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

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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.

**INFECTION 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: Guidance for Industry: Recommendations for Donor Questioning, Deferral, Reentry and Product Management to Reduce the Risk of Transfusion-Transmitted Malaria (8/2013, updated 8/2014).

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 & Malaria Information, by Country table can be found at: http://wwwn.cdc.gov/travel/yellowbook/2016/infectious-diseases-related-to-travel/yellow-fever-malaria-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 prophylaxis 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 prophylaxis 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 donors have never resided in a malaria-endemic country are evaluated for travel to malaria-endemic areas within the past 12 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".
Malaria Screening Facts

- Thirty to forty species of Anopheles mosquitoes are known to spread malaria.
- 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/


# 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.

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### Countries With Malaria-Endemic Areas

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

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*Note: The document is not a table but a list of countries.*
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

Anguilla
Blowing Point
Road Bay
Sandy Ground
Antigua & Barbuda
Antigua
Barbuda
English Harbor
Falmouth
Prickly Pear Island
St. John's
Argentina
Buenos Aires
Camarones
Comodoro Rivadavia
Elephant Island
Mar del Plata
Patagonia
Puerto Madryn
Tierra del Fuego
Ushuaia
Aruba
Oranjestad
Bahamas
Bimini
Castaway Cay
Cockburn Town
Coco Cay
Elutheria
Freeport
Grand Bahama Island
Great Inagua
Great Stirrup Cay
Half Moon Cay
Lucaya
Nassau
Paradise Island
Port Lucaya
Princess Cays
Barbados
Bridgetown
Belize
Belize City
Harvest Caye
Hunting Caye
Bermuda
Hamilton
Heritage Wharf
King's Wharf
Royal Naval Dockyard
St. George
Bonaire
Kralendijk
Brazil
Abraao
Almeirim
Alter Do Chao
Amatura
Anapaihanas
Angra Dos Reis
Ariau
Armacao dos Buizos
Arraial do Cabo
Belem
Boca da Valeria
Boca do Jari
Buzios
Cabedelo
Cabo Friio
Curu
Fernando de Noronha
Fiorianapolis
Fortaleza
Ilha Grande
Ilhabela
Ilheus
Itajai
Brazil (contd)
Macaipa
Maceio
 Manaus
Natal
Novo Airao
Paraio
Parati
Paraty
Parintins
Porto Belo
Recife
Rio de Janeiro
Rio Grande
Salvador
Salvador de Bahia
Santarem
Santo Antonio do Ica
Santos
Sao Francisco do Sul
Sao Paulo
Sao Sebastian
Ubatuba
Vitoria
British Virgin Islands
Anegada
Jost Van Dyke
Norman Island
Peter Island
Prickly Pear Island
Road Town
Soper's Hole
Spanish Town
Tortola
Virgin Gorda
Caribbean Netherlands
Fort Bay
Kralendijk
Oranjestad
Cayman Islands
Cayman Brac
George Town
Grand Cayman
Chile
Alafia Glacier
Ancud
Antofagasta
Arica
Cape Horn
Castro
Chanaral Island
Chiloé Island
Coquimbo
Easter Island
Garibaldi Glacier
Hangaroa
Iquique
Isla Chanaral
Isla Chiloe
Isla Pan de Azucar
Isla Robinson Crusoe
La Serena
Laguna San Rafael
Niebla
Pio XI Glacier
Puerto Chacabuco
Puerto Montt
Puerto Natales
Puerto Williams
Punta Arenas
Robinson Crusoe Isl.
Santiago
Talcahuano
Valdivia Puerto Corral
Valparaiso
Colombia
Bahia Blanca
Cartagena
Colombia (contd)
Isla de Providencia
Isla de San Andres
Parque Nacional Isla
Providencia Island
San Andres Island
Santa Marta
Utria National Park
Costa Rica
Bahia Drake
Bahiia Paraiso
Caldera
Curu
Drake Bay
Golfito
Golfo Dulce
Herradura
Isla Tortuga
Playa del Coco
Puerto Caldera
Puerto Jimenez
Puerto Limon
Puerto Moyn
Puntarenas
Quepos
Tortuga Island
Cuba
Antilla
Cayo Coco
Cienfuegos
Guardalavaca
Havana
Isla de la Juventud
Maria la Gorda
Santiago de Cuba
Curacao
Willemstad
Dominica
Cabrits
Dominica (contd)
Portsmouth
Roseau
Dominican Republic
Amber Cove
Casa de Campo
Catalina Island
Cayo Levantado
Isla Catalina
La Romana
Puerto Plata
Punta Cana
Samaná
Samaná Bay
Santo Domingo
Ecuador
Baltra
Bartolome
Esmeraldas
Espanola
Fernandina
Floreana
Genovesa
Guayaquil
Isabela
Isla de la Plata
Isla Plata Sur
Las Bachas
Manta
North Seymour
Plaza
Rabida
San Cristobal
San Salvador
Santa Cruz
Santa Fe
Santiago
POC.012.1
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.

4/1/2019
# Ports of Call of the Caribbean, Mexico, Central America, & South America

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<th>Country</th>
<th>City</th>
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<td>Barren Island, Carcass Island, New Island, Port Stanley, Westpoint Island</td>
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<tr>
<td>French Guiana</td>
<td>Devil's Island, Ile du Diable, Ile Royale, Iles du Salut</td>
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<tr>
<td>Grand Cayman</td>
<td>George Town</td>
</tr>
<tr>
<td>Grenada</td>
<td>Grenada, Carriacou, St. George's</td>
</tr>
<tr>
<td>Guadeloupe</td>
<td>Deshaies, Iles Des Saints, Pointe-à-Pitre, Terre de Haut</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Puerto Quetzal, Santo Tomás de Castilla</td>
</tr>
<tr>
<td>Guyana</td>
<td>Georgetown</td>
</tr>
<tr>
<td>Haiti</td>
<td>Haïti, Labadé</td>
</tr>
<tr>
<td>Honduras</td>
<td>Bay Islands, Cocks Hole, Isla Roatan, Mahogany Bay, Puerto Cortes, Roatán</td>
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<tr>
<td>Monserrat</td>
<td>Trujillo</td>
</tr>
<tr>
<td>Martinique</td>
<td>Fort-de-France, Le Marin, Les Anses d'Ariet</td>
</tr>
<tr>
<td>Mexico</td>
<td>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)</td>
</tr>
<tr>
<td>Netherland Antilles</td>
<td>Aruba, Bonaire, Curacao, Fort Bay, Kralendijk, Oranjestad, Philipsburg, Saba, Sint Maarten, Willemstad</td>
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<tr>
<td>Panama</td>
<td>Panama City, Pearl Islands, Portobelo, Punta Alegre, San Blas Island</td>
</tr>
<tr>
<td>Peru</td>
<td>Callao, General San Martin, Ilo, Iquitos, Islas Lobos de Tierra, Islas de Guanape, Lima, Matarani, Paia, Paracas Bay, Pisco, Salaverry, San Martin, Trujillo, Puerto Rico, Culebrita Island, Esperanza, Fajardo, Mayaguez, Ponce, San Juan, Saba</td>
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<td>Saint Lucia (contd)</td>
<td>Union Island, Vieux Fort, Castries, St. Lucia</td>
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<td>Turks, Caicos, Grand Turk, Providenciales, Turtle Island, Cooper Island</td>
</tr>
<tr>
<td>Uruguay</td>
<td>Colonia, Montevideo, Punta del Este, US Virgin Islands</td>
</tr>
<tr>
<td>Venezuela</td>
<td>Barquisimeto, Maracaibo, Caracas, Maracay, Ciudad Guayana, La Guaira, La Guaira, La Guaira, La Guaira</td>
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</tbody>
</table>

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

POC.011.2

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4/1/2019
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# 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.

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.
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.
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.

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BRAZIL

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

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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.

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.
Caribbean Islands Reference & Map

1. Anguilla
2. Antigua and Barbuda
3. Aruba
4. Bahamas
5. Barbados
6. Bonaire (Caribbean Netherlands)
7. British Virgin Islands (Anegada, Jost Van Dyke, Tortola, Virgin Gorda)
8. Caribbean Netherlands (Bonaire, Saba, Sint Eustatius)
9. Cayman Islands
10. Cuba
11. Curaçao
12. Dominica
13. Dominican Republic
14. Grenada
15. Guadeloupe (France)
16. Haiti
17. Jamaica
18. Martinique (France)
19. Monserrat
20. Puerto Rico
21. Saba (Caribbean Netherlands)
22. Saint Barthélemy (St. Barts)
23. Saint Kitts & Nevis (St. Kitts A.K.A. St. Christopher)
24. Saint Lucia (St. Lucia)
25. Saint Martin (St. Martin)
26. Saint Vincent & the Grenadines (St. Vincent)
27. Sint Eustatius (St. Eustatius - Caribbean Netherlands)
28. Sint Maarten (St. Maarten)
29. Trinidad & Tobago
30. Turks & Caicos Islands
31. United States Virgin Islands (St. Croix, St. Thomas, St. John)
32. Venezuelan Coastal Islands

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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.
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.
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

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.
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.
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.

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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.
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.

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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 Atitlán.

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.
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.

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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.
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.
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 Gili 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 Gili Islands, the Thousand Islands (Kepulauan Seribu or Pulau Seribu), and the cities of Jakarta and Ubud.
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.

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: JAVA

Malaria-endemic areas: Rural areas of Java, including Pangandaran, Sukabumi (Sukalumi), and Ujung Kulon 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.
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.

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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.

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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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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.

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.
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.

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.
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.
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.
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.

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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.
MEXICO: CHIHUAHUA

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

Malaria-endemic areas: Regions of Kavango (East and West), Kunene, Ohangwena, Omusati, Oshana, Oshikoto, Otjozondjupa, and Zambezi.
Non-malaria-endemic areas: Regions not specified above, including Windhoek.
NEPAL

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.
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.
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.

*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.
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.

Refer to the Mindanao Region map for more detail of this area.
SAUDI ARABIA

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

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.
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.

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.
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.

Demilitarized Zone (DMZ)

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

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Intelligence Agency World Factbook, GeoNames

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.
SOUTH KOREA: INCHEON, KANGWON-DG, 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.

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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.
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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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.

Refer to the map of Southern Thailand for more detail of this area.

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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.

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TIMOR LESTE

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

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.
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.

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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.

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).

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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.
YEMEN

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.
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vCJD 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.

INFECTION 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
- Believed to be transmissible by administration of infected bovine-sourced insulin

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.). Affected areas include most European countries, U.S. military bases located in Europe and Turkey, as well as certain overseas dependencies and areas of special sovereignty of the primarily affected countries.

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. Donors are screened for several risk factors:
1. A medical diagnosis of suspected vCJD (or CJD)
3. Time spent in Europe from 1/1/1980 to the present
4. Time spent affiliated with U.S. military bases in Europe and/or Turkey from 1/1/1980 through 12/31/1996
5. Receipt of blood or blood component transfusion in the U.K. or France from 1/1/1980 to the present
vCJD Screening Facts

6. Injection of bovine insulin since 1980, unless confirmed that it was not manufactured from U.K. cattle

The FDA’s recommendations for donor screening for vCJD in blood donors are detailed in the guidance document: Revised Preventive Measures to Reduce the Possible Risk of Transmission of Creutzfeldt-Jakob Disease and Variant Creutzfeldt-Jakob Disease by Blood and Blood Products (5/2010, updated 1/2016)

Countries and associated locations with vCJD risk are specified in the FDA guidance document.

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

1. A medical diagnosis of suspected vCJD (or CJD)
2. Three months or more (cumulatively) spent in the U.K. from 1/1/1980 through 12/31/1996
3. Five years or more (cumulatively) spent in Europe from 1/1/1980 to the present
4. Current or former U.S. military personnel, civilian military workers, and their dependents that lived on U.S. military bases in the following European countries for six months (cumulatively) during the following timeframes:
   a. Northern European bases in Germany, United Kingdom, Belgium, and the Netherlands from 1/1/1980 through 12/31/1990
   b. Southern European bases in Greece, Spain, Portugal, Italy, as well as Turkey from 1/1/1980 through 12/31/1996
5. Transfusion of blood or blood components in the U.K. or France from 1/1/1980 to the present
6. Administration of bovine insulin since 1980, unless confirmed that it was not manufactured from U.K. cattle

REFERENCES:


# List of Countries With vCJD Risk

**Color Key:** United Kingdom, France, Europe  
**Symbol Key:** U.S. Military Bases

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OVERVIEW OF VCJD GEOGRAPHIC RISK DETERMINATION

United Kingdom:
Defer 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.
Refer to vCJD Risk Map of the United Kingdom for more detailed location information.

France:
Defer if donor spent a total of 5 years or more in France since 1/1/1980. OR
If donor received a transfusion in France any time since 1/1/1980.
Refer to vCJD Risk Map of France for more detailed location information.

Europe:
Defer if donor spent a total of 5 years or more in Europe since 1/1/1980.
Refer to vCJD Risk Maps of Northern and Southern Europe for more detailed location information.

U.S. Military Base: Northern Europe:
Defer if donor resided on a U.S. military base for 6 months or more from 1/1/1980 through 12/31/1990.
Refer to vCJD Risk Map of U.S. Military Bases in Europe for more detailed location information.

U.S. Military Base: Southern Europe:
Defer if donor resided on a U.S. military base for 6 months or more from 1/1/1980 through 12/31/1996.
Refer to vCJD Risk Map of U.S. Military Bases in Europe for more detailed location information.

NOTE: The Armed Services Blood Program does not consider or count time aboard ship in the Mediterranean as time in Europe for purposes of vCJD donor deferrals.

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Geographic information from several sources were used in the production of this map. Location and boundary information is based on sources provided, 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 information available.
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.

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VCJD RISK: FRANCE

For vCJD screening France includes its overseas departments of French Guiana, Guadeloupe, Martinique, Mayotte, and Réunion.
VCJD RISK: NORTHERN EUROPE

European countries with vCJD risk include: Albania, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Republic of Ireland, Italy, Liechtenstein, Luxembourg, Netherlands (Holland), Republic of North Macedonia (Macedonia), Norway, Poland, Portugal (including the Azores), Romania, Slovak Republic (Slovakia), Slovenia, Spain (including the Canary Islands and Spanish North African Territories), Sweden, Switzerland, and the former Federal Republic of Yugoslavia (Serbia, Montenegro, and Kosovo).
VCJD RISK: SOUTHERN EUROPE

European countries with vCJD risk include: Albania, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Republic of Ireland, Italy, Liechtenstein, Luxembourg, Netherlands (Holland), Republic of North Macedonia (Macedonia), Norway, Poland, Portugal (including the Azores), Romania, Slovak Republic (Slovakia), Slovenia, Spain (including the Canary Islands and Spanish North African Territories), Sweden, Switzerland, and the former Federal Republic of Yugoslavia (Serbia, Montenegro, and Kosovo).

Geographic information from several sources were used in the production of this map. Location and boundary information is based on sources provided. 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 information available.
VCJD RISK: U.S. MILITARY BASES IN EUROPE

U.S. Military Bases in Northern Europe (risk from 1/1/1980 through 12/31/1990) were located in Belgium, Germany, the Netherlands, and the United Kingdom.

U.S. Military Bases in Southern Europe (risk from 1/1/1980 through 12/31/1996) were located in Greece, Italy, Portugal (Azores), Spain, as well as Turkey.

NOTE: The Armed Services Blood Program does not consider or count time spent by military personnel aboard U.S. Naval ships in the Mediterranean as time in Europe for purposes of vCJD donor deferrals.