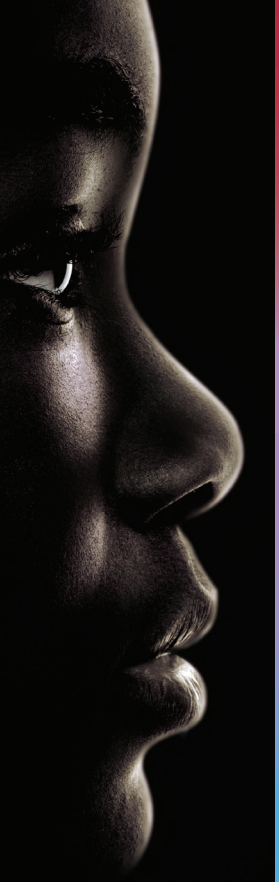

IVCC
Delivering the mission

Why 3 active ingredients?

Three is the magic number for creating a new era in vector control where insecticide resistance is no longer a challenge

Over a million lives have been saved in the past 10 years as drugs and insecticides have enabled malaria control programmes to challenge the disease. But the success of the widespread interventions that have been implemented also threatens future progress.

The malaria parasite is developing resistance to current drugs, and the mosquito that transmits the parasite to humans is developing resistance to insecticides. Without both working well it will be impossible to eradicate malaria.

Insecticide treated bednets and indoor residual spraying have proven to be effective methods of vector control. But they depend on only four classes of insecticide for IRS and just one, the pyrethroids, for bednets. Insecticide resistance threatens the effectiveness of all four classes and resistance to pyrethroids has been detected in over 64 countries.

IVCC was established to tackle the problem of insecticide resistance, and develop new tools and insecticides to continue the efficacy of vector control in the battle against malaria and other insect borne diseases.

Over the past five years our industrial partners have searched their chemical libraries—over four million compounds—and have identified nine classes of novel active ingredient, which could form the basis of new insecticides.

The next task is to choose three of these new active ingredients to take to the stage of full development, which will take about seven years. But why are three new active ingredients needed, when one or two new insecticides will control mosquitoes?

Resistance becomes detectable much quicker when only one insecticide is used. 1 in 10 million mosquitoes are naturally resistant to one insecticide, 1 in 100 trillion are resistant to two forms of insecticide and 1 in every 10^{-28} (there is no word for this number) is resistant to three.

Despite there currently being four classes of insecticide available, they have only two modes of action. And all four current classes are compromised by growing insecticide resistance—not surprising when all of them have been in use for more than 20 years. New public health insecticides are long overdue.

By developing three new insecticides that retain many of the qualities of pyrethroids, but without insecticide resistance, we will be giving insect-borne disease control programmes the tools that are needed to protect lives for the foreseeable future.

Using at least three insecticides in rotation or mosaics means that the mosquito population has little chance of developing future resistance.

It is over 30 years since a new insecticide was developed that was suitable for public health purposes. Pyrethroids have served the global health community well—saving lives, protecting health and increasing prosperity in communities once devastated by malaria. But a new generation of insecticides is critical to the lives and wellbeing of millions in the future. And the need is urgent. The insecticide resistance time-bomb is ticking.

By fully developing three new active ingredients, and working together in a planned programme with better drugs and vaccines, we can help build a world free of the scourge of malaria.