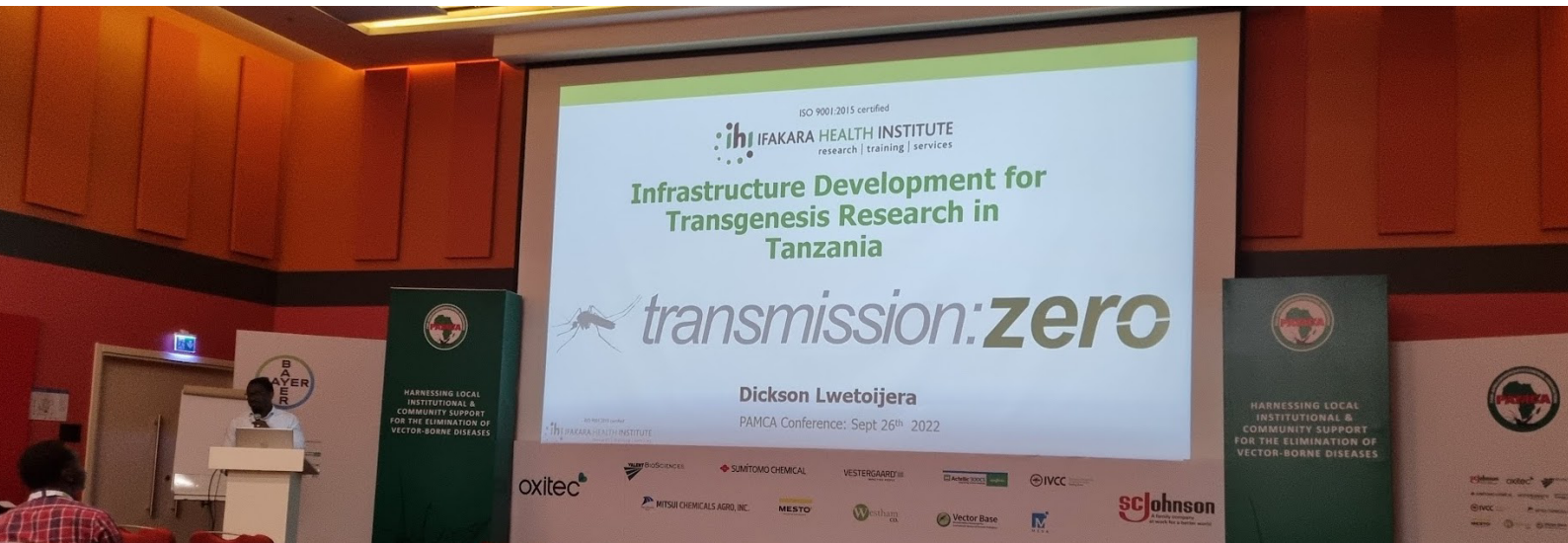


Transmission Zero

An international malaria research programme



FACTS AT A GLANCE

TYPE OF ENTERPRISE

Not-for profit research programme

NAME

Transmission Zero or T0

PARTNERS

Imperial College London
(ICL, United Kingdom)
Ifakara Health Institute
(IHI, Tanzania)
National Institute of Medical
Research
(NIMR, Tanzania)

ESTABLISHED

2016

WEBSITE

www.transmissionzero.org

FOLLOW

Twitter: @transm0

CONTACT

T0@ic.ac.uk

Transmission Zero is an international research programme that strives to develop and test mosquito population modification gene drives for malaria elimination. Its modular effector and drive systems, rooted in minimal genetic modifications of the mosquito genome, will allow for staged, adaptive and educated development and testing of vector control interventions in semi-field and field settings.

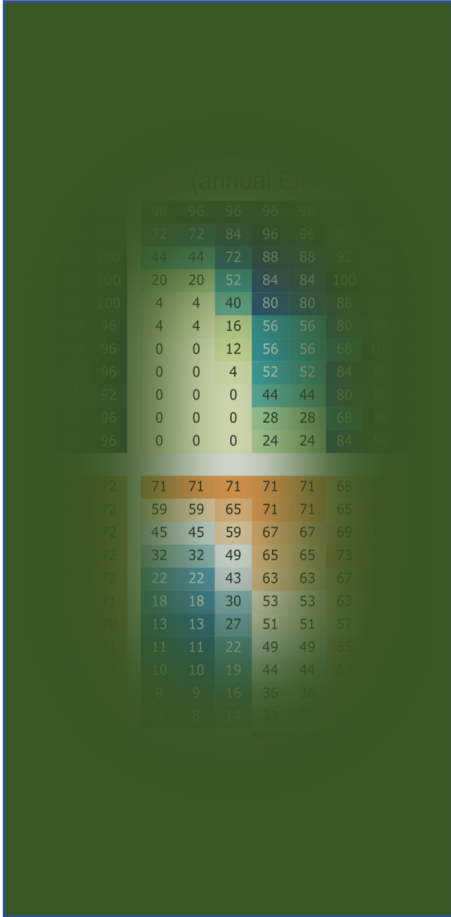
MISSION & VISION

Since 2015, progress in tackling malaria has been stalling. In sub-Saharan Africa, populations at risk of malaria have increased, coverage of vector control interventions has flattened, and available tools are compromised by the rise of resistance. New efficient and equitable tools to reduce and eliminate malaria are needed. Transmission Zero has been developing genetic vector control tools that aim to reduce malaria transmission by mosquitoes. These tools are developed and tested in close partnership with local research institutions.

BACKGROUND

Vector population modification or replacement refers to replacing disease vectors with others that cannot transmit the disease. Transmission Zero, established in 2016, aims to develop and trial new concepts for vector population replacement based mainly on modular genetic designs. It is currently founded on a close partnership between Imperial College London (ICL), the Ifakara Health Institute of Tanzania (IHI) and the Tanzanian National Institute for Medical Research (NIMR).

Transmission Zero develops new and equitable vector control tools to help end malaria transmission in Africa.



SCIENCE

Transmission Zero’s genetic designs of vector population modification drives differs from the canonical concept in that it uses a stepwise and adaptive approach for the development and testing of such scientific concepts. The leading concept involves the functional and physical separation of the transmission-blocking effector and gene drive into distinct constructs and strains, thus allowing the development and evaluation of effector strains in endemic settings without the gene drive component. In addition, constructs and strains expressing a static source of the drive can be used to augment the frequency of the effector without causing a population-wide gene drive, allowing a wider yet contained spread of the effector. All genetic modifications are minimal and, when possible, fully integrated within a host gene (Integral Gene Drive or IGD), thus also reducing the risk of emergence of resistant alleles to the effector and/or the drive.

OBJECTIVES

Capitalising on a number of successes and the favourable enabling environment generated to date, Transmission Zero aims to bring the technologies developed a step closer to application, while at the same time continue enriching its portfolio of tools and fully uncovering their mechanisms of action and impacts. The ultimate goal is for the programme to be in position to proceed to field testing of a population-wide modification gene drive by 2030.

Half of the world’s population is at risk of contracting malaria, a disease caused by *Plasmodium* parasites that are transmitted from one person to another through bites of Anopheles mosquitoes. In 2021 alone, there were over 247 million cases and 619,000 deaths from malaria, mostly children below 5 in sub-Saharan Africa. With current measures failing to halt disease transmission, the vision of Transmission Zero to modify mosquitoes so that they are unable to transmit the disease could be game changing.

STAKEHOLDER ENGAGEMENT

Before any work involving genetically modified mosquitoes commences, Transmission Zero seeks and is provided approvals by all relevant Institutional and State authorities.

WORKING WITH COMMUNITIES

Transmission Zero engages with community stakeholders on the use of genetically modified mosquitoes for malaria transmission research and control. These include academic and research institutions, state regulators and other relevant authorities, and the public.