

# Rolling out ACT in Bioko Island, Equatorial Guinea

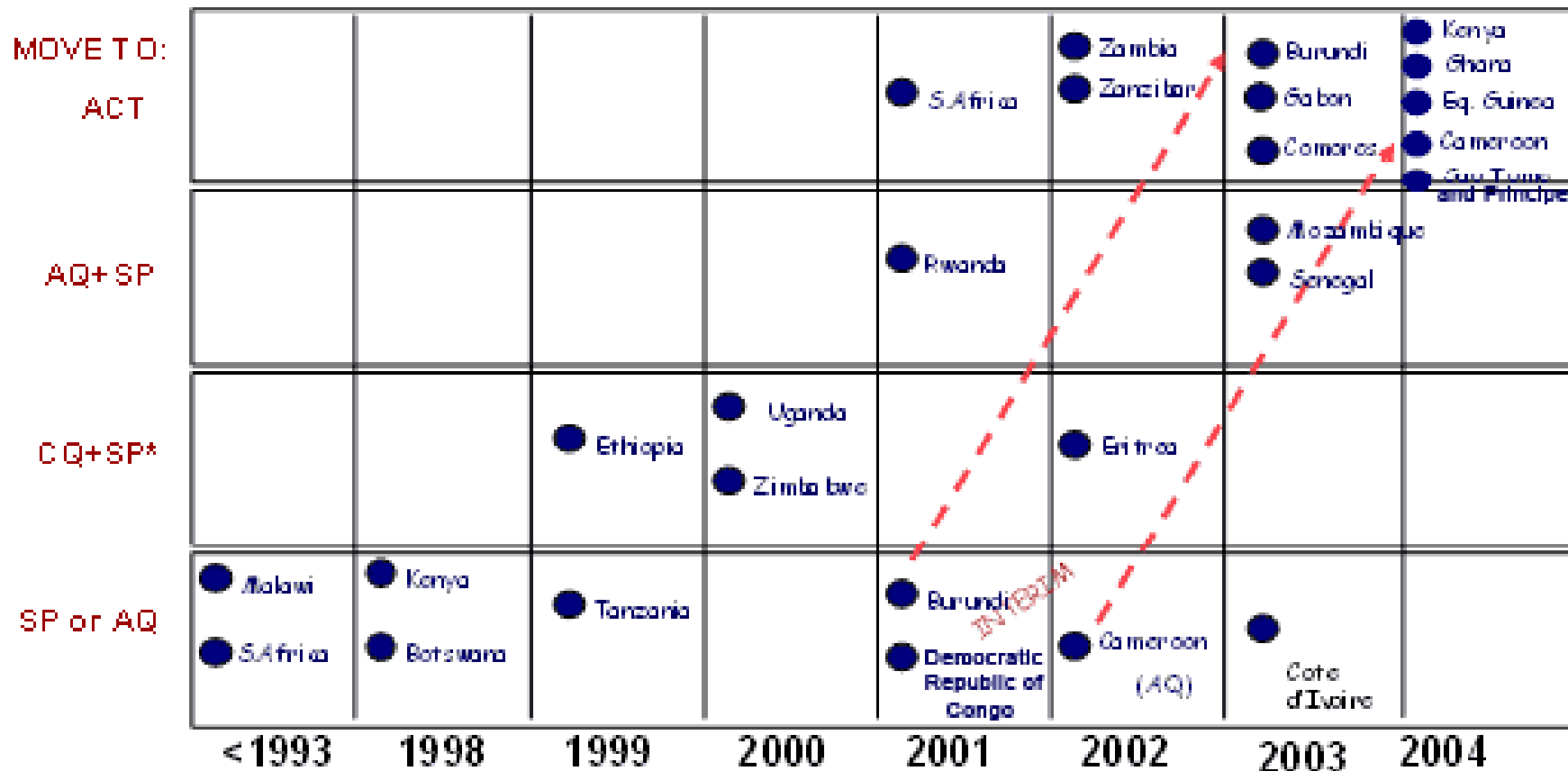
Luis Benavente, MD, MSc  
Spring CORE Meeting  
West Point, NY, April 2005



Bioko Island Malaria Control Project



# Countries moving to ACT in Africa (RBM data)



- Based on information available to WHO up to March 2004.
- Chloroquine (CQ); sulfadoxine/pyrimethamine (SP); amodiaquine (AQ); red arrows show the transition from an interim policy with SP to an ACT.
- \* Not recommended by WHO since 2001



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# Steps Recommended for ACT Rollout

- 1) Create an awareness that a change might be needed
- 2) Verify the data that trigger the concern
- 3) Present data in an appropriate language and format that is understood by policymakers
- 4) Advocate for change
- 5) Foster consensus-building among stakeholders that a change is required
- 6) Identify and assess policy options, and select the most appropriate
- 7) Agree on the replacement drug (s)
- 8) Agree on a time-line for change
- 9) Develop the policy document
- 10) Complete preparatory steps for implementation
- 11) Implement policy
- 12) Monitor and evaluate implementation
- 13) Plan for next policy cycle

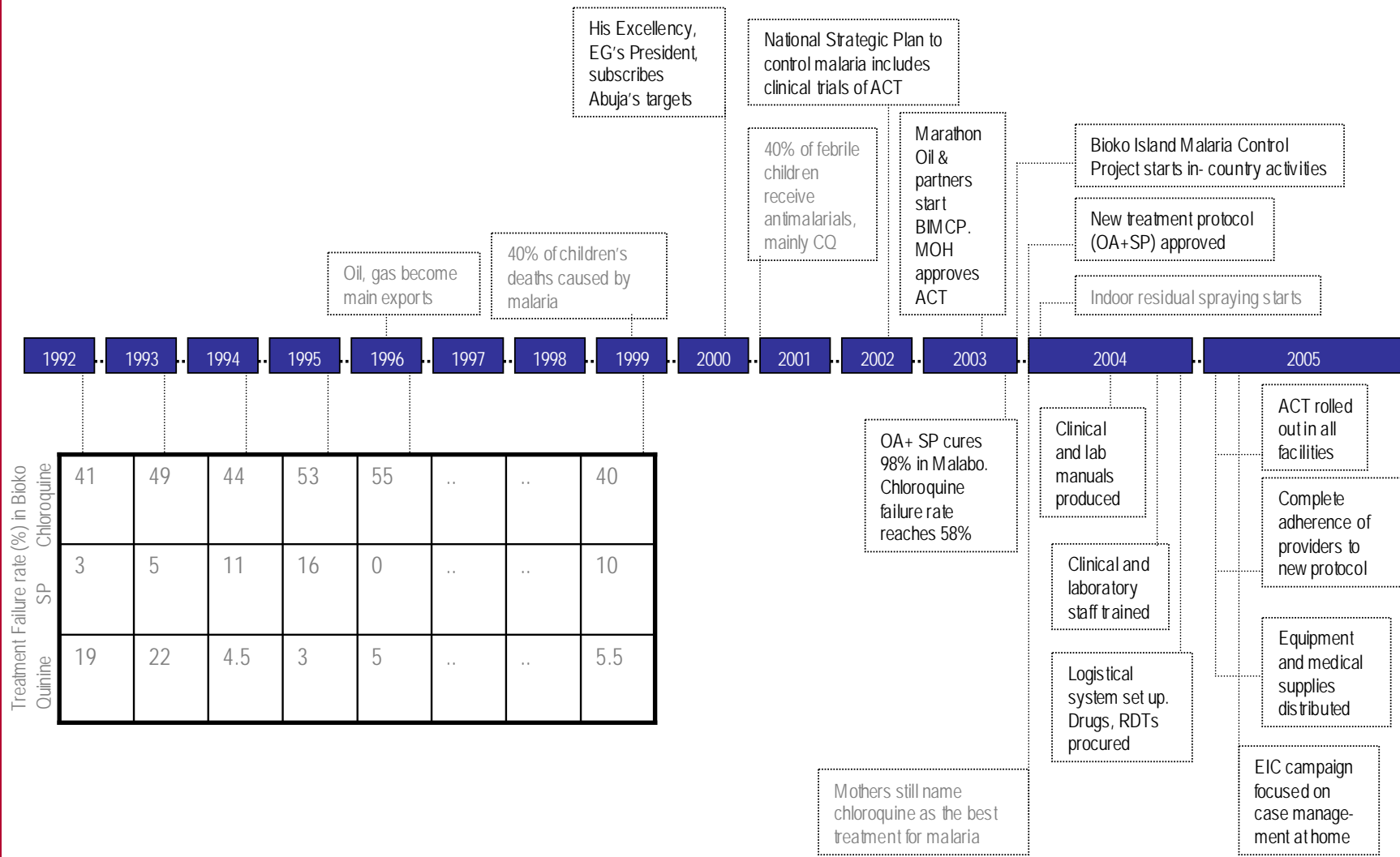
*Williams HA, Durheim D and Sharetta R: The process of changing national malaria treatment policy: lessons from country-level studies. Health Policy and Planning 19(6):365-70, 2004*



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# Bioko Island Malaria Control Project (BIMCP): Case Management Benchmarks as of April, 2005



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# Case Definition

## Criteria Used for Classifying Uncomplicated Malaria

Hospital or Health Center or Health Post		Community
History of fever OR fever	History of fever OR fever	History of fever OR fever
↓	↓	↓
No danger signs	No danger signs	No danger signs
↓	↓	↓
Laboratory test for malaria is positive	Laboratory test for malaria is negative	No laboratory test is available
↓	↓	↓
<b>Confirmed uncomplicated malaria</b>	<b>Probable uncomplicated malaria</b>	<b>Probable uncomplicated malaria</b>

\* If an obvious localized infection is present, the patient must be treated for malaria and the localized infection.

## Criteria Used for Classifying Severe/Complicated Malaria

Hospital or Health Center or Health Post		Community
History of fever OR fever	History of fever OR fever	History of fever OR fever
↓	↓	↓
Danger signs present*	Danger signs present*	Danger signs present*
↓	↓	↓
Laboratory test for malaria is positive**	Laboratory test for malaria is negative**	No laboratory test is available**
↓	↓	↓
<b>Confirmed complicated malaria</b>	<b>Probable complicated malaria</b>	<b>Probable complicated malaria</b>

\*Danger signs include: rapid breathing, coma, seizures, severe anemia, hypoglycemia, acidosis, renal failure/anuria, shock, pulmonary edema

\*\* If rapid breathing is present, classify as malaria plus pneumonia or very severe disease.



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# Criteria to Select Artesunate + SP

Table 6: Feasibility of WHO Recommended Combination Therapies (CT) in Bioko Island

Combination	Feasibility for use in Bioko Island
1. Oral artesunate (OA) + sulfadoxine/ pyrimethamine (SP)	Yes, provided that resistance to SP does not increase.
2. Artemeter/ Lumefantrine (Coartem)	Yes, provided that the pills are ingested with a fatty meal or milk.
3. Artesunate + Amodiaquine	No information available on sensitivity of malaria parasites in Bioko to amodiaquine.
4. Amodiaquine + sulfadoxine/ pyrimethamine (SP)	No information available on sensitivity of malaria parasites in Bioko to amodiaquine.
5. Artesunate + Mefloquine	No, this combination is for low transmission areas only.



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# Criteria to Select Artesunate + SP (2)

Table 7: Artesunate + SP vs. Coartem for use in Bioko Island

Criteria	Oral Artesunate + SP	Coartem
Duration of treatment (days)	3	3
Frequency of treatment (# times per day)	1	2
Dosage (example: adult 40 years and older)	9 pills OA 3 pills SP	24 pills
Efficacy	100%	95.5% - 97% (6 doses) 70% (4 of 6 doses)
Bioavailability	Well absorbed (OA: 80% or more)	Pills must be taken with a fatty meal or milk.
Special groups	OA + SP can be safely used to treat pregnant women (during 2 <sup>nd</sup> - 3 <sup>rd</sup> trimester)	No data on pregnant or lactating women, small children or subjects weighing more than 65 kg.
Contraindications	Allergy to sulfa	None
Side effects	A few fatal cases of Steven-Johnson syndrome reported with use of SP in Cameroon.	Extremely rare (one reported case of hemolytic anemia in the literature)
Restrictions for use	None	For use in accredited health facilities
Availability in Pharmacies on Bioko	Yes	No
Lead time for procurement	1- 2 weeks	4-6 months after being ordered.
Shelf life	Prolonged ( 3 years)	Reduced (18-24 months)
Cost per treatment in Malabo (1-year old)	\$0.73 (from Mission Pharma)	\$1.14 (purchased through WHO)



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# Treatment Schedules (Job Aid)

## Numero de pastillas en letra resaltada

Tratamiento del paludismo no complicado				Primeros tres días (Tratamiento de Combinacion) o primeros 7 días (quinina)						
Peso (Kg)	Edad	Tratamiento		Quinina (200mg)	Paracetamol* 500 mg o 120/5ml	Trat. de combinacion (días 1-3)				
						SP-día 1	AO-día 1	AO-día 2	AO-día 3	
Menores de 15a		1era eleccion	2da eleccion							
Rojo	5-6	<4 meses	quinina	AO +SP	1/4 cada 8hs por /d (6)	1/4 tab c/ 8hs (1)	1/2	1	1	1
Naranja	7-10	4-11 meses	quinina	AO +SP	1/3 cada 8 s por /d (7)	1/4 tab/ 8hs (1)	3/4	1	1	1
Amarillo	11-14	1-2 años	AO+ SP		1/2 cada 8hs (2)	1	1 1/2	1 1/2	1 1/2	
Verde	15-18	3-4 años	AO+ SP		1/2 cada 8hs (2)	1 1/4	2	2	2	
Azul	19-29	5-9 años	AO+ SP		1 cada 8hs (3)	1 1/2	2	2	2	
Violeta	30-39	10-11 años	AO+ SP		1 cada 8hs (4 1/5)	1 3/4	3	3	3	
Marron	40-49	12-14 años	AO+ SP		2 cada 8hs (6)	2	4	4	4	
Gestantes febriles		1er trimestre	2-3 trimestre							
Gris	50-59	?15 años	quinina	AO +SP	9* / días (63)	2 cada 8hs (6)	3	5	5	5
Negro	60+	?15 años	quinina	AO +SP	10.5*7días (77)	2 cada 8hs (6)	3	6	6	6

\* asume se repite hasta 3 veces por dia si no baja la fiebre

\*\* AO de 50 mg

Si esta usando quinina, ignore las columnas referentes a tratamiento de combinacion

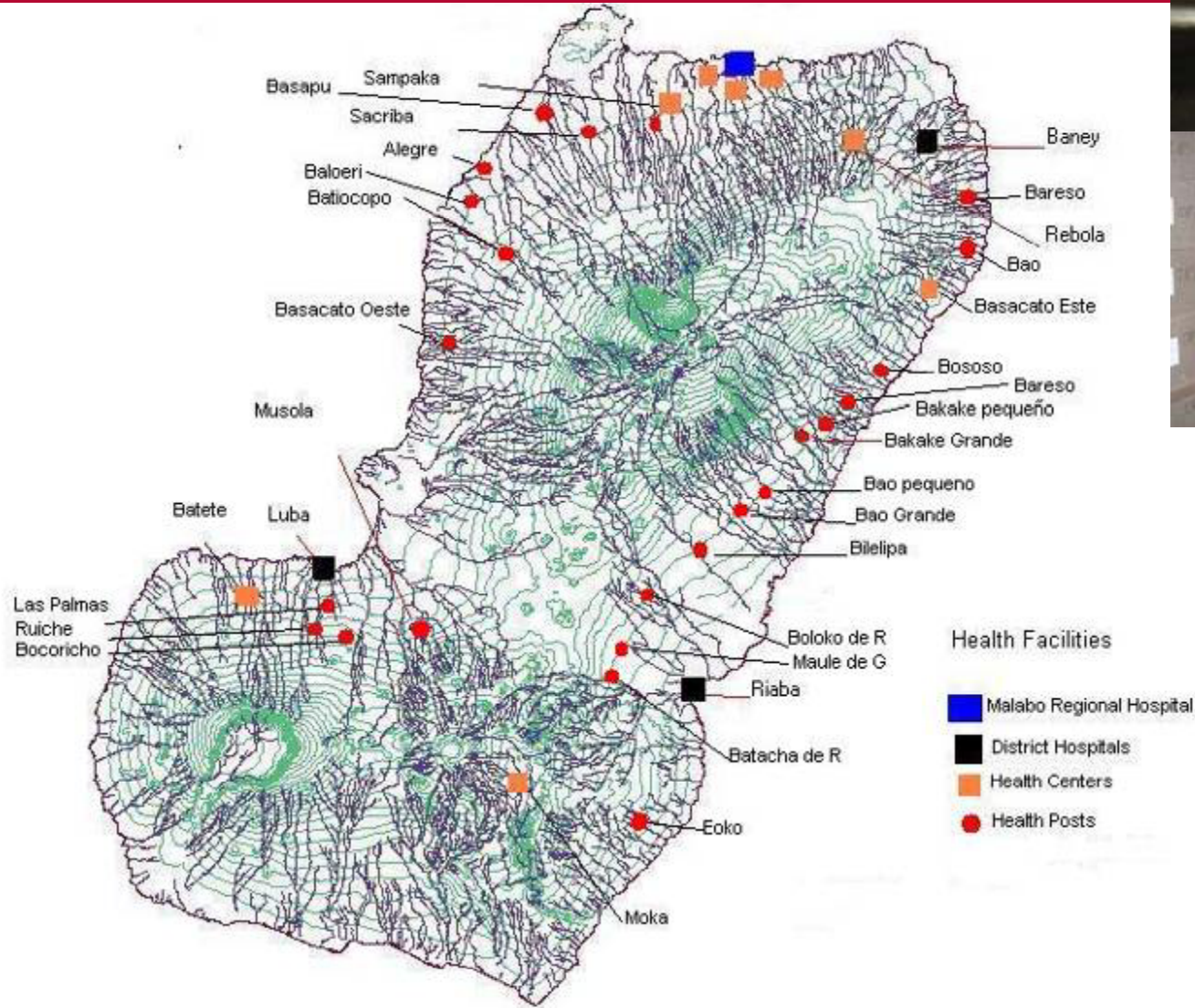
Si esta usando tratamiento de combinacion, ignore la columna referente al tratamiento con quinina



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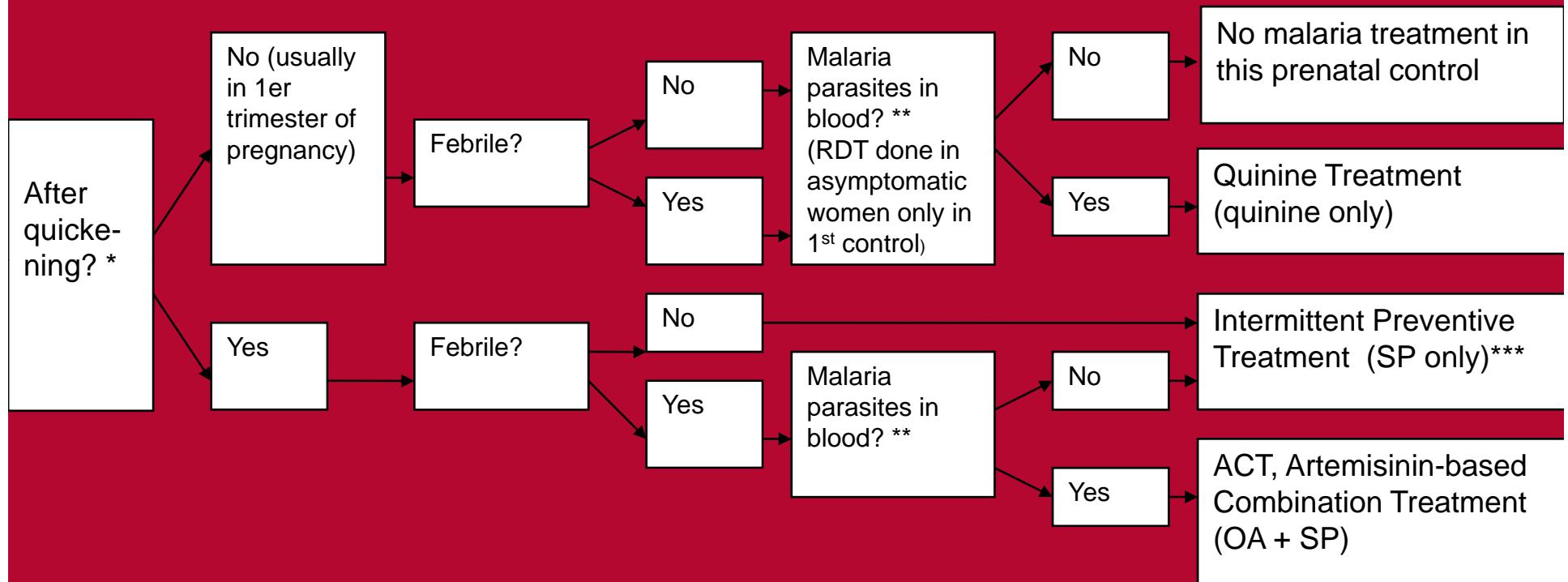
# Logistics



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# Intermittent Preventive Treatment



\* quickening is defined as the first time fetal movements are perceived by the mother

\*\* as determined by RDTs or thick blood smear.

\*\*\* 2-3 doses during the pregnancy (minimum=2), with an interval not shorter than 1 month

Pregnant women with severe anemia receive malaria treatment regardless of the result of thick blood smear or RDT.

All pregnant women found with anemia receive therapeutic doses of iron + folate supplements.



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# Reminder Materials Given to Patients

Tratamiento (quinina) para gestantes con paludismo, primeros tres meses de embarazo

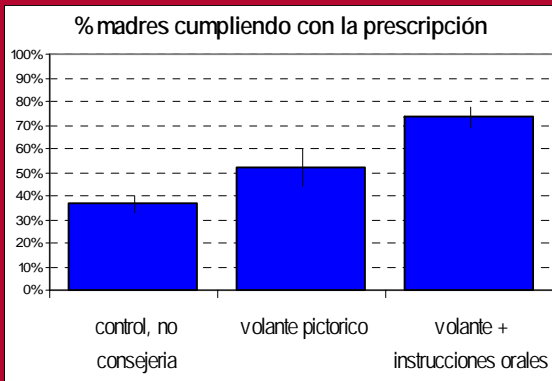
	Día de tratamiento						
	DIA 1	DIA 2	DIA 3	DIA 4	DIA 5	DIA 6	DIA 7
<b>Quinina (300 mg) dos pastillas tres veces al día</b>	☀️ • 🌙 ⌚ ⌚ ⌚	☀️ • 🌙 ⌚ ⌚ ⌚	☀️ • 🌙 ⌚ ⌚ ⌚	☀️ • 🌙 ⌚ ⌚ ⌚	☀️ • 🌙 ⌚ ⌚ ⌚	☀️ • 🌙 ⌚ ⌚ ⌚	☀️ • 🌙 ⌚ ⌚ ⌚
<b>Medicina para la fiebre, Paracetamol (500 mg), dos pastillas juntas</b>	⌚ ⌚ Repita hasta 3 veces/ día si no cae la fiebre	⌚ ⌚ Repita hasta 3 veces/ día si no cae la fiebre	Si no cae la fiebre tras los dos días, regrese al establecimiento de salud.				
<b>Otra (s) Medicina(s)</b>							

Evite la muerte por paludismo! Inicie el tratamiento el día que empieza la fiebre y tome todas las pastillas de quinina. Aunque caiga la fiebre antes, tome quinina los siete días.



Proyecto Control del Paludismo en Bioco

Después del día 7 de tratamiento de la vuelta a esta página



Bioko Island Malaria Control Project



# Quality Assurance of Repackaged ACT

Table 8a: Bioko Island malaria Control Project. Quality assurance of repackaged malaria medication (artemisinin-based combination therapy) using Lot Quality Assurance Sampling (LOAS)

Lot number....	Supervisors' initials (date of packaging) ↓  Color →	Number of bags containing the correct amount of pills in that color and lot					Decision Rule	Total number of bags with the correct content	Sample, number of bags inspected in that color and lot					Total simple in this lot	Percent of bags correct in that lot (%)
		Red	Orange	Yellow	Green	Blue			Red	Orange	Yellow	Green	Blue		
Sulfadoxine-pyrimethamine															
1	DN& ** (Feb-Mar 05)	12	12	12	12	12	11	60	12	12	12	12	12	60	100
Artesunate															
1	DN& ** (Feb-Mar 05)	12	12	12	12	12	11	60	12	12	12	12	12	60	100
Paracetamol															
1	DN& ** (Feb-Mar 05)	12	12	12	12	12	11	60	12	12	12	12	12	60	100

Table 8b: Bioko Island malaria Control Project. Quality assurance of repackaged malaria medication (artemisinin-based combination therapy) using Lot Quality Assurance Sampling (LOAS)

Lot number....	Supervisors' initials (date of packaging) ↓  Color →	Number of bags containing the correct amount of pills in that color and lot					Decision Rule	Total number of bags with the correct content	Sample, number of bags inspected in that color and lot					Total simple in this lot	Percent of bags correct in that lot (%)
		Violet	Brown	Grey	Black				Violet	Brown	Grey	Black			
Sulfadoxine-pyrimethamine															
1	DN& ** (Feb-Mar 05)	12	12	12	12		11	48	12	12	12	12		48	100
Artesunate															
1	DN& ** (Feb-Mar 05)	12	12	12	12		11	48	12	12	12	12		48	100
Paracetamol															
1	DN& ** (Feb-Mar 05)	12	12	12	12		11	48	12	12	12	12		48	100



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# Quality Assurance: RDT vs. PCR

Of the 153 samples tested, 103 were positive for *P. falciparum*, an estimated prevalence rate of 67%.

		PCR result	
		Neg	Pos
RDT result	Neg	46	21
	Pos	5	82

- Sensitivity = 80%  
[95% CI 71% to 87%]
- Specificity = 90 %  
[95% CI 79% to 97%]
- Positive Predictive Value = 94%
- Negative Predictive value = 69%



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# Quality Assurance: Microscopy vs. PCR

Of the 153 samples tested, 52 were positive for *P. falciparum* in microscopy (66%)

		PCR result	
		Neg	Pos
Microscopy result	Neg	24	28
	Pos	26	75

- Sensitivity = 72.8%  
[95% CI 63% to 81%]
- Specificity = 48 %  
[95% CI 34% to 63%]
- Positive Predictive Value = 74%
- Negative Predictive value = 46%



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# Medical Supplies Distributed

	Hospitals	Health Centers *
Equipment	Microscopes (3) Hemocue photometer for hemoglobin (5) Hemocue photometer for glucose (4) Pediatric and adult scale, when needed Pediatric and adult blood pressure cuffs and stethoscopes	Pediatric and adult scale, when needed Pediatric and adult blood pressure cuffs and stethoscopes
Laboratory/diagnostic supplies	Supplies for hemoglobin photometers Supplies for glucose photometers Rapid Diagnostic tests Reagents (Giemsa) and glassware	Rapid Diagnostic tests WHO's Hemoglobin Color Scale
Malaria Drugs	Artesunate, SP, oral quinine, IV quinine, artemether	Artesunate, SP, oral quinine
IMCI drugs	Paracetamol, iron/folate supplements, oral rehydration salts, vitamin A, mebendazole	Paracetamol, iron/folate supplements, oral rehydration salts, vitamin A, mebendazole
Med. supplies	5% glucose solution, syringes, EV tubes, digital thermometers	Digital thermometers
Medical records	Out patient, in patient records	Outpatient records
Other supplies	..	Cabinets to store ACT safely
Manuals distributed	Management of uncomplicated malaria, management of severe malaria, laboratory manual, IPT manual, logistics manual	Management of uncomplicated malaria, management of severe malaria, laboratory manual, IPT manual, logistics manual

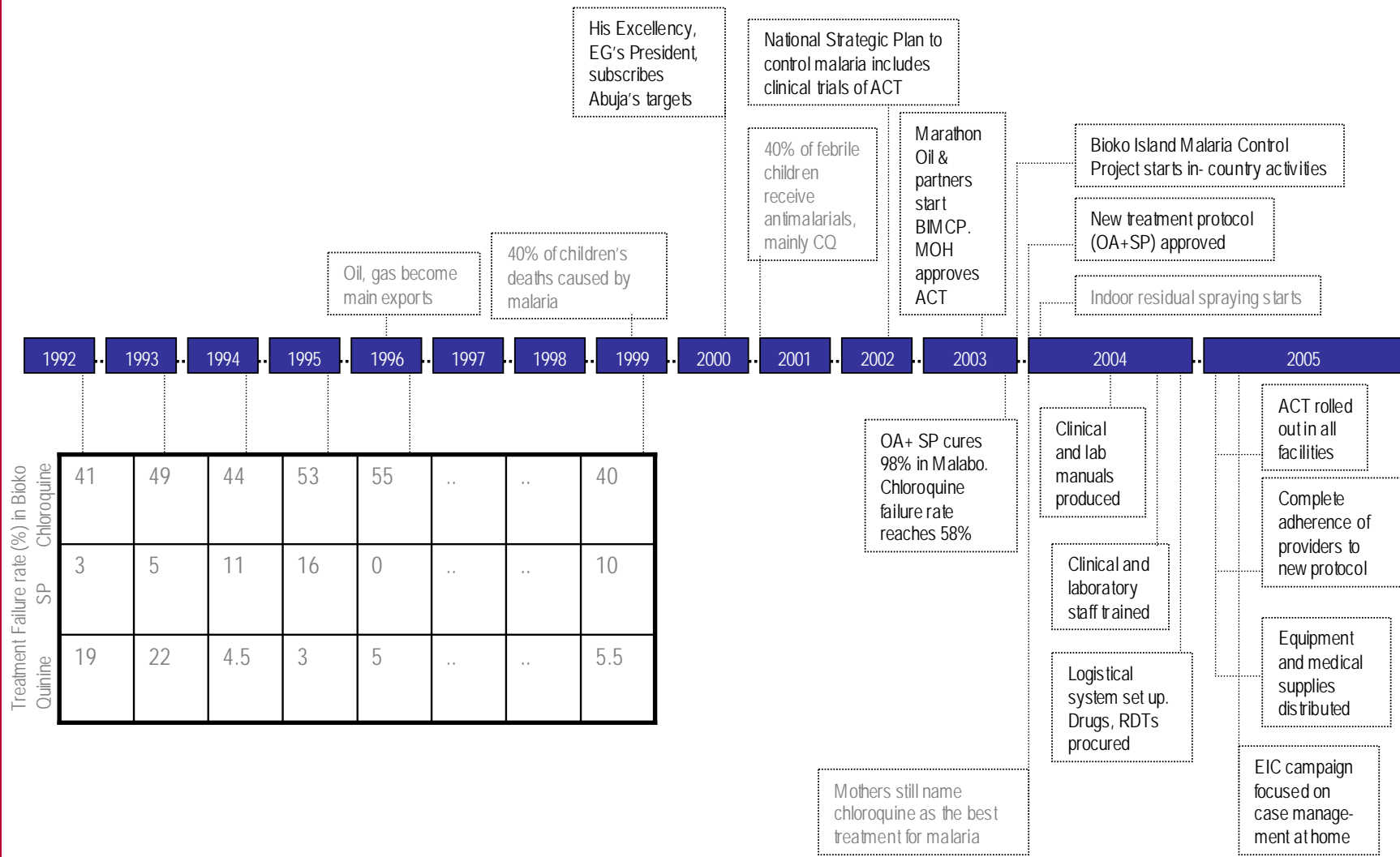


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# Bioko Island Malaria Control Project (BIMCP): Case Management Benchmarks as of April, 2005



Bioko Island Malaria Control Project



# Supervision Checklist

Variable	Num e rator	Denomina tor	%
Asked the age of the child	77	79	97
Asked for symptoms*	76	79	96
Asked for duration of illness	75	79	95
Asked for previous treatments	61	79	77
Weighted the child	71	79	90
Measured temperature of the child	74	79	94
Danger signs**:			
Asked about vomiting	47	79	49
- Asked about seizures	24	79	30
- Asked about fast breathing	33	79	42
- Asked about inability to eat/drink	37	79	47
- Asked about somnolence	24	79	30
- Asked for 3 or more danger signs	33	79	42
Physical exam***:			
Explored for fast breathing	28	79	35
- Explored dehydration signs	25	79	45
- Explored stiff neck	17	79	22
- Probed for lethargy	15	79	19
- Explored for 2 or more danger signs	29	79	37



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# Supervision Checklist (2)

RDT: performed a rapid test (others had a thick blood sm)	57	79	72
- Made it right	57	57	100
- Interpreted RDT result correctly	57	57	100
Anemia: tested for anemia (Hemocue or WHO color scale)	73	79	91
Classification & recording: malaria case classified correctly	77	79	97
- Other diagnosis (i.e. anemia) classified correctly	72	79	91
- Case registered completely and correctly	46	79	82
Treatment: prescribed quinine or ACT	76	79	96
- Given the correct dose (color code)	74	79	94
- Given the right fever medication (no aspirine or novalg)	73	79	92
Counseling: Informed about the diagnosis	70	79	89
- Counseled on number of doses, given a flyer	71	79	90
- Counseled about danger**** signs (3 or more)	30	79	38
- Told when to return	69	79	87
- Counseled about fluids	64	78	82
- Counseled about feeding	61	79	77
- Warned against irrational/unnecessary treatment*****	64	79	81
- Probed to verify understanding of advice/messages	50	79	63
Other criteria (IMCI guidelines): Vaccination card revised	1	79	1



Bioko Island Malaria Control Project



# Diagnostic-case and Treatment-case Indexes

Health Facility		Thick Blood Smears		Rapid Diagnostic tests		Malaria Cases	Diagnostic-Case	Treatment-s	Treatment-Case
		Done	Positive	Done	Positive				
1	Campo Yaounde (HC)	13	4	150	24	52	3.1	21	0.4
2	Madre Bisila (HC)	0	0	75	7	35	2.1	35	1.0
3	Ela Nguema (HC)	0	0	95	13	5	19.0	81	16.2
4	Sampaka (HC)	183	140	100	48	106	2.7	94	0.9
5	Baney (Hospital)			5	2	58	0.1	4	0.1
6	Rebola (HC)	0	0	55	9	11	5.0	15	1.4
7	Riaba (Hospital)	0	0	10	6	10	1.0	14	1.4
8	Luba (Hospital)	71	33	33	17	26	4.0	26	1.0
9	Batete (HP)	0	0	13	1	5	2.6	6	1.2
10	Malabo Regional Hospital	100	77	0	0	90	1.1	296	3.3
	Total	367	254	536	127	398	2.3	592	1.5



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# Exit Interviews with Caretakers

	Nume	Denomin	%
The patient came to the health facility because of fever, malaria suspected	84	84	100
Before coming to the facility, sought help elsewhere	11	85	13
A blood sample was drawn to diagnose malaria	82	85	96
Provider explained the diagnosis	57	85	67
Patient was given a bag containing malaria treatment	78	85	92
Color code of that bag is consistent with the patient's weight (or age)	...	...	..
Patient or caretaker was given a flyer about malaria treatment	64	85	75
Patient/caretaker can say how many days the treatment should last (days)			
Patient/caretaker can say what treatment was prescribed		60	
Besides malaria and fever medication, the patient was prescribed other drugs	54	85	64
Provider explained how to take those medicines	72	85	85
Provider counseled patient/caretaker about increased fluids during illness	59	85	69
Provider counseled about diet during illness	57	85	67
Provider told patient/caretaker when to return to health facility	62	85	73
Provider counseled on danger signs	22	85	26
Number of danger signs recalled by the mother			
CFA paid for clinic (visit) fee (zero=nothing)			
CFA paid for laboratory analysis (zero=nothing)			
CFA paid for drugs			
Satisfied with waiting time	75	85	88
Satisfied with services provided	82	85	96
Caretaker considers their problems were solved	83	85	98
Would return if case has malaria again	84	85	99



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# Poster Promoting ACT



Menos de  
4 meses

Entre 4 y  
11 meses

1 a 2  
años

3 a 4  
años

5 a 9  
años

10 a 11  
años

12 a 14  
años

Gestante  
60 Kg o-

Gestante  
60 + Kg

# Este arcoiris nos salva del paludismo

El nuevo tratamiento tiene una dosis para cada edad.  
Inicia el tratamiento el día que empieza la fiebre.  
Toma todas las pastillas que te receten.

Proyecto Control del Paludismo en Bioko, Guinea Ecuatorial

Diseño gráfico: Dr. Luis Benavente (MCDI)



Bioko Island Malaria Control Project



# Poster Promoting Early Careseeking



**Porque te  
quiero, te  
cuido...**

Proyecto Control del Paludismo en Bioko, Guinea Ecuatorial

...y te llevo al  
centro de salud  
el mismo dia que  
empiezas a tener  
fiebre...

...y te doy toda tu  
medicina si es  
paludismo...

...y te llevo al  
hospital si asi lo  
indica el médico

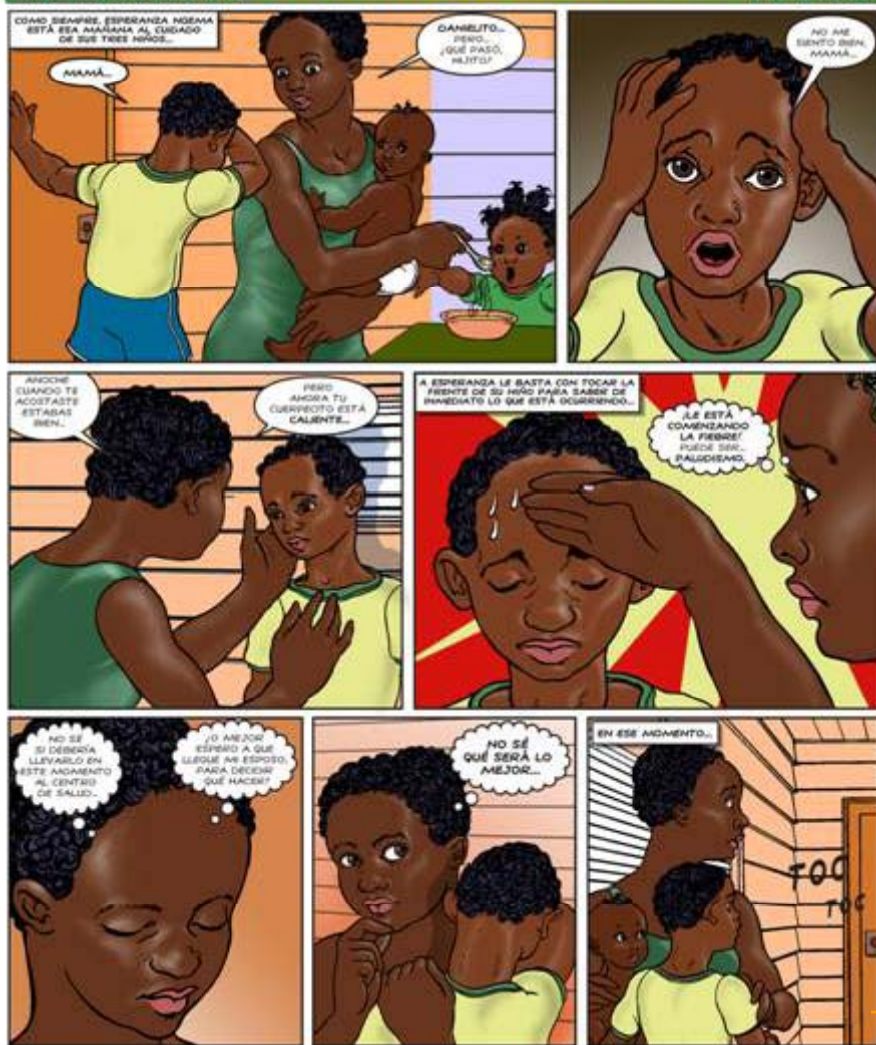


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# ESPERANZA NO ESPERA

ILUSTRACIONES: MARGARITA REYNOLDS



Sorteo próximo: Exhibe esta página en un lugar visible de tu casa y gana un premio!

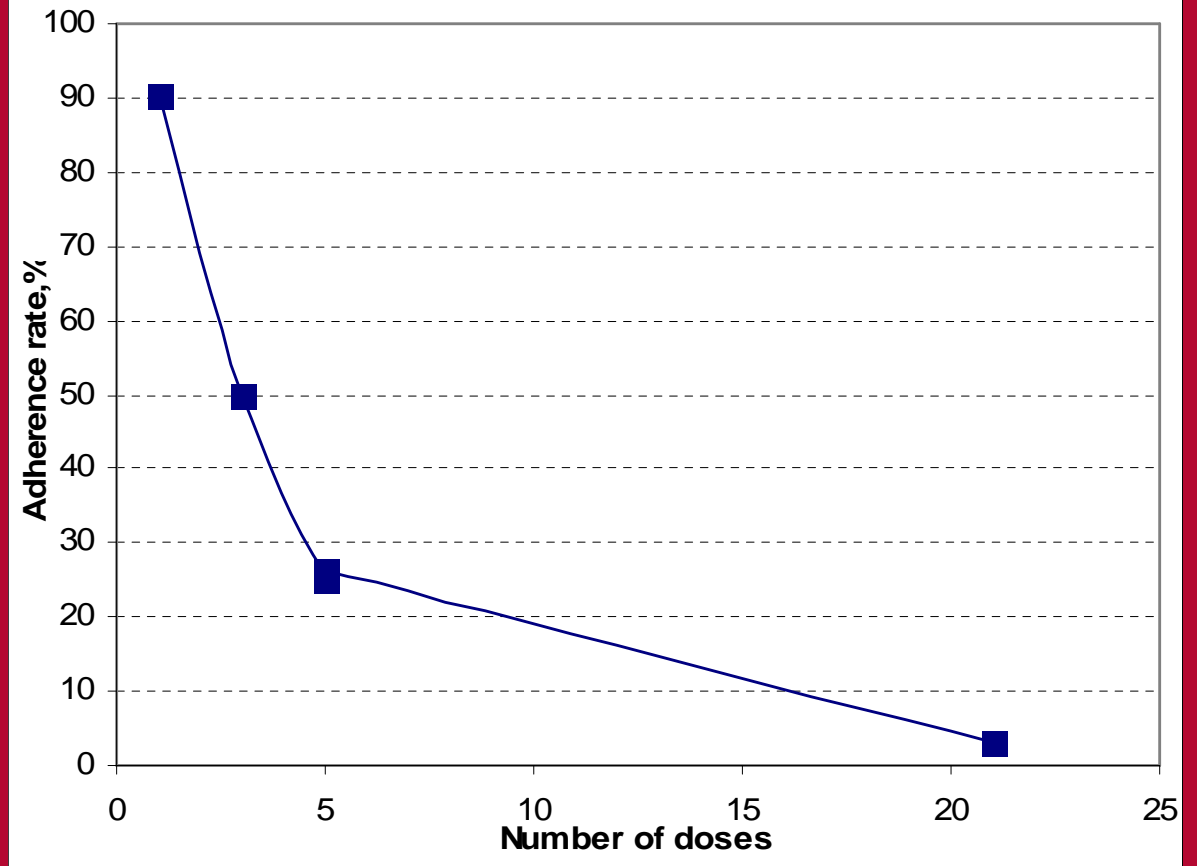


El Proyecto Control del Paludismo en Bioco celebra el Día Africano del Paludismo 25 de Abril, 2005



# Adherence to Treatment

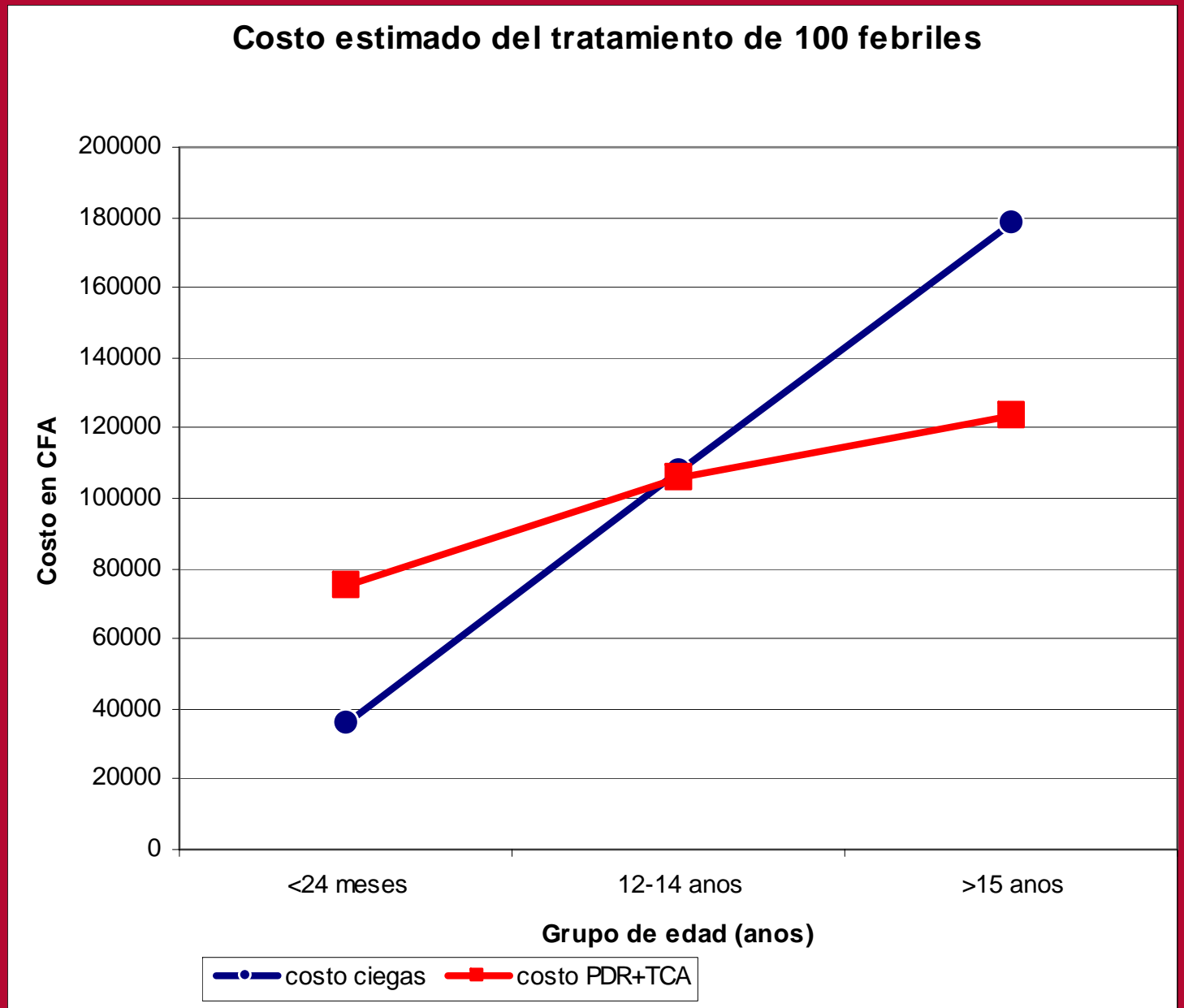
Fig.6: Adherence to antimalarial treatments in Bioko by duration of treatment



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# Costs



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