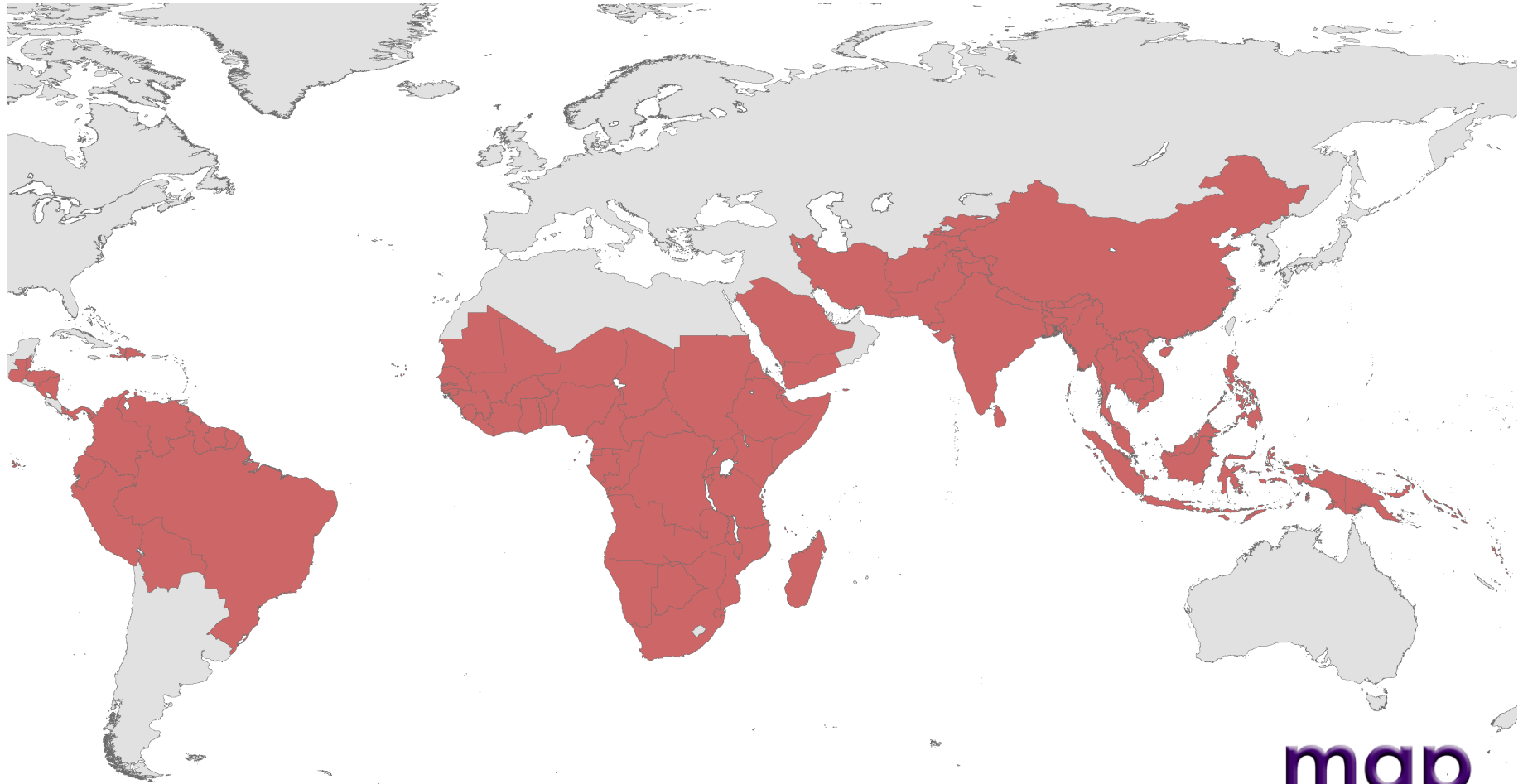


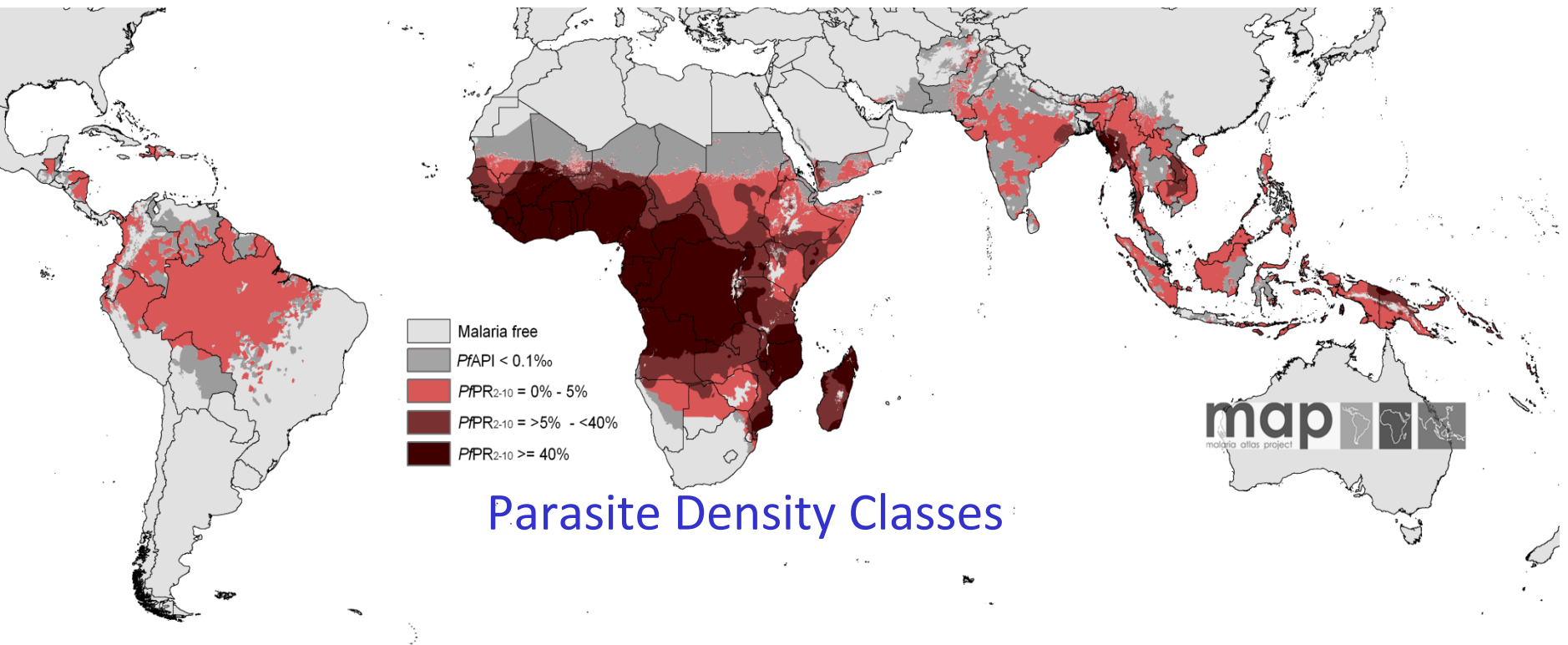
Malaria disease burden, epidemiology, status of malaria control and surveillance, and the need for new interventions.

Kevin Marsh

Malaria is a Global Problem

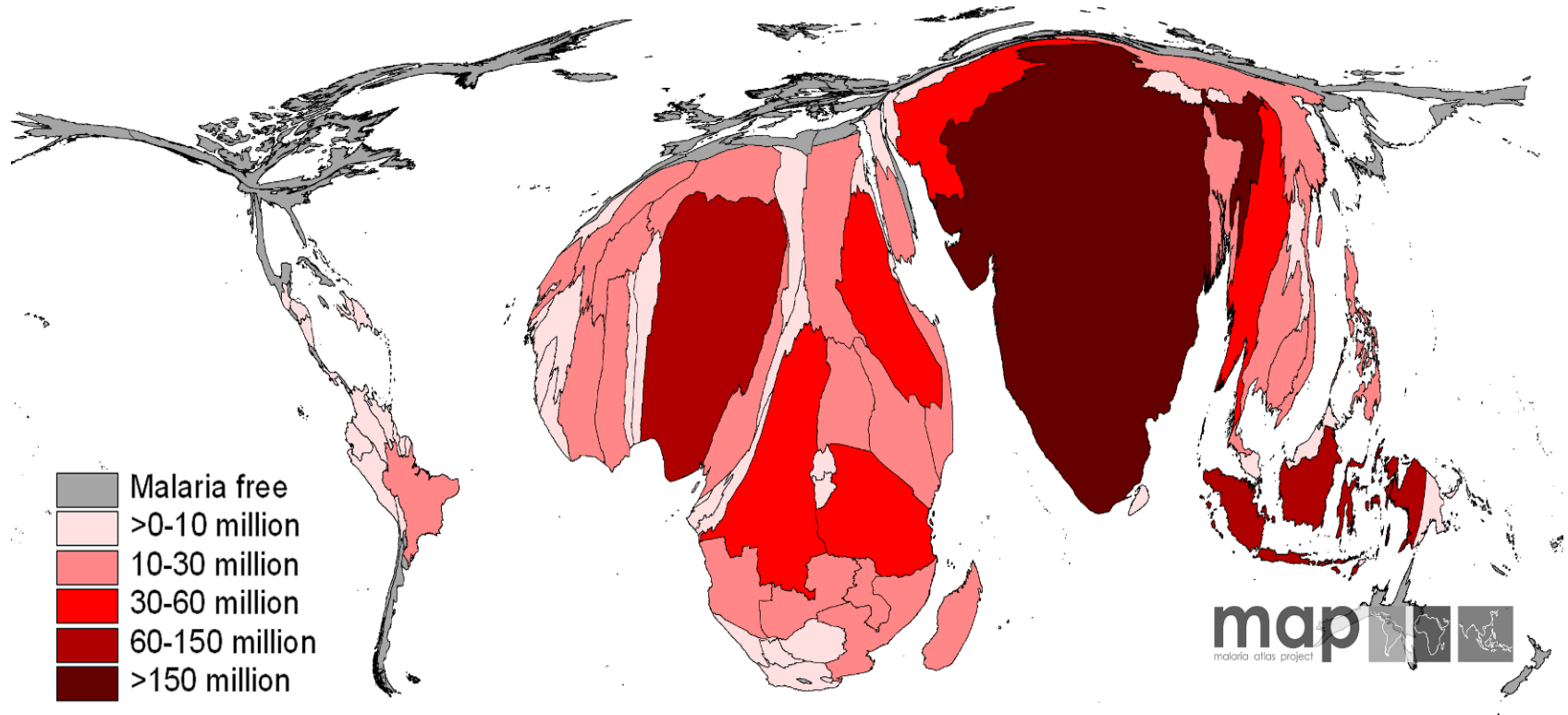


Transmission is heterogeneous



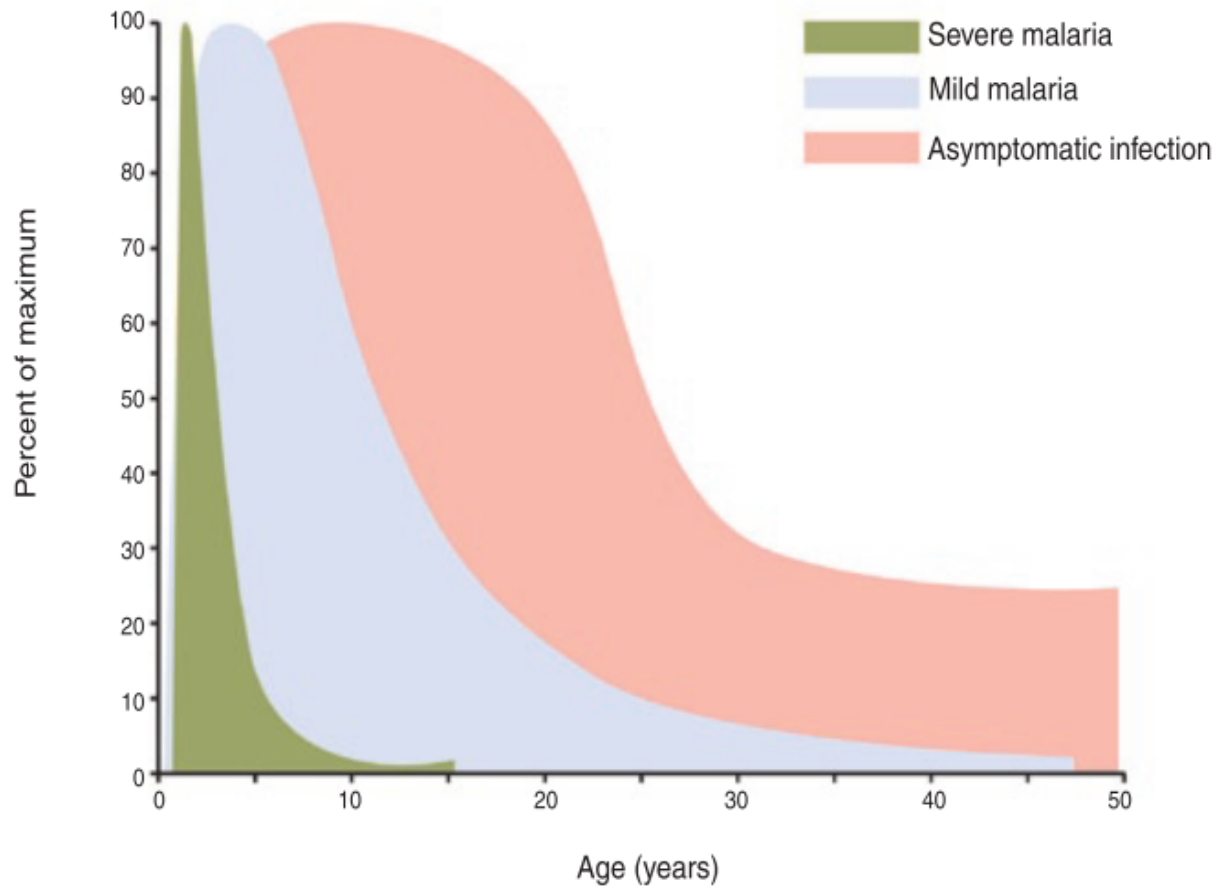
Hay *et al.* (2008) *PLoS Medicine*,

Most of the people with malaria are in Africa and Asia



But around 90% of mortality still in Africa

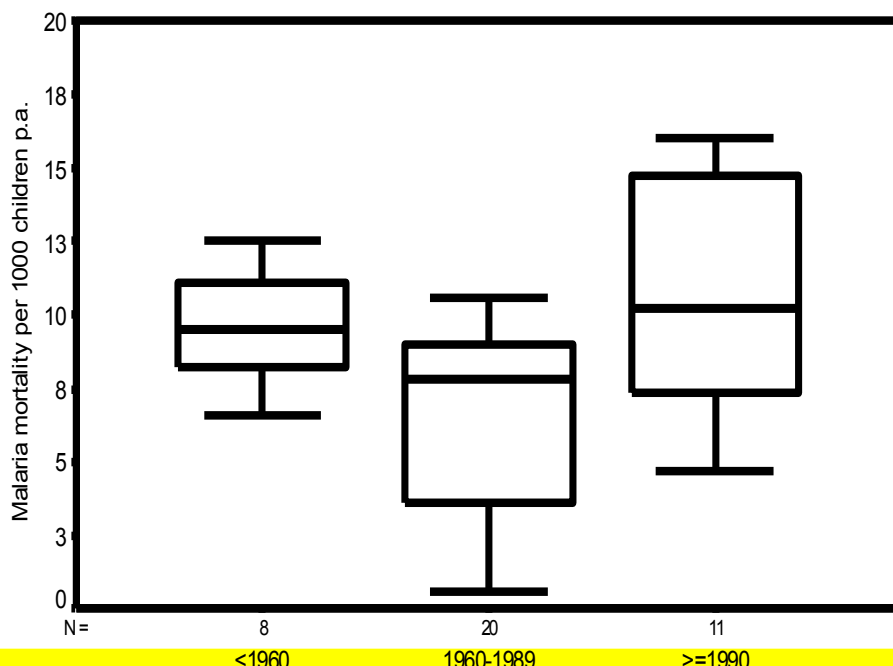
Burden on children because of immunity



Malaria in Africa 1999

- Malaria a disaster
- 1-3 million deaths
- Failing drugs
- Lack of national and International will
- Major economic impediment to development

Malaria mortality change since Independence in Africa



*Snow and Marsh(2003),
Trends in Parasit*

Concerted International Action

- RBM 1998
- Medicines for Malaria Venture MMV 1999
- Abuja declaration 2000
- Millennium Development Goals 2000
- The Global fund 2001

Global Expenditure on Malaria Control

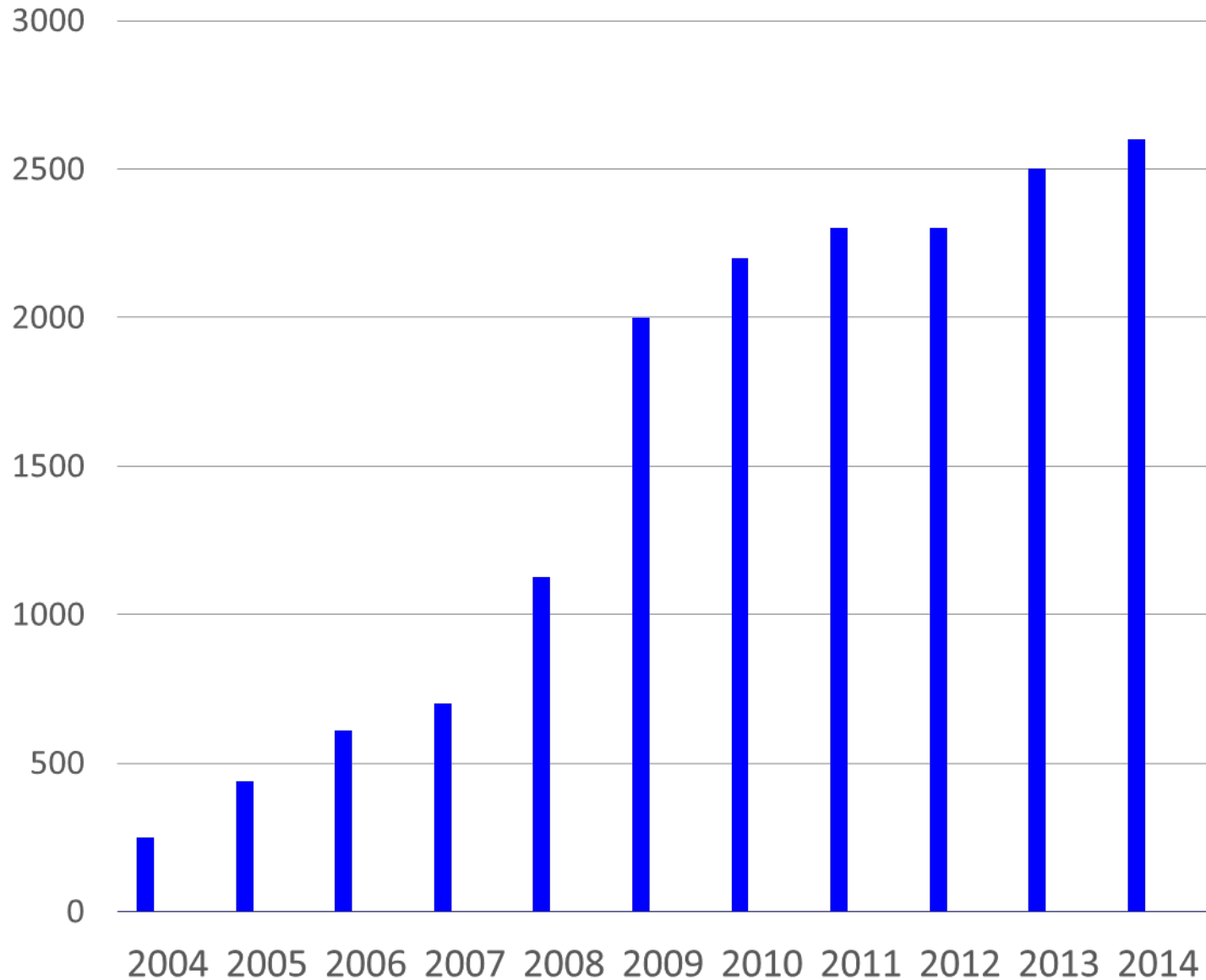
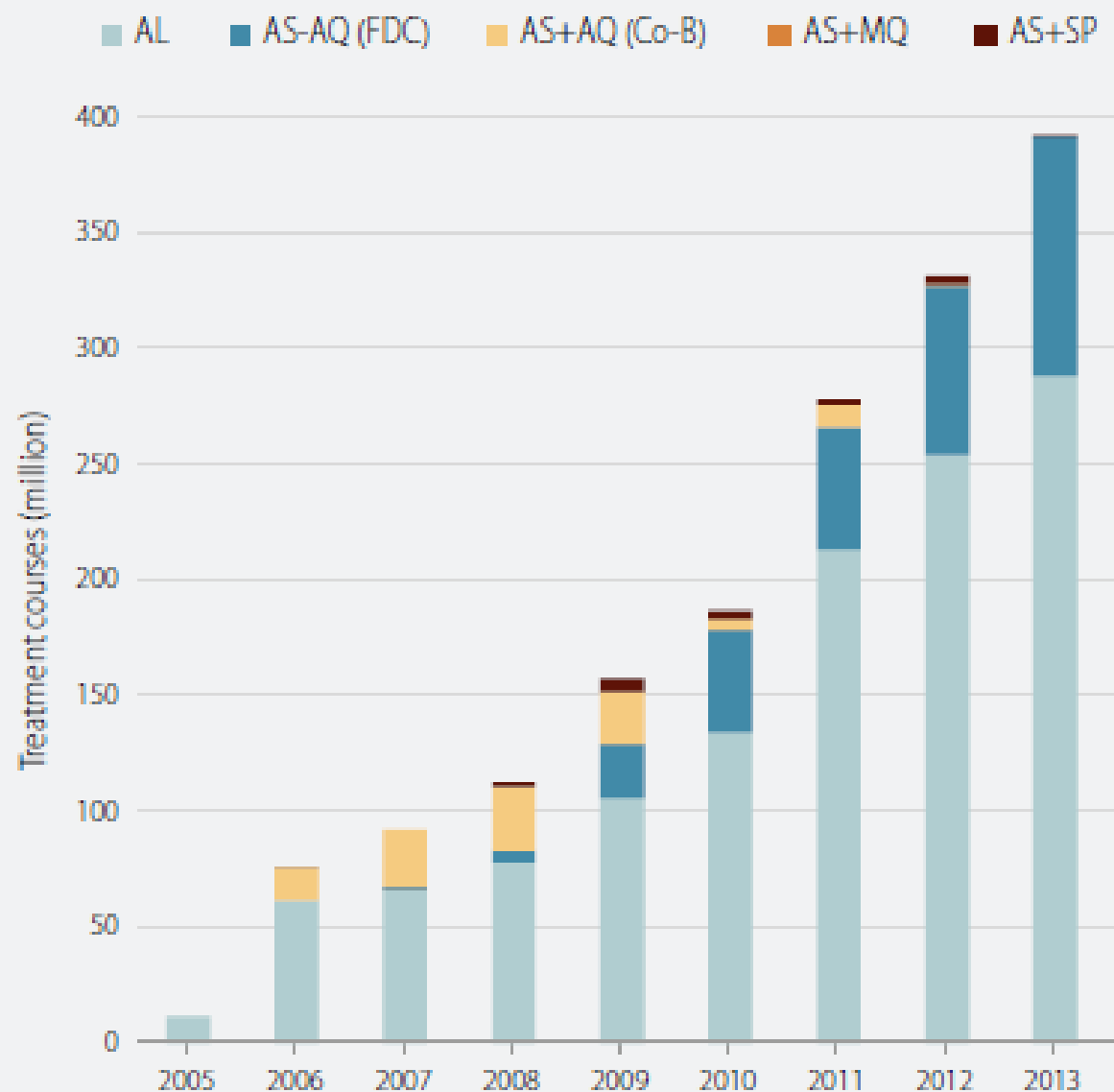
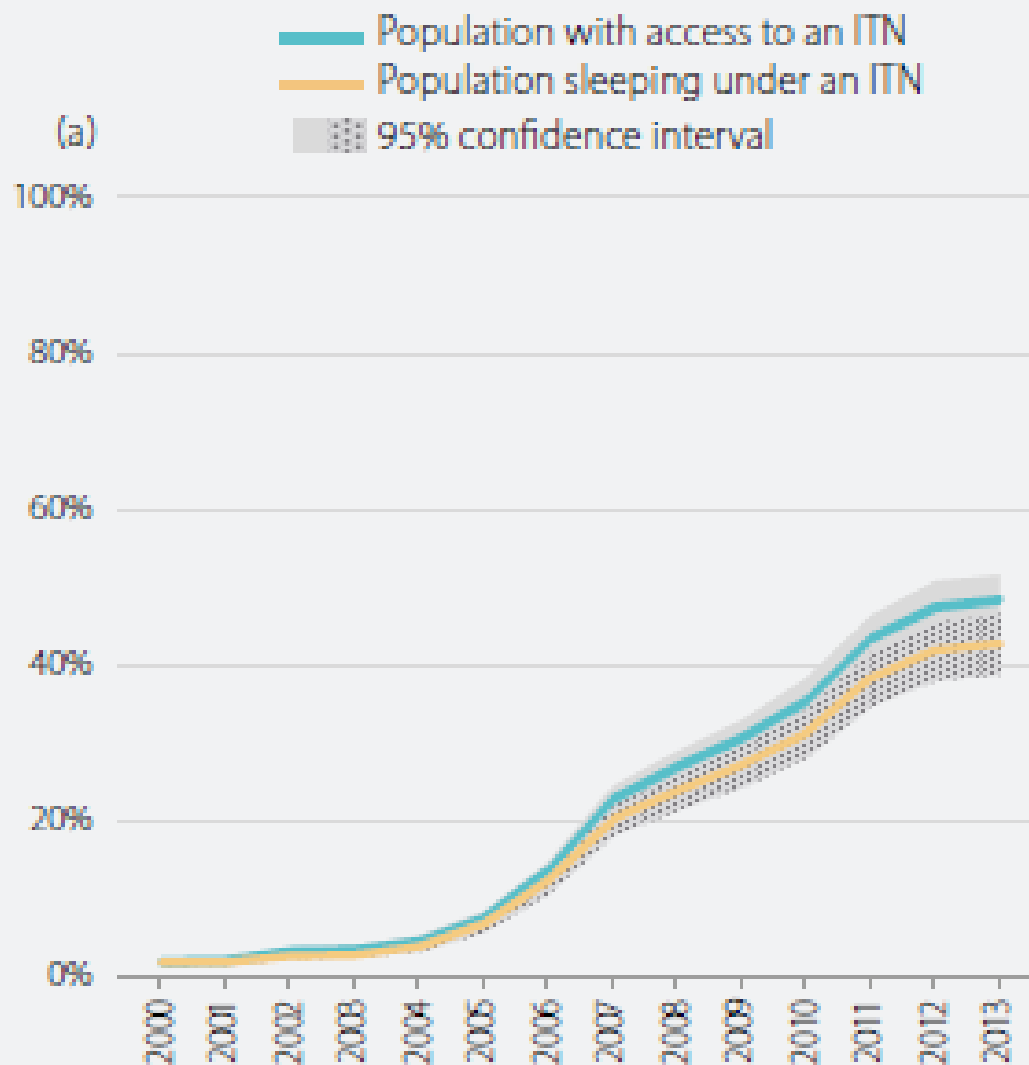


Figure 6.3 ACT deliveries from manufacturers to the public and private sectors, by drug and presentation, 2005–2013



From The World
Malaria Report
2014

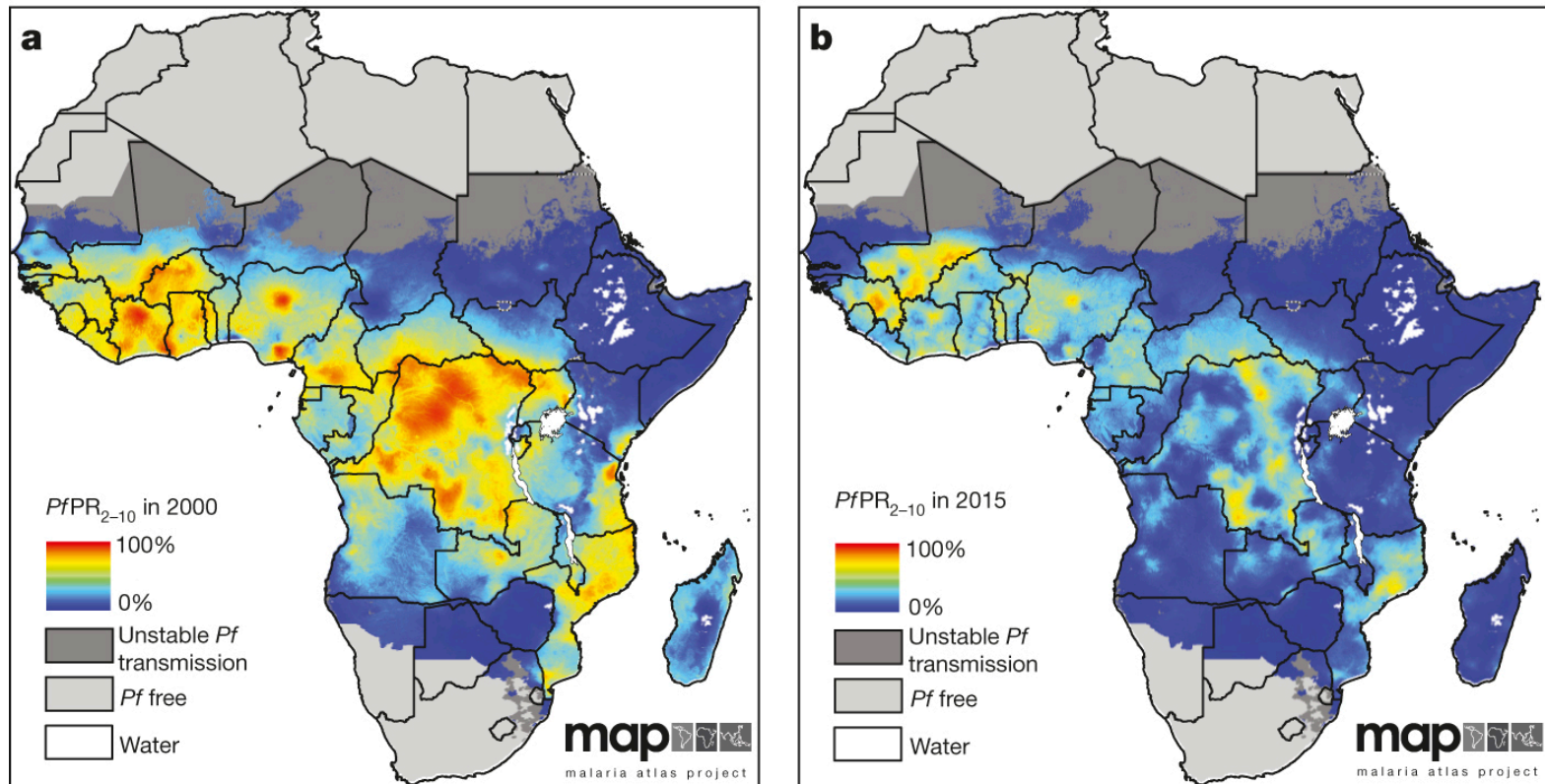


ITN, Insecticide-treated mosquito net

Source: ITN coverage model from the Malaria Atlas Project (based at the University of Oxford)

From The World
Malaria Report
2014

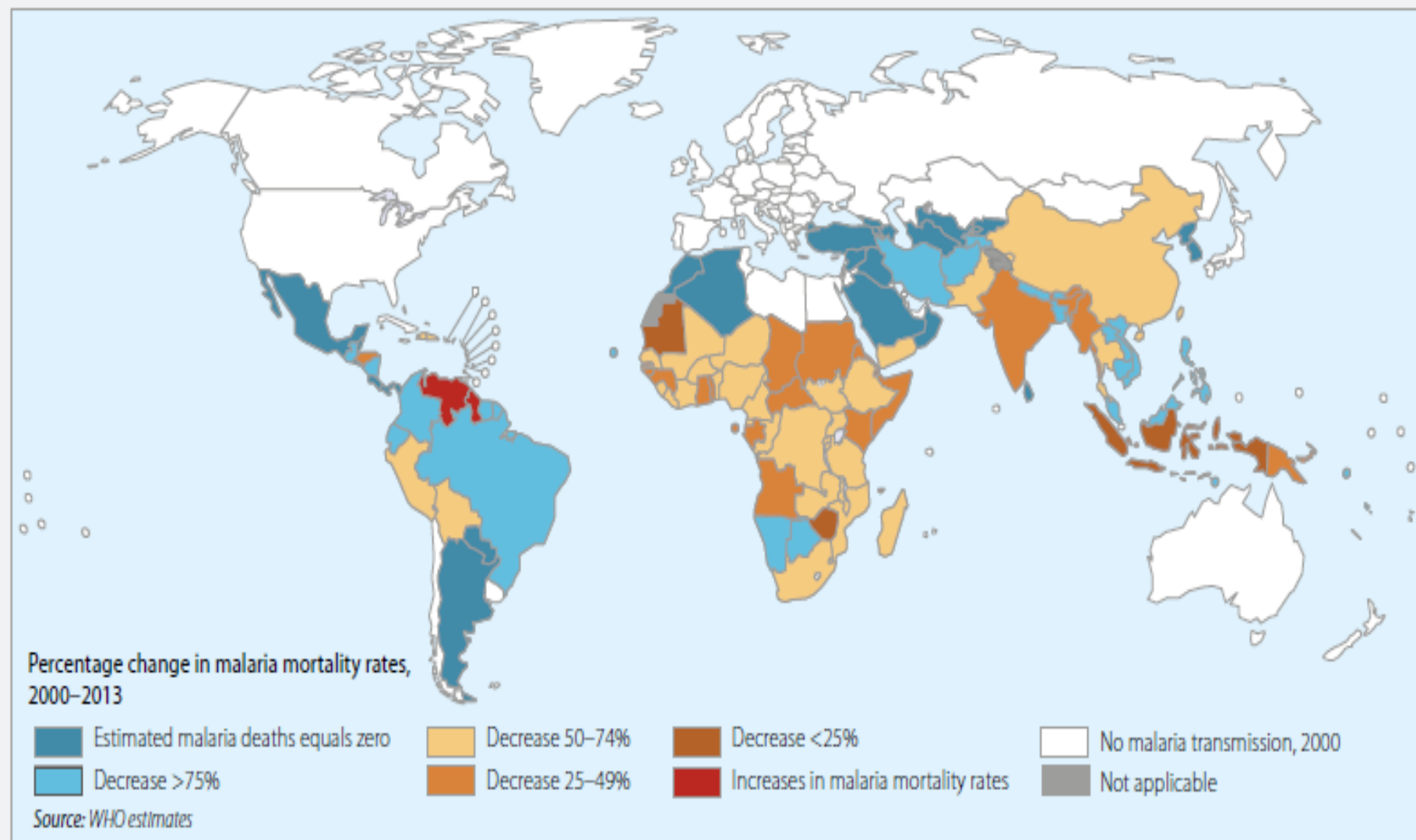
Changes in infection prevalence 2000–2015.



S Bhatt *et al. Nature* **000**, 1-5 (2015) doi:10.1038/nature15335

663 million cases averted (542-753)

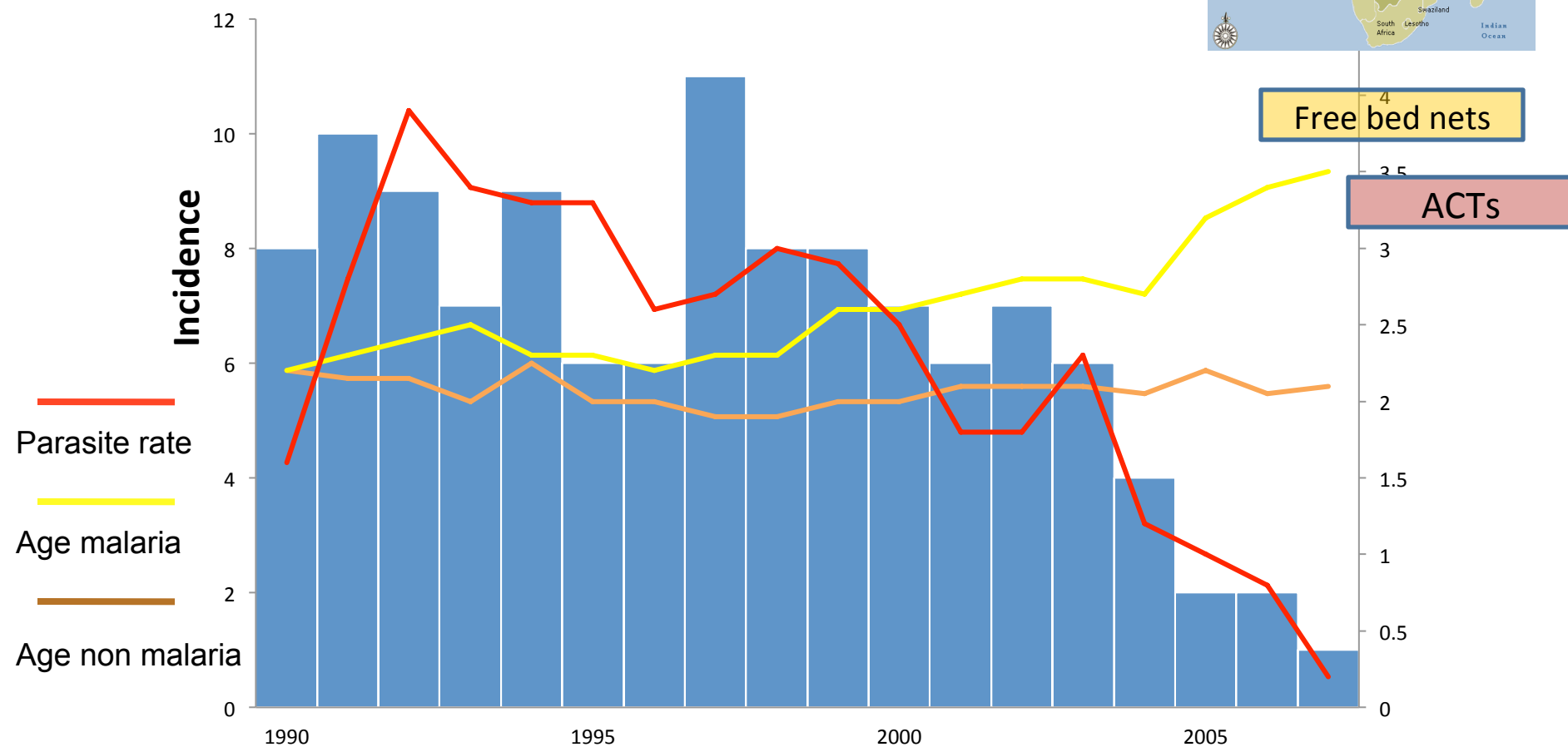
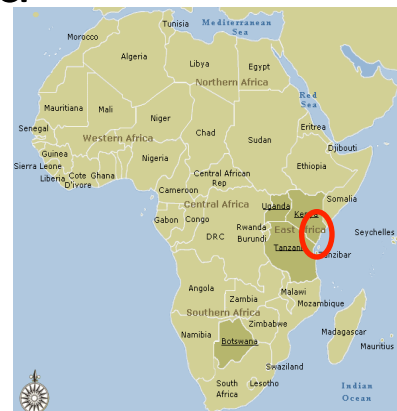
Figure 8.9 Percentage change in malaria mortality rates, 2000–2013



Malaria mortality down 47% globally and 54% in Africa

From The World
Malaria Report
2014

Malaria Transmission falling over long period

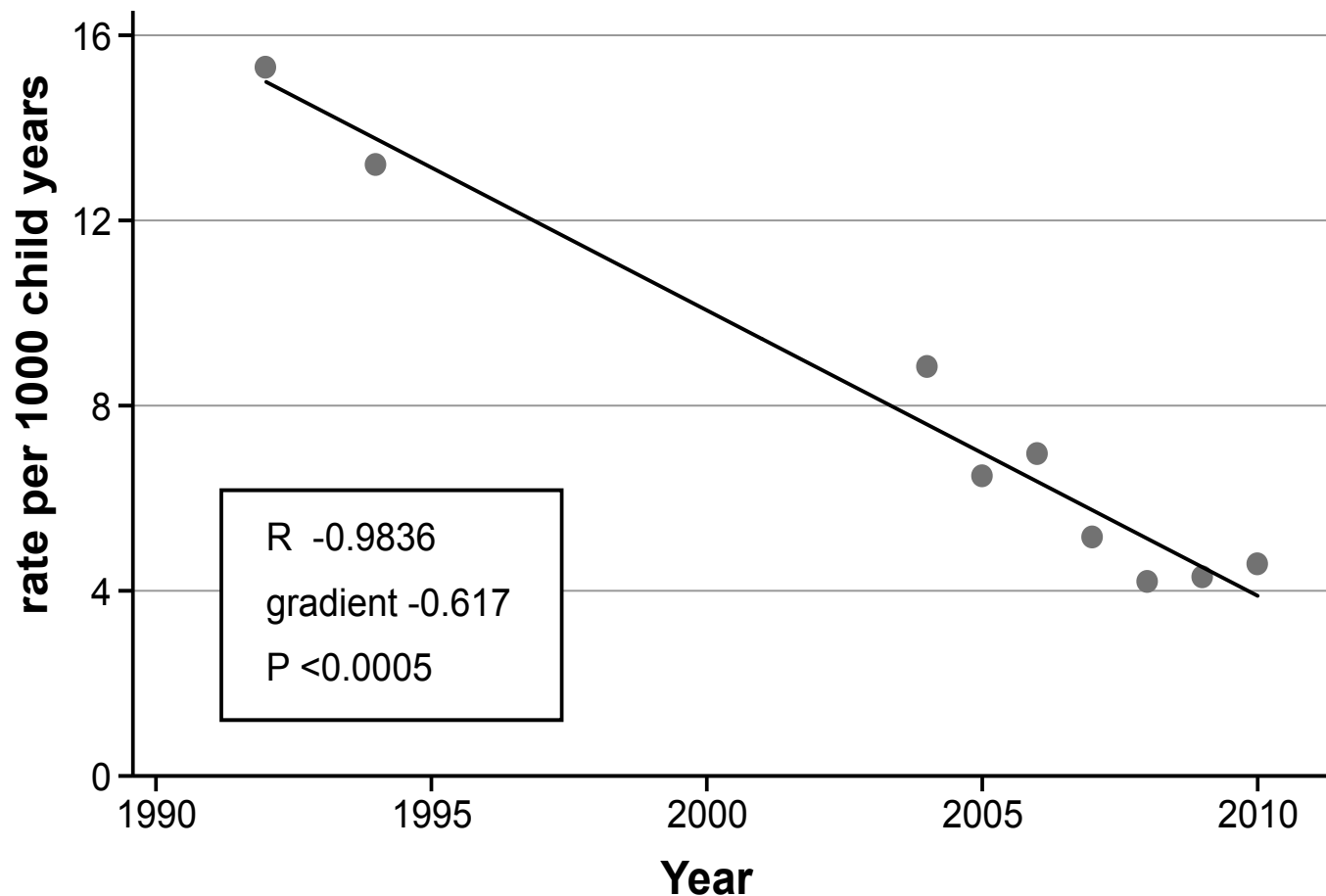


Free bed nets

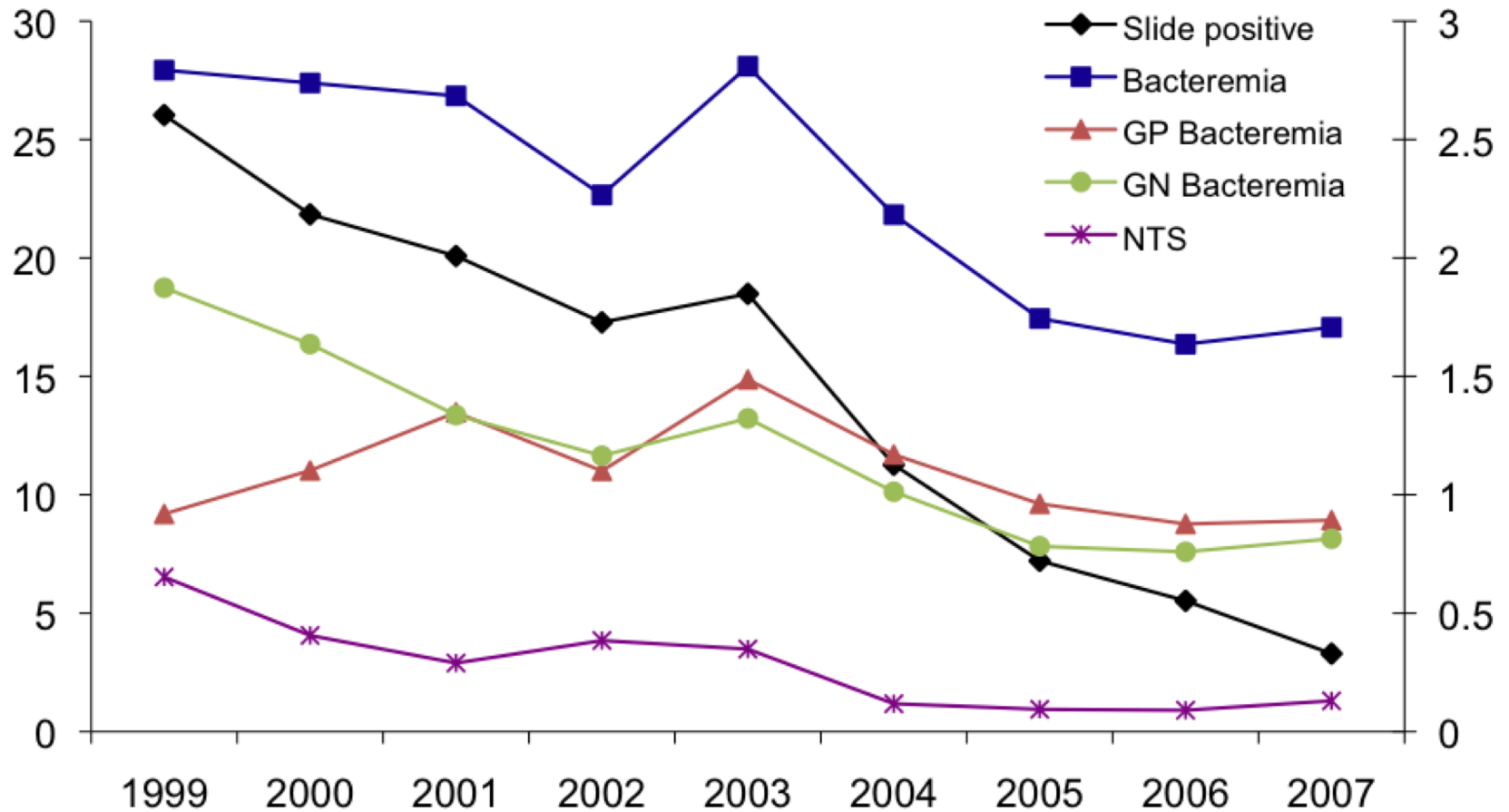
ACTs

Mortality Trends in Kilifi DSS

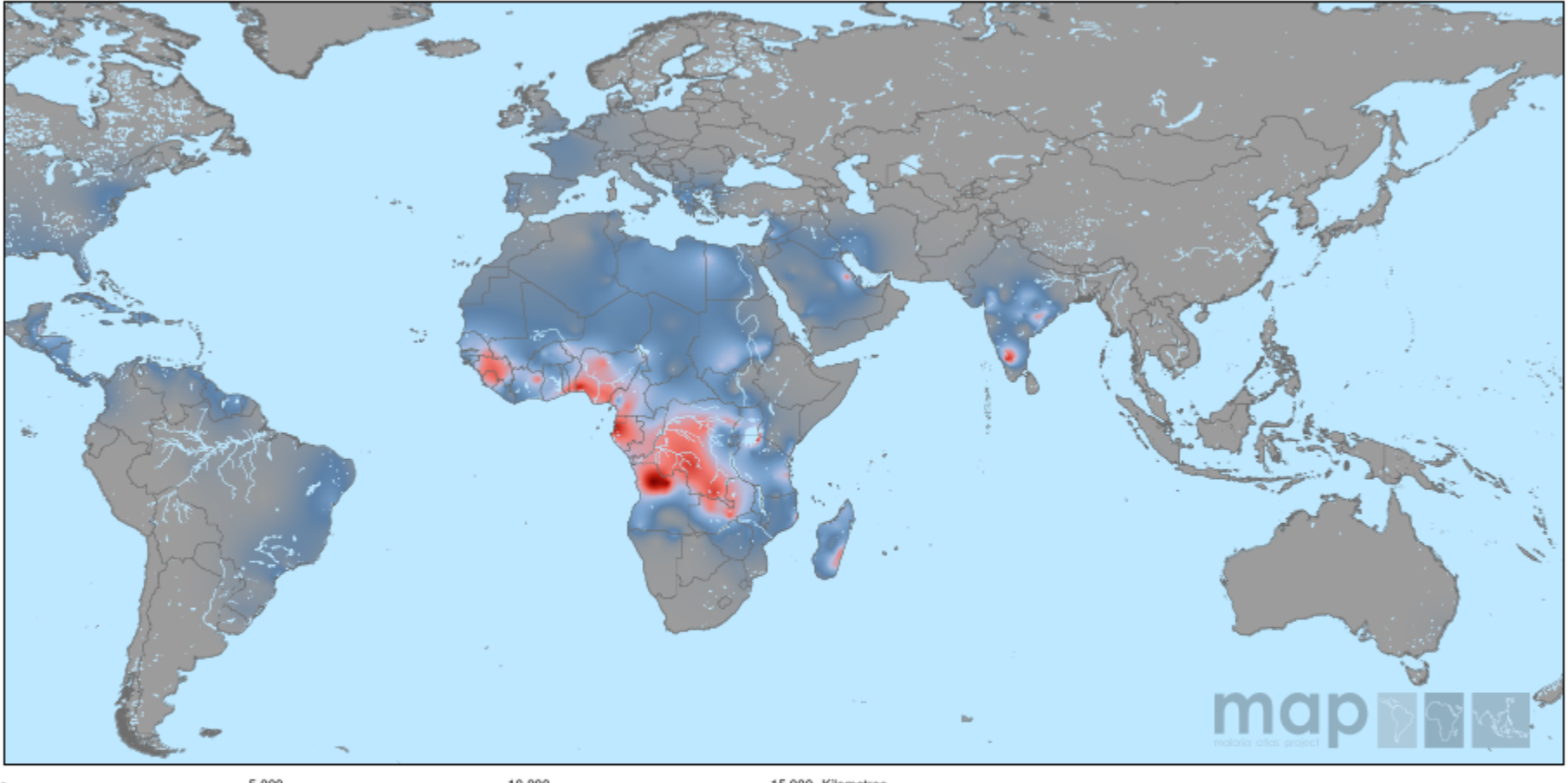
Trend in mortality rates in children 1-59m in KHDSS



Bacteraemia declines with malaria

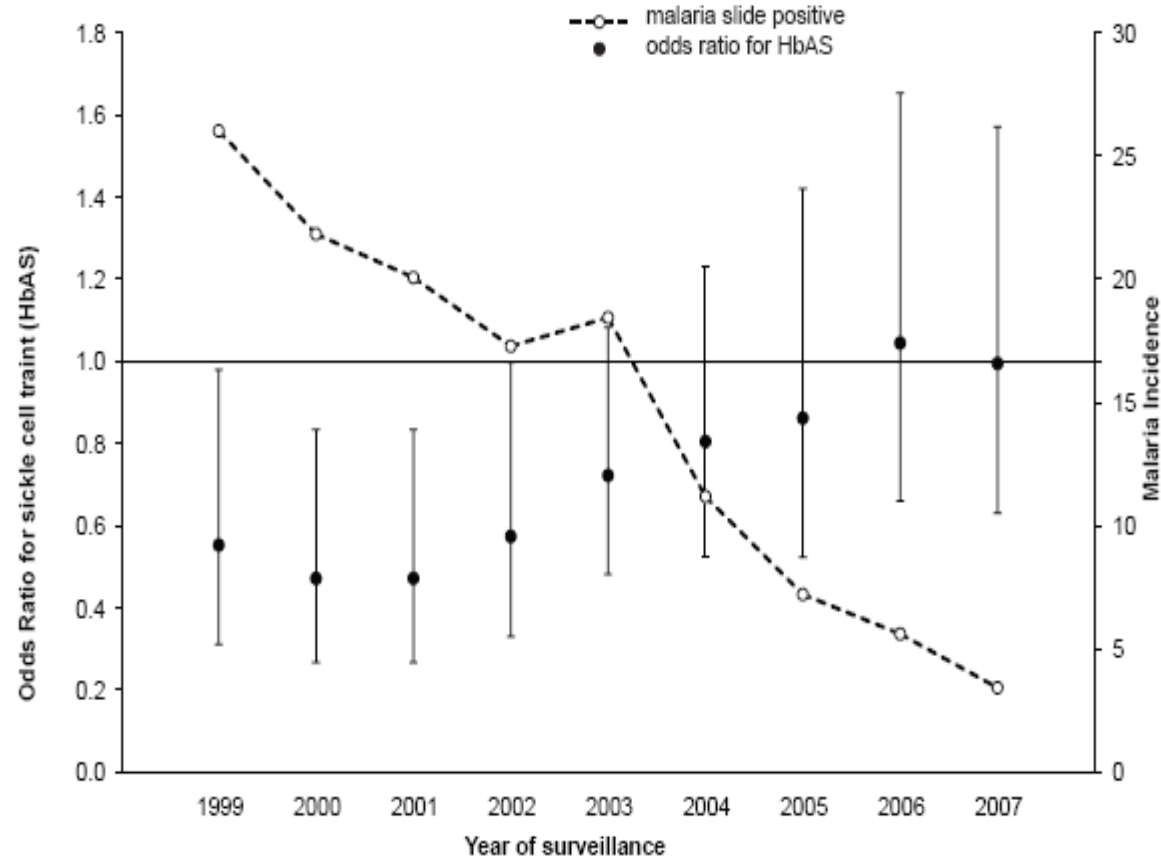


Sickle Cell Trait and Malaria



Sickle cell trait provides strong protection against malaria but in mid 1990's we observed apparent strong protective effect against bacteraemia

Protective effect of AS against bacteraemia 1999-2007



Malaria may “cause” 50% of cases of bacteraemia

Scott et al 2010

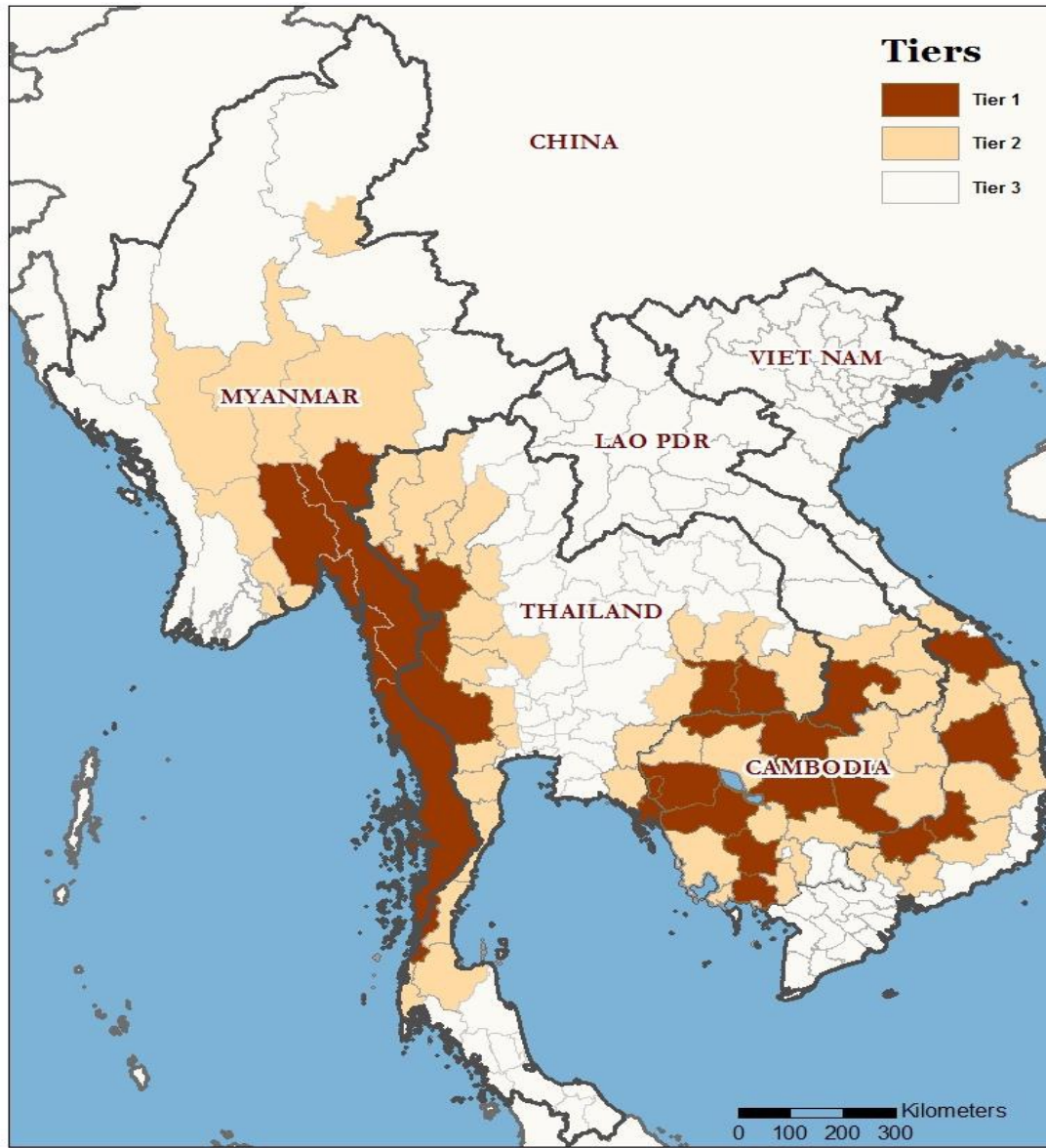
Malaria Control and Child Mortality Bioko



Year	CMR per 1000 births
2000	157
2001	189
2002	137
2003	111
2000-2003	157
2004	51
2004	72
2006	39
2007	59
2004-2008	55

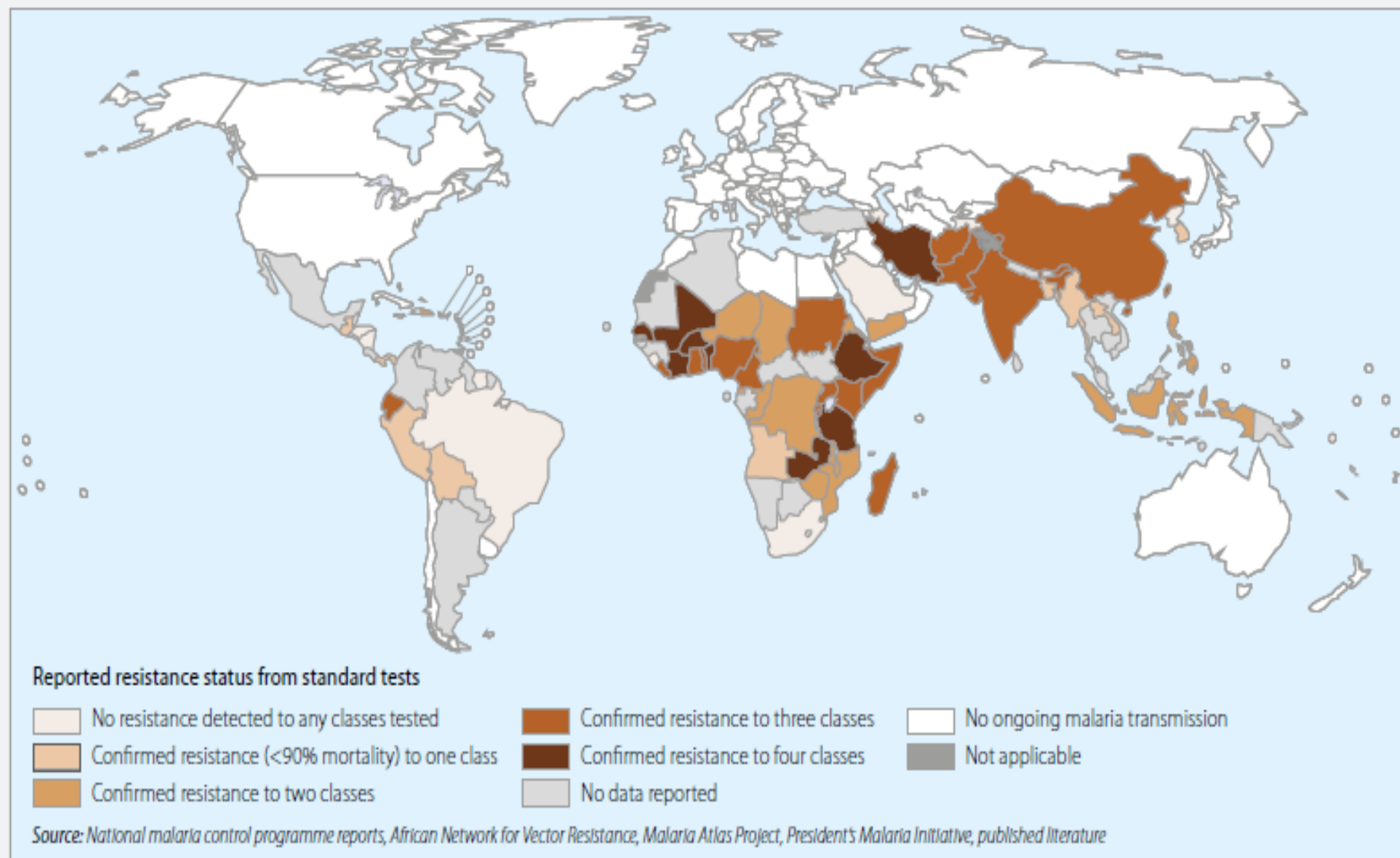
51

Artemisinin Resistance in the Greater Mekong



- Observed from around 2006 but probably arose in Cambodia and on Thai Myanmar border around 2001
- 2014 MPAC recommended that a policy of malaria elimination be pursued in the Greater Mekong

Figure 3.10 Countries reporting resistance since 2010, by number of insecticide classes



2015: Where are we?



Good News

- Malaria falling in many (but not all) parts of Africa
- Disproportionate gains in child survival
- Renewed optimism and thoughts of eradication
- New interventions- Vaccines, drugs, vector control approaches

BUT

- Artemisinin resistance
- Insecticide resistance
- Flat (and insufficient) funding for control in an uncertain world
- Large populations with reducing immunity

Concluding Thoughts

- Elimination and eventual Eradication must be the long term goals
- But elimination depends first on control
- Historically many countries have been to the brink of elimination followed by resurgence.
- A new Global Technical Strategy (WHO) and new Global Malaria Action Plan (RBM) were launched in 2015
- It is essential that global funding be increased and sustained and that new tools be developed