



## Antibiotic Resistance: What the WSU Paul G. Allen School for Global Animal Health is doing to help solve this global health crisis



*Dr. Douglas Call (left) with Beatus Lyimo, a graduate student at the Nelson Mandela African Institution for Science and Technology. They are working in the lab at the Mandela Institution where Dr. Call and his team process samples to analyze for antibiotic resistance.*

Bacteria can do something remarkable. They can share genes. So if one bacterium is resistant to a particular antibiotic, such as penicillin, it can pass that resistant gene to another bacterium. That bacterium will become resistant and can pass its resistant gene to another bacterium. And they can keep the resistance for a long time. That allows antibiotic resistance to spread widely.

This highly adaptable behavior, while good for bacterial survival, poses a major risk to human health. Treatments for common infections are becoming ineffective in some parts of the world, according to a recent report by the World Health Organization. Globally, there are already very high rates of antibiotic resistance for urinary tract infections and pneumonia.

Standard recommendations to reduce antibiotic resistance include using antibiotics only when medically necessary. The FDA recently released guidelines

to discontinue the use of antibiotics in food animals who are not showing signs of illness. U.S. prescription guidelines for people are created to help ensure antibiotics are only prescribed when someone has a bacterial infection, not a viral illness. Both will have some impact. But according to researchers at the Paul G. Allen School for Global Animal Health, it is unlikely to do enough.

“Treatment guidelines in the United States alone are not sufficient to solve the problem,” said Guy Palmer, director of the Paul G. Allen School for Global Animal Health.

In many parts of the world, antibiotics are sold over the counter or the quality of the antibiotics is not well regulated, said Palmer. And because the spread of resistant bacteria is accelerated by travel and transporting food, or by more people moving into urban areas—particularly those with poor sanitation—the problem is much more complicated.

“The movement of people and food makes it a global issue,” said Palmer.

Because antibiotic resistance is a complex problem, scientists at the Allen School are taking several approaches to understand the emergence and spread of antibiotic resistance. Researchers are looking at the transmission of resistant bacteria (how it spreads from animals to animals or animals to humans) and how bacteria maintain their resistance to antibiotics. They are also identifying reservoirs, such as untreated water or soil, that can harbor resistant bacteria. Many reservoirs also provide ways for bacteria to travel.



*Rabies vaccination team in Rebanda, Tanzania. From left, Machunde Bigambo, assistant project manager; Constance Niva, WSU Regent; Dr. Imam Mzimhiri, project manager and veterinarian; and Paulo Tembo, field assistant and mechanic.*

## Message from the Director

Meeting the global health mission of the Allen School—one that extends from basic science discovery to assessing the health and socioeconomic outcomes of interventions—requires continual strategic evaluation of our project portfolio. How can we best focus our resources to achieve and sustain global impact? Fortunately, we have been able to call on a wealth of talent and experience to provide us with perspective and advice. An important aspect of this guidance has been those individuals who have dedicated their time and expense to observe and review our global programs. In addition to the program officers at the Paul G. Allen Family Foundation (notably Dr. Kathy Richmond), College of Veterinary Medicine Dean Bryan Slinker, practicing veterinarian and WSU Trustee Dr. Kyle Frandle, and WSU Vice President for Government Relations Colleen Kerr, have traveled to Africa to meet with key partners, review programs on the ground, and provide forward guidance. Most recently, the immediate past chair of the Board of Regents, Constance (Connie) Niva, joined Allen School faculty in Kenya and Tanzania to help assess ongoing programs as diverse as rabies vaccination and elimination strategies as part of the Serengeti Health Initiative, the impact

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