is present only in the plains of the province of Khuzestan on the southwestern border with Iraq. The following areas are affected: Dasht Mishan, Khorramshahr, Khuzestan, Hamidieh, Ahwaz and the extensively irrigated areas of Dezful, Shushtar, Mian Ab, Haft Tappeh, including the area of Sardasht. The infection does not extend beyond the Zagros Mountains to the east.
- 29 =IRAQ
S. haematobium is endemic along the entire Euphrates and Tigris (as far north as Samarra) river systems, their tributaries, irrigation canals, marsh areas, including urban areas. Isolated infection exists in the northern province of Mosul in the area of Tall Kayft.
Note: The mountainous regions of the northeastern part of the country bordering Iran, namely the provinces of Irbil, Kirkuk, and Sulaymaniyah are risk free.
- 30 =JAPAN
 Schistosomiasis has been brought under control due to improved sanitation and irrigation systems, and widespread elimination of the snail intermediate host.
S. japonicum in Japan is a zoonosis (infection of animals) limited to the Kofu basin, with cattle and rodents being the major parasite vectors.
- 31 =KENYA
 Both *S. haematobium* and *S. mansoni* are endemic in Kenya, especially in irrigated agricultural zones and densely populated rural and suburban areas around Lake Victoria (Kavirondo Gulf and Nyakach Bay), the islands of Mfangano and Rusinga, Kisumu, and Kano Plain.
 Risk of infection is also present on the plains to the east, northeast, and north of Nairobi, especially in the districts of Kitui and Machakos; in the lower valley of the Tana river in the southeastern part of Kenya extending from the towns of Garissa to Galole; the Indian ocean coastal areas from Lamu to the border with Tanzania, including the areas of Mombasa; Lake Jipe and surrounding areas, including Taveta, Wundanyi, and Voi. Localized infection exists in Wajir and W. Bor in North Eastern province, and Kimilili in Western Province. The full extent of the infection is unknown.
 Additional snail intermediate hosts: *Bulinus ugandae*, *Bulinus tropicus* and *Bulinus*

- nasutus* for *S. haematobium*, and *Biomphalaria choanomphala* for *S. mansoni*.
- 32 = LAOS
Risk of infection is present on Không Island in the Mekong River in the southwest part of the country bordering Cambodia, and further north on the Mekong River in the districts of Pakxé and Bassac.
- 33 = LEBANON
The infection has been brought under control since no cases of locally human acquired schistosomiasis have been reported. However, caution should be taken when in the area of the Litani River delta near As Sarafand between Sur (Tyre) and Sayda (Sidon) since the snail host is still present.
- 34 = LIBERIA
The interior regions of Liberia are heavily infected with both *S. haematobium* and *S. mansoni*.
Note: The coastal regions of the country are risk free, specifically the counties of Grand Cape Mount, Montserrado, Grand Bassa, Sinoe, Maryland, and Grand Gedeh.
- 35 = LIBYA
The regions of Tripoli and Cyrenaica are risk free, except for two localized areas of risk near the Mediterranean coast, one at Darnah (*S. haematobium*) located halfway between Benghazi and the border with Egypt, and the other at Tawurgha (*S. mansoni*), an oasis located south of Misratah.
S. haematobium is highly endemic in the central part of Fezzan around Sabha, mainly in areas along the wadis of Buanis, Shati, Ajal, and Hufra. Risk is also present in the oases of Ghat, El Feuët, and Albirkah on the southwestern border with Algeria.
- 36 = MADAGASCAR
The infection is highly endemic in most areas of Madagascar except for the most northern tip of the country (canton of Antsiranana) and the following cantons of the northeastern coast: Maroantsetra, Mananara, Soanierana-Ivongo, Andilamena, Ambatondrazaka, and Manjakandriana. The cantons of Anjozorobe, Amdramasina, Abatolampy, Betafo, and Antsirabe in the interior of the country are also risk free.
S. haematobium is prevalent in the northern and western parts of Madagascar while *S. mansoni* is predominant in the eastern and southern parts. Madagascar has a high incidence of internal migration which facilitates the spreading of Schistosomiasis. Travellers should consider the entire country as infected. Additional snail intermediate host for *S. haematobium*: *Bulinus obtusispira*.
- 37 = MALAYSIA
Known areas of risk are present in the region of Fort Betau (Pahang state) along the Kapar River (tributary to the Pahang) in central Malaysia, east of Kuala Lumpur, and in two camps of the Orang Asli Indigenous group: Pos Iskandar and Bukit Lanjan (east of Kuala Lumpur). Snail intermediate host: *Robertsiaella kaporensis*.
- 38 = MALI
The entire southern half of Mali (south of Lake Faguibine) is endemic with both *S. haematobium* and *S. mansoni*, especially in the highly populated areas of the Niger and Senegal river basins and their tributaries. High incidence rates of infection have been reported from the urban areas of Bamako, Ségou, and Mopti regions. No information is available from the Gao area and the northern desert regions. Travellers should consider the entire country as infected.
- 39 = MARTINIQUE
Public health control measures have brought the infection under control, however continuous vigilance is needed to avoid re-infection as the snail hosts are still present.
- 40 = MAURITANIA
Risk of infection with *S. haematobium* exists in all regions, including the capital Nouakchott, except in Dakhlet Nouadhibou. The highest infection rates are reported from populated areas along the Sénégal River, the Karakoro River valley including the settlements along their tributaries and diversion canals, and from the Adrar mountain region in the centre of the country. The nomadic life of Mauritanian herdspeople facilitates the spread of the infection. Travellers should consider all oases and settlements as infected. Additional snail intermediate host: *Bulinus truncatus rohlfsi*.
- 41 = MAURITIUS
Public health control programs have brought the infection under control, however continuous vigilance is needed to avoid re-infection as the snail host is still present in the formerly endemic districts of Pamplémousses, Port Louis, and Grand Port.
Snail intermediate host for *S. haematobium*: *Bulinus cernicus*.
- 42 = MONTSERRAT
Public health control programs have brought the infection under control, however continuous vigilance is needed to avoid re-infection since the snail host is still present in the formerly endemic areas of Trants, Farms, Bethel, Bramble, and Tuitts.
- 43 = MOROCCO
Public health control programs are ongoing and have reduced infection rates, however risk is still present in the following areas:
In the north, infection is present in the province of Tétouan affecting the areas of Dar Chaoui, Souk Tnine de Sidi el Yamani, Larache, Tleta Rissana, El Rhedira, and Souk Tolba; in the province of Kenitra, the areas of Arbaoua, Lalla, Mimouna, Karia Ouda, Moulay Boussehham, and Gnafta are infected; in the province of Nador, the areas of Nador town, Segangane, Mont Arouia, Zaïo, Hassi Berkane, and Ras el Ma are infected; and in the Province of Oujda, the areas of Aklim, El Aioun, Jerad, and Ain Benimathar are infected.
S. haematobium is endemic throughout the southern half of Morocco, with high incidence rates of infection especially in the irrigated agricultural areas of Beni-Mellal, El Kelaa des Srarhna, Marrakech, Agadir, Taroudant, Tiznit, the Anti Atlas and Haut Atlas regions of Ouarzazate and Er Rachidia. Travellers should consider all oases, settlements and temporary water bodies in southern Morocco as infected.
- 44 = NAMIBIA
Risk of infection is present only in the north of the country along the border with Angola, Zambia, and Botswana (Kavango and Caprivi Strip), affecting the villages along the Okavango, Chobe, and Zambezi rivers.
- 45 = NIGER
High rates of infection with *S. haematobium* have been reported from all populated areas in the southern part of the country, especially from the Niger River basin and surrounding areas including the capital Niamey, and from the departments of Niamey, Dosso, Tahoua, Maradi, Zinder and Diffa.
Localized infection with *S. mansoni* is present in the region of Gaya in the southeast corner of Dosso on the border with Benin.
- Infection has not been reported from the northern desert area of Agadez.
- 46 = OMAN
Risk of infection exists in the region of the Dhorfar affecting the areas of Salalah, Arzatz, Mirbat and Taqah.
- 47 = PHILIPPINES
Risk of infection is present in the following regions:
Luzon - In the areas of Sorsogon in the Irosin-Juban valley on the southern tip of the island.
Mindoro - In the area surrounding Lake Naujan, including the villages of Pola, Victoria, and Naujan.
Samar - Along the entire western coastal area from Allen to Basey, and along the northern coast from Lavezares to Palapag, extending south to Las Navas.
Leyte - The entire island is infected except the southern quarter (the area south of Julita and Mac Arthur).
Bohol - In the northern coastal areas of Talibon and Trinidad.
Mindanao - In all villages along the Bay of Panquil from Dipolog to Lala (provinces of Misamis Occidental and Lanao del Norte); in all villages in the Agusan River valley from Butuan to Compostela; in the northern coastal peninsular area from Butuan to Tago including the area around Lake Mainit; in the area around Davao and the Penal Colony on the Bay of Davao. Additional localized infections are present in Malaybalay, Maramag (province of Misamis Oriental), and Pitik (province of Cotabato).
- 48 = PUERTO RICO
Low rates of infection have been reported from all parts of the island. Risk of infection is also present on the islands of Vieques and Culebra, both located off the eastern coast of Puerto Rico.
- 49 = RWANDA
The eastern highland areas, including lakes Bugesera, Mugesera, Muhazi, Kagera, and the valleys of Akagera and Kagitumba are risk free.
Note: Risk of S. mansoni is present in the western half of the country, including the Kigali area, Lake Kivu, Lake Ruhondo, Lake Bulera, and Lake Cyohoha areas.
Additional snail intermediate hosts: *Biomphalaria choanomphala*, *Biomphalaria stanleyi*, and *Biomphalaria smithi*.
- 50 = SAINT LUCIA
Projects for total eradication of Schistosomiasis are in progress and risk of infection is low. However, travellers should still consider all fresh water bodies infected.
- 51 = SAO TOME and PRINCIPE
Infection with *S. haematobium* was introduced on the island of São Tomé by workers from the African continent during the construction of major irrigation projects. The infection seems to be localized around the capital São Tomé, but the extent of the infection has not been determined. The snail intermediate host has not been identified.
- 52 = SAUDI ARABIA
S. haematobium and *S. mansoni* (predominant) are highly endemic throughout Saudi Arabia except in the Al Ahsa' Plain on the Persian Gulf, the An Nafud desert (north) and the southern region of Ar Rub'al Kahli. Travellers should consider all oases, watering holes, irrigation canals and open wells infected. Additional intermediate hosts for *S. haematobium*: *Bulinus beccarii* and *Bulinus reticulatus wrighti*.

53 =SENEGAL

S. haematobium is endemic along the entire S n gal River valley including the area of Lake Guiers, in the western regions of Cap Vert (including Dakar), Thi s, Dioubel and Sine Saloum, and in the two southern provinces of S n gal Oriental and Casamance. Additional snail intermediate hosts for *S. haematobium*: *Bulinus jousseaumei* and *Bulinus guernei*.

S. mansoni is endemic in areas along the border with Guinea in (S n gal Oriental province), in two localized areas at Kolda and Bignona (Casamance province); and in two localized areas in the north at Fatick (Sine Saloum) and at Fand ne-St. Marcel (Thi s).

54 =SIERRA LEONE

An approximate 100km deep coastal strip is free of infection.

Note: Both *S. haematobium* and *S. mansoni* are highly endemic in the interior of Sierra Leone.

55 =SOMALIA

S. haematobium is highly endemic in the southern provinces of Hiran, Benadir, Lower Jubba, and Upper Jubba, especially in the irrigated agricultural areas of the Shabeelle and Jubba river valleys. Snail intermediate host: *Bulinus abyssinicus*.

Note: The northern provinces of North West, North East, Migiurtinia and Mudugh are free of infection.

56 =SOUTH AFRICA

S. haematobium (predominant) and *S. mansoni* are highly endemic in the northeastern part of South Africa, particularly in Northern Transvaal (including Bophuthatswana, Venda, and Kruger National Park) extending from the Limpopo River basin and its tributaries south to the northern part of the Witwatersrand mountains.

In Southern Transvaal, the infection is present in the northwest: Marico, Swartruggens, and Rustenburg districts with localized infections in the southwest at Koster, Wolmaransstad and Bloemhof on the

Vaal River; and in the Piet-Retief district in the eastern part of the state (on the border with Swaziland).

High rates of infection are present in Kwa Zulu and the entire plain and coastal areas of Natal (limited to the west by the Drakensberg mountains). This endemic area extends south into Transkei to the area of Port St. Johns.

Localized areas of infection are present in Ciskei in the area of East London, and in Eastern Cape in the area of Uttenhage, north of Port Elizabeth. Localized infections also exist in the lower Orange River in northern Cape Province along the border with Namibia.

Note: *S. matthei* is mainly an infection of animals and rarely transmitted to humans.

57 =SUDAN

S. haematobium and *S. mansoni* are endemic throughout all populated areas of Sudan except for the province of Red Sea (al-Bahr al-Ahmar). *S. haematobium* is predominant in the north and west, while *S. mansoni* is prevalent in the east and south of the country.

58 =SURINAME

Risk of infection is present in the central part of the coastal region in the cultivated swamp and shell sand bar areas surrounding Paramaribo. This endemic region extends from the delta area of the Commewijne River to the marsh areas north of Wageningen (Nickerie district).

59 =SYRIA

Risk of infection with *S. haematobium* is present in the northeastern part of Syria along the Belikh and lower Euphrates river basins. In the Ar Raqqah sector, the infection extends from Tall al Abyad along Wadi Belikh and from the Euphrates River to Khamisia, continuing in the Dayr az Zawr sector along the Euphrates River to Abu Kamal on the border with Iraq. In the Al Hasakah sector, the infection is limited to a localized area around Khatunyah (close to the Iraq border).

60 =TANZANIA

Additional snail intermediate hosts: *Bulinus nasutus* for *S. haematobium*, and *Biomphalaria choanomphala* for *S. mansoni*.

61 =THAILAND

Infection with *S. mekongi* is limited to two areas: The first is present in the region of Chongmek (near the confluence of the Mae Nam Mun and the Mekong rivers) in Ubon province on the border with Laos; the second is present in the southern province of Nakhon Si Thammarat in towns located in the cantons of Chawang, Chang Klang, and Toong Song.

62 =TUNISIA

Extensive control measures have reduced the once extensive endemic area. Low risk infection areas are located in the the Governorate of Gab s (El Hamma, Zarat, and Matmata) and the Governate of Gafsa (Ouled Tlijane, and Ouled Majed).

63 =UGANDA

Additional intermediate snail hosts: *Bulinus nasutus* for *S. haematobium* and *Biomphalaria choanomphala* for *S. mansoni*.

64 =VENEZUELA

Risk of infection is limited to the highly populated agricultural areas surrounding Lake Valencia (states of Carabobo and Aragua), extending from Valencia in the west to La Victoria in the east, and southwards to Manuare, Belen, and San Juan de los Morros (Gu rico state). Localized infections are present in the following areas: Federal District in Caraballeda and Rosalia; State of Miranda in C a on R o Tuy and Guatire on R o Caucagua; and in the centre of the state of Aragua in Boca del Negro.

65 =YEMEN

All populated areas of Yemen are highly endemic with both *S. haematobium* and *S. mansoni*. Travellers should consider all oases, open wells and temporary water bodies in the desert areas infected. Additional snail intermediate hosts for *S. haematobium*: *Bulinus beccari* and *Bulinus wrighti*.

