The authoritative academic voice on malaria research

Improving health worldwide

At the 6th MIM Conference
Durban, 6-11 October 2013
Economic evaluations of four prevention trials conducted by the Malaria in Pregnancy Consortium

Malaria in pregnant women causes a dual health burden, with adverse consequences for the mother and for the unborn child, who is at greater risk of low birthweight. The Malaria in Pregnancy Consortium is undertaking four trials to evaluate different ways of preventing malaria in pregnant women in multiple sites across Africa including Burkina Faso, The Gambia, Mozambique and Benin. In addition to undertaking the epidemiological evidence, it is crucial for policy makers to know the cost-effectiveness and affordability of different interventions, in order to be able to predict the economic implications for their setting. Centre members Kara Hanson and Silke Lutzelschwab are working in collaboration with the Barcelona Centre for International Health Research and Universitat de Barcelona to conduct economic evaluations of all four prevention trials using cost data collected in exit surveys, observational studies and health facility costings in a number of settings. All analysis will be preformed from a health provider and societal perspective. Results will help policy makers and programme managers in making decisions about the optimal policy and regimen to prevent malaria during pregnancy.

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Phase III Trial of RTS/S/AS01 Malaria Vaccine Candidate in African Children

RTS/S/AS01 is the most advanced malaria vaccine candidate which has progressed through phase II clinical trials to a multicentre phase III study. Kintampo Health Research Centre in Ghana is one of the 11 centres in Africa participating in large phase III trials of the vaccine in collaboration with Malaria Centre members Seth Oweisu-Agyei, Daniel Chandramohan and Brian Greenwood. The trials are investigating the impact of this vaccine on severe and uncomplicated malaria when given to either 5-17 month old children or to infants aged 6-24 weeks in conjunction with their routine EPI vaccines. Results from the first year of follow up in each group of children have been published and those from the 18 months of follow up, broken down by centre will be presented at the MIM 2013 meeting. Final results, including the impact of a booster dose, will become available at the end of 2014.

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Assessment of the Infectious Reservoir of Malaria - AFRIRM

In some areas, hotspots of transmission sustain transmission of malaria. The stability of hotspots is not entirely clear and Centre members are exploring the potential of surveillance-based interventions to disrupt transmission in these hotspots. Chris Drakeley and Teun Bousema are working on the AFRIRM project which will establish a standardized framework for assessing population infectivity to mosquitoes and thus the infectious reservoir in Uganda and Burkina Faso. This will enable identification of target populations and optimal timings for control efforts. Data generated will fill crucial gaps in mathematical models of malaria transmission and will allow examination of the links between routinely collected clinical, parasitological and entomological metrics by quantifying the processes. AFRIRM is a Bill & Melinda Gates Foundation funded project in collaboration with the National Institute for Medical Research in Cotonou, Benin. PAMVERC’s mission is to set up a public partnership to develop and evaluate improved vector control tools that will have a positive impact in the near and medium future on human health in Africa.

www.afrirm.org

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OvAART: Oviposition of Anopheles gambiae – Attractants, Residual Larvicides and Traps

OvAART is developing more efficient and cost-effective methods for controlling and monitoring Anopheles gambiae populations for malaria vector control. This approach is underpinned by multidisciplinary research to identify the visual and olfactory stimuli that cause female Anopheles gambiae to lay eggs at certain sites and not others. This knowledge will be used to identify important breeding sites and selectively treat preferred hotspots of malaria transmission.

The collaborative team including Ulrike Fillinginger are working in Kenya and testing bacteria-generated volatiles from aquatic habitats function as oviposition semiochemicals and whether the bacterial communities and chemicals released from them can be detected in stagnant water between sites with and without larvae. The team are also testing novel residual larvicides and developing an oviposition trap for collecting gravid Anopheles gambiae. Findings from all specific objectives tested will be combined to develop an ‘attract-and-kill’ strategy. OvAART is a collaboration with Durham University and the Liverpool School of Tropical Medicine in the UK, the Royal Institute of Technology in Sweden and International Centre for Insect Physiology and Ecology in Kenya.

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Evaluation of the efficacy and safety of primaquine for clearance of gametocytes

Chi Ezereula, Chris Drakeley, Shumay Yeung, Sarah Staedke and Teun Bousema are involved in a randomized placebo-controlled trial of the anti-malarial drug primaquine. For Plasmodium falciparum, primaquine has specific gametocytocidal properties, meaning it destroys the form of the parasite found in the human blood that is infectious to mosquitoes. It is recommended for reduction of malaria transmission (WHO 2010). However, treatment with primaquine is associated with haemolysis in individuals with G6PD deficiency. This effect is dose-related. This study aims to evaluate whether lower doses of primaquine have equally potent gametocytocidal effects but result in reduced levels of haemolysis.

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Introducing Rapid Diagnostic Tests into the private health sector

It is common in Uganda for people to seek treatment for malaria in drug shops as their first point of care but parasitological guidance to diagnose malaria treatment is not usually offered in drug shops. Since Rapid Diagnostic Tests (RDTs) are easy to perform and have high accuracy in many settings, these tests could feasibly be offered in drug shops. Kristian Hansen, Sian Clarke and Sham Lal are conducting a cost-effectiveness study alongside a cluster-randomised trial in Mukono district, Uganda. They are evaluating the cost of interventions as well as conducting interviews with some customers to capture the household cost of treatment-seeking for fever. The data will be used to estimate the incremental cost and effects of introducing RDTs in private, registered drug shops as well as to perform various decision analyses. This project is in collaboration with the Ugandan Ministry of Health and the Centre for Health Research and Development in Denmark. It is funded by The Bill & Melinda Gates Foundation through the ACT Consortium.

www.actconsortium.org/RTDrugsshops

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The Pan African Malaria Vector Research Consortium (PAMVERC)

PAMVERC was founded in 2008 as a consortium of three African based insecticide and vector control testing sites. They are located at Moshi and Muheza in Tanzania and in Colombo, Sri Lanka. PAMVERC’s mission is to set up a public partnership to develop and evaluate improved vector control tools that will have a positive impact in the near and medium future on human health in Africa.

www.pamverc.org

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Barriers and solutions to the scale-up of Intermittent Preventive Treatment of malaria in Pregnancy and syndromic-management of curable Sexually Transmitted Infections

A recent meta-analysis by Centre members showed that one-third of pregnant women attending antenatal care facilities in sub-Saharan Africa are infected with malaria and at least one curable sexually transmitted and reproductive tract infection (STI/RTI). The effects of malaria infection can be mitigated using Intermittent Preventive Treatment in Pregnancy (IPTp), whereas treatment for curable STIs/RTIs can be provided using a syndrome-based management algorithm. Centre members have developed the syndrome-based management against curable STIs/RTIs have been poor at best. Matthew Chico, Jayne Webster, Fern Tennish-Shresth and Christine Michaels-Igbokwe are collaborating with the Tanzanian National Institute of Medical Research to conduct focus group discussions and semi-structured in-depth interviews among pregnant women, health providers and policymakers to identify barriers and solutions to make and scale up syndromic-based management of STIs/RTIs in pregnancy. Results will be used to formulate discrete choice experiments to further understand the policy-offs that providers make when selecting between future policy trade-offs.

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The Malaria Centre

Established in 1998, the Malaria Centre at the London School of Hygiene & Tropical Medicine supports and facilitates interdisciplinary research as well as promoting collaboration with external groups, particularly in malaria endemic countries.

The aim of the Malaria Centre is to make a significant contribution to international efforts to reduce the burden of malaria by influencing global practice and policy with high quality, relevant research.

To fulfil our aims, we work in a variety of malaria research areas ranging from basic laboratory science to social and economic studies. As well as developing tools, techniques and knowledge about malaria, a strong emphasis is placed on translating research outcomes into practice. The Centre also has a range of facilities that contribute to the diagnosis, treatment and research of malaria.

In addition to scientific and policy work, we provide teaching and training on malaria both in the UK and many countries overseas. The director of the Malaria Centre is Chris Drakeley and the deputy director is Mark Rowland. The Centre is coordinated by Karen Thurley and Dalia Iskander. You can contact us by emailing malaria@lshtm.ac.uk

For more information on specific research areas please contact the following people:

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Malaria teaching, training and capacity strengthening in Africa

The shortage of trained personnel and adequate infrastructure in malaria endemic countries continues to be a major issue for malaria control. We continue to play an important role in strengthening research capacity in malaria endemic countries, particularly in Sub-Saharan Africa.

The Malaria Capacity Development Consortium: strengthening malaria research capacity across Africa.

Location: UK, Denmark, Ghana, Tanzania, Uganda, Malawi, Senegal

The Malaria Capacity Development Consortium (MCDC) is funded by the Wellcome Trust and the Bill & Melinda Gates Foundation. The consortium is led by Brian Greenwood and David Schellenberg and is a collaboration with the College of Medicine, University of Malawi, Kilimanjaro Christian Medical College in Tanzania, Kwame Nkrumah University of Science and Technology in Ghana, Makerere University in Uganda, Université Cheikh Anta Diop in Senegal, the Liverpool School of Tropical Medicine in the UK and the University of Copenhagen in Denmark. MCDC supports a cohort of over 50 malaria researchers, all based in Africa.

18 PhD students are registered for their PhDs at one of the five African universities and 33 post-doctoral researchers receive career development support from MCDC. Students moving to post-doctoral research will continue to receive support from The consortium, through a number of different initiatives: career development grants, mentorship and personal development planning.

MCDC has also been working with each university to address identified needs in their PhD programmes and aims to embed sustainable career development structures within each institution.

www.mcddconsortium.org

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Multidisciplinary malaria research in Africa

We bring together researchers from many disciplines to make innovative and thorough contributions to the advancement of knowledge on malaria.

The ACT Consortium.

Location: Afghanistan, Cameroon, Ghana, Malawi, Nigeria, Rwanda, South Africa, Tanzania, and Uganda

The ACT Consortium, directed by David Schellenberg and funded by the Bill & Melinda Gates Foundation is a global research partnership providing data on a range of studies on Artemisinin-Based Combination Therapy (ACT) - recommended for the treatment of *Plasmodium falciparum* malaria. The Consortium takes a multi-disciplinary approach to its work. For example, in one qualitative project, researchers found that using checklists to elicit information on harms in clinical trials from participants enrolled in malaria trials in South Africa and Tanzania generally increased the sensitivity of detection of medical histories, concomitant medications and adverse events compared to open enquiries. However, from interviews, they found that trial participants deliberately withheld some further information. Barriers to reporting included poor memory, perception of the significance or relevance of the event or treatment to the participant, fears of reporting and problems with naming concomitant treatments. In this project, Centre members Clare Chandler & Sarah Staedke worked in collaboration with researchers at the University of Cape Town in South Africa, the Tanzanian National Institute of Medical Research and the University of Copenhagen in Denmark. It will make important contributions to the design of appropriate and feasible harms data elicitation methods within the malaria clinical research community.

www.actconsortium.org/safetydatacollection

Contact at MIM 2013:
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*Courtesy ACT Consortium.*
Pan-African studies

We have a major international profile with members currently working in around 30 malaria endemic countries in Africa. This allows us to make comparisons in research techniques and data between countries.

Mapping the spread of drug resistance in African malaria.

Location: Continent wide

Malaria Centre members Cally Roper and Inbarani Naidoo, in collaboration with the WorldWide Antimalarial Resistance Network, Malaria Atlas Project and University of Oxford, have developed a mathematical model of the prevalence of point mutations in the \textit{dhfr} and \textit{dhps} genes of \textit{Plasmodium falciparum} that confer resistance to Sulphadoxine and Pyrimethamine. Resistance in \textit{dhfr} and \textit{dhps} genes emerged on just a few occasions, but then showed a remarkable capacity to disperse. After collating, standardising and mapping all published surveillance data, we are using modelling to describe spatial and temporal patterns of resistance dispersal. Adopting a Baysian model-based geostatistics approach, we converted spatio-temporal data to a continuous surface. Models of resistance dispersal patterns in the past will help to inform policy on the management and containment of resistance in future. This project is funded by the Bill & Melinda Gates Foundation via WorldWide Antimalarial Resistance Network.

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Modelling the dispersal of resistance mutations at Codons 437 and 540 Of The DHPS Gene in 2000 and 2005.
Primary school children in Uganda, part of a Malaria Capacity Development Consortium PhD student project on impact of intermittent preventive treatment. Photo by Helen Allwood.