4P37

Protective effectiveness of seasonal malaria chemoprevention in Magaria, Niger

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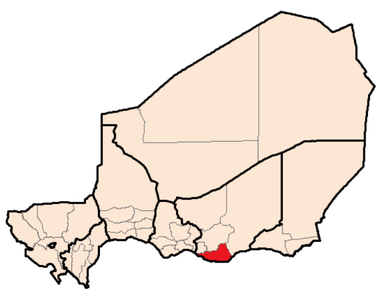
INTRODUCTION

- SMC recommended in the Sahel
- Monthly courses of sulfadoxine-pyrimethamine and amodiaquine (SPAQ) are administered to children aged 3-59 months during the high-transmission rainy season
  - Medicines taken over 3 days, variety of delivery strategies used in different countries
- MSF supports MOH in implementing SMC since 2013
  - Target 110 000 children
- Despite high investment, good coverage and reported parent satisfaction, malaria continued to overwhelm health structures in 2014-2015, leading to concerns about effectiveness of SMC
- In 2016, SMC given with two strategies: first dose directly-observed (DOT) and first dose not directly observed (non-DOT)



OBJECTIVES

- Estimate protective effectiveness of SMC (PESMC) in a real-world program implementation setting
- Compare effectiveness of SMC vs developing clinical malaria in areas receiving first-dose DOT vs non-DOT

METHODS

- Enrollment between 1 August and 2 December 2016
- Cases enrolled in 2 integrated health centers and 4 health posts (maximum 2 cases/day/facility)
- Age-matched controls (+/- 6 months):
  - 3 afebrile children (or febrile with negative malaria rapid test) from same village of origin, enrolled on same day as case
- Caregivers were asked about receipt of SMC, access to health care, demographics, diet and socio-economic status
- Thick and thin smear + 500 µl blood in EDTA-microtube
- Definitions:
  - Clinical malaria: child with fever + positive pLDH RDT
  - Laboratory-confirmed malaria: child with clinical malaria and parasitemia
- Double-reading of slides with external QC at WHO-certified center of excellence
- Conditional logistic regression to compare cases and controls; PE_{SMC} was estimated as (1-OR)x 100%.
- The odds ratio (OR) for having received SMC was compared for the cases and the controls
  - Adjusted for sex, mid-upper arm circumference, prescription of antimalarials in week prior to enrollment, sleeping under bednet, dietary diversity, family's animal wealth and ethnicity

RESULTS

Table 1: Description of study participants

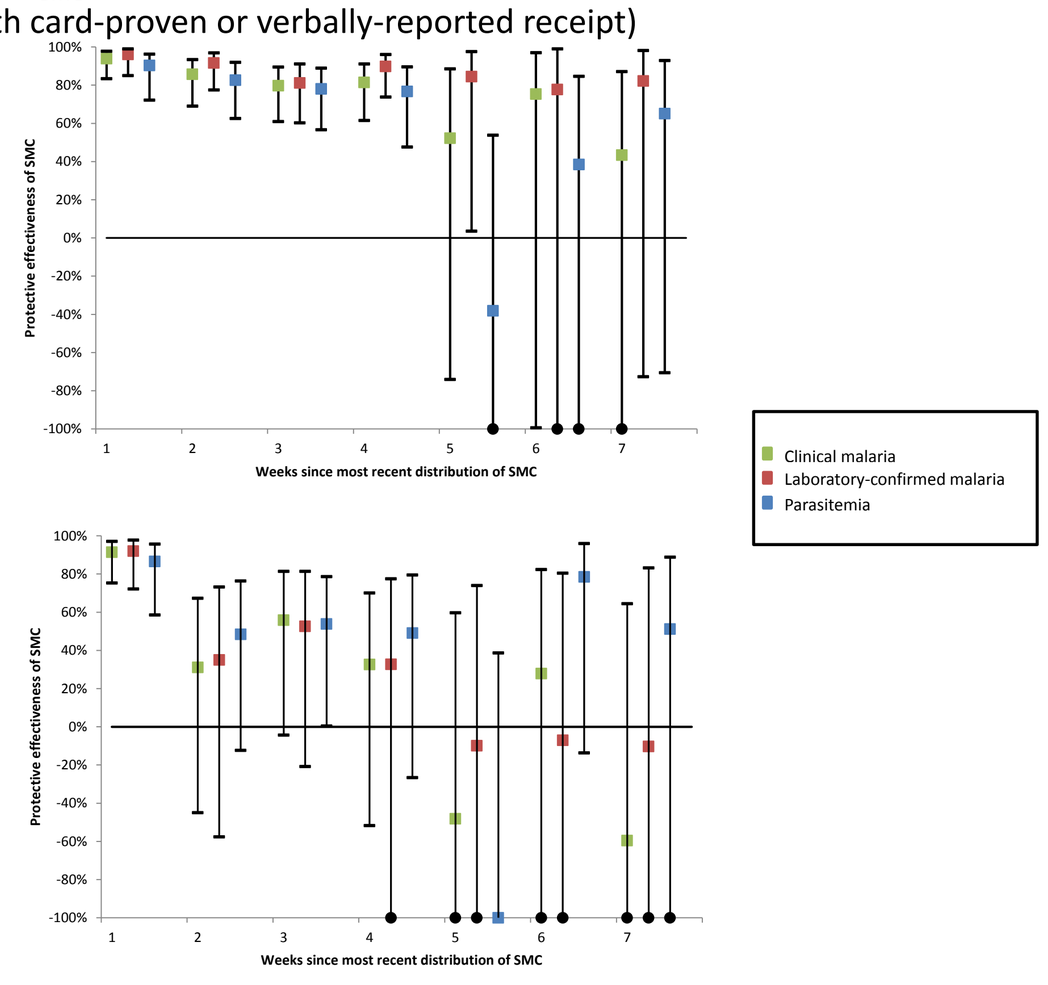
	DOT zone		Non-DOT zone	
	Cases (N=264)	**Controls (N=765)**	**Cases (N=313)**	**Controls (N=935)**
Male sex, n (%)	153 (58)	384 (50)	169 (54)	497 (53)
Age in months, n (%)				
3-11	20 (8)	56 (7)	21 (7)	88 (9)
12-23	118 (45)	355 (47)	75 (24)	221 (24)
24-35	91 (34)	267 (35)	111 (35)	316 (34)
36-47	20 (8)	56 (7)	72 (23)	222 (24)
48-59	15 (5)	31 (4)	34 (11)	88 (9)
Receipt of SMC, n (%)				
With a card as proof	96 (36)	552 (72)	210 (67)	710 (76)
By card or verbal report	196 (74)	659 (86)	242 (77)	750 (80)

- Overall, PE_{SMC} was significantly higher in the area where the first dose was directly-observed, than in areas where the first dose was not directly-observed
- PE_{SMC} was also significantly higher when considering only children who had cards to prove receipt

Table 2: Protective effectiveness of SMC

	DOT zone		Non-DOT zone	
	PE_{SMC}	**95%CI**	**PE_{SMC}**	**95%CI**
With a card as proof of receipt				
Clinical malaria	96	92-98	52	29-67
Lab-confirmed malaria and <4 weeks since SMC	97	94-99	53	21-73
By card or verbal report				
Clinical malaria	75	57-86	25	-11-49
Lab-confirmed malaria and <4 weeks since SMC	90	77-95	11	-50-47

Figure 1: PE_{SMC} over time (top panel with card-proven receipt; bottom panel with card-proven or verbally-reported receipt)



DISCUSSION AND CONCLUSION

- SMC is effective when distributed using a first-dose DOT strategy, but its effectiveness is significantly lower if the first dose is not observed. The duration of protection is approximately 4 weeks.
- Our results suggest problems with correct adherence to a 3-day course of AQ and/or incorrect reporting of receipt of SMC.
- Analysis of plasma desethylAQ levels (ongoing) will provide objective data about adherence to SMC.