Donor Screening GEO Guide

Blood Donor Screening Essentials Edition
Introduction

This Donor Screening GEO Guide has been designed to specifically support the assessment of transfusion-transmissible disease risk in potential blood donors. These materials have been developed and are updated in accordance with current applicable FDA regulations and guidance for blood establishments. The following section provides an overview of the donor screening process and the role of geographic donor screening in helping to ensure the safety of the blood supply.

Overview of Donor Screening

Blood, tissue, and organ donation can save lives. Donor screening plays a key role in reducing the risk of a potentially lifesaving transfusion or transplant transmitting a harmful or deadly disease to a vulnerable patient. Donor screening involves the meticulous and systematic evaluation of the vital source of each transfusion or transplant: the donor. The term “donor screening” encompasses the pre-donation assessment of potential donors as well as blood testing of donors for several infectious diseases.

Donor Screening in the United States

Donor Screening practices in the United States are primarily based on regulations and recommendations from the Food and Drug Administration (FDA), but are also influenced by:

- Standards established by industry-specific accreditation groups such as the AABB (Advancing Transfusion and Cellular Therapies Worldwide), AATB (American Association of Tissue Banks), FACT (Foundation for the Accreditation of Cellular Therapy) and AOPO (Association of Organ Procurement Organizations)
- Donor screening policies recommended by or instituted by other programs or industry groups, such as the ASBP (Armed Services Blood Program), ABC (America’s Blood Centers), ISCT (International Society for Cellular Therapy), OPTN (Organ Procurement and Transplant Network)

Donor screening requirements and recommendations vary depending on the substance to be donated for transfusion or transplant (i.e., blood, tissue, or organ type). Individual programs may follow more stringent donor screening practices than those required or recommended.

Donor Blood Testing

Donor blood testing contributes greatly to transfusion and transplant safety, but testing alone cannot ensure the highest degree of safety. This is because there are limitations in donor testing technology, including the following:

- Blood tests have not yet been developed for certain blood-borne diseases. This is the case with Variant Creutzfeldt Jakob Disease (vCJD).
- Blood tests may exist, but may not have FDA licensure for donor screening. This is the case with Malaria and Leishmaniasis infections as well as emerging viruses.

**NOTE:** The FDA sometimes allows blood banks to use certain blood tests prior to licensure under an investigational new drug application (IND).

- There is a period of time, usually immediately after a person is infected, when the blood test cannot detect the infectious agent. This is known as the “window period”. Window periods for different tests vary from a few days to several months.
- Donor blood testing cannot detect all known and emerging blood borne diseases. In the United States blood donors are routinely tested for the following diseases/agents:
  - Syphilis
  - Hepatitis B virus
  - Hepatitis C virus
• Human T-Lymphotropic virus
• Human Immunodeficiency virus
• West Nile Virus
• Trypanosoma cruzi
• Zika Virus

For all of these reasons, the assessment of potential donors plays a crucial role in ensuring the safety of donated blood, tissue, and organs by identifying a broad range of infectious disease risk factors and deferring high-risk individuals from the collection process.

**Donor Assessment**

In addition to identifying donors at risk for blood-borne infectious diseases, the pre-donation assessment also evaluates the donor’s health and suitability for the donation and determines if the donor has taken certain medications that could cause harm to vulnerable patient recipients.

Donor screening recommendations for infectious diseases take several factors into account:

- The risk of transmission by transfusion or transplantation
- The severity of potential effects of transmission on vulnerable patient recipients
- The availability and limitations of donor blood testing

Identifying donors at risk of blood-borne infectious diseases is based on the donor’s responses to questions regarding:

- Medical history
- Physical symptoms
- Specific risk history (needle-stick, tattoo/piercing, high-risk sexual contact, incarceration, etc.)
- Travel & residency history (geographic screening)

**Donor Geographic (GEO) Screening**

Some transfusion and transplant transmissible diseases are associated with certain locations or areas. The careful evaluation of each potential donor’s travel and residence history seeks to identify potentially infectious asymptomatic donors that may not (or cannot) be identified with donor blood testing. Because some infectious diseases can be acquired and then transmitted through sexual contact, the foreign travel, residence, or country of origin of a potential donor’s sexual contacts may also be considered in the donor assessment.

Geographic risk areas for donor screening are usually referenced in the FDA guidance document for the specific disease. The risk areas may be listed directly in the guidance document or the guidance may point to a secondary source for up to date information. The FDA commonly refers to the Centers for Disease Control and Prevention (CDC) for current risk area information.

Donor GEO screening is a challenging process and typically accounts for the majority of donor screening errors and post-donation information reports. This is because donor GEO screening is a complex process that relies on:

- Potential donors’ complete and accurate reporting of where they have lived and traveled during various time frames (for different disease risk factors).
- Screeners’ clear understanding of disease risk areas, time frames, and deferral criteria.

This guide seeks to provide clear, concise, and current information on disease risk areas for donor GEO screening, but there are some quirks of geography that are important to bear in mind. In particular, the following three aspects of geography make GEO screening especially challenging:

- Political change
- Duplicate naming
- Spelling variations
**Political Change:**

Political change is happening all the time around the world in large and small ways. On the grand scale, country boundaries and names change over time as the result of wars, claims, and political movements. Within individual countries, the names and boundaries of internal divisions and the names of towns and cities also change over time. In compiling this guide, we seek to provide the most current geographic references as possible, but we also include references to alternate or former names of key countries, since donors may refer to a risk country by its previous or alternate name.

**Duplicate Naming:**

Geographic location names are often not unique. A familiar example of this is the town name of “Springfield”, which is shared by locations in 30 U.S. states and 9 different countries. The most commonly used location names tend to be of Spanish origin. Wikipedia has compiled a helpful list of the most popular place names. The list can be found at https://en.wikipedia.org/wiki/List_of_popular_place_names. It is important to be aware of this issue and it may be helpful to confirm locations reported by the donor with additional information such as regional details or tourist attractions.

**Spelling Variations:**

Differences in how locations are spelled are very common. Foreign location names often have more than one spelling that are technically “correct”. This is the result of the different alphabets and symbols that different languages use to convey words and names. Romanization is the process of approximating words and names from languages that use different symbols or alphabets with our own alphabet. The English language uses the Roman alphabet, hence the term Romanization.

Several systems have been developed to Romanize words from different languages. Some systems seek to preserve the meaning of the original word, whereas other systems try to represent the word phonetically, approximating the pronunciation of the original word. This is how we can end up with more than one “correct” spelling for the same place.

Spelling variations related to Romanization are particularly apparent on the Asian continent, where Arabic, Cyrillic, Greek, Chinese, Japanese, and Korean writing systems exist (just to name a few). It is helpful to bear in mind that the sound of a location name is more important than the exact spelling, particularly when dealing with locations in Asia. Performing a Google search or location lookup on the Geonames.com website can often resolve spelling discrepancies, although in some donor screening environments this is not available.

**Conclusion**

Donor GEO screening is a complex process that plays a key role in ensuring the safety of the blood supply as well as other human-sourced biological products. The purpose of this guide is to convey geographic disease risk information based on blood industry recommendations in a readily usable format for donor screening. This guide is offered as a reference tool and should always be used according to your program’s Standard Operating Procedures.
Malaria Section Contents

Malaria Screening Facts

Document Change History: Malaria

Reference Lists

- Malaria-Endemic Countries (for screening residents)
- Countries with Malaria-Endemic Areas (for screening travelers)
- Ports of Call of the Caribbean, Mexico, Central America, & South America
- List of Non-Malaria Endemic Countries, Dependencies, and Areas of Special Sovereignty

Reference Maps

A
- Afghanistan
- Afghanistan: Kabul Region (detail)

B
- Bangladesh
- Bolivia
- Botswana
- Brazil
- Burma (Myanmar)

C
- Cambodia (Kampuchea)
- Caribbean Islands Reference & Map
- Colombia
- Colombia Highlands (detail)
- Costa Rica

D
- Dominican Republic

E
- East Timor (see Timor-Leste)
- Ecuador
- Eritrea
- Eswatini (formerly Swaziland)
- Ethiopia

F
- French Guiana

G
- Guatemala
- Guatemala City (detail)
- Guatemala: Lake Atitlan (detail)
- Guyana

H
- Honduras

I
- India
- Indonesia
- Indonesia: Bali (detail)
- Indonesia: Jakarta and the Thousand Islands (detail)
- Indonesia: Java (detail)
- Indonesia: Nusa Tenggara Region (detail)
- Iran

CAUTION: DO NOT SCREEN DONORS USING THE LOCATIONS LISTED ON THIS PAGE

MSC.009S 12/16/2019
K
  Kampuchea (see Cambodia)
  Kenya
  Korea (see North Korea and South Korea)
L
  Laos
M
  Madagascar
  Malaysia
  Malaysia: Kuala Lumpur Urban Area (detail)
  Malaysia: Penang State (detail)
  Mauritania
  Mexico: Overview
  Mexico Location Index (4 pages)
  Mexico: Chiapas (detail)
  Mexico: Chihuahua (detail)
  Myanmar (see Burma)
N
  Namibia
  Nepal
  Nicaragua
  North Korea
P
  Pakistan
  Panama
  Papua New Guinea
  Peru
  Philippines: Overview
  Philippines: Mindanao Region (detail)
  Philippines: Palawan Region (detail)
S
  Saudi Arabia
  South Africa
  South Korea
  South Korea: Incheon, Kangwon-do, & Kyonggi-do Provinces (detail)
  Suriname
  Swaziland (see Eswatini)
T
  Tanzania
  Thailand
  Thailand: Southern Region (detail)
  Timor-Leste (East Timor)
V
  Venezuela
  Vietnam
  Vietnam: Mekong Delta (detail)
  Vietnam: Red River Delta (detail)
Y
  Yemen

CAUTION: DO NOT SCREEN DONORS USING THE LOCATIONS LISTED ON THIS PAGE

MSC.009S

12/16/2019
Malaria Screening Facts

Malaria is a blood-borne infectious disease most commonly spread by mosquito bites. The disease is caused by single-celled parasites of the genus Plasmodium. Because no malaria blood test is currently available for donor screening, donor assessment is the only donor screening safeguard against transfusion or transplant-transmitted malaria.

INFECTIONOUS AGENT: Plasmodium (parasite)

DISEASE VECTOR: Anopheles mosquitoes

MODES OF TRANSMISSION:
- Most cases are spread by mosquito bites
- Can be transmitted by blood transfusion
- Can be transmitted by shared use of needles or syringes
- Can be transmitted by certain cellular, tissue, and organ transplants
- Can transmitted from mother to fetus during pregnancy
- Malaria is not sexually transmitted

INCUBATION PERIOD: Symptoms usually appear from 7 days to 3 months after exposure; occasionally this period can be up to 12 months or longer.

ASYMPTOMATIC PERIODS: Very common, both in patients with recurrent or resolved infections as well as individuals with acquired immunity.

GEOGRAPHIC DISTRIBUTION FACTORS: Tropical, subtropical, and some temperate areas. Affected by climate and conditions that favor the survival and reproduction of Anopheles mosquitoes (particularly temperature, humidity, and rainfall) and Plasmodium reproduction in infected mosquitoes (primarily temperature).

In some countries, malaria transmission does not occur in high elevation areas. This is because higher elevations are associated with lower temperatures (the Plasmodium parasites cannot reproduce inside infected mosquitoes below certain temperatures). The cutoff elevation for malaria transmission varies from country to country, based on local conditions, climate and Plasmodium species endemic to the area.

TEMPORAL FACTORS: In some areas, malaria transmission is seasonal (limited to warmer months with temperatures conducive with Anopheles mosquito survival and reproduction.

DETECTION BY BLOOD TESTS: Blood tests do exist to diagnose malaria in patients, but FDA regulations do not allow these tests to be used for screening blood donors at the current time.

WINDOW PERIOD: Unknown – no donor test currently available.

BASIS FOR DONOR SCREENING – RATIONALE & REGULATORY GUIDANCE:
Minimizing the risk of transfusion and transplant transmission of malaria is currently based solely on the donor interview process. Donors are screened for three primary risk factors:
1. A medical history of malaria
2. Prior residence in a malaria-endemic country
3. Travel to a malaria-endemic area
Malaria Screening Facts

The FDA has published recommendations to address the threat of malaria to the blood supply for blood establishments in the following guidance document: Revised Recommendations to Reduce the Risk of Transfusion-Transmitted Malaria: Guidance for Industry (4/2020).

The FDA recommends that blood establishments refer to the current version of the CDC Health Information for International Travel (commonly known as The Yellow Book), available on the CDC website. The Yellow Fever Vaccine & Malaria Prophylaxis Information, by Country table can be found at: https://wwwnc.cdc.gov/travel/yellowbook/2020/preparing-international-travelers/yellow-fever-vaccine-and-malaria-prophylaxis-information-by-country

METHODS FOR DONOR SCREENING:
The donor history questionnaire and interview process should identify and assess potential donors for the following risk factors:

- History of malaria in the past 3 years
- Prior residence in a malaria-endemic country – see the following definitions from FDA guidance:
  - Malaria-endemic country - "Any country having an area or areas with malaria where CDC recommends anti-malarial chemoprophylaxis in travelers in The Yellow Book at the time the donor is screened...."
  - Residence in a malaria-endemic country - "... a continuous stay of longer than 5 years in a country or countries having any malaria-endemic area (see definition above). In determining residence, consideration is by malaria-endemic country and not by malaria-endemic area since the geographic distribution of malaria-endemic areas may change during the period of residence, or the resident may have traveled from a non-endemic area to an endemic area in the country during his or her stay."
- Travel to a malaria-endemic area – see the following definitions from FDA guidance:
  - Malaria-endemic area - "Any areas with malaria where CDC recommends anti-malarial chemoprophylaxis in travelers in the most current version of the CDC Health Information for International Travel (commonly known as The Yellow Book) at the time the donor is screened...."
  - Travel to a malaria-endemic area - "Any travel to or through a malaria-endemic area or areas, as identified by CDC (see definition above). The duration of travel to a malaria-endemic area is defined as more than 24 hours to less than 5 years."

IMPORTANT: Potential blood donors have never resided in a malaria-endemic country are evaluated for travel to malaria-endemic areas within the past 3 months, but prior residents of malaria-endemic countries must first establish 3 continuous years of residence in a non-malaria country (with no travel to malaria-risk areas).

More Malaria Facts:

- Five Plasmodium species are known to cause malaria in humans, Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, Plasmodium malariae, and Plasmodium knowlesi.
- Plasmodium falciparum (P. falciparum) is known to cause severe malaria and is responsible for the greatest number of malaria deaths worldwide.
- Malaria is primarily spread by mosquitoes, but only by females of certain species of the Anopheles genus.
- Anopheles mosquitoes do not directly cause malaria, but they spread the disease from person to person and are therefore termed "vectors".
- Thirty to forty species of Anopheles mosquitoes are known to spread malaria.
Malaria Screening Facts

- The risk of getting infected with malaria is greatest in areas where mosquitoes are active in spreading the disease from person to person. This is known as "local transmission" or "vector-borne transmission".

- Some people that have been infected with malaria may not have symptoms or realize that they are infected, but their blood can still contain Plasmodium parasites and can therefore infect others.

- People that live in areas where malaria is common may develop immunity to malaria from repeated exposure to Plasmodium parasites over the course of time, but their blood can still infect others for several years after their last exposure.

REFERENCES:


"Malaria Parasite, Mosquito, and Human Host", National Institute of Allergy and Infectious Diseases webpage, reviewed March 4, 2016, https://www.niaid.nih.gov/diseases-conditions/malaria-parasite

"Disease Information: Malaria" World Health Organization, International Travel and Health webpage http://www.who.int/ith/diseases/malaria/en/


Vietnam:

**Description:** VTN.007.D (7/6/2018): Description of malaria-endemic areas edited for greater clarity.

VTN.008.D (8/10/2015): Updated description of malaria-endemic areas for consistency in terminology. No changes to malaria-endemic areas. Retired 7/6/2018

**Screening map:** VTN.007.S (7/6/2018): Upgraded map detail; Vung Tau revised to non-malaria endemic due to population increase (now classified as urban); added malaria-endemic location of Ha Tinh; added non-malaria-endemic locations of Bac Loc, La Gi, Phan Thiet, Pleiku, Song Cau, Tam Ky, & Sa Pa; deleted locations of Bien Hoa, Cam Pha, Dong Xoai, Thai Nguyen, & Thanh Hoa; location name Phan Rang revised to Phan Rang-Thap Cham and Buon Me Thuot revised to Buon Ma Thuot.

VTN.006.S (8/10/2015): Identified the Gulf of Tonkin, deleted the locations of Vinh Yen, Nam Dinh, Ninh Binh, My Tho, Vinh Long, Soc Trang, Can Tho, Long Xuyen, Rach Gia, and Ca Mau; revised color coding of the Red River and Mekong Deltas to grey, delineated the boundaries of the detail maps, and added instructions to refer to the detail maps. Retired 7/6/2018


VTN.002.O (8/10/2015): Revised to reflect the names and boundaries of regions as designated by the Vietnamese government. Retired 7/6/2018

Vietnam: Mekong Delta:

**Description:** VMD.002.D (7/6/2018): Description of malaria-endemic areas edited for greater clarity.

VMD.001.D (8/10/2015): Malaria-endemic areas described as "Rural areas only. The Mekong Delta is not malaria-endemic as well as Ho Chi Minh City (Saigon)" according to the 2016 Yellow Book. Retired 7/6/2018

**Screening map:** VMD.002.S (7/6/2018): Upgraded map detail; Vung Tau revised to non-malaria endemic due to population increase (now classified as urban); added malaria-endemic locations of Ba Ria, Can Gio, & Phu Khuong; added non-malaria-endemic locations of Ap Tan Ngai, Can Giuoc, Con Son, Cu Chi, Sa Dec, & Thu Duc Mot as well as the islands Hon Khoai Island, Hon Son Island, and the Nam Du Islands; deleted the locations of Binh Minh, Go Cong, Hong Ngu, Kien Tuong, Long Dien, & Vinh Chau; revised name of Cho Dok (from Chau Doc); added alternate name for Don Luan (Dong Xoai); added the locations of the Tan Son Nhat International Airport, Can Tho International Airport, and Phu Quoc International Airport.

VMD.001.S (8/10/2015): New map identifying the Mekong Delta, including Phu Quoc Island, Con Son Island, the Con Dao Islands, and urban locations of Bien Hoa and Ho Chi Minh as non-malaria-endemic. Retired 7/6/2018

**Overlay map** (Enhanced Reference Editions Only): No overlay map

Vietnam: Red River Delta:

**Description:** VRD.002.D (7/6/2018): Description of malaria-endemic areas edited for greater clarity.

VRD.001.D (8/10/2015): Malaria-endemic areas described as "Rural areas only. The Red River Delta is not malaria-endemic as well as the cities of Haiphong and Hanoi" according to the 2016 Yellow Book. Retired 7/6/2018

**Screening map:** VRD.002.S (7/6/2018): Upgraded map detail; Ha Long revised to non-malaria endemic due to population increase (now classified as urban); corrected location of Bac Ninh and revised to non-malaria-endemic due to confirmed location within Red River Delta region; added malaria-endemic location of Bac Giang; added non-malaria-endemic locations of Cat Ba, Cung Kiem, Ha Dong, Sa Pa, & Uong Bi; deleted locations of Nghia Lo, Phu Tho, Phuc Yen, Tam Diep, Tu Son, & Tuan Chau Island; added location of the Noi Bai International Airport.

VRD.001.S (8/10/2015): New map identifying the Red River Delta, including Cat Ba Island, and urban locations of Yen Bai, Thai Nguyen, Viet Tri, Hoa Binh, Cam Pha, Thanh Hoa, and Mong Cai as non-malaria-endemic. Retired 7/6/2018

**Overlay map** (Enhanced Reference Editions Only): No overlay map

Yemen:

**Description:** YMN.002.D (8/18/2017): Updated to "malaria-endemic" terminology and added description of non-malaria-endemic areas.

YMN.001.D (5/31/2008) Retired 8/18/2017

**Screening map:** YMN.002.S (8/18/2017): Upgraded the quality and accuracy of malaria-endemic areas mapped by elevation; added the locations of Al Bayda’ and Kawkaban as non-malaria-endemic; added the locations of Ash Shihr, ‘Alaq, Hadibo, Hejjar, Ibb, Lahij, Ma‘rib, Rumah, Zabid, and the Hanish Islands as malaria-endemic; deleted the locations of Ad Dali, Al Luhayyah, Az Zaydiyah, Sanaw, and Shabwah; revised the location names of Al Mukha to Mocha; Amran to ‘Amran, Rida’ to Rada’; and Saywun to Selayun.

YMN.001.S (5/31/2008) Retired 8/18/2017

**Overlay map** (Enhanced Reference Editions Only): No overlay map
FOR DONOR RESIDENT SCREENING (MORE THAN 5 YEARS DURATION)

Malaria-Endemic Countries

When screening donors that have spent more than 5 continuous years in one or more countries with malaria-endemic areas, treat all countries with malaria-endemic areas as malaria-endemic in their entirety.

Do not use the individual country maps to screen donors that have resided for more than 5 years in countries with malaria.

<p>| A | Afghanistan | Angola |
| B | Bangladesh | Benin (Dahomey) | Bolivia | Botswana | Brazil | Burkina Faso (Upper Volta) | Burma (Myanmar) | Burundi |
| C | Cambodia (Kampuchea) | Cameroon | Central African Republic | Chad | Colombia | Comoros | Congo-Brazzaville | Congo-Kinshasa | Costa Rica | Cote d’Ivoire (Ivory Coast) |
| D | Dahomey (Benin) | Democratic Rep. of Congo | Djibouti | Dominican Republic |
| E | East Timor (Timor-Leste) | Ecuador | Equatorial Guinea | Eritrea | Eswatini (Swaziland) | Ethiopia |
| F | French Guiana | Gabon | Gambia |
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| H | Haiti | Honduras |
| I | India | Indonesia | Iran | Ivory Coast (Cote d’Ivoire) |
| K | Kampuchea (Cambodia) | Kenya | Korea (North &amp; South) |
| L | Laos | Liberia |
| M | Madagascar | Malawi | Malaysia | Mali | Mauritania | Mexico | Mozambique | Myanmar (Burma) |
| N | Namibia | Nepal | New Hebrides (Vanuatu) | Nicaragua | Niger | Nigeria | North Korea |
| P (contd) | Pakistan |
| P | Panama | Papua New Guinea | Peru | Philippines |
| R | Republic of Congo | Rhodesia (Zimbabwe) | Rwanda |
| S | Sao Tome &amp; Principe | Saudi Arabia | Senegal | Sierra Leone | Solomon Islands | Somalia | South Africa | South Korea | South Sudan | Sudan | Suriname | Swaziland (Eswatini) |
| T | Tanzania | Thailand | Timor-Leste (East Timor) | Togo |
| U | Uganda | Upper Volta (Burkina Faso) |
| V | Vanuatu (New Hebrides) | Venezuela | Vietnam |
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| Z | Zaire (D.R. Congo) | Zambia | Zimbabwe (Rhodesia) |</p>
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**FOR DONOR TRAVEL SCREENING**

(MORE THAN 24 HOURS THROUGH 5 YEARS DURATION)

**Countries With Malaria-Endemic Areas**

RED: entire country is malaria-endemic
BLACK: malaria-endemic areas in country - refer to map

MRA.013

12/16/2019
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Ports of Call of the Caribbean, Mexico, Central America, & South America

Ports listed in BLACK are non-malaria-endemic

Port cities printed in BLACK within a RED BOX are non-malaria-endemic, BUT surrounded by malaria-endemic areas

El Salvador
- Acapulco
- Acajutla
- La Union
- Honduras (contd)
- Trujillo
- Jamaica
- Falmouth
- Montego Bay
- Ocho Rios
- Port Antonio
- Martinique
- Fort-de-France
- Le Marin
- Les Anses d’Arlet
- Mexico
- Acapulco
- Cabo San Lucas
- Calica
- Cancun
- Costa Maya
- Cozumel
- Ensenada
- Guaymas
- Huatulco
- Ixtapa (Zihuatanejo)
- La Paz
- Loreto
- Los Cabos
- Majahual
- Manzanillo
- Mazatlan
- Merida
- Playa del Carmen
- Progreso
- Puerto Chiapas
- Puerto Costa Maya
- Puerto Vallarta
- Punta Venado
- Topolobampo
- Zihuatanejo (Ixtapa)

Monserrat
- Little Bay
- Netherland Antilles
- Aruba
- Bonaire
- Curacao
- Fort Bay
- Kralendijk
- Oranjestad
- Philipsburg
- Saba
- Sint Maarten
- Willemstad
- Nicaragua
- Corinto
- Puerto Corinto
- San Juan del Sur
- Panama
- Amador
- Balboa
- Bocas del Toro
- Colon
- Cristobal (Pier)
- Darien
- Darien Jungle
- Flamenco
- Fuerte Amador
- Gatun Lake
- Isla de Cola
- Isla de las Perlas
- Mogo Mogo
- Panama Canal
- Panama City
- Panama Province
- Pearl Islands
- Portobelo
- Punta Alegre
- San Blas Island

Peru
- Callao
- General San Martin
- Ilo
- Iquitos
- Isla Lobos de Tierra
- Islas de Guanape
- Lima
- Matarani
- Paita
- Paracas Bay
- Pisco
- Salaverry
- San Martin
- Trujillo
- Puerto Rico
- Culebrita Island
- Esperanza
- Fajardo
- Mayaguez
- Ponce
- San Juan

Saint Lucia (contd)
- Rodney Bay
- Soufriere
- Saint Martin
- Marigot
- Saint Thomas (USVI)
- Charlotte Amalie
- Saint Vincent & the Grenadines
- Bequia
- Canouan Island
- Kingstown
- Mayreau
- Saint Vincent
- Tobago Cays
- Union Island
- Sint Eustatius
- Oranjestad
- Sint Maarten
- Philipsburg
- South Georgia & the South Sandwich Islands
- Cooper Bay
- Gold Harbor
- Grytviken
- King Haakon Bay
- Right Whale Bay
- Salisbury Plain
- South Georgia
- Stromness Fortuna Bay

Suriname
- Paramaribo
- Trinidad & Tobago
- Charlotteville
- Port of Spain
- Scarborough
- Trinidad

POC.011.2

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4/1/2019
## List of Non-Malaria Endemic Countries, Dependencies, and Areas of Special Sovereignty

### ALL ENTITIES LISTED ARE NON-MALARIA ENDEMIC

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*The most current geographic and CDC malaria risk information was used in the production of this list. Malaria risk, location names, and other details may vary or may have changed due to regional politics, disease spread, or other factors. This list is offered as a reference tool and should always be verified against the most current malaria risk information available.*
AFGHANISTAN

Malaria-endemic areas: During April-December - all areas <2,500 m (8,202 ft).
Non-malaria-endemic areas: During April-December - all areas at 2,500 m or greater elevation.
During January-March - all areas in Afghanistan are non-malaria-endemic.

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The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors. Including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
AFGHANISTAN: KABUL REGION

Malaria-endemic areas: During April-December - all areas <2,500 m (8,202 ft).
Non-malaria-endemic areas: During April-December - all areas at 2,500 m or greater elevation.
During January-March - all areas in Afghanistan are non-malaria-endemic.
BANGLADESH

Malaria-endemic areas: All areas, EXCEPT in the city of Dhaka.
Non-malaria-endemic areas: The city of Dhaka.

Symbols denote ancient temples

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BOLIVIA

Malaria-endemic areas: All areas < 2,500 m (8,202 ft).
Non-malaria-endemic areas: The city of La Paz and areas at 2,500 m or greater elevation.

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Geographic Credits: Esri, DeLorme Publishing Company, Central Intelligence Agency, World Factbook; Topography: National Aeronautics and Space Administration, National Geospatial-Intelligence Agency, National Science Foundation, OpenTopography

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BOTSWANA

Malaria-endemic areas: Districts of Central, Chobe (including Chobe National Park), Ganzi, North-East (including Francistown) and North-West (Ngamiland).
Non-malaria-endemic areas: Districts of Kgalagadi, Kgatleng, Kweneng, South-East, and Southern.
BRAZIL

Malaria-endemic areas: States of Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Para, Rondônia, and Roraima.
Non-malaria-endemic areas: The cities of Belem, Cuiabá, and São Luís.
All areas of states not specified above, including Iguaçu Falls.
BURMA (MYANMAR)

Malaria-endemic areas: All areas <1,000 m (3,281 ft), including Bagan.
Non-malaria-endemic areas: Areas at 1,000 m or greater elevation.

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CAMBODIA

Malaria-endemic areas: Siem Reap City and throughout the country, EXCEPT the city of Phnom Penh and at the temple complex at Angkor Wat. Non-malaria-endemic areas: The city of Phnom Penh and at the temple complex at Angkor Wat.
COLOMBIA

Malaria-endemic areas: All areas <1,700 m (5,577 ft)
Non-malaria-endemic areas: The cities of Bogota, Cartagena, and Medellin; areas at 1,700 m or greater elevation.

FOR THIS REGION, REFER TO COLOMBIA HIGHLANDS MAP ON NEXT PAGE

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
COLOMBIA HIGHLANDS

Malaria-endemic areas: All areas <1,700 m (5,577 ft)
Non-malaria-endemic areas: The cities of Bogotá and Medellín; areas at 1,700 m or greater elevation.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
COSTA RICA

Malaria-endemic areas: The Districts of Cutris and Pocosol in San Carlos Canton of Alajuela Province.
Non-malaria-endemic areas: All other Districts of San Carlos Canton, all other Cantons of Alajuela Province, and all other Provinces.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
DOMINICAN REPUBLIC

Malaria-endemic areas: Provinces bordering Haiti, and provinces of La Altagracia and Santo Domingo, except the city of Santo Domingo (Distrito Nacional).
Non-malaria-endemic areas: The city of Santo Domingo (Distrito Nacional) and provinces not identified above.
ECUADOR

Malaria-endemic areas: Areas <1,500 m (4,921 ft) in the provinces of Carchi, Esmeraldas, Morona Santiago, Orellana, and Pastaza.
Non-malaria-endemic areas: The cities of Guayaquil and Quito; the Galápagos Islands; areas at 1,500 m or greater elevation in the provinces specified above; all areas of the provinces not specified above.

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ERITREA

Malaria-endemic areas: All areas <2,200 m (7,218 ft).
Non-malaria-endemic areas: The city of Asmara and areas at 2,200 m or greater elevation.

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Geographic Credits: Esri, DeLorme Publishing Company, Central Intelligence Agency
World Factbook; Topography: National Aeronautics and Space Administration,
National Geospatial-Intelligence Agency, National Science Foundation, OpenTopography

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ESWATINI
(FORMERLY SWAZILAND)

Malaria-endemic areas: All of Lubombo district and the eastern halves of Hhohho, Manzini, and Shiselweni districts.
Non-malaria-endemic areas: The western halves of Hhohho, Manzini, and Shiselweni districts.
ETHIOPIA

Malaria-endemic areas: All areas <2,500 m (8,202 ft).
Non-malaria-endemic areas: The city of Addis Ababa and areas at 2,500 m or greater elevation.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
FRENCH GUIANA

Malaria-endemic areas: All areas, including Matoury, Macouria, and Kourou, EXCEPT the coastal areas west of Kourou and Cayenne City.
Non-malaria-endemic areas: The coastal areas west of Kourou and Cayenne City.
GUATEMALA

Malaria-endemic areas: Rural areas only at altitudes <1,500 m (4,921 ft).
Non-malaria-endemic areas: Urban areas, areas at 1,500 m or greater elevation, including Antigua, Guatemala City, and Lake Atitlan.

Symbols denote Archaeological sites

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
GUATEMALA: GUATEMALA CITY AREA

Malaria-endemic areas: Rural areas only at altitudes <1,500 m (4,921 ft).
Non-malaria-endemic areas: Urban areas, areas at 1,500 m or greater elevation, including Antigua and Guatemala City.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
GUATEMALA: LAKE ATITLÁN

Malaria-endemic areas: Rural areas only at altitudes <1,500 m (4,921 ft).
Non-malaria-endemic areas: Urban areas, areas at 1,500 m or greater elevation, including Lake Atitlan.
**GUYANA**

Malaria-endemic areas: All areas EXCEPT the cities of Georgetown and New Amsterdam.
Non-malaria-endemic areas: The cities of Georgetown and New Amsterdam.

*NOTE: There are two villages named Kumaka in Guyana. Both are malaria-endemic.*
HONDURAS

Malaria-endemic areas: Throughout the country and in Roatán and other Bay Islands, EXCEPT none in San Pedro Sula and Tegucigalpa
Non-malaria-endemic areas: The cities of San Pedro Sula and Tegucigalpa.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
INDIA

Malaria-endemic areas: All areas <2,000 m (6,562 ft), including the cities of Bombay (Mumbai) and Delhi (New Delhi).
Non-malaria-endemic areas: Areas at 2,000 m or greater elevation in Himachal Pradesh, Jammu and Kashmir, and Sikkim.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
INDONESIA

Malaria-endemic areas: All areas of eastern Indonesia (provinces of Maluku, Maluku Utara, Nusa Tenggara Timur, Papua, and Papua Barat). Rural areas of Kalimantan (Borneo), Nusa Tenggara Barat (EXCEPT the Gill Islands), Sulawesi, and Sumatra. Rural, non-resort areas of Java; and non-resort areas of Bali.

Non-malaria-endemic areas: Urban areas of Java, Kalimantan, Nusa Tenggara Barat, Sulawesi, and Sumatra; resort areas of Bali and Java; the Gill Islands, the Thousand Islands (Kepulauan Seribu or Pulau Seribu), and the cities of Jakarta and Ubud.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional risk information available.
INDONESIA: BALI

Malaria-endemic areas: Non-resort areas outside of the city of Ubud. Non-malaria-endemic areas: The city of Ubud and resort areas.
INDONESIA: JAKARTA & THE THOUSAND ISLANDS

Malaria-endemic areas: Rural areas of Java (including Pangandaran, Sukabumi, and Ujung Kulon National Park - not shown on this map).
Non-malaria-endemic areas: Urban and resort areas of Java, the Thousand Islands (Pulau Kepulauan or Pulau Seribu), and the city of Jakarta.
INDONESIA: JAVA

Malaria-endemic areas: Rural areas of Java, including Pangandaran, Sukabumi (Sukalumi), and Ujung Kulong National Park.
Non-malaria-endemic areas: Urban and resort areas of Java, the Thousand Islands (Kepulauan Seribu or Pulau Seribu), and the city of Jakarta.

Refer to the map of Jakarta & the Thousand Islands for more detail of this area.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
INDONESIA: NUSA TENGGARA REGION

Malaria-endemic areas: All areas of Nusa Tenggara Timur, including the town of Labuan Bajo and Komodo Islands. Rural areas of Nusa Tenggara Barat (includes the island of Lombok).

Non-malaria-endemic areas: Urban areas of Nusa Tenggara Barat and the Gili Islands.
IRAN

Malaria-endemic areas: During March-November - rural areas of Fars, Sistan-Baluchestan, Hormozgan, and southern parts of Kerman provinces. Non-malaria-endemic areas: During March-November - urban areas of Fars, Sistan-Baluchestan, Hormozgan, and southern Kerman provinces; all areas of northern Kerman province and all other provinces. During December-February - all areas in Iran are non-malaria-endemic.
KENYA

Malaria-endemic areas: All areas (including game parks) <2,500 m (8,202 ft), including the city of Nairobi.

Non-malaria-endemic areas: Areas at 2,500 m or greater elevation.
LAOS

Malaria-endemic areas: All areas, EXCEPT the city of Vientiane.
Non-malaria-endemic areas: The city of Vientiane.

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MADAGASCAR

Malaria-endemic areas: All areas EXCEPT in the city of Antananarivo. Non-malaria-endemic areas: The city of Antananarivo.

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MALAYSIA

Malaria-endemic areas: Rural areas.
Non-malaria-endemic areas: Penang State (including Penang Island) and urban areas.

NOTE 1: Singapore is separate from the country of Malaysia. Singapore is non-malaria-endemic.
NOTE 2: Refer to the additional maps of Penang State and the Kuala Lumpur urban area for more detailed information on locations within these regions.
MALAYSIA: KUALA LUMPUR URBAN AREA

Malaria-endemic areas: Rural areas.
Non-malaria-endemic areas: Kuala Lumpur, urban areas.

NOTE: The green area surrounding the location marker for Kuala Lumpur shows the extent of the city of Kuala Lumpur, known officially as the Federal Territory of Kuala Lumpur. This entire area is urban.

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MALAYSIA: PENANG STATE

Malaria-endemic areas: Rural areas in all states except Penang.
Non-malaria-endemic areas: Penang State, including Penang Island and the city of George Town; urban areas in other states.
MAURITANIA

Malaria-endemic areas: All areas EXCEPT the regions of Dakhlet-Nouadhibou and Tiris-Zemour.
Non-malaria-endemic areas: The regions of Dakhlet-Nouadhibou and Tiris-Zemour.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors. Including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
MEXICO: OVERVIEW

Malaria-endemic areas: All areas of Chiapas State and the southern part of Chihuahua State.
Non-malaria-endemic areas: All areas EXCEPT Chiapas State and the southern part of Chihuahua State.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
MEXICO: CHIAPAS

Malaria-endemic areas: All areas of Chiapas.
Non-malaria-endemic areas: None.
MEXICO: CHIHUAHUA

Malaria-endemic areas: The southern part of Chihuahua.
Non-malaria-endemic areas: All areas EXCEPT the southern part of Chihuahua.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
NAMIBIA

Malaria-endemic areas: Regions of Kavango (East and West), Kunene, Ohangwena, Omusati, Oshana, Oshikoto, Otjozунjupa, and Zambezi.
Non-malaria-endemic areas: Regions not specified above, including Windhoek.
Malaria-endemic areas: All areas <2,000 m (6,562 ft).
Non-malaria-endemic areas: All areas at 2,000 m or greater elevation, Kathmandu, and on typical Himalayan treks.
Nicaragua

Malaria-endemic areas: The departments of Región Autónoma Atlántico Norte (RAAN), and Región Autónoma Atlántico Sur (RAAS). Non-malaria-endemic areas: All other departments, including the city of Managua.
NORTH KOREA

Malaria-endemic areas: Southern provinces.
Non-malaria-endemic areas: Northern provinces.
PAKISTAN

Malaria-endemic areas: All areas (including all cities) <2,500 m (8,202 ft).
Non-malaria-endemic areas: Areas at 2,500 m or greater elevation.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
PANAMA

Malaria-endemic areas: Provinces of Darién (including Emberá), Guna Yala (Kuna Yala), Ngäbe-Buglé, and eastern Panama province (Panamá Este).

Non-malaria-endemic areas: All other provinces, Panamá Oeste, the Canal Zone, and Panama City.

NOTE: According to the CDC the Tocumen International Airport is located within the Panama City urban area.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors. Including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
PAPUA NEW GUINEA

Malaria-endemic areas: All areas <2,000 m (6,562 ft).
Non-malaria-endemic areas: All areas at 2,000 m or greater elevation.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors. Including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
PERU

Malaria-endemic areas: All departments <2,000 m (6,562 ft), including the cities of Iquitos and Puerto Maldonado and only the remote eastern regions of La Libertad and Lambayeque.

Non-malaria-endemic areas: Lima Province; the cities of Arequipa, Ica, Moquegua, Nazca, Puno, and Tacna; the highland tourist areas (Cusco, Machu Picchu, and Lake Titicaca); along the Pacific Coast; and areas at 2,000 m or greater elevation.

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PHILIPPINES: OVERVIEW

Malaria-endemic areas: Palawan and Mindanao Islands EXCEPT urban areas.
Non-malaria-endemic areas: Metropolitan Manila and all urban areas, all areas of islands EXCEPT Palawan and Mindanao Islands.
ONLY urban areas of Palawan and Mindanao Islands are non-malaria-endemic.

NOTE: Metropolitan Manila includes Manila, Quezon City, Caloocan, Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasay, Pasig, San Juan, Taguig, Valenzuela, and the Municipality of Pateros.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
PHILIPPINES: MINDANAO REGION

Malaria-endemic areas: Mindanao Islands EXCEPT urban areas.
Non-malaria-endemic areas: Urban areas.

Refer to the Palawan Region map for more detail of this area.

*IMPORTANT NOTE ABOUT ROXAS:
There is also a place named ROXAS on Palawan Island that is MALARIA-ENDMIC.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
PHILIPPINES: PALAWAN REGION

Malaria-endemic areas: Palawan Islands EXCEPT urban areas.
Non-malaria-endemic areas: Urban areas.

*IMPORTANT NOTE ABOUT ROXAS:
There is also a place named ROXAS on
Palawan Island that is MALARIA-ENDEMIC.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
SAUDI ARABIA

Malaria-endemic areas: The emirates of Asir and Jizan.
Non-malaria-endemic areas: All areas EXCEPT the emirates of Asir and Jizan.
SOUTH AFRICA

Malaria-endemic areas: All areas of the districts of Mopani, Vhembe, and Waterberg (Limpopo Province), Ehlanzeni (Mpumalanga Province), and Umkhanyakude (KwaZulu-Natal Province), including all areas of Kruger National Park.

Non-malaria-endemic areas: All areas except the areas listed above.

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SOUTH KOREA

Malaria-endemic areas (only during the months of March-December):
Rural areas in the northern parts of Incheon, Kangwon-do, and
Kyonggi-do provinces, including the demilitarized zone (DMZ).
Non-malaria-endemic areas (during the months of March-December):
Urban areas in the northern parts of Incheon, Kangwon-do,
and Kyonggi-do provinces and all other areas.

Refer to the map of Incheon, Kangwon-do,
and Kyonggi-do provinces
for more detail of this area.

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SOUTH KOREA: INCHEON, KANGWON-DO, AND KYONGGI-DO PROVINCES

Malaria-endemic areas (only during the months of March-December): Rural areas in the northern parts of Incheon, Kangwon-do, and Kyonggi-do provinces, including the demilitarized zone (DMZ).
Non-malaria-endemic areas (during the months of March-December): Urban areas in the northern parts of Incheon, Kangwon-do, and Kyonggi-do provinces and all other areas.
During January-February - all areas in South Korea are non-malaria-endemic.
SURINAME

Malaria-endemic areas: All areas in the municipality of Tapanahony in Sipaliwini Province.

Non-malaria-endemic areas: All areas outside of Tapanahony in Sipaliwini Province and all other provinces; the city of Paramaribo.

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TANZANIA

Malaria-endemic areas: All areas <1,800 m (5,906 ft).
Non-malaria-endemic areas: Areas at 1,800 m or greater elevation.

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The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
THAILAND

Malaria-endemic areas: Provinces that border Burma (Myanmar), Cambodia, and Laos. ALSO the provinces of Kalasin, Nakhon Si Thammarat, Narathiwat, Pattani, Phang Nga, Rayong, Sakon Nakhon, Songkhla, Surat Thani, Yala, and the Plai Phraya district of Krabi.

Non-malaria-endemic areas: Provinces not described above, all areas of Krabi province EXCEPT the Plai Phraya district, and the cities of Bangkok, Chiang Mai, Chiang Rai, Koh Phangan, Koh Samui, Pattaya, and Phuket.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
THAILAND: SOUTHERN REGION

Malaria-endemic areas: Provinces that border Burma (Myanmar) as well as the provinces of Nakhon Si Thammarat, Narathiwat, Pattani, Phang Nga, Songkhla, Surat Thani, Yala, and the Plai Phraya district of Krabi.

Non-malaria-endemic areas: Provinces of Phatthalung, Phuket, Satun, and Trang as well as areas of Krabi province OUTSIDE of the Plai Phraya district. The cities of Koh Phangan, Koh Samui, and Phuket and the islands of Ko Lanta and Koh Phi Phi.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
TIMOR LESTE

Malaria-endemic areas: The Oecusse District.
Non-malaria-endemic areas: All areas EXCEPT the Oecusse District.
VENEZUELA

Malaria-endemic areas: All areas <1,700 m (5,577 ft) including Angel Falls. Non-malaria-endemic areas: Areas at 1,700 m or greater elevation.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
VIETNAM

Malaria-endemic areas: Rural areas outside of the Mekong Delta and Red River Delta.
Non-malaria-endemic areas: The Red River Delta and Mekong Delta; urban areas, including the cities of Da Nang, Haiphong, Hanoi, Ho Chi Minh City (Saigon), Nha Trang, and Qui Nhon.

Refer to the map of the Red River Delta for more detail of this area.

Refer to the map of the Mekong Delta for more detail of this area.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors. Including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
VIETNAM: MEKONG DELTA

Malaria-endemic areas: Rural areas outside of the Mekong Delta. Non-malaria-endemic areas: The Mekong Delta and urban areas, including Ho Chi Minh City (Saigon).

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
VIETNAM: RED RIVER DELTA

Malaria-endemic areas: Rural areas outside of the Red River Delta.
Non-malaria-endemic areas: The Red River Delta and urban areas, including the cities of Haiphong and Hanoi.

The most current malaria information from the CDC and geographic information from a variety of sources were used in the production of this map. Location and boundary information is based on sources provided and in some cases is estimated based on limited source information. Malaria endemic areas, location names, boundaries, and other details may vary or may have changed due to regional politics, disease spread, or other factors, including estimated boundaries and location information. This map is offered as a reference tool and should always be verified against the most current malaria risk information available.
Malaria-endemic areas: All areas $<2,000$ m (6,562 ft).
Non-malaria-endemic areas: The city of Sana'a and areas at 2,000 m or greater elevation.
Section Contents

vCJD Screening Facts

Document Change History: vCJD

Reference List

Countries with vCJD Risk

Reference Maps

vCJD Reference Map of the United Kingdom (U.K.)

vCJD Reference Map of France & Ireland
vCJD Blood Donor Screening Facts

Variant Creutzfeldt Jakob Disease (vCJD) is an infectious disease believed to be caused by prions and associated with Bovine Spongiform Encephalopathy (BSE) in cattle. The first cases of vCJD in humans emerged during a BSE epidemic in cattle in the United Kingdom (U.K.). It is believed that humans acquired the disease by consuming beef products infected with BSE. Because no blood test is currently available to detect vCJD, donor assessment is the only donor screening safeguard against transfusion or transplant-transmission of this incurable and ultimately fatal disease.

INFECTIONOUS AGENT: vCJD Prion

DISEASE VECTOR: None

MODES OF TRANSMISSION:
- Associated with consumption of beef infected with Bovine Spongiform Encephalopathy (BSE)
- Transmissible by blood transfusion and some types of cellular, tissue, and organ transplants
- Believed to be transmissible by surgical instruments
- Unknown if transmission can occur from mother to fetus during pregnancy
- Not believed to be sexually transmitted
- No longer believed to be transmitted by administration of bovine-sourced insulin produced in BSE-affected countries

INCUBATION PERIOD: Has not yet been determined, but is estimated to be from years to decades in length.

ASYMPTOMATIC PERIODS: See Incubation Period.

GEOGRAPHIC DISTRIBUTION FACTORS: Associated with the distribution of cattle and beef infected with BSE from the United Kingdom (U.K.), with the greatest risk in the U.K., France, and Ireland.

TEMPORAL FACTORS: The period from 1980 through 1996 was the peak of the BSE epidemic in the U.K. The FDA concluded that control measures implemented in the U.K. to prevent the spread of BSE had been adequate to prevent the BSE agent from entering the human food supply there since 1996.

DETECTION BY BLOOD TESTS: No blood tests exist to positively diagnose patients or screen donors for vCJD. Post-mortem examination of brain tissue is currently the only accepted method to confirm a diagnosis of vCJD.

WINDOW PERIODS: Unknown – no donor blood test currently available.

BASIS FOR DONOR SCREENING – RATIONALE & REGULATORY GUIDANCE:
Minimizing the risk of transfusion and transplant transmission of vCJD is currently based solely on the donor interview process. Blood donors are screened for several risk factors:
2. Time spent in France or Ireland from 1/1/1980 to 12/31/2001
3. Receipt of blood transfusion in the U.K., France, or Ireland from 1/1/1980 to the present

The FDA's recommendations for donor screening for vCJD in blood donors are detailed in the guidance document: Recommendations to Reduce the Possible Risk of Transmission of Creutzfeldt-Jakob Disease and Variant Creutzfeldt-Jakob Disease by Blood and Blood Products (4/20/2020)

The FDA guidance document specifies that the United Kingdom includes England, Northern Ireland,
vCJD Blood Donor Screening Facts

Scotland, Wales, the Isle of Man, The Channel Islands, Gibraltar, and the Falkland Islands; and France does not include the French overseas departments of French Guiana, Guadeloupe, Martinique, Mayotte, and Réunion.

METHODS FOR BLOOD DONOR SCREENING:
The blood donor history questionnaire and interview process should identify and assess potential donors for the following risk factors:

1. Three months or more (cumulatively) spent in the U.K. from 1/1/1980 through 12/31/1996
2. Five years or more (cumulatively) spent in France or Ireland from 1/1/1980 to 12/31/2001
3. Receipt of blood transfusion in the U.K., France, or Ireland from 1/1/1980 to the present

REFERENCES:


Countries With vCJD Risk
ONLY USE THIS LIST FOR SCREENING OF BLOOD DONORS

United Kingdom (U.K.):
Qualification of vCJD risk:
If donor spent a total of 3 months or more in the U.K. from 1/1/1980 through 12/31/1996.
OR
If donor received a transfusion in the U.K. any time since 1/1/1980.

The United Kingdom includes the following locations:
- Alderny Island
- Britain
- British Isles
- Channel Islands
- England
- Falkland Islands
- Gibraltar
- Great Britain
- Guernsey Island
- Hebrides Islands
- Herm Island
- Ireland (Northern)
- Islas Malvinas (Falkland Islands)
- Isle of Man
- Jersey Island
- Northern Ireland
- Orkney Islands
- Sark Island
- Scotland
- Shetland Islands
- Wales

France & Ireland:
Qualification of vCJD risk:
If donor spent a total of 5 years or more in France or Ireland from 1/1/1980 through 12/31/2001.
OR
If donor received a transfusion in France or Ireland any time since 1/1/1980.

France includes the island of Corsica.
France does not include the overseas departments of French Guiana, Guadeloupe, Martinique, Mayotte and Réunion.

Ireland (the Republic of Ireland) does not include Northern Ireland, which is part of the U.K.
VCJD RISK: UNITED KINGDOM (U.K.)

For vCJD screening the United Kingdom includes: England, Northern Ireland, Scotland, Wales, The Isle of Man, the Channel Islands, Gibraltar, and the Falkland Islands.
VCJD RISK: FRANCE & IRELAND

For vCJD screening France includes the island of Corsica and does not include its overseas departments of French Guiana, Guadeloupe, Martinique, Mayotte, and Réunion. Ireland includes the Republic of Ireland and does not include Northern Ireland, which is part of the United Kingdom (U.K.).