

Novembre 2011

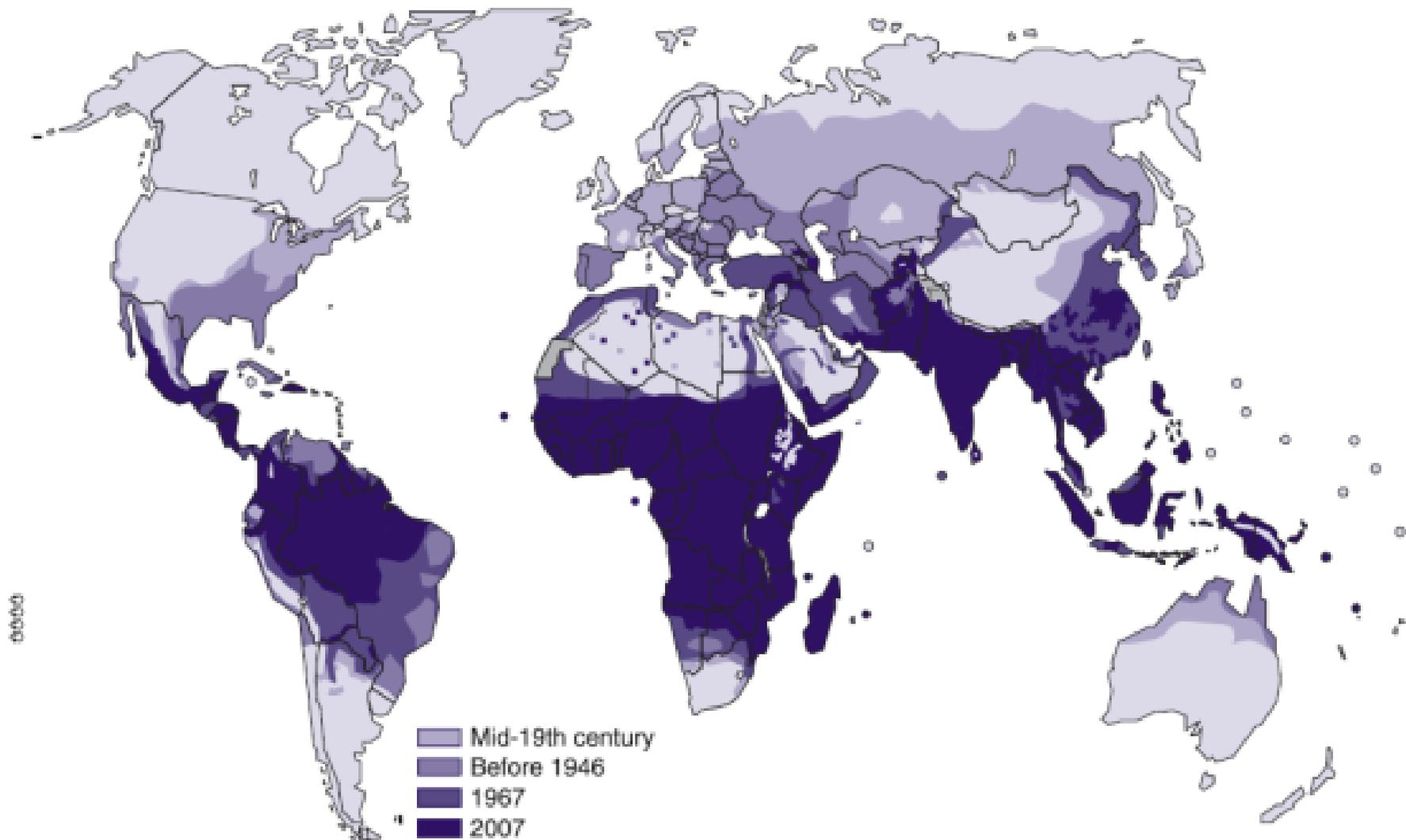
# Actualités sur le paludisme

Frederic Arieu

Odile Mercereau Puijalon

Jacques Le Bras

# Le poids du paludisme



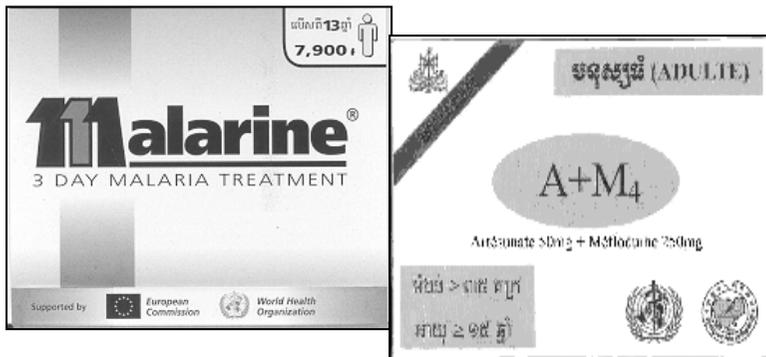
# Outils de lutte contre le paludisme



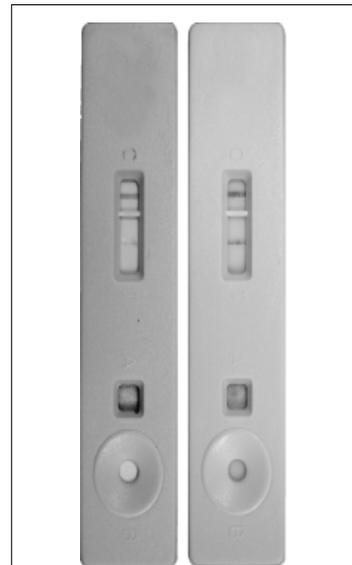
**Pulvérisations intra domiciliaires**



**Moustiquaires imprégnées d'insecticide MII**



**Traitement combiné à base de dérivés de l'artémisinine (ACT)**

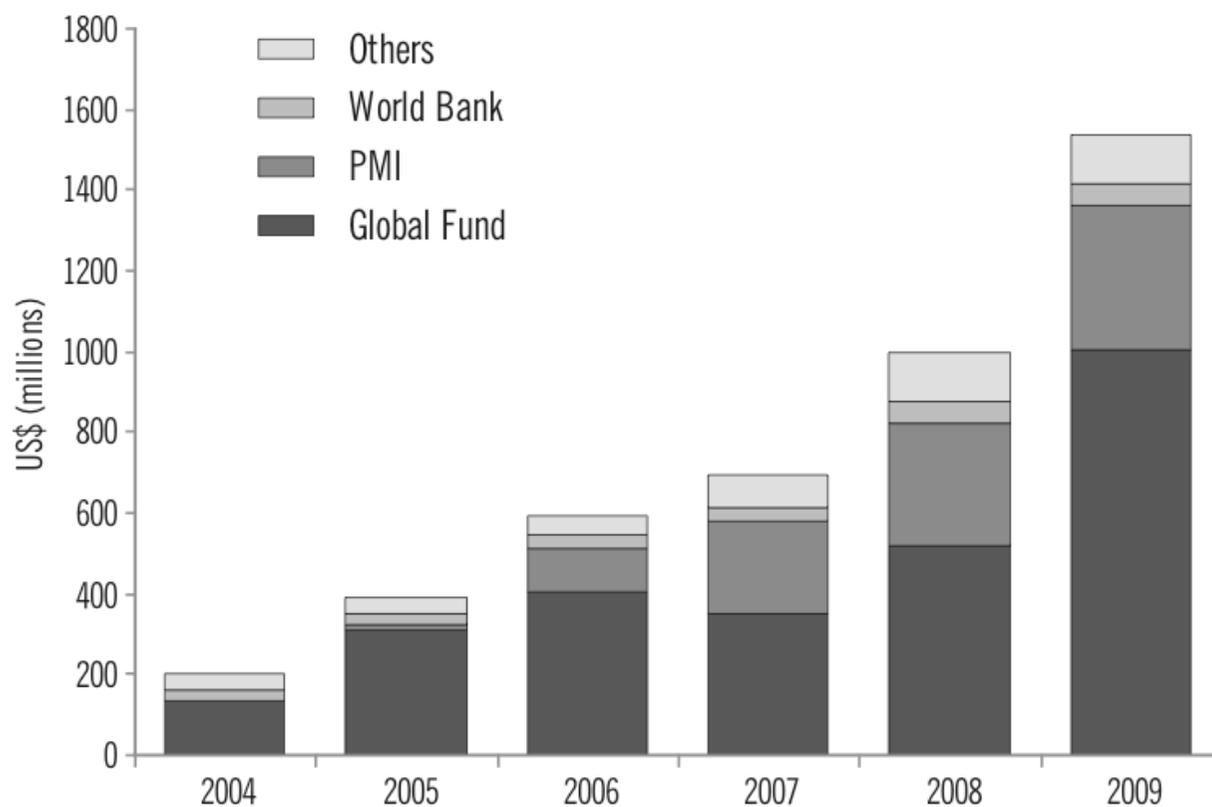


**Diagnostic TDR**



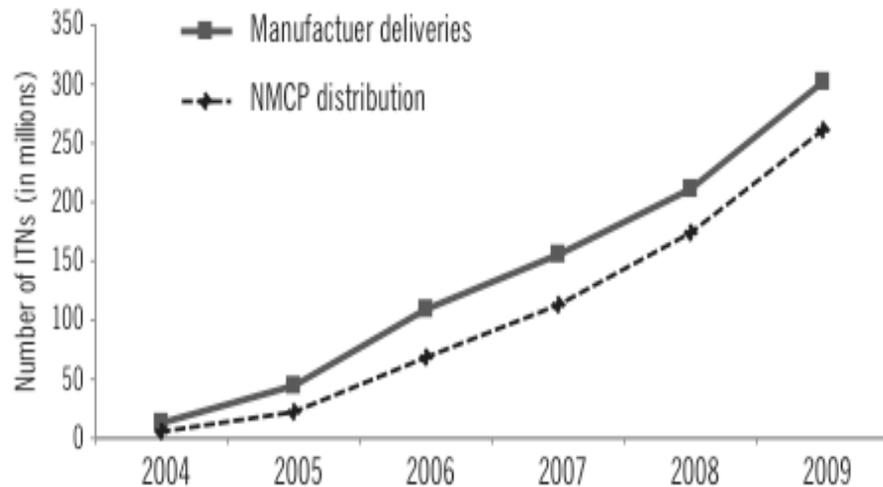
**Traitement Préventif Intermitant IPT**

# Augmentation exponentielle des fonds alloués à la lutte contre le paludisme

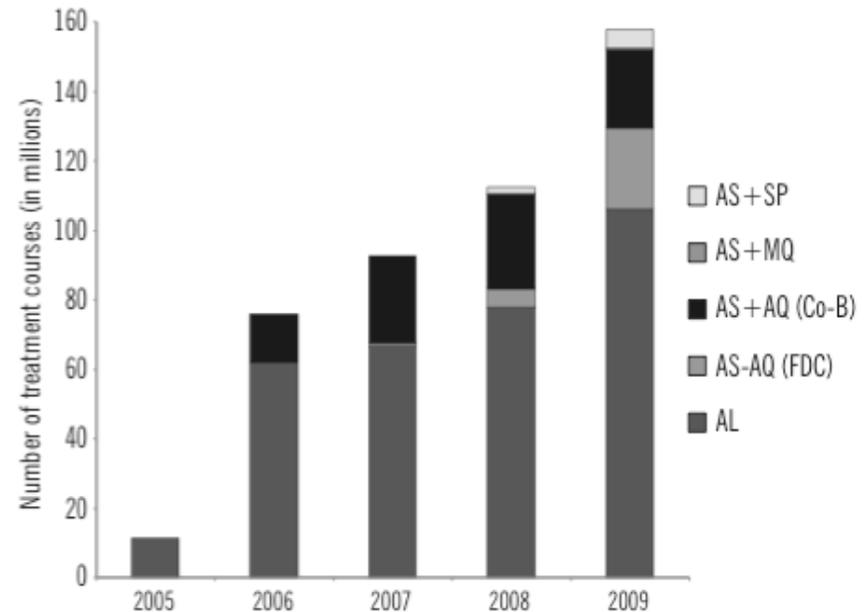


**Figure 3.2 Disbursements to malaria endemic countries, 2004–2009**

# Augmentation effective des moyens de lutte



**Figure 4.2** Cumulative number of ITNs distributed in sub-Saharan Africa, 2004–2009



**Figure 5.6** ACT sales to the public sector (2005–2009) by artemisinin-based combination (data provided by 7 companies eligible for procurement by WHO/UNICEF)

# Efficacité sur le poids du paludisme

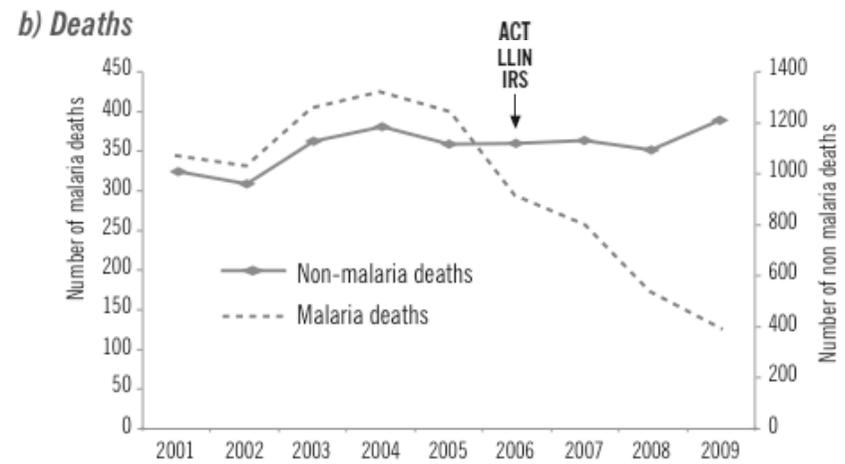
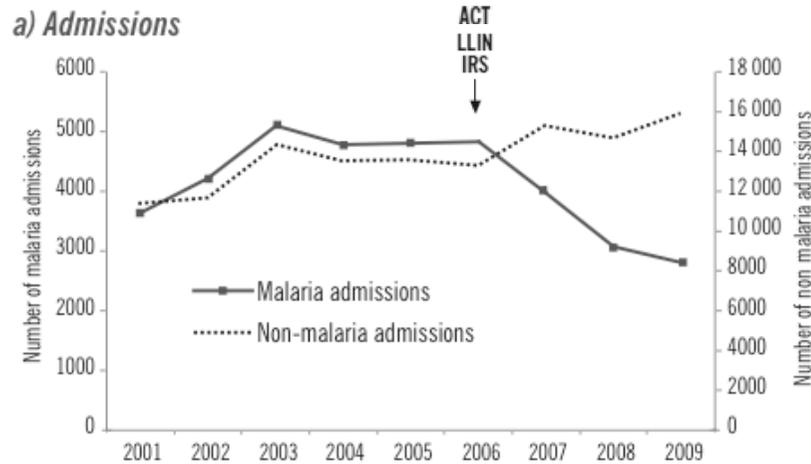
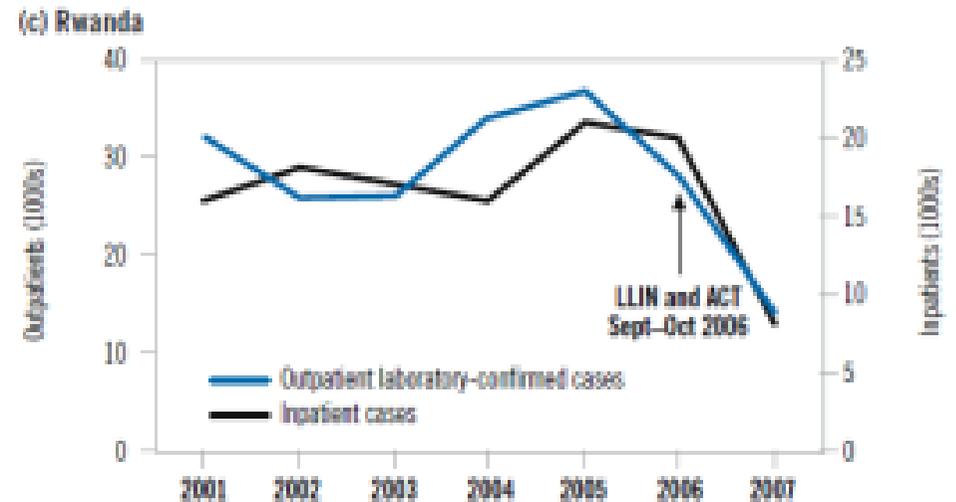
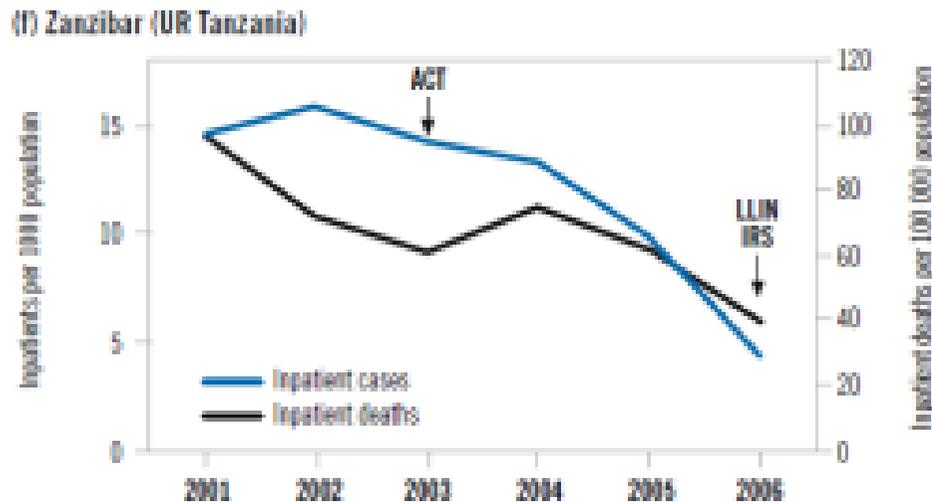
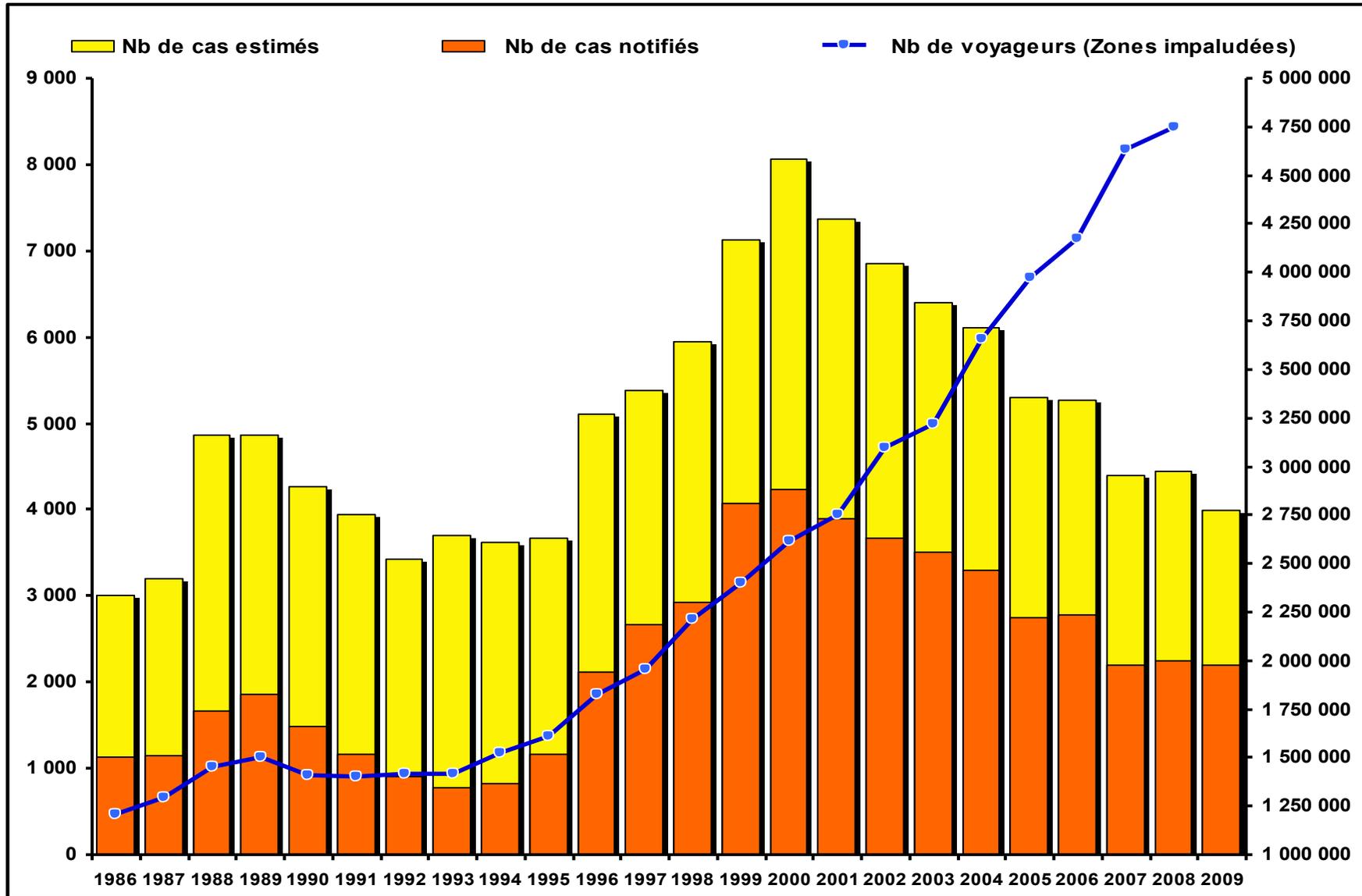


Figure 6.3 Malaria and non malaria admissions and deaths in Madagascar, 2001–2009

NOTE: Data from 35 health facilities. Excludes Nov. and Dec. of each year owing to missing data in 2009



# Paludisme importé en France



# Elimination



In recent years we have seen an increased fiscal and political commitment to malaria control that has resulted in a rapid scale-up of proven malaria control interventions and a consequent reduction in both the number of malaria cases and deaths. This progress provides encouraging evidence that with currently available tools malaria can be better controlled -- and even eliminated-- in some countries and regions. However, a broad consensus also exists that new tools focused specifically on the interruption of transmission need to be developed if malaria eradication is to be eventually achieved.

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World Health Organization  
Geneva (Switzerland)

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Roll Back Malaria Partnership  
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**Mark Walport**

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**Tachi Yamada**

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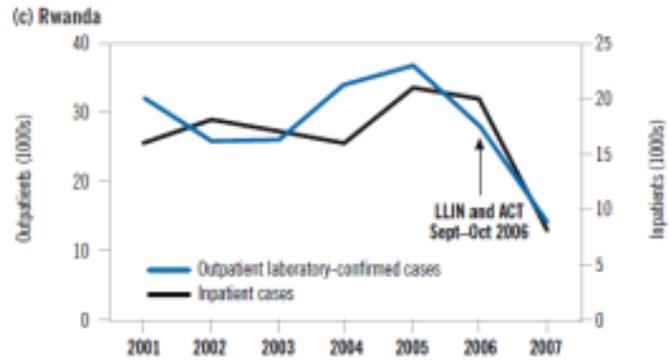
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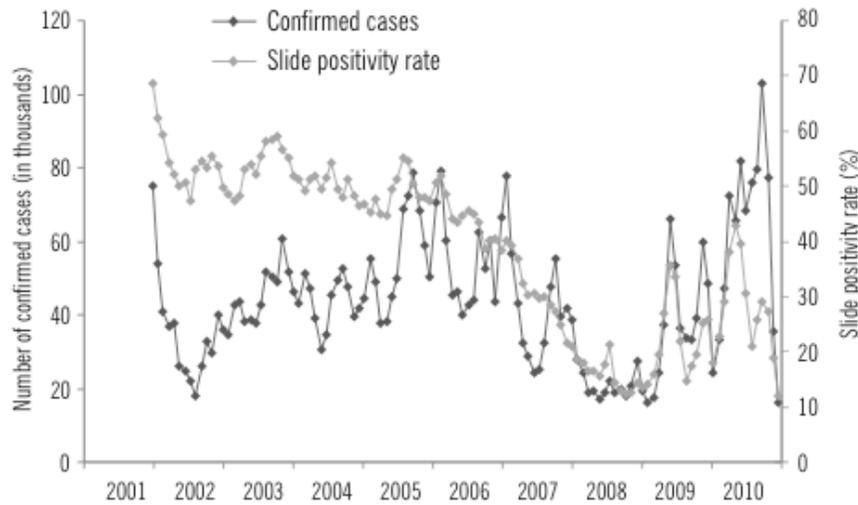
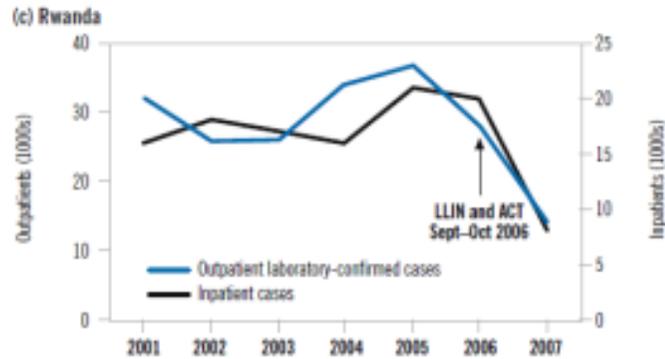
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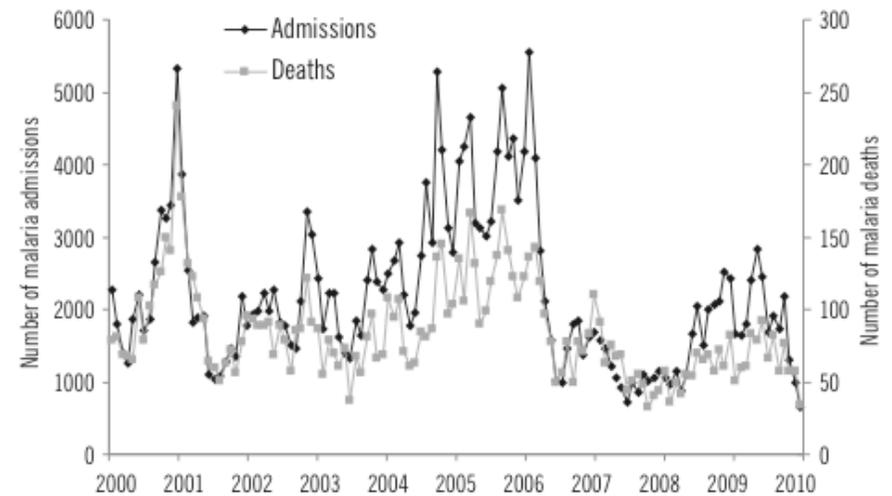
# Echappement ?



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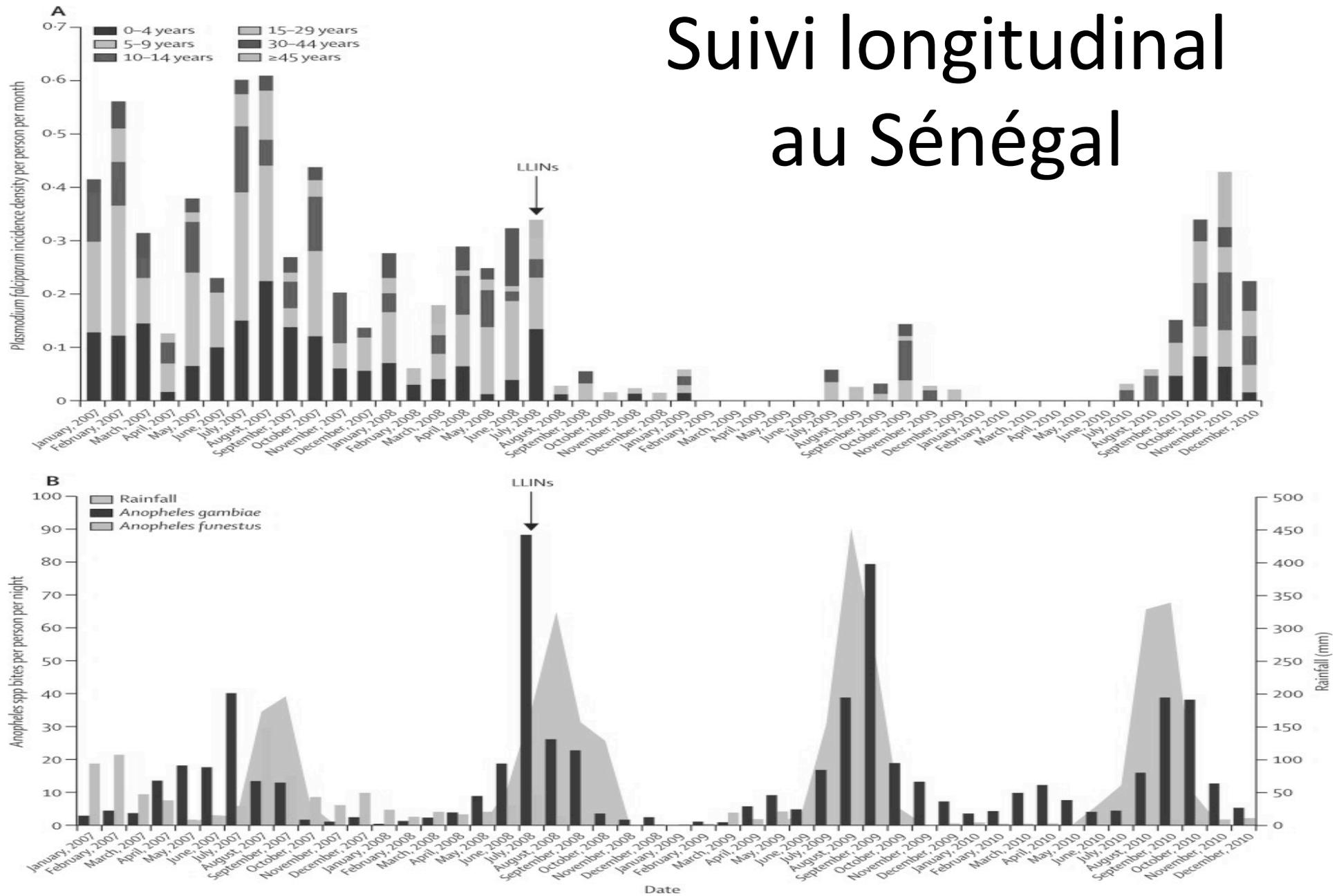


**Figure 6.4** Confirmed malaria cases and slide positivity rate, Rwanda, 2001–2010



**Figure 6.5** Malaria admissions and deaths, Rwanda, 2000–2010

# Suivi longitudinal au Sénégal



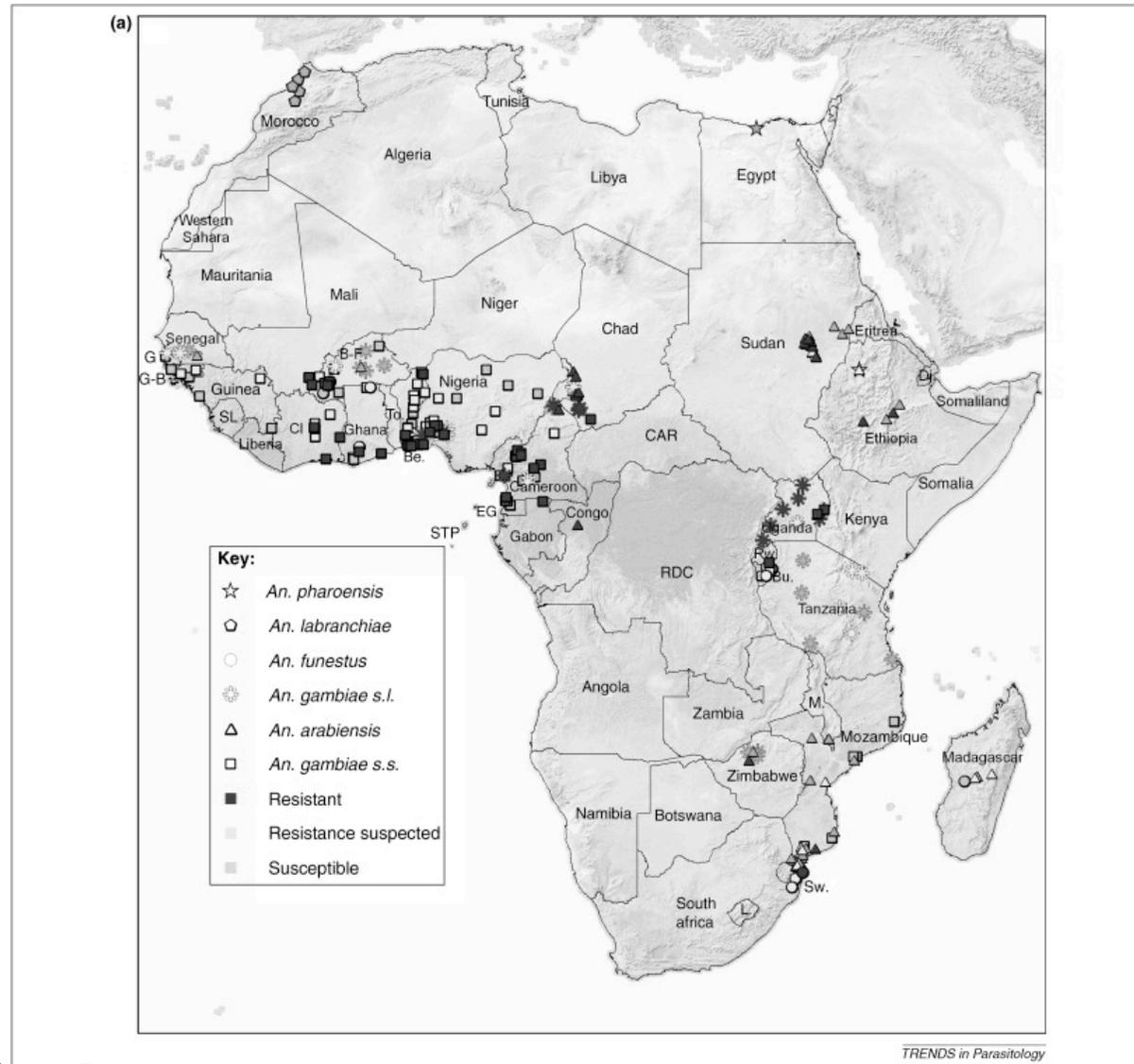
Trape et al, 2011, The Lancet Infectious Diseases

# Baisse efficacité MII ?

## Résistance aux insecticides

NB à Dielmo

7% en 2007,  
47% en 2010



Ranson et al, 2011, Trends in Parasitology

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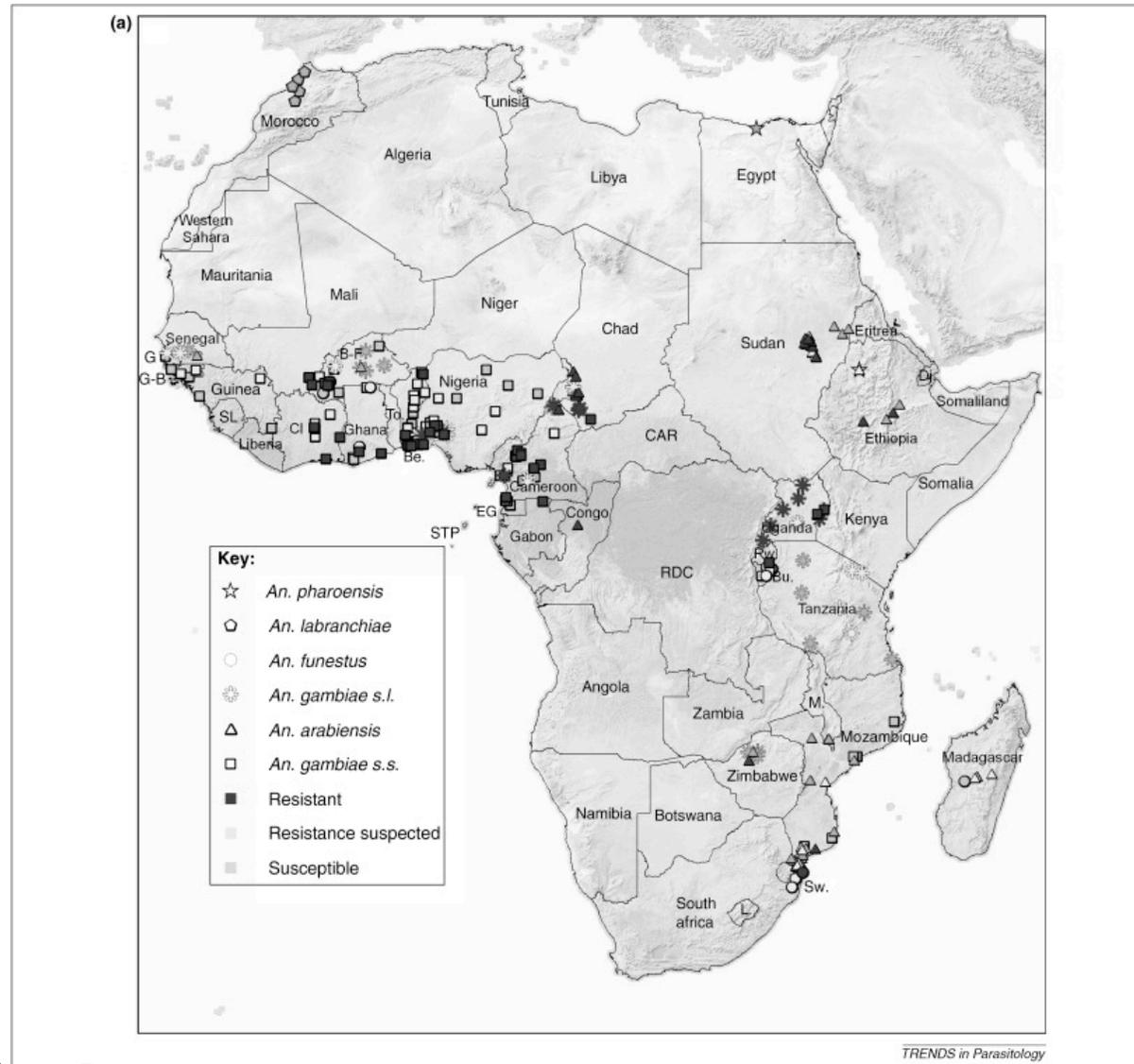
Résistance aux insecticides

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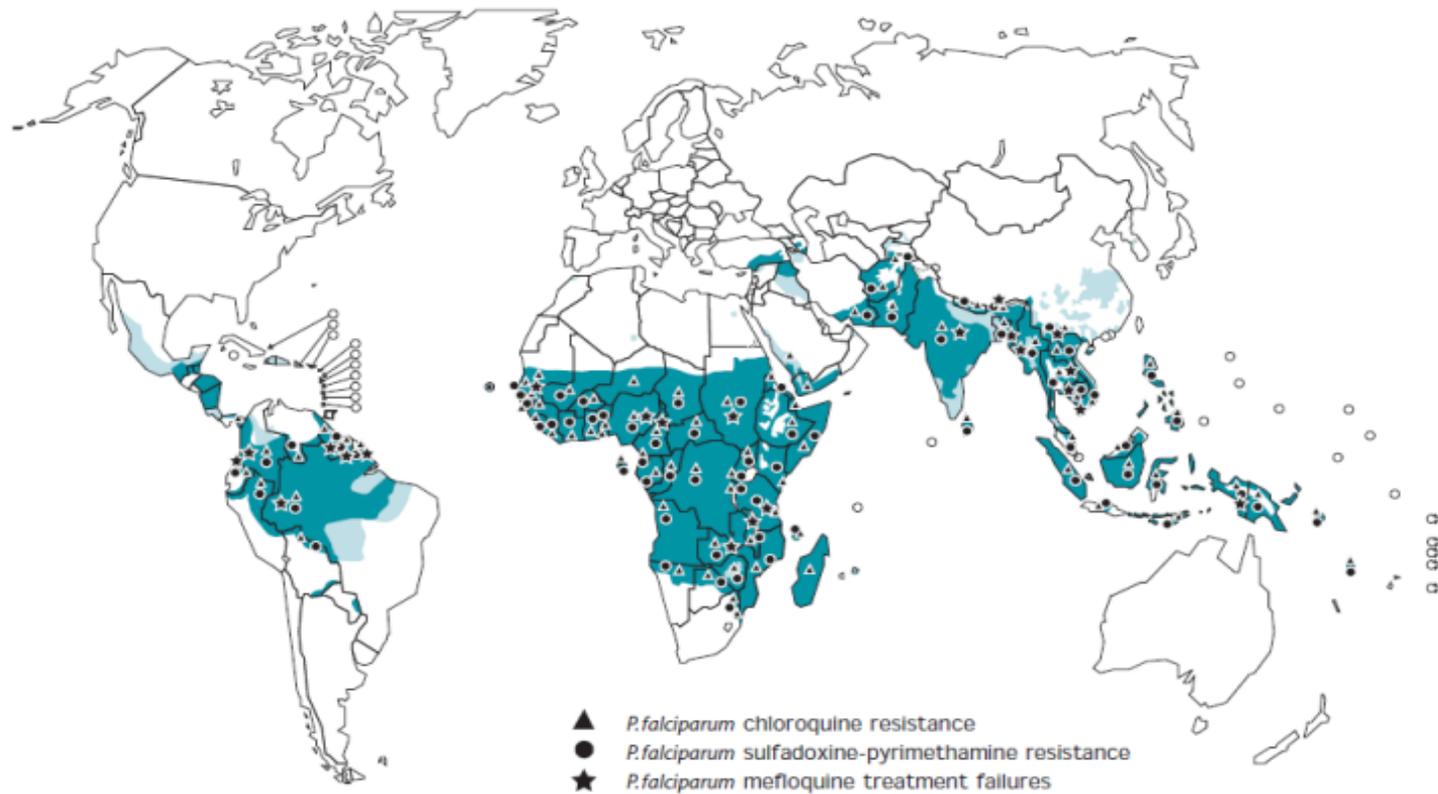
Changement de comportement



Ranson et al, 2011, Trends in Parasitology

# Résistance aux Antipaludiques

Malaria transmission areas and reported *P. falciparum* resistance, 2004

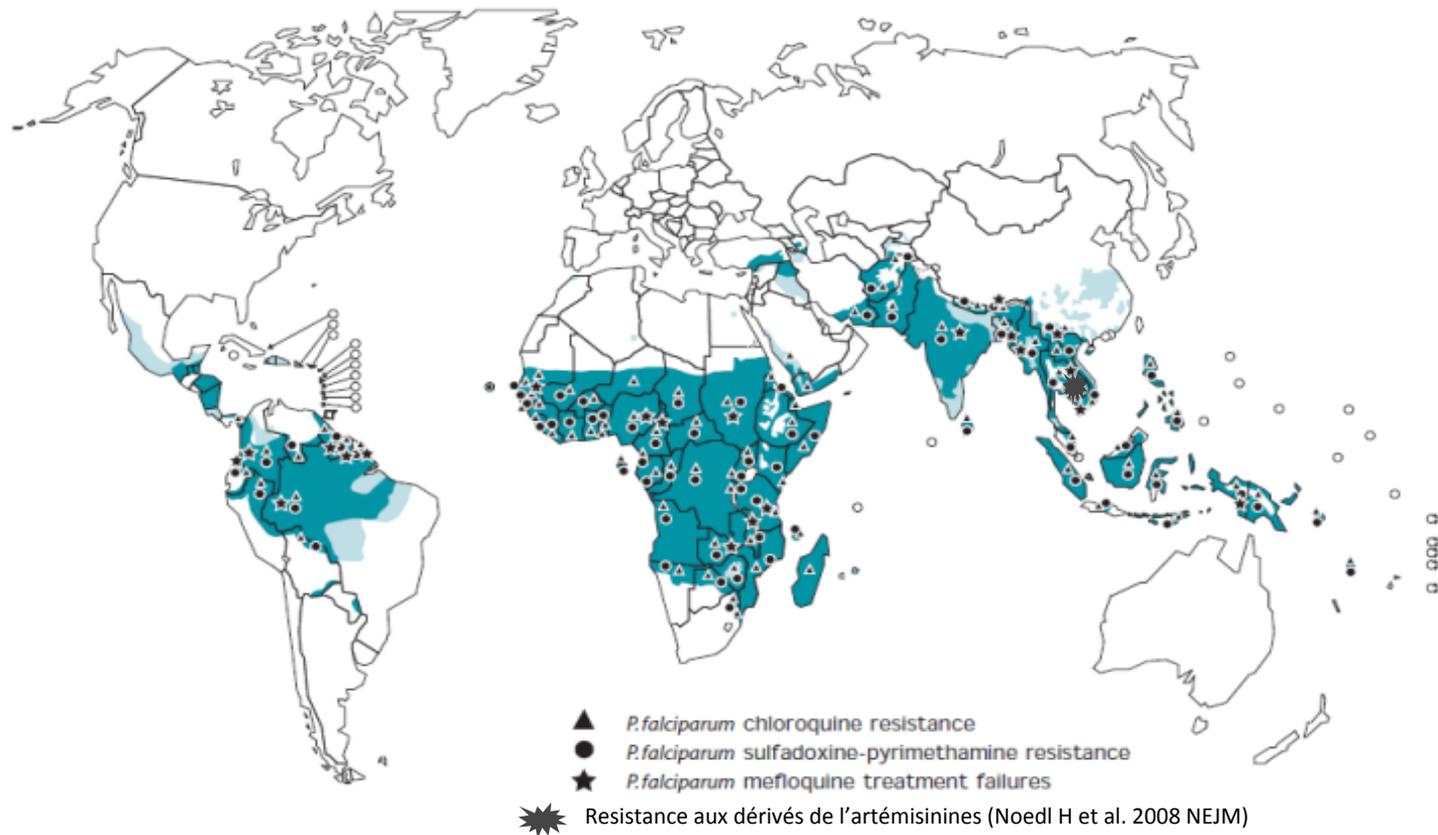


This map is a visual aid only, it is not a definitive source of information about malaria endemicity

Source: ©WHO, 2004

# Résistance aux Antipaludiques

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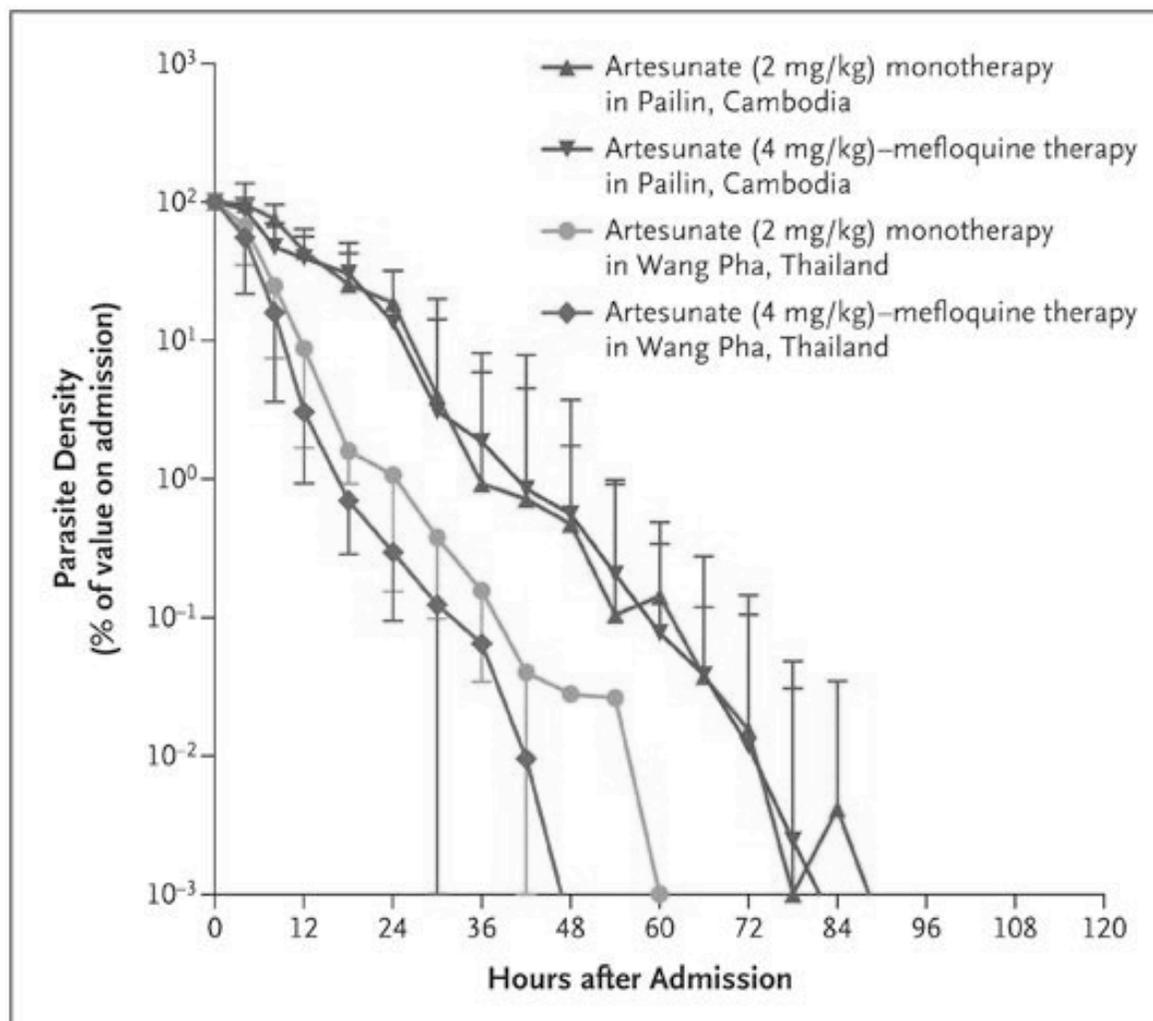


This map is a visual aid only, it is not a definitive source of information about malaria endemicity

Source: ©WHO, 2004

# Résistance aux dérivés de l'artémisinine

- Artésunate (Asie SE)
- Extension ?
- ACT ?



# Vers l' élimination ?

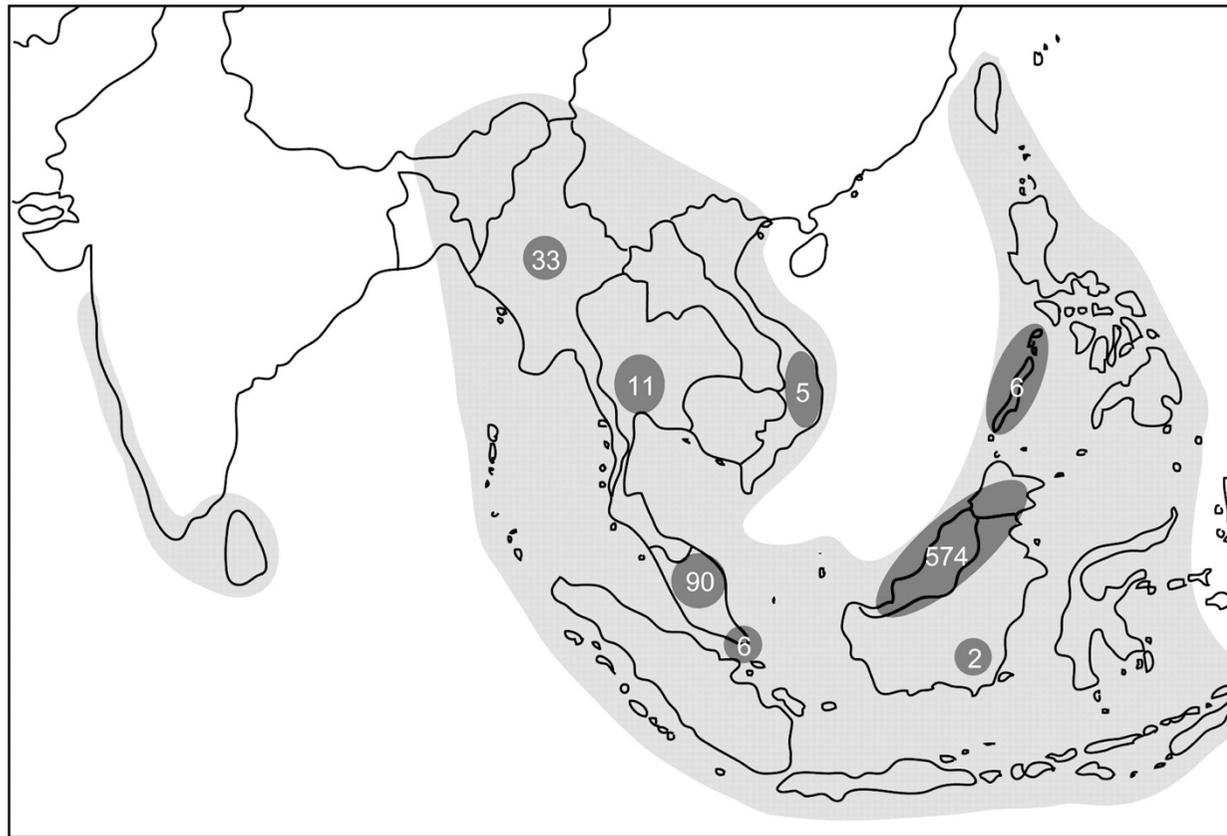
- Le développement des résistances (MII et ACT) ne sera pas forcément le plus grand obstacle
- La pérennisation des financements et le maintien de la mobilisation seront les facteurs déterminants

# Nouvelles menaces

- Emergence de *P. knowlesi* ?
  - Origine macaque (*Anopheles leucosphyrus*)
  - +/- 1000 cas originaires d'Asie du sud est
  - Cycle érythrocytaire de 24 heures
  - 5 morts répertoriés
  - Sensibilité aux antipaludiques
  - Transmission possible par *An. stephensi*

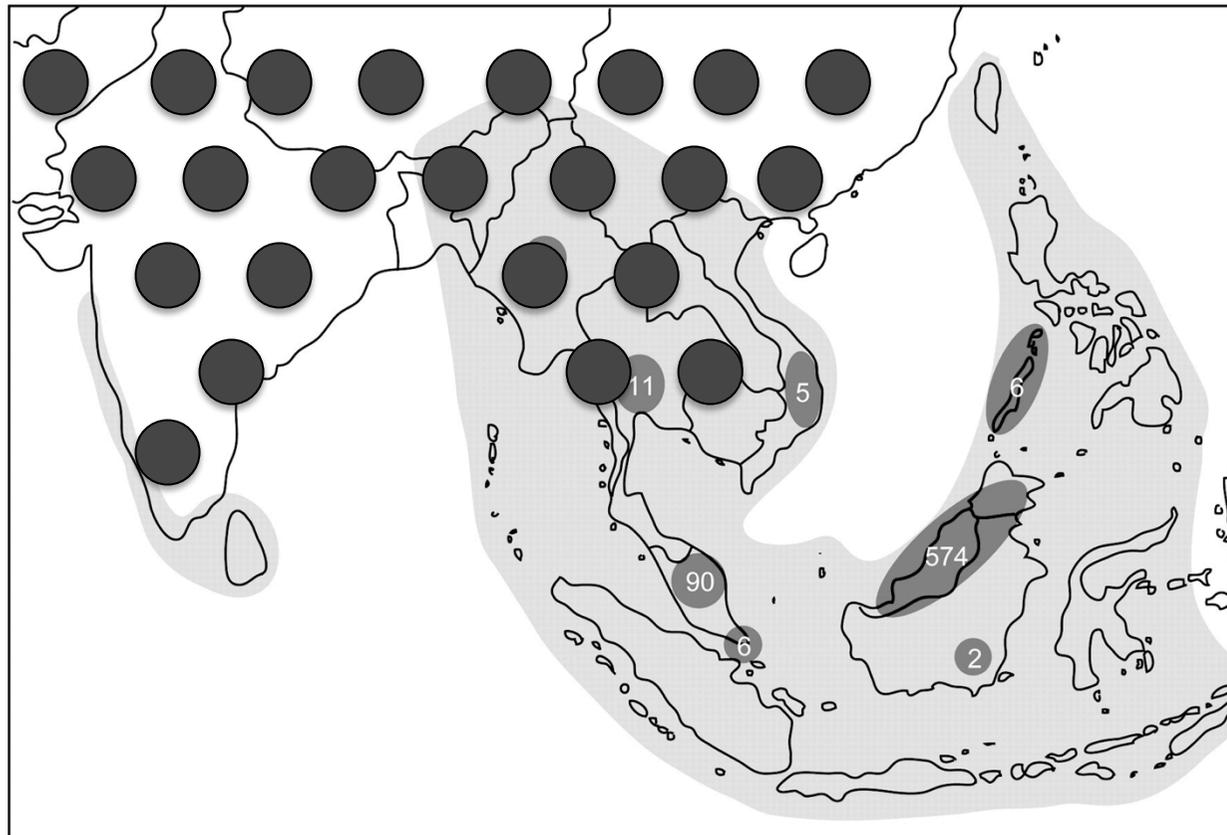
## Emergence de *P. knowlesi* ?

- Zoonose : contact homme macaque
  - *Anopheles leucosphyrus*



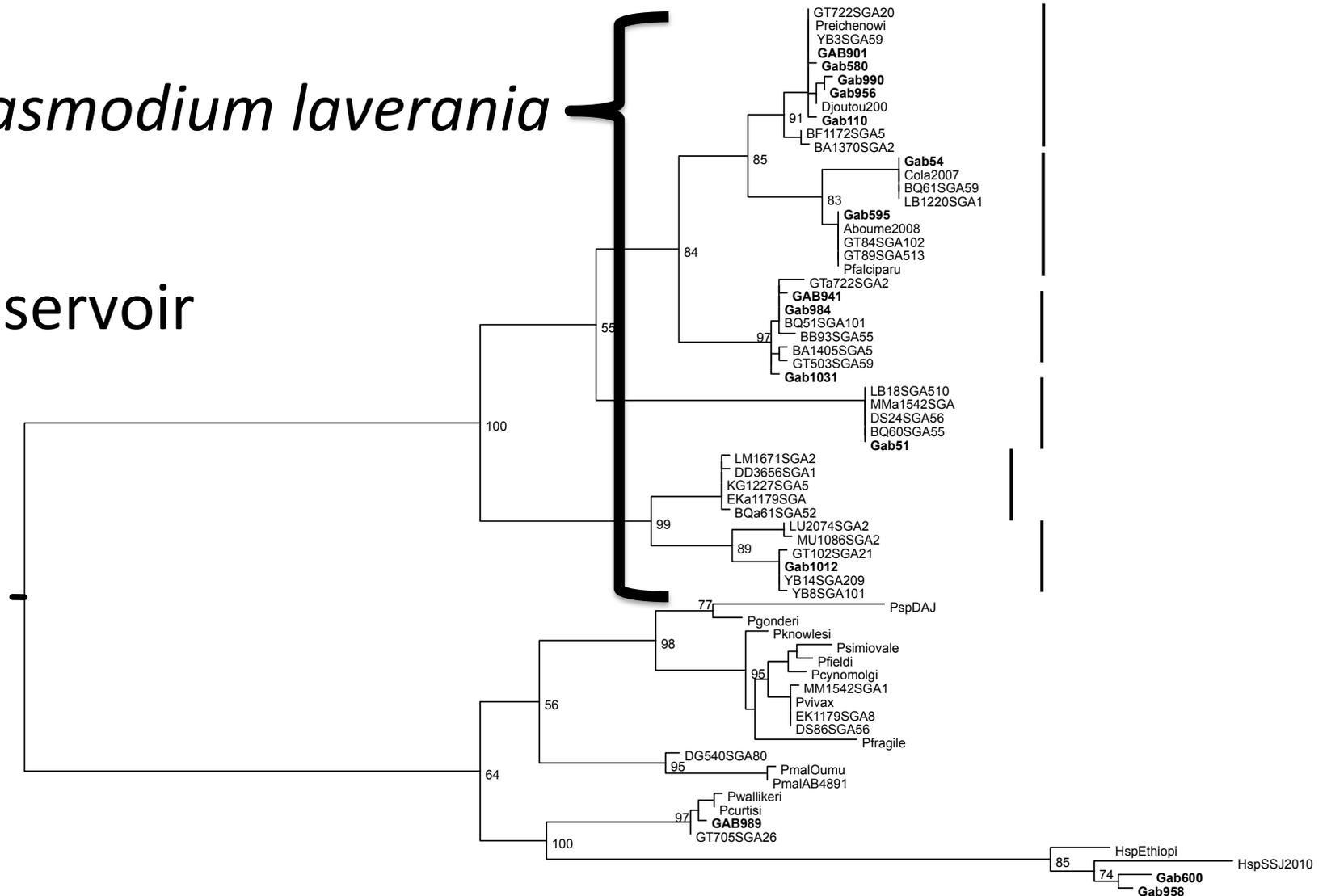
## Emergence de *P. knowlesi* ?

- Capture transmission interhumaine
  - *Anopheles stephensi*



# *Plasmodium* des grands singes

- *Plasmodium laverania*
- Réservoir

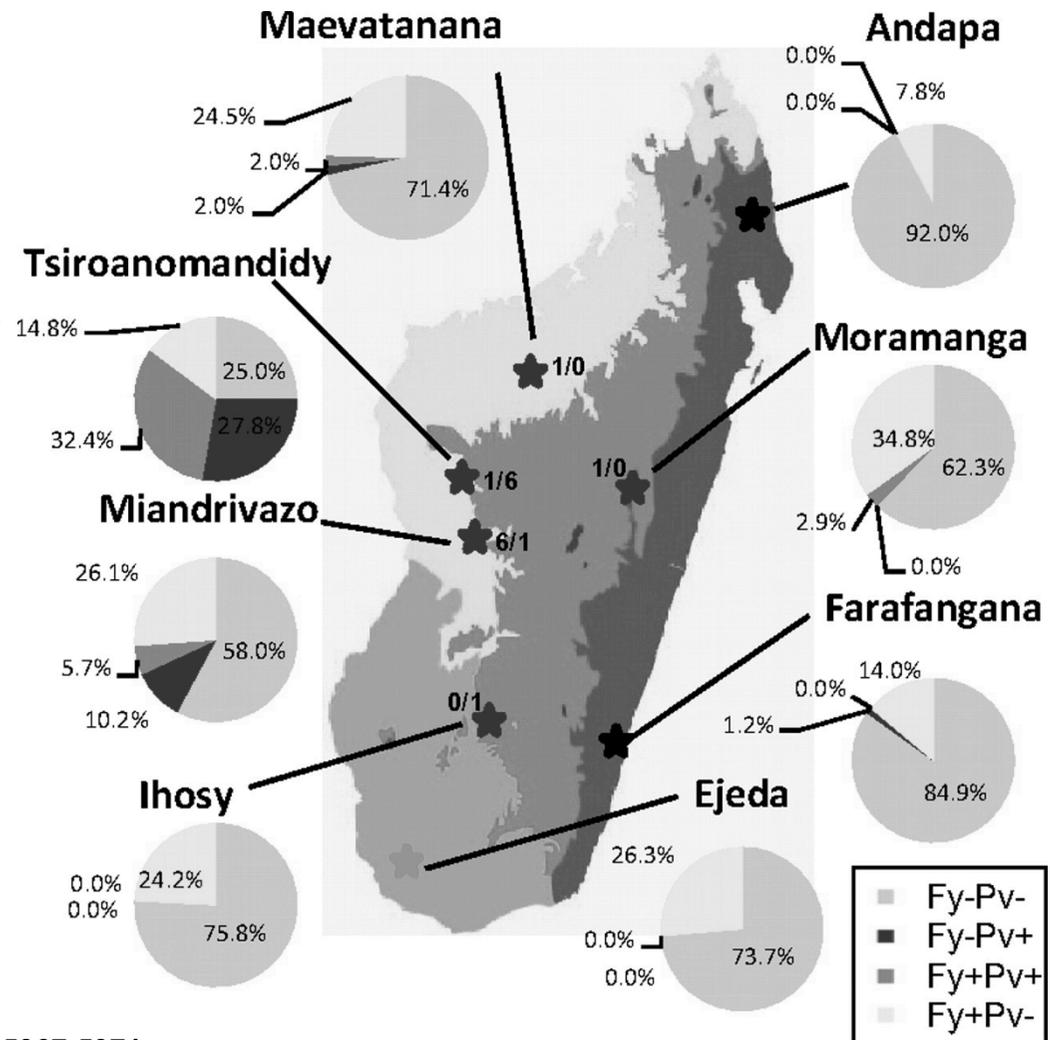


Duval, 2011, MNHN d'après Liu et al, 2010, Nature

# *P. vivax* en Afrique

- *P. vivax* retrouvé dans les populations Duffy Neg

Madagascar



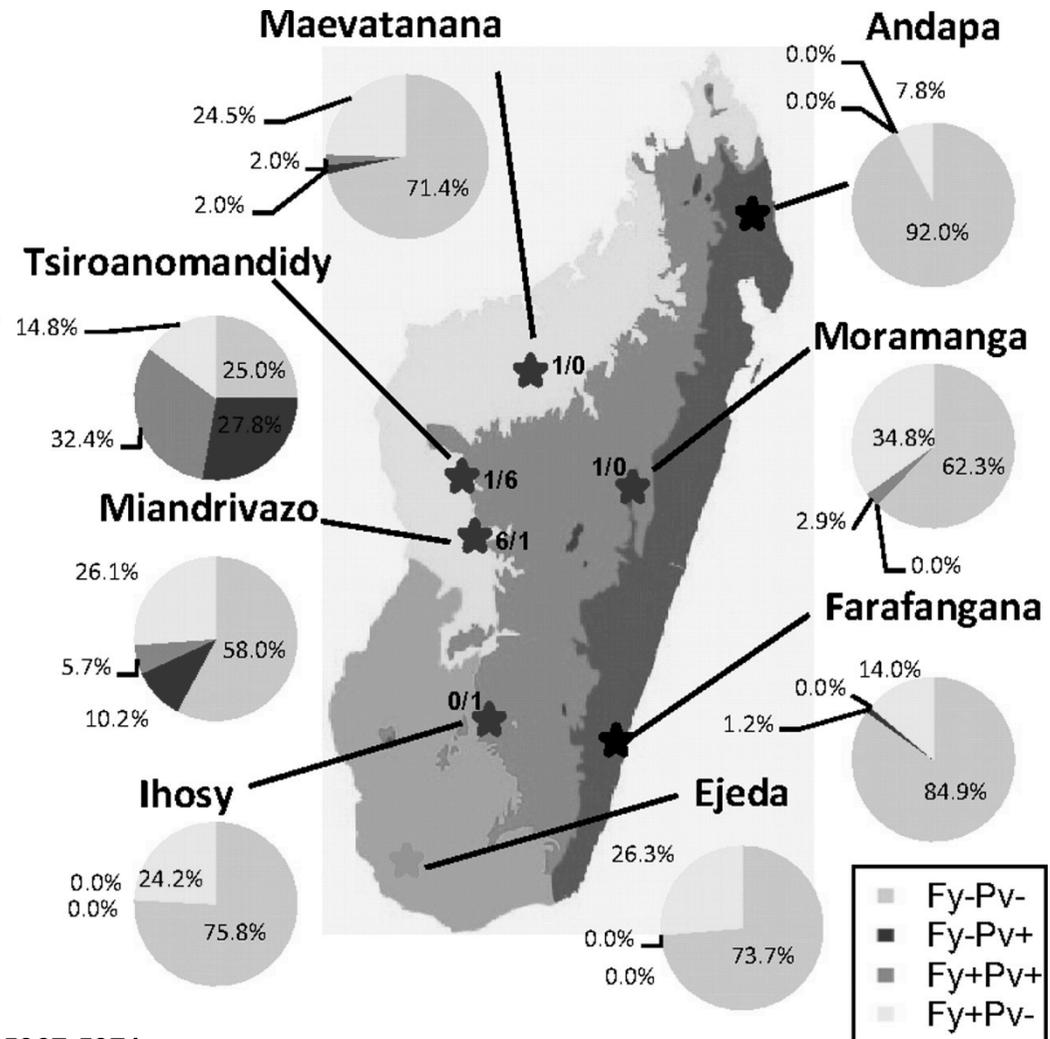
# *P. vivax* en Afrique

- *P. vivax* retrouvé dans les populations Duffy Neg

Madagascar

Kenya, Ethiopie

Mauritanie



# *Vaccin MSP3*

## *essai au Burkina Faso*

Phase Ib chez l' enfant (phase I en zone d' endémie)

Cible MSP3 : Merozoite Surface Antigen 3 (stage érythrocytaire)

Peptide de 95 acides aminés  
dérivé de la partie hautement conservé de la région C terminale de MSP3  
MSP3 Long Synthetic Peptide (MSP3-LSP)

Burkina Faso (+- 200 piqures infectantes par homme et par an)

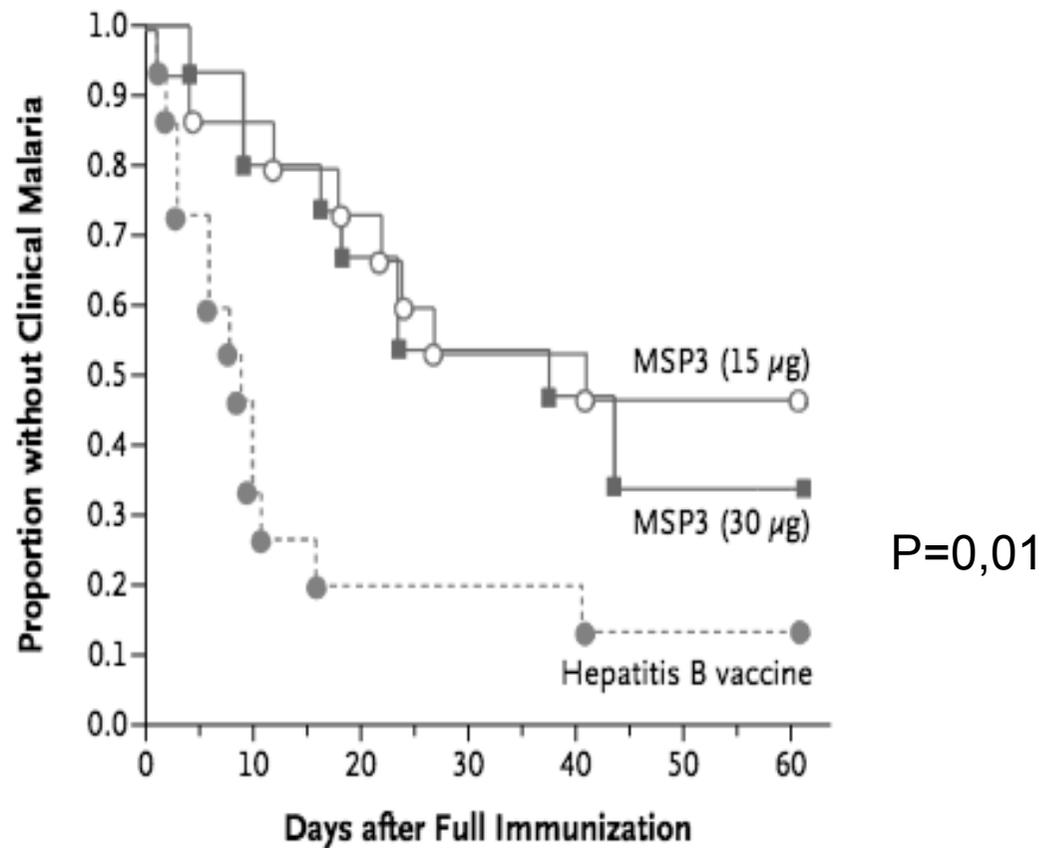
45 enfants 12 à 24 mois  
15 vaccins contrôles (hépatite B)  
15 vaccins dose 15  
15 vaccins dose 30

# Vaccin MSP3

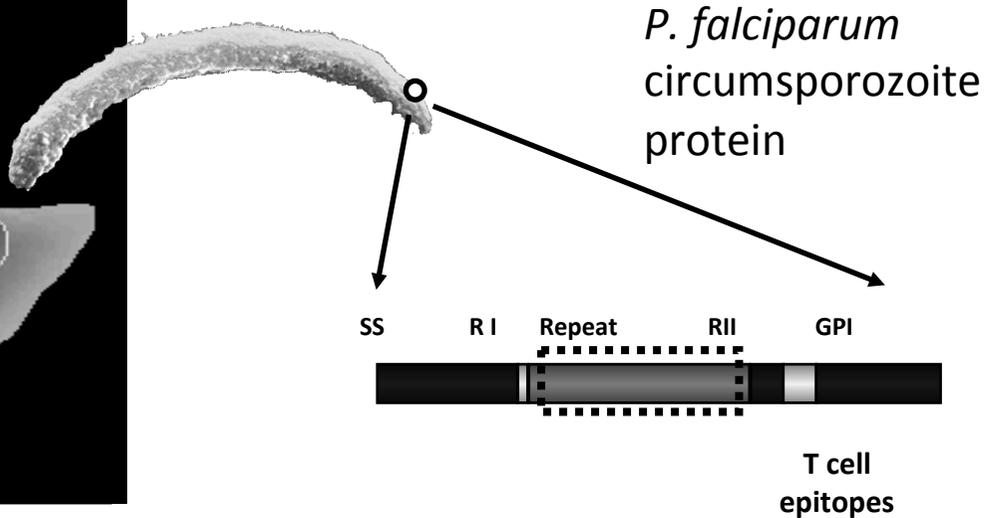
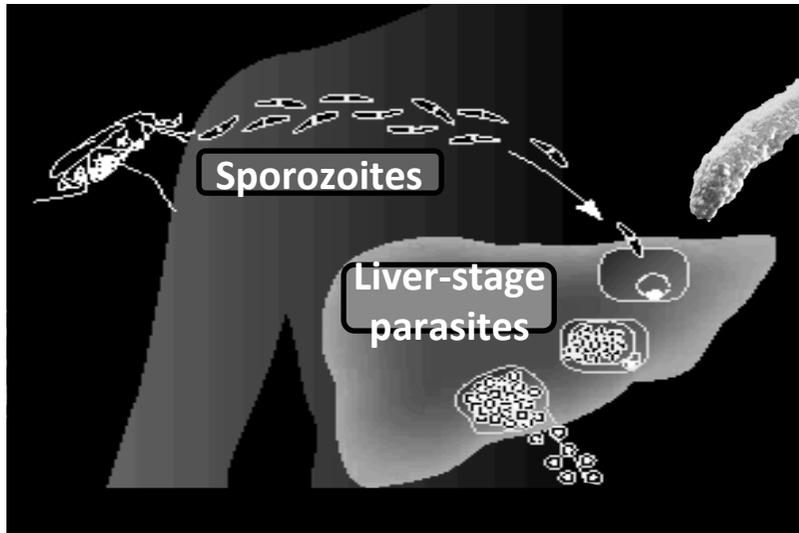
## essai au Burkina Faso

45 enfants 12 à 24 mois

15 vaccin contrôle + 15 vaccin dose 15 +15 vaccin dose 30

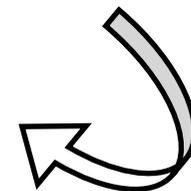
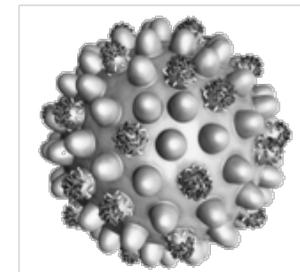
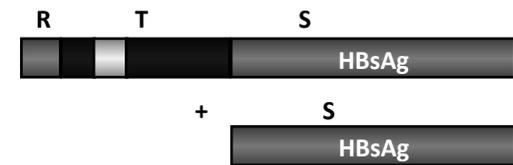


# Vaccin RTS,S



## Generation des particules RTS,S

co-expression de **RTS** (protéine fusion ) et de la protéine de surface de l'Hepatite B **dans** *S. cerevisiae*  
Réassemblage spontané en particules



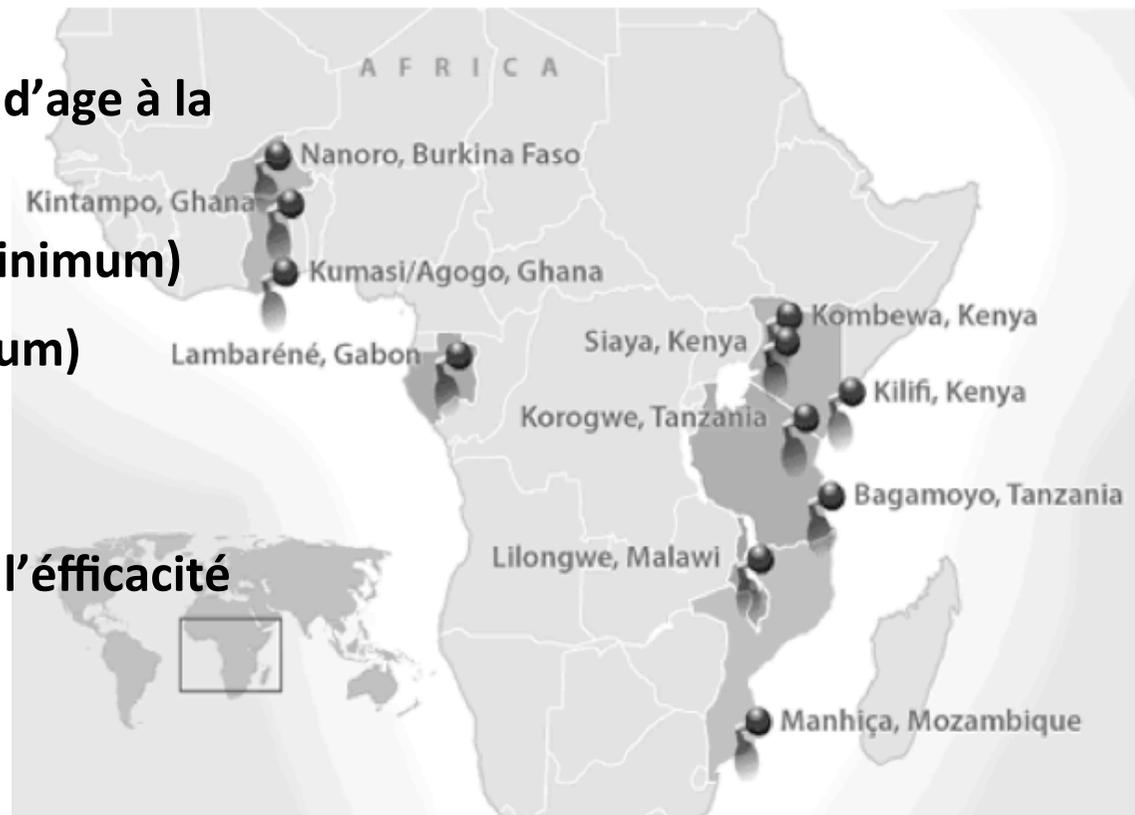
*Gordon et al. J Infect Dis 1995*

D'après Johan Vekemans, GSK

# Essai Phase III RTS,S/AS

- 11 sites
- 16 000 enfants, deux groupes d'âge à la première dose:
  - 6 à 12 semaines (6 000 minimum)
  - 5 à 17 mois (6 000 minimum)

- Objectifs
  - Données sur l'inocuité et l'efficacité



D'après Johan Vekemans, GSK

# Trois bras, deux groupes d'age

<b>6-12 weeks</b>	
<b>Primary vaccination (0, 1, 2 mo schedule)</b>	<b>Boost at M20</b>
<b>RTS,S/AS01</b> + Tritanrix-HepB/Hib + OPV	<b>RTS,S/AS01</b> + OPV
<b>RTS,S/AS01</b> + Tritanrix-HepB/Hib + OPV	MCC Vaccine + OPC
MCC Vaccine + Tritanrix-HepB/Hib + OPV	MCC Vaccine + OPC

<b>5-17 months</b>	
<b>Primary vaccination (0, 1, 2 mo schedule)</b>	<b>Boost at M20</b>
<b>RTS,S/AS01</b>	<b>RTS,S/AS01</b>
<b>RTS,S/AS01</b>	MCC Vaccine
Rabies Vaccine	MCC Vaccine

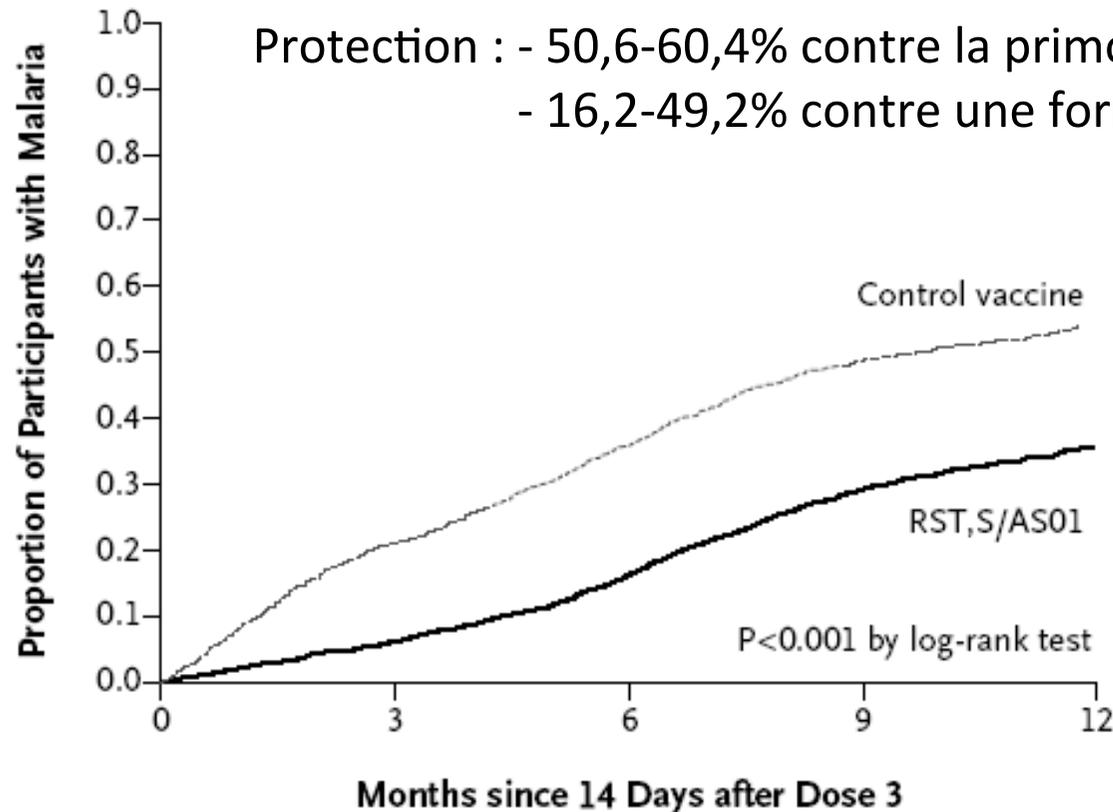
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<b>RTS,S/AS01</b>	<b>MCC Vaccine</b>
<b>Rabies Vaccine</b>	<b>MCC Vaccine</b>

# Premiers résultats

## A Per-Protocol Population



### No. at Risk

RTS,S/AS01	2830	2602	2279	1885	698
Control vaccine	1466	1137	909	712	274

Figure 3. Cumulative Incidence of First or Only Episodes of Clinical Malaria (Primary Case Definition) in the Older Age Category.

NEJM Oct 2011

# Vaccins

- QUI ?
  - Nourrissons PEV;
  - Autres ?
- QUAND ?
  - OMS pourrait recommander l' utilisation du vaccin RTS,S-01 dans certains pays d' Afrique dès 2015 ;
  - Phase IV
- PLACE ?
  - Complément aux outils actuels : MII, RDT, ACT, TPI
  - Pré – élimination ?
  - Hypo-endémie ?

Merci pour votre attention

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