

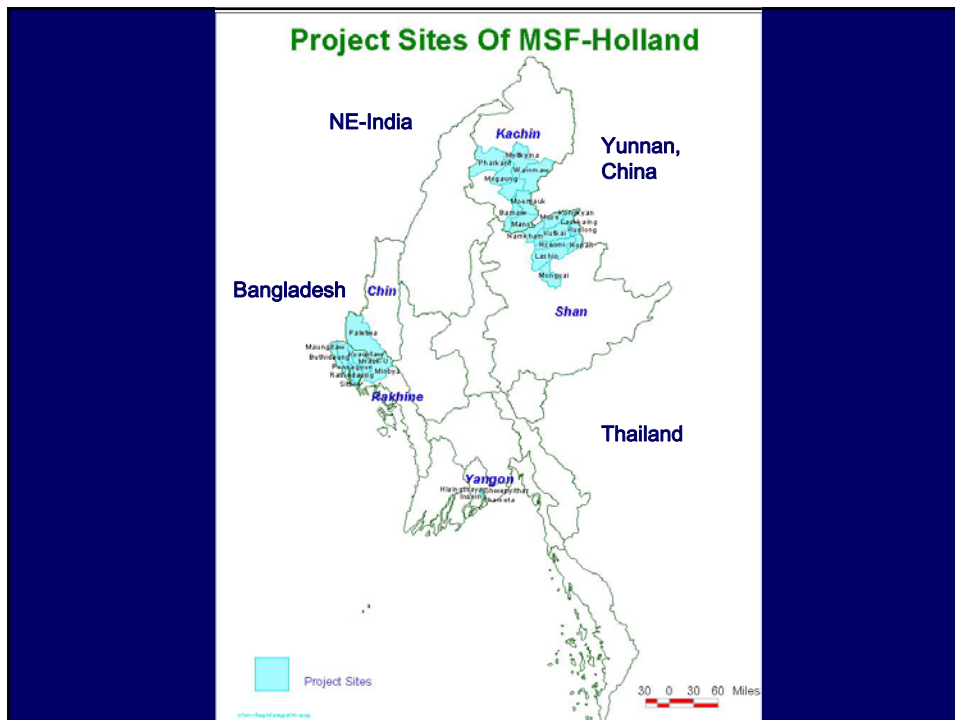
## Comparison 5 ACT's in Myanmar

- **Background malaria in Myanmar & study area.**
- **Comparison 5 ACT's in Myanmar**
- **Achievements and needs**

## In 1994 MSF-H started in Rakhine state, Western Myanmar

### Proposal

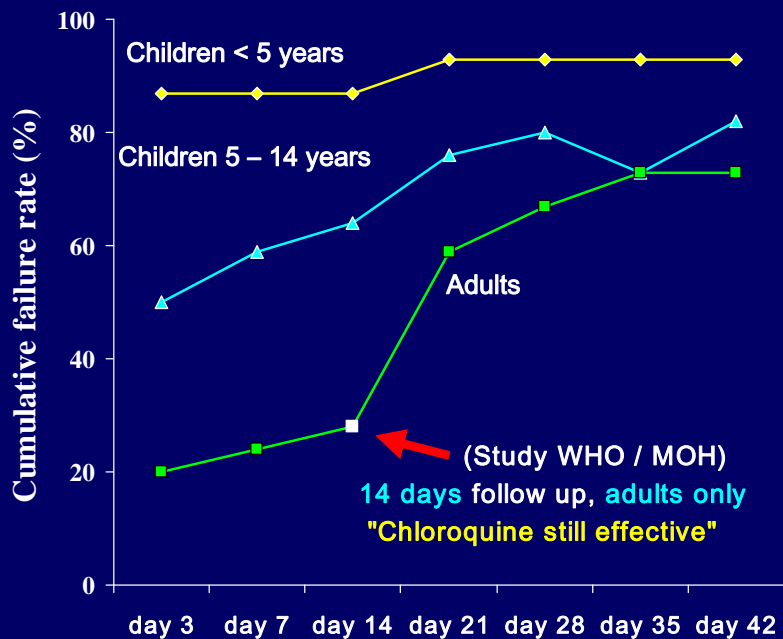
- Cooperation with 20 DoH clinics
- Training microscopists
- Staff ask a small fee (0.10-0.15 USD)
- Mefloquine-Artesunate

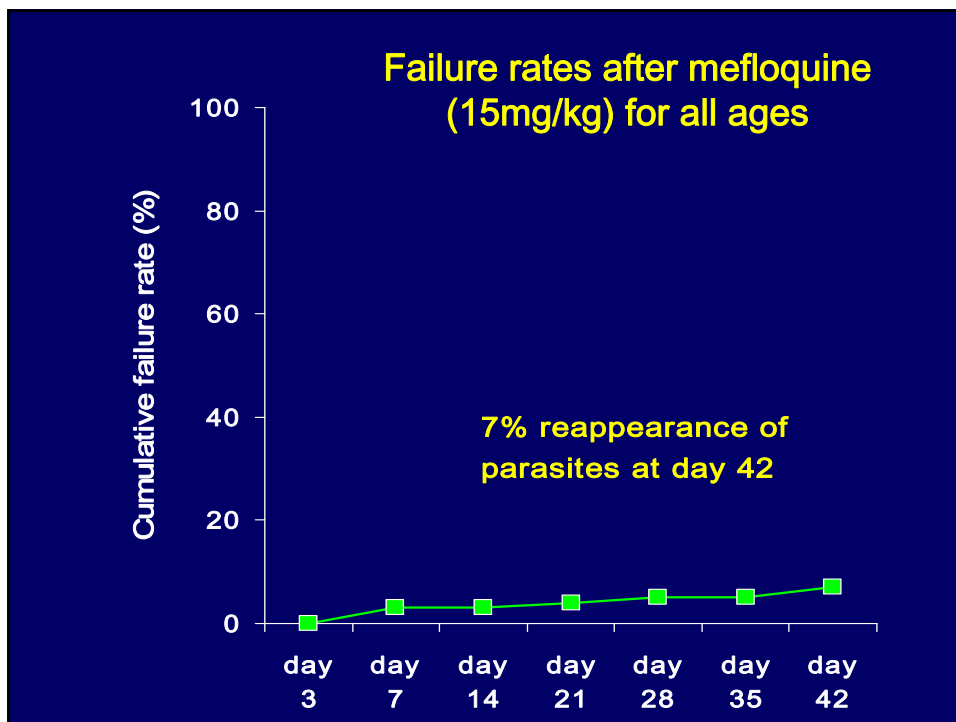
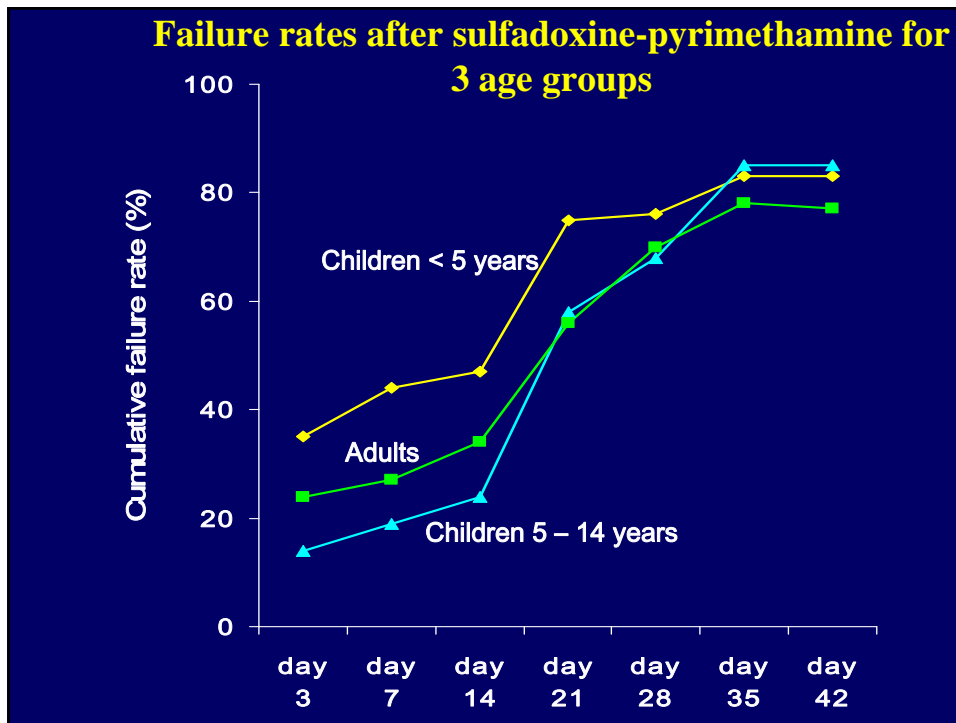


## Malaria in Myanmar in 1994

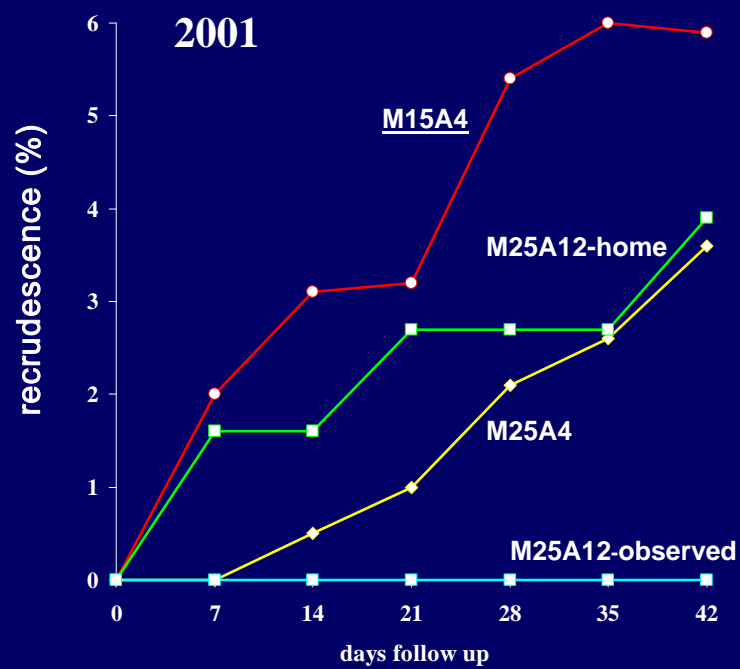
- Population = 50-55 million
- Malaria cases 500.000, 75% clinical diagnosis.
- WHO / DoH; CQ and SP still effective
- Malaria protocol 1<sup>st</sup> chloroquine 2<sup>nd</sup> fansidar.

### Failure rates after chloroquine for 3 age groups



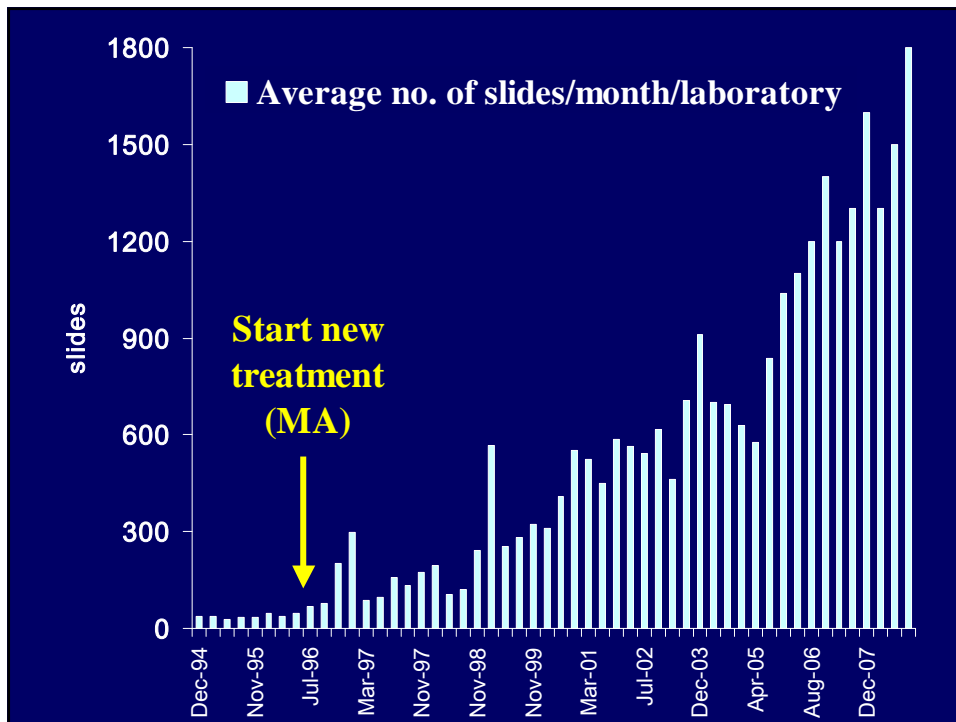


1996 ; DoH agreed the project to use M 15mg/kg + A 4 mg/kg for children as a 'study'



**2001**

**M 25mg/kg +  
A 4mg/kg x 3 days**



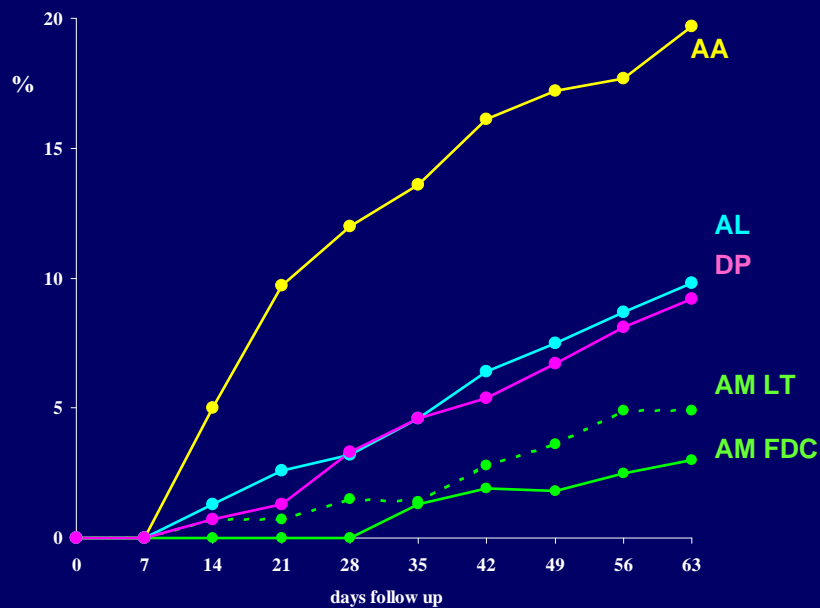
## Comparing the effectiveness of 5 artemisinin combination treatment regimen

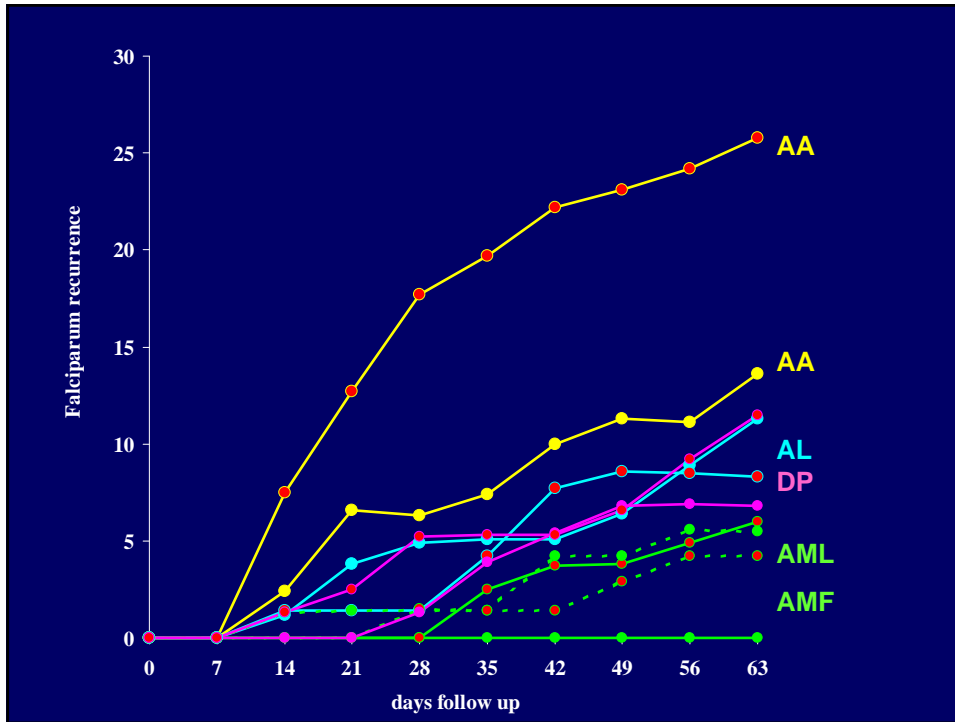
1. AA Artesunate-amodiaquine
2. AL Artemether-lumefantrine
3. AM-F Artesunate-mefloquine Fixed dose combination
4. AM-L Artesunate-mefloquine Loose tablets
5. DP Dihydroartemisinin-piperaquine

Half patients with primaquine 0.75 mg/kg (sd) and half without.

Sample size ; 800

### Recurrence of P.falciparum





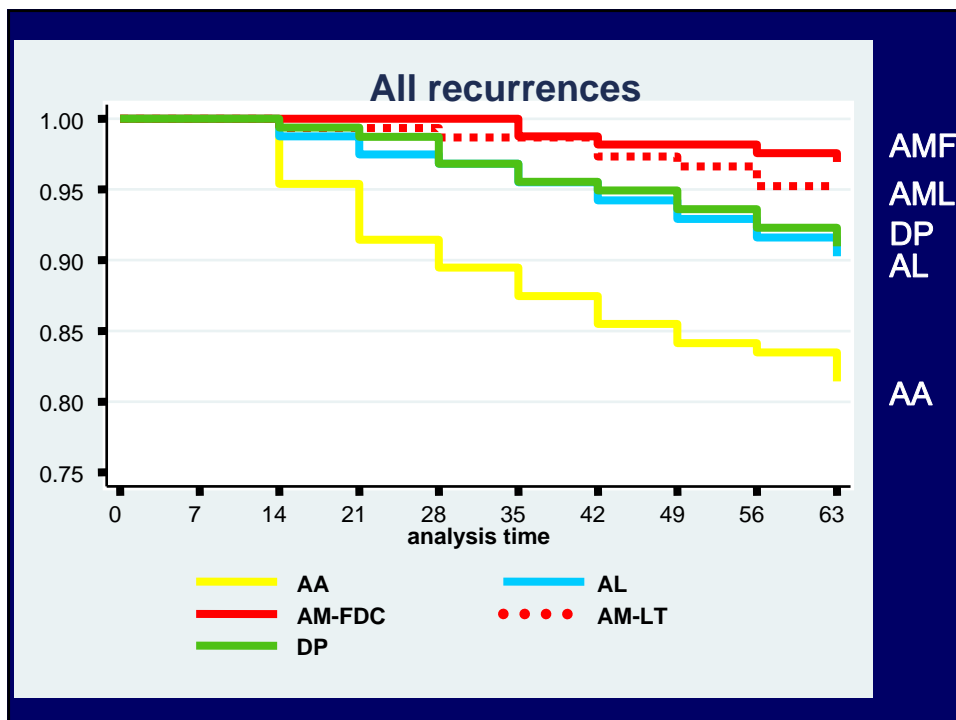
### Outcome day 63

	n	Pf +
AA	155	28
AL	162	15
AM-FDC	169	5
AM-LT	161	7
DP	162	14



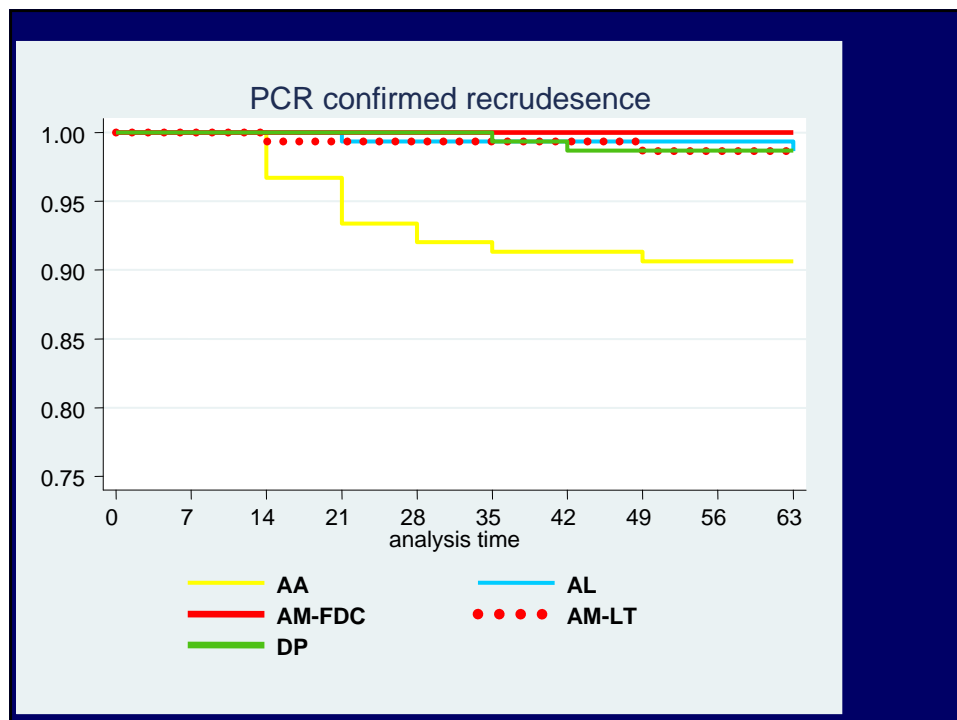
## PCR results recurrent *P.falc*

- 38 new infection
- 20 recrudescence
- 11 indeterminate



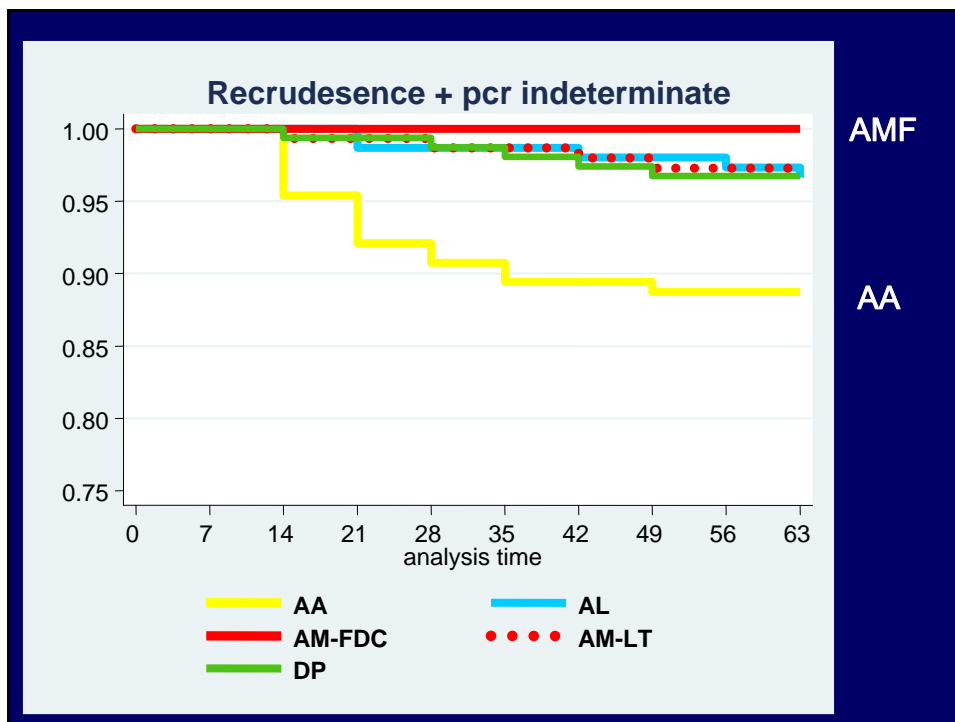
## Recurrence of *P.falc* day 63

Compared to AM-FDC	P value
AA	0.0000
AL	0.014
AM-LT	0.430
DP	0.023



## Recrudescence of *P. falc* day 63

Compared to AMFDC	P value
AA	0.0001
AL	0.138
AM-LT	0.138
DP	0.141

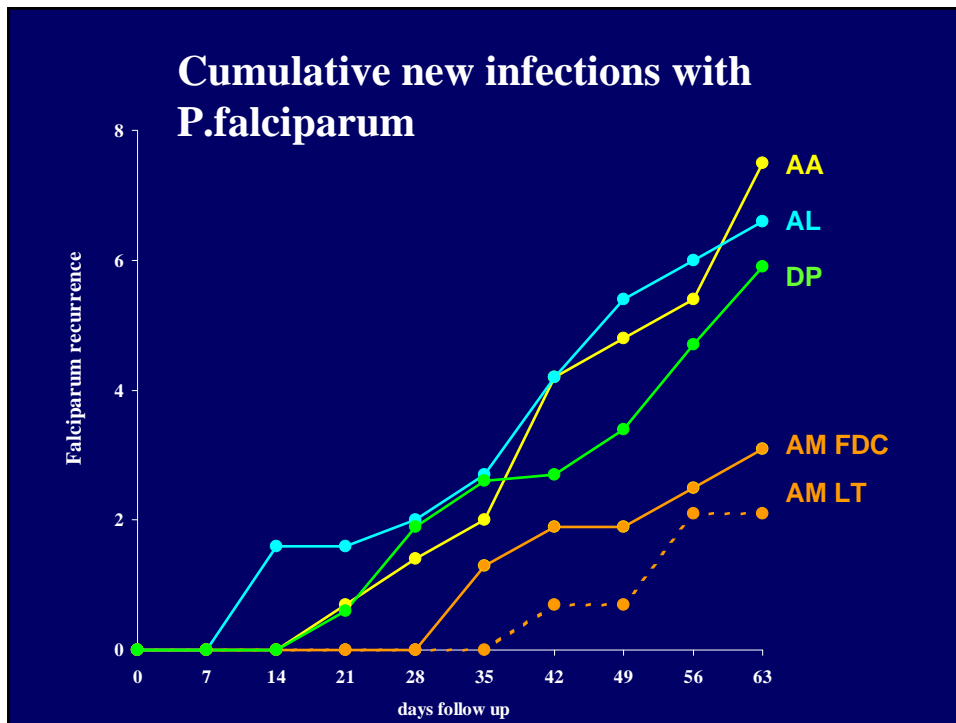


## Recrudescence of *P.falc* day 63

Compared to AM-FDC	P value confirmed (+ indeterm)
AA	0.0001 - 0.0000
AL	0.138 - 0.019
AM-LT	0.138 - 0.035
DP	0.141 - 0.021

## Recrudescence rates (+ indeterminate)

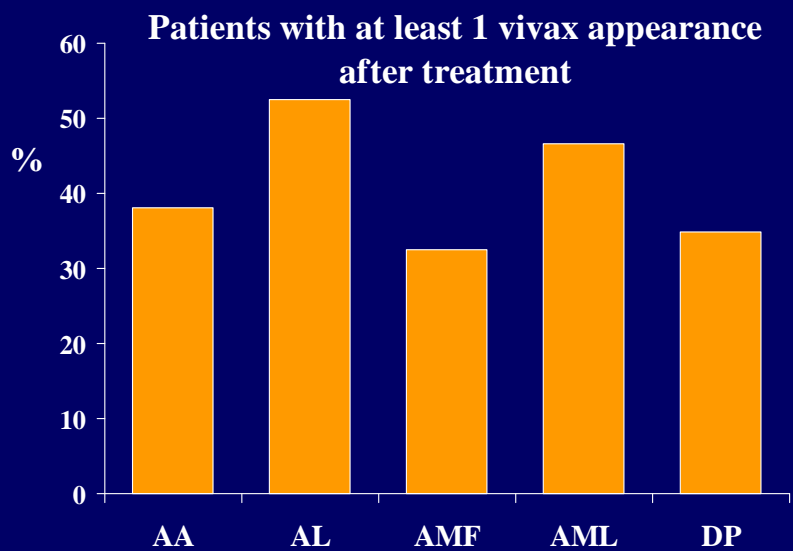
- AA 10.3 – 12.5%
- AL 1.4 – 3.5%
- AML 1.4 – 2.8%
- AMF 0%
- DP 1.4 – 3.4%



### Outcome day 63

	n	Recr.	Indeter minate	New inf	LTF	Neg
AA	155	14	3	11	8	119
AL	162	2	3	10	10	137
AM-FDC	169	0	0	5	8	156
AM-LT	161	2	2	3	17	137
DP	162	2	3	9	9	138

## Effect on *P. Vivax*

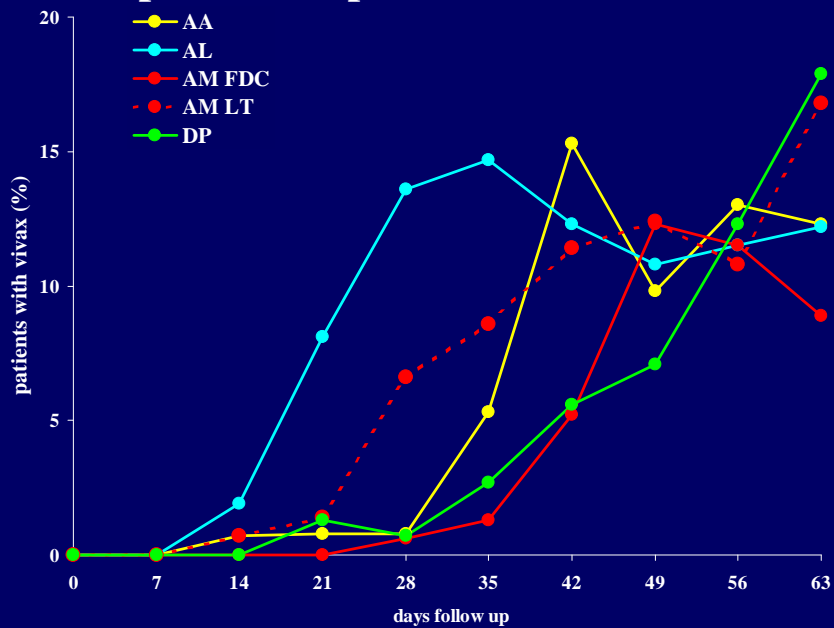


Significant difference between AM-FDC and AL ( $p < 0.001$ ) and AM-LT ( $p = 0.01$ )

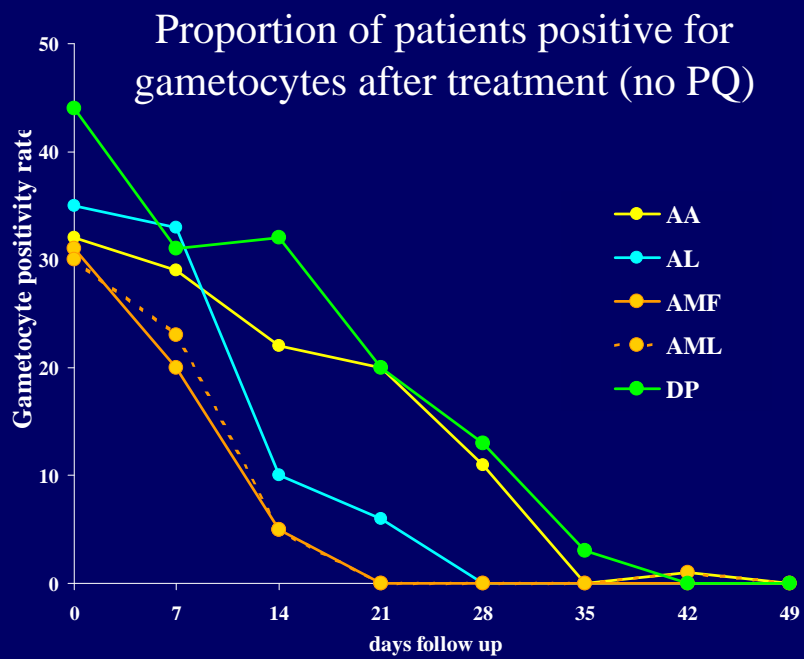
## Vivax appearance after treatment

ACT	N	P.vivax $\geq 1$	1x	>1
AA	155	59	47	12
AL	162	85	52	33
AM-FDC	169	55	49	6
AM-LT	161	75	57	18
DP	162	56	46	10

## Proportions of patients with P.vivax



## Effect on gametocytes

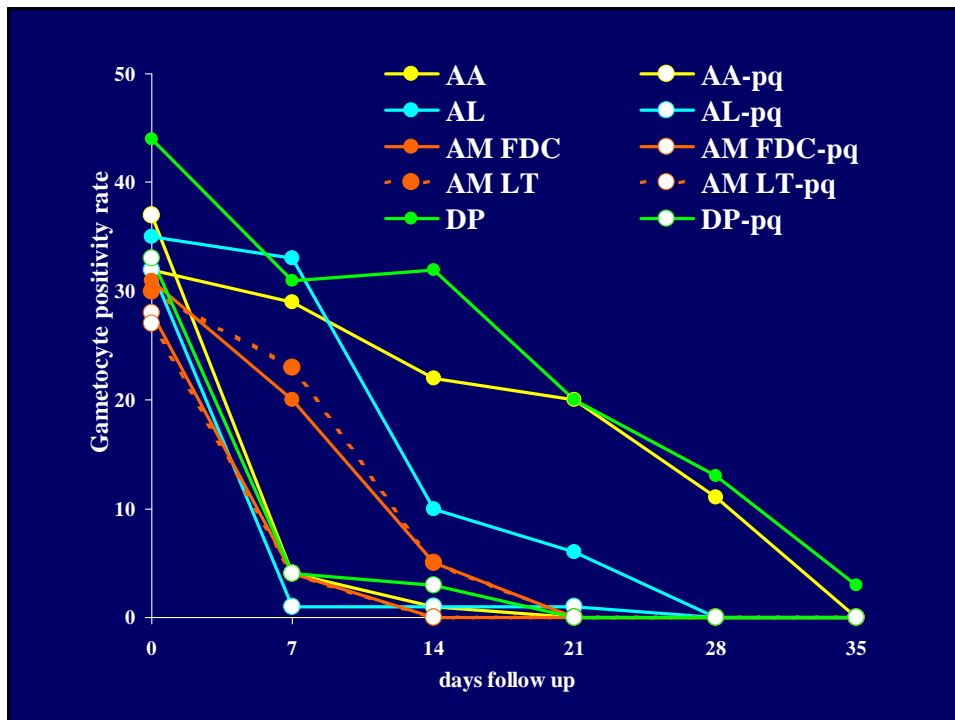


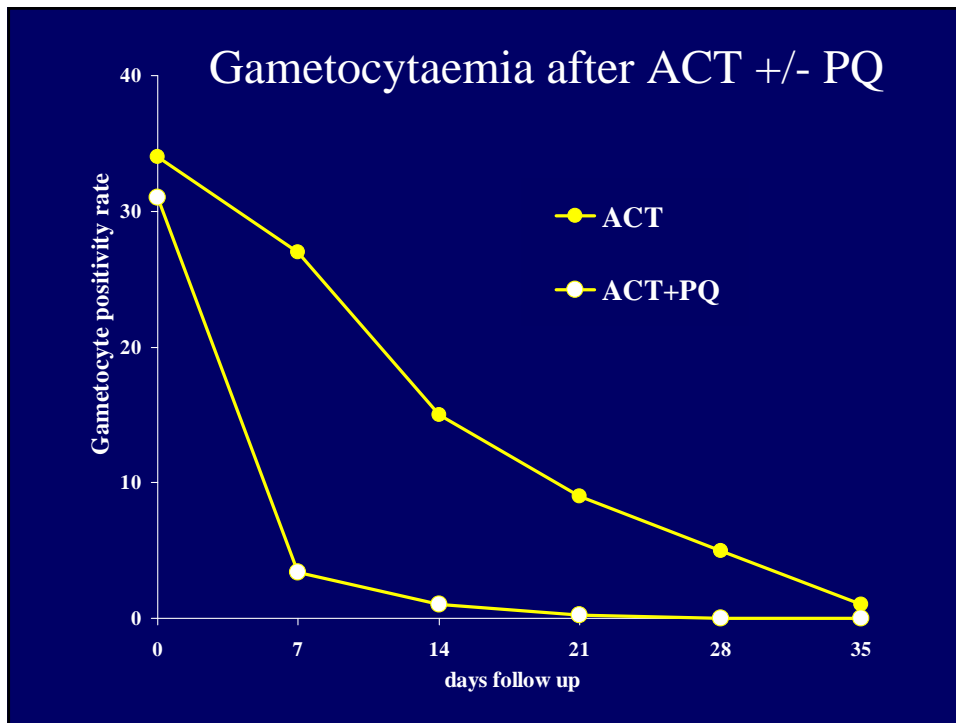


## Gametocytaemia after ACT's (no PQ)

	Episodes	Person time	Inc rate ratio *	95% CI	p-value
AM-FDC	21	718			
AA	66	699	3.2	2.0-5.6	0.0000
AL	41	704	2.0	1.1-3.5	0.005
AM-LT	23	664	1.2	0.6-2.2	0.29
DP	75	665	3.9	2.4-6.6	0.0000

\* Compared to AM-FDC





### Gametocytaemia after ACT with PQ and without PQ

	Episodes	Person time	Inc rate ratio	95% CI	p-value
<b>ACT + PQ</b>	<b>18</b>	<b>3279</b>			
<b>ACT</b>	<b>226</b>	<b>3450</b>	<b>11.9</b>	<b>7.4-20.5</b>	<b>0.0000</b>

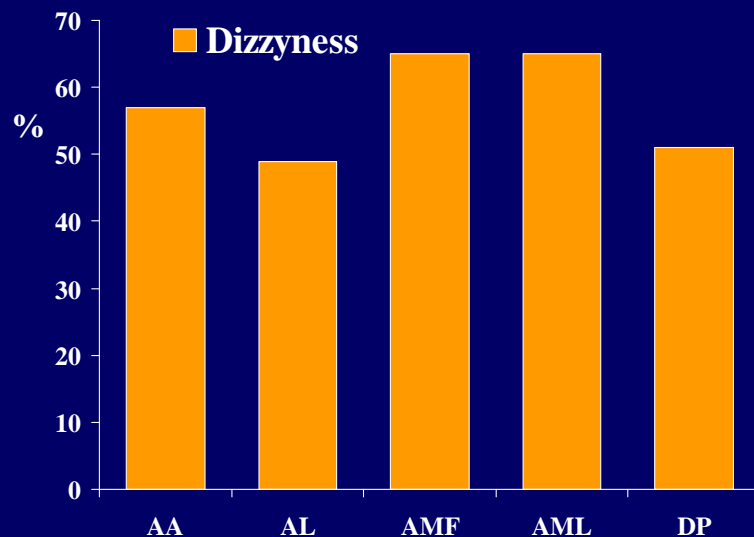
## Effect on gametocytes and transmission *person-gametocyte-weeks (PGW)*

1. The 5 treatment regimen had a similar PGW when primaquine was added. [average 12.2]
2. However, when primaquine was not added, the 5 regimen had significantly different PGW
  - AA 206
  - AL 127
  - AMF 66
  - AML 74
  - DP 239

## Side effects

## Artesunate + Mefloquine

- 1630 patients studied
- > 1 million patients treated with Artesunate and Mefloquine combination
- Never very severe side effect observed !?!
- Sometimes serious dizziness
- Sometimes repeated vomiting among children => other drugs



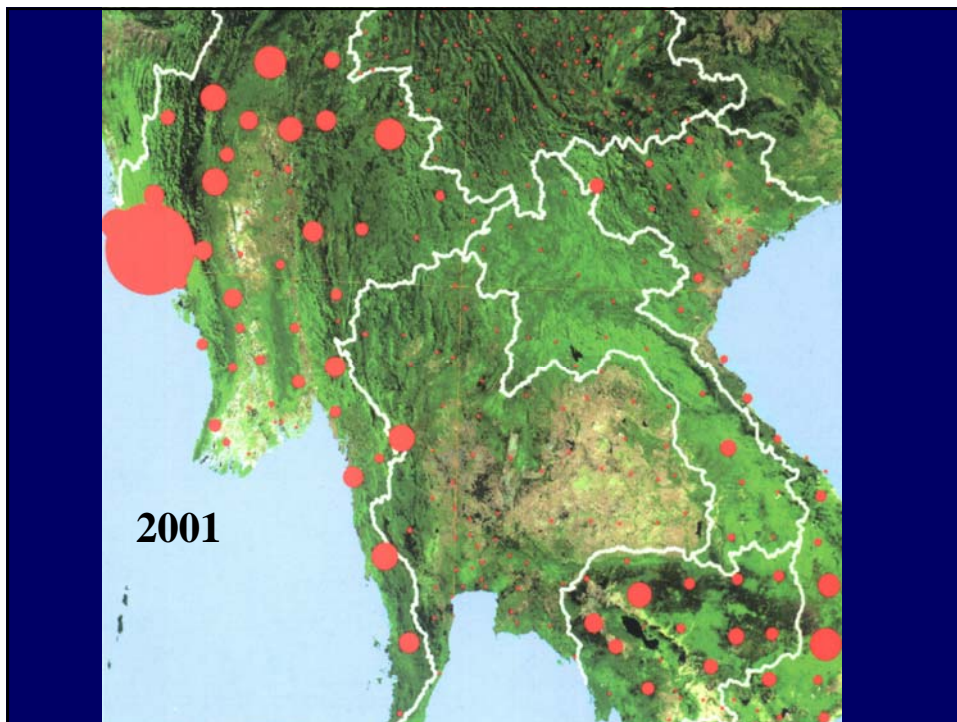
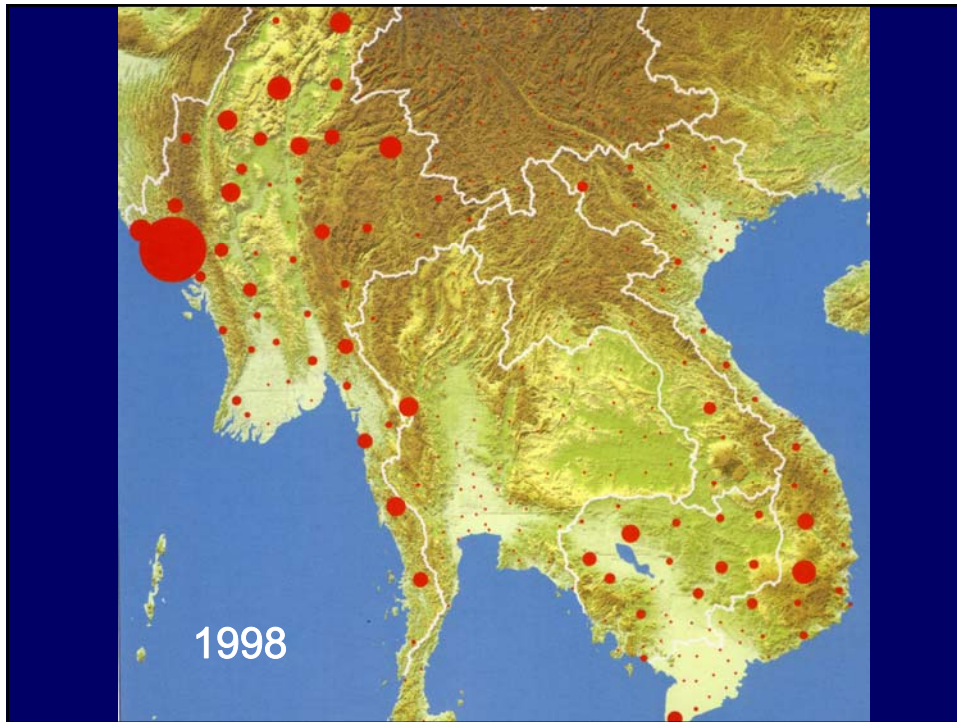
After AM more dizziness than after AL ( $p=0.004$ ) and DP ( $p=0.015$ )

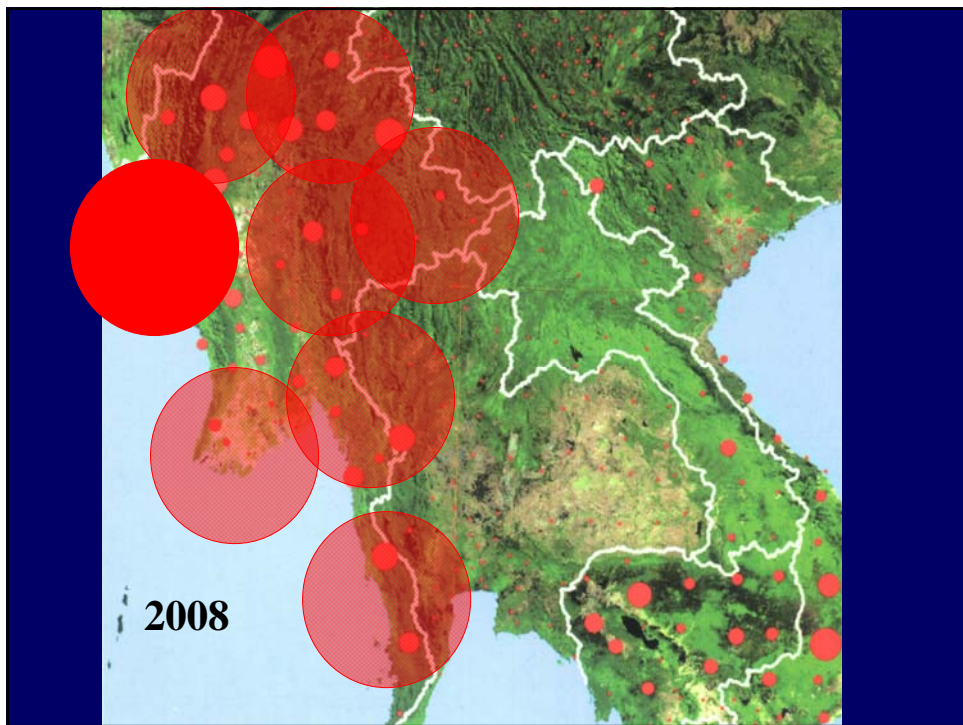
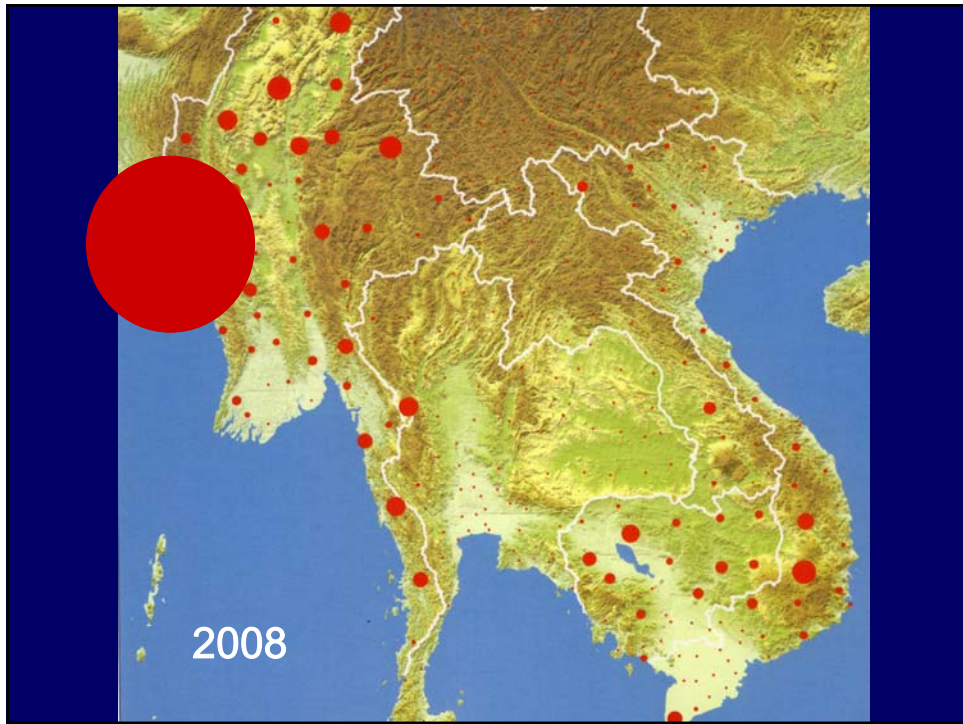
## Summary

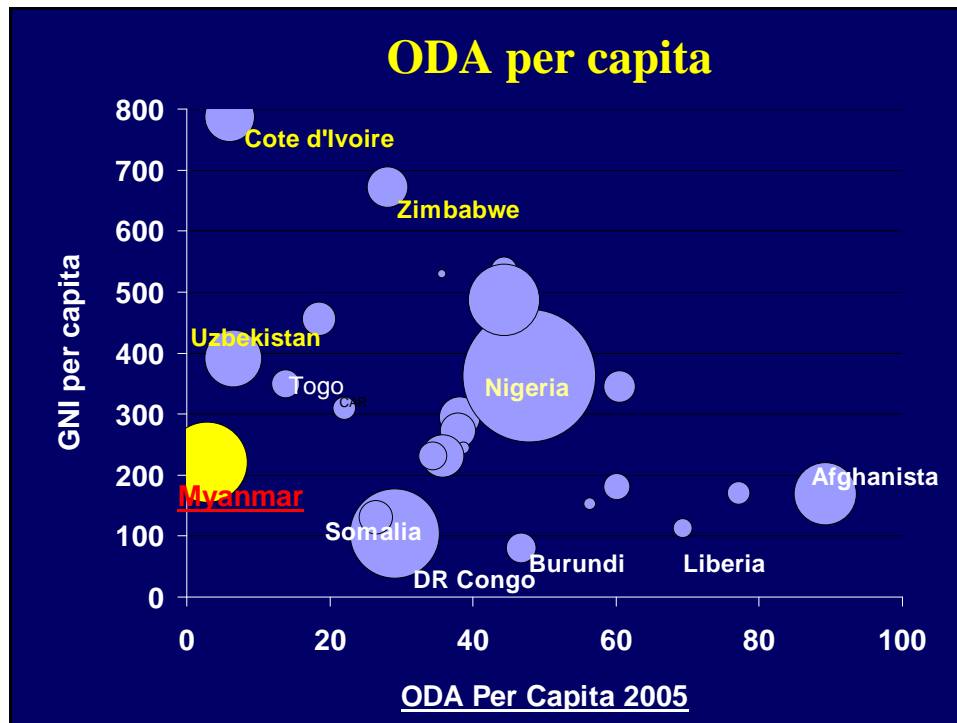
- **AM, DP and AL are effective for treatment uncompl. Falciparum malaria**
- **AM FDC had no recrudescence and**
  - Less new infections with P.falc
  - Least vivax after treatment
  - Less gametocytes after treatment
  - More dizziness .... but compliance seems OK
  - ..... AM is more expensive .....

## How to deal with artemisinin resistance in Myanmar

- **Use the most effective ACT available.**
- **At a large scale.**
- **Reduce transmission by adding PQ.**







## Needs

- It is possible to set up effective projects
- Health investment is too low.
- Myanmar people the lowest recipients of ODA.... for political reasons?
- Lobby groups 'anti-aid-to-Burma', Politicians / donors afraid
- Most malaria treatment is uncontrolled.
- Resistance to artemisinin.....



