衞生防護中心
Centre for Health Protection

Scientific Committee on Vector-borne Diseases

Global Malaria Risk Summary October 2014

Introduction

Malaria is a notifiable disease in Hong Kong. Since 1998, annual malaria notifications ranged from 20 to 55 cases and the vast majority of these cases were imported from outside Hong Kong. The last local indigenous malaria case was reported in 1998, yet there was no definite source of infection identified.

2. Based on an initial discussion on malaria epidemiology, the Scientific Committee on Vector-borne Diseases (the Committee) developed the ñGuidelines on Malaria Chemoprophylaxis for Travellers from Hong Kongò for reference by healthcare professionals.

3. In support of the Guidelines, the Committee also compiled the malaria risk of various countries or administrative areas for healthcare professionals' reference in October 2010. The Committee recommended this ñGlobal Malaria Risk Summaryò (the Risk Summary) be updated and reviewed on an annual basis at the Committee meetings. This paper highlights the major changes in the global malaria epidemiology in the past one year.

Objectives

4. This document serves to provide general reference for healthcare professionals in their management of potential travellers to areas with malaria risk. It is to be used together with the ñGuidelines on Malaria Chemoprophylaxis for Travellers from Hong Kongò, published by the Committee which is available in the website of the Centre for Health Protection of the Department of Health.

Methods and Explanatory Notes

5. Understanding the global distribution of areas with malaria risk relies on accurate disease and laboratory surveillance information supplied by various countries and administrative areas. Apart from the World Health Organization (WHO), the health authorities in the United States (US), the United Kingdom (UK), and Canada also compile malaria epidemiology information together with recommendation for outbound travellers.

6. This Risk Summary is compiled based on the epidemiology information as well as malaria prevention strategies recommended by these health authorities. While information on malaria risk published by these overseas health authorities most often concurs, there may be different levels of details and occasional discrepancies among different sources. To allow for a better assessment of the risks, the details of such discrepancies are described in the Risk Summary. Nonetheless, as a general principle, even in countries with malaria risk, the risk of malaria infection is generally lower in areas with altitudes greater than 2,000 m or in well-developed city areas.

7. As regards the recommendation, it is notable that mosquito-bite prevention is highlighted in all authorities. There are also changes in the recommendation regarding chloroquine-resistant malaria. In the latest version of its guideline, WHO states that *P. falciparum* resistance to chloroquine is nearly universal. It removed the malaria risk category type III, which referred to ñrisk of *P. vivax* and *P. falciparum* malaria transmission, combined with emerging chloroquine resistanceò. It now recommends chemoprophylaxis by atovaquone-proguanil, doxycycline, or mefloquine for all countries with reported chloroquine-resistant malaria. On the other hand, UK still recommends using chloroquine plus proguanil for chemoprophylaxis in travelers visiting areas with little chloroquine resistance, and atovaquone-proguanil, doxycycline or mefloquine in areas with high risk of chloroquine resistance.

8. In order to better reflect the current epidemiology and recommendations, we have developed a set of risk and recommendation categories. A total of five main categories of risk levels with the respective recommended malaria prevention approaches are defined as shown in **Annex 1**. **Annex 2** shows the Risk Summary with the respective risk and recommendation categories for each country or administrative area. Additional accounts of the specific risk descriptions together with the discrepancy of risk information among different sources are given to allow for a better understanding and risk assessment of the situation. **Annex 3** summarizes the risk and recommendation profiles of the countries or administrative areas in the six WHO regions.

Updates from October 2013 to October 2014

9. Over the past year, the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC) of US and the Public Health England (PHE) of UK provided updated malaria situation and recommendations on malaria prevention for travellers. From time to time, WHO, US CDC, UK PHE and the Public Health Agency of Canada issued updated reports on malaria outbreaks. **Annex 2** of this document has been updated accordingly with the changes detailed below.

Major Outbreak Reports

10. Over the past year, no major change in malaria burden has been reported.

11. US CDC provided an update on malaria cases in Egypt as of 14 August 2014. From late May to mid June 2014, there were 19 cases of locally-acquired *P. vivax* malaria in one village of the Aswan Governorate.

Updates in the Global Malaria Risk Summary for Countries with Change in Risk Category and Recommendation

12. This year, seven countries namely Azerbaijan, the Bahamas, Georgia, Jamaica, Kyrgyzstan, Sri Lanka and Uzbekistan have their malaria risk categories and recommendations revised.

13. The malaria risk of Azerbaijan has changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñMalaria risk reported to be very limited (risk category: 2)ò. According to WHO, malaria risk due exclusively to *P. vivax* exists from June to October in lowland areas, mainly in the area between the Kura and Arax rivers. There has been no locally acquired case in 2013, and chemoprophylaxis is not recommended. According to UK, there is low to no risk of malaria, and only mosquito bite avoidance is needed. According to US CDC, low risk of malaria exists from May to October in rural areas <1500m, and only mosquito avoidance is recommended. Although Canada recommended chloroquine chemoprophylaxis in its guideline in 2009, the guideline has not been updated in recent years. Furthermore, in its notes, the Canadian authority recommended that travel health practitioners should keep abreast of potential changes by regular monitoring of the WHO and US CDC information. As such, the malaria risk and recommendation are changed to 2 and II respectively.

14. The malaria risk of the Bahamas has changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñNo malaria risk (risk category: 1)ò. According to WHO and US CDC, there is no malaria transmission in the Bahamas. There is also no risk of malaria in the Bahamas according to UK. Although Canada stated that ñintermittent rare cases have been reported in Greater Exuma Islandò, it also added ñthe risk is very limited; therefore, prophylaxis is not recommendedò in its guideline in 2009. As such, the malaria risk and recommendation are changed to 1 and I respectively.

15. The malaria risk of Georgia has changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñMalaria risk reported to be very limited (risk category: 2)ò. According to WHO, limited malaria risk due exclusively to *P. vivax* may exist from June to October in the eastern part bordering Azerbaijan, and chemoprophylaxis is not recommended. According to UK, the malaria risk is very low in the rural southeast from June to October while no risk exists during the rest of the year. As such, only mosquito bite avoidance is recommended. US CDC stated that no malaria transmission exist in Georgia. Although Canada mentioned that malaria risk existed in areas in the southeastern part of the country and recommended chloroquine chemoprophylaxis in its guideline in 2009, the document has not been updated in recent years. As such, the malaria risk and recommendation are changed to 2 and II respectively.

16. The malaria risk of Jamaica has changed from ñMalaria risk reported to be very limited (risk category: 2)ò to ñNo malaria risk (risk category: 1)ò. WHO and UK reported no risk of malaria in Jamaica in their updated guidelines. According to US CDC, there was also no malaria transmission in Jamaica. Although Canada reported very limited risk of malaria in Kingston, Jamaica and recommended prophylaxis with chloroquine in 2009, the document has not been updated in recent years. As such, the malaria risk and recommendation are changed to 1 and I respectively.

17. The malaria risk of Kyrgyzstan has changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñMalaria risk reported to be very limited (risk category: 2)ò. According to WHO, malaria risk due exclusively to *P. vivax* exists from June to October in some southern and western parts of the country, mainly in areas bordering Tajikistan and Uzbekistan and in the outskirts of Bishkek. No locally acquired case has been reported between 2011 and 2013, only mosquito bite prevention is recommended. According to UK, very low risk of malaria exists in the southwest areas bordering Tajikistan and Uzbekistan from June to October and only bite prevention is necessary. According to US CDC and Health Canada, there is no malaria risk in Kyrgyzstan. As such, the malaria risk and recommendation are changed to 2 and II respectively.

18. The malaria risk of Sri Lanka has changed from ñEmerging chloroquine-resistant malaria exists in certain area (risk category: 4C)ò to ñRisk of chloroquine-resistant malaria exists in certain areas (risk category: 4B)ò. WHO has removed the risk category of ñEmerging chloroquine-resistanceò in its updated guideline, due to the fact that *P. falciparum* resistance to chloroquine is new considered nearly universal. Regarding the malaria risk, WHO now describes it as ñlimitedò, with no locally acquired case reported in 2013. Furthermore, while UK and WHO no longer recommend chemoprophylaxis in Sri Lanka in their guidelines, US and Canada still advise chemoprophylaxis for all areas in Sri Lanka except Colombo, Galle, Gampaha, Kalutara, Matara and Nuwara Eliya. As such, the malaria risk is changed to 4B while the recommendation remains to be IV.

19. The malaria risk of Uzbekistan has changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñMalaria risk reported to be very limited (risk category: 2)ò. According to WHO, limited malaria risk due to *P. vivax* exists from June to October in some villages located in the southern and eastern parts of the country bordering Afghanistan, Kyrgyzstan and Tajikistan. No locally acquired cases were reported between 2011 and 2013, and only mosquito bite prevention is recommended. According to UK, very low malaria risk exists in the extreme southeast of the country and only mosquito bite avoidance is recommended. US CDC as well as Health Canada both stated that no malaria risk exist in Uzbekistan. As such, the malaria risk and recommendation are changed to 2 and II respectively.

<u>Updates in the Global Malaria Risk Summary for Countries with Proposed Change in Risk Category and Recommendation</u>

20. This year, two countries namely Democratic Peopleôs Republic of Korea (North Korea) and Republic of Korea (South Korea), are proposed to have their malaria risk categories and recommendations revised.

21. The malaria risk of Democratic Peopleôs Republic of Korea (North Korea) is proposed to be changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñMalaria risk reported to be very limited (risk category: 2)ò. WHO stated that limited malaria risk due exclusively to *P. vivax* exists in some southern areas. It only recommended mosquito bite prevention. UK also stated that very low malaria risk exist in some southern areas and recommended bite avoidance only. On the other hand, US stated that malaria risk is present in the southern provinces, but there is no data to quantify the magnitude of the risk. Chemoprophylaxis is recommended in those areas. Canada also recommended chemoprophylaxis, and stated that limited malaria risk exists. Since the risk of malaria is very limited according to these guidelines, the malaria risk and recommendation are proposed to be changed to 2 and II respectively

22. The malaria risk of Republic of Korea (South Korea) is proposed to be changed from ñRisk of chloroquine-sensitive malaria exists in certain areas (risk category: 3B)ò to ñMalaria risk reported to be very limited (risk category: 2)ò. WHO stated that limited malaria risk due to *P. vivax* exists mainly in the northern areas of Gangwon-do and Gyeonggi-do, as well as in Incheon City towards the demilitarized zone. It recommended mosquito bite prevention only. UK also stated that malaria risk is very low and recommended mosquito bite avoidance only. On the other hand, US recommended chemoprophylaxis from March to December in the rural areas of northern Incheon, Gangwon-do and Gyeonggi-do, but added that the malaria risk is low. Canada recommended chemoprophylaxis in these areas throughout the year in its guideline in 2009. Since the risk of malaria is very limited according to guidelines from WHO, UK and the US, the malaria risk and recommendation are proposed to be changed to 2 and II respectively.

<u>Other Updates in the Global Malaria Risk Summary for countries without Change in Risk Category and Recommendation</u>

23. A total of 40 countries/administrative areas distributed in the six WHO regions have updates in the risk descriptions about the geographical and seasonal distribution, altitude, predominant species and resistance pattern of malaria. Nonetheless, there is no change in their risk categories and recommendations. The following summarizes the changes with respect to each of the WHO Regions.

(1) African Region: Eight of the 47 countries/areas in the region have their risk descriptions updated. They are Algeria, Botswana, Cape Verde, Congo, Mayotte (French territorial collectivity), South Africa, Swaziland and Zimbabwe.

- For Algeria, WHO updated to figure from ñfive local cases of *P. falciparum* transmission reported in 2010ò to ñ59 local cases of *P. falciparum* and *P. vivax* transmission reported in 2012ò.

- For Botswana, ñLow to no risk in the southern half of the countryò is added according to the UK guideline.

- For Cape Verde, WHO has updated the figure from ñ18 locally acquired cases reported in 2010ò to ñ1 locally acquired case reported in 2012ò.

- For Congo, the prevalence of malaria species is updated to ñ*P. falciparum* 90%, *P. ovale* 5-10% and rarely *P. vivax*ò according to US CDC.

- For Mayotte (French territorial collectivity), the prevalence of malaria species ñ*P. falciparum* (40-50%), *P. vivax* (35-40%), *P. ovale* (<1%)ò is added according US CDC.

- For South Africa, UK has revised the risk of malaria in the low altitude areas of Mpumalanga and Limpopo provinces from ñhighò to ñmoderateò and added ñfrom September to May onlyò. On the other hand, US CDC and Canada stated that malaria risk is throughout the year in these areas. WHO also stated that malaria risk exists throughout the year, being ñhighest from October to Mayò. As such, the period with highest risk is revised to ñfrom September to Mayò in accordance to the UK guideline.

- For Swaziland, the update by WHO added the description that ñRisk is highest from November to Mayò.

- For Zimbabwe, the description of ñthe risk is high in areas below 1200m from November to June; and low during the rest of the year. The risk is throughout the year in the Zambezi valley, and very low risk exists in Bulawayo and Harareò is added in view of updated risk descriptions from UK and WHO.

(2) Region of the Americas: The prevailing species of malaria parasites and the areas at risk for contracting malaria in 13 out of the 46 countries/areas in the Americas have been updated. They are Argentina, Belize, Brazil, Columbia, Costa Rica, Dominican Republic, Ecuador, Guyana, Haiti, Honduras, Mexico, Peru and Venezuela.

- For Argentina, the malaria risk area is updated to ñDepartments of Oran and San Martin in Salta Province in the north, and to a lesser extend to Chaco, Corrientes and Misiones Provincesò and ñRural areas in northern Jujuy Provinceò according to the guidelines by WHO and US CDC.

- For Belize, WHO has revised the areas at risk from ñRisk is moderate in Stan Creek and Toledo Districts; and low in Cayo, Corozal and Orange Walkò to ñMalaria risk due predominant to *P. vivax* presents in some areas of Stann Creek and negligible elsewhereò. The recommendation by WHO was downgraded from ñmosquito bite prevention and chloroquine chemoprophylaxisò to ñmosquito bite prevention onlyò. On the other hand, the US CDC still considered malaria risk to be present in all areas, especially in the districts of Cayo, Stann

Creek, and Toledo and recommended chemoprophylaxis in these areas. In view of this, the area at risk is revised to ñAll districts but varies within regions. Risk is present especially in Cayo, Toledo and Stan Creek Districts. No risk in Belize City and islands frequented by tourists.ò

- For Brazil, the prevalence of malaria species is changed from ñ*P. vivax* (84%) and *P. falciparum* (15%)ò to ñ*P. vivax* (86%) and P. falciparum (13%)ò based on update by WHO. Furthermore, the description of areas with higher transmission intensity is revised from ñé in jungle areas of mining, agricultural settlements less than 5 years old, and in some peripheral urban areas of Cruzeiro do Sul, Manaus and Pôrto Velhoò to ñé in jungle areas of mining, agricultural settlements, indigenous areas, and in some peripheral urban areas of Cruzeiro do Sul, Manaus and Pôrto Velhoò according to revised description from WHO.

- For Colombia, the prevalence of malaria species is changed from ñ*P. vivax* (72%) and *P. falciparum* (27%)ò to ñ*P. vivax* (73%) and *P. falciparum* (27%)ò according to data in WHO World Malaria Report 2013. *P. falciparum* resistant to chloroquine is no longer limited to Amazonia, Pacífico and Urabá-Bajo Cauca according to WHO. The area at risk of contracting chloroquine-resistant malaria is revised from ñé especially in municipalities of the regions of Amazonia, Orinoquía, Pacífico and Urabá-Bajo Cauca. Transmission intensity varies by department, with the highest risk in Antioquia, Amazonas, Chocó, Córdoba, Guaviare, La Guajira, Nariño and Vichada. *P. falciparum* exists in Amazonia, Pacífico and Uraba-Bajo Cauca.ò to ñé risk is high in some municipalities of the Departments of Antioquia, Bolivar, Cauca, Choco, Cordoba, Guajira, Narino, and Risaralda. At a lower level, risk is also present in some municipalities of Amazonas, Caqueta, Guaviare, Guainia, Meta, Putumayo, Vaupes, and Vichadaò in accordance to update by WHO.

- For Costa Rica, WHO described ñvery low risk in the canton of Matina, Limón Provinceò and ñnegligible or no riskò in the rest of the country. Both WHO and US recommended only mosquito bite prevention and no need for chemoprophylaxis for the whole country, while UK still advocated chloroquine chemoprophylaxis in the Limón Province. Although the Canadian guideline included Alajuela, Limón, Guanacaste and Heredia provinces as areas at risk, the document has not been updated since 2009. As such, the provinces of Alajuela,

Guanacaste and Heredia are removed from the risk description.

- For Dominican Republic, the description of at risk area is rephrased as ñIn all areas (including resort areas), except none in the cities of Santiago and Santo Domingoò, and ñthere is risk especially in the western provinces of Dajabón, Elias Pina, San Juan, as well as rural areas bordering Haiti. Risk is also present in La Altagracia provinceò for easier understanding.

- For Ecuador, the prevalence of malaria species is changed from ñ*P. vivax* (87%) and *P. falciparum* (13%)ò to ñ*P. vivax* (86%) and *P. falciparum* (14%)ò based on update by WHO. ñMalaria risk due to *P. falciparum* is higher in Esmeraldas Provinceò is added in the risk description according to update by WHO.

- For Guyana, the prevalence of malaria species is changed to ñ*P. falciparum* (53%), *P. vivax* (36%) and mixed infections (11%)ò according to WHO. The description of risk area is revised from ñHighest risk occurs in Regions 1, 2, 4, 7, 8, 9 and 10; and very low risk in Regions 3, 5 and 6ò to ñHighest risk occurs in Regions 1, 7, 8 and 9; and very low risk in Regions 3, 4, 5 and 6ò according to update by WHO.

- For Haiti, the description of ñno falciparum resistance to chloroquine reportedò was added according to the guideline by WHO.

- For Honduras, the prevalence of malaria species is changed to ñ*P. vivax* (91%), *P. falciparum* (8.5%) and mixed infections (0.5%)ò according to WHO. For the risk description, Islas de la Bahia and Valle are no longer listed as having moderate or high transmission risk of P. vivax; Atlantida and Islas de la Bahia are no longer listed as having *P. falciparum* case according to update by WHO.

- For Mexico, the risk of contracting malaria in the state of Chiapas is changed from moderate to low in view of updates by WHO and UK.

- For Peru, the prevalence of malaria species is changed to ñ*P. vivax (87*%), *P. falciparum* (13%) according to update by WHO. The departments of Junin, San Martin and Tumbes are removed from, while the department of Pasco is added to the areas with the highest risk for chloroquine-resistant malaria according to

update by WHO. The department of Loreto now contains 17 instead of 18 of the highest-risk districts in the country for *P. falciparum* infection according to update by WHO.

- For Venezuela, Angostura is added to the areas with risk of falciparum malaria transmission according to update by WHO. Although UK still considered the states of Apure, Monagas, Sucre and Zulia to have little chloroquine-resistance and recommended chloroquine plus atovaquone, WHO, US and Canada stated that chloroquine resistance exist in these states. As such, the description that these states have ñEmerging chloroquine-resistant malariaò is removed.

(3) Eastern Mediterranean Region: Six of the 22 countries/areas in the region have their risk descriptions updated. They are Egypt, Islamic Republic of Iran, Iraq, Oman, Pakistan and Syrian Arab Republic (Syria).

- For Egypt, US CDC reported 19 locally transmitted cases of *P. vivax* malaria in Aswan Governorate from May to June 2014. This information is added to the risk description. The statement of ñno indigenous cases reported since 1998ò is removed as a result.

- For Islamic Republic of Iran, the malaria risk due to *P. falciparum* is very limited according to update by WHO. Thus, ñvery limited risk due to *P. falciparum*ò is added to the risk description of Islamic Republic of Iran. Although UK recommended chloroquine plus atovaquone in all areas with malaria risk in Islamic Republic of Iran, implying the existence of little chloroquine resistance, WHO, US and Canada consider chloroquine resistance to be established in these areas. As such, the description for ñEmerging chloroquine-resistant malariaò is removed.

- For Iraq, the risk description is updated to ñlimited risk due exclusively to *P. vivax* may existò according to WHO.

- For Oman, the description of ñSporadic transmission in Ad Dakhliyah, North Batinah, and North and South Ash Sharqiyah. None in the city of Muscatò is added according to update by US CDC. Local cases were reported in 2012 according to update by WHO. The risk description by UK is removed because UK deleted Oman from the list of countries with malaria transmission in its latest update.

- For Pakistan, the description that the risk for malaria is ñespecially in rural areas from July to Decemberò is added according to update by WHO.

- For Syrian Arab Republic (Syria), the description that ñthe reporting system has been disrupted since 2010ò is added according to update by WHO.

(4) European Region: Two of the 53 countries/areas in the region have their risk descriptions updated. They are Tajikistan and Turkey.

- For Tajikistan, *P. falciparum* resistant to sulfadoxine / pyrimethamine was no longer reported according to update by WHO. The altitude at risk of malaria is revised from ñbelow 2500mò to ñbelow 2000mò according to US and UK guideline. Furthermore, the description ñthere is a low risk of malaria in areas below 2,000m during the rest of the yearò is added according to update by UK.

- For Turkey, the areas at risk of malaria transmission remain unchanged. The description that ñthe risk is low from May to October, and very low during the rest of the yearò is added according to update by UK and WHO. According to WHO, a few sporadic cases were reported in 2010, 2011 and 2013.

(5) South-east Asia Region: Four of the 11 countries in the region have updated their at-risk areas and anti-malarial resistance/tolerance pattern. They are Bangladesh, Bhutan, India and Nepal.

- For Bangladesh, the area at risk of malaria transmission is revised to ñtransmission occurs only in rural areas in 13 of 64 districts. High risk in Chittagong Hill Tract districts (Bandarban, Rangamati and Khagrachari), Chittagong district and Cox Bazaar district. Low risk exists in the districts of Hobigonj, Kurigram, Moulvibazar, Mymensingh, Netrakona, Sherpur, Sunamgonj and Sylhet. Most parts of the country, including Dhaka city, have no risk of malariaò according to guideline by WHO and UK.

- For Bhutan, the area at risk of malaria remains unchanged compared to last year. However, it is noticed that different guidelines used different names to refer to the same district. Therefore the list of districts at risk is revised to ñChukha,

Dagana, Chirang, Pemagatshel, Samtse (Samchi), Samdrup Jongkhar, Sarpang (Geyleg-phug) and Zhemgang (Shemgang)ò for better understanding.

- For India, a summary of the updated recommendation by UK is included. The updated UK guideline considered the risk of malaria to be high enough to justify chemoprophylaxis in the states of Assam, Orissa, and parts of the states of Andhra Pradesh (districts of East Godavari, Srikakulam, Vishakhapatnam and Vizianagaram) and Madhya Pradesh (districts of Balaghat, Dindori, Mandla and Seoni). For the rest of India including Goa and the Andaman and Nicobar Islands, it no longer considered chemoprophylaxis to be routinely justified. On the other hand, the recommendations by Canada, US and WHO were not changed and still recommended chemoprophylaxis over a larger area of the country. The altitude of ñarea >2000mò is added to better specify areas with no transmission in Himachal Pradesh, Jammu and Kashmir, and Sikkim, according to the US guideline.

- For Nepal, the risk description by WHO is revised to ñin rural areas of the 20 Terai districts bordering Indiaò and ñseasonal transmission of *P. vivax* takes place in 45 districts of the inner Terai and mid-hillsò. The description by Canada ñbelow 1,200m in rural areas in the Tarai and Hill districts bordering India and in the inner Tarai valley areas of Udaypur Sindhupalchowk, Makwanpur, Chitwan and Dangò is added.

(6) Western Pacific Region: Seven of the 34 countries/areas in the region have their risk description updated. It is Cambodia, China, Lao Peopleôs Democratic Republic, Malaysia, the Philippines, Singapore and Viet Nam (Vietnam).

- For Cambodia, the update by UK considered Siem Reap city to be at very low risk of malaria transmission and did not recommend chemoprophylaxis. WHO also considered the city not at risk of malaria transmission. However, the US guideline still considered Siem Reap to be at low risk of mefloquine-resistant malaria and recommended chemoprophylaxis. In view of this, Siem Reap is added to the areas with low to negligible risk for malaria transmission.

- For China, the description of areas at risk of malaria is revised in accordance to the guidelines by WHO, US, UK for easier understanding. Risk of *P. falciparum* malaria exists in

Yunnan, and to a lesser extent, in Hainan provinces. Mefloquine-resistant *P. falciparum* exists in Western Yunnan along China-Myanmar border. Chloroquine-sensitive malaria exists in rural southern and some central provinces including Anhui, Guizhou, Henan, Hubei and Jiangsu. Urban areas carry no malaria risk, while the risk is very low at popular tourist areas and Yangtze River cruises, where chemoprophylaxis is not necessary.

- For Lao People's Democratic Republic, the overall risk description is revised as ñHigh risk of malaria in the whole country except in Vientiane where there is low to no riskò in accordance to update by UK. The area where mefloquine-resistant malaria exists remains unchanged.

- For Malaysia, the area at risk of chloroquine-resistant malaria is revised as ñrisk is high in limited foci in the deep hinterland of Malaysian Borneo (inland areas of eastern Sabah and inland forested areas of Sarawak), and to a lesser extend in the inland forested areas of peninsular Malaysiaò according to the guidelines by WHO and UK.

- For the Philippines, Mindoro is removed from the areas with no malaria risk, as the guidelines by UK and US both reported malaria risk to exist.

- For Singapore, the risk description is updated as ñHuman *P. knowlesi* infection was reported in 2007 and 2008ò. US CDC, UK and Health Canada stated that there is no malaria risk in Singapore. While WHO stated the risk of human *P. knowlesi* infection, it recommended mosquito bite prevention only. As such, the risk category for Singapore remains to be ñMalaria risk reported to be very limited (risk category: 2)ò and recommendation remains to be II.

- For Viet Nam (Vietnam), Can Tho and Hue are removed from the areas with no malaria risk, in accordance to the US guideline.

Limitation and disclaimers

24. The information presented in this paper is quoted from the following reports:

(a). WHO. International travel and health 2012 edition (2014 updates), Country list: yellow fever vaccination requirements and recommendations; and malaria situation.

(b). Centers for Disease Control and Prevention. Health Information for International Travel 2014 ï The Yellow Book. Atlanta: US Department of Health and Human Services, Public Health Service.

(c). (i) Public Health England. Guidelines for malaria prevention in travellers from the UK 2014, July 2014.
(ii) National Travel Health Network and Centre (NaTHNaC) Website [commissioned by the Public Health England].

(d). Public Health Agency of Canada. Canadian Recommendations for the Prevention and Treatment of Malaria among International Travellers, July 2009.

25. While great efforts have been made to ensure that the epidemiology information in this Risk Summary is maintained as up-to-date as possible, disease situation may change rapidly over time. Moreover, under-reporting and delayed reporting of the disease in various countries or administrative areas included in the Risk Summary may affect the timeliness of malaria risk assessment. Healthcare professionals are advised to review the latest outbreak situations when necessary.

Feedbacks and Enquiries

26. This Risk Summary will be updated in the fourth quarter of 2015. Any feedbacks and enquiries are welcome to be sent to the Centre for Health Protection.

Annexes

Annex 1: Key to the Global Malaria Risk Summary
Annex 2: Global Malaria Risk Summary (As of 15 October 2014)
Annex 3: Risk Profile Statistics

Centre for Health Protection
October 2014

Key References

World Health Organization

1. WHO. International travel and health 2012 edition (2014 updates), List of countries, territories and areas: yellow fever vaccination requirements and recommendations; malaria situation; and other vaccination requirements [Cited 2014 October 15]. Available at: http://www.who.int/ith/ith_country_list.pdf

United States

2. Centers for Disease Control and Prevention. *Health Information for International Travel 2014 – The Yellow Book*. Atlanta: US Department of Health and Human Services, Public Health Service. [Cited 2014 October 15]. Available at: http://wwwnc.cdc.gov/travel/yellowbook/2014/chapter-3-infectious-diseases-related-to-travel/travel-vaccines-and-malaria-information-by-country

United Kingdom

3. Public Health England. *Guidelines for malaria prevention in travellers from the UK 2014*, July 2014. [Cited 2014 October 15]. Available at: https://www.gov.uk/government/publications/malaria-prevention-guidelines-for-travellers-from-the-uk

Canada

4. Public Health Agency of Canada. Canadian Recommendations for the Prevention and Treatment of Malaria among International Travellers, July 2009. Volume 35S1 [Cited 2014 October 15]. Available at http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s1/index-eng.php

Reference Websites for Updated Epidemiology on Malaria

i. World Health Organization. News on Malaria. Available from: http://www.who.int/topics/malaria/news/en/index.html

ii. Centers for Disease Control and Prevention, US. Travelerôs Health: Outbreak. Available from: http://wwwn.cdc.gov/travel/default.aspx

iii. National Travel Health Network and Centre, UK. Travellers: News by topic ï Malaria. Available from: http://www.nathnac.org/UpdatesListForm.aspx?levelone=travel&leveltwo=news&disease=Malaria&display=all

iv. National Travel Health Network and Centre, UK. Health professionals: Clinical Updates
Available from: http://nathnac.org/pro/index.htm

v. Public Health Agency of Canada. Travel Health: Notice and International Reports.
Available from:
http://www.phac-aspc.gc.ca/tmp-pmv/notices-avis/index-eng.php

vi. The Travel Health Service, Department of Health, Hong Kong.
Available from: http://www.travelhealth.gov.hk/

vii. Guidelines on Malaria Chemoprophylaxis for Travellers from Hong Kong. Scientific Committee on Vector-borne Diseases. Centre for Health Protection, Department of Health, Hong Kong.
Available from:
http://www.chp.gov.hk/files/pdf/Guidelines_on_Malaria_Chemoprophylaxis_for_Travellers_from_Hong_Kong.pdf

Annex 1: Key to Global Malaria Risk Summary

Risk Category	General Description of the Risk	Recommendation	Recommendation Description
1	**No malaria risk** (as reported by WHO, US CDC, UK PHE and Health Canada)	**I**	General precaution during travel
2	**Malaria risk reported to be very limited**	**II**	Malaria prevention may be required ➢ Advise to undertake mosquito bite prevention. ➢ Obtain update on latest epidemiology.
3	**Risk of chloroquine-sensitive malaria only** **3A**: *Risk of malaria exists in the whole administrative area* **3B**: *Risk of malaria exists in certain areas*	**III**	Malaria prevention recommended ➢ Advise to undertake mosquito bite prevention. ➢ When travel to at-risk areas, consider chemoprophylaxis using chloroquine.
4	**Chloroquine-resistant malaria have been reported** **4A:** *Risk of malaria exists in the whole administrative area* **4B:** *Risk of malaria exists in certain areas* **4C***: Emerging chloroquine-resistant malaria exists in certain areas*	**IV**	Malaria prevention recommended ➢ Advise to undertake mosquito bite prevention. ➢ When travel to areas at risk of chloroquine-resistant malaria, consider chemoprophylaxis using atovaquone/proguanil, doxycycline, or mefloquine. ➢ When travel to areas at risk of emerging chloroquine-resistant malaria, consider chemoprophylaxis using chloroquine + proguanil (recommended by WHO and UK PHE) or atovaquone/proguanil, doxycycline, or mefloquine (recommended by US CDC and/or Health Canada). ➢ When travel to areas at risk of chloroquine-sensitive malaria, consider chemoprophylaxis using chloroquine.

Risk Category	General Description of the Risk	Recommendation	Recommendation Description
5	**Malaria resistant to both chloroquine and mefloquine have been reported** **5A**: *Risk of malaria exists in the whole administrative area* **5B**: *Risk of malaria exists in certain areas*	**V**	Malaria prevention recommended ➢ Advise to undertake mosquito bite prevention. ➢ When travel to areas at risk of mefloquine-resistant malaria, consider chemoprophylaxis using atovaquone/proguanil or doxycycline, BUT NOT mefloquine. ➢ When travel to areas at risk of chloroquine-resistant malaria, consider chemoprophylaxis using atovaquone/proguanil, doxycycline, or mefloquine.

Annex 2: Global Malaria Risk Summary (As of 15 October 2014)

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Algeria**	2	Malaria risk is limited. At-risk area: - Small foci of local transmission of *P. vivax* have previously been reported in the 6 southern and south-eastern wilayas (Adrar, El Oued, Ghardaia, Illizi, Ouargla, and Tamanrasset). - 59 local cases of *P. falciparum* and *P. vivax* transmission reported in 2012 in areas under the influence of trans-Saharan migration.	II
African	**Angola**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Benin**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Botswana**	4B	Malaria risk predominantly due to *P. falciparum* exists. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in the northern provinces of the country: Bobirwa, Boteti, Central, Chobe, Ghanzi, Ngamiland, the Okavango Delta area, the Tutume districts/sub-districts, and North West district from November to June. - No risk in the city of Gaborone and Francistown. Low to no risk in the southern half of the country.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Burkina Faso**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Burundi**	4A	Malaria risk predominantly due to *P. falciparum* (86%) exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Cameroon**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Cape Verde**	2	Limited malaria risk, due predominantly to *P. falciparum*, exists from August to November inclusive. *P. falciparum* resistant to chloroquine reported. At-risk area: - In São Tiago Island and Boa Vista Island from August through November. 1 locally acquired cases reported in 2012.	II
African	**Central African Republic**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Chad**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Comoros**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Congo**	4A	Malaria risk due to *P. falciparum* (90%), *P. ovale* (5-10%) and rarely *P. vivax*, exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Cote d'Ivoire (Ivory Coast)**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Democratic Republic of the Congo (formerly Zaire)**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Equatorial Guinea**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Eritrea**	4B	Malaria risk due to *P. falciparum* and *P. vivax* exists throughout the year. Resistance to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas below 2,200 m. - No risk in Asmara.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Ethiopia**	4B	Malaria risk, due to *P. falciparum* (60%ï 70%), *P. vivax* (30%ï 40%), and rarely *P. malariae* and *P. ovale*, exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. *P. vivax* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: In all areas below 2,500 m. - No risk in Addis Ababa.	IV
African	**Gabon**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Gambia**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Ghana**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Guinea**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Guinea-Bissau**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Kenya**	4B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistance to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: In all areas below 2,500 m. - There is normally little risk in the city of Nairobi and in the highlands (above 2,500 m) of Central, Eastern, Nyanza, Rift Valley and Western provinces.	IV
African	**Lesotho**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
African	**Liberia**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Madagascar**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: -Chloroquine-resistant malaria: in all areas, with the highest risk in the coastal areas.	IV
African	**Malawi**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Mali**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Mauritania**	4B	Malaria risk predominantly due to *P. falciparum* exists. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in Adrar and Inchiri during the rainy season from July through October. Throughout the year in all other areas in the country except in the northern areas of Dakhlet-Nouadhibou and Tiris-Zemour.	IV
African	**Mauritius**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
African	**Mayotte (French territorial collectivity)**	4A	Malaria risk due to *P. falciparum* (40-50%), *P. vivax* (35-40%), *P. ovale* (<1%), exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Mozambique**	4A	Malaria risk, due to *P. falciparum* (90%), and rarely *P. malariae*, *P. ovale* and *P. vivax*, exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
African	**Namibia**	4B	Malaria risk predominantly due to *P. falciparum* exists. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in the regions of Ohangwena, Omaheke, Omusati, Oshana, Oshikoto and Otjozondjupa from November to June. Throughout the year along the Kunene river and in Caprivi and Kavango regions.	IV
African	**Niger**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Nigeria**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV
African	**Rwanda**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV
African	**Sao Tome and Principe**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV
African	**Senegal**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas. Less risk in the central western regions from January through June.	IV
African	**Seychelles**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
African	**Sierra Leone**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**South Africa**	4B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in the low altitude areas of Mpumalanga Province (including the Kruger National Park), Northern Province (Limpopo) and north-eastern KwaZulu-Natal as far south as the Tugela River. The risk is highest from September to May.	IV
African	**Swaziland**	4B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in the northern and eastern areas bordering Mozambique and South Africa, including all of the Lubombo district and the eastern half of Hhohho, Manzini and Shiselweni districts (mainly Big Bend, Mhlume, Simunye and Tshaneni). Risk is highest from November to May. - Very low risk in the west of the country.	IV
African	**Tanzania, United Republic of**	4B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas below 1,800 m, and in Zanzibar.	IV
African	**Togo**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
African	**Uganda**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas including the main towns of Fort Portal, Jinja, Kampala, Mbale and Kigezi.	IV
African	**Zambia**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas including Lusaka.	IV
African	**Zimbabwe**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas. The risk is high in areas below 1200m from November to June; and low during the rest of the year. The risk is throughout the year in the Zambezi valley, and very low risk exists in Bulawayo and Harare.	IV
The Americas	**Anguilla (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Antigua and Barbuda**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Argentina**	3B	Malaria risk due exclusively to *P. vivax.* Risk is very low, being limited to certain areas: - Departments of Oran and San Martin in Salta Province in the north, and to a lesser extend to Chaco, Corrientes and Misiones Provinces. - Rural areas of northern Jujuy Province. - No risk in Iguassu Falls and the rest of Argentina.	III
The Americas	**Bahamas**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Barbados**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Belize**	3B	Malaria risk, due to *P. vivax* (95%) and *P. falciparum* (5%), exists throughout the year. At-risk area: - All districts but varies within regions. Risk is present especially in Cayo, Toledo and Stan Creek Districts. - No risk in Belize City and islands frequented by tourists.	III
The Americas	**Bermuda (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Bolivia (Plurinational State of)**	4B	Malaria risk due predominantly to *P. vivax* (94%) exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas below 2,500 m - In the Amazon basin and in the following departments: Beni, Chuquisaca, Cochabamba, La Paz, Pando, Santa Cruz, and Tarija except in the city of La Paz. - Falciparum malaria occurs in Santa Cruz and in the northern departments of Beni and Pando, especially in the localities of Guayaramerín and Riberalta.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Brazil**	4B	Malaria risk due to *P. vivax* (86%) and *P. falciparum* (13%) exists throughout the year. Multidrug-resistant *P. falciparum* reported. *P. vivax* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in most forested areas below 900 m within the nine states of the ñLegal Amazoniaò region (Acre, Amapá, Amazonas, Maranhão (western part), Mato Grosso (northern part), Pará, Rondônia, Roraima and Tocantins). Transmission intensity varies from one municipality to another, and is higher in jungle areas of mining, agricultural settlements, indigenous areas, and in some peripheral urban areas of Cruzeiro do Sul, Manaus and Pôrto Velho. Malaria also occurs on the periphery of large cities such as Belem, Boa Vista, Macapá, Maraba, Rio Branco and Santarém. - Malaria transmission risk is negligible or non-existent in the states outside "Legal Amazonia". - No transmission at Iguassu Falls.	IV
The Americas	**Canada**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Cayman Islands (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Chile**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Colombia**	4B	Malaria risk, due to *P. vivax* (73%) and *P. falciparum* (27%), exist throughout the year. *P. falciparum* resistant to chloroquine is present. Resistance to sulfadoxineï pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: In all rural areas below 1,700m. - Risk is high in some municipalities of the Departments of Antioquia, Bolivar, Cauca, Choco, Cordoba, Guajira, Narino, and Risaralda. At a lower level, risk is also present in some municipalities of Amazonas, Caqueta, Guaviare, Guainia, Meta, Putumayo, Vaupes, and Vichada. - No risk in Bogotá and Cartagena.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Costa Rica**	3B	Malaria risk, almost exclusively due to *P. vivax,* exists throughout the year. At-risk area: - Very low risk in the canton of Matina, Limon Province. - Negligible or no risk of malaria transmission exists in the other cantons of the country. - No risk in Limón city (Puerto Limón).	III
The Americas	**Cuba**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Dominica**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Dominican Republic**	3B	Malaria risk exclusively due to *P. falciparum* exists throughout the year. No evidence of *P. falciparum* resistant to any antimalarial drug. At-risk area: - In all areas (including resort areas), except none in the cities of Santiago and Santo Domingo. - There is risk especially in the western provinces of Dajabón, Elias Pina, San Juan, as well as rural areas bordering Haiti. Risk is also present in La Altagracia province.	III
The Americas	**Ecuador; Including the Galápagos Islands**	4B	Malaria risk, due to *P. vivax* (86%) and *P. falciparum* (14%), exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas below 1,500 m and Amazon basin, with moderate transmission risk in coastal provinces. - Malaria risk due to *P. falciparum* is higher in Esmeraldas Province. - No risk in the cities of Guayaquil, Quito, cities of inter-Andean region, the central highland tourist areas, or the Galápagos Islands.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**El Salvador**	3B	Malaria risk, due almost exclusively to *P. vivax*, is very low throughout the year. At-risk area: - In rural areas of migratory influence from Guatemala, in Santa Ana and Ahuachapán, and La Unión departments. - Sporadic vivax malaria cases are reported from other parts of the country.	III
The Americas	**French Guiana**	4A	Malaria risk, due to *P. falciparum* (45%) and *P. vivax* (55%), is high throughout the year. Multidrug-resistant *P. falciparum* reported in areas influenced by Brazilian migration. At risk area: - Chloroquine-resistant malaria: in all areas. Risk is high in nine municipalities of the territory bordering Brazil (Oiapoque river valley) and Suriname (Maroni river valley). In the other 13 municipalities, transmission risk is low or negligible. - No risk in the city of Cayenne or Devil's Island (Ile du Diable).	IV
The Americas	**Grenada**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Guadeloupe, including St. Barthelemy and Saint Martin (France)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Guatemala**	3B	Malaria risk, predominantly due to *P. vivax*, exists throughout the year. At risk area: - In areas below 1,500 m. There is moderate risk in the departments of Escuintla and Izabal; and low risk in Alta Verapaz, Baja Verapaz, Chiquimula, Peten, Suchitepequez and Zacapa. - No risk in Guatemala City, Antigua or Lake Atitlán.	III

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Guyana**	4B	Malaria risk, due to *P. falciparum* (53%), *P. vivax* (36%) and mixed infections (11%), is high throughout the year. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in all parts of the interior below 900 m. - Highest risk occurs in Regions 1, 7, 8 and 9; and very low risk in Regions 3, 4, 5 and 6. Rare cases in the cities of Amsterdam and Georgetown. Sporadic cases of malaria have been reported from the densely populated coastal belt.	IV
The Americas	**Haiti**	3A	Malaria risk exclusively due to *P. falciparum* exists throughout the year. No falciparum resistance to chloroquine reported. At risk area: The whole country.	III
The Americas	**Honduras**	3B	Malaria risk, due to *P. vivax* (91%), *P. falciparum* (8.5%) and mixed infection (0.5%), exists throughout the year. At-risk area: - In all areas and in Roatán and other Bay Islands. Risk exists in the outskirts of Tegucigalpa and San Pedro Sula. Malaria transmission risk due to *P. vivax* is high in the departments of Gracias a Dios and Colon, and moderate in Atlantida, Olancho and Yoro. *P. falciparum* transmission risk is high in Gracias a Dios; and a few cases are also reported in Colon, Olancho and Yoro. - No risk in San Pedro Sula and Tegucigalpa.	III
The Americas	**Jamaica**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Martinique (France)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Mexico**	3B	Malaria risk, due almost exclusively to *P. vivax*, exists intermittently throughout the year. At-risk area: - In some rural areas that are not often visited by tourists. Low risk in the states of Chiapas and Oaxaca (mainly in Costa and Loxichas). Very low risk in the states of Chihuahua, Durango, Jalisco, Nayarit, Quintana Roo, Sinaloa, Sonora, and Tabasco. - No malaria risk exists along the United States-Mexico border and in the major resorts along the Pacific and Gulf coasts. .	III
The Americas	**Montserrat (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Netherlands Antilles (Bonaire, Curaçao, Saba, St. Eustasius, and St. Martin)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Nicaragua**	3B	Malaria risk, due predominantly to *P. vivax* (82%), exists throughout the year. At-risk area: - Low malaria risk exists throughout the year in a number of municipalities, mainly in Region Autonoma del Atlantico Norte, with sporadic transmission also reported in Boaca, Chinandega, Jinoteca, Leon, Matagalpa, Managua and Region Autonoma del Atlantico Sur. Cases are reported from other municipalities in the central and western departments but the risk in these areas is considered to be very low or negligible.	III

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Panama**	4B	Malaria risk due to *P. vivax* (99%) and *P. falciparum* (1%) exists. *P. falciparum* resistant to chloroquine has been reported in Darién and San Blas provinces. At-risk area: - In all areas, except none in urban areas of Panama City or in the former Canal Zone. - Chloroquine-resistant malaria: in provinces east of the Canal Zone towards the border with Colombia, including Darién, San Blas (Kuna Yala), San Blas Islands, and Panama. - Chloroquine-sensitive malaria: in provinces west of the Canal Zone along the Atlantic coast and the border with Costa Rica, including Bocas del Toro, Chiriqui, Colon, Ngobe Bugle and Veraguas.	IV
The Americas	**Paraguay**	3B	Malaria risk, due almost exclusively to *P. vivax,* is moderate. At-risk area: - In the departments of Alto Paraná, Caaguazú, and Canendiyú. - No or negligible transmission risk in the other departments.	III

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Peru**	4B	Malaria risk, due to *P. vivax* (87%) and *P. falciparum* (13%), exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. *P. vivax* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: In all departments below 2,000 m, including cities of Iquitos and Puerto Maldonado. The 23 highest-risk districts are concentrated in the departments of Ayacucho, Loreto, Madre de Dios, Piura, and Pasco. 99% of *P. falciparum* cases are reported from Loreto, which is situated in the Amazon and contains 17 of the highest-risk districts in the country. Risk is also high in the Amazon basin along the border with Brazil. - No risk in cities of Arequipa, Moquegua, Puno, Ica, Nazca and Tacna. Travelers who will visit only Lima and its vicinity, coastal areas south of Lima, coastal region south of Chiclayo or the highland tourist areas (Cuzco, Machu Picchu, and Lake Titicaca) are not at risk and need no prophylaxis.	IV
The Americas	**Puerto Rico (U.S.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Saint Kitts and Nevis (Saint Christopher and Nevis) (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Saint Lucia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Saint Vincent and the Grenadines**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Suriname**	5B	Malaria risk, due to *P. falciparum* (40%), *P. vivax* (58%), and mixed infections (2%), has decreased in recent years and occurs throughout the year. *P. falciparum* resistant to chloroquine, sulfadoxine-pyrimethamine and mefloquine reported. Some decline in quinine sensitivity also reported. At-risk area: In all areas in the interior of the country beyond the coastal savannah area, with highest risk mainly along the eastern border and in gold-mining areas. Risk is also present in provinces of Brokopondo and Sipaliwini. Risk is low or negligible in Paramaribo city and the other seven coastal districts (Nickerie, Coronie, Saramacca, Wanica, Commewijne, and Marowijne north of latitude 5°N).	V
The Americas	**Trinidad and Tobago**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Turks and Caicos Islands (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**United States of America**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
The Americas	**Uruguay**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
The Americas	**Venezuela (Bolivarian Republic of)**	4B	Malaria risk, due to *P. vivax* (75%) and *P. falciparum* (25%), exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: US/Canada: In some rural areas of Apure, Amazonas, Anzoategui, Barinas, Bolívar, Sucre, Táchira, Monagas, Zulia, and Delta Amacuro and in Angel Falls. WHO: There is moderate to high risk in some rural areas of Amazonas, Anzoategui, Bolívar and Delta Amacuro states. There is low risk in Apure, Monagas, Sucre and Zulia. *P. falciparum* malaria is mostly restricted to municipalities in jungle areas of Amazonas (Alto Orinoco, Atabapo, Atures, Autana, Manapiare,) and Bolívar (Angostura, Cedeño, El Callao, Heres, Gran Sabana, Piar, Raul Leoni, Rocio, Sifontes and Sucre). UK: High risk in all areas south of and including the Orinoco river and Angel Falls. - No risk in Caracas and Margarita Island.	IV
The Americas	**Virgin Islands, British**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Afghanistan**	4B	Malaria risk due to *P. vivax* and *P. falciparum* exists. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas at altitude below 2,500 m from April to December.	IV
Eastern Mediterranean	**Bahrain**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Djibouti**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
Eastern Mediterranean	**Egypt**	2	Malaria risk, due to *P. falciparum* and *P. vivax*, is very limited. At-risk area: - In El Faiyûm governorate from June through October. - 19 locally transmitted cases of *P. vivax* in Aswan Governorate from May to June 2014. No more case since 14 June 2014. - No risk in tourist areas, including Nile River cruises.	II
Eastern Mediterranean	**Islamic Republic of Iran**	4B	Malaria risk due to *P. vivax* (88%), and very limited risk due to *P. falciparum* (12%), exists. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: In rural areas of the Fars Province, Sistanï Baluchestan Province and the southern, tropical part of Hormozgan and Kerman Provinces from March to November. In Ardebil and East Azerbijan provinces north of the Zagros mountains, and North Khorasan province near the Turkmenistan border.	IV
Eastern Mediterranean	**Iraq**	3B	Limited malaria risk exclusively due to *P. vivax* may exist. At-risk area: - In Basrah province and in areas in the north below 1,500 m (in provinces of Duhok, Erbil, Ninawa, Sulaimaninya, and Ta'mim) from May through November. - No risk in Baghdad, Tikrit, and Ramadi. - No indigenous cases reported since 2009.	III
Eastern Mediterranean	**Jordan**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Kuwait**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Lebanon**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Libya**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
Eastern Mediterranean	**Morocco**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Oman**	2	Malaria risk, due to *P. falciparum* and *P. vivax,* is limited. There is sporadic local transmission. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: Canada: Limited risk in remote areas of Musandam Province. US: Sporadic transmission in Ad Dakhliyah, North Batinah, and North and South Ash Sharqiyah. None in the city of Muscat. WHO: Sporadic transmission of *P. falciparum* and *P. vivax* may occur subsequent to international importation of parasites. In 2010, local outbreaks of *P. falciparum* and *P. vivax* were reported in North Sharqiya region. Local cases were also reported in 2011 and 2012.	II
Eastern Mediterranean	**Pakistan**	4B	Malaria risk, due to *P. falciparum* and *P. vivax,* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas (including all cities) below 2,500 m, especially in rural areas from July to December.	IV
Eastern Mediterranean	**Qatar**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
Eastern Mediterranean	**Saudi Arabia**	4B	Limited malaria risk, predominantly due to *P. falciparum*, exists from September to January inclusive. *P. falciparum* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: exists in foci along the southern border with Yemen, Al Bahah, Al Madinah, Asir (excluding the high altitude areas above 2,000 m), Jizan, Makkah, Najran, and Tabuk provinces. - No risk in urban areas of Jeddah, Mecca, Medina, Riyadh, and Ta'if.	IV
Eastern Mediterranean	**Somalia**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas. Risk is relatively low and seasonal in the north. It is higher in the central and southern part of the country.	IV
Eastern Mediterranean	**South Sudan**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas.	IV
Eastern Mediterranean	**Sudan**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas. Risk is low and seasonal in the north. It is higher in the central and southern part of the country. Malaria risk on the Red Sea coast is very limited. Very low risk in Khartoum.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
Eastern Mediterranean	**Syrian Arab Republic (Syria)**	3B	Malaria risk is very limited, and is exclusively due to *P. vivax*. No indigenous cases reported since 2005, however, the reporting system has been disrupted since 2010. At-risk area: In foci along the northern border, especially in rural areas of El Hasaka Governorate, from May through October.	III
Eastern Mediterranean	**Tunisia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**United Arab Emirates**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Eastern Mediterranean	**Yemen**	4B	Malaria risk predominantly due to *P. falciparum* exists throughout the year, but mainly from September through February. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas below 2,000 m. Very limited risk on Socotra Island. - No risk in Sanaôa city.	IV
European	**Albania**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Andorra**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Armenia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Austria**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Azerbaijan**	2	Malaria risk exclusively due to *P. vivax* exists. Four locally acquired cases were reported in 2011, and no locally acquired case in 2013. At-risk area: - In rural areas below 1,500 m, mainly in the area between the Kura and the Arax rivers, from May to October. - No risk in Baku city.	II
European	**Belarus**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
European	**Belgium**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Bosnia and Herzegovina**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Bulgaria**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Croatia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Cyprus**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Czech Republic**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Denmark**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Estonia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Finland**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**France**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Georgia**	2	Malaria risk, due exclusively to *P. vivax*, may exist locally. No case reported in 2010, one locally acquired case reported in 2011, no locally acquired case was reported in 2013. At-risk area: - WHO, UK: Limited risk may exist in the rural eastern and southeastern part of the country bordering Azerbaijan from June to October. - US: No malaria transmission - Canada (2009): In the south-eastern part of the country near Azerbaijan border and Kura River and in the districts of Gardabani, Marneuli and Sighnaghis in the Kakheti and Kveno Kartli regions from June to October. No risk in Tbilisi.	II
European	**Germany**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
European	**Greece**	2	Malaria risk is very limited, and is due exclusively to *P. vivax*. At-risk area: - According to WHO, very limited malaria risk may exist from May to October in villages of the Evrotas delta area in Lakonia district (an area of 20 km^2) in agricultural area with large migrant populations. There is no risk in tourist areas. - According to UK NaTHNaC, the risk of malaria in Greece is very low. Sporadic cases of locally acquired malaria have been reported in Greece annually since 2009.	II
European	**Hungary**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Iceland**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Ireland**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Israel**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Italy**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Kazakhstan**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Kyrgyzstan**	2	Malaria risk is limited, and is due exclusively to *P. vivax*. No locally acquired cases reported between 2011 and 2013 At-risk areas: - Very limited malaria risk exists in some southern and western parts of the country, mainly in areas bordering Tajikistan and Uzbekistan ï Batken, Osh and Jalal-Abad regions from June through October. Risk also exists in the capital city Bishkek.	II
European	**Latvia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Lithuania**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Luxembourg**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
European	**Macedonia, the Former Yugoslav Republic of**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Malta**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Republic of Moldova**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Monaco**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Montenegro**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Netherlands**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Norway**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Poland**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Portugal**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Romania**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Russian Federation**	2	Very limited malaria risk, due exclusively to *P. vivax*. At-risk area: - In areas under influence of intense migration from southern countries in the Commonwealth of Independent States.	II
European	**San Marino**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Serbia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Slovakia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Slovenia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Spain**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Sweden**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Switzerland**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
European	**Tajikistan**	4B	Malaria risk exists, and is predominantly due to *P. vivax*. *P. falciparum* resistant to chloroquine reported in the southern part of the country. At-risk area: - Chloroquine-resistant malaria: in all areas below 2,000 m particularly in southern border areas (Khatlon Region), and in some central (Dushanbe), western (Gorno-Badakhshan), and northern (Leninabad Region) areas from June through October. There is a low risk of malaria in areas below 2,000m during the rest of the year.	IV
European	**Turkey**	3B	Limited malaria risk, due to *P. vivax* predominantly and *P. falciparum* sporadically, exists from May to October. At-risk area: - In the southeastern part of the country, including the provinces of Adana, Adryaman, Batman, Bingol, Bitlis, Diyarbakir, Elazig, Gaziantep, Hakkari, Hatay, Icel, Kahraman Maras, Kilis, Mardin, Mus, Osmaniyeh, Sanliurfa, Siirt, Sirnak, and Van. The risk is low from May to October, and very low during the rest of the year. - A few sporadic cases were reported in 2010, 2011 and 2013. - No risk in the main tourist areas in the west and southwest of the country, on the Incerlik U.S. Air Force base and on typical cruise itineraries.	III
European	**Turkmenistan**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**Ukraine**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
European	**United Kingdom (with Channel Islands and Isle of Man)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
European	**Uzbekistan**	2	Limited malaria risk due exclusively to *P. vivax* exists. No locally acquired cases reported between 2011 and 2013. At-risk area: - Limited malaria risk from June to October, in some villages located in the southern and eastern parts of the country bordering Afghanistan, Kyrgyzstan and Tajikistan. - Sporadic cases reported in Uzunskiy, Sariassiskiy, and Shurchinskiy districts (Surkhanda- Rinskaya Region).	II
South-East Asia	**Bangladesh**	4B	Malaria risk, due to *P. falciparum* (>50%) and *P. vivax*, exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Malaria risk exists throughout the year but transmission occurs only in rural areas, in 13 of 64 districts. - High risk in Chittagong Hill Tract districts (Bandarban, Rangamati and Khagrachari), Chittagong district and Cox Bazaar district. - Low risk exists in the districts of Hobigonj, Kurigram, Moulvibazar, Mymensingh, Netrakona, Sherpur, Sunamgonj and Sylhet. - Most parts of the country, including Dhaka City, have no risk of malaria.	IV
South-East Asia	**Bhutan**	4B	Malaria risk (*P. falciparum* 60%, *P. vivax* 40%) exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: In rural areas below 1,700 m of the southern belt districts of: Chukha, Dagana, Chirang, Pemagatshel, Samtse (Samchi), Samdrup Jongkhar, Sarpang (Geyleg-phug) and Zhemgang (Shemgang). - No transmission occurs in the four following districts: Bumthang, Gasa, Paro and Thimphu. Seasonal transmission during the rainy summer months occurs in focal areas in the rest of country according to WHO.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
South-East Asia	**Myanmar (formerly Burma)**	5B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. Mefloquine resistance reported in Kayin state and the eastern part of Shan state. Emerging artemisinin resistance suspected in south-eastern Myanmar. *P. vivax* resistant to chloroquine reported. Human *P. knowlesi* infection reported. At-risk area: - Chloroquine and Mefloquine resistant malaria: States of Bago, Shan, Kayah, Kachin, Kayin, and Tanintharyi. - Chloroquine-resistant malaria: Present at altitudes below 1,000 m. Risk is highest in remote rural, hilly and forested areas of the country as well as in some coastal areas in Rahkine State. - No risk in the cities of Yangon and Mandalay.	V
South-East Asia	**Timor-Leste (East Timor)**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At risk area: -Chloroquine-resistant malaria: in all areas.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
South-East Asia	**India**	4B	Malaria risk exists throughout the year, with overall 40% -50% of cases due to *P. falciparum*. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: US/Canada: In all areas below 2,000 m, including Delhi and Mumbai (Bombay). WHO: Risk of falciparum malaria is relatively higher in the north-eastern states, in the Andaman and Nicobar Islands, Chhattisgarh, Gujarat, Jharkhand, Karnataka (with exception of the city of Bangalore), Madhya Pradesh, Maharashtra (with the exception of the cities of Mumbai, Nagpur, Nasik and Pune), Orissa and West Bengal (with the exception of the city of Kolkata). UK: Chemoprophylaxis is recommended in the states of Assam and Orissa; the districts of East Godavari, Srikakulam, Vishakhapatnam and Vizianagaram in the state of Andhra Pradesh; and the districts of Balaghat, Dindori, Mandla and Seoni in the state of Madhya Pradesh. It no longer considers malaria risk to be high enough to routinely justify use of chemoprophylaxis in the rest of India including Goa and the Andaman and Nicobar Islands. - There is no transmission in parts of the states (areas >2000m) of Himachal Pradesh, Jammu and Kashmir, and Sikkim. There is also no risk in the Lakshadweep islands.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
South-East Asia	**Indonesia**	4B	Malaria risk exists throughout the year. *P. falciparum* resistance to chloroquine and sulfadoxine-pyrimethamine reported. *P. vivax* resistance to chloroquine reported. Human *P. knowlesi* infection reported in the province of Kalimantan. At-risk area: - Chloroquine-resistant malaria: Most areas of the five eastern provinces of Papua, West Papua, Maluku, North Maluku and East Nusa Tenggara. Also, in rural areas of Kalimantan (Borneo), Nusa Tenggara Barat (includes the island of Lombok), Sulawesi, and Sumatra. Low transmission risk in rural areas of Java including Ujung Kulong, Sukalumi, and Pangandaran. - No risk in the cities of Jakarta, Ubud, other cities and urban areas, or resort areas of Bali and Java.	IV
South-East Asia	**Democratic People's Republic of Korea (North Korea)**	2	Limited malaria risk, due exclusively to *P. vivax*. At risk area: In some southern areas.	II
South-East Asia	**Maldives**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
South-East Asia	**Nepal**	4B	Malaria risk predominantly due to *P. vivax* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At risk area: - Chloroquine-resistant malaria: WHO: in rural areas of the 20 Terai districts bordering with India. Occasional outbreaks of *P. falciparum* from July to October. Seasonal transmission of *P. vivax* takes place in 45 districts of the inner Terai and mid-hills. Canada: Below 1,200m in rural areas in the Tarai and Hill districts bordering India and in the inner Tarai valley areas of Udaypur Sindhupalchowk, Makwanpur, Chitwan and Dang. US: in all areas below 2,000 m (except see below). UK: in all areas below 1,500 m (except see below). - No risk in Kathmandu or on typical Himalayan treks.	IV
South-East Asia	**Sri Lanka**	4B	Limited malaria risk due to *P. vivax* (88%) and *P. falciparum* (12%) exists throughout the year. No locally acquired cases reported in 2013. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: - Chloroquine-resistant malaria: in all areas except no risk in the districts of Colombo, Galle, Gampaha, Kalutara, Kandy, Matara and Nuwara Eliya.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
South-East Asia	**Thailand**	5B	Malaria risk exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxineï pyrimethamine reported. Resistance to mefloquine and to quinine reported from areas near the borders with Cambodia and Myanmar. Artemisinin resistance reported near the border with Myanmar. *P. vivax* resistant to chloroquine reported. Human *P. knowlesi* infection reported. At-risk area: - Mefloquine-resistant malaria: In areas near the border with Cambodia, Lao Peopleôs Democratic Republic, and Myanmar (Burma). - Chloroquine-resistant malaria: In rural, especially forested and hilly, areas of the whole country, mainly towards the international border with Cambodia, Lao Peopleôs Democratic Republic, and Myanmar (Burma), including the southernmost provinces, and in rural, forested areas in districts of Phang Nga and Phuket. - No risk in cities of Bangkok, Chiang Mai, Chiang Rai, Koh Phangan, Koh Samui and Pattaya, and the main tourist resorts of Phuket island. However, there is a risk in some other areas and islands.	V
Western Pacific	**Australia; Including Cocos (Keeling) Islands.**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Brunei Darussalam**	2	Malaria risk is very low to none. Human *P. knowlesi* infection reported. At-risk area: Obtain latest epidemiology.	II

Region	Country/Area	Risk Category	Risk Description	Recommendation
Western Pacific	**Cambodia**	5B	Malaria risk, due predominantly to *P. falciparum* and *P. vivax*, exists throughout the year. *P. falciparum* resistance to chloroquine and sulfadoxine-pyrimethamine has been reported throughout the country. *P. falciparum* resistance to artesunate, mefloquine, lumefantrine and piperaquine has been reported in western Cambodia. *P. vivax* resistant to chloroquine has been reported in eastern Cambodia. At-risk area: Present throughout the country, except very low to negligible risk in Phnom Penh, area close to Tonle Sap, including Siem Reap city, and the temple complex at Angkor Wat.	V
Western Pacific	**China**	5B	Malaria risk, including *P. falciparum*, exists. *P. falciparum* malaria occurs in Yunnan and to a lesser extent in Hainan throughout the year. Resistance to chloroquine and sulfadoxine-pyrimethamine has been reported. *P. falciparum* resistant to mefloquine exists along China-Myanmar border in Western Yunnan province. Limited risk of chloroquine-sensitive malaria exists in rural areas of southern and some central provinces, including Anhui, Guizhou, Henan, Hubei, and Jiangsu. There is no malaria risk in urban areas. Travellers to popular tourist areas, including Yangtze River cruises, are at very low to no risk, and do not need to take chemoprophylaxis.	V
Western Pacific	**Cook Islands (New Zealand)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Fiji**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
Western Pacific	**French Polynesia, includes the island groups of Society Islands (Tahiti, Moorea, and Bora-Bora); Marquesas Islands (Hiva Oa and Ua Huka); and Austral Islands (Tubuai and Rurutu)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Guam (U.S.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Japan**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Kiribati (formerly Gilbert Islands), includes Tarawa, Tabuaeran (Fanning Island), and Banaba (Ocean Island)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Republic of Korea (South Korea)**	2	Malaria risk is limited, and is due exclusively to *P. vivax*. At-risk area: Risk limited to the months from March to December in rural areas in the northern parts of Gangwon-do and Gyeonggi-do Provinces and Incheon City (towards the Demilitarized Zone DMZ).	II

Region	Country/Area	Risk Category	Risk Description	Recommendation
Western Pacific	**Lao People's Democratic Republic**	5B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At risk area: - High risk of malaria in the whole country, except in Vientiane where there is low to no risk. - Risk of mefloquine-resistant malaria in the provinces of Bokèo and Louang Namtha along the Laos-Burma border, and along the Laos-Thailand border in the provinces of Saravan and Champasack.	V
Western Pacific	**Malaysia**	4B	Malaria risk, due to *P. falciparum* (40%) and *P. vivax* (50%), exists only in limited foci. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. *P. vivax* resistance to chloroquine reported. Human *P. knowlesi* infection reported. At-risk area: - Chloroquine-resistant malaria: Risk is high in limited foci in the deep hinterland of Malaysian Borneo (inland areas of eastern Sabah, and inland forested areas of Sarawak), and to a lesser extend in the inland forested areas of peninsular Malaysia. - Very low risk in the rest of peninsular Malaysia, including the Cameron Heights, and the city of Kuala Lumpur, - Very low risk in the rest of Malaysian Borneo including the coastal areas of Sabah and Sarawak.	IV
Western Pacific	**Marshall Islands**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Micronesia, Federated States of; includes: Yap Islands, Pohnpei, Chuuk, and Kosrae**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Mongolia**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
Western Pacific	**Nauru**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**New Caledonia (France)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**New Zealand**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Niue (New Zealand)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Northern Mariana Islands (US) Includes Saipan, Tinian, and Rota Island**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Palau**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Papua New Guinea**	4B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. *P. vivax* resistant to chloroquine reported. At-risk area: - Chloroquine-resistant malaria: in all areas below 2,000 m.	IV

Region	Country/Area	Risk Category	Risk Description	Recommendation
Western Pacific	**Philippines**	4B	Malaria risk exists throughout the year. *P. falciparum* 70%-80%, *P. vivax* 20%-30%. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. Human *P. knowlesi* infection reported in the province of Palawan. At-risk area: - Chloroquine-resistant malaria: in areas below 600 m, on islands of Basilu, Luzon, Mindanao, Mindoro, Palawan, Sulu (Jolo) and Tawi-Tawi. - No risk in the 22 provinces of Aklan (including Borocay Island), Albay, Benguet, Bilaran, Bohol, Camiguin, Capiz, Catanduanes, Cavite, Cebu, Guimaras, Iloilo, Northern Leyte, Southern Leyte, Marinduque, Masbate, Eastern Samar, Northern Samar, Western Samar, Sequijor, Sorsogon, Surigao Del Norte, metropolitan Manila, other urban areas, or in the plains.	IV
Western Pacific	**Pitcairn Islands (U.K.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Samoa (formerly Western Samoa)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Samoa, American (U.S.)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Singapore**	2	Human *P. knowlesi* infection was reported in 2007 and 2008. No malaria risk reported by US CDC, UK PHE and Health Canada.	II
Western Pacific	**Solomon Islands**	4A	Malaria risk predominantly due to *P. falciparum* exists throughout the year. *P. vivax* resistant to chloroquine reported. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
Western Pacific	**Tokelau (New Zealand)**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I

Region	Country/Area	Risk Category	Risk Description	Recommendation
Western Pacific	**Tonga**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Tuvalu**	1	No malaria risk reported by WHO, US CDC, UK PHE and Health Canada.	I
Western Pacific	**Vanuatu**	4A	Malaria risk, predominantly due to *P. falciparum*, is low to moderate throughout the year. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine reported. *P. vivax* resistant to chloroquine reported. At-risk area: -Chloroquine-resistant malaria: in all areas.	IV
Western Pacific	**Viet Nam (Vietnam)**	5B	Malaria risk predominantly due to *P. falciparum* exists throughout the year. Resistance to chloroquine, sulfadoxine-pyrimethamine and mefloquine reported. At-risk area: - Mefloquine-resistant malaria: in the southern part of the country in the provinces of Tay Ninh, Song Be, Lam Dong, Ninh Thuan, Khanh Hoa, Dak Lak, Gia Lai, and Kon Tum. - Chloroquine-resistant malaria: in all areas. High-risk areas are the highland areas below 1,500 m south of 18ęN, notably in the 4 central highlands provinces Dak Lak, Dak Nong, Gia Lai and Kon Tum, Binh Phuoc province, and the western parts of the coastal provinces, Quang Tri, Quang Nam, Ninh Thuan and Khanh Hoa. - No risk in urban centres, the Red River delta, the Mekong delta, and the coastal plain areas of central Viet Nam including Hanoi, Ho Chi Minh City (Saigon), Da Nang, Nha Trang, Qui Nhon, and Haiphong.	V

Annex 3: Risk Profile Statistics

Table 1: Risk categories versus countries/administrative areas in the six WHO regions

Region	1	2	3A	3B	4A	4B	4C	5B	Total
African	3	2			33	9			47
The Americas	25		1	10	1	8		1	46
Eastern Mediterranean	9	2		2	4	5			22
European	45	6		1		1			53
South-East Asia	1	1			1	6		2	11
Western Pacific	22	3			2	3		4	34
Total	105	14	1	13	41	32	0	7	213

Table 2: Recommendation categories versus countries/administrative areas in the six WHO regions

Region	I	II	III	IV	V	Total
African	3	2		42		47
The Americas	25		11	9	1	46
Eastern Mediterranean	9	2	2	9		22
European	45	6	1	1		53
South-East Asia	1	1		7	2	11
Western Pacific	22	3		5	4	34
Total	105	14	14	73	7	213