

Bioko Island Malaria Control Project (BIMCP)

Improvement in
hemoglobin concentration
one year after starting
indoor residual spraying
on Bioko Island, Equatorial
Guinea

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Program strategies

- (1) Vector control through indoor residual spraying or IRS (spraying the walls of all structures with an clear, odorless and relatively safe insecticide that kills the mosquitoes that come to rest there at night);
- (2) Improved case management (diagnosis and treatment with a combination of new and much more effective front-line drugs);
- (3) Monitoring and evaluation (to ensure that the BIMCP is being effective and to ultimately isolate and eradicate any local re-emergence of malaria on the island in the years to come);
- (4) Information, Education and Communications (a strategy to ensure full community participation in the IRS activity and to promote improved prevention and treatment practices); and
- (5) Capacity building so that the new malaria control activities can be taken over by the Government of Equatorial Guinea and sustained in the future to ensure that malaria never re-emerges as a major health threat on the island.

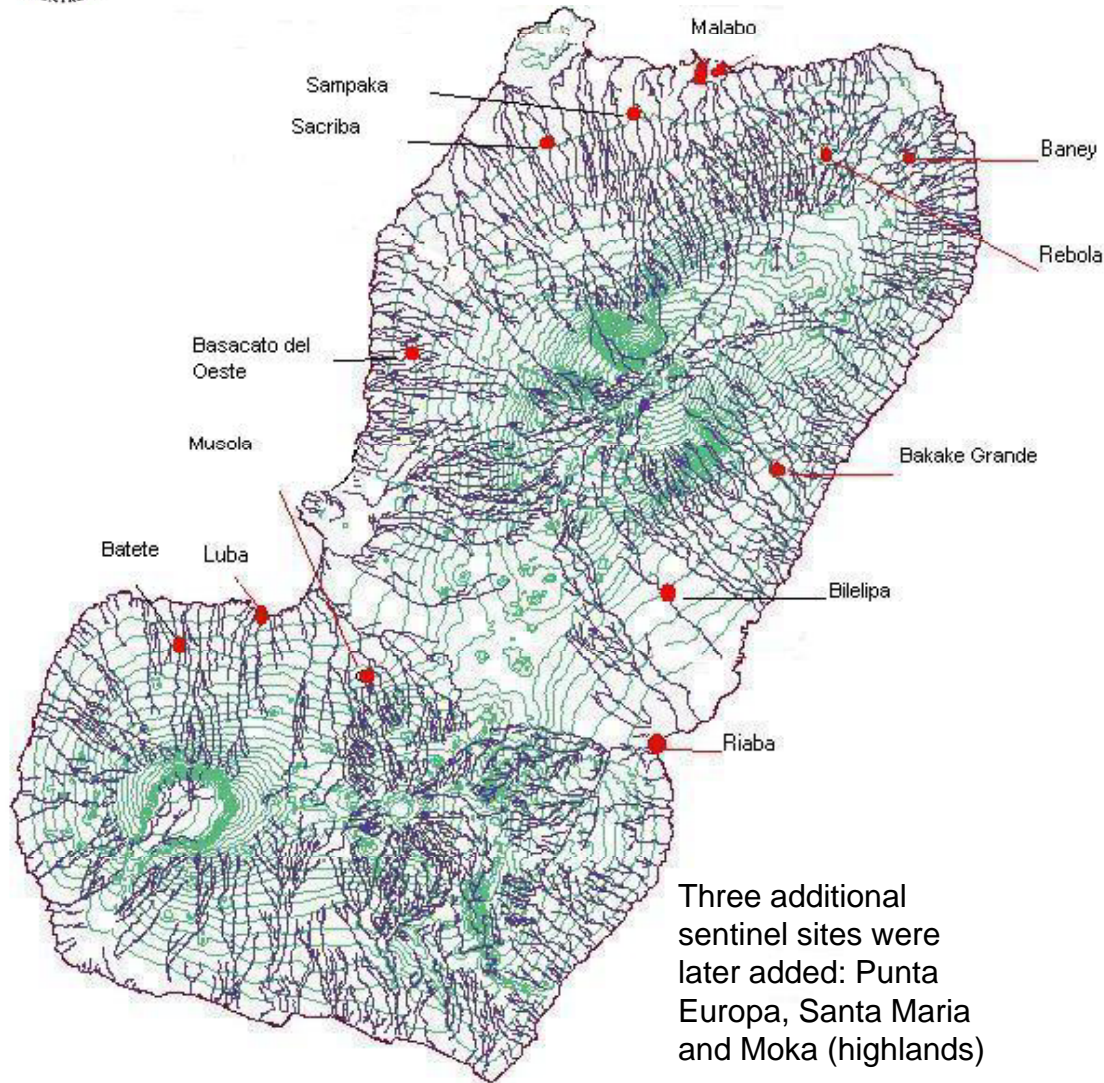


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Monitoring and evaluation



Parasitemia/ anemia and mini-KPC surveys are conducted annually in 15 sentinel sites (red dots).

Target groups: children <15y and pregnant women (data not shown for the later)

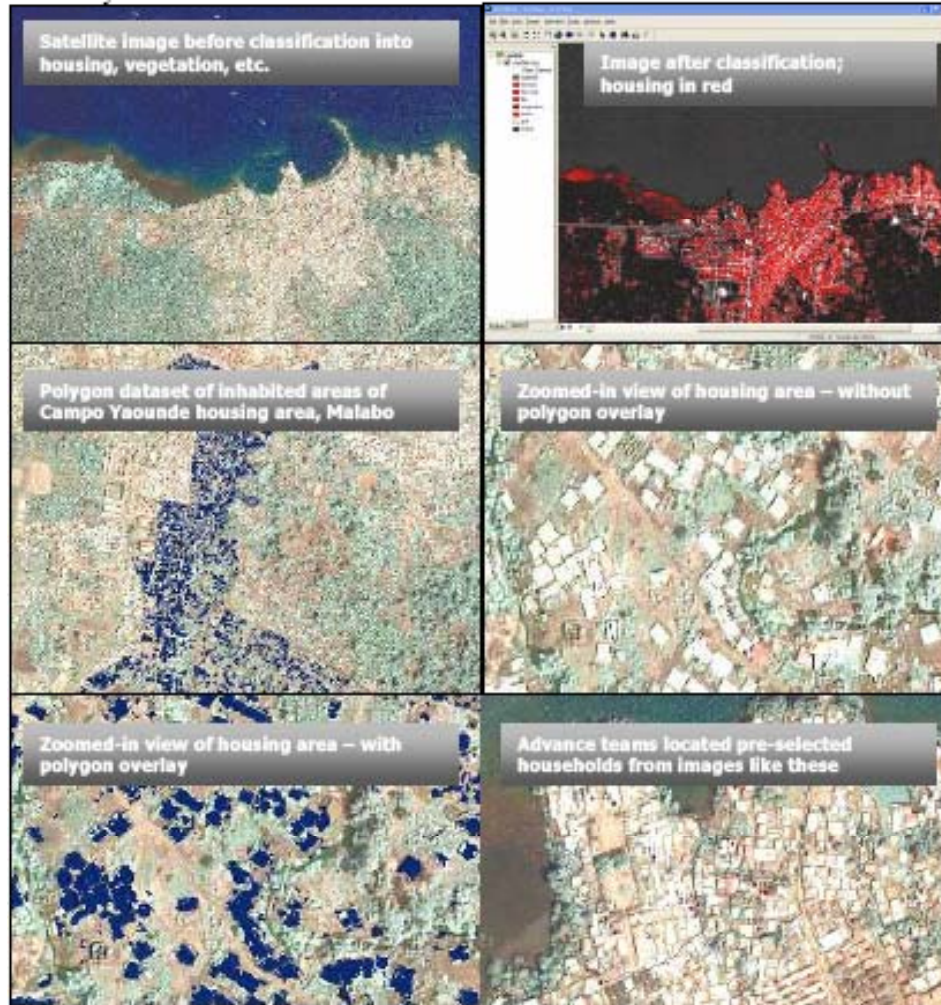


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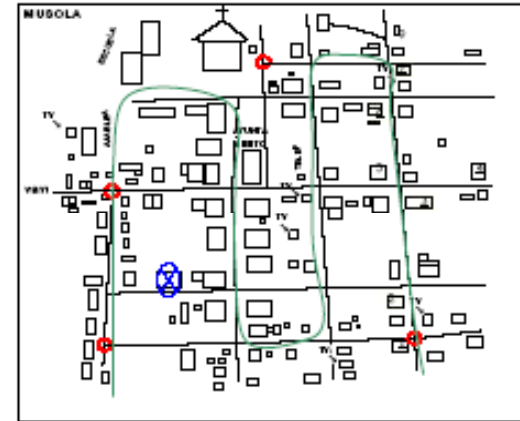




House selection for surveys



urban



rural

Total sample size:

2004: 2232 children

2005: 2662 children

Sample size calculated to show changes in prevalence at sentinel site level



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Cutoffs, hemoglobin (g/dL)

Elevation above sea level

Lowlands, < 1000 meter Highlands 1300+m

Non anemic:	≥ 11 (children 12-59mo);	≥ 11.4
	≥11.5 (children 5-11y);	≥ 11.9
	≥ 12 (children 12-14y)	≥ 12.4



Mild-moderate anemia	<cut-off, > 7.9
Marked anemia	6 – 7.9
Severe anemia	<6
Critical	<4



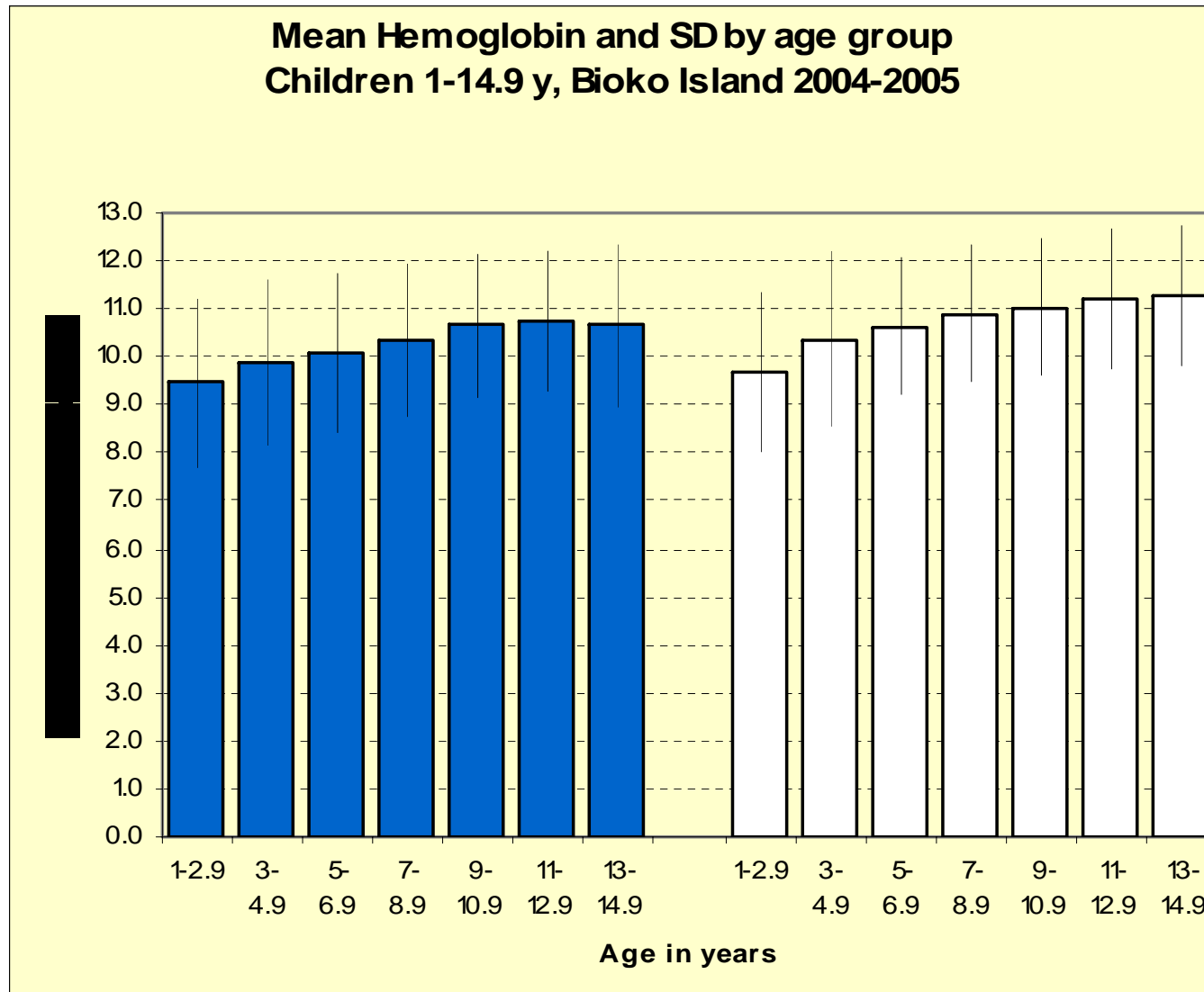
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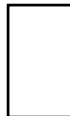




Mean Hemoglobin Concentration

Mean Hemoglobin and SD by age group
Children 1-14.9 y, Bioko Island 2004-2005



 = 2004
 = 2005

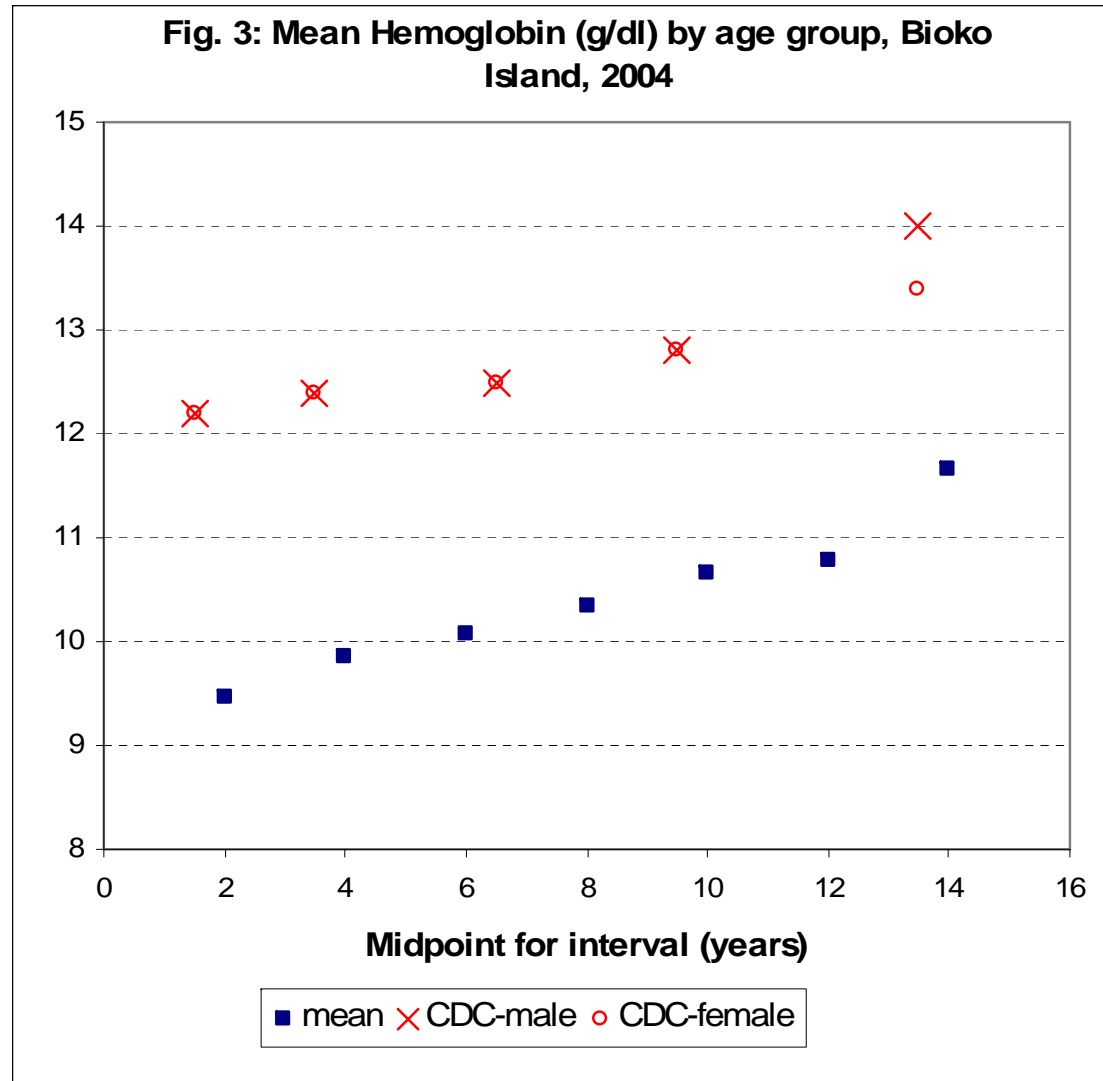


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Comparison with CDC standard





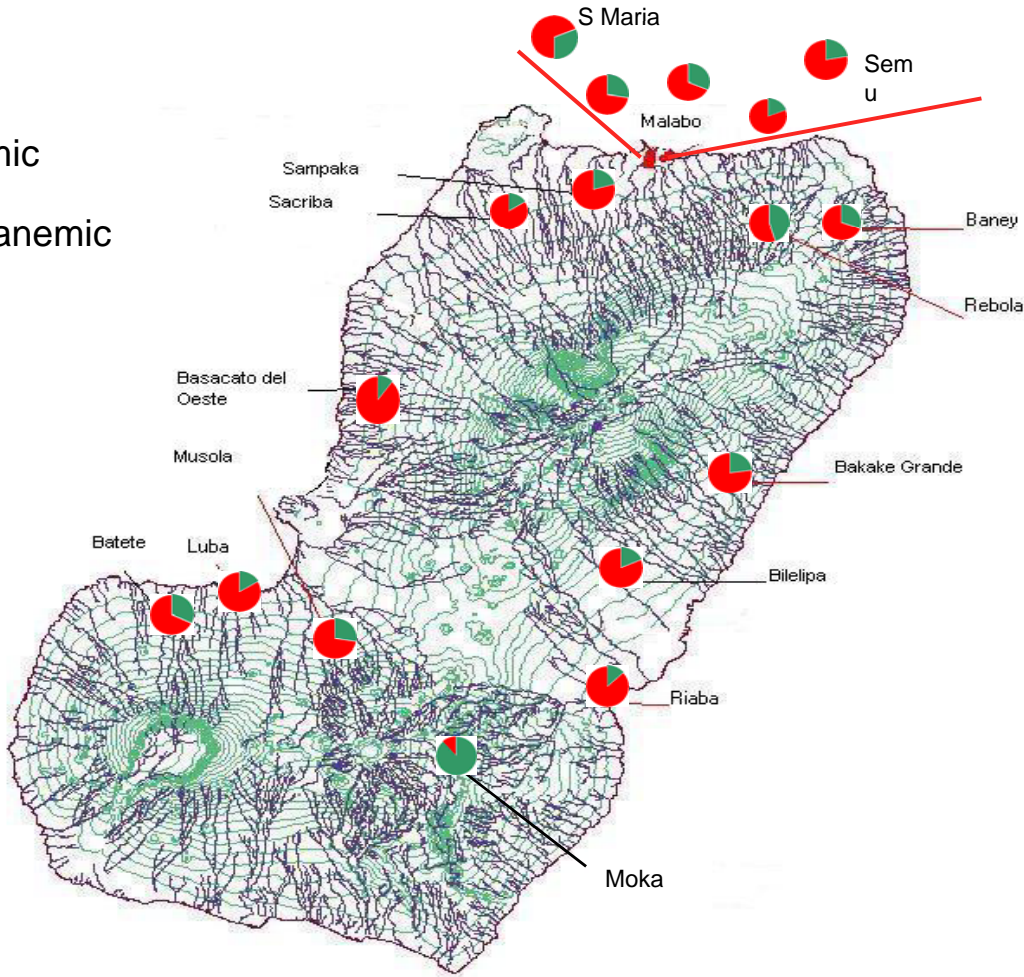
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Anemia baseline prevalence by site

-  =anemic
-  =non anemic



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Reduction in anemia prevalence



Overall anemia		
Year	Prevalence (%)	95% CI
2004	76	71-80
2005	66	60-72
$p= 0.0001$		

Severe anemia		
Year	Prevalence (%)	95% CI
2004	1.2	0.8-1.8
2005	0.4	0.2- 0.9
$P= 0.009$		



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Parasitemia and Anemia

Rapid Test	Mean Hb (standard deviation)	N
2004		
Negative	10.57 (1.63)	1266
Positive	9.75 (1.67)	1033
Total	10.23 (1.7)	2299
2005		
Negative	10.82 (1.64)	2399
Positive	10.05 (1.54)	1039
Total	10.20 (1.7)	3438

Subjects with parasitemia had lower Hemoglobin concentrations ($p < 0.001$)



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Conclusions and recommendations

- Malaria control activities contribute to the improvement of hemoglobin concentration.
- Modest (13%) reduction in anemia prevalence (in comparison with reduction 31% in parasitemia prevalence), not explained by hookworm infestation, may be associated to low consumption or foods with readily available iron.
- BIMCP must increase effort in screening for anemia and ensuring that anemic cases return for a F/U visit, receive iron supplements and are given dietary counseling.
- If children show low adherence to iron supplements, BIMCP may consider using an iron-fortified food.



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