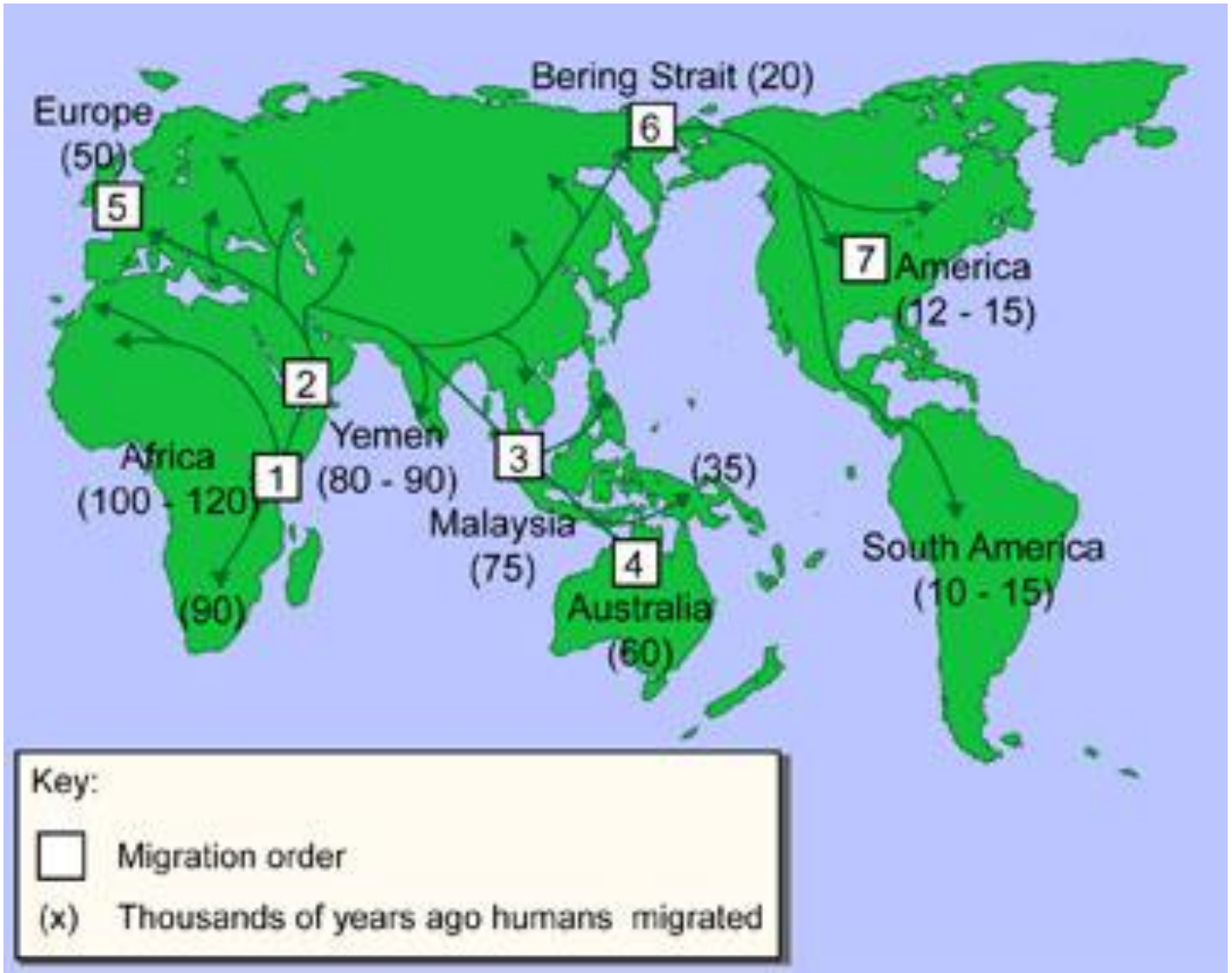
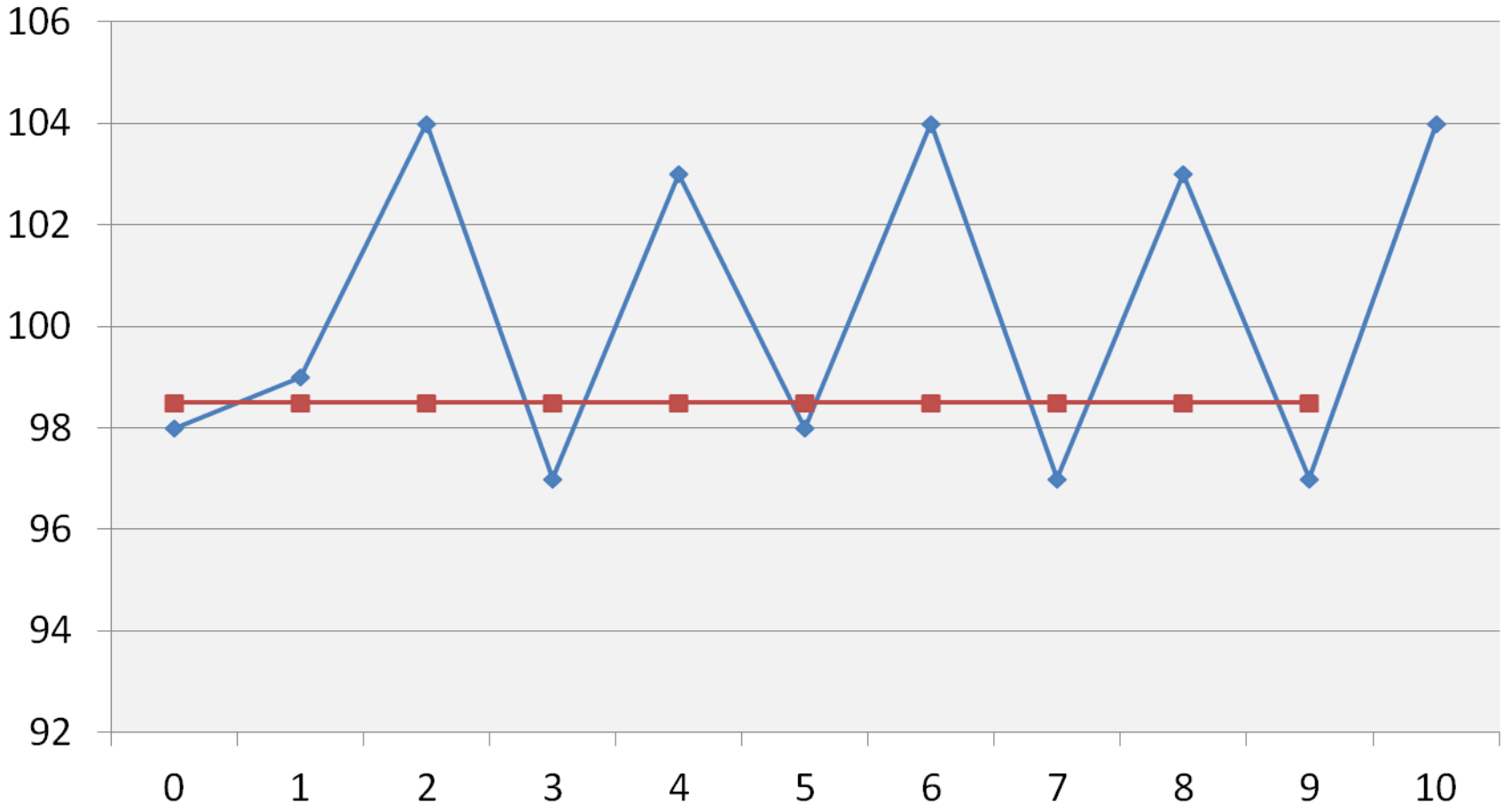

Every
45 seconds a child dies
of malaria
"SMS for Life"
Improving medicine access through innovation
A Roll Back Malaria partnership initiative

Human migration from Africa

Courtesy Wellcome Trust

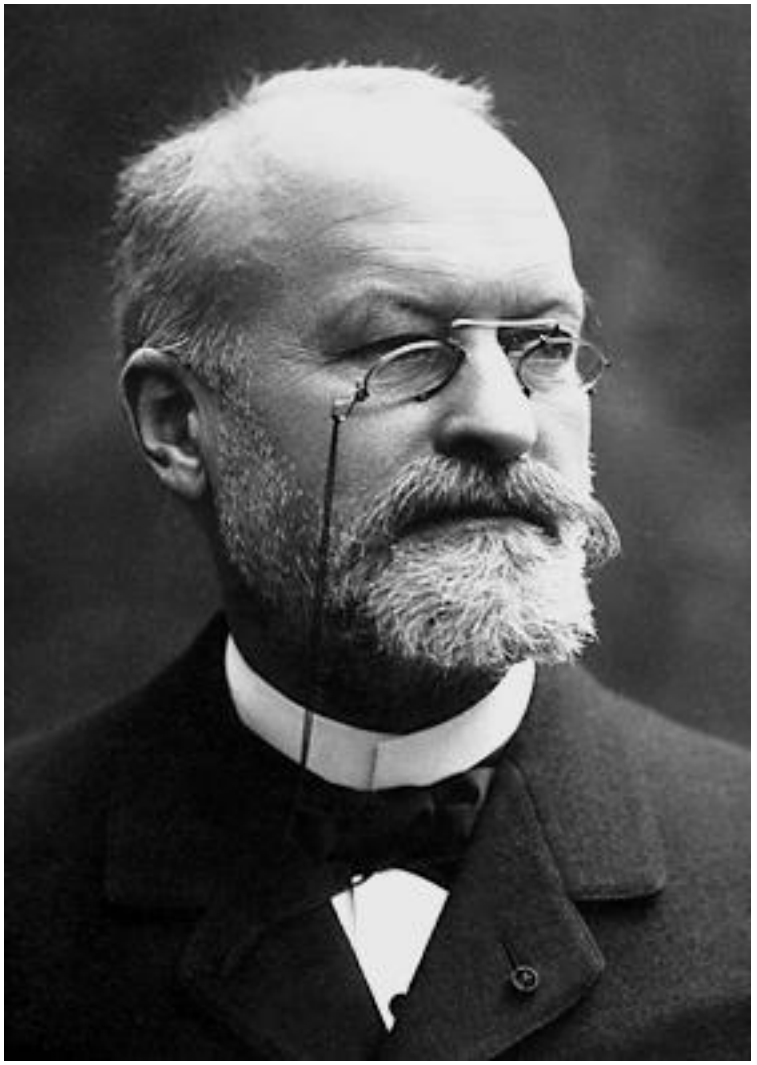


Tertian malaria fever periodicity



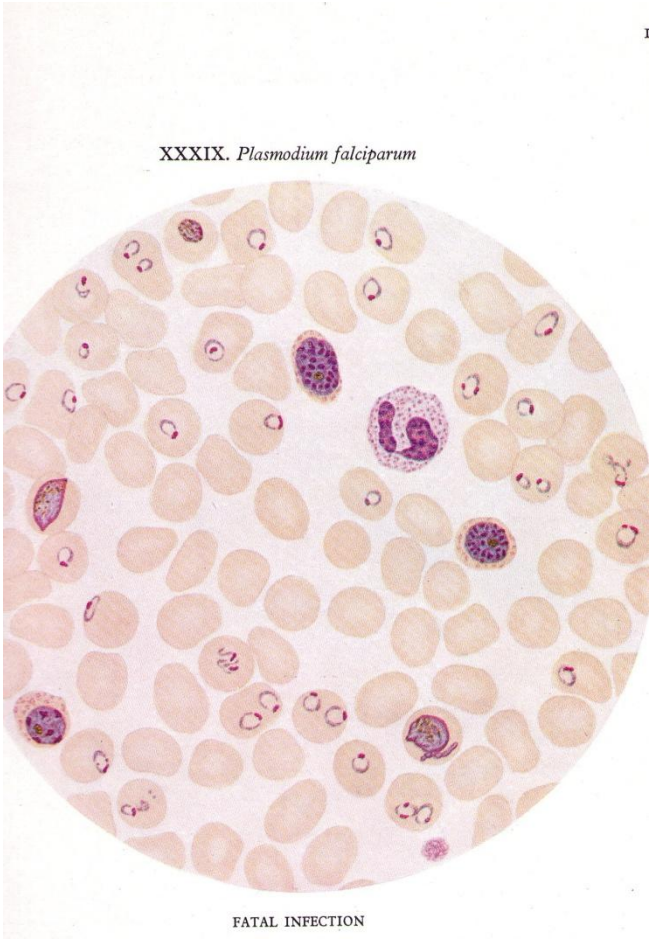
Alphonse Charles Laveran
1845-1922
Nobel Laureate 1909

Was the first to observe parasites in the red blood cells of a patient suffering from malaria



Plasmodium falciparum in peripheral blood

Field, JW & Shute PG The Microscopic Diagnosis of Human Malaria



Sir Ronald Ross FRS, Nobel Laureate 1857-1944

Discovered that the malaria parasite is is transmitted by mosquitoes.

Anopheles mosquito feeding

Courtesy Wellcome Trust

Species of malaria parasite in humans

Plasmodium falciparum. Malignant tertian malaria

Plasmodium vivax. Benign tertian malaria

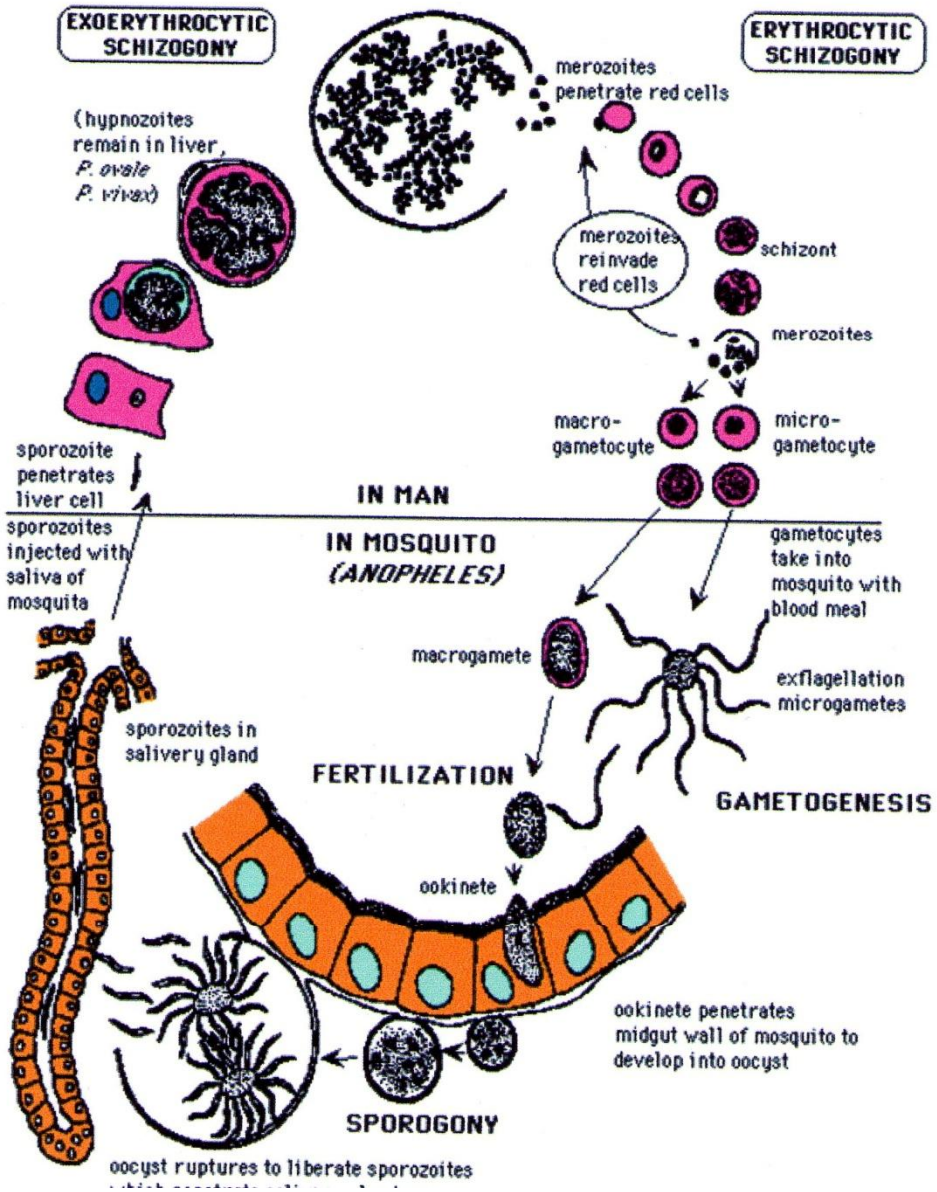
Plasmodium malariae. Quartan malaria

**Plasmodium ovale.* Ovale tertian malaria

***Plasmodium knowlesi.* Quotidian malaria

* 1922 ** 1932 and 2004

The life-cycle of *Plasmodium vivax* in man & the mosquito. (after Vickerman and Cox, 1967)



Global Malaria Eradication Programme: the beginning

1955 Initiated by WHO. Aim: Global eradication of malaria

Weapons available:

Drugs:	Quinine (1850s)
	Chloroquine (1940s)
	Pyrimethamine (1950s)
	Proguanil
Insecticides:	DDT (1940s)
	Pyrethrum (1900s)

Global Malaria Eradication Programme: the end

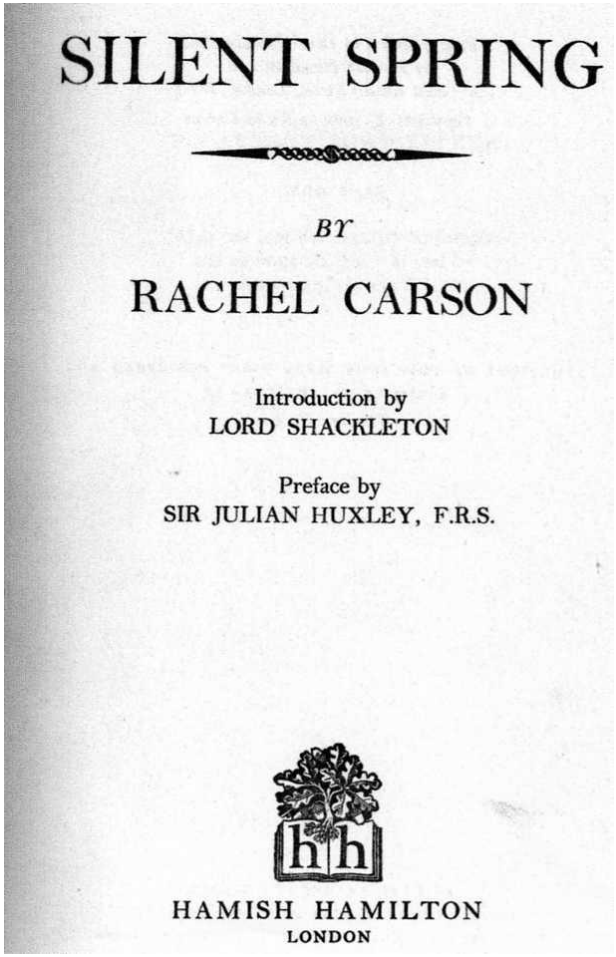
1969 Abandoned

- Resistance to antimalarial drugs
- Resistance to DDT and other insecticides
- Population movements
- Other priorities
- Wars and conflicts
- Social and political upheaval
- Lack of sustained funding
- Inflexibility
- Environmental damage caused by DDT

The book that destroyed DDT

Rachel Carson's book,

Silent Spring, drew the attention of the public to the dangers of environmental pollution. Unfortunately this also led to the banning of the manufacture and use of DDT with disastrous consequences for the control of malaria and other insect-borne diseases.



Roll Back Malaria

1998 New policy. Elimination not eradication.

Aim: To halve cases of malaria by 2010 by

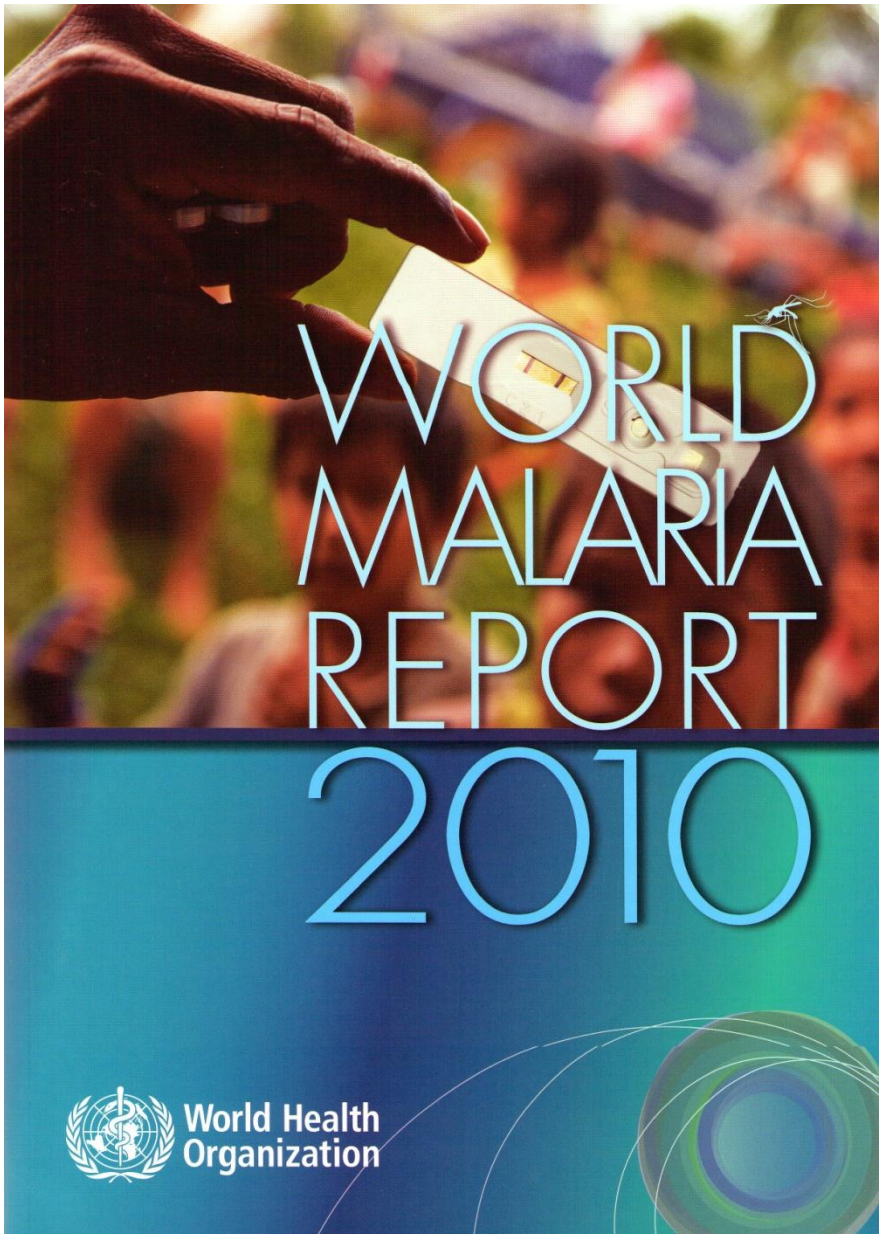
ensuring prompt access to treatment

giving priority pregnant women and infants

providing insecticide-impregnated bednets

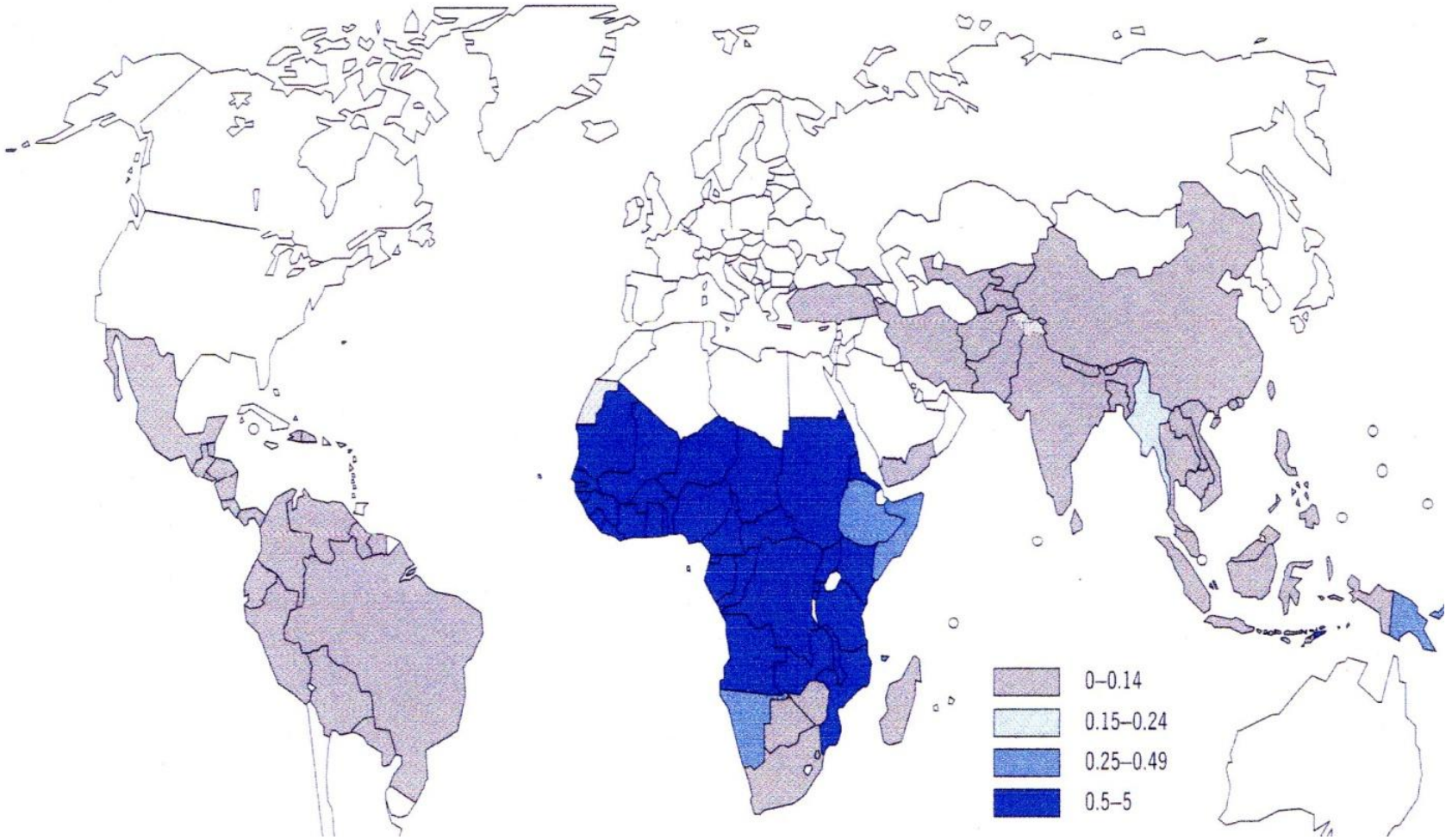
World Malaria Report 2010

The World Malaria Report summarises information received from 106 malaria-endemic countries/areas



Deaths from malaria per 1000 population

Fig. 3.8 Estimated deaths from malaria per 1000 population, 2006

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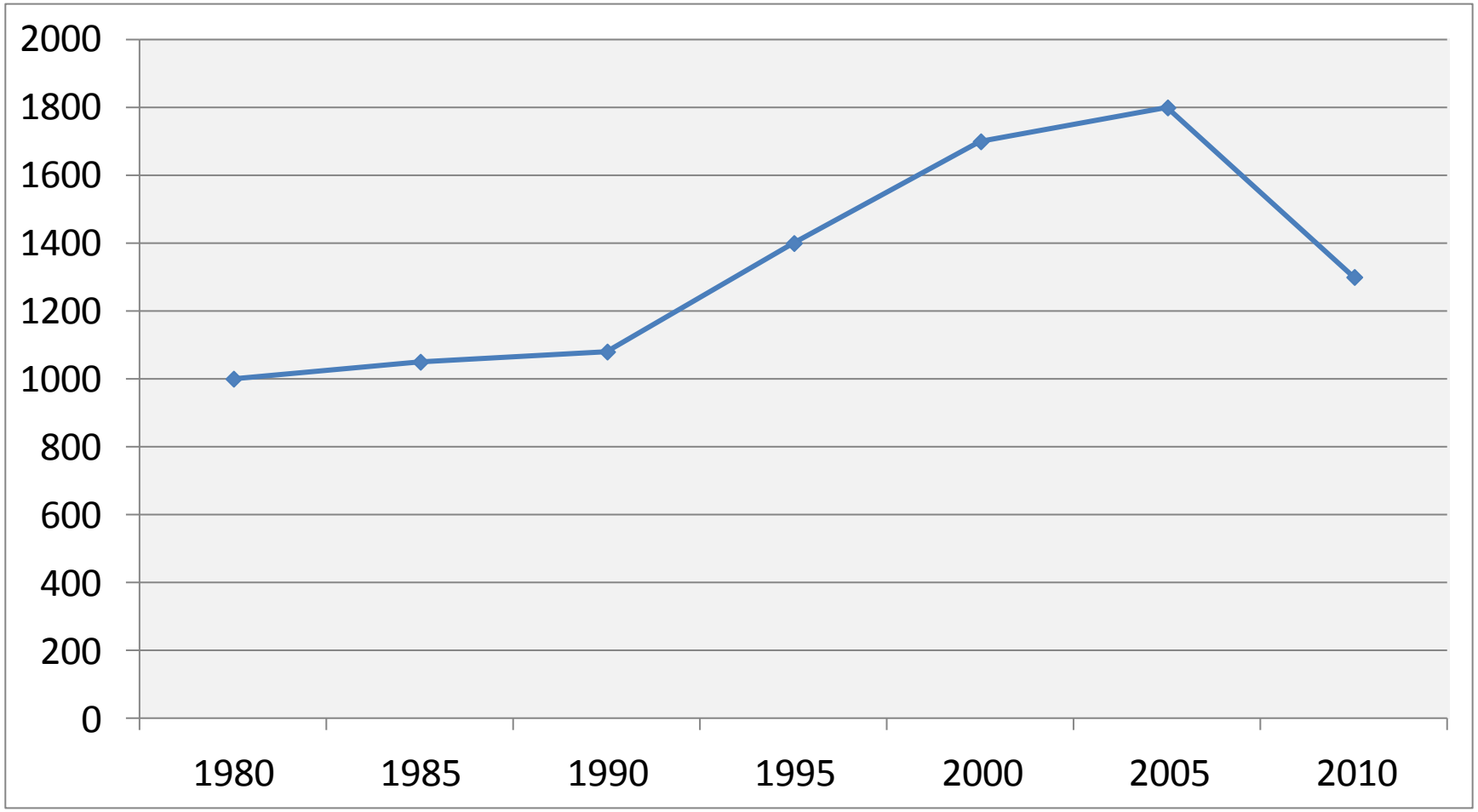
Deaths from malaria 1980-2010 (thousands)



The current armoury

7100 malariologists

+ innumerable health personnel, field workers etc.

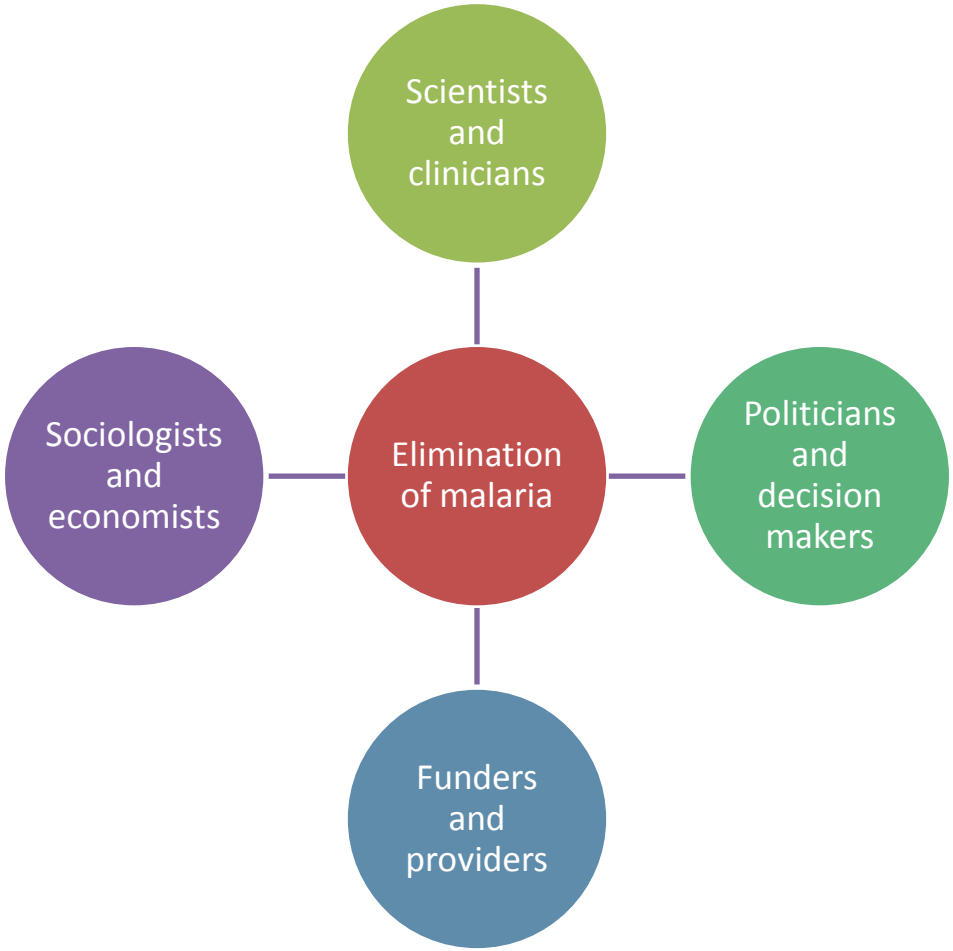
New diagnostics

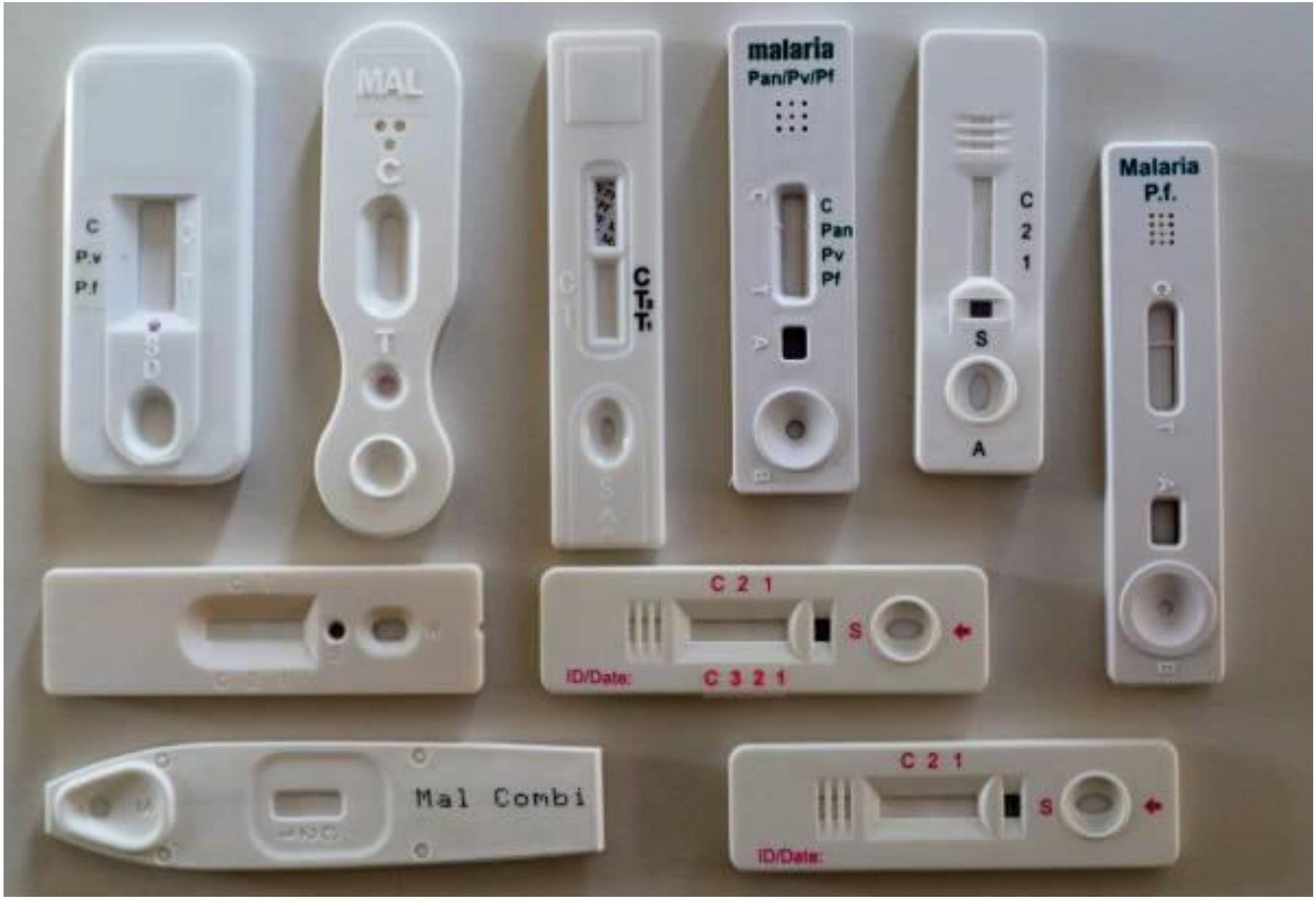
Antimalarial drugs

Insecticides

Funding agencies

Involvement in malaria elimination

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Current antimalarials

4-aminoquinolines

• Chloroquine	1934-1947
• Amodiaquine	1977-1980

8-aminoquinolines

• Primaquine	1944-1952

4-methanolquinalones

• Quinine (quinidine)	c. 1638-1850
• Mefloquine (Larium)	1970-1974

Antifolates

• Pyrimethamine	1944-1952
• Proguanil (+ atovaquone Malarone)	1944-1952
• Atovaquone	1992-1998

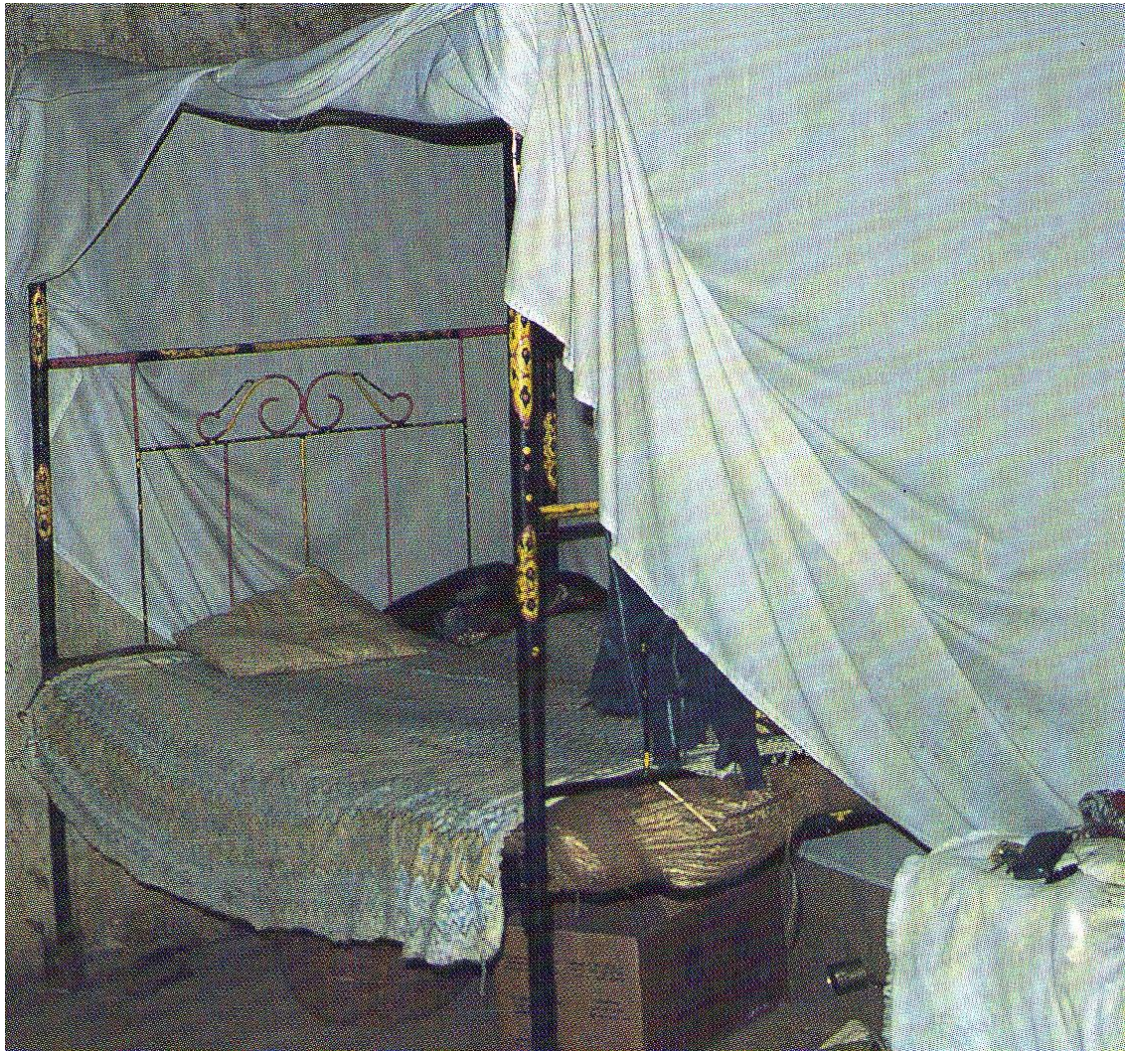
Antimicrobials

- Doxycycline

Artemisinin derivatives

Artemisinin

Bednet



Bednets

Non-treated Bednets

Insecticide Treated Nets (ITN)

Long lasting Insecticidal Nets (LLIN)

- Rectangular or conical
- Coloured (dark green, dark blue, light green, light blue, white)
- Cotton, polythene, polyester, nylon
- Pyrethroids (Deltamethrin, Permethrin)

Acceptability of bednets

- Cost £5-£7 (Cost to us £10-15)

Willingness to pay

- Ethiopia £2.0
- Kenya £0.40

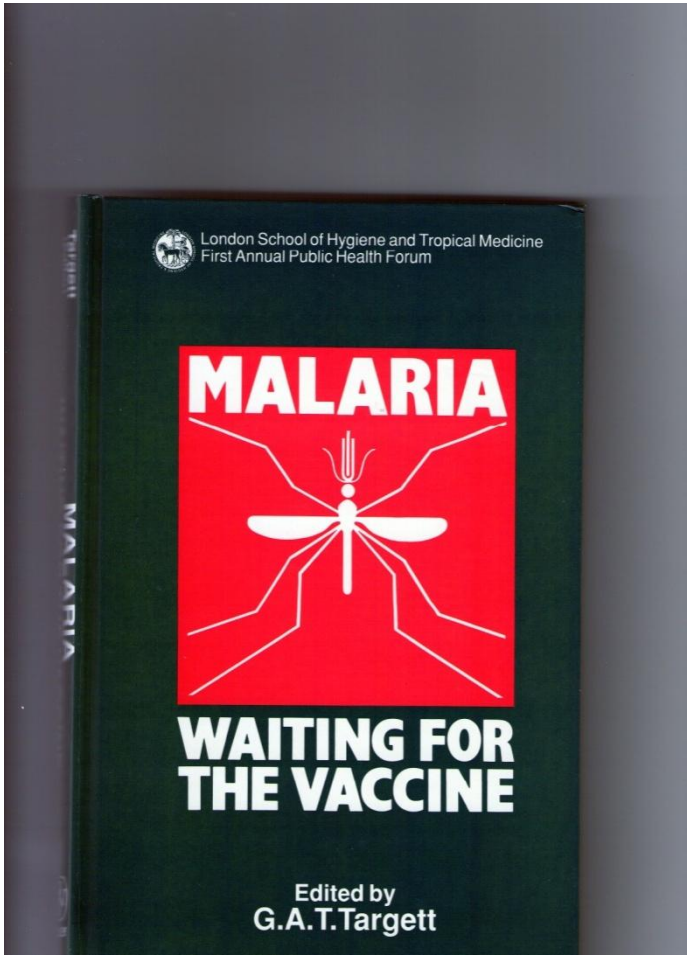
Shape: Rectangular > conical

Colour: Green > blue > white. Dark > light

Material: Cotton > polyester > nylon

Actual usage 8% (Chad)-82% (Mali)

Waiting for the vaccine



William Jobin. *A realistic strategy for fighting malaria in Africa*. Boston Harbor 2010

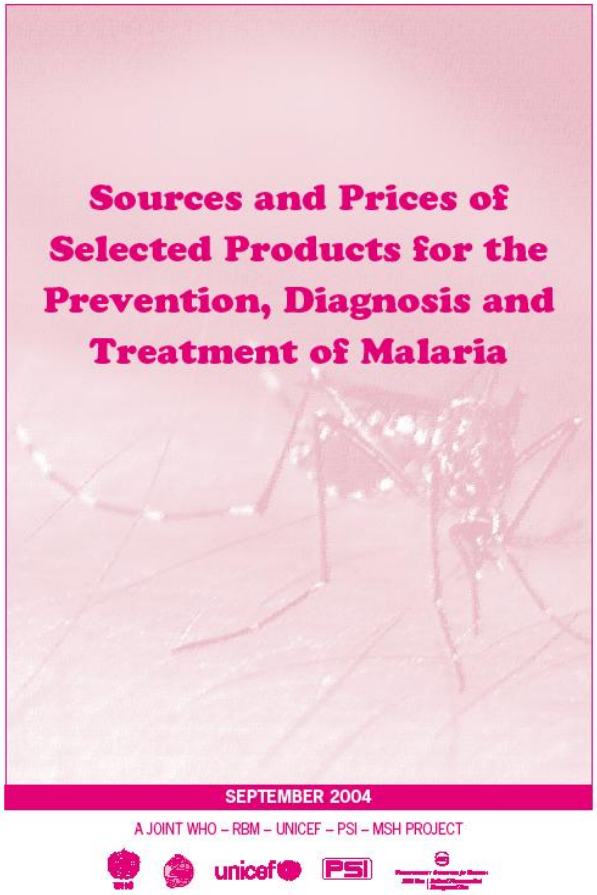
- Fantasies about eradication should not be allowed to derail realistic approaches to this problem.
- Available resources should be focused where transmission can be permanently reduced within African resources in those countries which have stable and democratic governments
- Appropriate local strategies should be developed in ecological zones across the continent which match transmission patterns.
- Malaria transmission can be reduced to levels that are tolerable and sustainable.

Home based management of malaria (HMM)

Introduced in2005

- Selecting and training community health workers as Community Medicine Distributors
- Ensuring availability of appropriate drugs in labelled blister packs with instructions
- Education of mothers and other carers
- Ensuring 24 hour access ‘close to home’
- Diagnosing malaria
- Prescription of appropriate drug

Cost of intervention



Diagnostic test £0.37-£1.60

Treatment £0.80 -£2.0

Bednet £5.00

Impregnated bednet £6-7

HIV/AIDS, TB and Malaria
Deaths and cost of cure

HIV/AIDS	1.8 million	£18,000
Tuberculosis Drug resistant	1.7 million	£5,000 £50-70,000
Malaria	660,000	£2.0

Reasons to be hopeful

- Malaria cannot pass directly from person to person
- Malaria is not a disease of poverty
- Malaria is not a disease associated with unsanitary conditions
- Malaria is easy to prevent
- Malaria is easy to diagnose (c.f. TB, HIV)
- Malaria is easy to treat (c.f TB, HIV)

Global Fund to Fight AIDS, Tuberculosis and Malaria

2002 Established (Gates Foundation)

Aim £18 bn from 54 countries

2011 £14 bn disbursed

2012 £21-25m misappropriated (0.15-0.17%)

2012 Frozen until 2014