

## **A political crisis, coronavirus and mounting insecticide resistance are just some of the challenges faced by the Vestergaard-NMIMR's Vector Labs in Ghana.**

[L'article en français](#)

Every successful project relies on dedication to overcome challenges. It was this drive that pushed Joseph Chabi to start a colony of mosquitoes in his bedroom.

His growing insectary would eventually be used in a lab created by Vestergaard and the [Noguchi Memorial Institute for Medical Research \(NMIMR\)](#) in Ghana to rigorously test long-lasting insecticidal nets (LLINs).

An innovator in the field, Vestergaard had been testing at its manufacturing sites in Vietnam. But it soon became clear that testing must be done in Africa, home to around 95 per cent of malaria cases and deaths.

Malaria control is a fight, but the complex and demanding task of rearing mosquitoes to support that fight is a battle of its own.

In 2011, while waiting for the lab to be built, Senior Research Assistant Mr Chabi tended to his mosquito eggs.

“My first intent was to rear the first larvae and produce adults. Soon I had four students joining me every morning in my apartment to test all the net samples that the company was making and sending.”



Before the Vestergaard-NMIMR Vector Labs were built, Joseph Chabi reared mosquitoes and conducted testing in his home.

Creating the lab had been tough enough.

A year earlier, Mr Chabi had begun testing in a lab in Abidjan in Côte d'Ivoire, where the first collaboration initiated by Vestergaard started. But the Ivorian political crisis forced the organisation to move the lab to Ghana, where it formed a new collaboration with NMIMR, in the University of Ghana.

"Those were difficult days," Mr Chabi said. "We had to start everything from scratch. Putting down the first brick, trying to get partners, trying to get builders, everything."

Six months later, Vestergaard-NMIMR Vector Labs (VNVL) opened their doors, and this November Vestergaard and NMIMR celebrate 10 years of partnership.

## **Innovation, teamwork and collaboration**

As well as monitoring existing tools, VNVL supports the research and development of new vector control tools.

The battle against malaria is intensifying. The [World Malaria Report 2020](#) indicates that the reduction in cases achieved between 2000 and 2015, due largely to the wide deployment of LLINs, seems to have stalled as insecticide resistance has increased.

Innovation is key. Vestergaard's pyrethroid-only LLINs ([PermaNet® 2.0](#)) have morphed into Piperonyl Butoxide (PBO) pyrethroid nets ([PermaNet® 3.0](#)), which use a synergist that recovers the susceptibility of certain types of resistant mosquitoes. Even more complex products are in the pipeline.

"We have been able to provide a lot of data that offers assurance to the population who buys the nets," Mr Chabi said.

Melinda Hadi, Vestergaard's Director of Market Development and Access, Public Health, spent two years in Ghana during VNVL's setup. She feels privileged to have watched the facility grow.

"Its strength today is a credit to its staff," she said, which in 2021 consists of 14 Ghanaians, with women making up the majority of the management team.



The VNVL team celebrates their 10th anniversary in November 2021

“A lot of our staff are graduates of Ghanaian universities. We believe in developing young scientists, that’s been part of the partnership with NMIMR.”

Collaboration with external partners is central to research and innovation. Over the decade, NMIMR has worked with academic institutions and vector control stakeholders worldwide. VNVL offers collaborators high insectary capacity and bioassay testing capabilities for both laboratory and field-based trials, provides entomology training, and hosts local and international research projects.

“It’s a great example to show what can be done if you have a plan and a commitment,” Ms Hadi said.

## **Unique strengths**

Dr Eleanore Sternberg was hired through the Liverpool School of Tropical Medicine to work with Vestergaard. She oversees VNVL's day-to-day operations and describes the public-private partnership between Vestergaard and NMIMR as "unique".

"NMIMR has created space for the labs, literally by providing land, the resources and the personnel but also metaphorically by creating space in their research community. Vestergaard has provided the funding and shaped the mission of the labs. VNVL is in a position to be able to do independent testing and research consistently without having to worry about the grant cycle that weighs on academic researchers. We should be really proud of the relationship."

Ms Hadi said Vestergaard's ability to conduct its testing internally stands it apart.

"Testing is a core element to how we approach our work both in innovation but also in our quality assurance program."



Senior research assistant, Joannitta Joannides coats Wheaton bottles with insecticide in the VNVL bioassay lab

Rearing mosquitoes is complicated, said Chief Research Assistant Rebecca Pwalia. But the team has risen to the task; even during the COVID-19 pandemic, the labs remained open.

“It’s very tiring work. As someone always needs to cover the insectary, we have to be flexible with our schedules, which sometimes requires working at weekends or holidays. But the team takes the role seriously. I would say we have the best insectary in the country because we have mosquitoes all year around.”

### **‘Exciting time’ in vector control**

A decade on, Vestergaard and NMIMR see a bright future for their partnership.

Medical entomologist Dr Samuel Dadzie, a Senior Research Fellow in NMIMR's Parasitology Department, believes the war against malaria may be winnable.

"We need to think outside the box," he said. "We hope we can develop new vector control tools and new innovations to push us towards elimination of vector-borne diseases including malaria."

As the fight against insecticidal resistance reshapes the vector control landscape in new and complex ways, Dr Sternberg said products must also become increasingly diverse.

"It's an exciting time in vector control," she said. "It would be great to have more diversity in the types of resistance we can test against. Insecticides act differently on different mosquitoes."

Dr Sternberg and Ms Pwalia agree more complex testing will require staff with a thorough understanding of entomology and mosquitoes.