

Raising mosquitoes is an arduous task but as insecticide resistance increases, the insectary team at the Vestergaard-NMIMR Vector Labs in Ghana knows a fierce commitment is what it will take to support the deployment of more effective mosquito nets against malaria.

[L'article en français](#)

Every day before 8am, Alidu, Sammy, Ibrahim and Sampson are dressed in their lab coats and shoes at the Vestergaard-NMIMR Vector Labs (VNVL) in Accra, Ghana, ready to commence their day of work.

The work of raising mosquitoes in an insectary is constant and laborious, and routines are crucial.

But despite the arduous commitment, VNVL's insectary team remains fiercely motivated to generate enough adult mosquitoes for large-scale testing of insecticide-treated bednets.

Ibrahim says it's incredible to witness what he had learned in his biology studies occur right before his eyes.

"Far back in high school when we were being taught about the mosquito life cycle from the egg stage to adulthood, it was basically theoretical. But you appreciate it when you see the physical things in front of you. [This] motivates me," he says.



Alidu, Sampson, Ibrahim and Samuel rear the mosquitoes at the insectary used for the large-scale testing of insecticide treated nets.

For Sammy and Sampson, it's about the pride of contributing to the global fight against malaria.

"Malaria is the most deadly disease in the world. Since I know that here I will help to fight against malaria, I'm happy," Sampson says.

Sammy finds it fascinating to work with one of the smallest yet deadliest insects in the world, knowing that he is making a difference.

"By breeding mosquitoes, I'm helping to control the spread of malaria and saving people's lives," he says. "In our own small way, we are contributing to saving the lives of many people — not only our families, but lives of other people who will play relevant roles in their

countries and in the future.”

Incessant demands

VNVL’s insectary produces more than one million mosquitoes per year, a combination of susceptible and insecticide resistant *Anopheles gambiae*, and can also support wild strains.

“Mosquitoes are capable of prodigious reproduction,” the lab workers explain.

“They multiply in large numbers. Five hundred mosquitoes can lay 100 eggs each, providing a total of 50,000 eggs per cycle,” Alidu says.

Keeping up with the cycle is a major undertaking; workers often have to pick up each mosquito pupa, sometimes as many as 2,000 pupae each day.



Sampson picking pupae in larval room.

“The daily activities at the insectary are loaded and cannot be taken as a part-time job,” Alidu says.

Mosquitoes need attention seven days per week, 52 weeks of the year. Alidu, Ibrahim and Dominic, who works at another lab, modify their working days to make sure the insectary is covered throughout the weekend.



The insectary team continually seeks to make improvements to processes, such as using a Hemotek system to feed the mosquitoes instead of live rabbits.

The insectary team continually seeks to make improvements to processes and outcomes to ensure VNVL is well placed to meet future challenges. For example, mosquitoes are no longer fed on live rabbits but instead a Hemotek system where mosquitoes feed from heated receptacles that hold small amounts of sheep blood behind artificial membranes. In addition, the team works constantly to improve and update their skills to ensure they keep abreast of global insectary trends and techniques.

Research for the future

Insectaries play a critical role in the product development and quality control of long-lasting insecticidal nets (LLINs), which effectively kill mosquito vectors of malaria on contact, and may also repel them, before they feed on sleeping humans.



Alidu cleans dead mosquitoes from adult cages in the insectary.

LLINs have significantly reduced malaria morbidity and mortality over the past two decades, particularly in Africa, which accounted for 94 per cent of all malaria deaths in 2020, according to the [World Health Organization](#).

The world's largest producer of LLINs, Vestergaard set up VNVL as part of a public-private partnership with the [University of Ghana's Noguchi Memorial Institute for Medical Research \(NMIMR\)](#) in November 2011.

Since its creation, the facility has become crucial to the deployment of high-quality LLINs across sub-Saharan Africa. To date, it has generated mosquitoes used in over 800,000 tests.

And as mosquitoes adapt and their resistance to insecticide increases, VNVL continues to play a vital role in the research and development of effective vector control tools and in

providing opportunities for knowledge sharing, capacity building and collaboration.