

# Fighting Malaria

*in Malawi*



Malawian women and children wait to see doctors at clinic in Ntcheu, Malawi.

## UNC researchers work to improve Malaria diagnosis and treatment; provide educational opportunities for Malawian epidemiology students

BY EMILY J. SMITH

# Malawi

Malawian native Linda Kalilani said she had malaria so many times as a child that she lost count. The 28-year-old doctoral student in epidemiology at UNC's School of Public Health considers herself lucky.

Many in her country, where the average life expectancy is 41 years, don't survive their childhood bouts with the infectious disease. And those who do survive into adulthood, contract the disease many times before developing immunity to it.

"Many children get malaria five or six times a year and 40 percent of all children under two who die, die from the disease," says Dr. Steven Meshnick, professor of epidemiology at the UNC School of Public Health, and Kalilani's doctoral advisor.

It was Kalilani's interest in helping combat this disease in her country that brought her to UNC in 2003 to study. She is here thanks to a Fogarty International Training Grant — funding that has sponsored six other Malawian students at the School since 2003, including Adamson Muula and Atupele Kapito-Tembo, who are presently pursuing doctoral degrees in epidemiology at UNC.

"Malaria is such a big problem in Malawi. I really wanted to do something to help fight it,"

says Kalilani who has a medical degree from the University of Malawi in Blantyre, and a master's degree in epidemiology from the University of Cambridge in England.

Kalilani is working with Meshnick on a study exploring preventative treatment therapies for malaria for pregnant women.

"Adults develop immunity to malaria over time, but women become susceptible to the disease again when they become pregnant because the parasite targets the placenta which has not yet developed immunity," Kalilani explains.

The study, funded by the U.S. Centers for Disease Control and Prevention, explores the effectiveness and tolerability of three drug treatment options.

New ways of controlling the illness in this population are imperative, Meshnick says.

"It is a national health policy in Malawi and about 20 other African countries to give intermittent preventive therapy for malaria to all pregnant women in the form of two therapeutic doses of the anti-malarial drug sulfadoxine-pyrimethamine," Meshnick says. "But this drug is becoming less and less effective in preventing malaria due to the development of drug-resistant strains of the parasite."

Furthermore, recent research, conducted by Meshnick, in collaboration with researchers at the University of Melbourne in Australia and the University of Malawi, found that pregnant women co-infected with malaria and HIV, have nearly double the number of HIV particles in their blood as pregnant women who are HIV-positive and don't have malaria. Data from this study also suggest that co-infection among ▶▶



PHOTO BY LAUREN VOLTERO



# Fighting M



**WHERE IS MALAWI?** Located in southeast Africa, Malawi is bordered by Tanzania, Mozambique and Zambia.



▶ pregnant women may increase their risk of transmitting HIV to their babies by 25 percent.

“This work is important because it suggests that if we can protect women from malaria when they are pregnant, we might be able to reduce the likelihood of their transmitting HIV to their babies,” Meshnick says of the research, published in the journal *AIDS*.

In addition, HIV makes pregnant women more susceptible to malaria. In a country where between 15 and 30 percent of the total population is infected with

## Improving malaria diagnosis & management

Ntcheu, a moderately-sized town south of Lilongwe, Malawi’s capital, sees its share of malaria infections.

“About 5,000 kids are admitted to Ntcheu District Hospital’s pediatric ward each year, and during the rainy season, when malaria is most common, all 60 beds are filled with three children each — all sick with malaria,” says Meshnick, who spends 10 to 20 percent of his academic work year on-site in Malawi.



Linda Kalitani, of Malawi, is a UNC School of Public Health doctoral student

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HIV, the inability to protect pregnant women from malarial infection puts the lives of both women and their offspring at risk. This same research group also showed that HIV infections impair the ability of pregnant women to make antibodies to malaria. This work was published in the British medical journal *Lancet*.

About a third of new mothers in Malawi suffer from malaria, approximately a third are HIV-infected, and roughly 10 percent have both illnesses.

But diagnosis of the disease is sometimes slower than it could be and this delay can increase the severity of the illness in patients, and, in worst-case scenarios, lead to needless deaths, says Meshnick, who has been working with medical and hospital personnel to improve malaria diagnosis and management in the facility.

One change has been to educate doctors and nurses about the right questions to ask patients and the right tests to perform.

“If a kid is hypoglycemic or has menin-

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PHOTOS BY DR. STEVE MESHNICK AND LAUREN VOLTERO

gitis, they might display similar symptoms to malaria,” Meshnick says. “So it’s important for them to know what they’re looking for and what to ask. To help with this, we’ve developed a checklist for providers.”

Another change has been to move the lab where blood samples are taken to a location adjacent to where patients are seen by doctors so that if malaria is suspected, a blood sample can be immediately drawn and analyzed. Previously, if malaria was suspected, the sick patient would then have to wait in a long line at the lab to get a blood sample taken (this, after waiting in a long line to see the doctor in the first place).

## UNC’s ties with the University of Malawi

Meshnick’s work in the country extends to the University of Malawi in Blantyre where he oversees the “Program in Infectious Disease Epidemiology” in the university’s newly established master’s in public health program, named the “School of Community and Public Health.” About 15 students a year attend the new three-year program. A Fogarty International Training Grant, overseen by Meshnick, sponsors 5 to 10 of those students. Meshnick teaches classes at the university and provides research guidance to students.

“The biggest challenge in improving public health in Malawi is getting enough people in the country trained to implement all the public health programs that are needed,” Meshnick says. “I see this work with the University of Malawi as one way to help with this.”

Linda Kalilani’s fellowship at UNC could also help with the long-term goal of improving public health in Malawi. Following her studies, she plans to return to her country where she hopes to use her knowledge and skills to help lessen malaria’s destructive force in the country.

“One of the things that excited me about studying at UNC was the opportunity to do something to help with the situation back home,” she says. “I’ve seen so many children die of malaria. I want to contribute what I can to fighting this disease.”

Kalilani’s presence at the School as well as that of her Malawian classmates Muula and Kapito-Tembo, also contributes to a richer academic environment for those with whom they share class.

“It must be interesting for UNC students to hear the perspective of Malawians on U.S. health problems like obesity,” Meshnick says. “Their presence makes UNC a real international experience for U.S. students and gives them insight into what Africans are like as people.” ■

**PHOTOS:** left to right (1) Malawian women and children wait in line to see doctors at clinic in Ntcheu; (2) Young Malawian women get water from a well; (3) UNC professor Dr. Steve Meshnick teaches epidemiology at the University of Malawi in Blantyre; (4) A young Malawian child is tested for malaria; (5) A Malawian toddler pauses for the camera.

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