

# Scientist warns on growing mosquito resistance

By A Special Correspondent

WHILE a new report shows the country has recorded good progress in the war against malaria, a researcher from Ifakara Health Institute (IHI) has unveiled findings requiring all stakeholders in the war against malaria to remain vigilant as there are more challenges ahead.

Dr Fredos Okumu from the IHI said on Thursday evening that while the results of the war against the disease suggested significant improvements there is evidence that mosquitoes that transmit malaria are becoming more and more resistant to those insecticides currently being used to control them.

"If this trend continues important interventions such as insecticide treated nets and house spraying, both of which have led to the successes we see today, will become less effective," Dr Okumu said.

He warned that an increasing percentage of malaria transmission now occurs outside people's houses, meaning that additional methods of malaria prevention will be necessary to eventually eliminate the disease.

"However, before any new tools are readily available, families are strongly encouraged to consistently use bed nets every night and to seek appropriate diagnosis and treatment, so as to sustain the current successes as presented in this new report," he advised.

The Ifakara Health Institute has contributed much in global malaria research. IHI studies of malaria transmission epidemiology, including mathematical modeling, demonstrated the community-wide impact of Insecticide Treated Nets (ITNs), beyond individual users.

The IHI findings helped to spur the global policy shift from targeting vulnerable groups to universal ITN coverage in endemic countries.

New results of the national malaria indicators released on Thursday by the National Bureau of Statistics show encouraging progress - particularly with regard to malaria prevalence and the use of insecticide-treated nets.

These are preliminary results from the Tanzania HIV/Aids and Malaria Indicator Survey 2011-12.

The data shows that 9.5 percent of children aged from

6 to 59 months tested positive for malaria. This is nearly half the prevalence found in 2007/8 which was 17.7 percent.

For anemia, 5.6 percent of children between 6 and 59 months were found to be severely anemic (with blood hemoglobin less than 8 g/dl). This compares to 7.7 percent in 2007/8 and 5.1 percent in 2010.

On Insecticide Treated Nets (ITN), around 70 percent of the whole population slept under an ITN the night before the survey (72 percent of children under age of five; 75 percent of expectant mothers; 69 percent of the whole population).

The proportion of households that own at least one ITN has risen from 64 percent (children) and 57 percent (pregnant women) in 2010. In 2007/8, use of ITNs was only 26 percent and 25 percent for children and expectant mothers respectively.

According to the NBS statistics, one quarter of children who suffered fever in the past two weeks were tested for malaria, and 21 percent were treated the same day or next with Alu (ACT). In 2007/8 only 14 percent of children with fever received prompt treatment with Alu.

The proportion of women who took at least two doses of SP to prevent malaria during their last pregnancy was 32 percent, similar to the result in 2007/8 (30 percent).

The results show that Tanzania has made rapid progress in the use of ITNs, reflecting the success of the distribution campaigns for under-fives and all households in 2009-10. This is probably the main reason that malaria prevalence has halved compared to 2007/8. Although anemia prevalence in children has not changed much compared to 2010, it represents half the rate found in 2004/5.

Indicators of prompt and effective treatment of malaria illness are less encouraging. Three quarters of children with fever are not tested for malaria, and only one in five were treated with Alu within 24 hours of fever onset.

Protection against malaria in pregnancy has improved due to the increased use of ITNs by pregnant women. However, the proportion receiving Intermittent preventive Treatment in pregnancy (IPTp) has barely changed compared to the last survey.

As Tanzania records good achievements in the fight against malaria, the Kenya

Medical Research Institute (KEMRI)-Wellcome Trust Research has unveiled new research that also uses cell phone data on the fight against malaria. It brought together surveys touching 15 million people in Kenya with detailed information on the regional incidence of malaria, which has shown on the largest scale so far, how human travel patterns contribute to malaria spread.

The findings from researchers at KEMRI Wellcome Trust Research Program, also involving the Harvard School of Public Health (HSPH), a reputable academic and hospital outfit in the United States, and six other institutions indicate that malaria, in large part, emanates from Kenya's Lake Victoria region and spreads east, chiefly toward the capital, Nairobi.

The study appeared in the 12 October 2012 issue of the journal Science.

"This is the first time that such a massive amount of cell phone data—from millions of individuals over the course of a year—has been used, together with detailed infectious diseases data, to measure human mobility and understand how a disease spreads," said senior author Caroline Buckee, HSPH

assistant professor of epidemiology.

Commenting on the study, Professor Bob Snow of the Kenya Medical Research Institute - University of Oxford - Wellcome Trust Research Programme based in Nairobi said Kenya is one among countries in Africa where even the most rural inhabitants have a cell phone.

Kenya is also a country where people move between regions, cities and rural areas for business, home-leave and funerals, it said, noting that as Kenya begins to succeed in reducing malaria transmission in some areas but not others, cell phone mapping of human movement between high and low risk regions becomes a valuable planning tool.

Malaria kills about one million people each year—95 per cent being children under age five in sub-Saharan Africa—and threatens 40 million globally.

To estimate malaria's potential spread, it's important to factor in not only information about the location of the mosquitoes that carry the malaria parasite, but also the behavior of the people who might be infected, said Buckee. "Since many infected people have no symptoms, they can

unknowingly carry the parasite during their travels and infect hundreds of others," the researcher noted.

Between June 2008 and June 2009, the researchers mapped every call or text made by each of 14,816,521 Kenyan mobile phone subscribers to one of 11,920 cell towers located in 692 different settlements. Every time an individual left his or her primary settlement, the destination and duration of each journey was calculated.

Then, using a malaria prevalence map to estimate the disease's prevalence in each location being studied, the researchers inferred each resident's probability of being infected and the daily probability that visitors to particular areas would become infected.

They found that a surprisingly large fraction of 'imported' infections—that is, infections that are carried by people moving from one place to another—wind up in Nairobi, with infected residents returning there after journeys to spots such as Lake Victoria or the coast.

By using disease prevalence data, added Buckee, researchers can estimate the probability that each person is carrying

malaria parasites and build a map of parasite movements between 'sour' areas (areas that mostly emit disease) and 'sink' areas (areas that mostly receive disease).

Dr Abdisalam Noor of KEMRI- Wellcome Trust Research Programme, noted that imported malaria infections contribute to risks of epidemics in low transmission areas. "The analysis provided in the paper in Science shows how we might use this information to mitigate and prepare areas subject to the highest imported infection risk," he asserted.

This kind of research—coupling 'big data' from mobile phones with detailed malaria incidence information—will be an important tool for understanding the spread of the disease, said Buckee.

Information available from the new types of analyses holds promise for helping public health officials decide where and how to control imported cases of malaria. For instance, Buckee said, officials could send text message warnings to the phones of people traveling to high-risk areas, suggesting that they use a bed net.

Why wouldn't officials in Kenya start doing so right now?

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