

PERCEPTION OF THE MOTHERS AND THE CHILD MINDERS OF THE REGION OF SÉDHIU ON THE SEASONAL MALARIA CHEMOPREVENTION IN 2017: ARE THE ABSENCES AND THE DISEASES OF THE CHILDREN - NO CASES OF DISGUISED REFUSALS?

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In the South of Senegal, the region of Sédhiou applies the Seasonal Malaria Chemoprevention (SMC) recommended by the WHO at the children from 3 to 120 months with 3 passages a year. Used Amodiaquine can give unwanted effects which could be sources of refusal. However according to the passages, the number of refusals decreases compared with the cases of sick or absent children by which the number increases that is why we wondered if it did not constitute cases of disguised refusals. The documentary review and the survey investigates qualitative were used with 8 focus group and 19 individual interviews. And was noted 544 cases of vomitings, on 2079 of sick children and 4621 of the absent children while we noted that 116 cases of refusal. All the women recognized that the CPS served to prevent the malaria and some people ask for it even for them. The posology of the SMC is known as well by the women and they give medicine rather in the evening to avoid the side effects. **FD 26 years mother of 4 children:** " my children run to put themselves under the bed as soon as they see the agents giving medicine because they are bitter and they vomit when they take them but I make them go out so that they take them and for the second and the third dose I give them to them in the evening like that, they have nothing, it is because I know the value of this medicine ". For the absent and sick cases of child, the conversations are in favour of real cases of disease and the absent children took medicine left with their mom their return. It was noted as well as children declared absent were found hidden in the rooms of their parents. The importance of the SMC is well known by the women however the unwanted effects especially digestive create reluctances for the parents who think that the medicine is too powerful but effective for the prevention of the malaria so that they developed a particular strategy to limit these effects to know the taking in the evening in the bedtime. However the increase of the absent and sick children seems to be a new shape of refusal.

THE ROLE OF ACTIVE CASE DETECTION IN MALARIA ELIMINATION: WHAT ARE THE CHALLENGES?

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Zanzibar has made significant progress in reducing malaria burden, with malaria prevalence reported to be 0.7% by microscopy in children under five in the 2015-16 Tanzania Demographic and Health Survey. Considering this and other key impact indicators, in 2014 the Ministry of Health changed the name and strategies of the program from Zanzibar Malaria Control to Zanzibar Malaria Elimination Program. In this context intensive malaria surveillance, which includes case investigation and classification, was implemented in 2013. In our program, tracking and follow up investigations and prompt reporting of each malaria case is imperative. Active case detection involves both reactive and proactive case detection. Reactive is triggered whenever a case is identified by passive case detection at health facility. It involves visits to the households

of index case, screening family members and neighbors. Proactive is the screening of a focal population in hotspots with at least five index cases reported in a village within 7 days. This study presents findings of reactive case detection. Reactive case detection is conducted by the district response teams, in collaboration with village leadership. In 2017, reactive case detection was conducted in 32 villages following reporting of 3609 confirmed index cases. A total of 16,163 household's members were screened for malaria parasites from the targeted 19,617 community members. Eighty three (0.5%) members were found positive. Reactive case detection requires adequate resources to ensure intended target is reached. Regardless of intensive community involvement refusal among the community members is always reported. In some instances, non-targeted community members request for malaria testing of which interferes with the planned budget and logistics. Reactive case detection is one of the core interventions towards malaria elimination. The system requires high involvement of community members, and sufficient resources. Active case detection is an expensive and complex intervention which needs proper planning.

THE RISK OF PLASMODIUM VIVAX PARASITAEMIA AFTER PLASMODIUM FALCIPARUM INFECTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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In Thailand, there is a high risk of *Plasmodium vivax* parasitaemia following treatment of *P. falciparum* infection. To inform the benefits of universal radical cure for patients with *P. falciparum*, the risk of *P. vivax* after *P. falciparum* was quantified across a range of co-endemic settings. A systematic review identified prospective clinical studies of antimalarial efficacy for uncomplicated *P. falciparum* malaria, published before January 2018 undertaken in areas co-endemic for *P. vivax*. The primary outcome was risk of *P. vivax* parasitaemia following *P. falciparum* infection at day 42. Secondary outcomes were risk of *P. vivax* at day 28 and 63 and risk of any parasitaemia. Estimates were pooled using meta-analysis and heterogeneity was investigated using meta-regression. We included 153 studies enrolling 31,262 patients. The risk of any recurrent parasitaemia by day 42 was 18.4% (95%CI 15.2-21.8; $I^2=94.8\%$; 117 estimates) with 37.1% (28.2-46.2, $I^2=92.2\%$) of these due to *P. vivax*. The risk of *P. vivax* parasitaemia was 5.6% (4.0-7.5; 92.7%; 117 estimates) by day 42 and 24.0% (18.0-30.6; 95.2%; 30 estimates) by day 63. *P. vivax* appeared later than *P. falciparum* recurrences and the risk was greater following rapidly-eliminated drugs and in studies undertaken in areas of short-relapse periodicity. The risk of *P. vivax* parasitaemia within 42 days of treatment with artemether-lumefantrine was 15.3% (4.1-31.4; 97.8%; 10 estimates). Partner drugs such as mefloquine or piperazine delayed recurrence compared to lumefantrine, however, the risk of *P. vivax* parasitaemia was >15% by day 63 following all ACTs. In summary, following *P. falciparum* treatment, the risk of *P. vivax* parasitaemia is far greater than expected from reinfection alone. In co-endemic settings, universal radical cure with

an ACT and hypnozoitocidal agent, for patients with *P. falciparum* or *P. vivax*, has the potential to reduce all-cause recurrent parasitaemia and facilitate malaria elimination.

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GENETIC STRUCTURE OF *PLASMODIUM FALCIPARUM* IN AN ENDEMIC AREA OF THE PACIFIC COAST OF SOUTH AMERICA

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Ecuador plans to eliminate malaria by 2023; indeed, the country has seen a decrease in the number of cases from more than 100 000 in 2001 to only 558 in 2015. Nevertheless, the number of cases has increased in recent years and approximately 1280 infections were reported in 2017, 30 % of which were caused by *P. falciparum*. Most malaria population genetics studies performed in Latin America indicate high clonality and clear structure of *P. falciparum* populations. An outbreak of *P. falciparum* in Northwest Ecuador was the result of a clonal expansion of parasites circulating at low levels in the country or re-invading Ecuador from neighboring territories. However, general characteristics of *P. falciparum* circulating in Ecuador have not been determined. The main goal of this study was to genetically characterize and geographically map the population structure of *P. falciparum* in Northwest Ecuador and determine how the *P. falciparum* population structure changed across time. For this purpose, seven neutral microsatellites markers in two groups of samples from two locations were used (79 samples collected from 2002 to 2006 and 109 samples collected from 2013 to 2016). We found that the genetic population structure of *P. falciparum* in Ecuador has changed from 2002 to 2016 while diversity decreased. Our analyses showed that parasites from border locations have higher diversity than parasites from inland locations and that Ecuadorian *P. falciparum* share genotypes with both Colombian and Peruvian parasites. In addition, *P. falciparum* genotypes not previously reported, were found in Ecuadorian locations. The *P. falciparum* diversity found in Ecuador could be a product of migration or the result of haplotypes circulating in the country in low proportions. Studies of the genetic characterization of *P. falciparum* in eliminating areas help determine the possible origin of parasites in order to create strategies to prevent the entrance of new lineages and achieve local elimination of malaria.

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A MIXED METHOD STUDY OF HEALTH SEEKING BEHAVIOR FOR FEBRILE ILLNESSES AND ITS IMPLICATIONS FOR MALARIA CONTROL AND ELIMINATION IN SAVANNAKHET PROVINCE, LAO PDR

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Health seeking behavior is shaped by interactions between individual and societal factors as well as health services. Analyses of the determinants of health seeking behavior are important for malaria control and elimination.

The main objective of this study was to explore factors affecting the health seeking behavior for febrile illnesses in Lao PDR. Household heads or their representatives (n=281) were interviewed using a structured questionnaire. 8 to 10 people from each study village (n=100) were included for focus group discussions (FGDs). Most respondents were Lao Theung (269/281; 95.7% that comprised ethnic groups: Mang Kong: 200/281; 71.7% and Tree: 64/281; 22.7%), males (201/281; 71.5%) and almost half were from the age group 31-50 years (138/281; 49.1%). Geographic proximity to a health centre (AOR=6.5; CI=1.74-24.25; for those < 3.5km versus those > 3.6km) and previous experience of attending a health centre (AOR=4.7; CI=1.2-19.1) were both strong predictors of visiting a health centre when febrile symptoms were experienced as opposed to traditional healers. Attending local health centers/hospitals was often constrained by the transportation and finances. The first choice for treatment for most participants was local health centres, even though there was a mix of seeking health care from traditional healers as well. Participants indicated that they navigate more than one type of health care system (health centre/hospitals and traditional healers). Decisions about where and when to attend formal health care facilities depended on finances, travel capabilities (distance to the health centre, road conditions, availability of transport), severity of symptoms and recognition of the illness (more likely to attend health centres/hospitals if considered severe). Reducing health care costs and increasing the ease of access to health care facilities may lead to improved health care attendance. Current and future malaria control programs can only benefit by addressing these factors in addition to collaboration with the existing network of health workers, village health volunteers and traditional healers.

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IMPACT OF MOSQUITO LARVAL SOURCE REDUCTION ACTIVITIES OF TRAINED SCHOOL AGED CHILDREN IN THE CONTROL OF MALARIA IN NIGERIA

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Malaria prevention in Nigeria is focused almost entirely on the use of Long Lasting Insecticide Treated Bed-Nets (LLIN) with little or no attention on Larva Source Reduction (LSR). Involvement of school-aged children in health interventions have been found to be positive, therefore, this study was carried out to measure the impact of mosquito LSR activities of school-aged children (6-12 years) in the control of malaria. A total of 24 primary school-aged children were trained and engaged for LSR activities in the intervention community while no training was carried out in the control community. There were pre and post intervention assessment of social, entomological and parasitological indices in the study communities. The activities of the children were observed to significantly (P<0.05) reduce potential mosquito breeding sites and containers as well as larval abundance in the intervention community with a reduction in House Index (HI), Container Index (CI) and Breteau index from 66.67% to 16.67%, 46.91% to 8.02% and 211.1 to 33.3 respectively. Population of Indoor resting mosquitoes and an overall malaria parasite prevalence also reduced significantly in the intervention community from 40.8% to 23.0% (P<0.05). There were no significant reductions in any of the parameters measured in the control community. Knowledge of participants about mosquito breeding sites, consciousness to cover any water-holding containers and environmental hygiene were all observed to improve significantly (P<0.05) in the intervention community with 84.6% of respondents attributing their behavioral changes to the influence of the activities of the children. The LSR activities of the trained children in this study were seen to positively impact the intervention community; therefore, children participation in mosquito LSR may be a good strategy for malaria elimination