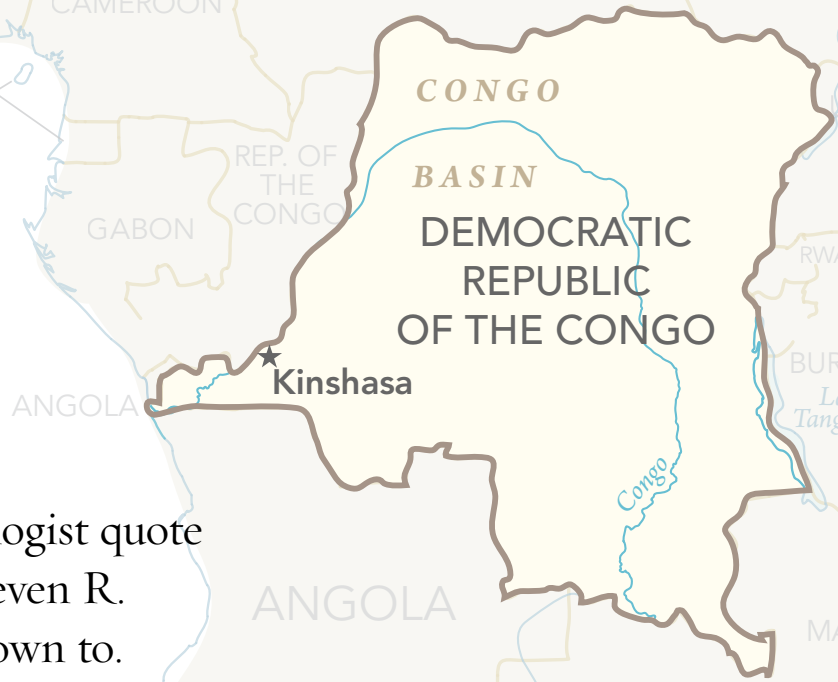
Tracking tropical disease



You may not hear an epidemiologist quote a politician very often, but Steven R. Meshnick, MD, PhD, has been known to.

"As the late Senator Daniel Patrick Moynihan once said, 'You can't solve a problem until you first learn how to measure it,'" says Meshnick, who leads a highly collaborative Gillings Innovation Laboratory project to quantify cases of HIV and tropical disease in the Democratic Republic of the Congo (DRC).

Infectious diseases are the leading cause of death and disability in developing countries such as DRC. Yet remarkably, international health and development organizations don't have good figures on how many people suffer from these diseases.

"There aren't reliable estimates or maps of where people are," says Meshnick, an epidemiology professor at UNC Gillings School of Global Public Health. "This is a burning public health problem."

And he's about to help extinguish it, first for the DRC and then for other countries that undertake similar projects. In April 2010, Meshnick planned to share his team's results with the DRC's Ministry of Health, after which the team was to write formal reports of their findings. Such information will allow aid groups to make better decisions about where to expend money and resources.

Meshnick's interdisciplinary team has spent more than a year analyzing dried blood-spot samples for prevalence of disease. The team includes epidemiologists, geographers, molecular biologists and tropical disease experts.

Under the guidance of three doctorate-level Congolese researchers, two labs in Kinshasa, DRC, are extracting serum from samples to gauge levels of African sleeping sickness. At UNC-Chapel Hill, the lab is measuring HIV and malaria.

Researchers at UNC include epidemiology postdoctoral fellow Steve Taylor, PhD, microbiology doctoral candidate Martha Clark, geography doctoral candidate Jane Messina, assistant professor of microbiology Julie Nelson, PhD, and associate professor of geography Mike Emch, PhD.

The team records where people who have the diseases are located. A high prevalence of HIV was found in the war-torn eastern areas, for instance. There also is a high prevalence of malaria not only in rural areas, as expected, but in densely populated areas around Kinshasa.

KATHRYN JOHNSON

Dr. Steven Meshnick (right) works with Kashamuka Mwandagalirwa (left) and Jeremie Muwonga to sort dried blood-spot samples.

Dr. Steven Meshnick

"We are currently looking into whether HIV or drug-resistant malaria tends to associate with refugee camps," Meshnick says.

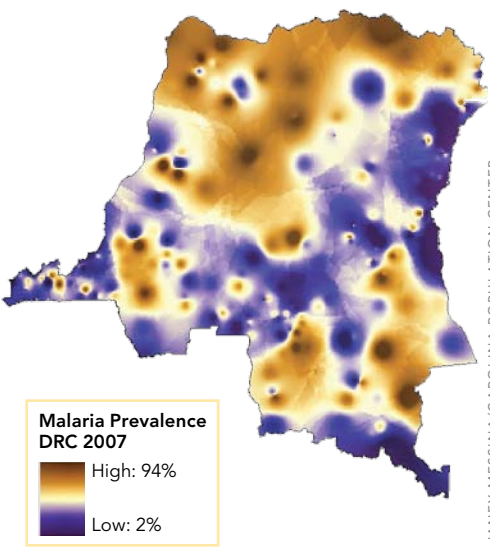
The team also looks at its data in light of information from the Demographic and Health Survey conducted in the DRC in 2007, which featured interviews with nearly 9,000 households. Surveyors also obtained dried blood-spot tests to check for HIV, and that's where Meshnick's team got its samples.

"We got the leftovers," he says.

But the "leftovers" were enough for a project that Meshnick believes will evolve into something more extensive over the next decade. Gene chips now being developed will allow robots to analyze far more about DNA than current methods can. These chips can look at thousands of antibodies and pathogens from a dried blood spot.

"Ultimately, we could look for any disease you can imagine," Meshnick says. ■

–Susan Shackelford



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