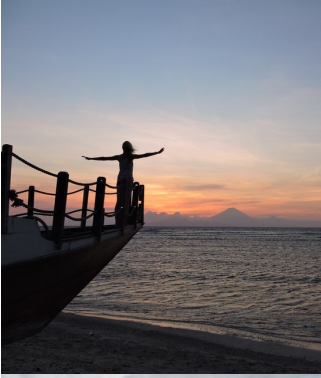


Malaria prophylaxis in the Travel Clinics

Frederike Nederlof

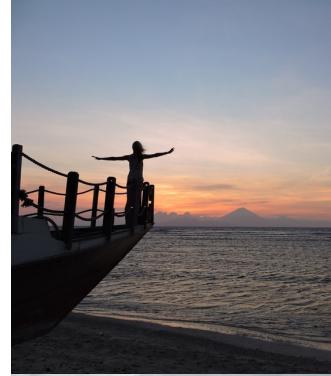
Nurse Travel Health Advice

Vaccinatiecenter Travel Clinic East, The Netherlands



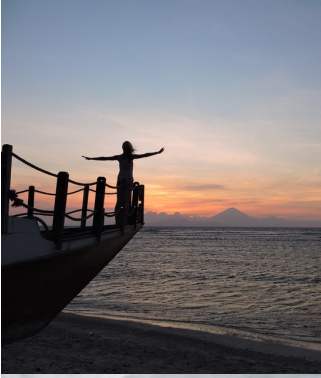
Conflicts of interest

Function	Organisation	Conflicts of interests
Nurse Travel Health Advice	Vaccinatiecenter Travel Clinic East The Netherlands	None
Medical advisor for vaccination	Municipal Public Health Service (GGD GHOR The Netherlands)	None
Member program committee	MMM Travel Medicine congress The Netherlands	None
Chairman of the nursing working group & member broad working group	The Netherlands National Coordination Center for Travel Health Advice (LCR)	None



Program

- Malaria prevention strategy in the Netherlands
- Protocol
- Consultation room visual
- Mosquito bite prevention
- Take a QUIZ!
- Take home messages



Dutch malaria protocols & maps

- **The Netherlands National Coordination Center for Travel Health Advice**
 - (LCR – Landelijk Coördinatiecentrum Reizigersadviesing)
- **Malaria mapping**
 - Co-operation with the National Coordination organisations from Switzerland, Belgium and Germany
- **Several working groups, including:**
 - **Malaria working group**
 - Updates: based on literature search, new science results, changes in malaria prophylaxis information leaflets, malaria protocols from other countries and international organisations, input and questions from Dutch travel health advice clinics.
 - **Nursing working group**
 - New & already existing protocols
 - Clear
 - Practical usable
 - Travellers' information brochures
 - **Broad working group**
 - Final check (medical information & practical use)



Malaria prevention strategy

Choice depends on various factors:

- Malaria transmission-intensity in visiting area
 - Low – medium – high
- Local possibilities diagnostics & treatment
- Local resistance malaria prophylaxis
- (possible) side effects, interactions & contra-indications chemoprophylaxis
- Medical condition of the traveller
- Duration of stay in malaria risk area
- Time before depart
- Therapy compliance
- Costs

But also:

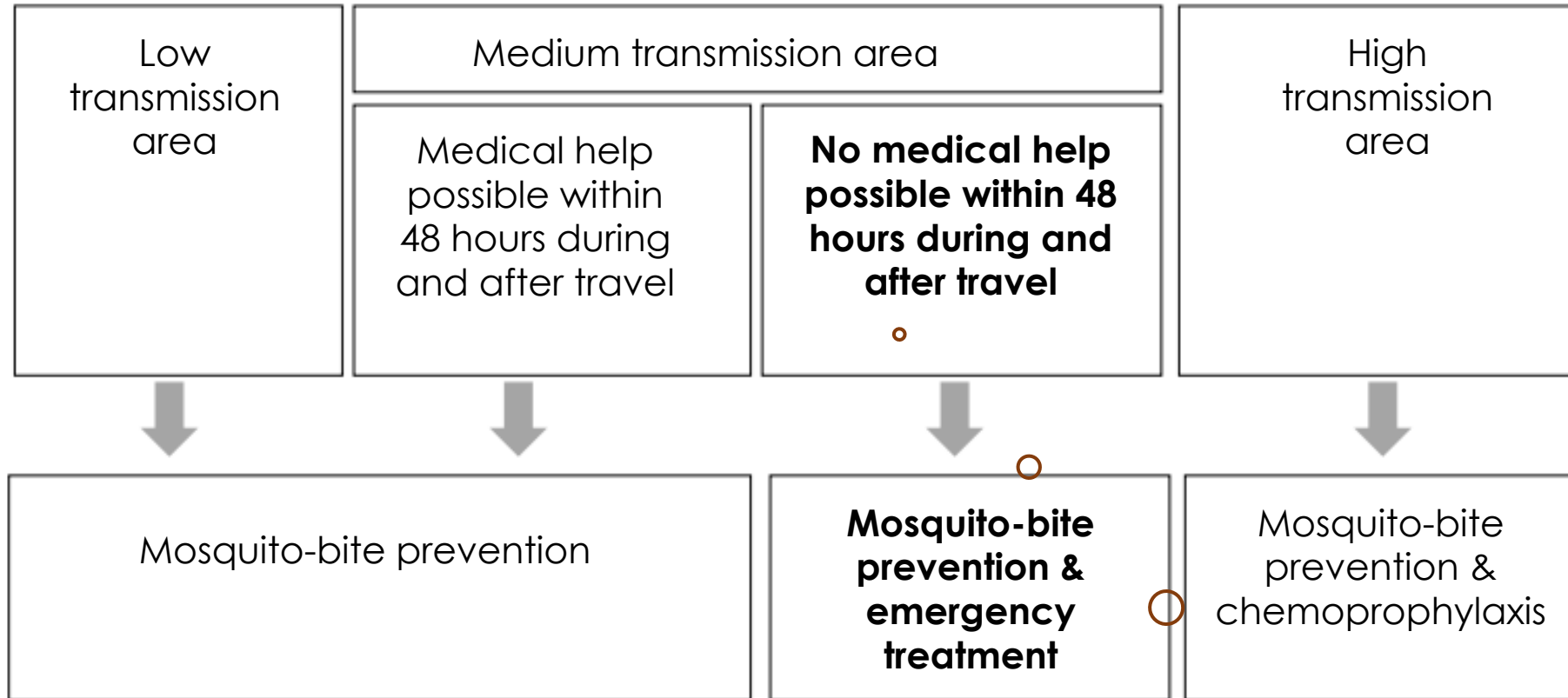
- Personal preference
- Choice of chemoprophylaxis travel companion

Shared decisionmaking vs. clear information & advice!



Malaria prevention strategy in The Netherlands

GENERAL



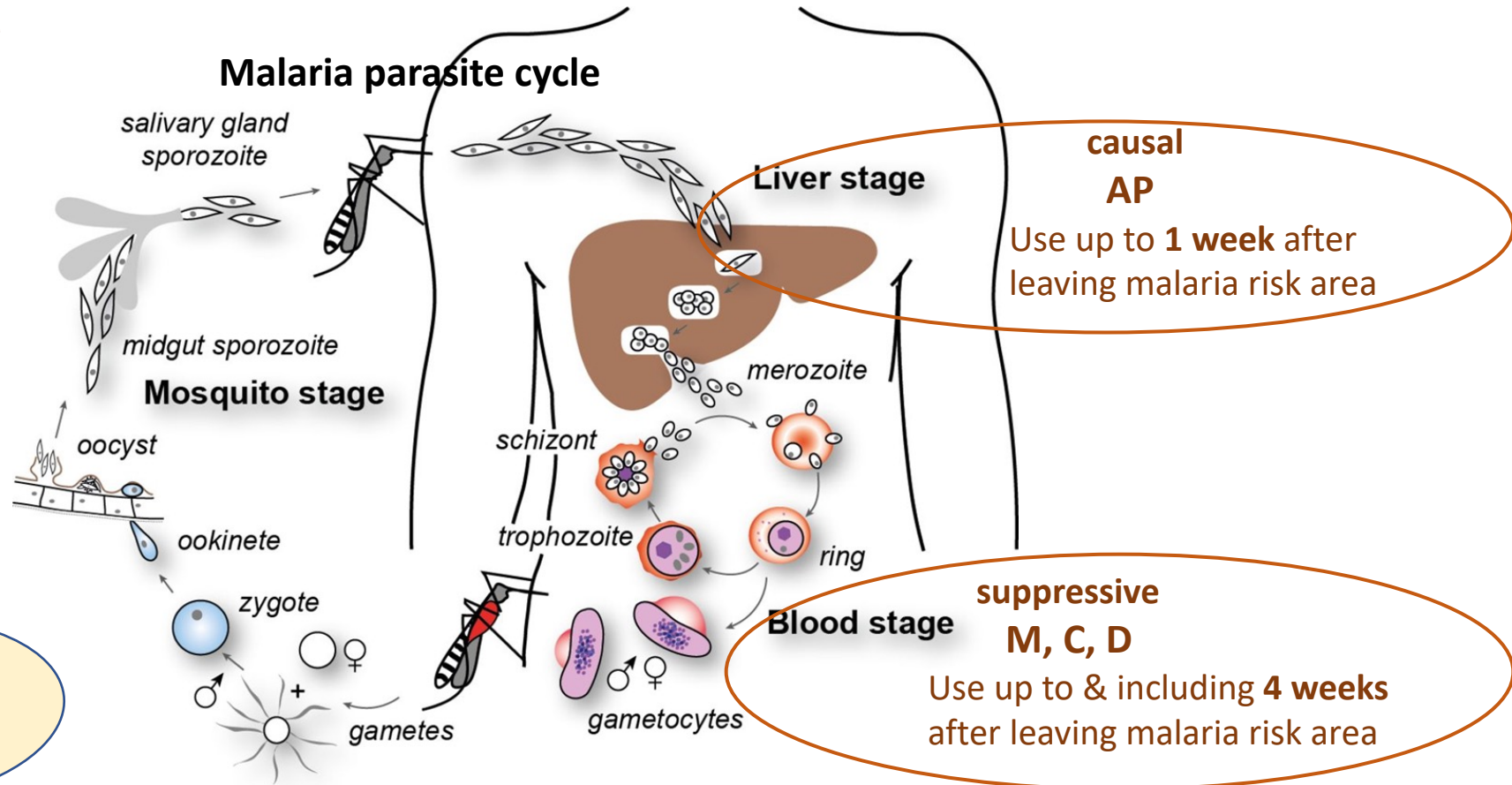
Travelers at higher risk: alternative advice

NET, BEL,
GER, CH



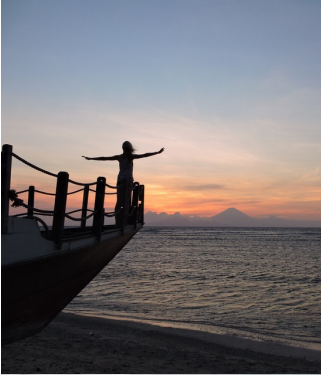
Causal/suppressive prophylaxis

- AP Atovaquon/Proguanil
- M Mefloquine
- D Doxycycline
- C Chloroquine



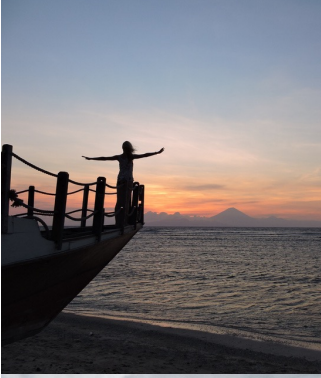
upto **FOUR** weeks?!!!

therapy compliance!



Information brochure

- Hardcopy
- Digital
 - Mail
 - Website
 - Some organisations: app
- **Emergency Treatment**
 - Always hand over personally via hardcopy version or mail



Costs malaria prophylaxis in The Netherlands

Average:

AP

ca.

€2,60/tabl

M

Ca.

€4,25/tabl

D

Ca.

€0,80/tabl

BENU Apotheek				
	Reisduur	Aantal tabletten	Totale kosten	Kosten per tablet
<u>Atovaquone/Proguanil</u>	7 dagen	15	50,92	3,39
	28 dagen	36	94,13	2,61
<u>Mefloquine</u>	7 dagen	8	43,40	5,42
	28 dagen	11	52,23	4,75
<u>Doxycycline</u>	7 dagen	35	29,70	0,85
	28 dagen	56	42,98	0,77

E-pharma Apotheek				
	Reisduur	Aantal tabletten	Totale kosten	Kosten per tablet
<u>Atovaquone/Proguanil</u>	7 dagen	15	12 st 32,48	2,71
	28 dagen	36	24 56,90 36 81,31	2,37 2,26
<u>Mal junior</u>			12 st 20,28	1,69
<u>Mefloquine</u>	7 dagen	8	8 33,36	4,17
	28 dagen	11	16 58,36	3,64
<u>Doxycycline</u>	7 dagen	35	40 33,79	0,84
	28 dagen	56	56 44,08	0,79



Atovaquon/Proguanil

KALENDER						
Ma	Di	Wo	Do	Vrij	Za	Zo
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

DAILY



- Ca. € 2,60/tabl (= ca. € 18,20/week)
- From 5 kg

Side effects

- > 10% headache, nausea, vomiting, diarrhea en stomach ache
- 1-10% allergic reactions, fever, coughing, lack of appetite, aphthous ulcers, abnormal dreams, depression and insomnia
- 0,1- 1% hair loss

Mefloquine

KALENDER						
Ma	Di	Woe	Don	Vrij	Za	Zo
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

WEEKLY



- Ca. € 4,25/tablet (= ca.€ 4,25/week)
- From 5 kg

Side effects*

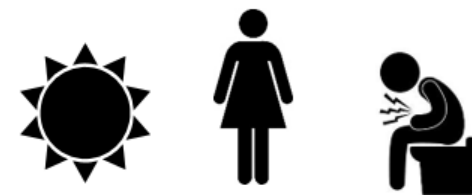
- >10% insomnia en abnormal dreams
- 1-10% nausea, vomiting, diarrhea, stomach ache, depression, loss of balance en anxiety
- <0,01% confusion, hallucinations en psychosis

*Women are at higher risk for side effects

Doxycycline

KALENDER						
Ma	Di	Wo	Do	Vrij	Za	Zo
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

DAILY



- Ca. € 0,80/tablet (ca. € 5.60/week)
- From 8 years (because of dental discoloration)

Side effects

- 1-10% gastrointestinal complaints en vaginal fungal infection*
- 0,1-1% fotosensibility**
- <0,01% allergisch reactions en nail detachment

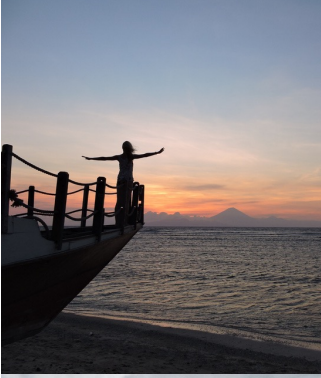
* Consider clotrimazol tablet 500mg because of vaginal fungal infection

** Pharmacy will warn; adequate: advice sunburnprevention

visual support!



Mosquito bite prevention



MOSQUITO BITE PREVENTION FOR TRAVELERS



LEARN ABOUT THE HEALTH RISKS RELATED TO YOUR TRIP



CHOOSE AN HOTEL WITH AIR CONDITIONING OR SCREENS ON WINDOWS AND DOORS



SLEEP UNDER A MOSQUITO BED NET



WEAR PROTECTIVE LONG SLEEVED CLOTHES AND TREAT THEM WITH AN EPA-REGISTERED INSECTICIDE



USE A SAFE INSECT REPELLENT AND REAPPLY EVERY FEW HOURS



AVOID GOING OUTDOORS WHEN MOSQUITOES ARE MORE AGGRESSIVE (DAYTIME, DAWN, DUSK)



AVOID MOSQUITOES NATURAL HABITATS, LIKE SWAMPS AND PONDS



Insect repellents: ages & percentages

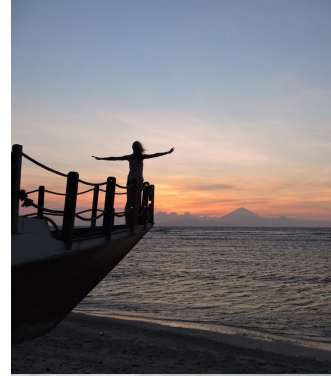
Product-information leaflet:

- DEET, Icaridin en Lemon-Eucalyptus oil for tropics: ► **Use one time daily**

LCR:

- Healthrisk because of insect transmittable diseases: ► **More times daily**

Product-information leaflet	+ 3 months	+ 2 years	+ 13 years	+ 18 years	Product advised by LCR & WHO?
F.E. Care Plus products					
DEET	✗	✗	✓ 30- 40%	✓ 30- 50%	LCR & WHO guidelines
ICARIDIN	✗	✓ (3+)	✓	✓	LCR & WHO guidelins
Lemon-Eucalyptus oil for tropics (f.e. natural/bio)	✓	✓	✓	✓	LCR: Worldwide used as DEET-alternative WHO: Not first choice in guidelines



DEET based on LCR: groups & percentages

	20% DEET	21-30% DEET	31-40% DEET	41-50% DEET
Adults	5x	4x	3x	2x
Pregnant women	5x	4x	Don't use	Don't use
Children < 2 years	5x	4x	Don't use	Don't use
Children ≥ 2 years	5x	4x	3x	2x

- **< 20% DEET:** insufficient protection for the tropics and is not recommended
- **>50% DEET:** not better or longer-lasting and therefore not advised



Let's take a QUIZ!

- Get your devices, open this item on the NECTM9-app
- General questions to check differences per country
- Case study questions: most fitting answer based on Dutch protocol



Which country are you from?

A Denmark

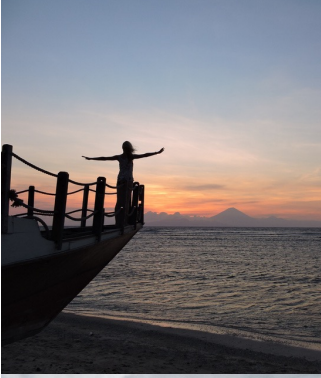
B Sweden

C Norway

D Germany

E The Netherlands

F Other



What's your job title?

A Nurse

B Nurse Travel Health Advice / Nurse Travel Medicine

C Nurse Specialist

D Other



Do you need to check the malaria prescription with your doctor?

- A** I'm not allowed to make malaria prescriptions; this is a doctor-function in my organisation
- B** Yes, always (including healthy travellers)
- C** Yes, just for all travellers with health complications (co-medication & any disease)
- D** Yes, just for travellers in special medical conditions which aren't protocol based
- E** No



Which malaria prophylaxis do you prescribe the most?

- A** 90+ % atovaquone/proguanil
- B** 75+ % atovaquone/proguanil
- C** 50+ % atovaquone/proguanil
- D** 50+ % mefloquine
- E** 50+ % doxycycline
- F** Something else



Which malaria prophylaxis do you prescribe the most?

A 90+ % atovaquone/proguanil

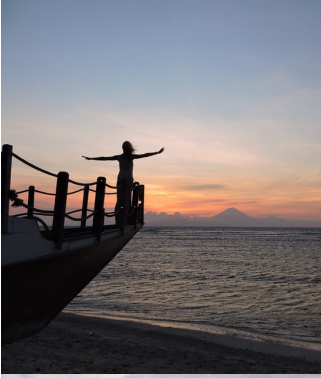
B 75+ % atovaquone/proguanil

C 50+ % atovaquone/proguanil

D 50+ % mefloquine

E 50+ % doxycycline

F Something else



Case study I: Last minute backpacker

Do you prescribe mefloquine when a backpacker (21, healthy) leaves within 3 weeks?

- A** Yes, if he has no contraindications and stays for a long time in an malaria risk area, provided that he doesn't arrive in malaria risk area sooner than in 10 days
- B** Yes, if he has no contraindications and stays for a long time in an malaria risk area with mefloquine indication, even if he leaves in less than 10 days
- C** Yes, if he has no contraindications and only when he has used mefloquine before and for the first days in combination with another malaria chemoprophylaxis
- D** No



Advice when to start Mefloquine

Consult before departure	Advice when to start mefloquine
Consultation >3 weeks before departure	- Start 3 weeks before arriving at malaria risk area (4th tablet on day of arrival in risk area)
Consultation <3 weeks and ≥ 10 days before departure	- First tablet 10 days before arriving at malaria risk area, 1 tablet per week - Spreading 4 tablets from first tablet up to and including the day of arrival in risk area
Consultation <10 days before departure	- Loading dose: 1 tablet a day during 3 days , from then 1 tablet per week (off label) - Spreading 4 tablets from first tablet up to and including the day of arrival in risk area (off label)

Didn't use mefloquine before and/or enter a malaria area some time after the start of the trip?
→ Advise to take three trial tablets before departure from the Netherlands.

Continue 1 tablet per week up to and including 4 weeks after leaving malaria risk area



Case study – last minute backpacker

Do you prescribe mefloquine when a traveller leaves within 3 weeks?

A Yes, if he has no contraindications and stays for a long time in an malaria risk area with mefloquine indication, provided that he doesn't arrive in malaria risk area sooner than in 10 days

B Yes, if he has no contraindications and stays for a long time in an malaria risk area with mefloquine indication, even if he leaves in less than 10 days

C Yes, but only when he has used mefloquine before and for the first days in combination with another malaria chemoprophylaxis

D No

Offlabel, higher risk of side effects!

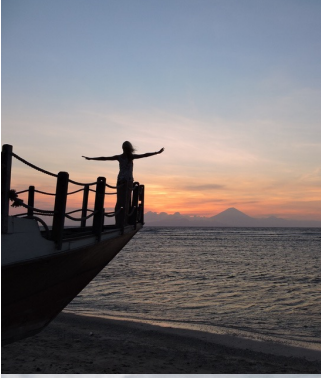


Case study II: International business trip

- Thomas (26 jaar, healthy): **Reunion of student association: Thailand tour**
 - 7 days Phuket
 - 3 days Western Thailand (Tak region)
 - 3 days hiking Golden Triangle
 - 5 days Chang Mai & Bangkok (medical health within 48 hours okay?)
- International friends already got a consultation in their own country
 - Belgium, Germany, United States, Thailand

What's the malaria prevention advice based on LCR?

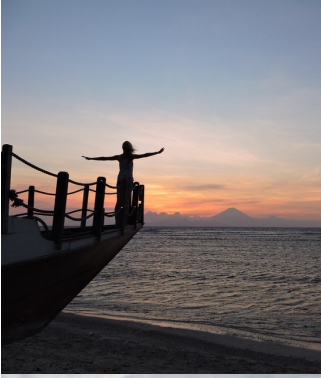
- A** Mosquito bite prevention
- B** Emergency Treatment Atovaquone/Proguanil
- C** Malariaprophylaxis: Atovaquone/Proguanil
- D** Other



LCR

2 months a go:

Emergency Treatment?



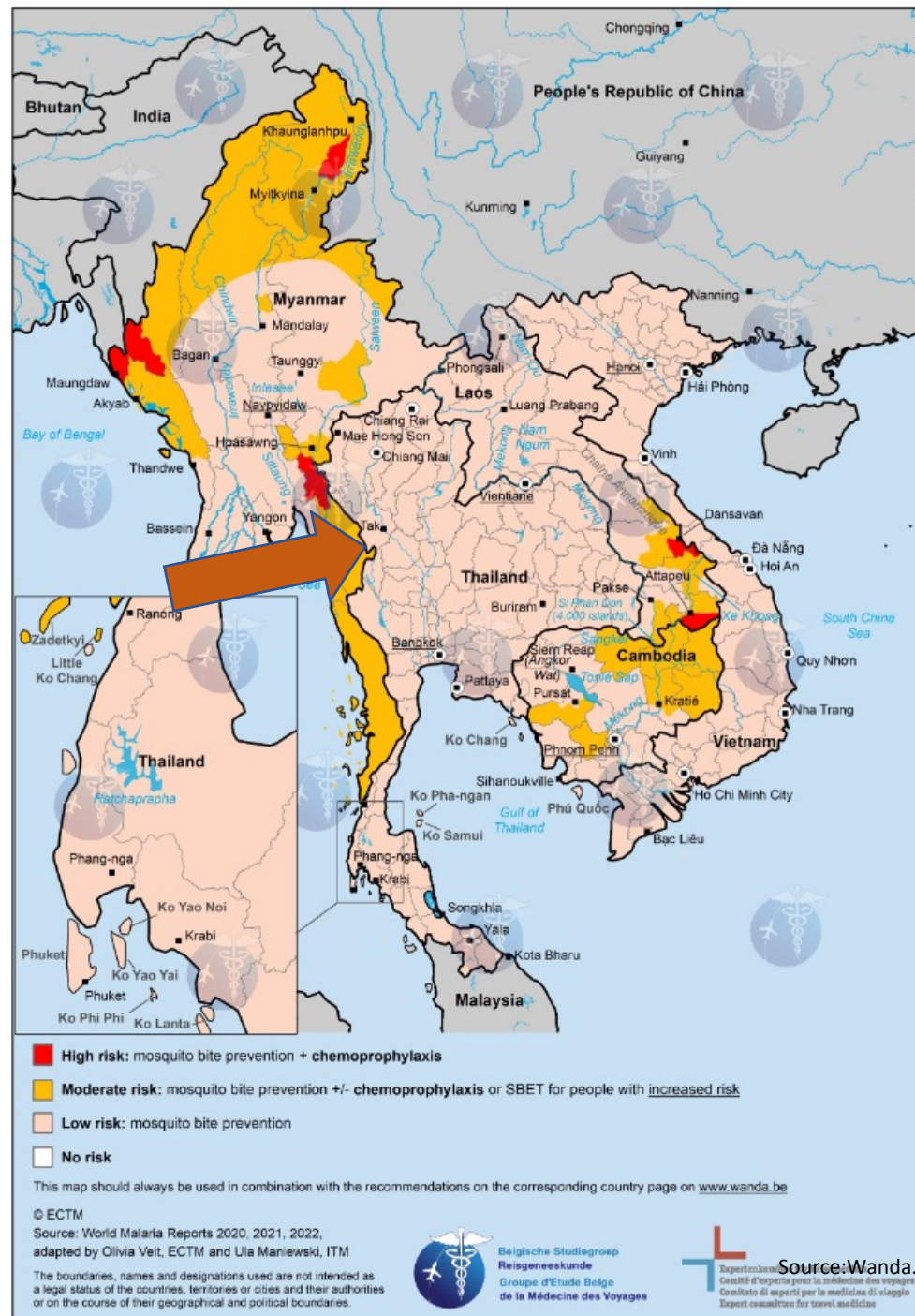
LCR

Since a month:
Mosquito bite prevention



Belgium

Mosquito bite prevention



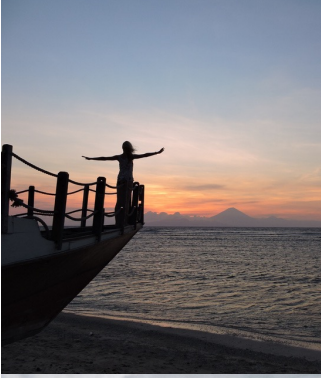
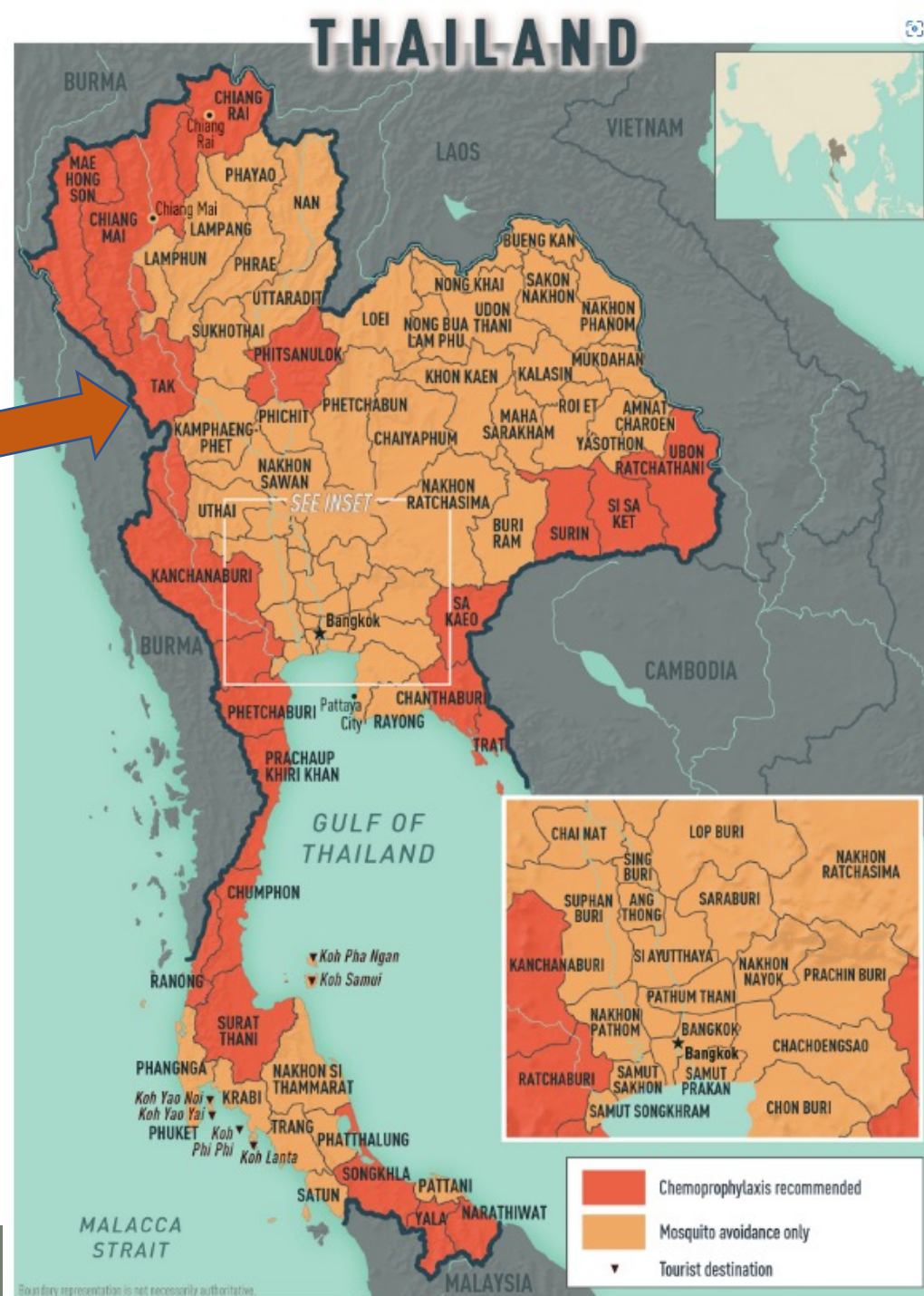
Germany

Emergency Treatment?



United States of America

Chemoprophylaxis



Thailand

Mosquito bite prevention?
Emergency Treatment?
Chemoprophylaxis?



Malaria Prevention in Travelers

Thai Travel Clinic
Hospital for Tropical Diseases
Faculty of Tropical Medicine, Mahidol University

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Main Menu

- Home
- About Thai Travel Clinic
- Services in Travel Clinic
- Available vaccines in our clinic
- Useful articles for travelers
- Education and Research
- Location of our clinic
- Make an appointment
- Frequently Asked Questions
- Contact us
- Link
- Terms of Services

Appointment for vaccine/consultation

Teleconsultation

Traditional Thai Massage
New

Malaria Prevention in Travelers

Since malaria in Thailand and in South East Asia are the multi drug resistance strain. The used of antimalarial prophylaxis should be advised by qualified medical staff only. Over-the-counter antimalarial drug is not recommended.

In our clinic we provide counseling on basic knowledge of malaria, epidemiology, how to prevent yourself from malaria and whether antimalarial drug is recommended for you. You should have some basic knowledge about malaria. Please read these articles

- [FAQ about malaria in Thailand](#)
- [Risk to get malaria in Thailand](#)
- [Standby emergency treatment of malaria \(SBET\)](#)

We usually have 3 options of antimalarial prophylaxis

- 1 Take antimalarial drug to prevent malaria
- 2 Not to take antimalarial drug
- 3 Carry a standby (emergency) drugs

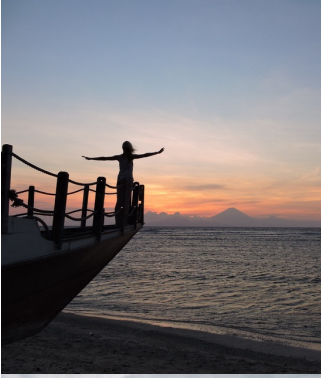
Counseling with our staff is strongly recommended in this issue

0 Shares

f Share t Tweet in Share

‘The use of antimalarial prophylaxis should be advised by qualified medical staff only. Over-the-counter antimalaria drug is not recommended. Consult our travel clinic.’

Source:thaitravelclinic.com



International business trip

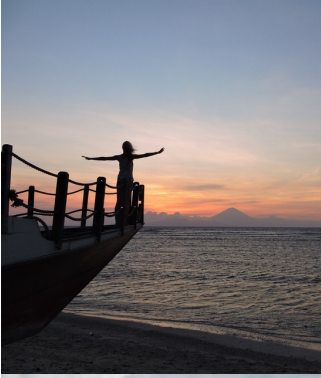
- Mosquito bite prevention
- Clear information
- Shared decision making because of various advises

A Mosquito bite prevention

B Emergency Treatment Atovaquone/Proguanil

C Malariaprophylaxis: Atovaquone/Proguanil

D Other



III: Depression & anticoagulation therapy

- Thomas recently recovered from depression
- Medication: acenocoumarol
- Departure in a week to high risk area for 2 months
- Really wants to minimize the risk of psychological side effects.



Which prophylaxis do you advise?

A Mefloquine (start 3 weeks before arriving risk area, thereafter weekly until and including 4 weeks after leaving risk area)

B Chloroquine (100 mg) – 3 tablets on day 0 & 1, thereafter 1x/wk 3 tablets, until and including 4 weeks after leaving risk area

C Atovaquon/Proguanil (250/100 mg) - 1 tablet daily, start 1 day before arrival, use until and including 7 days after leaving risk area

D Doxycycline (100 mg) – 1 tablet daily, start 1 day before arrival, use until and including 4 weeks after leaving risk area



Atovaquon/Proguanil

KALENDER						
Ma	Di	Wo	Do	Vrij	Za	Zo
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

DAILY



- Ca. € 2,60/tabl (= ca. € 18,20/week)
- From 5 kg

Side effects

- > 10% headache, nausea, vomiting, diarrhea en stomach ache
- 1-10% allergic reactions, fever, coughing, lack of appetite, aphthous ulcers, abnormal dreams, depression and insomnia
- 0,1- 1% hair loss

Mefloquine

KALENDER						
Ma	Di	Woe	Don	Vrij	Za	Zo
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

WEEKLY



- Ca. € 4,25/tablet (= ca.€ 4,25/week)
- From 5 kg

Side effects*

- >10% insomnia en abnormal dreams
- 1-10% nausea, vomiting, diarrhea, stomach ache, depression, loss of balance en anxiety
- <0,01% confusion, hallucinations en psychosis

*Women are at higher risk for side effects

Doxycycline

KALENDER						
Ma	Di	Wo	Do	Vrij	Za	Zo
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

DAILY



- Ca. € 0,80/tablet (ca. € 5.60/week)
- From 8 years (because of dental discoloration)

Side effects

- 1-10% gastrointestinal complaints en vaginal fungal infection*
- 0,1-1% fotosensibility**
- <0,01% allergisch reactions en nail detachment

* Consider clotrimazol tablet 500mg because of vaginal fungal infection

** Pharmacy will warn; adequate: advice sunburnprevention



Doxycycline combined with anticoagulation therapy:

- **Doxycycline, when combined with VKAs (vitamin K antagonists), increases the risk of bleeding by 3-5 times.**
- **Doxycycline can be given as prophylaxis, but with extra precautions. The advice when using VKAs is to start doxycycline, if possible, a few weeks before departure so that there is enough time to adjust the dose of the vitamin K antagonists to a changed anticoagulation level.**
- If this is not possible, inform about the risk of simultaneous use of these medications and advise to regularly monitor their coagulation while traveling and/or contact the thrombosis service to possibly adjust the VKA dosage

A Mefloquine (start 3 weeks before arriving risk area, thereafter weekly until and including 4 weeks after leaving risk area)

B Chloroquine (100 mg) – 3 tablets on day 0 & 1, thereafter 1x/wk 3 tablets, until and including 4 weeks after leaving risk area

C Atovaquon/Proguanil (250/100 mg) - 1 tablet daily, start 1 day before arrival, use until and including 7 days after leaving risk area

D Doxycycline (100 mg) – 1 tablet daily, start 1 day before arrival, use until and including 4 weeks after leaving risk area



IV: Case study Breastfeeding



- Iris(32, healthy, giving breastfeeding)
- Mother has past away: Iris will leave tomorrow for the funeral to **North East Nicaragua (high transmission area)**
- Baby son stays home with father
- **Takes breast pump with her, wants to continue breastfeeding directly when arriving back home**

What prophylaxis do you advice?

A Mefloquine

B Chloroquine

C Atovaquon/Proguanil

D Doxycycline



Landen	Gele koorts	DTP	Buiktyfus	Mazelen	Hep A	Hep B	TBC	Meningokokken	Rabiës	Virale encefalitis	Muggenmaatregel	MALARIA gebieden	Transmissie maanden	Advies	Bijzondere reizigers*	Bijzonderheden algemeen
Nicaragua	g3	D			A	B			R1		CDZ	In het noordoosten van het land in de autonome gebieden (Región Autónoma del Atlántico Norte (RAAN) en het noorden van Región Autónoma del Atlántico Sur) (zie kaart)	1 t/m 2	AP/C/D/M		MALARIA <i>P. vivax</i> (53%), <i>P. falciparum</i> (47%)

- D: CI
- M: Relative CI
- AP: off label
- C: 'coming back': Nicaragua included

A Mefloquine

B Chloroquine

C Atovaquon/Proguanil

D Doxycycline



4 cases... how often should a nurse travel health advice consult the doctor at a Dutch travel clinic?

- Backpacker leaving soon
- Man recovered of depression & using anticoagulation therapy
- Trip international business (Thailand)
- Funeral Nicaragua

A 0: protocol gives clear answers at all cases

B 1 times

C 2 times

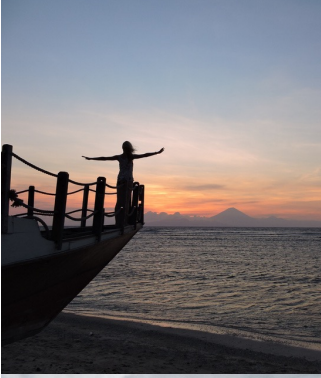
D 3 times



Justification for delegating tasks:

The travel nurse advises travelers belonging to the group of special travelers to have their advice reviewed by a travel medicine specialist before advising and vaccinating:

- a traveler with asplenia or (possible) hyposplenia
- a traveler who is (possibly) immunocompromised
- pregnant women
- children < 1 year
- children < 5 years traveling to medium or high malaria transmission areas
- a traveler with liver and/or kidney dysfunction
- ➔ a traveler with a coagulation disorder
- a traveler with previous adverse reactions to vaccines or malaria prophylaxis
- travelers with an unknown illness or unknown medication to the nurse
- travelers taking co-medication if a prescription is provided
- ➔ a traveler with a relative contraindication to a vaccine or malaria tablets



4 cases... how often should a nurse travel health advice consult the doctor at a Dutch travel clinic?

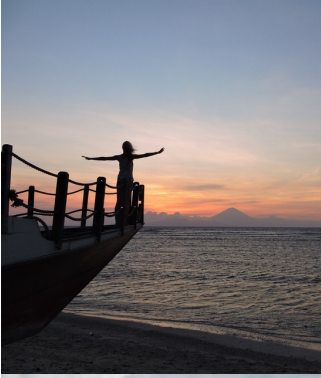
- Doctors prescription (pre-signed) 'based on doctors protocol given by nurse'
- Justification for delegating tasks
- Protocols
- All necessary? Working agreements!

A 0: protocol gives clear answer at all caeses

B 1 times

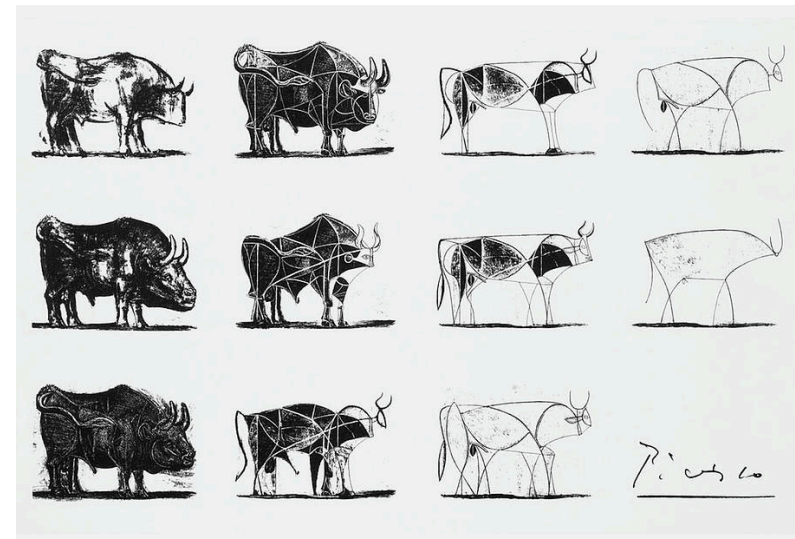
C 2 times

D 3 times



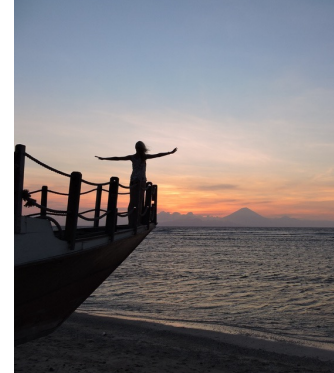
Take home messages

- Personal malaria prophylaxis advice requires customization!
- Shared decisionmaking vs. clear information
- Atovaquon/Proguanil often good to use (but don't forget the others!)
- **Visual support**
 - Malaria prophylaxis consultation room visual
 - Information brochure/app/website
- **Document when doctor consultation is required**
 - Justification for delegating tasks and/or
 - Protocol & working agreements



Thank you for your attention!

Any questions? Feel free to ask!

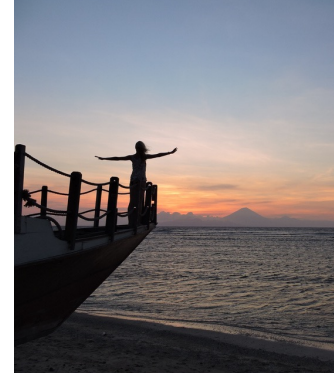


Frederike Nederlof - Travel Clinic East The Netherlands - fnederlof@rijnstate.nl – www.travelclinicoost.nl



VACCINATIECENTRUM
Travel Clinic Oost

Vaccinaties, keuringen en (reis)advies op maat



Frederike Nederlof - Travel Clinic East The Netherlands - fnederlof@rijnstate.nl – www.travelclinicoost.nl



VACCINATIECENTRUM
Travel Clinic Oost

Vaccinaties, keuringen en (reis)advies op maat

Case study - child

- **Boaz - 4 years old - 21 kg**
- Summer holiday: Namibia (21 days Okakara)
- → medium malaria transmission area
- **Hyper active (ADHD), bad sleeper**
- **Parents: we absolutely go**

What malaria advice would you give?

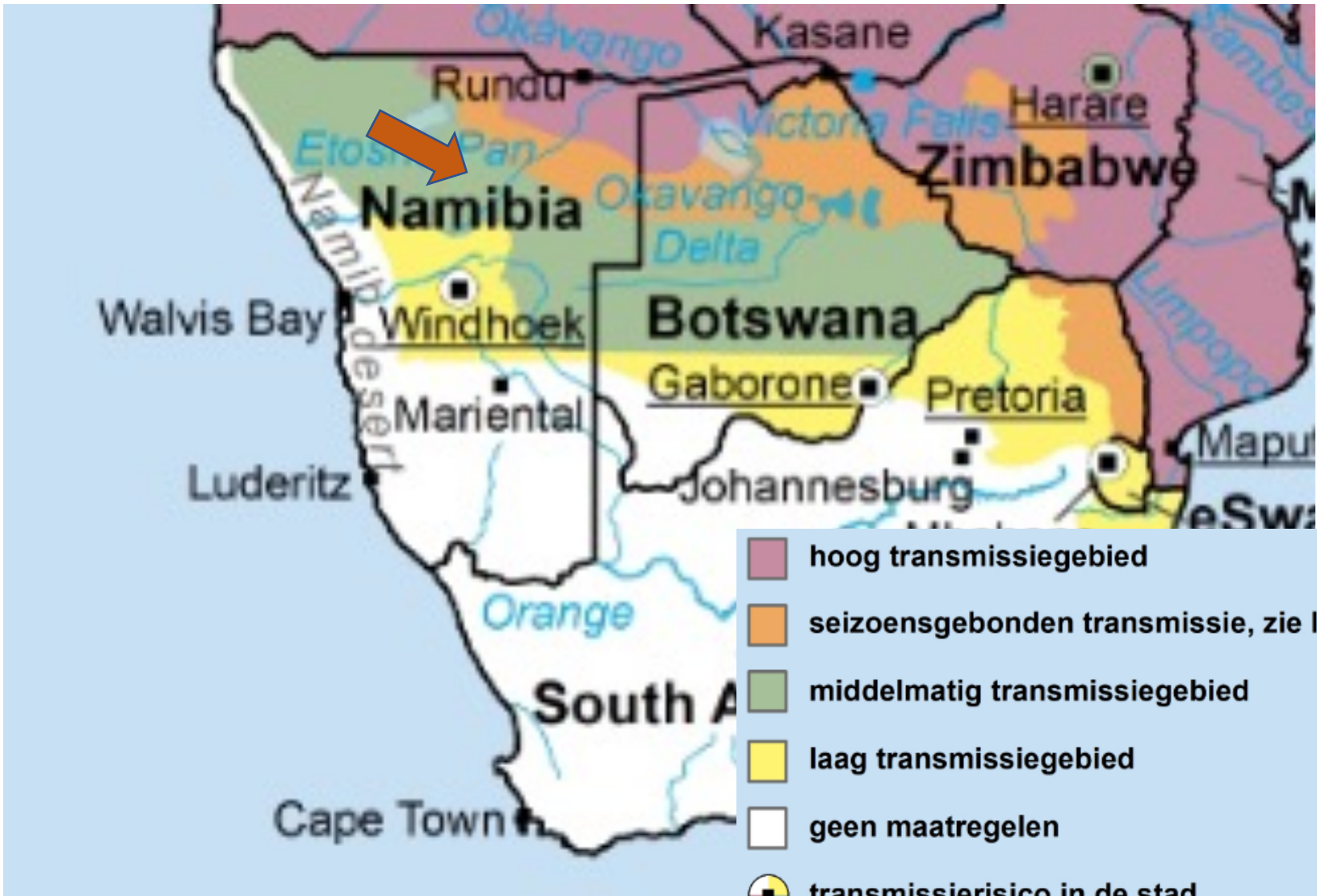
A **Mosquito bite prevention** incl. mosquito net, chemoprophylaxis not needed.
To be sure: **Emergency Treatment** Atovaquon/Proguanil 250/100 mg: 6 tablets
(1xdaily 2 tablets for 3 days)

B **Atovaquon/Proguanil childrentablets** (62,5/25 mg): (1 x daily 2 tablets

C **Atovaquon/Proguanil** (250/100 mg) – (1x daily 0,5 tablet)

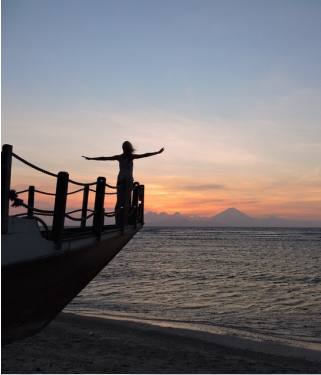
D **Mefloquine** 250 mg: 1 x / wk 0,5 tablet





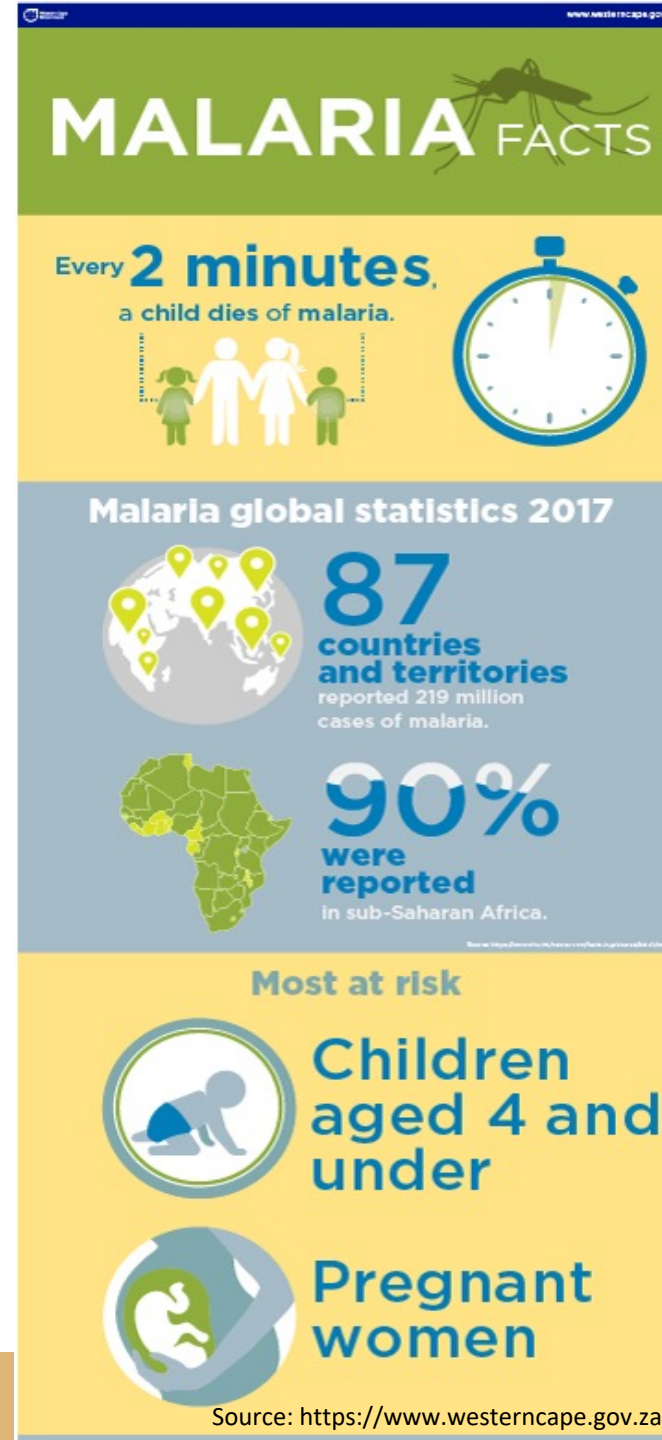
Deze kaart in combinatie met LCR-landenlijst en LCR-malariaprotocol (E10) gebruiken.

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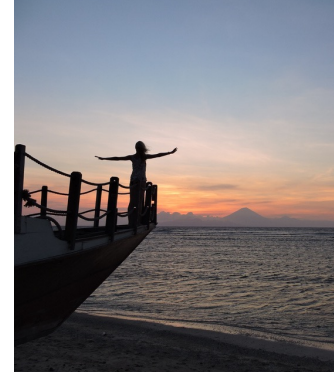
LCR:

- Young children until 4 years old
 - Higher risk of severe course of malaria
 - Advised better not to go to medium & high malariarisk areas
 - In case of decision to travel: **prophylaxis** i.s.o. emergency treatment
 - Also when shorter than 7 days of medium malariarisk area
 - + intensive mosquito bite prevention



Tabel 2. Dosering antimalariamiddelen voor profylactisch gebruik

Gewicht in kg		>45	41 t/m 45	31 t/m 40	21 t/m 30	11 t/m 20	9 t/m 10	5 t/m 8	< 5
Middel	Dosering								
Atovaquon/ proguanil [#]	Tabletten/dag	1 volw tab		3 kindertab	2 Kindertab	1 kindertab	3/4 * kindertab	1/2 * kindertab	Niet geven
Mefloquine	Mg/week	250	187,5		125		62,5		Niet geven
	Tabletten à 250 mg/week	1	3/4		1/2		1/4		Niet geven
[^] # Doxycycline	Mg/dag	100	2 mg/kg (kinderen < 8 jaar niet geven)						
	Tabletten à 100 mg/dag	1	1/2 -1						
Proguanil	Mg/dag	200	150		100	50	25		25
	Tabletten à 100 mg/dag	2 dd 1	2 dd 3/4		2 dd 1/2	1 dd 1/2	1 dd 1/4		1 dd 1/4
Chloroquine	Mg base/week	300	250		150	100	50		5 mg/ kg
	Tabletten à 100 mg/week	3	2 1/2		1 1/2	1	1/2		1/4



- **Doxycycline: CI < 8 years old**
- **Mefloquine: Relative CI psychological & psychosocial problems**
- **Atovaquone/Proguanil 250/100 mg: cheaper, not registered, difficult to break**

A **Mosquitoprevention** incl. mosquito net, chemoprophylaxis not needed
To be sure: **Emergency Treatment** Atovaquon/Proguanil 250/100 mg: 6 tablets
(1xdaily 2 tablets for 3 days)

B **Atovaquon/Proguanil childrentablets (62,5/25 mg): (1 x daily 2 tablets)**

C **Atovaquon/Proguanil (250/100 mg) – (1x daily 0,5 tablet)**

D **Mefloquine 250 mg: 1 x / wk 0,5 tablet**

