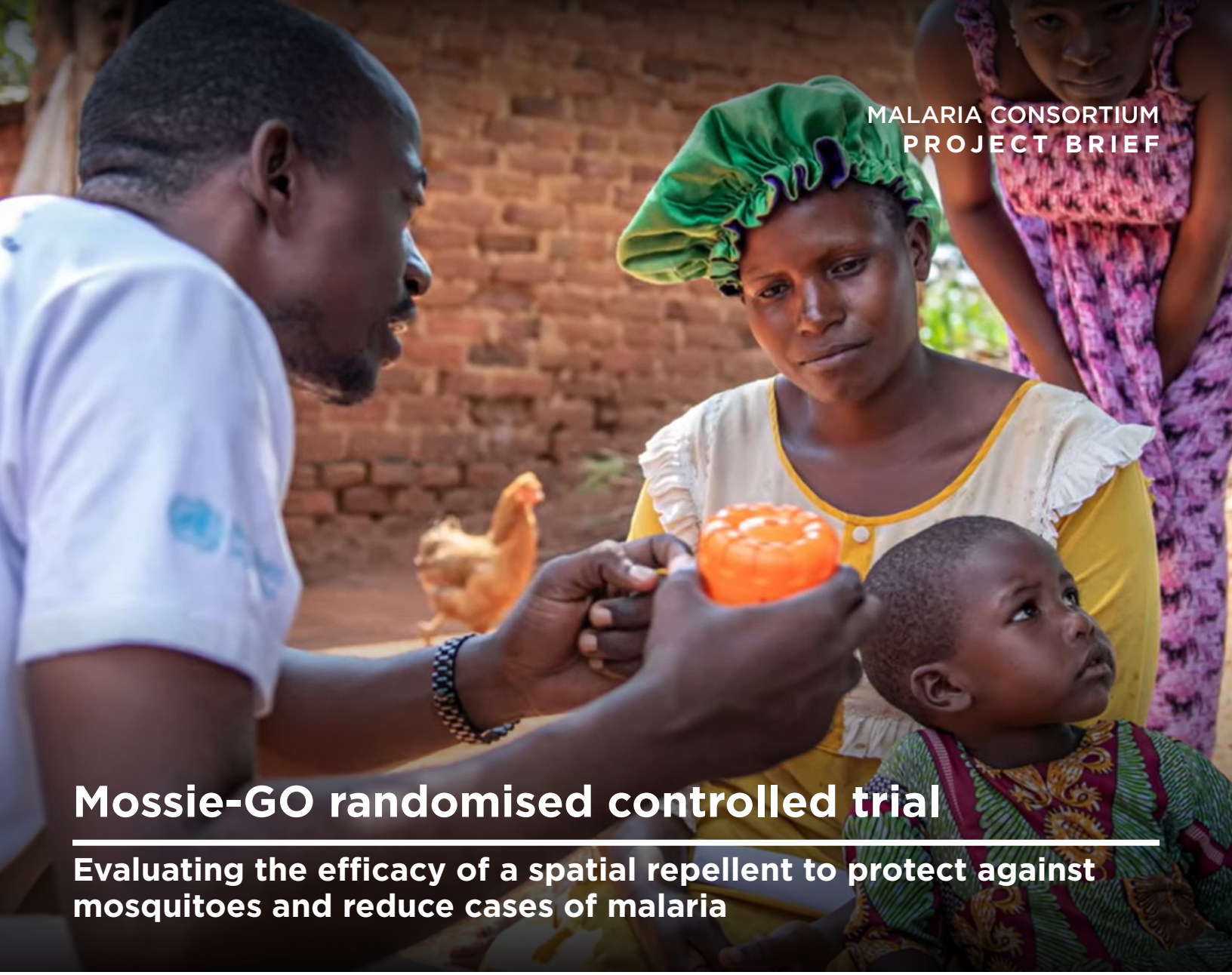


MALARIA CONSORTIUM
PROJECT BRIEF

Mossie-GO randomised controlled trial

Evaluating the efficacy of a spatial repellent to protect against mosquitoes and reduce cases of malaria

Background

In 2023, of the 597,000 deaths attributed to malaria globally, 95 percent occurred in Africa.[1] Uganda had the third highest global burden of malaria cases (4.8 percent) and the tenth highest level of deaths (2.7 percent).[1] Progress towards malaria elimination is threatened by challenges including insecticide resistance, and limitations in coverage of existing vector control tools due to increasing costs.

Spatial repellents reduce human–vector contact by repelling the vector, making the host more difficult for the vector to locate and inhibiting biting.[2,3] Repellents provide protection against biting in enclosed, semi-enclosed and peri-domestic spaces. Some existing spatial repellent devices require a source of external power or heat to diffuse and disperse the volatile active ingredients; however, many houses in sub-Saharan Africa have limited or no access to electricity. The Mossie-GO — a solar-powered device that actively distributes the insect repellent transfluthrin through a non-heat fan system — provides an alternative to traditional electricity-powered devices.

Country
Uganda

Donor
Innovate UK grant, via Africa Power

Length of project
January 2024 – December 2025

Partners
Africa Power
Arctech Innovation
KuaSolar
SolarMed

Project outline and objectives

Malaria Consortium and project partners will carry out a cluster-randomised placebo-controlled trial in Jinja and Buikwe districts, eastern Uganda. The trial aims to evaluate the protective efficacy of the Mossie-GO spatial repellent device in children under five years of age living in areas of moderate to high malaria transmission.

The Mossie-GO is a solar-powered device fitted with discs that are impregnated with the repellent transfluthrin and a carrier oil. The discs, which need to be replaced every month, sit above a small fan that distributes the repellent around the room to kill mosquitoes. The device is attached to a solar cell unit that must be placed in direct sunlight to charge during the day for use in the evening and overnight.

A total of 56 clusters of households have been randomly assigned to one of two study arms, to receive either the repellent device or a placebo device containing blank discs with no active ingredient. Households have been asked to continue using other malaria prevention practices, such as mosquito nets, as recommended by national policy.

Malaria Consortium will measure the impact of the device on reducing the prevalence of malaria infection in children ≤5 years of age, and on entomological factors linked to disease transmission, including vector densities, biting rates and host-seeking behaviour. Insecticide resistance in the local mosquito population will also be explored.

Activities

Trained village health teams have distributed 9,431 Mossie-GO devices to households in both Buikwe and Jinja districts. They will return to replace repellent discs at monthly intervals to provide sustained protection. Households in the control arm receive blank discs with no active ingredient.

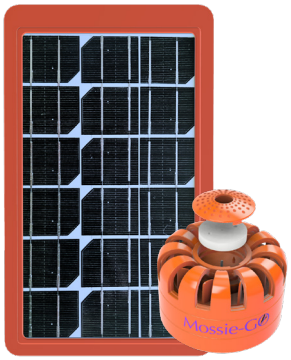
Trained research assistants will monitor recruited households at six-monthly intervals. Children under five years will be tested for malaria over a period of up to 12 months. Every six months, vector populations will be monitored: indoor light traps will run overnight to collect mosquitoes in selected households, and human landing catches — when people sit with their lower legs exposed and collect the mosquitoes that come to feed on them — will be conducted inside and outside households. Air sampling will be carried out to determine concentrations of transfluthrin in the air.

An acceptability survey and a household survey to collect information on participants' behaviour related to malaria exposure and their use of existing control tools will also be conducted.

Outcomes and impact

Providing evidence of the efficacy and acceptability of the Mossie-GO spatial repellent in preventing malaria in children under five in a real-world setting. The evidence generated from this study will be shared with policy makers in Uganda and other countries, to inform the choice of suitable vector control measures.

Addressing health inequalities by broadening the range of malaria prevention measures that can be used by households that lack access to a reliable power source. Adding an effective intervention to the vector control toolbox that can be used alongside existing measures would ultimately help to reduce morbidity and mortality from malaria.



Mossie-GO and solar panel devices

AFRICA POWER DETERMINE • DEVELOP • DEPLOY KuaSolar SOLARMED

References

1. World Health Organization (WHO). World Malaria Report 2024. WHO; 2024.
2. WHO. Guidelines for efficacy testing of spatial repellents. WHO; 2013.
3. Ogoma SB, Ngonyani H, Simfukwe ET, Mseka A, Moore J, Maia MF, et al. The mode of action of spatial repellents and their impact on vectorial capacity of *Anopheles gambiae sensu stricto*. PLoS ONE, 2014; 9(12): e110433.

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Cover image: Village health team distributes Mossie-GO device to family, Uganda

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