Malaria : Where do gene drive technologies fit in?

Malaria is a threat to life, health and well-being with **228 million people infected** worldwide in 2018 and **3.3 billion at risk**. Africa is the region most affected by the disease. In 2018, it recorded 213 million cases or 93% of the global number of infections and accounts for most deaths from the disease (94% of the total).[1]

Malaria represents a tremendous public health challenge for countries in the region, who have dedicated considerable efforts and resources to reducing the impact of the disease for decades.

To fight this disease **we need innovative approaches** that will work in the most malaria-affected countries in Africa. Novel ways to tackle mosquito control and decrease malaria transmission are needed for several reasons:

- Mosquitoes and the malaria parasite are becoming increasingly resistant to current methods, which is reducing the efficiency of existing tools and requires adding new tools to manage this change in behaviour.
- The costs and difficulty of having to carry out repeat interventions over vast and often remote rural areas has made it difficult to keep the level of coverage high enough and consistent over time, and it is stretching the financial and human resources available to carry out these interventions on a regular basis.
- While human behaviour change is important to reduce the risk of infection, it is also a process that takes a long time. It can be challenging to achieve and it will not on its own end malaria transmissions.

Gene drive is one of the novel approaches being investigated that could potentially complement existing ones by increasing their efficiency and addressing existing challenges.

Gene drive could be a 'first mile' or 'last mile' intervention as part of an integrated approach to malaria control. As a first mile, it would increase the efficiency and lower the cost of current methods; as a last mile, it would help stop transmission in areas that have achieved important improvements in lowering cases but are not managing elimination, in particular in remote rural areas.

Gene drive technologies are not a silver bullet. They should rather be considered as one additional tool to deploy as part of locally-appropriate malaria strategies. Our mosquito-focused malaria prevention approach would achieve protective benefits without interfering with people's daily lives. It would provide protection for everyone in the community, regardless of their education, wealth or ability to access healthcare services and without requiring a behaviour change. And because the gene drive mosquitoes would do the work of reducing their own population, it could be a cost-effective and long-term solution.

1 *WHO (2018) Analysis of research and priorities for malaria - https://www.who.int/research-observatory/analyses/malaria_rd_priorities_working_paper.pdf?ua=1*