OVERCOMING THE GROWING THREAT OF INSECTICIDE RESISTANCE

Statement by ZERO by 40 Partners
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The growing threat of insecticide resistance in mosquito vectors of malaria has the potential to undermine the significant gains that have been made in the fight against the disease since the turn of the century. Given the limited range of insecticide classes available for malaria vector control the urgency to complement the current products with different classes of chemistry, as well as novel interventions, is well-recognized.

In recent years, the ZERO by 40 industry partners (BASF, Bayer, Mitsui Chemicals, Sumitomo Chemical and Syngenta) have been working successfully with IVCC, and other stakeholders, to discover, develop and bring to market new insecticides with novel modes of action to control mosquitoes and prevent malaria transmission. For these innovations to have long term impact, the vector control community and ZERO by 40 partners recognise that their use must be carefully managed through integrated vector management (IVM) and insecticide resistance management (IRM) strategies, tailored to local needs and available resources. The goal of IRM is to prevent or delay the evolution of resistance in pest populations to the insecticides used for their control.

Effective IRM programmes should include the planned rotation of both solo-insecticide products and insecticide mixtures to reduce the selection pressure to mosquitoes to any single mode of action chemistry, or chemical class to preserve the useful life of existing insecticide-based interventions.

Using insecticides that were primarily developed for use in agriculture brings many advantages compared to the development of novel active ingredients specifically for vector control, including speed to market, lower risk of development failure and reduced costs in development, but we know this brings potential disadvantages as well. Prior exposure of these classes of insecticide to malaria vector populations, for example through agricultural or (less commonly) household use, means that selection towards reduced susceptibility to that class of insecticides may already exist. The geographic relevance of this needs to be considered in the planning of malaria vector control operations, and it reinforces the need for pro-active, surveillance and resistance management strategies to protect such newly available products as well as older chemistry.

The ZERO by 40 partners are committed to support the local implementation of robust, science- based IRM programmes that effectively delay selection for insecticide resistance: ensuring the technical and financial sustainability of national programmes. We commit to working with all stakeholders, including NMCPs, regulators and other departments of national and local government, through the following means:

- Continued development and supply of a toolbox of new products, using novel mode-of-action insecticides, designed and deployed to minimise resistance development.
- Promoting product rotations which aim to expose mosquito populations to multiple modes of action over time, as well as best-practice insecticide use, to further reduce the likelihood of resistance development.
- Ensuring product-related information is clear in the context of IRM guidance, for example through product labels (as already practised in agriculture), regular stakeholder engagement, communication, training and educational materials to inform all those involved in vector control programmes of best practice IRM.
- Supporting the monitoring of insecticide susceptibility in mosquito populations, which is the foundation on which all IRM is based.

Preserving and extending the efficacy of all insecticide-based tools used in vector control, through scientifically-sound insecticide resistance prevention and management, is critical to achieving our collective goal of eradicating malaria by 2040.

NOTES

The ZERO by 40 partners are also members and sponsors of the Insecticide Resistance Action Committee (IRAC) which was formed in 1984. IRAC's mission is to facilitate communication and education on resistance to insecticides and insect-resistant traits and promote and facilitate development and implementation of resistance management strategies to maintain efficacy and support sustainable agriculture and improved public health.

For more information on IRAC go to www.irac-online.org/teams/public-health/