

Researchers use math, maps to plot malaria elimination plan

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Two University of Florida researchers and their international colleagues have used mathematical models and maps to estimate the feasibility of eliminating malaria from countries that have the deadliest form of the disease.

Andrew Tatem led a study that appears online today and in the November print edition of the <u>British medical journal</u> *The Lancet* Malaria Elimination Series.

"People need to know that the money they are spending is having an effect," said Tatem, an assistant professor with joint appointments in UF's geography department, Emerging Pathogens Institute and Center for African Studies.

David L. Smith, a UF professor and co-author of the paper, says the data suggest that Plasmodium falciparum malaria, the deadliest parasite, could be eliminated in most parts of the world in 10 to 15 years, including most areas in Asia and the Americas, if transmission could be reduced by 90 percent from 2007 rates.

Half the world population lives at risk of malaria, a disease that kills 1.2 million people each year. Ninety percent of those deaths occur in sub-Saharan Africa.

Malaria has affected Africa disproportionately more than in any other part of the world, though other areas, including Pakistan and



Afghanistan, face a growing challenge to contain a mosquito-borne illness that now has resistance to the medicines used to treat malaria and to the pesticides used to kill mosquitoes.

For five years, Tatem and Smith have collaborated with a team of scientists, geographers, statisticians and on-the-ground <u>health workers</u> to create a single worldwide database for mapping and modeling P. falciparum transmission. Their assessments in The *Lancet* Series are based on malaria's regional intrinsic transmission, the disease's toll on crippling health systems and the levels in which population movement help spread malaria across borders. Tatem and Smith's analysis may give the public health community a tool it needs to most effectively allocate financial and technical support for regions whose citizens suffer with the disease.

The UF researchers also evaluated the relative feasibility between countries of *P. vivax* elimination, another deadly form of malaria, though no comparable worldwide database currently exists to map the levels of risk for that strain.

Thirty-two of the 99 countries that still have endemic malaria have started to eliminate the disease from within their borders, and Tatem and Smith assert that, generally, countries in South America appear to be in the best position to succeed at elimination. Many sub-Saharan African nations rank at the bottom of the researchers' list of countries of relative feasibility for <u>malaria elimination</u>, including Angola, Chad, Somalia, and the Democratic Republic of Congo, places plagued by unstable governments and systemic poverty.

"Civil and economic strife is always good for malaria and bad for the people," said Smith, associate director for disease ecology at the UF Emerging Pathogens Institute and an associate professor of zoology. He added that there are signs of success in Africa, as several countries have



scaled up malaria control programs. "Some African nations, such as Tanzania, Kenya and Botswana, are in a better position than others to fight <u>malaria</u>," Smith said.

Provided by University of Florida

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