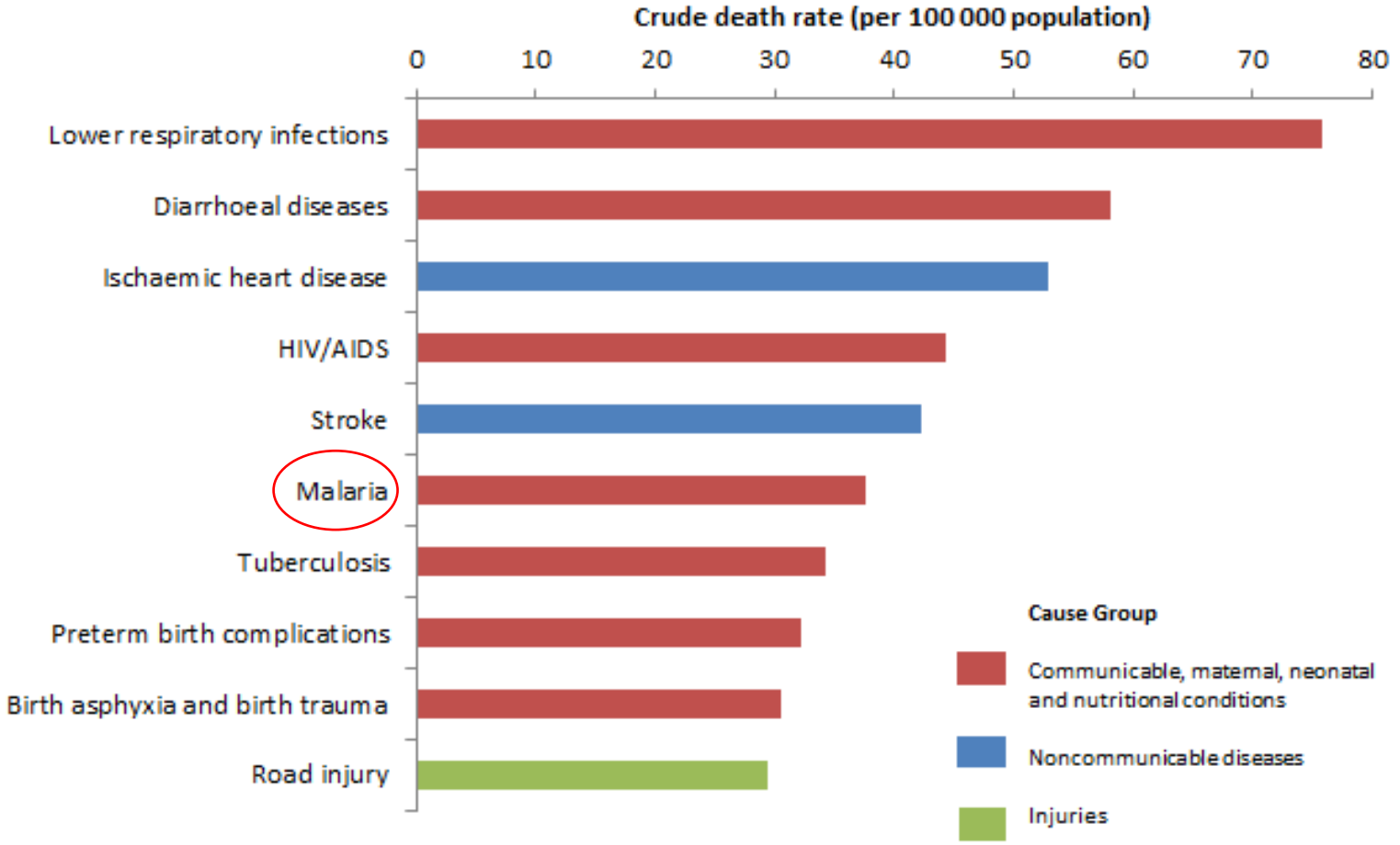
Top 10 causes of deaths in low-income countries in 2016



Source: Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2016. Geneva, World Health Organization; 2018.
World Bank list of economies (June 2017). Washington, DC: The World Bank Group; 2017 (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups).

LA MALARIA
IN NUMERI

400 mila

Le vittime ogni anno

2/3

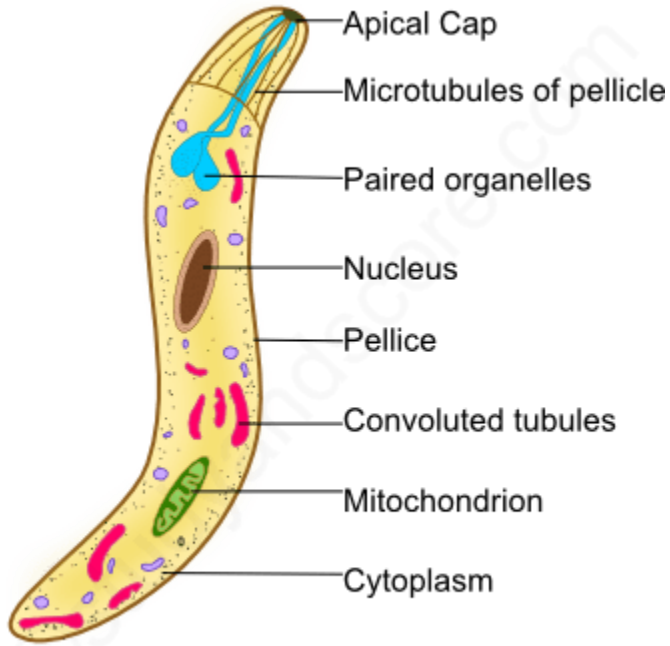
Le vittime di età inferiore a 5 anni

94%

Dei contagi e dei morti si registra in Africa

87

I paesi in cui è considerata endemica



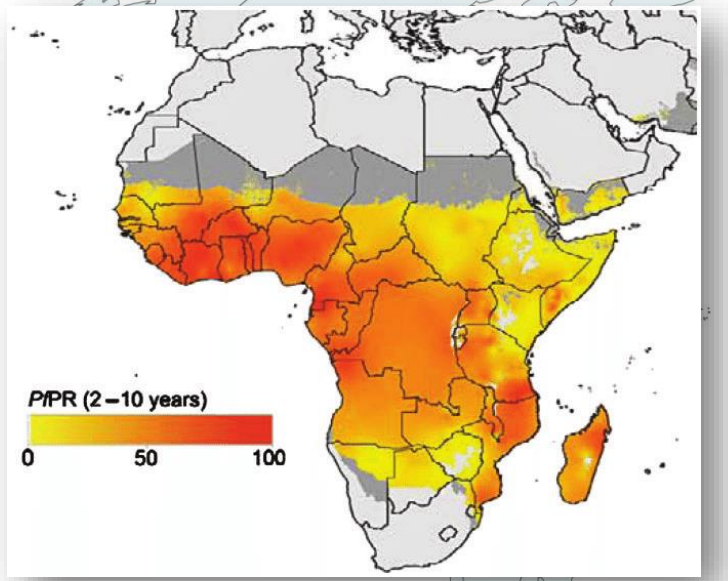
STRUCTURE OF SPOROZOITE

FONTE:
WHO Malaria Report 2020

ISPI

Number of deaths from malaria

Our World in Data

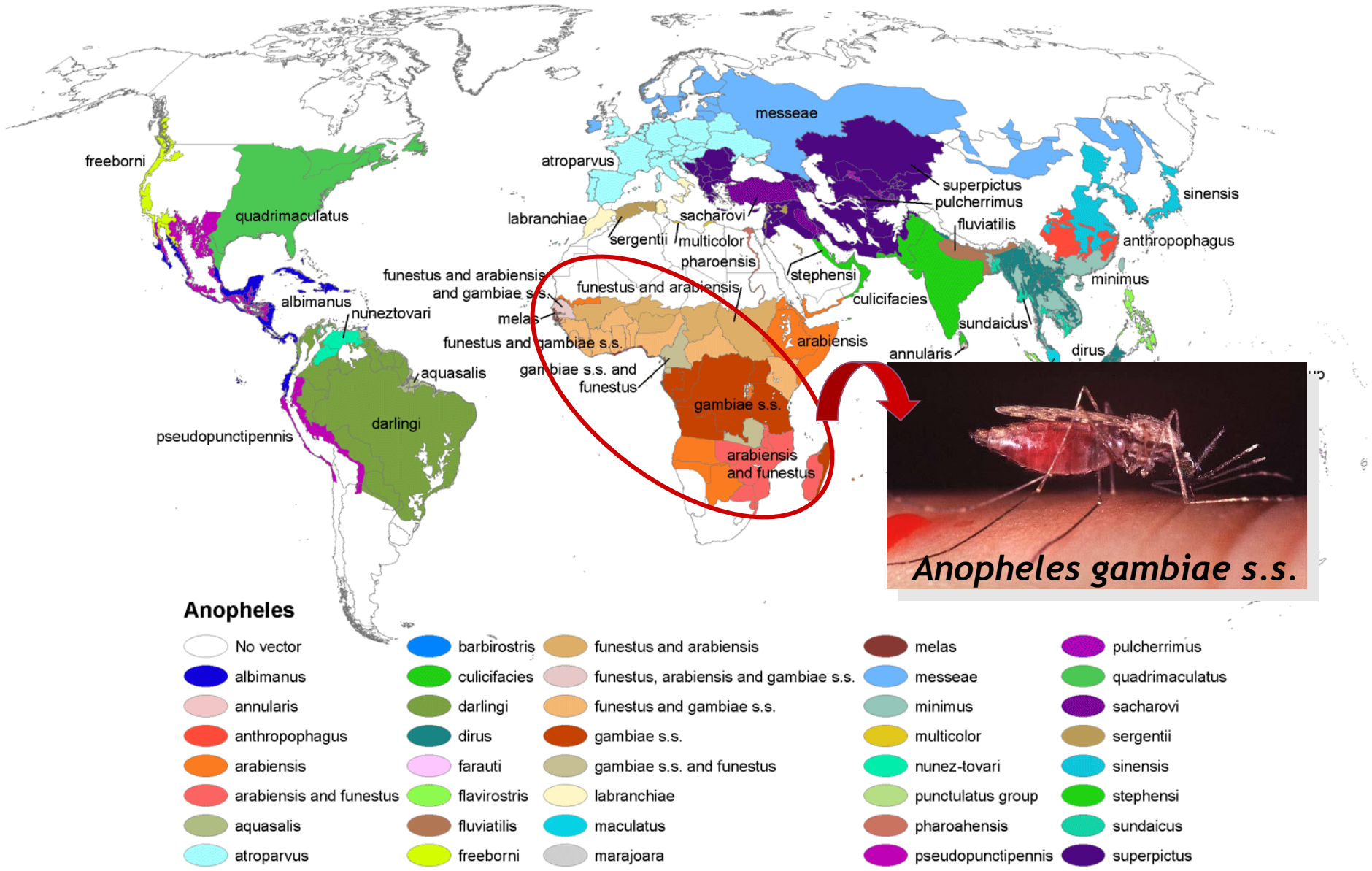


Plasmodium falciparum

No data | 0 | 1,000 | 2,500 | 5,000 | 10,000 | 50,000 | >100,000

Source: Institute for Health Metrics and Evaluation (IHME)

Principali vettori della malaria (genere *Anopheles*)

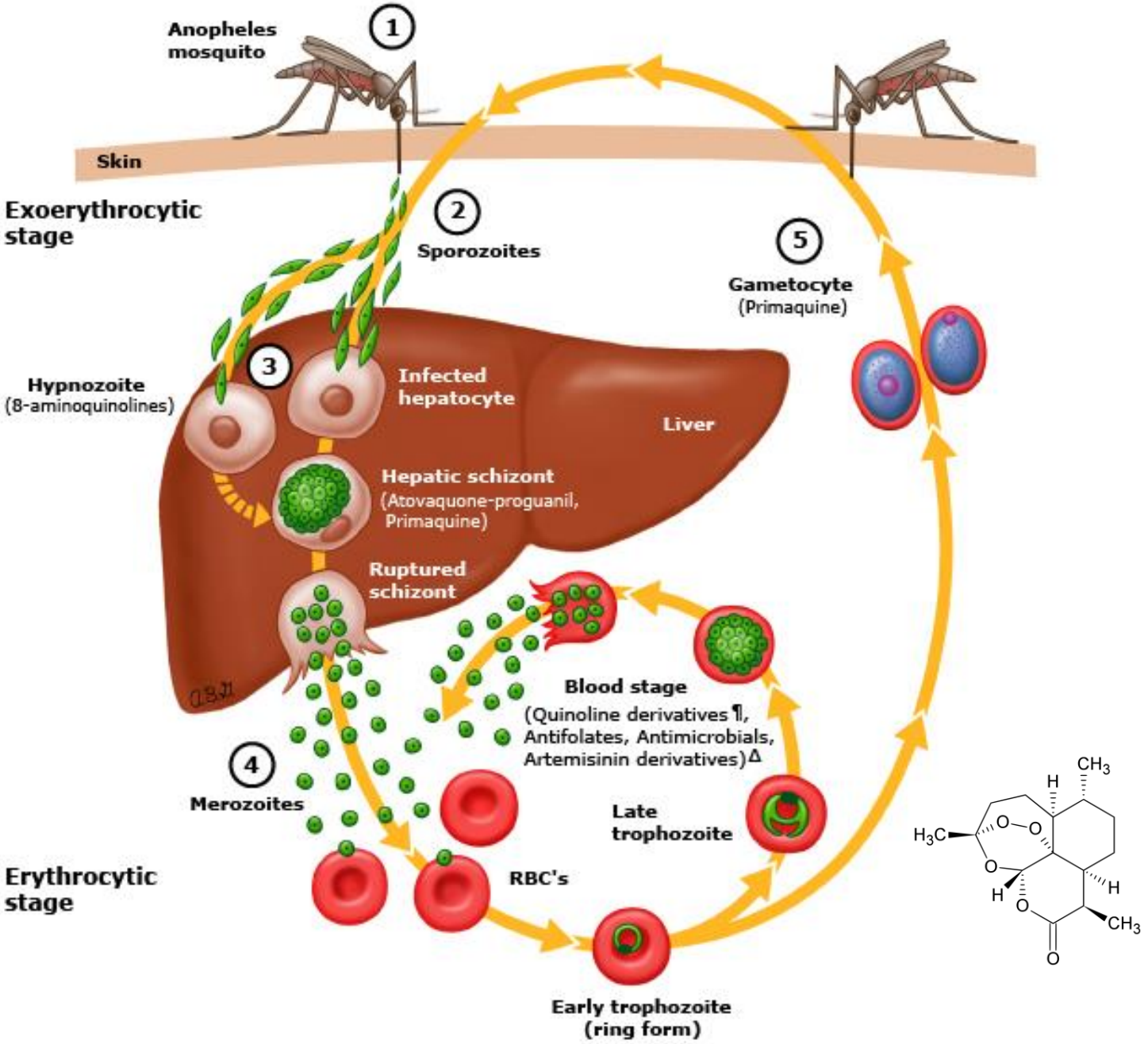


Kiszewksi *et al.*, 2004. American Journal of Tropical Medicine and Hygiene 70(5):486-498.

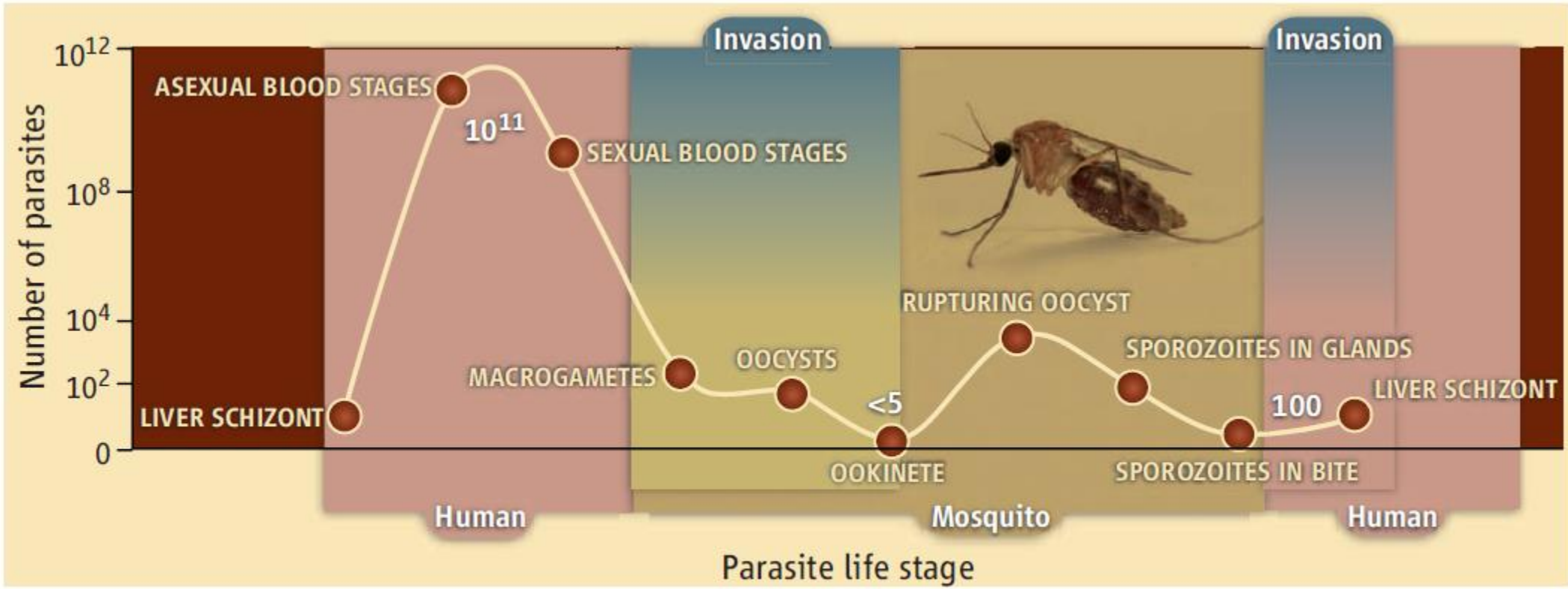
E in ITALIA??

~~MALARIA~~

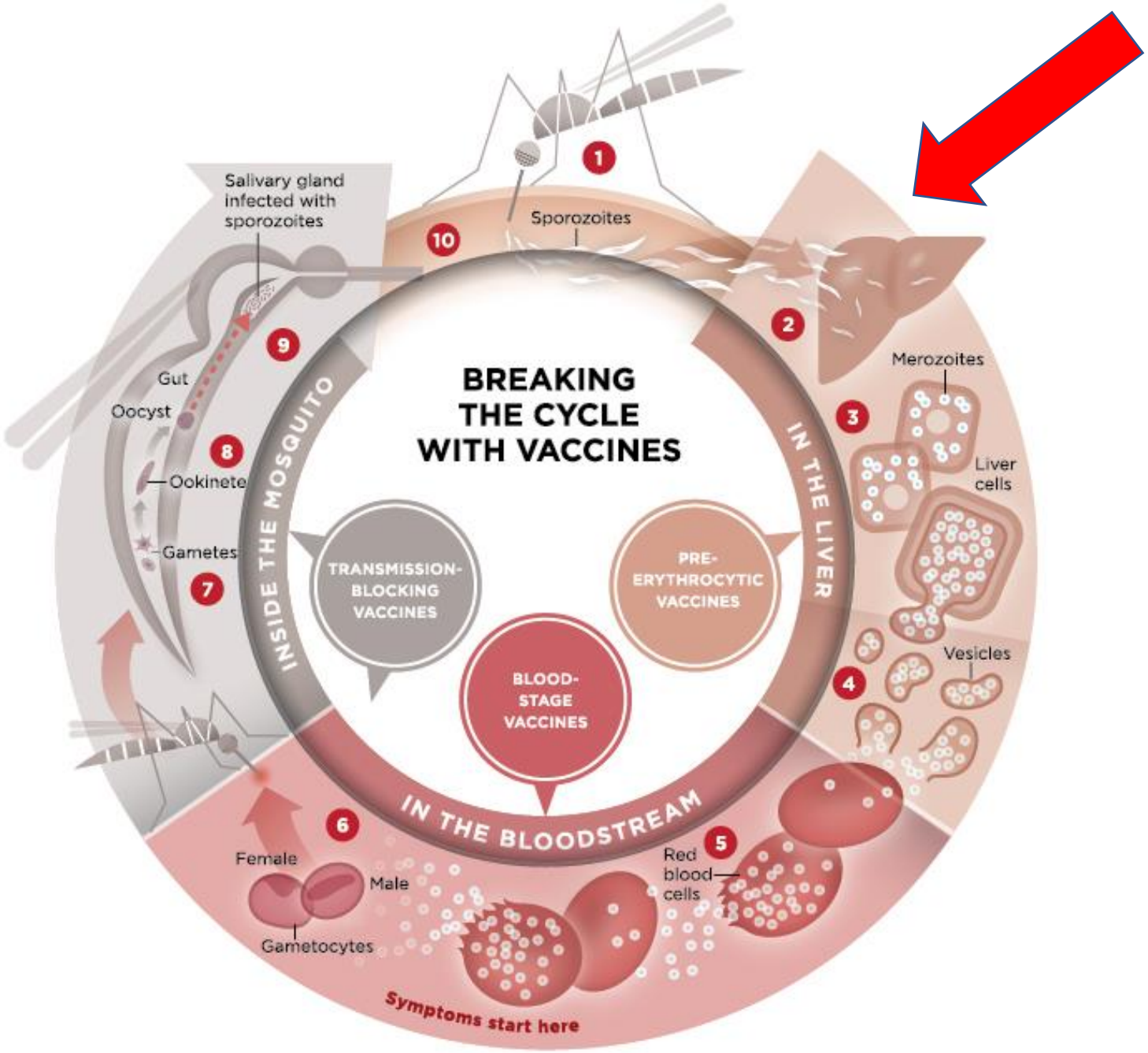
L'Italia, in data 21 settembre 1970, fu iscritta dall'O.M.S. nei registri ufficiali dei Paesi liberi da malaria.



Ciclo della malaria (e farmaci antimalarici)



Vulnerable target. The malaria parasite's population ranges from about five inside the mosquito to trillions in the human bloodstream.



- Vaccini che portano alla produzione di anticorpi in una fase pre-eritrocitica

- Vaccini che agiscono a livello del flusso sanguigno

- Vaccini che bloccano la trasmissione

Mosquirix (RTS, S/AS01) vaccine

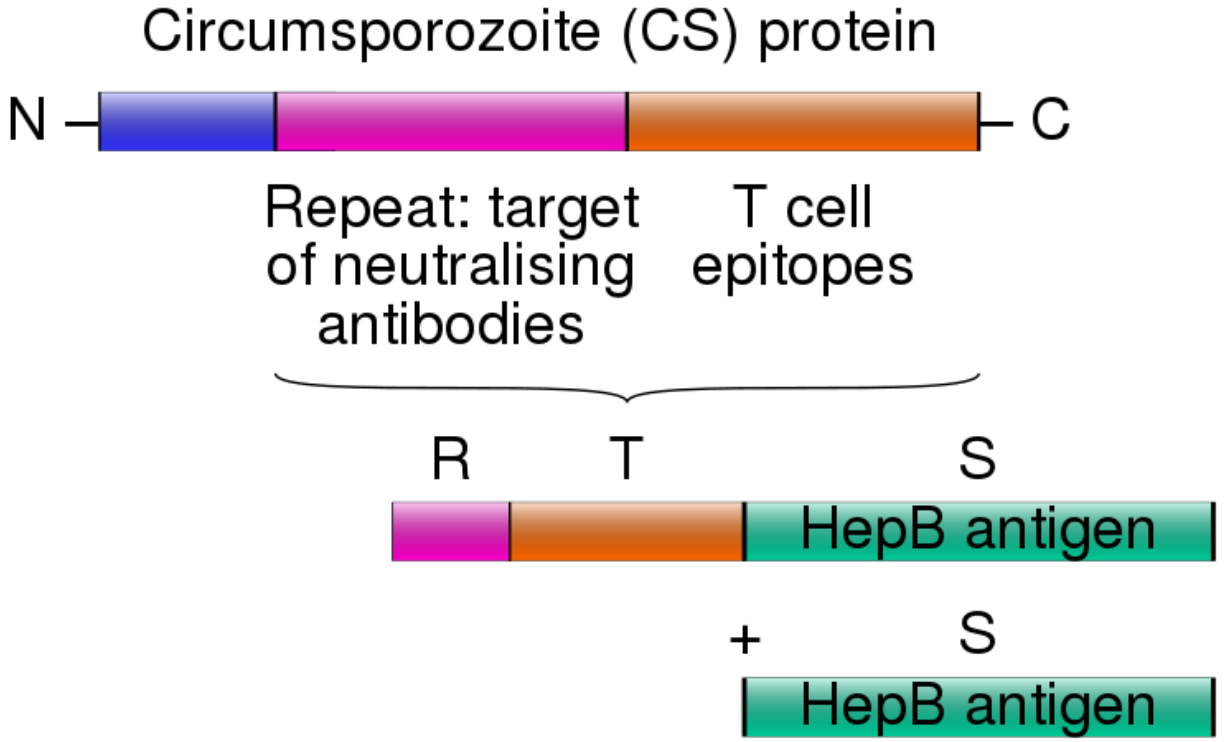
- Proteina circumsporozoitica del *Plasmodium*

+

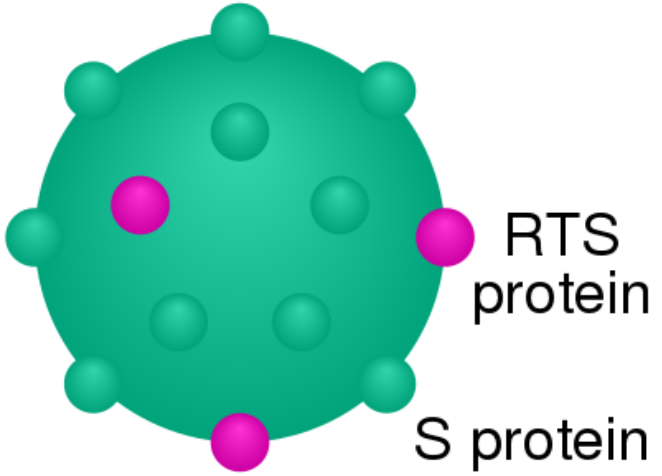
- Antigene superficiale del virus dell'epatite B

+

- Lisosomi contenenti un antagonista del Toll receptor 4 (per attivare la risposta immunitaria)



Co-expression of **RTS** (fusion protein) and HB**S** protein that assemble into mixed particles, in *S.cerevisaiae*



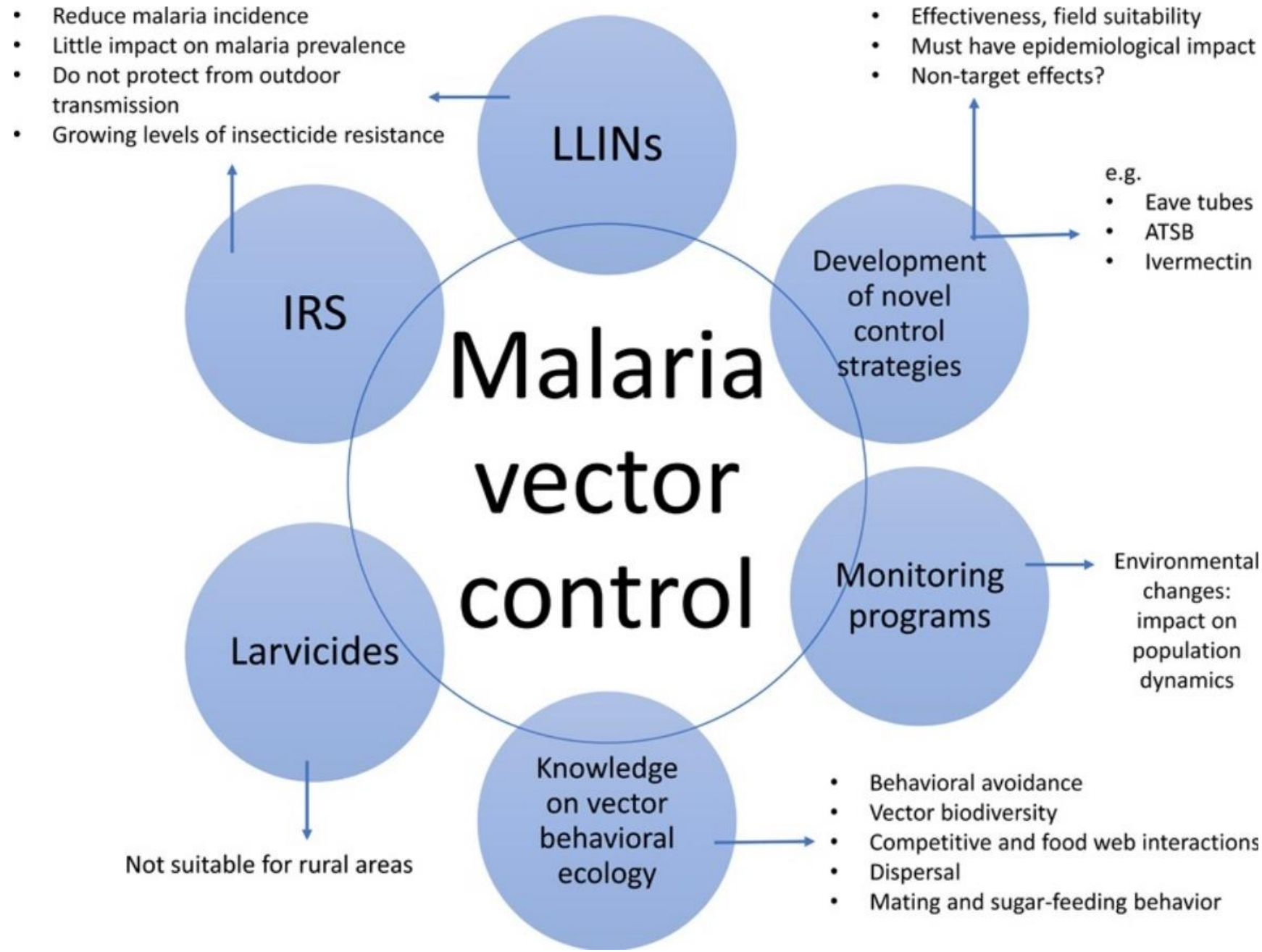
Mosquirix (RTS, S/AS01) vaccine

- Primo studio nel 2015, **120.000 bambini** di **7 paesi africani** (e prima approvazione dell'E.M.A.)

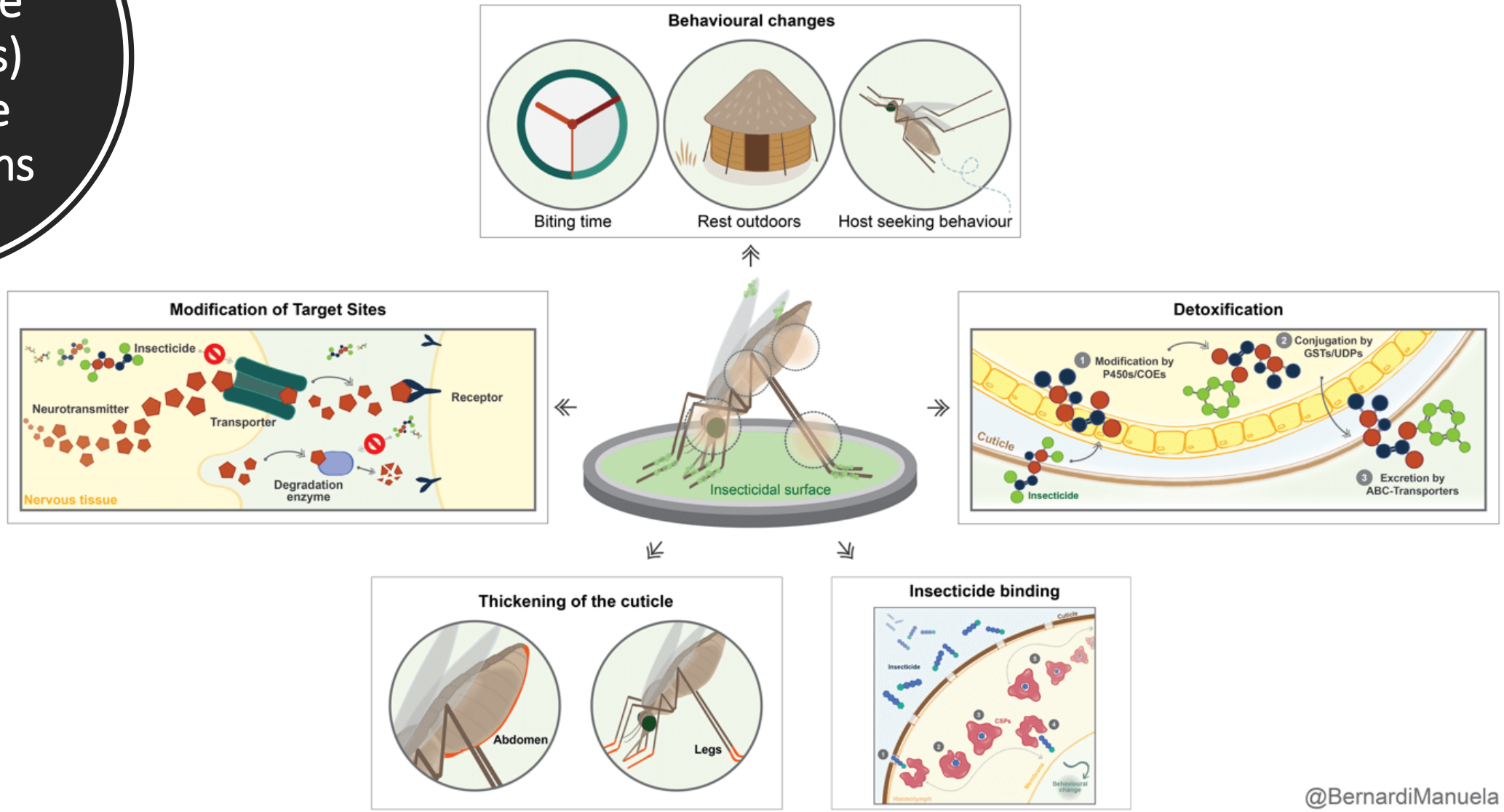
- Nell'ultima fase di una sperimentazione condotta in **3 Paesi** pilota (Ghana, Kenya e Malawi) su circa **800.000 bambini**, Mosquirix si è mostrato efficace nella riduzione dei contagi infantili soprattutto entro i 12 mesi successivi alla terza iniezione: prevenzione di malaria grave per bambini 5-17 mesi = 56%; per bambini 6-12 settimane = 31% **(approvazione W.H.O., 6 Ottobre 2021)**

Margine di efficacia basso (circa 30% nel ridurre le forme di malaria grave nei neonati) MA grande risultato (ci vogliono 4 dosi…)!

(potrebbe prevenire circa 25.000 morti l'anno nei bambini sotto i 5 anni!)


Reduce malaria incidence
Little impact on malaria prevalence
Do not protect from outdoor transmission
Growing levels of insecticide resistance
LLINs
Effectiveness, field suitability
Must have epidemiological impact
Non-target effects?
IRS
Development of novel control strategies
e.g.
Eave tubes
ATSB
Ivermectin
Malaria vector control
Larvicides
Monitoring programs
Environmental changes: impact on population dynamics
Not suitable for rural areas
Knowledge on vector behavioral ecology
Behavioral avoidance
Vector biodiversity
Competitive and food web interactions
Dispersal
Mating and sugar-feeding behavior

The emergence of (various) resistance mechanisms



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