

Prevalence of parasitemia in an area receiving seasonal malaria chemoprevention

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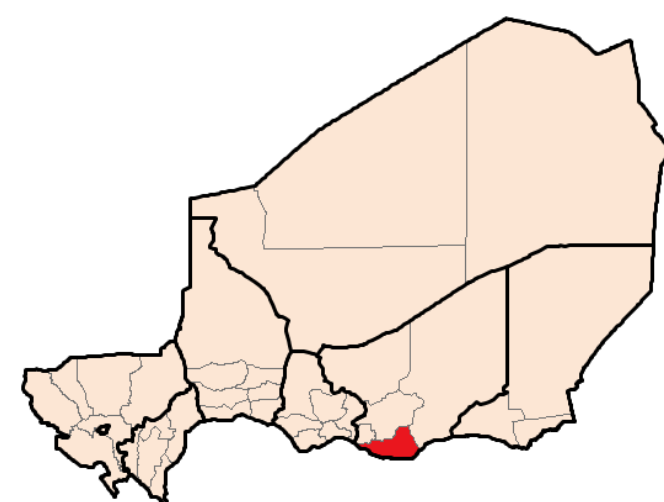
INTRODUCTION

Seasonal malaria chemoprevention (SMC)

- Recommended in the Sahel
- Monthly courses of sulfadoxine-pyrimethamine and amodiaquine (SP-AQ) administered to children aged 3-59 months during the high-transmission rainy season
- Clinical trials show a decrease in malaria incidence of up to 75%
- Expanding target age group has been beneficial in at least one trial¹, but has not been explored in Niger

Magaria Health District, Zinder Region, Niger

- Population 744 268, one of the most densely-populated districts in Niger.
- MSF supports MOH in implementing SMC since 2013
- Over 110 000 children living in the target area receive SP-AQ each month between July and October



OBJECTIVE

In order to evaluate the appropriateness of potentially expanding the SMC target population, we conducted surveys to estimate the prevalence of parasitemia during different malaria transmission seasons in three age groups:

- 3-59 months
- 5-9 years
- ≥10 years

METHODS

- Two surveys:
 - High season: 9-11 October 2016
 - Low season: 21-23 December 2016
- All villages in catchment areas of 6 health centers, with number of households included per village proportional to population of village
- Random selection of households: spatial sampling using Google Earth and handheld GPS devices
- One household member from each age stratum selected using random numbers table
- Target sample size in high season was 396 households; in low season it was 266 households.
- Febrile participants tested with rapid diagnostic test on-site and treated per national guidelines
- Thick and thin smears for all participants
- Double-reading of slides with external QC at WHO-certified center of excellence
- Ethical approval from MSF-ERB and National Consultative Ethics Committee of Niger

RESULTS

- 263 households were included in October and 268 households included in December
- Absenteeism among children aged 5-9 years was high; only 130 were included in October and 153 in December
- Overall prevalence of parasitemia
 - October: 43% (95%CI 39-48)
 - December: 40% (95%CI 37-44)
- No differences by sex

	October (N=588)		December (N=634)	
Prevalence of parasitemia by age	%	95%CI	%	95%CI
3-59 months	51.9 [*]	45.1-58.6	48.1 [†]	41.4-54.9
5-9 years	66.2	57.5-73.9	64.1	56.1-71.3
≥10 years	23.6	18.6-29.4	21.0	16.6-26.2
Median parasitemia (parasites/μl), IQR				
3-59 months	6066 ^{‡§}	1281-26065	1320 [‡]	489-4272
5-9 years	1516 [§]	530-5705	576	220-1495
>=10 years	189 [§]	126-629	103	63-159
Prevalence of gametocytemia by age				
3-59 months	19.3 [§]	14.6-25.2	12.4 [§]	8.6-17.6
5-9 years	18.5	12.7-26.1	13.1	8.6-19.4
>=10 years	4.9	2.8-8.4	1.5	0.6-3.9

^{*} Adjusted Wald $p=0.005$ between 3-59m and 5-9y; $p<0.0001$ between both groups of children and adults

[†] Adjusted Wald $p=0.002$ between 3-59m and 5-9y; $p<0.0001$ between both groups of children and adults

[‡] Kruskal-Wallis $p=0.001$ for age in each survey

[§] Between two surveys: Mann-Whitney $p<0.0001$ for children 3-59m; $p=0.0002$ for children 5-9y; $p=0.0001$ for persons ≥10y

[¶] Adjusted Wald $p<0.001$ between both groups of children and adults during each survey



A child receiving SMC, photo credit Juan Carlos Tomasi/MSF

DISCUSSION AND CONCLUSION

- Low-season prevalence not actually low, survey occurred too early
- Prevalence of parasitemia high among children <5 despite SMC, but prevalence of clinical malaria low
- Children aged 5-9 years have a high prevalence of parasitemia and gametocytemia, it would be logical to include them in SMC in this area
 - But additional cost and effort might be high if scaled-up

References

¹ Cissé B et al, PLoS Medicine 2016;13:11